

Decision

Statement of principles for the regulation of electricity transmission revenues —background paper

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Contents

Glossary	iv
Summary	vii
1 Introduction	1
1.1 Electricity industry reform	1
1.2 The ACCC's role as regulator of transmission revenues	2
1.3 Draft regulatory principles	2
1.4 Application of the statement of principles for the regulation of transmission revenues	3
1.5 Transition to SRP	3
1.6 Guidelines	4
1.7 Decision	7
2 Regulatory framework	9
2.1 Introduction.....	9
2.2 Objectives and form of regulation	9
2.3 Overview of the transmission sector	11
2.4 Natural monopoly and price regulation	12
2.5 Incentive regulation.....	13
2.6 Factors to be taken into account in the design of an incentive regime	16
2.7 Outline of regulatory principles	18
2.8 Decision	21
3 Revenue cap decision making process	24
3.1 Introduction.....	24
3.2 Issues.....	24
3.3 Code requirements	25
3.4 Draft SRP	26
3.5 Submissions from interested parties on draft SRP	26
3.6 ACCC's considerations	27
3.7 Decision	32
4 Asset base	36
4.1 Introduction.....	36
4.2 Issues.....	36
4.3 Code requirements	37
4.4 Draft SRP	37
4.5 Submissions by interested parties on draft SRP.....	40
4.6 ACCC's considerations	40
4.7 Decision	42
5 Incentive framework for capital expenditure	43
5.1 Introduction.....	43
5.2 Issues.....	44
5.3 Code requirements	45

5.4	Draft SRP	46
5.5	Submissions from interested parties on draft SRP	48
5.6	ACCC's considerations	52
5.7	Capex incentive mechanism.....	55
5.8	Arrangements for separate network planners and owners	60
5.9	Decision	61
6	Incentive framework for operating and maintenance expenditure.....	64
6.1	Introduction	64
6.2	Issues	64
6.3	Code requirements	65
6.4	Draft SRP	65
6.5	Submissions by interested parties on draft SRP.....	65
6.6	ACCC's considerations	66
6.7	Decision	73
7	Reopening the revenue cap.....	76
7.1	Introduction	76
7.2	Issues	76
7.3	Code requirements	76
7.4	Draft SRP	77
7.5	Submissions from interested parties on draft SRP	77
7.6	ACCC's considerations	79
7.7	Decision	86
8	The weighted average cost of capital.....	87
8.1	Vanilla WACC	87
8.2	Capital asset pricing model	92
8.3	Risk free rate	95
8.4	Market risk premium.....	98
8.5	Betas	102
8.6	Cost of debt	108
8.7	Gearing.....	114
8.8	Imputation credits—gamma.....	116
8.9	Debt and Equity Raising Costs	118
8.10	Decisions.....	121
9	Financial indicators.....	123
9.1	Introduction	123
9.2	Code requirements	123
9.3	Submissions by interested parties on Draft SRP	123
9.4	ACCC's considerations	123
9.6	Decision	124
Appendix A	Information requirements.....	125
A.1	Introduction.....	125
A.2	Draft SRP	125
A.3	Submissions by interested parties on draft SRP.....	125

A.4	Decision	126
Appendix B	Transitional capital expenditure arrangements.....	130
B.1	Issue	130
B.2	Code requirements	130
B.3	Draft SRP	130
B.4	Submissions by interested parties on Draft SRP.....	131
B.5	ACCC’s considerations	131
B.6	Decision	133
Appendix C	Revaluation of easements	135
Appendix D	Capex—categories of capex covered by cap and supporting information	137
Appendix E	Capex—possible construction of a dynamically adjusting cap..	140
Appendix F	Capex—expected error formulae	141
Appendix G	Capex—implementation process for contingent projects	142
Appendix H	Submissions from interested parties on draft SRP	145

Glossary

AARR	aggregate annual revenue requirement
AC	alternating current
ACCC	Australian Competition and Consumer Commission
ACG	Allen Consulting Group
AER	Australian Energy Regulator
capex	capital expenditure
CAPM	capital asset pricing model
COAG	Council of Australian Governments
code	National Electricity Code
contingent projects	capital expenditure projects whose inclusion in the regulated asset base is contingent upon a specified event occurring
CPI	consumer price index
DC	direct current
discussion paper	discussion paper— <i>2003 review of draft statement of principles for the regulation of transmission revenues</i>
DORC	depreciated optimised replacement cost
draft SRP	<i>Draft statement of principles for the regulation of electricity transmission revenues</i> (August 2004)
DRP	<i>Draft statement of principles for the regulation of transmission revenue</i> (May 1999)
ECCSA	Electricity Consumers Coalition of SA
ENA	Energy Networks Association
ESC	Essential Services Commission (Victoria)
ESIPC	Electricity Supply Industry Planning Council
EUAA	Energy Users Association of Australia
excluded projects	now referred to as contingent projects

gas code	National Third Party Access Code for Natural Gas Pipeline Systems
GW	gigawatt
IC	Industry Commission
IPART	Independent Pricing and Regulatory Tribunal of New South Wales
KV	kilovolt
MAR	maximum allowable revenue
MRP	market risk premium
NECA	National Electricity Code Administrator Ltd
NECG	Network Economics Consulting Group Pty Ltd
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NERA	National Economic Research Association
NPV	net present value
ODRC	optimised depreciated replacement cost
Ofgem	Office of Gas and Electricity Markets (UK)
Ofwat	Office of Water Services (UK)
opex	operating and maintenance expenditure
ORG	Office of the Regulator-General (Victoria)
RAB	regulated asset base
SRP	<i>Statement of principles for the regulation of electricity transmission revenues</i>
supplementary discussion paper	supplementary discussion paper— <i>Review of the draft statement of principles for the regulation of transmission revenues: capital expenditure framework</i>
TNSP	transmission network service provider
TUOS	transmission use of system
VENCorp	Victorian Energy Networks Corporation
WACC	weighted average cost of capital

Summary

The Australian Competition and Consumer Commission (ACCC) is responsible for regulating the revenues of transmission network service providers (TNSPs) operating in the National Electricity Market (NEM).

The introductory explanation to chapter 6 of the National Electricity Code (code) envisaged that the ACCC would publish a Statement of Regulatory Intent to establish guidelines explaining how the ACCC would perform its regulatory functions. Accordingly, in May 1999 the ACCC released its *Draft statement of principles for the regulation of transmission revenues* (DRP).

In the DRP the ACCC noted that its approach to regulation would need to evolve in response to factors such as code amendments, changes in the industry, and improvements in regulatory models and best practice worldwide.

In August 2004 the ACCC released for consultation, the *Draft statement of principles for the regulation of electricity transmission revenues* (draft SRP). After considering submissions received in response to the draft SRP, the ACCC has released this document, the *Statement of principles for the regulation of electricity transmission revenues* (SRP).

Objectives

The code requires the ACCC to implement an incentive based regulatory regime in the form of a revenue cap or some incentive based variant. The code intends that this incentive regime should foster efficient investment and operating practices, and ensure quality of service.

This document explains how the ACCC intends to implement its code obligations. The document builds on the DRP, but makes improvements in a number of areas. The ACCC's main objectives in making changes to the DRP are to:

- promote certainty and
- improve efficiency incentives.

This summary briefly describes the changes that have been made to achieve these objectives.

Promoting certainty

The ACCC has sought to promote certainty through:

- changing the way sunk assets are valued
- implementing an ex ante capital expenditure (capex) incentive and
- maintaining consistency in the calculation of the weighted average cost of capital (WACC).

Valuation of sunk assets

With respect to valuation of sunk assets, in the DRP the ACCC advocated that the asset base should be periodically revalued on a depreciated optimised replacement cost (DORC) basis.

However, periodic revaluation of sunk assets can lead to significant variations in the value of sunk assets due to differences between asset replacement costs and historic costs.

Revaluations can lead to unpredictable revenues and prices, and the prospect of windfall gains or losses. Periodic revaluation can also create a risk that efficient expenditure may not be recoverable. This may deter efficient investment.

For these reasons, the ACCC considers that the periodic revaluation of sunk assets should not be continued. The ACCC will now roll forward the value of sunk assets at their depreciated historic cost, taking account of inflation.

Ex ante capex incentives

The ACCC has decided to move to a regulatory incentive for capital expenditure based on the determination of investment targets, before expenditure is incurred. This provides TNSPs with certainty on its revenue allowance over the life of the asset.

Consistency in WACC calculations

The ACCC has decided to continue to establish the WACC on the basis of benchmark parameters such as the market risk premium, the equity beta and the risk free rate. Consistency of regulatory approach is intended to increase certainty for TNSPs when making investments. However the ACCC will continue its research in this area and reserves the right to change the value of the WACC parameters to reflect refinements in the methodology and data.

Improving efficiency incentives

The ACCC has sought to improve efficiency incentives by:

- moving to an ex ante investment regulatory incentive
- implementing an efficiency carry forward mechanism for operating and maintenance expenditure (opex)
- allowing the regulatory period to be re-opened if unexpected events have a material impact on TNSP costs
- improving transparency of TNSP cost and service performance.

Ex ante regulatory incentives

The ACCC's objective in revising the investment regulatory arrangements is to ensure that TNSPs select efficient capital projects and develop them at the lowest sustainable cost for a given level and quality of service.

To date the ACCC has retrospectively assessed the efficiency of a TNSP's investment program. This not only requires an assessment of investment decisions after they have been made, but also requires an assessment of the efficiency with which assets were developed. This is highly intrusive and creates uncertainty.

The SRP outlines an approach to transmission investment regulation that relies on the efficiency incentives arising from the establishment of ex ante investment targets. In designing the revised incentive, the ACCC has sought to promote certainty and create incentives for efficiency, while also minimising forecasting errors. Forecasting errors lead to windfall gains and losses and could deter efficient investment.

The revised investment incentive consists of two elements, a main ex ante incentive and a contingent project¹ ex ante incentive.

The main ex ante incentive is specified as a capital expenditure target for each year of the regulatory period, to be established at the start of each regulatory period. This expenditure target would be based on the expected efficient expenditure for each year of the regulatory period.

It is expected that the majority of investment will be covered by the main ex ante incentive. The expenditure target can have a fixed element and an element that changes in line with key cost drivers, such as demand growth. This provides TNSPs with the flexibility to deal with reliability issues that emerge within the regulatory period.

At the end of the regulatory period, the depreciated value of the actual expenditure (rather than target expenditure) during the regulatory period will be recorded in the regulated asset base (RAB).

This means that TNSPs retain the depreciation and return on investment on the difference between the actual and allowed expenditure (as determined by the ACCC) for the regulatory period. This creates an efficiency incentive for the TNSP as it will be able to achieve a higher return on its assets during the regulatory period if it spends below the expected level, while still delivering the same outputs.

The design of the main ex ante incentive has been altered from the asymmetric mechanism described in the draft SRP. The draft SRP provided for a firm cap such that if TNSPs exceeded the cap, they would be unable to recover the excess from consumers.

¹ [When the SRP was released in December 2004, the term 'excluded projects' rather than 'contingent projects' was used. The ACCC has replaced any reference to 'excluded projects' with 'contingent projects' throughout this document.](#)

The ACCC considered that this arrangement would be problematic where the efficient expenditure requirement turns out to be higher than expected. In these circumstances TNSPs would not be fully compensated for efficient overspend. Therefore, the SRP proposes a symmetric treatment of underspends and overspends.

In addition to the main ex ante incentive, the regime provides for separate incentives on contingent projects. The contingent project ex ante incentive is an allowance for significant capital projects that may be developed during the regulatory period but whose likelihood and cost is difficult to predict with certainty at the time that the main ex ante incentive is established.

Contingent projects will be kept outside the main ex ante incentive and will instead be subject to their own regulatory incentive which will run for a period of five years. The contingent project incentive will operate in the same way as the main ex ante incentive described above. However the contingent project incentive is project specific and will be established shortly before expenditure on that project is about to begin.

Excluding significant but uncertain investments from the main ex ante incentive will therefore improve the accuracy of the ex ante cap and hence ensure that the allowed expenditure is reasonably aligned with efficient costs. Further, 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.

Finally, the ACCC recognises that the implementation of the preferred contingent project incentive will require a code change to ensure that project specific incentives can be established during the regulatory period.

Opex efficiency carry forward mechanism

The ACCC has also sought to improve efficiency incentives for opex, by redeveloping the efficiency carry forward mechanism. The effect of this change is to provide more constant incentives during the regulatory period.

The choice of the appropriate power of the incentive is difficult, requiring an assessment of the profit motive of TNSPs and an assessment of the extent to which the prospect of higher profits is likely to stimulate efficiency or result in degraded quality of service.

The ACCC has decided to introduce an efficiency carry forward mechanism that will result in TNSPs retaining the benefit/loss of incremental efficiency changes for five years after the year in which that incremental change is made.

Compared to the existing opex incentives (ignoring the glide path carry forward mechanism established in the DRP) the opex efficiency carry forward mechanism considerably strengthens the efficiency incentive in the later years of the regulatory period.

Effectively the implementation of a carry forward mechanism produces a nearly constant incentive to make efficiency improvements over the course of the regulatory period.

Revenue cap reopening

The ACCC is also improving incentives by allowing the revenue cap to be reopened if unexpected events have a material impact on TNSP costs.

The incentive regulation model adopted by the ACCC entails establishing expenditure allowances (targets) for each year of a five year regulatory period. While considerable effort is made to ensure that these allowances represent the expected efficient investment, inevitably such forecasts are subject to imperfect foresight. Therefore, while setting expenditure targets will promote efficiency, it also introduces the prospect of windfall gains or losses to TNSPs.

In addition, if the target expenditure is sufficiently below the true efficient level of expenditure, there is a prospect that efficient investment will not be made, or that TNSPs will be financially penalised for investing efficiently. Conversely, if the target is set significantly above the efficient expenditure level, TNSPs will obtain windfall gains. These are unacceptable outcomes, particularly in view of the critical role that electricity transmission plays in the economy.

Therefore the ACCC has decided to introduce a mechanism that would allow expenditure targets to be adjusted if an unexpected event occurred that had a material impact on TNSP expenditure.

One way to adjust expenditure allowances would be to allow automatic cost pass throughs. The main disadvantage to such an approach is that it damages efficiency incentives and introduces the prospect that consumers could end up paying the same cost twice.

An alternative approach is to re open the revenue cap before the next scheduled review. This allows the ACCC to make adjustments to the allowed expenditure to take account of the impact of the unexpected event, but also to take account, where appropriate, of other changes in efficient expenditure. Reopening the revenue cap, rather than simply automatically passing costs through to consumers ensures that the integrity of efficiency incentives will be upheld, while also removing the financial risk to TNSPs posed by unexpected events. The ACCC has therefore decided to allow the revenue cap to be reopened if unexpected events arise that have a material impact on TNSP expenditure.

Currently the ACCC cannot reopen the revenue cap for the circumstance described above. The implementation of this reopener provision will require a change to the code which is discussed in chapter 7.

Improving transparency of TNSP cost and service performance

As the regulatory regime matures, there is an increasing need for greater transparency of TNSPs' cost and service performance. This is particularly relevant in view of the efficiency incentives that now exist for capex and the strengthened opex efficiency incentives.

The ACCC is seeking to improve transparency through the development of improved regulatory accounts and through the publication of service standard transparency measures.

In revising the regulatory accounts, the ACCC intends to simplify these accounts to reduce the emphasis on financial information but at the same time, to improve the quality of reporting on capex and opex during the regulatory period. TNSPs and other interested parties will be consulted on these proposals in 2005.

With respect to the service standard transparency measures, the ACCC is seeking to publish various measures of transmission performance including a quantitative valuation of the impact of transmission constraints on market outcomes. The ACCC intends that this information should assist market participants to better understand the impact of transmission networks on market outcomes. The ACCC is also investigating the merits of service standard incentives, based on the impact of transmission constraints on market outcomes.

1 Introduction

1.1 Electricity industry reform

In 1990, as part of the Commonwealth Government's commitment to micro-economic reform, the Industry Commission (IC) was requested to undertake an inquiry into the efficiency of the generation, transmission and distribution of electricity and the transmission and distribution of gas.

In 1991 the IC produced its report entitled *Energy Generation and Distribution*. The report recommended a major restructuring of the Australian electricity and natural gas supply industries to increase competition and thus efficiency.

As an extension of the micro-economic reform agenda, in 1991 the Council of Australian Governments² (COAG) agreed to examine a national approach to competition policy. The first step in this process was the National Competition Policy Review undertaken by a committee chaired by Professor Fred Hilmer.

On completion of the Hilmer Committee's report in August 1993, the Commonwealth, state and territory governments began negotiations on implementing its recommendations. The recommendations made by the Hilmer Committee were generally accepted by COAG in April 1995 and the processes culminated in the *Competition Policy Reform Act 1995*.

The Competition Policy Reform Act was coupled with three intergovernmental agreements (the Competition Principles Agreement, the Agreement to Implement the National Competition Policy and Related Reforms and the Competition Code Agreement). These resulted in a number of wide ranging reforms, including the agreement that all state and territory governments and the Commonwealth would review and, where appropriate, reform legislative restrictions on competition.

The broad competition policy reforms embodied in the three intergovernmental agreements operated in tandem with the COAG reforms to the electricity market. The COAG reforms resulted in vertical separation of contestable from non contestable services to the market, introduced competition to generation and retail sectors and placed non contestable transmission and distribution networks under access and price regulation. The COAG agreements also provided for creation of the NEM and the code.

The NEM is a wholesale market for electricity which commenced operation in December 1998 in southern and eastern Australia.

The code was established under the National Electricity Law and enacted in each participating jurisdiction. The code sets out the rules for participating in the NEM and

² COAG consists of the Prime Minister, Premiers and Chief Ministers of the Commonwealth, state and territory governments. The role of COAG is to initiate, develop and monitor the implementation of policy reforms which are of national significance and which require cooperative action by Australian governments.

forms the basis of an industry access code for transmission and distribution businesses participating in the NEM.

1.2 The ACCC's role as regulator of transmission revenues

The ACCC has assumed responsibility for the regulation of transmission revenue in the NEM, on a progressive basis, since 1 July 1999. The ACCC's power to perform this regulatory role stems from Part IIIA of the *Trade Practices Act 1974* (TP Act).

The arrangements governing the economic regulation of transmission revenue in the NEM are set out in Part B of chapter 6 of the code. Clause 6.2.4(a) of the code provides that economic regulation is to be of the CPI-X form or some incentive based variant. In applying this form of regulation, clause 6.2.4(b) requires the ACCC to set a revenue cap to apply to each TNSP for a regulatory period. Under clause 6.2.4(f), the revenue cap applies only to those services that the ACCC considers are not reasonably expected to be offered on a contestable basis. In addition, under clause 6.2.3(c), the ACCC is responsible for determining whether sufficient competition exists to warrant the application of a more light handed regulatory approach.

Part C of chapter 6 of the code sets out the pricing arrangements applying to transmission networks. In summary, TNSPs are required to publish the transmission service prices to apply for the following year by 15 May each year. The prices are based on the TNSP's aggregate annual revenue requirement (AARR) which in turn must not exceed the TNSP's maximum allowed revenue (MAR) for provision of revenue capped transmission services for the relevant financial year. The MAR is determined by the revenue cap set by the ACCC. If the revenue earned by a TNSP from regulated services exceeds the AARR, the TNSP is required to adjust its prices in the following financial year and vice versa.

Clauses 6.2.2-6.2.4 of the code set out objectives and principles for the regulation of transmission revenue. These clauses are discussed in greater detail in the following chapters.

1.3 Draft regulatory principles

The introductory explanation to chapter 6 of the code envisaged that the ACCC would publish a Statement of Regulatory Intent to establish guidelines about how the ACCC would perform its regulatory functions. Accordingly, in May 1999, the ACCC published its *Draft statement of principles for the regulation of transmission revenues* (DRP).

In the DRP, the ACCC noted that its approach to regulation would need to evolve in response to factors such as code amendments, changes in the industry, and improvements in regulatory models and best practice worldwide.

The ACCC has now completed all first round revenue cap decisions. The ACCC considered it appropriate to review the principles in light of this experience so that it can apply the revised principles to second round revenue cap decisions.

The process of reviewing the DRP has involved the following key steps:

- In August 2003 the ACCC released a discussion paper—*2003 Review of draft statement of principles for the regulation of transmission revenues* (discussion paper) outlining the key issues for review in the DRP
- In March 2004 the ACCC released a supplementary discussion paper—*Review of the draft statement of principles for the regulation of transmission revenues: capital expenditure framework* (supplementary discussion paper) on the capex framework
- In April 2004 the ACCC held a public forum which discussed the key issues for review
- In August 2004 the ACCC released for public comment the *Draft statement of principles for the regulation of electricity transmission revenues* (draft SRP). Interested parties who provided submissions on the Draft SRP are listed in Appendix H.

Following this consultation process, the ACCC has now released the SRP. The SRP comprises a background paper and a consolidated version of the principles.

1.4 Application of the statement of principles for the regulation of transmission revenues

The SRP is intended to set out the ACCC’s general approach to setting revenue caps under clause 6.2.4 of the code. Like the DRP, the SRP does not form part of the code and is not an instrument made pursuant to the code. Accordingly, the application of the SRP to particular TNSPs will depend on the individual circumstances of the case. The ACCC will depart from the SRP where required or justified by the code provisions.

As with the DRP, it is envisaged that the approach set out in the SRP will continue to evolve in response to factors such as code amendments, changes in the industry, and improvements in regulatory models and best practice worldwide.

1.5 Transition to SRP

TNSPs that submit a revenue cap application after the release of the SRP should refer to the SRP rather than the DRP. However, where the relevant TNSP is subject to a revenue cap set before the release of the SRP, the following transitional arrangements apply:

- the approach outlined in chapter 5 of this paper in relation to capex would only apply to the treatment of forward capex. The valuation of past capex for the purpose of the next revenue cap reset for that TNSP would be guided by chapter 5 of the DRP and appendix B to this paper
- the approach outlined in chapter 6 of this paper in relation to opex would only apply to the treatment of forward opex. The treatment of past opex for the purpose of the next revenue cap reset for that TNSP would be guided by chapter 7 of the DRP.

1.6 Guidelines

Since releasing the DRP, the ACCC has also issued the following documents:

- Information requirements guidelines (5 June 2002)
- Transmission ring fencing guidelines (15 August 2002)
- Reporting guidelines (23 October 2002)
- Service standards guidelines (12 November 2003)
- Guidelines for the negotiation of discounted transmission charges (3 May 2002)
- Regulatory test for network augmentations (11 August 2004)

Information requirements guidelines

Clause 6.2.5 of the code requires TNSPs to submit certified annual financial statements to the ACCC in a form and by a date determined by the ACCC. In addition, the ACCC may require a TNSP to provide any other information the ACCC reasonably requires to perform its regulatory functions.

In accordance with clause 6.2.5, on 5 June 2002, the ACCC issued its *Information requirements guidelines* setting out the information to be provided by TNSPs. Among other things, the information provided by TNSPs forms the basis for the ACCC's revenue cap decisions and annual monitoring of compliance by TNSPs with the revenue caps. The information is also used to assess the allocation of costs between regulated and non regulated activities to ensure that regulated activities do not cross subsidise contestable activities.

TNSPs are also required to comply with the *Information requirements guidelines* when preparing their accounts under the ACCC's *Transmission ring fencing guidelines* (15 August 2002). This is discussed further below.

Appendix A sets out information that TNSPs should include in their revenue cap applications in addition to that prescribed in the *Information requirements guidelines*.

Transmission ring fencing guidelines and Reporting guidelines

Part G of chapter 6 of the code requires the ACCC to develop *Transmission ring fencing guidelines*. The ACCC published its *Transmission ring fencing guidelines* on 15 August 2002.

The *Transmission ring fencing guidelines* require TNSPs to maintain a separate set of accounts in respect of regulated services, and to provide compliance reports to the ACCC.

In addition to the *Transmission ring fencing guidelines*, TNSPs are required under clause 6.2.5 of the code to provide specific financial accounts to the ACCC in a form and at intervals determined by the ACCC. The ACCC's *Information requirements*

guidelines require the separation of information between the TNSP's regulated and unregulated activities.

In the *Transmission ring fencing guidelines*, the ACCC states it does not intend to impose financial reporting obligations in addition to those already imposed under the *Information requirements guidelines*. Accordingly, the ACCC's *Reporting guidelines* align the obligations of TNSPs under the *Transmission ring fencing guidelines* with the obligations imposed by the *Information requirements guidelines*.

Service standards guidelines

The interrelationship between revenue and the standard of service is recognised in clauses 6.2.4 and 6.5.7 of the code. In setting a TNSP's revenue cap, the ACCC must consider the service standards applicable to that TNSP. Clause 6.2.5 also permits the ACCC to obtain information from TNSPs to set and publish annual performance statistics, and for this information to be used in revenue cap decisions.

The ACCC's *Service standards guidelines* set out:

- the ACCC's approach to setting service standards and related performance incentives as part of a revenue cap decision
- the information to be provided by a TNSP under clause 6.2.5 of the code as part of its revenue cap application and on an annual basis in its revenue cap compliance statement.

The *Service standards guidelines* use a TNSP's own historical performance to set a performance benchmark. During the regulatory period, any improvements or reductions in performance in a calendar year will result in an increase or decrease in the MAR for the following financial year. These increases and decreases in the regulated revenue will be initially capped at 1 per cent of the TNSP's MAR for each calendar year.

The ACCC recognised that these guidelines do not deal with the market impact of transmission networks, in particular transmission constraints. As a result, the ACCC convened an industry working group to review this issue.

On 20 July 2004 the ACCC released a draft decision outlining the information it intends to publish about market impacts and transmission constraints. The paper focuses on identifying the market impact of transmission networks and how to quantify that impact.

The ACCC has received submissions from interested parties and aims to release a final decision by early next year.

Discount recovery guidelines

Clause 6.5.8 of the code refers to the ACCC's *Guidelines for the negotiation of discounted transmission charges (Discount recovery guidelines)*. The code permits a TNSP to recover the amount of a discount to a transmission customer's general and/or common service charges from other transmission customers where the TNSP can demonstrate that the discount complies with the *Discount recovery guidelines*. At each

subsequent revenue reset, the ACCC may ‘claw back’ the recovered revenue if it decides the discount does not meet the *Discount recovery guidelines*.

In accordance with the code, such applications for discount recovery will be formally considered at each revenue cap decision. There is also provision for a TNSP to apply for a letter of guidance from the ACCC at the time the discount is being negotiated.

Hence each TNSP must include information in its revenue cap application regarding TUOS discounts, where it is recovering the amount of the discount from other customers. The information submitted must refer to discounts offered in the current and previous regulatory periods. For discounts that have been considered at previous regulatory resets the TNSP must state whether the information relied upon was correct. Further where the TNSP has sought a letter of comfort from the ACCC it must clarify that the information provided at that time was correct and provided in good faith.

Regulatory test

On 15 December 1999 the ACCC, in accordance with its obligations under chapter 5 of the code, promulgated the *Regulatory test for new interconnectors and augmentations* (version 1). The regulatory test (version 1) is a cost benefit analysis test containing three limbs:

- the interconnector limb—used when assessing interconnectors and involves the application of a ‘net present value’ (NPV) analysis
- the reliability limb—used to consider reliability driven augmentations and involves the application of a minimisation of cost test
- the market benefits limb—used for all other augmentations and like the interconnector limb is an NPV analysis.

After its promulgation, interested parties raised a number of concerns about the regulatory test’s operation, in particular, whether it allowed for the measurement of competition benefits. That is, the benefits of increased competition between generators as a result of free flowing transmission lines. As a result the ACCC instigated a review, as part of a commitment with National Electricity Code Administrator (NECA), to consider the framework for essential new investment.

The ACCC published its decision on 11 August 2004 which promulgates changes to the *Review of the regulatory test for network augmentations* (version 2). The three sets of changes included:

- modifications to the regulatory test (version 1) to ensure consistency between it and the code
- introduction of a number of definitions to be used by TNSPs when applying the regulatory test to ensure its consistent application across the NEM
- introduction of competition benefits test. This test captures the efficiency benefits of increased competition between generators.

1.7 Decision

1.1 Purpose

The SRP sets out the ACCC's general approach to setting revenue caps to apply to transmission network owners and TNSPs under clause 6.2.4 of the code.

1.2 Application

The SRP does not form part of the code and is not an instrument made pursuant to the code. Accordingly, the application of the SRP to a particular TNSP will depend on the individual circumstances of the case. The ACCC will depart from the SRP where required or justified by the code provisions.

The approach set out in the SRP will continue to evolve in response to factors such as code amendments, changes in the industry, and improvements in regulatory models and best practice worldwide.

1.3 Transition to SRP

TNSPs that submit a revenue cap application after the release of the SRP should refer to the SRP rather than the DRP. However, where the relevant TNSP is subject to a revenue cap set before the release of the SRP, the following transitional arrangements apply:

- the approach outlined in chapter 5 of this SRP in relation to capex would only apply for future revenue cap decisions. The valuation of past capex for the purpose of the next revenue cap reset for that TNSP would be guided by chapter 5 of the DRP and appendix B of the SRP.
- the approach outlined in chapter 6 of this SRP in relation to opex would only apply for future revenue cap decisions. The treatment of past opex for the purpose of the next revenue cap reset for that TNSP would be guided by chapter 7 of the DRP.

1.4 Structure of SRP

The ACCC's general approach to setting revenue caps is explained in the following chapters:

Chapter 2	Regulatory framework
Chapter 3	Revenue cap decision making process
Chapter 4	Asset base
Chapter 5	Incentive framework for capital expenditure

Chapter 6	Incentive framework for operating and maintenance expenditure
Chapter 7	Reopening the revenue cap
Chapter 8	Weighted average cost of capital
Chapter 9	Financial indicators
Appendix A	Information requirements
Appendix B	Transitional capital expenditure arrangements
Appendix C	Revaluation approach for easements
Appendix D	Capex—categories of capex covered by cap and supporting information
Appendix E	Capex—possible construction of a dynamically adjusting cap
Appendix F	Capex—expected error formulae
Appendix G	Capex—implementation process for contingent projects
Appendix H	List of submissions by interested parties on draft SRP

2 Regulatory framework

2.1 Introduction

This chapter explains the main objectives, features and incentive properties of the ACCC's regulatory framework. The ACCC recognises that a regulatory regime is more than the sum of its parts. Different parts of a regulatory regime must work together to form a single, consistent, coherent set of incentives which collectively achieve the code objectives.

Accordingly, this chapter sets out the ACCC's overall framework for the regulation of TNSPs' revenues. It starts with a summary of the key requirements of the statutory framework and an overview of the key features of the transmission industry. Subsequent sections explain why some industries are subject to economic regulation and why the ACCC makes use of incentives where possible. Issues associated with incentive based regulation are outlined and the implications for the design of an incentive regulation framework are discussed. Finally, the chapter explains how these issues guide the design of the incentive framework used by the ACCC in the regulation of TNSPs' revenues.

2.2 Objectives and form of regulation

In the case of the regulation of TNSPs, the objectives and form of regulation are set out in Part B of chapter 6 of the code.

Clause 6.2.4(a) of the code provides that economic regulation is to be of the CPI-X form or some incentive based variant. In applying this form of regulation, clause 6.2.4(b) requires the ACCC to set a revenue cap to apply to each TNSP for a regulatory period of at least five years.

In setting a revenue cap the ACCC is required, under clause 6.2.4(c), to take into account the revenue requirements of each TNSP, having regard for, among other things:

- expected demand growth
- service standard obligations
- the potential for efficiency gains, taking into account the expected demand growth and service standards obligations
- the weighted average cost of capital, taking into account the risk adjusted rate of return required by investors in commercial enterprises facing similar risks
- the provision of a fair and reasonable risk adjusted rate of return on efficient investment including sunk assets subject to clause 6.2.3(d)(4)
- the ongoing commercial viability of the transmission industry.

Clause 6.2.3 also sets out a number of factors which the ACCC is required to have regard to in setting a revenue cap. These include the need to:

- provide TNSPs with incentives and opportunities to increase efficiency
- create an environment in which generation, energy storage, demand side options and network augmentation options are given due and reasonable consideration
- take account of any agreement for the sharing of risk between TNSPs and users
- provide a fair and reasonable risk adjusted rate of return to TNSPs on efficient investment given efficient operating and maintenance practices where assets are valued consistently with the principles set out in clause 6.2.3(d)(4)(i)-(v)
- provide consistency and certainty in outcomes of regulatory processes over time, having regard to the need to balance the interests of TNSPs and users, the capital intensive nature of the business, the need to minimise regulatory costs, and any previous regulatory decisions, including decisions made by jurisdictional regulators.

In administering the regime the ACCC is required, under clause 6.2.2 of the code, to seek to achieve a number of objectives including:

- an efficient and cost effective regulatory environment
- an incentive based regulatory regime which shares any efficiency gains equitably between users and TNSPs and which provides for a sustainable commercial revenue stream including a fair and reasonable rate of return on efficient investment given efficient operating and maintenance practices
- prevention of monopoly rent extraction by TNSPs
- an environment which fosters efficient investment (both within the transmission sector and upstream and downstream), efficient operating and maintenance practices by TNSPs, and efficient use of existing infrastructure
- reasonable recognition of pre existing government policies
- promotion of competition
- reasonable regulatory accountability, regulatory discretion and certainty and consistency over time of the outcome of regulatory processes.

Part C of chapter 6 of the code sets out how the MAR, determined by the ACCC's revenue cap, is translated into prices for network users. This focuses on the code provisions relating to:

- the prevention of monopoly rent extraction

- the creation of incentives for efficient investment and operating expenditure taking into account service quality
- the on going commercial viability of the transmission industry and the need to provide TNSPs with a fair and reasonable rate of return
- balancing the interests of TNSPs and users
- consistency and certainty in regulatory outcomes.

2.3 Overview of the transmission sector

Any regulatory regime must be based on the characteristics of the industry being regulated. This section summarises the key features of the electricity transmission sector to provide a context to the subsequent discussion on the regulatory framework.

The electricity industry is conventionally divided into four sub-sectors, generation, transmission, distribution, and retailing. Transmission represents about 8–10 per cent of the total end user price for electricity. At present the transmission networks in the NEM are owned by six separate companies—ElectraNet, SPI PowerNet, TransGrid, Powerlink, TransEnergie and EnergyAustralia.

Electricity transmission networks exist in order to transport electricity long distances from large remote generators which are usually situated close to fuel sources (primarily coal deposits in Australia). It is often cheaper to transport energy in the form of electricity than to transport the underlying source of energy (such as coal or gas). In addition, electricity transmission networks reduce the costs of providing the diversity of generation necessary to ensure an adequate reliability of supply.

The primary components of an electricity transmission network are the transmission lines (comprising poles or towers and wires), underground cables, transformers, switching equipment, capacitors and other equipment for regulating reactive power and other equipment used to monitor and operate the network and to make remote changes in network configuration (e.g. telecommunications equipment).

Electricity can be transported over either alternating current (AC) or direct current (DC) networks. The vast majority of the Australian transmission network is of an AC nature.³ In the case of AC networks (unlike DC networks) power flows over individual elements of the network cannot be directly controlled. Instead, electrical power, which is injected at one point and withdrawn at another, flows over all the possible paths between the two points. As a result, decisions on how much electricity is produced or consumed at one point on the network can affect power flows on network elements in other parts of the network.

Electricity transmission is capital intensive. Capex typically accounts for more than half, and as much as two thirds, of a TNSP's total expenditure. An on going programme of capex is necessary to (a) expand the network in response to changing

³ Murraylink, Directlink and Basslink (which is currently under construction) are all DC links.

patterns of generation and load growth and (b) refurbish and replace existing assets to maintain service levels. The primary components of capex are the cost of substations (transformers, switching gear, etc.), the cost of land (including easements), and the cost of transmission lines themselves. Opex accounts for between one quarter and one third of total expenditure. The primary components of opex are the costs of monitoring and maintaining the network assets, and corporate overheads.

Transmission can enhance the value of generation assets by facilitating the transportation of electricity to the market. On the other hand, new transmission can undermine the commercial viability of generation located close to the load centres. Transmission is a substitute for generation located in electricity importing regions and a complement to generation located in electricity exporting regions.

TNSPs can also impact on generation dispatch and prices in the NEM by enhancing their capacity or reliability. This can be done by scheduling of planned outages, the specification of network characteristics, asset operation procedures, network design and possibly also through the use of interruptible contracts and price hedging. Incentives to promote service quality amount to incentives on TNSPs to take actions which reduce the frequency or the severity of the constraints implied in the constraint equations.

2.4 Natural monopoly and price regulation

When it comes to economic policy, policymakers commonly pursue three objectives: allocative efficiency, productive efficiency and dynamic efficiency.

For the vast majority of goods and services produced in a market economy, policymakers rely on competitive market forces to ensure that these three objectives are achieved. Competitive market forces operate within a set of economic laws⁴ which provide the background or framework for a market economy.

However, in the case of certain goods and services, it is not possible to rely primarily on traditional competition within the market to deliver these objectives. In some industries, the cost structure of the industry is such that the entire market demand for a particular set of goods or services is most efficiently provided by a single firm. These sectors are known as ‘natural monopolies’.⁵

Electricity transmission companies are subject to some competition in the form of merchant transmission companies, the threat of bypass, or embedded generation. However, none of these possibilities currently offers a viable threat to the bulk of services provided by electricity transmission companies. Therefore an electricity transmission company is largely a natural monopoly.

⁴ These laws govern, for example, property and contractual rights, consumers rights, forms of transactions and so on.

⁵ The conditions which create a natural monopoly depend on the demand level and the cost structure of the industry. Changes in demand or changes in technology can erode a natural monopoly. It is appropriate therefore for natural monopoly price and service regulation to be subject to periodic review.

In the absence of normal competitive forces, a monopoly firm is able to increase the price above the competitive level, leading to potentially substantial ‘monopoly rents’. In addition, in the absence of competitive pressures the owners of the monopoly firm have a harder time inducing the management to perform—that is, to minimise expenditure and to continuously innovate. As a result an unregulated monopolist tends to be less efficient and to charge higher prices than an otherwise equivalent competitive firm.

Being unable to rely on competitive forces, policymakers must seek some other form of intervention to deliver the desired public policy outcomes. Although a variety of policy responses are possible, the single most common form of intervention is direct regulatory control of the prices (or revenues) and services of the natural monopoly. It is this form of intervention which applies to electricity TNSPs (and most other infrastructure utilities) in Australia.

The objectives of such price and service regulation are to:

- ensure that the regulated firm provides the range of services consumers desire, at the quality they desire and continually develops new services or enhances quality when it is efficient to do so
- ensure that the regulated firm produces the desired services at least cost (in present value terms) and continually explores new ways of reducing expenditure
- ensure that services are priced so that they are utilised efficiently.

This chapter will focus on the first two of these objectives. The manner in which transmission prices are derived from the AARR is set out in the code. For the purposes of designing a regulatory regime, the last objective means that monopoly rents are, as far as possible, removed from the allowed revenues.

2.5 Incentive regulation

One key decision that must be faced by the regulator in the design of a regulatory regime is the extent to which the regulator will seek to directly control detailed aspects of the behaviour of the regulated firm. The regulator might attempt to micro manage the TNSP by specifying the make and model of the transformers that must be used by the TNSP, the details of the firm’s maintenance policies or the size and location of the firm’s head office. However, the regulated firm will almost always have access to information that is not available to the regulator.⁶

⁶ Jeff Balchin writes: ‘It is ... widely accepted that the regulator is in a poor position to judge whether a particular project or technology or organisation structure and associated staffing levels represent efficient production. The regulated entity’s knowledge of such matters vastly outweighs that of the regulator, and so attempts by a regulator to disallow perceived inefficiencies are unlikely to be effective.’ Allen Consulting Group, *Methodology for updating the regulatory value of electricity transmission assets*, Final report, August 2003, p. 14.

In the presence of this information asymmetry, it will be preferable for the regulator to leave a substantial amount of discretion to the firm, while providing a system of broad financial incentives to induce the firm to use that discretion to pursue desirable outcomes.

Incentive regulation refers to the approach where the regulated firm is allowed substantial discretion to make its own decisions subject to a set of financial incentives devised by the regulator to achieve desirable outcomes.

The code requires the ACCC to adopt an incentive based regulatory regime. However, this is not an ‘all or nothing’ decision. The ACCC recognises that in some cases it may be necessary for the regulator to take a close interest in the actions of the regulated firm, limiting the scope for discretion. The decision about where to grant discretion and where to limit discretion is a key element in the design of a regulatory regime.

The outcomes achieved under incentive regulation depend on the nature of the financial incentives established by the regulator. Depending on the nature of the financial incentives, the firm might have strong incentives to cut its costs or strong incentive to increase its costs. Alternatively, the firm could have a strong incentive to enhance reliability or reduce reliability. Subsequent sections of this paper therefore describe the fundamental principles which should be taken into account when designing the incentives at the heart of the regulatory regime.

2.5.1 Building block model

The ACCC, like most other regulators in Australia uses the building block model.

The building block model consists of two equations which are known as the revenue equation and the asset base roll forward equation. These two equations are used to determine an allowed stream of revenues for each TNSP for as long as it remains regulated. Ignoring any incentive rewards or penalties, these equations together ensure that the present value of the allowed revenue stream is equal to the present value of the expenditure stream of the regulated firm.

Expressed in the simplest form, the building block equations are as follows:

$$\begin{aligned} MAR &= \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax} \\ &= (WACC * RAB) + D + \text{opex} + \text{tax} \end{aligned}$$

and

$$\text{New RAB} = \text{previous RAB} - \text{depreciation} + \text{capex}$$

Where:

$$MAR = \text{maximum allowed revenue}$$

$$WACC = \text{weighted average cost of capital}$$

$$RAB = \text{regulatory asset base}$$

$$D = \text{depreciation}$$

$$\text{opex} = \text{operating and maintenance expenditure}$$

$$\text{tax} = \text{expected business income tax payable}$$

A description of each of these cost components is outlined below:

regulatory asset base (RAB)	The regulatory asset base is a stock of funds which reflects the total amount (in present value terms) which must be returned to investors in the future to compensate them for investments made in the past.
cost of capital (WACC)	The cost of capital is the rate of return required by investors to induce them to commit funds to the TNSP. The required rate of return will depend on the riskiness of the returns of the TNSP relative to other risky assets and the return on risk free assets. TNSPs are funded using a combination of debt and equity. The rate of return required by investors to induce them to purchase the debt and equity of the TNSP will be different, reflecting the different risks of these two financial instruments. The required rate of return for the firm as a whole (also known as the cost of capital) is the weighted average of the required rate of return on debt and equity and is referred to as the weighted average cost of capital (WACC).
depreciation (return of capital)	Depreciation is a flow of funds which returns to investors the 'capital' component of the funds they commit to the TNSP (as distinct from the return on that capital). The total amount of depreciation of the firm must be equal to its total stock of capex over the life of the firm.
operating and maintenance expenditure (opex)	The expenditures of the TNSP which are not amortised over time—i.e. which are recovered in revenue in the year in which they are incurred.
capital expenditure (capex)	The expenditures of the TNSP which are amortised over time—i.e. which are added to the RAB, earn a return on capital as long as they are in the RAB and which are recovered over time through the depreciation stream.
tax liabilities	In the 'post tax' framework, the firm's tax liabilities are treated as a separate expenditure item.

An objective of the regulatory regime is to foster efficient investment and operating practices within the transmission sector, and to provide for an equitable allocation of expected efficiency gains between TNSPs and users. Efficiency incentives are incorporated in the building block model through service standards, opex and capex incentive schemes.

The equations below show how financial incentive schemes can be included within the building block model:

$$\text{Forecast revenue} = \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax} + \text{service standards incentive scheme} + \text{opex incentive scheme}$$

$$\text{Closing } RAB_{t-1} = \text{opening } RAB_{t-1} + \text{actual capex}_{t-1} - \text{depreciation allowance}_{t-1} + \text{capex incentive scheme}$$

The design of the various incentive schemes in the equations above are the focus of chapters 5, 6 and 7.

2.6 Factors to be taken into account in the design of an incentive regime

2.6.1 Factors which influence the power of the incentive

The power of the incentive to enhance service quality, for example, depends on the sensitivity of the firm's future profit stream to changes in the firm's effort to maintain or improve service quality. The more sensitive the future profit stream to an increase in effort (i.e. the larger the increase in profits and the sooner it arrives) the greater the incentive to enhance service quality. Similarly, the power of the incentive to invest efficiently depends on the sensitivity of the profit stream to a change in effort to investing efficiently.⁷

The power of the incentive to pursue a particular objective need not be constant for all levels of effort. Furthermore, the power of the incentive need not be symmetric—the regulator might put in place a regime under which the firm is penalised if its service quality falls below some standard but is not rewarded if the service quality exceeds some standard. Similarly, the regulator might decide to give the firm strong incentives to reduce its expenditure when its expenditure exceeds some threshold and very weak incentives to reduce its expenditure when the expenditure drops below a lower threshold.⁸

In the case of the incentive to reduce expenditure, the most common way to increase the power of this incentive is for the regulator to simply commit to not changing the regulated prices for a fixed period of time (usually five years). In doing so, the regulator introduces a lag between the time when the firm reduces its costs and when those new costs are reflected in lower regulated prices. This increases the sensitivity of the present value of the firm's profit stream to changes in its actual costs. The code requires the ACCC to set a regulatory period of a minimum of five years. In general, the ACCC sets a regulated revenue for five years at a time.

The higher the power of an incentive mechanism the greater the incentive on the regulated firm to set a low performance target. For example, the greater the reward from improving service quality, the greater the incentive to set a low service quality target. Similarly the greater the incentive to reduce expenditure, the greater the incentive to set a high expenditure target.

⁷ This is explained by Laffont and Tirole (2000) as follows: 'A *high-powered incentive* [to reduce expenditure] ... is one in which the firm bears a high fraction of its costs at the margin. That is, when the firm raises its cost by \$1, its net [profit] ... is reduced by an amount close to \$1. ... In a procurement context, a fixed-price contract, in which the contractor receives a fixed gross payment, is the prototypical high-powered incentive scheme, since the firm is made fully accountable for its cost savings. In contrast, a low-powered incentive scheme is one in which a \$1 increase in the firm's realised cost translates into about a \$1 [increase in the firm's allowed revenue] ... and so hardly affects the firm's profit. In particular, in a cost-plus contract, the firm's cost is reimbursed, and so the firm is not made accountable for its cost savings or overruns'. Laffont and Tirole (2000), *Competition in Telecommunications*, p. 39.

⁸ This last approach might be adopted because it keeps the expenditure of the regulated firm within reasonable bounds, limiting the risk of unsustainable outcomes.

A regulated firm may be able to influence the regulator to set a high expenditure target by arguing that in the future the firm will need to incur higher costs to meet an increase in demand, or increase service quality.

The ACCC believes that a regulatory regime that relies on providing efficiency incentives to TNSPs is far preferable to an approach which attempts to micro manage their key business decisions. However, the power of the incentive set out in the capex and opex chapters does respond to these issues, in particular the need to ensure that service standards are not compromised by inefficient capex and opex underspending.

2.6.2 The need for balance between incentives

Where there are multiple objectives the regulator would like a firm to pursue, the power of the incentives to pursue these different objectives should be equal. For example, if the incentive to maintain service standards is weak, introducing high powered incentives greatly increases the risk that the firm will cut service standards in order to cut expenditure. Conversely, if the incentive to improve service standards is strong and incentives to reduce expenditure is weak, the firm will likely increase expenditure in order to increase service standards.

The need for balance between incentives can have a fundamental impact on the design of a regulatory regime.

The capex and opex incentive arrangements outlined in the SRP respond to these issues. The ACCC has attempted to ensure that the incentive arrangements for capex and opex do not create inefficient spending which jeopardises service quality.

2.6.3 Repeating incentive schemes—the ‘ratchet effect’

The regulator usually will take into account past performance when setting future performance targets. However, the regulated firm, knowing that its current level of effort is likely to affect future performance targets, will take this into account when choosing its level of effort.

In particular, if high performance today leads to a high performance target tomorrow, the firm will be reluctant to achieve high performance today (that is, the power of the incentive will be reduced).⁹

Note, in particular, that it may not be possible to induce the regulated firm to reveal its fully efficient costs and then to use that information in setting the regulated prices. The regulated firm, anticipating that the information it reveals will be used in this way has an incentive not to reveal the information in the first place. Note, also, that the ratchet effect does not necessarily always weaken incentives. An incentive regime can be designed where out performance today (i.e. reducing expenditure below the target by deferring expenditure) leads to a lower performance target in the future (in the form of a higher expenditure target) enhancing the incentive to outperform today.

⁹ Laffont and Tirole (2000), p. 55.

The SRP's capex and opex arrangements respond to these issues. The ACCC will not determine capex and opex allowances by only looking at past expenditure outcomes. While the ACCC will have regard to past capex and opex levels in setting future targets, it will also assess the circumstances that face the TNSP at the time these allowances are set.

2.6.4 Higher power is not always better

One immediate implication of these principles is that higher powered incentives are not always better. As discussed above, as long as the regulator is uncertain about the parameters affecting a firm's costs, the higher the power of the incentive to reduce expenditure, the larger the monopoly rents the regulated firm may earn. This may undermine the sustainability of the regulatory regime.

Furthermore the higher the power of the incentive, the greater the incentive the firm has to induce the regulator to set a low performance target. Finally, where the regulator cannot set a high powered incentive on one objective, a high powered incentive on another objective may induce the firm to sacrifice one objective to achieve another, which may not be desirable. For all these reasons, it may not always be desirable to choose high powered incentives.

As will be outlined in chapter 5, the ACCC is mindful that a high powered incentive may not be appropriate for capex spending. There are potentially significant lags between a reduction in capex and service deterioration. This is one factor governing the strength of the incentive outlined in the capex chapter.

2.7 Outline of regulatory principles

Having set out some broad principles governing the design of a regulatory regime, the remaining chapters will discuss how these principles are outlined to each of the key elements of the building block. These chapters are as follows:

- Chapter 4 outlines the ACCC's asset base decision. In outlining a roll forward approach, the ACCC has attempted to provide investment certainty for the TNSP. By moving away from an approach based on periodic revaluation of the TNSP's asset base, efficient investment is not deterred.
- Chapter 5 outlines the ACCC's capex decision. By setting an ex ante allowance and allowing the firm to profit from any reduction in capex under the allowance, the TNSP has an incentive to reduce its capex. The strength of this incentive has taken into account the need to maintain service standards, given that much transmission investment is non recurrent expenditure.
- Chapter 6 outlines the ACCC's opex decision. By setting an opex target and allowing the firm to profit from any reduction in opex under the allowance, the firm has an incentive to reduce its opex. The strength of this incentive takes into account the need to maintain service standards. However, given that opex is generally recurrent expenditure, an efficiency carry forward mechanism will be used for opex.

- Chapter 7 outlines the revenue cap reopening provisions. These provisions are designed to take account of unexpected events that could significantly alter the efficient required level of capex or opex. If the impact of such an event is large enough, an efficient TNSP may not have the ability to fund its operations from its allowed revenue.
- Chapter 8 outlines the ACCC's decision on the various WACC parameters. Correctly assessing the WACC is extremely important, as relatively minor changes to the WACC can have a large impact on the incentives faced by the TNSP. If the return is too low, the TNSP will be unable to recover efficient costs thereby reducing its incentive to invest, while if the return is too high the TNSP will have a strong incentive to overcapitalise, thus creating inefficient investment.

The ACCC considers that, in general, the adoption of the overall framework set out in these chapters should provide an appropriate balance between the different regulatory objectives:

- The regime is primarily incentive based. The TNSP has substantial discretion as to how it organises its affairs and how it meets its service standards. Regulatory controls on discretion are limited to direct controls on certain investment projects and possible allowance of potential future expenditure items.
- The regime fosters efficient capex and operating and maintenance practices and gives TNSPs an incentive and opportunity to enhance their efficiency.
- The regime ensures that monopoly rents, to the extent that they become apparent, can be reduced over time through the process of re-adjusting the allowed revenues every regulatory period.
- At the same time the process ensures that TNSP's receive a long term sustainable revenue stream for those expenditures. Provided the ACCC is able to forecast the appropriate opex and capex requirements, even if a TNSP is unable to make any efficiency enhancements, the TNSP will receive a normal risk adjusted rate of return on its investments.
- The framework provides TNSPs and users with greater certainty in regulatory outcomes over time.

Subsequent chapters describe in more detail the considerations and policy decisions of the ACCC in the development of each component of the overall incentive framework. The following diagram sets out how the overall regulatory framework fits together.

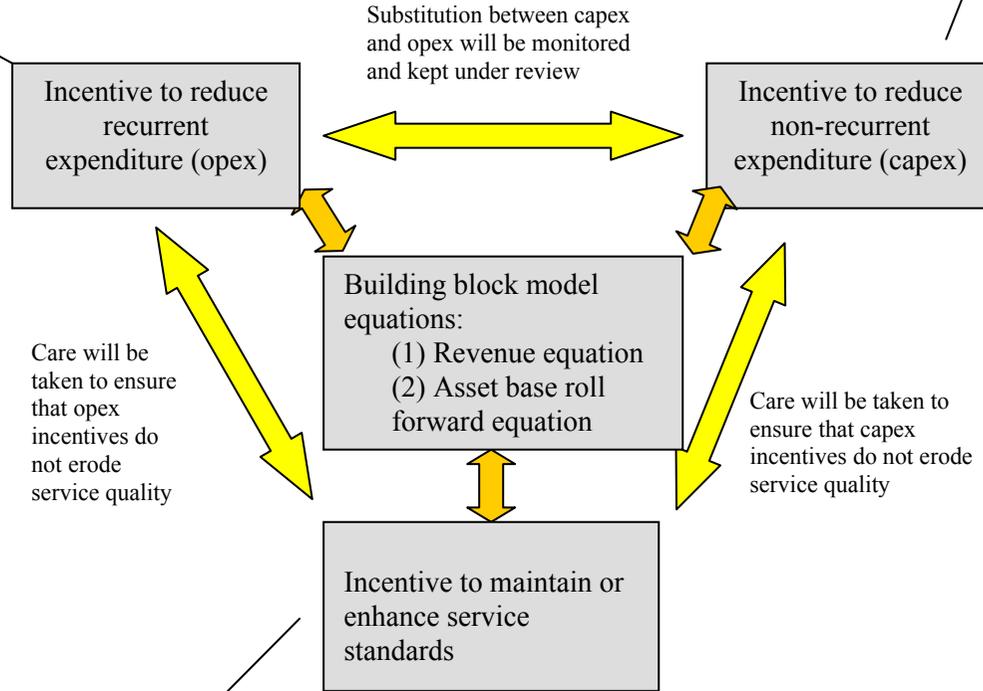
Opex incentive scheme

Revenue is fixed for five years at a time, allowing firm to profit by any reduction in opex that occurs during the regulatory period.

At the end of the regulatory period, the new opex revenue targets are set for the subsequent regulatory period taking into account historic expenditure, future demand forecasts and service standards requirements.

An efficiency carry-forward mechanism will be used.

ACCC's framework for the regulation of TNSPs



Capex incentive scheme

For the non project specific allowance, there are some incentives to reduce capex below the level set in the ex ante cap. TNSPs will choose to meet minimum reliability standards in a way that minimizes overall cost.

For the project-specific allowance, projects are pre-approved by the regulator. The TNSP has an incentive to carry out these projects at least cost.

Ex ante cap is set taking into account historic expenditure, future demand forecasts and service standards requirements.

Service standards incentive scheme:

TNSPs face statutory reliability obligations. In addition TNSPs are rewarded +/-1% for meeting reliability targets. ACCC is developing further a market-based service standards scheme.

2.8 Decision

2.1 Introduction

This section describes the broad framework that will be used by the ACCC for regulating transmission revenues.

2.2 Form of regulation

Clause 6.2.4(a) of the code provides that economic regulation is to be of the CPI-X form or some incentive based variant. In applying this form of regulation, clause 6.2.4(b) requires the ACCC to set a revenue cap to apply to each TNSP for a regulatory period of at least five years. In setting the maximum allowable revenue for the regulatory period, the ACCC makes use of the building block model.

2.3 Building block approach

The building block approach is used to ensure that the expenditure of each TNSP is appropriately amortised over time to ensure that each TNSP, given efficient expenditure practices and decisions, is adequately compensated for the cost of providing the transmission services to customers in the long run.

The building block model consists of two equations which are known as the revenue equation and the asset base roll forward equation. These two equations are used to determine an allowed stream of revenues for each TNSP for as long as it remains regulated. Ignoring any incentive rewards or penalties, these equations together ensure that the present value of the allowed revenue stream is equal to the present value of the expenditure stream of the regulated firm.

Expressed in the simplest form, the building block equations are as follows:

$$MAR = \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax}$$

$$= (WACC * RAB) + D + \text{opex} + \text{tax}$$

and

$$\text{new RAB} = \text{previous RAB} - \text{depreciation} + \text{capex}$$

where:

$$MAR = \text{maximum allowable revenue}$$

$$WACC = \text{post tax nominal weighted average cost of capital}$$

$$RAB = \text{regulatory asset base}$$

$$D = \text{depreciation}$$

$$\begin{aligned} \text{opex} &= \text{operating and maintenance expenditure} \\ \text{tax} &= \text{expected business income tax payable} \end{aligned}$$

A description of each of these cost components is outlined below:

regulatory asset base (RAB)	The RAB is a stock of funds which reflects the total amount (in present value terms) which must be returned to investors in the future to compensate them for investments made in the past
cost of capital (WACC)	The cost of capital is the rate of return required by investors to induce them to commit funds to the TNSP. The required rate of return will depend on the riskiness of the returns of the TNSP relative to other risky assets and the return on risk free assets. TNSPs are funded using a combination of debt and equity. The rate of return required by investors to induce them to purchase the debt and equity of the TNSP will be different, reflecting the different risks of these two financial instruments. The required rate of return for the firm as a whole (also known as the cost of capital) is the weighted average of the required rate of return on debt and equity and is referred to as the weighted average cost of capital (WACC).
depreciation (return of capital)	Depreciation is a flow of funds which returns to investors the 'capital' component of the funds they commit to the TNSP (as distinct from the return on that capital). The total amount of depreciation of the firm must be equal to its total stock of capital expenditure over the life of the firm.
operating and maintenance expenditure (opex)	The expenditures of the TNSP which are not amortised over time (i.e. which are recovered in revenue in the year in which they are incurred).
capital expenditure (capex)	The expenditures of the TNSP which are amortised over time (i.e. which are added to the RAB, earn a return on capital as long as they are in the RAB and which are recovered over time through the depreciation stream).
tax liabilities	In the 'post tax' framework, the firm's tax liabilities are treated as a separate expenditure item.

2.4 Incentive regulation

An objective of the regulatory regime is to foster efficient investment and operating practices within the transmission sector, and to provide for an equitable allocation between TNSPs and users of expected efficiency gains.

The efficiency incentives are incorporated in the building block model through service standards, opex and capex incentive schemes. This can be expressed in a more precise version of the building block model equations as follows:

$$\begin{aligned} \text{forecast revenue} &= \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax} \\ &\quad + \text{service standards incentive scheme} + \text{opex incentive scheme} \\ \text{closing RAB}_{t-1} &= \text{opening RAB}_{t-1} + \text{actual capex}_{t-1} - \text{depreciation} \\ &\quad \text{allowance}_{t-1} + \text{capex incentive scheme} \end{aligned}$$

Service standards incentive scheme

In addition to the statutory reliability requirements in each participating jurisdiction, the incentive to improve service standards is provided by the service standards scheme set out in the ACCC's Service standards guidelines (12 November 2003).

Opex incentive scheme

The incentive to increase the efficiency of operating and maintenance practices is provided by:

- (a) allowing the TNSP to retain, during a regulatory period, the difference between its actual opex and the forecast costs used to set the revenue cap
- (b) the mechanism by which the ACCC takes into account past expenditure out turns when setting future expenditure targets
- (c) the carry forward mechanism.

Capex incentive scheme

The incentive to reduce capital expenditure is provided by allowing the TNSP to retain, during the regulatory period, the difference between forecast and actual return on capital and depreciation for the component of the RAB that relates to forecast capex.

2.5 Certainty and consistency

An objective of the regulatory regime is to provide certainty and consistency for TNSP's and users. This is provided by not periodically revaluing the asset base which can lead to unpredictable revenues and prices. The ACCC will now roll forward the value of sunk assets at their depreciated historic cost, taking account of inflation. Further, the ACCC has decided to move to a regulatory incentive for capital expenditure based on the determination of investment targets, before expenditure is incurred. This provides TNSP's with certainty on its revenue allowance over the life of the asset.

3 Revenue cap decision making process

3.1 Introduction

This chapter outlines the ACCC's regulatory review process when setting a TNSP's revenue cap. This chapter:

- section 3.2 identifies issues arising from the ACCC's current regulatory process
- section 3.3 provides an overview of the code requirements
- section 3.4 sets out the options canvassed in the draft SRP and the ACCC's referred position
- section 3.5 summarises submissions from interested parties
- section 3.6 outlines the ACCC's considerations for the regulatory review process
- section 3.7 presents the ACCC's decision.

3.2 Issues

The ACCC considers the regulatory review process outlined in chapter 2 of the DRP needs to be amended to provide a better guide to the actual process followed by TNSPs and the ACCC.

3.2.1 Timelines

The ACCC considers the length of the regulatory review timeline is too short given the complexity of issues that generally need to be addressed in setting a TNSP's revenue allowance.

3.2.2 Late submissions

The ACCC considers the time given for making submissions should be increased from four to six weeks. The ACCC has found in practice, interested parties have sought to provide submissions after the specified date, delaying the ACCC's ability to finalise the draft and final decisions.

3.2.3 Pre-decision conference

The ACCC has tried to clarify whether section 90A of the TP Act applies to public forums where the ACCC's draft decision on a TNSP's revenue allowance is discussed.

3.2.4 Information requirements

The ACCC has found in practice that the *Information requirements guidelines*¹⁰ are insufficient for the purpose of setting a revenue cap. The ACCC has considered whether the *Information requirement guidelines* should be amended to better reflect the information required in making a revenue cap decision.

3.2.5 Confidentiality

The ACCC has considered whether the procedure for processing TNSPs' claims of confidentiality should be amended.

3.3 Code requirements

Clause 6.2.2 of the code provides that the regulatory regime should achieve:

- reasonable regulatory accountability through transparency and public disclosure of regulatory processes and the basis of regulatory decisions
- reasonable and well defined regulatory discretion which permits an acceptable balancing of the interests of TNSPs, transmission network users and the public interest.

Under clause 6.2.4(b), the ACCC is required to provide a description of the process and timetable for resetting the revenue cap of regulated TNSPs:

A description of the process and timetable for re setting the revenue cap must be published by the ACCC at a time which provides all affected parties with adequate notice to prepare for, participate in, and respond to that process, prior to the commencement of the regulatory period to which that revenue cap is to apply. The revenue cap re-setting process must provide all affected parties with a reasonable opportunity to prepare for, participate in, and respond to that process.

TNSPs are required to publish, by 15 May each year, their transmission service prices (which are derived using the revenue cap) to apply for the following financial year.

Under clause 6.2.5 of the code, TNSPs are required to submit certified annual financial statements to the ACCC in a form determined by the ACCC. In addition, the ACCC may require a TNSP to provide any other information the ACCC reasonably requires to perform its regulatory functions.

¹⁰ Under clause 6.2.5 of the code, TNSPs are required to submit certified annual financial statements to the ACCC in a form determined by the ACCC. In addition, the ACCC may require a TNSP to provide any other information the ACCC reasonably requires to perform its regulatory functions. The ACCC has issued two documents under clause 6.2.5: *Information requirements guidelines* (5 June 2002) (which replaced Chapter 10 of the DRP); and *Service standards guidelines* (12 November 2003). Clause 6.20.1 of the code also requires TNSPs to comply with the *Information requirements guidelines* (due to the operation of the ACCC's *Transmission ring-fencing guidelines* (15 August 2002) and *Reporting guidelines* (23 October 2002)).

Clause 6.2.6(c) requires the ACCC to publish full and reasonable details of the basis and rationale of the revenue cap decision including:

- (1) reasonable details of qualitative and quantitative methodologies applied including any calculations and formulae
- (2) the values adopted by the ACCC for each of the input variables in any calculations and formulae, including a full description of the rationale for adoption of those values
- (3) reasonable details of other assumptions made by the ACCC in the conduct of all material qualitative and quantitative analyses undertaken in relation to the setting of a revenue cap or related matter
- (4) full reasons for all material judgments and qualitative decisions made and options considered, and all discretions exercised which have a material bearing on the outcome of the ACCC's overall decision.

3.4 Draft SRP

3.4.1 Regulatory review timelines

In the draft SRP the ACCC noted that the process of assessing a TNSP's revenue allowance required detailed analysis of a number of complex issues and accordingly the current six month timeframe for this process was inadequate. Therefore, the ACCC proposed to extend the regulatory review period to 12 months.

3.4.2 Late submissions

The ACCC proposed to increase the time for making submissions from four weeks to six weeks following the receipt of the application and the release of the draft decision. The ACCC also proposed a similar process in relation to late submissions as that used by NEMMCO. This process requires interested parties to notify the ACCC of late submissions and justify why a late submission should be considered.

3.4.3 Pre-decision conference

To avoid confusion with the procedures for conducting a pre-decision conference under section 90A of the TP Act, the ACCC proposed that the forum in which the ACCC's draft decision on a TNSP's revenue cap is discussed be termed a public forum. The ACCC considered that this was necessary given that section 90A only purports to apply with respect to an application for authorisation. Further, the subject matter discussed at the public forum is different to that traditionally discussed at a pre-decision conference and therefore a different process to that outlined in section 90A may be appropriate.

3.4.4 Confidentiality

The draft SRP noted that confidentiality requests can potentially impede consultation and industry participation in the revenue cap review. All such requests will be assessed by the ACCC and only granted where justified.

3.5 Submissions from interested parties on draft SRP

The three main issues raised by interested parties on the ACCC's regulatory review proposal are:

- the ACCC’s proposal to extend the timeline for the revenue cap review
- the ACCC’s participation in public forums
- the requirements regarding confidentiality of submissions.

Regulatory review procedure

EnergyAustralia and Powerlink support the ACCC’s proposal to extend the regulatory review period to 12 months.

The Energy Users Association of Australia (EUAA) considers that the ACCC should investigate aligning the timing of the review for all TNSPs as soon as practical and to undertake a regulatory review for a single, multi-company NEM wide transmission system.

SPI PowerNet noted that the ACCC may wish to shift back three months all the time lines and dates outlined in its standard process for SPI PowerNet’s review.

Public forum

ElectraNet and Transend consider that the public forums would be greatly enhanced if the ACCC was more prepared to make presentations and enter into discussion raised. ElectraNet notes that ‘having the regulator speak to the draft decision and providing the opportunity for questions to the regulator on the draft decision would significantly improve the value of the public forum.’

Confidentiality

Transend, Powerlink, ElectraNet, EnergyAustralia and SPI PowerNet recognise that the ACCC wants to make information available in the revenue cap decision making process. However, a number of these submissions questioned whether all the information, particularly that of a commercially sensitive nature, should be made public. ElectraNet, for example, notes that it is inappropriate and unnecessary to make commercially sensitive information publicly available.

3.6 ACCC’s considerations

3.6.1 Regulatory review procedure

The ACCC considers that the regulatory review timetable needs to be amended to:

- reflect the needs of TNSPs to calculate and publish prices by 15 May each year
- allow more time for interested parties to analyse the information and make submissions
- allow more time for the ACCC to consider submissions, conduct its analysis and publish its reports.

The SRP provides for the regulatory review process to commence 15 months prior to the end of the regulatory period. In most cases this means, a TNSP must submit its application by 1 April in the penultimate year of the regulatory period, enabling the

ACCC's decision to be made by 1 May of the following year.¹¹ The revised timetable (set out below) allows an increased period for consultation (discussed in section 3.6.2 below) and increased time for the ACCC to consider the application and submissions. The timetable also links the consultation periods and consultants' reports.

The ACCC believes that this extended and revised process will facilitate participation in the regulatory process, provide greater transparency and allow for better planning on the part of TNSPs and other interested parties.

The ACCC notes the EUAA's argument that the ACCC investigate aligning the timing of the review for all TNSPs as soon as practical. While appreciating the intuitive appeal of this suggestion, the ACCC believes that the resource implications of conducting a revenue reset for all TNSPs simultaneously would be immense and therefore does not favour this approach at the current time.

3.6.2 Late submissions

The ACCC considers that by extending the period of time for submissions from four weeks to six weeks following the receipt of the application and the draft decision, interested parties should have adequate time to prepare their submissions. However, if a party wishes to provide a submission after the closing date, the party must notify the ACCC prior to the closing date. The notification must set out:

- the date by which the party proposes to provide the submission
- the key arguments or issues to be addressed in the submission
- the reason for the lateness
- the detriment if the ACCC does not consider the submission.

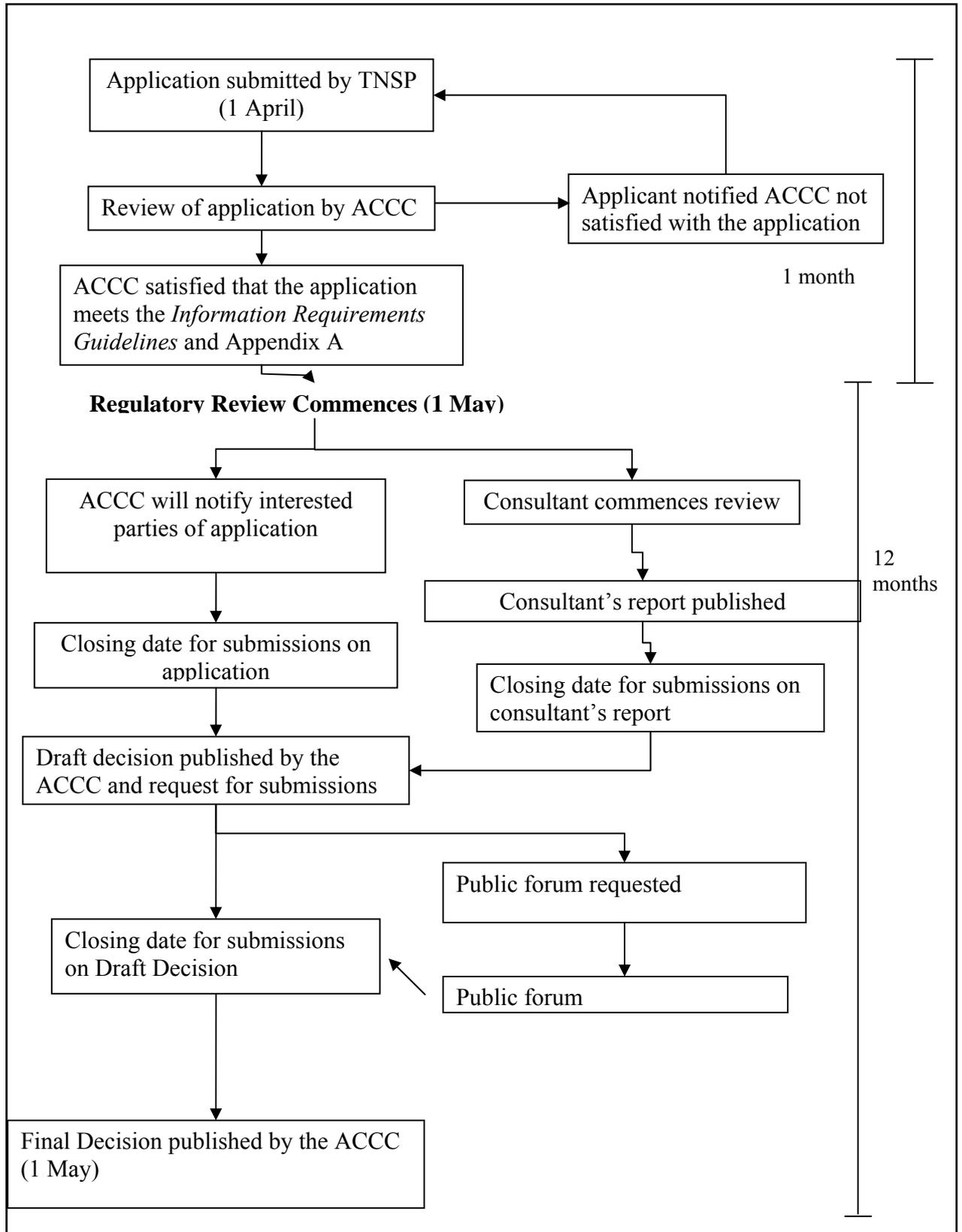
The party will then be advised whether or not the ACCC will consider the submission.

3.6.3 Public forum

The SRP refers to a public forum rather than pre-decision conference. In contrast to section 90A of the TP Act (which applies to applications for authorisation):

- a public forum is not necessarily held upon request by a party following the draft decision

¹¹ SPI PowerNet operates on a March to March financial year, so it would need to submit its application earlier.



- if a public forum is held, attendance or participation is not governed by section 90A(7).¹²

The ACCC believes that this will help maintain flexibility in the conduct of the public forum and make it more relevant to the consideration of issues arising from the ACCC's draft decision.

The ACCC notes the argument that the public forum would be more worthwhile if the regulator spoke to the draft decision and if interested parties were provided with the opportunity to ask questions of the regulator on the draft decision. While it believes that a public forum should not be used to discuss the intricate detail of the draft decision, the ACCC will endeavour to ensure that more time is allocated to explain the reasoning behind the draft decision. Interested parties will be able to raise issues, just as they can now. However, it is not possible for the ACCC to respond to all questions in a public forum as many of the issues raised will require further consideration and actual decisions can only be made by the full Commission.

3.6.4 Information requirements

Under clause 6.2.5 of the code, a TNSP's revenue cap application must include the information specified in the *Information requirements guidelines*. In addition to these requirements, the application should include the information set out in Appendix A of the SRP. Appendix A does not amend the *Information requirements guidelines* or impose any obligations under clause 6.2.5 of the code.

The revised timetable provides for the following steps to be completed within four weeks of the ACCC receiving the application:

- the ACCC reviews the application for compliance with the *Information requirements guidelines* and appendix A. Due to the uniqueness of each TNSP's circumstances and application, the ACCC may seek additional information after receipt of the application
- the ACCC reviews any accompanying request that all or part of the application remain confidential
- if the ACCC is not satisfied, the ACCC will provide written notice to the TNSP
- the TNSP should resubmit the application addressing the issues outlined in the notice.

As TNSPs are required to publish their transmission prices by 15 May each year, it is important that any issues concerning the application be resolved within the four week

¹² Section 90A, in effect, limits attendance at pre-determination conferences to the applicant and other persons who have a real and substantial interest in the application. A person who is entitled to attend may be assisted by a professional adviser but that adviser is not entitled to participate in the discussion. In contrast, under the code, the ACCC may allow wider participation by suitably qualified persons who wish to present their views on the merits of the ACCC's draft decision or to speak on behalf of other parties. Requests to participate will be considered by the ACCC on a case by case basis.

period. If an issue is not resolved expeditiously, the ACCC may need to consider using its compulsory powers under clauses 6.2.5 and 6.2.6, or basing its revenue cap decision on assumptions drawn by the ACCC in the absence of the requested information.

3.6.5 Confidentiality

The ACCC believes that it is important to minimise the amount of confidential information associated with a TNSP's revenue cap application. The ACCC considers that confidentiality claims impact on the ACCC's ability to provide a clear and transparent process, and to seek input from experts and industry participants. Therefore, all submissions and other documents relevant to the decision making process (except those containing information provided by a TNSP under clause 6.2.5 of the code) will be treated as public documents and placed on the public register, unless otherwise requested.

The ACCC notes respondents' comments on the appropriateness of having all information provided by the TNSP classified as public. The ACCC recognises that in some instances having all information publicly available may not greatly assist the revenue cap decision making process. The ACCC also acknowledges that it may be appropriate to limit the disclosure of some commercially sensitive information (eg. make it available only to the ACCC and its consultants).

If a party wishes to claim confidentiality with respect to all or part of a document, the party must:

- clearly identify the information that is the subject of the confidentiality claim
- where only part of a document is confidential, provide a non confidential version of the document for the ACCC's public register. (This version must clearly indicate where information has been deleted due to confidentiality)
- set out the reasons in support of the confidentiality claim.

The request for confidentiality will be assessed by the ACCC. If the request is not accepted, the document (or relevant part of the document) will be returned to the party and will not be taken into account by the ACCC.

Where the document (such as a revenue cap application) contains information provided by a TNSP pursuant to clause 6.2.5 of the code, the TNSP should:

- clearly identify the information that is provided pursuant to clause 6.2.5
- indicate whether the TNSP consents to the disclosure of that information
- if consent is not granted, provide reasons as to why disclosure is refused (to assist the ACCC in deciding whether to issue a written notice under clause 6.2.6(c))
- if consent is not granted in relation to part of a document, provide a non-confidential version of the document for the ACCC's public register. (This

version should clearly indicate where information has been deleted due to confidentiality).

If consent is not granted, the ACCC will review the refusal and decide whether to follow the procedure set out in clause 6.2.6.

3.6.6 Provision of information by the ACCC

The ACCC considers that a TNSP should receive a copy of the financial model used by the ACCC to calculate that TNSP's revenue cap. A generic version of the financial model is also available on the ACCC's website.

3.7 Decision

3.1 Introduction

This section describes the process and timetable that the ACCC intends to follow when setting or resetting a revenue cap under clause 6.2.4(b) of the code. The process and timetable may be adjusted by the ACCC where the process is not prescribed by the code and an adjustment is justified.

3.2 Submission of application

The TNSP must submit a revenue cap application by 1 April of the penultimate year of the regulatory period.

The application must comply with the information requirements set out in the Information requirements guidelines and should also contain the information set out in appendix A of the SRP.

Within four weeks of receipt:

- the ACCC will review the application for compliance with the Information requirements guidelines and appendix A of the SRP.
- the ACCC will review any accompanying requests that all or part of the application remain confidential
- if the ACCC is not satisfied with the information provided, the ACCC will provide a written notice to the TNSP
- the TNSP must resubmit the application addressing the issues outlined in the notice.

As TNSPs are required to publish their transmission prices by 15 May, it is important that any issues concerning the application be resolved within this four week period. If an issue is not resolved expeditiously, the ACCC may need to consider using its compulsory powers under clauses 6.2.5 and 6.2.6, or basing its revenue cap decision on assumptions drawn by the ACCC.

3.3 Public consultation process

The ACCC will notify interested parties of the application and will:

- describe the TNSP to which the application relates
- state how copies of the non confidential parts of the application may be obtained
- request submissions by a date specified in the notice.

The commencement of the ACCC's assessment of the application will be effective from the date of publication of the notice.

3.4 Submissions

The ACCC will call for submissions on the application to be submitted within six weeks from the publication of the notice. Submissions on any consultant's reports must be provided six weeks after publication of the consultants' reports.

If a party wishes to provide a submission after the closing date, the party must notify the ACCC before the closing date. The notification must set out:

- the date by which the party proposes to provide the submission
- the key arguments or issues to be addressed in the submission
- the reason for the lateness
- the detriment if the ACCC does not consider the submission.

The party will then be advised as to whether the ACCC will consider the submission.

3.5 Confidentiality

All submissions and other documents relevant to the decision making process (except those containing information provided by a TNSP under clause 6.2.5 of the code) will be treated as public documents and placed on the public register unless otherwise requested. If a party wishes to claim confidentiality with respect to all or part of a document, the party must:

- clearly identify the information that is the subject of the confidentiality claim
- where only part of a document is confidential, provide a non-confidential version of the document for the ACCC's public register. This version must clearly indicate where information has been deleted due to confidentiality
- set out the reasons in support of the confidentiality claim.

The request for confidentiality will be assessed by the ACCC. If the request is not accepted, the document (or relevant part of the document) will be returned to the party and will not be taken into account by the ACCC.

Where the document (such as the revenue cap application) contains information provided by a TNSP pursuant to clause 6.2.5, the TNSP should:

- clearly identify the information that is provided pursuant to clause 6.2.5
- indicate whether the TNSP consents to the disclosure of that information
- if consent is not granted, provide reasons as to why disclosure is refused (to assist the ACCC in deciding whether to issue a written notice under clause 6.2.6(c))
- if consent is not granted in relation to part of a document, provide a non-confidential version of the document for the ACCC's public register. This version should clearly indicate where information has been deleted due to confidentiality.

If consent is not granted, the ACCC will review the refusal and decide whether to follow the procedure set out in clause 6.2.6.

3.6 Assessment of the application and draft decision

The ACCC will assess the application against the relevant code provisions including clauses 6.2.2, 6.2.3 and 6.2.4.

In accordance with clause 6.2.6(a), the ACCC will publish full and reasonable details of the basis and rationale for the proposed decision, including but not limited to:

- reasonable details of qualitative and quantitative methodologies applied including any calculations and formulae
- the values adopted for each of the input variables in any calculations and formulae, including a full description of the rationale for adoption of those values
- reasonable details of other assumptions made in the conduct of all material qualitative and quantitative analyses undertaken in relation to the setting of a revenue cap or related matter
- full reasons for all material judgments and qualitative decisions made and options considered, and all discretions exercised which have a material bearing on the outcome of the ACCC's overall decision.

3.7 Public forum and consultation

Any interested party who wishes to comment on the ACCC's draft decision may request a public forum within two weeks of the release of the draft decision.

If the ACCC decides to hold a public forum, the forum will be held within one month of the request date.

Interested parties may make submissions following the release of the draft decision and the public forum.

Submissions must be provided within six weeks of the release of the draft decision or, if a public forum is held, two weeks after the forum.

3.8 Final decision

The ACCC will release the final decision on the application by 1 May of the final year of the regulatory period.

The process and timetable may be adjusted by the ACCC where the process is not prescribed by the code and the particular circumstances justify a departure.

4 Asset base

4.1 Introduction

This chapter sets out the ACCC's decision on the valuation of the opening asset base at the commencement of a new regulatory period.

The RAB is a significant determinant of a TNSP's MAR. In the building block formula the RAB is multiplied by the WACC to determine the return on capital. The building block formula illustrates how the RAB affects the calculation of the MAR:

$$\begin{aligned} \text{MAR} &= \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax} \\ &= (\text{WACC} * \text{RAB}) + D + \text{opex} + \text{tax} \end{aligned}$$

This chapter is set out as follows:

- section 4.2 outlines the issues for consideration in treating the RAB
- section 4.3 provides an overview of relevant code requirements
- section 4.4 discusses the options considered in the draft SRP and the ACCC's preferred position
- section 4.5 outlines issues raised in submissions in response to the draft SRP
- section 4.6 sets out the considerations underlying the ACCC's decision
- section 4.7 presents the ACCC's decision

4.2 Issues

The ACCC has considered two options for the valuation of the opening asset base:

- The first option is to revalue the closing asset base at the end of the prior regulatory period.
- The second option is to lock in the value of the opening asset base of the prior regulatory period but adjust for inflation and depreciation, and assess capex incurred during the prior regulatory period on the basis of the capex regulatory arrangements set out in chapter 5.

The code prescribes that for all first round revenue caps the ACCC must adopt a value for the RAB which is determined by the jurisdictional regulator or consistent with the existing jurisdictional asset valuation.

However, the code provides the ACCC with the flexibility to revalue the RAB for subsequent revenue caps. The ACCC must decide whether to use a revaluation approach or a lock in approach.

4.3 Code requirements

The code's provisions on asset valuation, particularly concerning asset valuation beyond the initial regulatory period, are very broad.

The code prescribes that for all first round revenue caps the ACCC must adopt a value for the RAB which is determined by the jurisdictional regulator or consistent with the RAB established in the jurisdiction, provided the value of the existing assets not exceed the deprival value.

The code provides that for all second round or subsequent revenue cap decisions, assets can be valued on a basis determined by the ACCC. However the code requires the ACCC to have regard to a number of principles and objectives, including the need to provide a fair and reasonable rate of return and the need to have regard to the COAG preference for deprival value.¹³

Finally, the code requires the ACCC to have regard to the need to provide consistency and certainty in outcomes of regulatory processes over time, given the capital intensive nature of the transmission businesses.¹⁴

4.4 Draft SRP

ACCC's current approach to asset valuation

The main economic principle for assessing the economic value of any asset is that its value to investors is equal to the present value of the expected future cash flows generated by those assets. The practical difficulty in making this assessment for regulated monopoly businesses is that the future revenue derived from the assets is determined by the regulator.

This circularity can be eliminated by the use of the DORC¹⁵ approach. The DORC methodology divorces the asset valuation from the assumed profile of revenues that an asset may generate. Given this characteristic, the DORC approach is a useful tool in the transition from government ownership to formal regulation by an independent regulator.

At the time the ACCC assumed responsibility for setting the revenues of TNSPs in the NEM, one approach would have been to adopt the pre-existing book values of these companies and use them as the basis for setting future revenues. However, there were a number of problems with this approach including:

¹³ National Electricity Code, clause 6.2.3(d)(4)(iii).

¹⁴ *ibid*, clause 6.2.3(d)(5).

¹⁵ The DORC of the network is the sum of the depreciated optimised replacement cost of the assets. It measures the cost of replicating the service potential in the most efficient way possible, from an engineering perspective, while also allowing for the service life of the asset which has expired – this is sometimes called the modern equivalent asset. The optimisation process in DORC is about identifying the most efficient facilities necessary to produce a specified level of services.

- inconsistent accounting approaches across states and
- poor historical records.

All jurisdictional regulators in the NEM determined the value of TNSPs' assets using the DORC valuation methodology, with the exception of easements which, in some cases, were valued using a historic cost approach.

Given the code requirement for all first round revenue caps, the ACCC adopted the existing DORC jurisdictional valuations to determine the revenue stream for first round revenue cap decisions.

Periodic revaluation

In the draft SRP the ACCC considered the option of periodically revaluing the asset base using the DORC methodology.

The ACCC recognised the potential for a periodic revaluation to result in a significant variation in the RAB from one period to the next. This in turn could lead to a variation in the revenue stream and price path.

The variation in the asset base could be due to changes in replacement costs or the potential for some forms of capex not being compensated. As a case in point, refurbishment capex, which merely renews or refurbishes an existing asset, does not necessarily affect the cost of buying a modern equivalent asset.

A TNSP facing the risk of an upcoming DORC valuation could have an incentive to either significantly reduce its refurbishment capex and/or seek to reclassify its refurbishment capex as opex, since its refurbishment capex might not be reflected in a DORC valuation. Such an approach could result in a lumpy revenue profile and undermine the objective of allocating capital costs across the economic life of the asset.

In addition, the uncertainty of whether or not the DORC approach would result in an upward or downward valuation might deter investment. In the case of revaluation the firm might wait to invest under the threat of its assets being optimised. Allens Consulting elaborated on this:

Whether a transmission business would expect to recover the cost of continuing to provide the service – or expected to earn returns much larger than that required to justify its continued financing of the business – would depend upon the accuracy of the estimated ODRC value, for which substantial statistical uncertainty will be inevitable. The inevitable error reflects the level of uncertainty inherent in each of the steps undertaken to estimate an ODRC value – including, amongst other things, the appropriate extent of optimisation and pre-building of the network, the cost of constructing the hypothetical assets given the unique characteristics of each network, the cost of purchasing equipment which may fluctuate substantially over time, and the prediction of the future cost of operating, maintaining and renewing the optimal asset.¹⁶

¹⁶ Allens Consulting, August 2003, Methodology for updating the Regulatory Value of Electricity Transmission assets, Attachment A to the ACCC discussion paper, pp. 38.

In summary, the ACCC considered that periodic revaluation of sunk assets could result in the TNSP facing an unpredictable revenue stream which could deter investment.

Locking in the asset base

The ACCC also considered the option of setting the RAB based on the closing asset base from the initial revenue cap and assessing capex incurred during the initial regulatory period on the basis of the capex regulatory arrangements set out in chapter 5.

The ACCC considered that locking in the RAB in this way would address many of the problems outlined with the revaluation approach. The lock in approach avoids the risk of changes in replacement costs and addresses the potential risk to investment of periodic revaluation. The overall effect is to create a more stable and certain environment for investment.

Further, the ACCC considered that the lock in approach would ensure consistency with the approach used by the ACCC in regulating gas pipelines. Neither the Gas code nor the code demands that the same methodology be used. However, the ACCC has endeavoured to maintain consistency between its approaches to the regulation of gas and electricity transmission, as this helps achieve reasonable certainty and consistency over time for both end users and investors.

The ACCC noted that if it were to consider revaluing the asset base it would adopt an historic cost approach for valuing easements. This is because an historic cost approach uses the TNSPs' actual expenditure incurred when acquiring easements.

Summary

In the draft SRP the ACCC concluded that a lock in approach provides greater certainty for investment compared to a revaluation approach. The ACCC recognised that the code provides the discretion to revalue assets in service before (existing assets) and after (new assets) 1 July 1999. The ACCC considered that it would be preferable to amend the code to formalise the lock in approach to asset valuation.

4.5 Submissions by interested parties on draft SRP

The three main issues raised by interested parties were:

- the treatment of the RAB
- the treatment of easements
- the asset base roll forward methodology.

Treatment of the RAB

All respondents supported locking in the asset base and assessing expenditure during the regulatory period on the basis of the capex regulatory arrangements set out in chapter 5 of the Draft SRP. Further, there was strong support for a code change to formalise the lock in of the asset base value.

However, ElectraNet and EnergyAustralia stated that they would only support a lock in of the asset base once a fair and reasonable asset valuation has been established.

Easements

ElectraNet supported the availability of the benchmark approach to easement valuation on the basis that a TNSP should not be disadvantaged simply because historical records were unavailable.

Transend and SPI PowerNet considered that easements should not be depreciated. However, both TNSPs considered it reasonable that when an easement is released for some reason, the TNSP should be able to depreciate or write down the easement value in order to recover the capital value.

Asset base roll forward methodology

ElectraNet, EnergyAustralia, SPI PowerNet, Powerlink and Transend outlined a number of issues on how the ACCC intends to roll forward the asset base, such as whether:

- the ACCC should adopt forecast or actual depreciation
- capital investment should be treated on an as spent or as commissioned basis
- the asset base should be rolled forward by actual CPI.

4.6 ACCC's considerations

After considering submissions in response to the Draft SRP, the ACCC has decided to adopt an approach to asset valuation in which the RAB is locked in. In arriving at this decision, the ACCC notes the general support in submissions for this approach.

The ACCC considers that periodic revaluation could potentially lead to significant variations in the value of the asset base from one period to the next. This could result in the TNSP facing an unpredictable revenue stream and large and uncertain shocks

to consumer prices. Further, the uncertainty created by such an approach could deter efficient investment.

The ACCC has considered whether a code change would be desirable to remove any doubt surrounding the ACCC's ability to lock in the RAB. However, on balance, the ACCC considers that such a change is probably not necessary and has the potential to delay the full application of the SRP.

The ACCC notes the submissions made by ElectraNet and EnergyAustralia whose preferred position is to lock in the value of sunk assets, but only once a fair and reasonable asset valuation has been established.

The ACCC recognises that the code provides the discretion to revalue assets and, hence, will review each TNSP's proposal to revalue the asset base at the time of their respective revenue cap applications. While the ACCC will have regard to all relevant matters at that time, the types of matters that might cause the ACCC to consider revaluation could include:

- establishing that such a step accords with the reasonable expectations of investors
- demonstrating that there was an error in the initial valuation that resulted in the TNSP not being compensated for an efficient investment.

The ACCC's preference, if it were to consider revaluing the asset base, would be to re-open the entire valuation and consider every element of the asset base. The revaluation process might encourage the regulated firm to identify only those asset classes that would result in an upward rather than downward valuation. In considering the whole asset base, the regulator reduces the scope for the TNSP to 'cherry pick' in the valuation assessment.

If the asset base is re opened the question arises as to how easements should be valued. Appendix C considers the ACCC's approach to easements. The ACCC has decided to adopt a historic cost approach or, where data is not available, a benchmark approach based on historical data.

The ACCC notes that Powerlink, EnergyAustralia, Transend, SPI PowerNet and ElectraNet have outlined a number of issues concerning how the ACCC intends to roll forward the asset base. The ACCC proposes to undertake further work in consultation with industry and user groups on the methodology to be adopted in determining the closing RAB.

In summary, the ACCC has decided to adopt the lock in approach to asset valuation as this would provide greater certainty for investment.

4.7 Decision

4.1 Introduction

This section sets out the ACCC's decision on the calculation of the RAB at the end of the regulatory period.

4.2 Lock in

The ACCC's preferred approach to asset valuation will be to lock in the RAB. This approach involves locking the value of the opening asset base of the prior regulatory period but adjust for inflation and depreciation, and assess capex incurred during the regulatory period on the basis of the capex regulatory arrangements set out in chapter 5.

The ACCC recognises that the code provides the discretion to revalue assets and hence, if TNSPs propose a revaluation, the ACCC will consider the proposal on its merits having regard to all relevant matters at that time. The onus is on the TNSP to make a case for departing from the preferred principle of locking in the asset base. If it were to consider revaluing the asset base, the ACCC's preference would be to reopen the entire valuation and consider every element of the asset base.

5 Incentive framework for capital expenditure

5.1 Introduction

This chapter sets out the ACCC's proposed approach with respect to capital expenditure (capex). Capex is one of the biggest drivers of a TNSP's regulated revenue requirement. The building block formula shows that capex is fundamental to the calculation of both the return on capital, through its impact on the RAB, and return of capital (depreciation). These components will in turn flow through to the MAR and therefore to transmission network charges.

$$\begin{aligned} \text{MAR} &= \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax} \\ &= (\text{WACC} * \text{RAB}) + D + \text{opex} + \text{tax} \end{aligned}$$

This chapter is structured as follows:

- section 5.2 outlines the current capex approach and the issues for consideration in reforming capex incentives
- section 5.3 provides an overview of code requirements in relation to capex
- section 5.4 outlines the draft SRP proposals in relation to capex and the rationale behind that approach
- section 5.5 outlines issues raised in submissions received in response to the draft SRP
- section 5.6 provides an overview of the changes from the draft SRP and the ACCC's considerations in moving to the revised approach
- section 5.7 sets out the detailed working of the capex incentives and responds to issues raised by interested parties

- section 5.8 outlines the arrangements applicable where there are separate network planners and owners
- section 5.9 sets out presents the ACCC's decision.

The approach outlined in this chapter only applies to the treatment of capex in revenue caps made after the release of the SRP. The approach to capex in the first round of revenue caps is outlined in appendix B.

5.2 Issues

Existing regulatory framework

In chapter 4 the arguments for and against periodic revaluation were considered, and the ACCC's decision was to roll-forward the opening asset base, rather than periodically revalue it. The remaining issue for consideration is the merits of ex post prudency assessment of capital expenditure during the regulatory period.

In the draft SRP the disadvantages of ex post assessment were discussed. Specifically, two key disadvantages were identified:

1. It creates uncertainty for investors that, after having invested, the ACCC could decide that the investment was not prudent and hence disallow recovery of the investment cost in regulated charges.
2. It is not clear that the threat of ex post prudency assessment provides effective efficiency incentives. If TNSPs do not think that the threat is credible, then they have no economic incentive to select the most efficient investment and develop assets at least cost. On the other hand, if they do think that the threat is credible, they may be inclined to inefficiently under-invest for fear that the ACCC will come to a different conclusion on the prudency of the investment they make.

Hence in the draft SRP the ACCC proposed revised capex arrangements that focussed on providing regulatory incentives before investment is committed.

Issues for consideration in reforming investment incentives

The code requires the ACCC to implement an incentive-based regulatory framework. Specifically, it requires the ACCC to set revenues based on forward-looking assessments of efficient operating and capital expenditure.

Setting investment targets will establish efficiency incentives if TNSPs are able to benefit by beating those targets while meeting their service obligations or are required to bear some of the loss if they exceed the targets. The ACCC has considered several objectives in the design of the incentive mechanism. Ideally the mechanism should:

- not result in windfall gains or losses attributable to forecasting errors
- be applicable to all TNSPs in the same way
- provide effective incentives to select the most efficient investment and ensure the development of assets at the lowest sustainable cost

- result in an equitable distribution of the benefits of efficiency gains
- minimise regulatory intervention and avoid monitoring
- take account of the accuracy with which the industry and regulator is able to forecast capex up to seven years in advance.

However, many of these objectives potentially conflict with each other. For example, high powered incentives may provide strong signals for increased efficiency but also increase the prospect of windfall gains or losses attributable to errors in the forecast investment targets.

5.3 Code requirements

The code establishes the principles underlying the regulatory regime that the ACCC must implement. These include:

- Certainty—the code requires the ACCC to provide ‘reasonable certainty and consistency over time of the outcomes of regulatory processes’ (clause 6.2.2(b)(j)). It also refers to the ‘need to minimise the economic cost of ... uncertainty’ (clause 6.2.3(d)(5)(iii)).
- Incentives—the code requires the ACCC to implement an incentive-based regulatory regime which provides an equitable allocation between TNSPs and network users of efficiency gains (clause 6.2.2(b)(1)). The code also requires the regulatory regime to be administered by the ACCC to have regard to the need to provide incentives and reasonable opportunities to increase efficiency’ (clause 6.2.3(d)(1)).
- Efficiency—the code requires the ACCC to implement a regulatory regime that provides an efficient and cost effective regulatory environment (clause 6.2.2(a)). It requires regulatory outcomes which foster an efficient level of investment within the transmission sector, and upstream and downstream of the transmission sector (clause 6.2.2(d)); and an environment which fosters efficient use of existing infrastructure (clause 6.2.2(f)).

- Adequate revenues—the code requires the ACCC to provide a sustainable commercial revenue stream which includes a fair and reasonable risk-adjusted cash flow rate of return to TNSPs on efficient investment, given efficient operating and maintenance practices on the part of the TNSP (clause 6.2.2(b)(2)).
- Regulatory costs—the code refers to the need to minimise the economic cost of regulatory actions (clause 6.2.3(d)(5)(iii)).

5.4 Draft SRP

The framework proposed in the draft SRP

The capex framework proposed in the draft SRP contained an ex ante cap, a provision for specific projects to be excluded and an off ramps provision. A brief overview of the framework and its incentive arrangements is set out below.

Ex ante cap

- TNSPs propose a five year capex allowance, to be assessed by the ACCC at the start of the regulatory period. The ACCC establishes a firm cap which would include most or all expected investment during the period.
- The cap is expressed as a profile of spending for each year of the regulatory period rather than as a specified list of investments and their expected costs. The cap would include a generosity factor to reduce the risk that the cap would be exceeded during the regulatory period.
- TNSPs would be free to decide which projects to build and when to build them. Where the aggregate cost of the projects is less than the cap over the regulatory period, TNSPs can fully recover the cost of these investments through regulated charges. However, if a TNSP invested more than the cap, this additional investment would not be recognised in its RAB.
- The calculation of the closing RAB at the end of the regulatory period would be the lower of the present value of the total actual investment in that period and the present value of the expenditure specified by the ex ante cap.
- The framework also allowed for the ex ante cap to be dynamically adjusted for changes in key investment drivers.

Exclusions

- Large and uncertain projects would be excluded from the cap because they could result in a significant error in the calculation of the cap.
- Investments excluded from the cap would be clearly defined at the start of the regulatory period. In this way, greater certainty would be provided on the maximum allowed investment during the regulatory period.
- Projects excluded from the cap would be subject to regulatory review during the period if those projects were developed. This regulatory assessment would take

account of a TNSP's investments during the regulatory period to determine the net additional investment needed to respond to the excluded events.

- The closing RAB would be determined by rolling in the actual cost of developing the contingent project.

Off-ramps

- Unforeseeable events that required additional capex spending by the TNSP, such as force majeure events, would be assessed during the regulatory period.

Rationale behind the approach in the draft SRP

The incentive arrangements outlined in the draft SRP sought to meet the code requirements in the following way:

- Certainty—by establishing a capex allowance at the start of a regulatory period, the ACCC provides certainty to TNSPs and transmission users on the maximum allowed investment during the regulatory period. This level of certainty is not possible under an ex post framework where investments can be optimised at the revenue reset.
- Incentives for efficiency—setting an investment target up front provides an efficiency incentive since the TNSP should be able to achieve a higher return on assets during the regulatory period if it spends below the allowed level while still delivering the same or higher outputs.
- Regulatory costs—by creating a regime which does not involve intrusive ex post assessment of a TNSP's expenditure, the potential for implementing a regime with lower regulatory costs is improved.

The design of the incentive for investment covered by the main ex ante cap is asymmetrical—TNSPs absorb all expenditure above the cap, but retaining the return on and of capital on underspend for the duration of the regulatory control.

This approach emphasizes incentivising underspend rather than penalising overspend. The asymmetry of reward/penalty is compensated for by determining a more generous ex ante expenditure allowance so that the probability of underspending is much higher than the overspending.

This arrangement offered the prospect of strong incentives not to overspend beyond the cap, as well as meaningful rewards for underspending. Consumers would share in the benefit of more efficient investment when the depreciated value of actual expenditure would be rolled into the RAB.

In addition, the marginal power of the incentive to underspend was relatively weak. This was intended to reflect the limitations of the current transmission service standards regime and the lag between the time that investment occurs and impacts on service quality. The ACCC was concerned that some efficiency incentives may lead to investment deferral at the expense of deteriorating service quality that would not be identified by the current service standards scheme.

The design of the ex ante incentive was combined with separate arrangements for contingent projects and pass-throughs. It was recognised that these additional elements would add considerable complexity to the regime, but they offered the prospect of considerably reducing the likelihood of windfall gains and losses. The ACCC considered this to be beneficial, taking account of the limited experience of TNSPs in developing rigorous and accurate five year investment forecasts.

5.5 Submissions from interested parties on draft SRP

General comments

The proposed shift to an ex ante capex approach and greater reliance on the use of incentives was generally supported in submissions. However, a number of TNSPs argued that more detail on the proposed approach was required. Concerns were also raised about the proposal for the establishment of a firm ex ante cap. TNSPs argued that this poses significant risks and may lead to inefficient outcomes.

Transend states that it ‘is extremely concerned by the Commission’s proposal to only roll in the lesser of the actual capital expenditure or the capped level of investment.’ It argues that such a proposal means that prudent overspend will not be remunerated at all, which may lead to inefficient outcomes.

ElectraNet states that it cannot accept the capex framework proposed in the Draft SRP. It supports the objective of introducing stronger incentives for capex efficiency but believes that there are a number of important issues to be resolved before the proposed capex framework can be finalised.

TransGrid argues that the firm cap proposal ‘does not provide incentives to undertake efficient investment. It merely provides an incentive to undertake less investment than forecast.’

EnergyAustralia similarly is concerned that the proposal for a firm cap ‘introduces the potential for efficient investment in excess of the cap to be excluded from regulatory revenues at the subsequent reset.’

Powerlink is not fundamentally opposed to an ex ante capex framework provided that all prudent investment will be eventually recognised and that the process does not add delays and prevent the timely delivery of reliability.

Electricity Supply Industry Planning Council (ESIPC) welcomes some of the changes to the pure ex ante model, most notably the option for contingent projects, but continues to have reservations about the long term behavioural implications of the model.

Ex ante cap

Approach is inconsistent with the code and recognised principles

A number of TNSPs note that the asymmetric incentive could result in prudent capex being excluded from the RAB which is inconsistent with the code requirement to provide a fair and reasonable rate of return on efficient investment. In addition, they considered that the penalty on underspend may result in inefficient underinvestment, particularly in the later years of the regulatory period. It was felt that TNSPs may be encouraged to run the risk of poor service delivery rather than commit expenditure that will be lost forever.

Various TNSPs also considered that the asymmetric approach to capex is inconsistent with the recognised principles of balanced incentives between opex and capex, uniform incentives throughout the regulatory period and equitable sharing of efficiency gains between the TNSP and customers. They state that as the TNSP only keeps the return on and of any underspend amount within the regulatory period, the incentive to seek efficiencies are diminished. They add that the incentive for capex underspend is also weaker than the five year rolling carry forward mechanism proposed for opex efficiencies.

However, a number of TNSPs consider that a symmetric incentive with a five year carry forward mechanism addresses most of these issues and that the symmetric incentive is strong enough to ensure that only prudent capex is incurred.

Complexity

Energy Australia considers the ex ante framework is a complex arrangement as a result of contingent projects, off-ramps and escalation indices. TransGrid argues that it is not clear that the imposition of an ex ante cap meets the ACCC's objective of reducing costly regulatory intervention. It claims that the ACCC will need to spend as much effort evaluating uncertain future expenditures and monitoring outcomes as it would have to devote to reviewing actual expenditures under an ex post review.

Strength of the incentive

A number of interested parties consider that the proposed efficiency incentive is weak relative to that proposed for opex and that the incentive to deliver efficiencies towards the end of the period diminishes. They consider that the incentive mechanism should provide constant incentives to deliver efficiency gains and be strengthened by including a five year carry forward incentive mechanism.

VENCorp believes that, because of a lag effect with service standards, it is feasible that a TNSP could defer capex uneconomically without affecting service performance in the short term. Moreover, it claims that it is possible that in response to the incentives created by the proposed capex arrangements that TNSPs may succeed in having a provision for the same capex included in two or more successive revenue cap decisions.

ESIPC states that the asymmetry of the incentive scheme has set up a scheme where overspend is extremely unlikely and incentives for underspending are strong. It believes that, despite the underspend incentive only applying within the regulatory

period, project deferral may still be a lucrative proposition for a TNSP, even for a relatively modest project. Managing these drivers will require that the ACCC's upfront assessment of the TNSPs capital requirements is one that is rigorous and clear.

Dynamic adjustment

Victorian Energy Networks Corporation (VENCorp) questions whether the dynamic cap is consistent with the code requirement that TNSPs be revenue capped. It considers that the regime being designed should not provide inappropriate incentives to encourage increased load growth or discourage demand-side initiatives.

Probabilistic approach and assessment of performance

VENCorp considers that there is a contradiction between the need for increased project-specific information upfront (as part of any ex ante review) and the use of a probabilistic approach (which it believes will not provide project specific information). VENCorp is concerned that the absence of a defined plan will make it very difficult for the ACCC to assess a TNSP's performance at the next revenue cap, particularly whether any underspend is efficient or whether any projects have been inefficiently deferred.

ESPIC believes that the probabilistic method for establishing the ex ante cap has the potential to produce uncertain customer benefit and a logistical headache for the ACCC. It argues for example, that a probabilistic capex program has the potential to incorporate large capital sums for projects that are unlikely to proceed and hamper an understanding about which of the projects have been completed, which have been deferred and which remain outstanding.

ESPIC acknowledges that the contingent projects arrangement does alleviate some of this uncertainty.

Role of the regulatory test

Powerlink and Transend state that the ACCC, in its review of the regulatory test earlier this year, deferred its decision on a couple of issues relating to the role of the regulatory test in the regulatory framework and the thresholds for new small and new large network assets.

Powerlink believes that the economic assessment of options under the ex ante regime is inappropriate as the incentive is already strong not to overspend the allowance. This will therefore drive the TNSP to select the most cost efficient solution to any network limitations. However, it acknowledges the need to retain the information content of the regulatory test and would propose that the code provisions be amended such that appropriate information be provided in the Annual Planning Report.

ESIPC, however, states that it would be reluctant to see the regulatory test process discontinued for those projects under the cap. It believes that the incentive scheme will normally act to encourage TNSPs to choose the most cost effective option, but short term deferrals across regulatory periods may lead to inefficient investment decisions. ESIPC states that as a regulatory test allows for cost benefit assessment over a longer time periods it will help to demonstrate where such deferrals are economically inefficient.

Similarly, VENCORP is concerned that the ACCC's approach to setting the ex ante cap appears to be decoupled from the regulatory test. It states that it is not clear what role, if any, the regulatory test will play in setting the ex ante cap. VENCORP considers that for assets to be included in the RAB the TNSP should demonstrate that the regulatory test has been undertaken. It also suggests that the amount rolled-in for a project should be capped at the amount determined by the regulatory test assessment.

Level of detail required to support capex application

Powerlink considers that the current indication is that the level of detail required to justify individual projects, in addition to the analysis in the probabilistic analysis, is in excess of the current requirements in conducting an ex post review. It believes that this is undesirable for the TNSPs as the documentation provided to justify expenditure in an ex post review is generated over a five year period, for an ex ante review the supporting documentation required would have to be generated in timescales of the application (approximately one year).

Contingent projects

Approach to contingent projects

ElectraNet considers that the implementation of the ACCC's proposed contingent projects scheme is unnecessarily complex and inconsistent with the principles of simplicity, transparency and practicality. It considers that the most appropriate approach is for the contingent project to earn a revenue stream within the regulatory period via a pass through mechanism.

Contingent project threshold

TXU argues that investments greater than \$20 million should be excluded from the ex ante cap. It believes that the application of an absolute value cap of \$20 million would be superior to a 10 per cent threshold, citing that a percentage threshold would be distorted by the relative size of the TNSP.

Expected error formula

Transend believes that the formula is too prescriptive and it is unclear how it would work.

Need for discretion

Most interested parties supported the concept of excluding projects from the ex ante allowance and the need for the ACCC to have some discretion or flexibility in determining what should be excluded.

Need for broad categories

A number of interested parties consider that the application of contingent projects could be broadened to include a class of projects driven by specific investment drivers but where the specific project is not known at the time of the forecast. It was acknowledged that these projects would be reviewed using the regulatory test to ensure that they are prudent and that they were not covered by the ex ante target forecast.

5.6 ACCC's considerations

This section outlines the capex incentive design that the ACCC has decided to implement. It contrasts the scheme set out in this final decision with the scheme described in the draft SRP, and then sets out the main considerations underlying the changes. A detailed description of the incentive mechanism and its operation is set out in section 5.7.

5.6.1 Overview of changes from the draft SRP

The key differences between the incentive design that the ACCC has decided to adopt and the scheme set out in the draft SRP are as follows:

- The asymmetric incentive in the main ex-ante cap has been replaced with a symmetrical incentive. This means that penalties for overspend and bonuses for underspend are the same. The specific incentive design is to calculate the closing RAB based on the depreciated value of actual expenditure during the regulatory control period. This means that TNSPs obtain the return on and of the difference between actual and target expenditure during the regulatory control period. Accordingly, the determination of efficient expenditure level will be based on expected expenditure rather than a level higher than this.
- Contingent projects are now to be subject to an efficiency incentive. The design of this efficiency incentive is the same as the incentive that applies in the main ex ante cap.
- There is no specific provision for capex pass throughs (off-ramps). Given code amendments (refer to chapter 7), the ACCC will replace this with a provision, covering unforeseen changes to the efficient requirement for opex and capex, that provides for the revenue control to be reopened.

5.6.2 Considerations underlying the revised approach

Move to symmetrical ex-ante allowance

As discussed in section 5.5, the proposals in the draft SRP received much comment. Most interested parties were generally supportive of the move to an incentive-based ex ante framework, but a number of concerns were raised about the asymmetrical nature of the incentives under the approach proposed in the draft decision. There are three issues:

1. Many interested parties thought the mechanism was unnecessarily complex.
2. There was concern that even though the ACCC had committed to establishing the ex ante cap conservatively, in practice the ACCC would be pressured into reducing the expenditure allowance below an efficient level. Further, a number of interested parties were concerned how the 'generosity factor' would be quantified.
3. A number of interested parties considered that the penalties associated with the scheme were too severe when actual capital spending levels exceeded the cap but resulted in efficient outcomes. It was suggested that either there should be no penalties for expenditure considered to be prudent and efficient or that overspend

penalties should be aligned with underspend incentives (i.e. a symmetrical incentive adopted).

The ACCC considers the design of an incentive scheme needs to find a balance between several often opposing objectives. The strength of the incentive needs to take account of the accuracy of expenditure forecasts and hence the size of possible windfall gains and losses. Windfall losses, for example, would arise if the efficient expenditure requirement turns out to be higher than expected and hence TNSPs would not be fully compensated for efficient overspend.

The incentive design also needs to take account of the relationship between the strength of the efficiency incentives and the quality of service. For example, higher powered incentives provide stronger efficiency incentives, but could result in deteriorating service standards in the longer term.

In addition, the design of the capex incentive mechanism needs to consider the extent to which capex incentives could lead to inefficient substitution between opex and capex. It is necessary to take account of the ability of firms to substitute between opex and capex, the difference between the opportunity cost of capital and the allowed WACC, and the relative investment of money and effort, needed to achieve opex or capex savings.

Finally, the decision on the design of incentives should take account of how those incentives change during the course of the regulatory period and between regulatory periods. Efficiency carry forward mechanisms could be used to provide more constant efficiency incentives through out the regulatory period. However capex efficiency carry forward mechanisms can also be problematic. For example, capex forecasts towards the end of the regulatory period can be expected to be less certain than forecasts earlier in the period. Applying the same power of incentive to expenditure at the end of the period, therefore, can be expected to give rise to larger windfall gains or losses.

In addition, strong efficiency incentives towards the end of the regulatory period can create an incentive for the inefficient deferral of expenditure from one regulatory period to the next. This means that consumers pay an additional cost.

In view of these factors and taking into account the concerns raised by interested parties, the ACCC has decided to apply a symmetrical incentive in the main ex ante allowance. This design provides progressively weaker efficiency incentives as the regulatory period progresses and therefore takes account of the increasing uncertainty over the level of efficient expenditure later in the period. It also limits the reasons to inefficiently defer expenditure to later regulatory periods.

The ACCC acknowledges that this capex incentive involves lower powered incentives than some other regulators have chosen. For example, the Essential Services Commission in Victoria currently allows a continuous carry over of rewards

for both capex and opex underspending for a period of five years.¹⁷ The ACCC is reluctant to use such a high powered incentive for capex at this time because it shares VENCORP's and ESIPC's concerns about the ability of the current service standards regime to identify the impact of changes in investment on service quality in a timely manner.

However, it may be the case that weak incentives towards the end of the regulatory period could give rise to spikes in expenditure as the regulatory period progresses. The ACCC will monitor capital expenditure and if it becomes clear that such spikes are attributable to the incentive mechanism rather than genuine efficient investment, the ACCC will consider changes to the incentive design, possibly through the implementation of some form of carry-forward mechanism.

Introduction of incentives on contingent projects

In the draft SRP the ACCC favoured an approach where the closing RAB calculation for a contingent project would be determined by taking into account its actual cost. The ACCC now considers that there may be problems with such an approach and has decided to implement an efficiency incentive for contingent projects. This decision reflects the ACCC's view that without such incentives TNSPs may choose to inefficiently substitute between investment under the main ex ante allowance and the contingent project control.

The ACCC considered applying a different incentive design on contingent projects compared to the incentive design applied to the main ex ante allowance. It could be argued that this would be appropriate if contingent project expenditure could be forecast with greater accuracy than expenditure under the main ex ante incentive.

However, on balance the ACCC considers that the dominant consideration should be to ensure consistent incentives between contingent projects and the main ex-ante allowance to avoid inefficient substitution. This means setting the closing RAB for contingent projects based on the depreciated value of the actual expenditure (whether it is higher or lower than the target expenditure). Therefore like the main ex ante allowance, TNSPs keep the depreciation and return on any underspend, or lose the depreciation and return on any overspend, for the first five years of the control.

Revised approach to off-ramps

Finally, the ACCC has decided not to proceed with the capex off-ramps provision. This reflects the ACCC's desire to simplify the incentive mechanism. TNSPs will still obtain the same protection against significant errors in the efficient expenditure allowance if they are able to request that the revenue cap be re-opened.

The reopening provision takes into account events over which the TNSP has no control but could significantly alter the allowed efficient investment level. Under certain specified conditions, the revenue cap would be reopened during the regulatory

¹⁷ A discussion of the Essential Services Commission's approach is outlined in Essential Services Commission, Victoria (2004) *Electricity Distribution Price Review 2006—Final Framework and Approach: Volume 1, Guidance Paper*, June 2004.

period. There would be no limit on the nature of an event that could give rise to a reopening of the revenue cap. The reopening mechanism is described in chapter 7.

5.7 Capex incentive mechanism

Ex ante allowance

The ex ante investment allowance should cover most or all expected investment during the regulatory period, including discretionary investment not related to statutory reliability obligations (such as investment to relieve constraints or investment in interconnectors). A discussion of the categories of investments covered by the allowance and the information that the ACCC expects to see in support of a capex application can be found in appendix D.

The ex ante approach involves the TNSP proposing a five year capex allowance. The ACCC will review the TNSP's proposal and establish a target allowance at the start of the regulatory period. The allowance will be established on the basis that it represents the expected efficient level of investment that the TNSP requires to meet its statutory and code obligations, taking account of the likely changes in the factors driving the need for and cost of investment. Establishing the allowance therefore requires thorough up front analysis by the ACCC.

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.

It is important to note that the capex allowance does not entail project-specific approval and there is no constraint on TNSPs investing in a different suite of projects to those used in the calculation of the allowance. Considerable certainty is provided by the ex ante allowance as the TNSP is able to invest up to the level of the capex allowance knowing that it can recover the cost of those investments through regulated charges.

The ACCC notes that the current provisions of the code concerning TNSPs' obligations to apply the regulatory test still stand. Therefore, TNSPs will still need to undertake regulatory test assessments of projects covered by the ex ante allowance. Compliance with the requirements of the code (including, where relevant, the application of the regulatory test) will be a pre-condition for the inclusion of actual expenditure in the closing RAB.

Under the code the ACCC has the authority to amend the thresholds relating to the definitions of new small network assets and new large network assets. A number of parties have argued that it may be appropriate to amend the existing thresholds. However, the ACCC wishes to examine the operation of the thresholds in the amended capex incentive framework before making any change to the current thresholds.

Flexibility for TNSPs in formulating capex proposals

The objective of the ex ante allowance is to establish certainty and incentives for efficiency. This requires the allowance to be reasonably aligned with efficient costs over the period.

The ACCC considers that there are many ways to formulate the ex ante capex target. For example, it could take the form of a fixed amount for each year of the regulatory period which would not vary with any changes in the underlying investment drivers, such as load growth, on which the initial investment target was established. In this formulation, the range of possible cost driver and investment outcomes could be accounted for through a probabilistic assessment.

An alternative is an allowance contingent on specified investment drivers, such as changes in demand. Therefore, the allowance could have a fixed element and an element that changes in line with key cost drivers. In this case, the actual target capex would only be known at the end of the regulatory period. However, to establish allowed revenues and hence prices during the regulatory period a forecast of investment drivers would need to be made. At the end of the regulatory period there would need to be an adjustment to allowed revenues to take account of differences between the actual and forecast level of the cost drivers. An example, of how a dynamically adjusting cap might be formulated can be found at Appendix E.

The ACCC expects that TNSPs will propose a structure for the allowance which provides them with reasonable protection against variation in efficient costs due to changes in underlying parameters. These proposals should demonstrate the rationale for the approach recommended, by providing quantified analysis of the relationship between any cost drivers (such as growth in peak demand) and the resulting investment requirement. The proposals would also need to establish how the relevant parameters will be measured and audited to ensure the integrity of the incentive.

Given that a dynamically adjusting capex allowance has not been previously used and the significance of capex in determining allowed revenues, the ACCC considers that it would be beneficial for a TNSP to discuss any such proposal with the ACCC prior to submitting its revenue cap application.

VENCorp questions whether the dynamic adjustment mechanism is consistent with the code requirement that TNSPs be revenue capped. It also states that the regime should not provide inappropriate incentives to encourage increased load growth or discourage demand-side initiatives.

The ACCC's view is that the proposal for revenue to be adjusted for changes in investment drivers is consistent with the code because the approach and formulae for adjusting the cap would be agreed upfront at the time of the revenue reset. The ACCC acknowledges the potential incentives provided by the dynamic adjustment mechanism. However, given the potential for forecasting error and the importance of the transmission system to the economy, the ACCC considers that the benefits of such a mechanism may outweigh its potential detriments.

VENCorp considers that there is a contradiction between the need for increased project-specific information upfront (as part of any ex ante review) and the use of a probabilistic approach (which it believes will not provide project-specific

information). It also states that a probabilistic approach implies that there is no defined investment plan that identifies specific projects and that the absence of a plan will make it very difficult for the ACCC to assess whether any underspend is efficient or whether any projects have been inefficiently deferred.

The ACCC does not agree that the need for increased project-specific information for an ex ante review and the use of a probabilistic approach are contradictory. Under the ACCC's ex post regime, TNSPs have been utilising a probabilistic approach to determine their capex programs. The use of a probabilistic approach has not prevented TNSPs from being able to provide the ACCC with detailed information on the majority of projects being sought in their revenue cap applications. This is particularly the case for those projects having a high probability of proceeding during the regulatory period and those being constructed in the earlier years of the period.

The ACCC agrees that it will be difficult to assess whether or not an underspend is efficient or whether projects have been inefficiently deferred. However, it has specifically recognised this issue through the introduction of a low-powered incentive arrangement. It is also the ACCC's intention to monitor capex throughout the period and compare which projects have been constructed by the TNSP relative to what was proposed in its application and the reasons for any significant changes.

Calculation of the closing RAB for the main ex ante allowance

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) for the remainder of the regulatory period. Conversely, if it exceeds its expenditure target during the regulatory period it suffers a penalty on that overspend (both return on and of) for the remainder of that regulatory period.

It is a precondition to the inclusion of actual capital expenditure in the closing RAB that the expenditure complies with the requirements of the code. For example, if a TNSP constructs a project without first complying with the requirements of chapter 5 of the code (including, where relevant, the application of the regulatory test) the expenditure will not be included in the closing RAB. To the extent that the relevant code requirements have been satisfied, actual capital expenditure will be included in the closing RAB, notwithstanding that it may exceed the ex-ante target.

Contingent projects provision

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.

The ACCC considers that excluding significant but uncertain investments from the main ex ante capex allowance will improve the accuracy of the allowance and hence ensure that it remains reasonably aligned with efficient costs. Further, 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.

Threshold for contingent projects

The ACCC has considered TXU's argument that a threshold of \$20 million be implemented for contingent projects. However, the ACCC believes that the key consideration in deciding whether a project should be excluded from the ex ante allowance relates not to its value, but to the extent to which including the project in the ex ante allowance would cause a substantial misalignment of the allowance with efficient costs over the regulatory period.

When such misalignments occur, it will give rise to windfall gains (if the allowance is too high) or losses (if the allowance is too low) not attributable to the actions of the TNSP. Hence, the ACCC considers projects should be excluded if their inclusion would lead to a significant error in the ex ante allowance, rather than on the basis of size alone.

The expected error presented by each project included in the calculation of the ex ante cap is equal to the greater of:

- the amount that was provided for that project in the calculation of the allowed revenues during the regulatory period—if that project was not, in the event, developed and
- the difference between the accumulated depreciation and return on the project calculated on the basis of the expected cost of the project; and the accumulated depreciation and return on the project based on the expected value of that project at the time of the ex ante allowance—if the project was developed.

The ACCC has decided to adopt the approach proposed in the draft SRP and will generally exclude projects from the ex ante cap if the expected error presented by the inclusion of that project in the allowance, is equal to more than 10 per cent of the ex ante capex allowance. The detailed specification of this criterion is set out in appendix F. It should be noted that the threshold of 10 per cent is an indicative number and the final decision as to whether a project should be excluded will be at the ACCC's discretion.

While the ACCC expects the majority of contingent projects to satisfy this threshold, TNSPs can apply to the ACCC for other specific projects to be excluded from the ex ante capex allowance. Consistent with the approach adopted in the Draft SRP, it will be at the ACCC's discretion as to whether these will be considered to be contingent projects.

In addition to this expected error threshold, the ACCC will take into account what has been included in the main ex ante capex allowance. Projects should in general only be excluded from the ex ante allowance to the extent to which they have not already

been provided for in the probabilistic assessments which take account of systemic cost drivers. In other words, projects should only be excluded if they arise in response to a specific, independent cost driver such as a major point load.

This condition, along with the expected error threshold, means that the ACCC would expect that typically only in rare circumstances would possible future projects be excluded from the ex ante allowance.

Setting the expenditure target for the contingent projects

In its draft SRP the ACCC considered whether the regulatory determination of the allowed investment in contingent projects should take place before, during or after the regulatory period in which the investment begins.¹⁸ The ACCC concluded that the decision on the allowed investment on contingent 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 still thinks that this approach is appropriate. The main advantage of this approach is that it avoids the complexity of establishing, at the start of the regulatory period, what the efficient level of investment should be. It also provides greater certainty that the regulatory determination of the allowed investment will not result in excessive windfall gains or losses.

After the TNSP has applied the regulatory test to the contingent project, the ACCC will establish a target annual expenditure level for each contingent project.¹⁹ This will be converted into a contingent 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 during in which the investment on the contingent project is made. This contingent project revenue requirement will be added to the revenue requirement determined at the start of the regulatory period.

The five year incentive period for contingent 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 a contingent project incentive could be established in, say, the fourth year of the regulatory period. Such a contingent project incentive would run for five years (i.e. the fourth and fifth year of the current control, and the next three years of the next regulatory period).

Calculation of the closing RAB for contingent projects

At the end of the five years of the contingent project incentive period, the depreciated value of the actual expenditure on the contingent project that complies with the requirements of the code will be included in the RAB.

¹⁸ While the contingent project example provided in the Draft SRP appears to suggest a preference for treating capex on an 'as spent' rather than 'as commissioned' basis, the ACCC has not formed a view on this issue and TNSPs are able to adopt either approach at this time.

¹⁹ More detail on the implementation process for contingent projects is provided at appendix G.

This means that, in the same way as for main ex ante capex, should a TNSP spend less than its expenditure target it retains the benefit of that underspend for the remainder of the five year period applying to the contingent project (both return on and depreciation), while if it exceeds its expenditure target it suffers a penalty on that overspend for the remainder of the period.

It should be noted that code changes will be required to ensure that the calculation of the revenue requirement and RAB can be adjusted during the period of the main revenue control.

However, as outlined in appendix G, in the absence of code changes, adjustments to the closing RAB and the capex allowance for the following period will need to be made at the re-set of the TNSP's revenue cap.

5.8 Arrangements for separate network planners and owners

5.8.1 Introduction

The transmission arrangements that apply in Victoria are unique within the NEM. Under a jurisdictional derogation from the code the network planning function and the ownership of transmission assets are separate and governed by separate TNSPs.

Under the derogation a not-for-profit statutory authority, VENCORP, has responsibility for planning and directing augmentations to the shared transmission network. VENCORP also provides transmission network services to users. It does not own any transmission assets itself. VENCORP sources bulk network services from, among others, the TNSPs that own and operate the Victorian transmission system.

SPI PowerNet owns, operates and maintains most of the transmission network in Victoria. VENCORP procures electricity transmission services for augmentation works from SPI PowerNet under long-term network agreements. The costs of those augmentation works are then passed onto transmission users via a mechanism that allows VENCORP to alter its TUoS charges to deal with the fluctuating costs.

The ACCC is responsible for regulating the revenue of both VENCORP and SPI PowerNet. SPI PowerNet's regulated revenue is determined by the ACCC in accordance with chapter 6 of the code. Its regulated revenue only includes capital expenditure to cover investment needed to maintain, refurbish and replace existing assets. It does not include provision for augmentations to the network.

The ACCC also determines VENCORP's MAR for each financial year in a similar manner to the determination of other TNSPs' regulated revenue. However, under the derogation, VENCORP is entitled to recover its costs, the bulk of which are payments to regulated owners, in full during the regulatory period. As a consequence, parts of chapter 6 do not apply to the regulation of VENCORP's revenue, and the MAR may be subject to adjustment during the period to account for any changes in SPI PowerNet's charges for the shared transmission services and any other change in VENCORP's statutory electricity transmission related costs.

Given this unique situation the ACCC will need to adopt a different approach to the regulation of VENCORP's revenue as the proposed incentive regime will not be suitable.

5.8.2 Code requirements

Clause 9.8.4C(a) sets out two principles that the ACCC must comply with when setting VENCORP's MAR:

- the amount of VENCORP's MAR for a relevant regulatory period must not exceed VENCORP's statutory electricity transmission related costs, and
- the MAR must be determined on a full cost recovery but no operating surplus basis.

Under clauses 9.8.4C(g1) to (g4) the MAR must be adjusted during the relevant regulatory period to reflect any changes in VENCORP's costs to ensure that VENCORP is able to achieve a full cost recovery.

5.8.3 Draft SRP

In the draft SRP the ACCC argued that the ex ante capex framework should apply to SPI PowerNet's maintenance, refurbishment and replacement capex. The ACCC also considered that as a derogation from the code explicitly recognises VENCORP's not-for-profit status, VENCORP's budget should not be subject to a fixed cap.

5.8.4 Submissions by interested parties on draft SRP

SPI PowerNet states that it is generally comfortable with being subject to an ex ante cap for its replacement capex but that for it to take on the extra risks of the regime it believes that higher incentives are warranted. It also considers that for augmentation capex the detail needs to be resolved and that practical hurdles remain.

5.8.5 ACCC's considerations

Although this issue cannot be determined until the next revenue cap reset for SPI PowerNet, the ACCC's current view is that the unique structure of the Victorian transmission network necessitates different arrangements from that proposed for the remainder of TNSPs in the NEM.

The ACCC proposes to set an ex ante allowance for those businesses which own, operate and maintain the transmission network in Victoria. The allowance will be limited to their maintenance, refurbishment and replacement capex. However, as these businesses are not responsible for augmenting the transmission network, the ACCC does not propose to exclude any projects from the ex ante allowance.

VENCORP's revenue cap will continue to be set by the ACCC with reference to its operating budget and the likely augmentations required for the efficient operation of the Victorian network.

5.9 Decision

5.1 Introduction

This section sets out the ACCC's proposed approach with respect to the treatment of capital expenditure.

5.2 Capital expenditure framework

The ACCC proposes to adopt capital expenditure incentives focused, as far as possible, on the determination at the start of the regulatory period of an efficient level of capex for the duration of the regulatory period. The proposed incentive design consists of the following elements:

- an ex ante allowance: this will cover most or all expected investments during the regulatory period and will establish an allowance on the level of investment during the regulatory period to be included in the regulatory asset base at the end of that period.
- a contingent projects provision: this will cover very large and uncertain investments.

5.3 Ex ante capex allowance

The ex ante capex allowance should cover most or all expected investment during the period of a regulatory control, including discretionary investment not related to statutory reliability obligations. The allowance will be determined on the basis of a probabilistic assessment of expected investments during the regulatory period. However, the allowance does not entail project-specific approval and although an expected project may have been included in the determination of the allowance, this does not oblige the TNSP to develop that project during the regulatory period.

TNSPs will propose the form of the allowance best suited to their circumstances. It is expected that in most cases the allowance will reflect the change in total investment in response to a change in the main investment drivers. TNSPs will be required to provide quantified analysis of the relationship between any cost drivers (such as growth in peak demand) and the resulting investment requirement. The proposals would also need to establish how the relevant parameters would be measured and audited.

In respect of investments covered by the ex ante capex allowance, the calculation of the closing RAB at the end of the regulatory period will be the written down value of the actual investment in that period that complies with the requirements of the code.

5.4 Excluded investment

The ACCC proposes to exclude a project from the main ex ante capex allowance 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.

The TNSP can apply to the ACCC for specific projects to be excluded from the ex ante allowance, even where this value threshold is not satisfied. It will be at the ACCC's discretion as to whether these projects will be considered as contingent projects.

Projects excluded from the ex ante capex allowance must be linked to unique investment drivers—such as a major point load or expected power station—rather than to general investment drivers (such as expectations of load growth within a region).

Determination of the allowed investment in contingent projects will occur during the regulatory period, once the probability of the project and its expected costs become known with greater certainty, but before investment is committed.

At the end of the contingent project incentive period the depreciated value of the actual investment in the contingent project that complies with the requirements of the code will be included in the RAB.

5.5 Arrangements applicable to separate network planners and owners

The ACCC proposes to set an ex ante allowance for those businesses which own, operate and maintain the transmission network in Victoria. However, as these businesses are not responsible for augmenting the transmission network, the ACCC does not propose to exclude any projects from the allowance.

VENCorp's revenue cap will continue to be set by the ACCC with reference to its operating budget and the likely augmentations required for the efficient operation of the Victorian network.

6 Incentive framework for operating and maintenance expenditure

6.1 Introduction

This chapter examines the opex component of the MAR within the building block framework. Typically, opex represents around one-third of the total expenditure over the regulatory period. The building block formula treats opex as a lump sum. Therefore, the opex allowance does not provide any return to the TNSP. This is illustrated in the building block equation:

$$\begin{aligned} \text{MAR} &= \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax} \\ &= (\text{WACC} * \text{RAB}) + D + \text{opex} + \text{tax} \end{aligned}$$

The key features of the opex arrangement are as follows:

- the opex allowance for the regulatory period is established at the start of the period based on the ACCC's assessment of the TNSP's proposal
- the opex allowance is reset at subsequent regulatory reviews taking into account the actual expenditure from the previous regulatory period and other information about likely future expenditure.

This chapter:

- section 6.2 summarises the issues in setting an efficient opex allowance
- section 6.3 provides an overview of the code requirements
- section 6.4 sets out the options considered in the draft SRP and the ACCC's preferred approach
- section 6.5 summarises submissions from interested parties
- section 6.6 outlines the ACCC's considerations in setting an opex allowance and the incentive mechanism to apply
- section 6.7 presents the ACCC's decision.

6.2 Issues

The two key issues to be considered in the treatment of opex are:

- how the allowed expenditure during the regulatory period should be established
- the design of an incentive mechanism.

6.2.1 Determining the allowed expenditure

At the start of a regulatory period, the ACCC determines the expected efficient opex for each year of the regulatory period. In doing so, the ACCC can use some combination of firm specific costs, comparative benchmarks or completely exogenous measures, such as indices or factor productivity measures.

Relying on firm specific costs requires the ACCC to overcome significant information asymmetries. However, comparative benchmarks or other exogenous measures can only be relied on if they are accurately constructed, and if there is sufficient confidence that they will deliver an allowance that represents expected efficient opex during the regulatory period.

6.2.2 Incentive mechanism design

The design of the incentive mechanism affects the amount of effort that TNSPs will make to reduce operating costs, and the trade-off between profit and quality of service. The incentive design also affects how TNSPs program their expenditure during the regulatory period, and between the current and next regulatory periods.

6.3 Code requirements

Chapter 6 of the code sets out the matters the ACCC must consider when setting a TNSPs revenue cap and specifies certain objectives for the ACCC's regulatory regime. In relation to opex, the code requires the regulatory regime to provide 'an environment which fosters efficient operating and maintenance practices within the transmission sector' (clause 6.2.2(e)). However, while the code provisions establish the objectives for the regulation of opex they do not prescribe how the ACCC should determine an opex allowance, or the incentive properties of that allowance.

6.4 Draft SRP

The draft SRP discussed the ACCC's current approach of relying mainly on firm specific costs when determining the opex allowance for TNSPs. The ACCC considered that a greater reliance on the use of benchmarking will provide a more accurate assessment of each TNSP's performance. However, the draft SRP highlights a number of implementation issues with benchmarking. The ACCC stated that it would continue to undertake further work in this area.

The ACCC also considers adopting an efficiency carry-forward mechanism and discussed self-insurance and pass-throughs. The ACCC considered that the option of self-insurance, in addition to external insurance, should generally be available to TNSPs to allow them to select the most efficient approach. Alternatively, it suggested that where a risk is not controllable by the TNSP, it may be appropriate to include (as an alternative to receiving an allowance in the cash flows) a mechanism in the revenue cap that allows the TNSP to pass through to users the costs of certain events.

6.5 Submissions by interested parties on draft SRP

The major focus of submissions on the draft SRP's opex proposals concerns the carry forward mechanism. All respondents support the use of carry forward mechanisms to

strengthen efficiency incentives and provide more constant efficiency incentives over time.

Origin considers this arrangement provides an appropriate balance between incentives for transmission companies to reduce costs and the sharing of those cost savings with consumers. However, AGL is not convinced that the proposed carry forward mechanism would be effective, but did not suggest how it should be changed.

ElectraNet notes that the scheme could be amended to exclude the carry-forward of net losses from one regulatory period to the next, consistent with the practice of other regulators. Powerlink, Transend and TransGrid all agree that losses should not be carried forward. However they all provide different reasons:

- Powerlink states that the ACCC had not committed to illustrating how forecast opex allowances will be set and that random and inappropriate efficiency targets may be set which would claw back previous efficiencies and hence erode the benefit carried forward. They concluded that the carry forward of losses would constitute a double penalty.
- Transend suggests that the ACCC's intention to carry over negative payments may reflect a mindset that TNSPs are 'fat businesses' and that any overspend must be as a result of inefficiency. Transend claims that over its revenue period, the ACCC has not provided sufficient opex for it to be able to operate the business efficiently and sustainably and the risk exists that insufficient opex will be provided in future controls. Therefore Transend does not support negative efficiency carry-forward.
- TransGrid states that a negative carry over from one regulatory period to the next would not provide a sufficient revenue stream to cover expected efficient future costs and hence the ACCC should incorporate a zero floor eliminating this possibility whilst retaining the incentive for TNSPs to make efficiency savings.

Electranet, SPI PowerNet, Transend and Powerlink suggest that the efficiency carry forward amount should be a separate line item in the revenue control decision.

Finally, TransGrid considers that it should be possible to revisit the reasonableness of the forecasts used at the beginning of the regulatory period to account for experience during the regulatory period.

6.6 ACCC's considerations

6.6.1 Determining the expenditure allowance

In determining the expenditure allowance, the ACCC has considered the following issues:

- the role of firm specific analyses versus exogenous benchmarks in establishing expenditure targets
- the use of actual costs in establishing expenditure costs

- the treatment of self-insurance premiums.

Firm specific analysis versus exogenous benchmarks

In establishing an opex allowance the regulator can rely on firm-specific costs and/or a variety of exogenous measures.

The key issue in constructing exogenous measures is how they should be calibrated to take account of TNSPs' specific operating conditions. The ACCC is aware of the work undertaken by the Office of Water Services (Ofwat) in the UK and by other European regulators to develop comparative benchmarks and other partially exogenous measures to establish expenditure allowances.

The ACCC considers that the development of comparative benchmarks has considerable merit since it would allow the ACCC to establish expenditure allowances without necessarily having to conduct exhaustive firm-specific cost analyses. The use of benchmarks offers the promise of less intrusive regulation. However, considerable work would need to be done to establish reliable benchmarks that produce fair and balanced comparisons between the TNSPs in the NEM.

The ACCC intends to begin work on appropriately calibrated benchmarks in 2005. However, until such benchmarks have been established, the ACCC will need to rely on firm specific analyses in setting opex targets.

This does not mean that without such comprehensive benchmarks, the ACCC will not consider inter firm or even inter industry comparisons. Indeed in some circumstances, partial measures could provide useful contextual information in informing the ACCC's decisions on expected efficient opex.

Use of outturn costs in setting future expenditure allowances

A large part of total opex is recurrent. For example, the total number of employees will be relatively constant from one year to the next and expenditure on operating fixed assets can be expected to be relatively constant over time. The recurrent nature of opex means that the firm's actual costs from the previous regulatory period can provide an indication of the TNSP's expected costs for the next regulatory period.

It is inevitable that new factors may emerge that affect the firm's future opex. For example:

- networks are expanding and the nature of assets change, which may change the opex requirement
- changes in the available technologies, such as greater use of automation and remote asset monitoring, may change opex requirements
- different approaches to maintenance (e.g. condition based pre-emptive maintenance versus failure based approaches) can lead to significant changes in maintenance expenditure and can shift expenditure between recurrent operating and one off capital expenditure

- TNSPs' networks cover an extensive geographical area. The operating costs of these assets can be subject to uncertain, exogenous events whose frequency and impact can not be forecast with confidence. For example, the bush fires in NSW led to a considerable spike in operating costs in 2002 and 2003.

For these reasons, the ACCC believes that, it is not appropriate, when determining the efficient opex allowance for future periods, to mechanically relate future targets to past outcomes. Consequently, when setting the opex target, the ACCC will generally consider:

- past opex
- any reasons why future opex may differ to past opex.

However, retaining the flexibility to consider a range of factors in setting future opex targets means that the power of the incentive becomes unpredictable. For example, if a TNSP saves one dollar in the regulatory period, they obtain the benefit of that saving during the regulatory period. However, if the full value of that saving is passed on to consumers at the end of the regulatory period (through a lower opex target) then their incentive to make that saving will be weaker than if none of the saving was passed through to consumers.

By retaining flexibility on how past opex is taken into account in setting future targets, TNSPs will not have certainty on what proportion of value created by cost reduction they will retain.

In the context of gas transmission regulation, the ACCC has adopted a mechanism that values the objective of predictability more highly than flexibility.

The ACCC's approach in the gas transmission industry is described in the *GasNet Final Decision* of 13 December 2002. Broadly, the ACCC bases opex targets on past opex unless the service provider can demonstrate reasons why future opex may be different to the past. Where the service provider is able to demonstrate the need for a departure from past opex this is accommodated through a step and trend adjustment.

The step adjustment takes account of changes in the nature and scale of the regulated business (for example, the addition of new capital equipment resulting in changing opex requirements). The trend adjustment implements assumptions about changes in productivity gains, demand growth and input costs.

This model provides an appropriate balance between predictability and flexibility in the gas industry where the industry is reasonably stable. For example, in the gas industry:

- technological change is not rapid
- capital investment on existing pipelines tends to be a modest proportion of the total value of the pipeline
- many firms have already made progress in improving the efficiency of their operations.

For electricity transmission regulation the ACCC has decided to adopt a mechanism that places greater value on flexibility than predictability. This reflects the comparatively more changeable nature of opex in the electricity transmission industry compared to gas transmission.

This means that in setting future opex targets, the ACCC will take into account past opex and a range of other factors. The future opex target will not be mechanistically linked to the observed level of opex during the previous regulatory period.

Self-insurance

Insurance is a legitimate cost of doing business. The ACCC will recognise an efficient allowance for insurance. Self-insurance implies that rather than paying a premium to an underwriter to accept a risk, the business has decided to accept the risk itself. The decision to self-insure rather to obtain insurance from a third party or remove risk altogether by building out, is a commercial decision.

The ACCC would like TNSPs to respond to regulatory efficiency incentives by seeking the most economical way to manage the risks that they face. If self-insurance is the most efficient way to manage a risk, then the ACCC would like to ensure that TNSPs are able to pursue this course.

However, compared to external insurance, an allowance for self-insurance can be more problematic to determine. Furthermore, with self-insurance there is no explicit cash flow between the insurer and the insured—they are the same legal entity. This creates the prospect of a disconnect between the insurance premium (which is obtained from consumers) and the compensation for self-insured risk that may transpire.

Essentially, it is difficult for the ACCC to observe that shareholders, rather than consumers, will have absorbed the cost of events that have been self-insured. To prevent the prospect of consumers paying the same cost twice, the ACCC has therefore decided that a number of administrative arrangements will need to be in place first before it will recognise an allowance for self-insurance. These administrative arrangements include:

- a board resolution to self-insure (i.e. a copy of the signed minutes recording resolution made by the board).

Board resolution and corporate governance requirements are fundamental issues. The risk management strategy of an entity and approaches to events that could affect the overall risk profile of the entity are generally matters for board consideration. Such matters may require parent entity/shareholder support to self-insure and/or affect debt covenant requirements of lenders.

- confirmation that the TNSP is in a position to undertake self-insurance for those events.

For example, an allowance should not be included if the business suggests it is self-insuring for a liability claim that would exceed the value of the business, or the board of directors is unaware of the self-insured risks faced by the business

and has no contingency plan for handling the specific events (such as undrawn lines of credit).

- self-insurance details setting out the specific risks which the TNSP has resolved to self-insure.

Such details need to clearly establish what the insured events and exclusions are, to avoid any future uncertainty as to whether or not an event was self-insured. Such details also form the basis for the required actuarial assessment.

- a report from an appropriately qualified actuary or risk specialist verifying the calculation of risks and corresponding insurance premiums
- ensuring that the cost of self-insurance is recorded as an operating expense in the audited and published income statement, and thereby deducted from the calculation of attributable profits
- ensuring that a self-insurance reserve (funded by self-insurance premiums charged in the income statement) is established in the audited and published balance sheet
- ensuring that when a claim against self-insurance is made, that an appropriate deduction to the self-insurance reserve is recorded.

Records to implement these arrangements should be available for the ACCC's periodic inspection. The ACCC recognises that this creates additional administrative requirements. However, it is unlikely that this is any more burdensome than the administration of external insurance.

6.6.2 Incentive mechanism design

The power of the incentive is determined by how any benefits/losses arising from the difference between target and actual expenditure are distributed between TNSPs and customers. There is likely to be a trade-off between the magnitude of any productivity improvements by TNSPs and the proportion of benefits they keep. If TNSPs take all the benefit from efficiency improvements, they may make significant efficiency improvements but customers would not share any of the benefit.

The DRP established the underlying opex efficiency incentive (excluding any carry-forward) by setting an opex target against which the actual expenditure could be measured. Leaving aside how the future opex targets are to be established, this arrangement means that TNSPs retain any difference between actual and target expenditure within the regulatory control period.

This provides stronger incentives to reduce opex in the early years of a regulatory period, compared to the later years of the period. For example, the benefit of a reduction in opex below the allowance in the first year of a five year regulatory period will be retained by the TNSP for the next four years.

By contrast, a saving made in the last year of the regulatory period will only be retained for that year. Without an efficiency carry forward mechanism, a saving made

in the first year is clearly worth more to a TNSP than a saving made in the last year of the regulatory period.

The DRP also said that an efficiency carry-forward mechanism should be used in the form of a glide-path. A glide-path carry forward mechanism has been applied in the first round revenue controls for ElectraNet and SPI PowerNet.

The glide path mechanism that has been applied is based on the outcome for one year in the regulatory period—usually the last year or the second last year. The difference between forecast and actual opex for this chosen year then becomes the basis of the efficiency benefit/loss that is then passed on to customers over the duration of the following regulatory control period.

This arrangement can provide an incentive to simply shift expenditure around during the regulatory period to maximize the benefit that is carried forward without achieving any lasting saving. For this reason the glide path carry forward approach has been rejected by other regulators and the ACCC in the regulation of gas pipelines.

However, the ACCC considers that there is merit in retaining some form of efficiency carry forward mechanism. The issue is therefore to find a mechanism that strengthens the incentives to achieve opex savings but does not provide perverse incentives to shift costs around within or between regulatory periods.

An efficiency carry-forward mechanism that allows TNSPs to retain the benefit of any savings (or exposes them to the detriment of any losses) for the same length of time regardless of when in the regulatory period the savings/losses are made, provides more consistent efficiency incentives. This avoids the cost shifting problem endemic to the glide-path approach and provides an ongoing incentive for least cost operation. Therefore, this is the form of the carry forward mechanism that the ACCC has decided to use.

For savings that arise in the first year of the regulatory period, the efficiency carry forward amount is calculated as:

$$E_1 = F_1 - A_1,$$

where A_1 is the actual operating cost for year 1 and F_1 is the regulatory target operating cost for that year.

For savings that arise in the second to fifth year of the regulatory period, the efficiency carry forward amount is calculated as:

$$E_t = (A_{t-1} - A_t) - (F_{t-1} - F_t),$$

where A_t , A_{t-1} is the actual operating cost for the years, t , $t-1$ respectively, F_t , F_{t-1} is the regulatory target operating cost for the years, t , $t-1$ respectively.

The efficiency benefit/loss will be carried forward for five years after the year in which the benefit/loss is incurred. During the regulatory period in which the efficiency benefit/loss is incurred, the carry-forward mechanism does not affect the

annual opex allowance. However, the total opex allowance for the next regulatory period will, in general, be based on:

- the expected efficient costs (determined after taking into account past opex and reasons as to why future opex may be different from past opex)
- plus/minus the carry-forward of the efficiency benefit/loss from the previous regulatory period.

The final design issue to be considered with this carry-forward mechanism is what efficiency loss/benefit should be carried forward for the last year of the current period—this information is typically not known when the next revenue cap is set. The ACCC proposes to:

- assume that actual opex equals forecast opex in the last year of the current regulatory period but
- apply an error correction mechanism at the end of the next regulatory period to account for any differences between the forecast and actual opex in the fifth year.

In this way, the treatment of the year five efficiency benefit/losses will be consistent with efficiency benefit/losses from the previous years.

In order to preserve the incentive effect of the carry-forward mechanism, benefits/losses will be adjusted for inflation, thereby maintaining the real value of the benefits/losses to TNSPs.

The ACCC agrees with the suggestion of a number of TNSPs that the efficiency carry forward amount should be identified separately from other elements of the building block allowed revenue calculation.

However the ACCC disagrees with Transend, TransGrid and Powerlink, that efficiency losses should not be carried forward. A common theme to the arguments of these TNSPs is that the ACCC is likely to set the future opex allowance below the efficient level, and hence carrying forward losses from previous periods would mean double counting.

Establishing incentives necessarily requires forecast of efficient expenditure and there is some possibility of forecasting error. This means that there is some prospect of windfall gains or losses to TNSPs as a result of this forecasting error, rather than due to actions that the firm took. This is a well recognised feature of incentive regulation.

However the ACCC has a code obligation to set opex based on the expected efficient expenditure level. The ACCC has no reason to believe that its opex allowance is asymmetrically skewed to under-provision rather than over provision. Accordingly the ACCC considers that there is no basis to adjust the carry forward mechanism to only carry forward efficiency gains.

6.7 Decision

6.1 Introduction

This section sets out the ACCC's general approach to providing incentives on the TNSP to reduce its operating and maintenance expenditure.

6.2 Determining the expenditure allowance

The ACCC will continue its current practice of relying primarily on historic and forecast expenditures for the TNSP in question in each revenue cap decision.

To facilitate greater use of benchmarking data in determining the opex allowance to be included in a revenue cap, the ACCC intends to undertake further work in this area in close consultation with industry and user groups.

6.3 Incentives to reduce operating expenditure

Under the approach to regulation set out in this document, the incentive on TNSPs to reduce operating expenditure derives from three different factors:

- (a) the fact that the ACCC will not claw-back any differences between forecast and actual opex which arise during the regulatory period
- (b) the manner in which the ACCC makes use of information on past opex when setting future opex targets
- (c) the carry forward mechanism.

6.4 The carry forward mechanism

The efficiency gain or loss in a year may be expressed mathematically as:

$$E_1 = F_1 - A_1,$$

where A_1 is the actual operating cost for year 1 and F_1 is the regulatory target operating cost for that year.

For savings that arise in the second to fifth year of the regulatory period, the efficiency carry forward amount is calculated as:

$$E_t = (A_{t-1} - A_t) - (F_{t-1} - F_t)$$

where

E_t is the efficiency benefit/loss in year t

A_t, A_{t-1} is the actual operating cost for year $t, t-1$ respectively
 F_t, F_{t-1} is the forecast operating cost for the years $t, t-1$ respectively.

The efficiency benefit/loss will be carried forward for five years after the year in which the benefit/loss is incurred.

During the regulatory period in which the efficiency benefit/loss is incurred, the carry forward mechanism does not affect the annual opex allowance. The opex allowance for the next regulatory control period will be based on:

- the expected efficient costs (determined after taking into account past opex and reasons as to why future opex may be different from past opex
- plus/minus the carry forward of the efficiency benefit/loss from the previous regulatory period.

Since the actual opex for the last year of the regulatory period will usually not be known at the time when the revenue cap is set for the next regulatory period, the carry forward of losses or gains will be incorporated through the use of a correction mechanism.

The efficiency carry forward calculation will be undertaken in such a way as to ensure inflation does not erode the value of any benefit/loss to be retained by the TNSP.

6.5 Self-insurance

The cost of self-insurance will be recognised as an operating expense subject to the implementation of appropriate administrative arrangements including:

- a board resolution to self-insure (i.e. a copy of the signed minutes recording resolution made by the board)
- confirmation that the TNSP is in a position to undertake credibly self-insurance for those events.
- self-insurance details setting out the specific risks which the TNSP has resolved to self-insure.
- a report from an appropriately qualified actuary or risk specialist verifying the calculation of risks and corresponding insurance premiums.
- ensuring that the cost of self-insurance is recorded as an operating expense in the audited and published income statement, and thereby deducted from the calculation of attributable profits.

- ensuring that a self-insurance reserve (funded by self-insurance premiums charged in the income statement) is established in the audited and published balance sheet.
- ensuring that when a claim against self-insurance is made, that an appropriate deduction to the self-insurance reserve is recorded.

7 Reopening the revenue cap

7.1 Introduction

This section sets out the ACCC's decision on cost pass-throughs. It brings together pass-through arrangements that were previously described separately in the opex and capex sections of the Draft SRP.

The section is structured as follows:

- section 7.2 sets out a statement of the issues
- section 7.3 provides an overview of the relevant code requirements
- section 7.4 outlines the ACCC's draft SRP considerations on pass-throughs
- section 7.5 summarises submissions from interested parties on the draft SRP
- section 7.6 discusses the ACCC's considerations
- section 7.7 presents the ACCC's decision.

7.2 Issues

The establishment of efficiency incentives requires that allowances for opex and capex are established at the start of the regulatory period, for the duration of that period. These allowances are meant to represent expected efficient expenditure during the regulatory period. They necessarily require the regulator to predict future risks and the expenditure required to manage those risks.

Predictions are subject to forecasting error and it is possible that unexpected events could lead to a significantly different expenditure requirement during the regulatory period, from what was expected when the revenue cap was established. This could lead to windfall losses or gains to TNSPs and network users.

This section discusses the role that cost pass through mechanisms should play in dealing with unforeseen events that have a significant impact on TNSPs' expenditure requirements.

7.3 Code requirements

The code makes no explicit provision for cost pass throughs.

The code (clause 6.2.2) does require the ACCC to establish incentives based on expected efficient expenditure during the coming regulatory period. Furthermore, the ACCC is required to establish a revenue stream that will allow TNSPs to fund the efficient costs of complying with their obligations (clause 6.2.4).

Nevertheless, the expected efficient expenditure outcomes through the regulatory period may differ for reasons beyond the TNSP's control. In this case the allowance

for efficient expenditure would be incorrect. In all cases, since the ACCC and TNSPs do not have perfect foresight there can be expected to be some degree of error.

Where the forecasting error is so large that TNSPs would suffer a material financial penalty in responding to the unexpected events, then there is a prospect that the allowed expenditure will fail to comply with the code requirement that TNSPs receive a fair and reasonable rate of return on efficient investment.

In this case, the ACCC considers that a mechanism to adjust the allowed expenditure level, during the regulatory period could be appropriate. This could be achieved by passing significant exogenous cost changes through to consumers, or by revoking and resetting the revenue cap. The discussion on the appropriate design of the mechanism is set out later in this section.

7.4 Draft SRP

The draft SRP discussed pass through arrangements for opex and capex separately.

The capex pass through mechanism was proposed as an element of the ex ante regulatory framework, and was called an off-ramp provision. The provision envisaged that TNSPs could make application during a regulatory period for the pass through of capex that resulted from exogenous events that were not forecast at the time that the revenue control was established. It provided an expenditure threshold that, if exceeded, would allow TNSPs to pass-through the full capex attributable to such pass through events to their consumers.

The opex pass through arrangements discussed in the draft SRP did not define specific pass through events. Instead, it suggested that TNSPs develop their own proposals on cost pass throughs. To guide TNSPs in their proposals, the draft SRP suggested a number of general criteria that opex pass throughs should satisfy, including that the pass through event should:

- be identified in advance with its scope precisely defined
- be beyond the control of the TNSP
- affect the TNSP, but not the market generally (systematic or market risk should be addressed in the WACC parameters)
- not already be compensated in the forecast opex or other revenue cap costs.

The draft SRP also set out features of an appropriate pass through mechanism.

7.5 Submissions from interested parties on draft SRP

SPI PowerNet, TransGrid, the Energy Users' Association of Australia (EUAA), EnergyAustralia, ESIPC, Powerlink, ElectraNet and Transend commented specifically on the capex off ramp and opex pass through provisions set out in the DRP.

It should be noted that TransGrid and EnergyAustralia also provided comprehensive comments on the draft *Pass through rules* that have been proposed as part of their respective revenue cap determinations. These comments have not been summarised as they relate mainly to the specific arrangements for those TNSPs rather than to the general policy questions considered here.

SPI PowerNet states that it broadly supports the ACCC's preferred position on opex pass-throughs outlined in the draft SRP. It also stresses that it is important to retain the capacity to deal with some extreme (low probability/high cost) events that fall outside the current scope of the pass-through guidelines.

Energy Australia states that the relationship between the pass through rules and the off ramp mechanism is unclear. It considers that many of the defined pass through events listed in the draft *Pass through rules* could in fact have ramifications for capital investment, and therefore that such events could trigger both mechanisms.

Further, EnergyAustralia argues that the *Pass through rules* should remain intact as they form an important part of the balancing of risks within the regulatory framework, particularly where opex is concerned. However it stresses that the off ramp mechanism should be clearly defined and made explicit.

Finally it provides a non exhaustive list of the events that should be considered to be off ramps. These included:

- changes in demand that drive material changes to the capital program
- material exchange rate variations
- unforeseen customer connection
- changes to planning standards that result in changes to the capex program
- response to a terrorism event.

Commenting on the application of the ACCC's *Standard pass through rules*, TransGrid developed a comprehensive list of cost pass through events that it considers should apply to it. This list included pass through events for:

- demand side management payments
- power system events
- environmental law
- occupational health and safety
- public safety
- electricity law
- insurance

- tax
- service standards.

In relation to capex off ramps, TransGrid stated that the administrative arrangements proposed by the ACCC do not make adequate provision for the need to fast track some projects. This can arise when an event or trigger occurs that requires a network development to be delivered within reasonable lead times.

ESIPC strongly supported the option to allow a TNSP to revisit its capital program in the event of a significant market variations from forecast, but questions why the reverse event is not also true.

7.6 ACCC's considerations

It is inevitable that in establishing a revenue allowance on the basis of future costs, that there will be some degree of forecasting error. This forecasting error will inevitably result in windfall gains or losses to the TNSP or its customers. In most cases, it is reasonable to expect that the forecasting error will be small enough that any resulting windfall gains or losses will not detrimentally impact on a TNSP's ability to fund its business.

However, it is possible that unexpected but significant events could have a large impact on the efficient level of required expenditure. If the impact is large enough, it could detrimentally affect a TNSP's ability to fund its operations. Alternatively the TNSP could simply avoid the increased expenditure, with resulting detrimental impacts on the level of service provided.

The ACCC considers that it is important that such outcomes are avoided, particularly for transmission businesses that provide a critical infrastructure service in the Australian economy. It is therefore appropriate to implement some form of mechanism that allows for an adjustment of allowed revenues during a regulatory control period if such significant but unexpected events occur and jeopardise the TNSPs' ability to fund its business.

However re-setting expenditure targets can weaken efficiency incentives and create uncertainty for investors and consumers. Furthermore, automatic cost pass through creates problems of moral hazard: if TNSPs can simply pass risks through to consumers it is reasonable to suppose that they will be less concerned to find the most efficient way to manage those risks.

Therefore the issue in deciding the approach to cost pass throughs/ re-opening is to find a balance between efficiency incentives and certainty on the one hand and, on the other hand, ensuring that TNSPs are provided with an expenditure allowance that allows them to earn a regulated return on efficient expenditure.

It would be a simple matter to develop an effective pass through/re-opening scheme if:

- costs within management's control (endogenous costs) could be clearly distinguished from costs over which management have no control (exogenous costs)
- it was easy to determine the extent to which costs associated with the pass through event have already been compensated in establishing the initial expenditure allowance and calculation of allowed returns.

But neither of these tasks is straightforward.

First, in most cases it is impossible to objectively distinguish between endogenous and exogenous costs. There may be a few events such as land taxes that are exogenous and over which management has little discretion. However, for most other events, even those that may be completely exogenous such as a flood or sabotage, management usually has some degree of discretion in deciding how it responds to those events.

Second, it is difficult to objectively determine the extent to which the cost has already been compensated in the decision on allowed expenditures and the calculation of allowed returns on investment. In some cases explicit provision for protection against risks will have been made in the determination of allowed expenditure. In other cases, provision for risks will have been made implicitly. For example, the design of substations and transmission lines should take account of the likelihood of a range of events, such as floods, during the life of those assets. The assets will be designed to withstand a certain level of risk and the cost of that protection is included in the cost of developing the asset.

For these reasons, if there was a cost pass-through every time there was a flood or an act of sabotage, TNSPs would have little incentive to manage these risks efficiently, and consumers could end up paying the same cost twice: once in the expenditure allowance and allowed return on investment; and again when costs are passed through.

7.6.1 Essential Services Commission

The Victorian Essential Services Commission (ESC) allows two specific cost pass throughs. The first relates to Transmission Use of System (TUOS) charges determined by VENCORP while the second relates to land taxes.

In preparing for the current regulatory review that the ESC is conducting, TXU Networks and the Energy Networks Association (ENA) both advocated off-ramps, or some form of cost pass-through mechanism, to take account of the potential for significant movements in costs. Off ramps were described by TXU Networks and the ENA as specific circumstances that caused the re-opening or review of a regulated company's price or revenue cap arrangement.

Examples of specific off-ramps provided by TXU Networks and the ENA were force majeure events, major industry restructuring or significant deviations between actual

returns and those anticipated due to technical, economic or regulatory requirements, legal responsibilities, insurance, terrorism or changes in taxes.²⁰

The ESC rejected TXU Networks' and the ENA's argument on the basis that:

- the risk associated with forecast error is already mitigated by the choice of a five year regulatory period
- forecasting errors due to unforeseen events can be corrected for when setting the price controls for the next regulatory period
- there is already provision under the Tariff Order (clause 6.3) to allow for the re-opening of a price determination as a result of an event beyond a distributor's control which was not contemplated at the time the price determination was made, if the distributor is materially adversely affected by the event and, on balance, the benefits of revoking (and substituting) the price determination outweigh any resultant detriment to participants in the Victorian electricity supply industry
- the inclusion of off ramps also reduces the incentives for increased efficiency that exist under the current regulatory framework, and increases the costs to both the distributor and the regulator (which eventually gets passed through to customers)
- off ramps tend to be triggered more often by events that negatively impact on customers rather than where an event causes a change in either direction.
- off ramps do not distinguish between exogenous or endogenous factors and thus it would be difficult and administratively complex for the ESC to determine whether any adverse movement in cost was due to actual unforeseen events or inefficient practices on the part of the distributor.

Clause 6.3 of the Tariff Order provides that the price control should be reopened in a few circumstances. Included in these circumstances is if the regulated firm is 'materially adversely affected' by the price determination as a result of an event 'beyond the firm's control which was not contemplated at the time the price determination was made and, on balance, the benefits of revoking the price determination outweigh the detriment to participants in the Victorian electricity supply industry resulting from revoking the price determination'.

7.6.2 Ofwat

The ACCC understand that Ofwat does not make any provision for automatic cost pass-throughs. However, in the water companies' licences, it has provided for prices to be reset during a regulatory period if substantial adverse or favourable events occur that have a substantial impact on revenues/costs.

Substantial is measured with reference to a hurdle for operating cost and capital cost events. Specifically, prices would be reset if

²⁰ ESC, 'Final Framework and Approach: Volume 1, Guidance Paper', 30 June 2004.

- an event had an operating cost or revenue impact whose 15-year NPV exceeds 20 per cent of last year's turnover or
- an event had a capital cost whose NPV to the next review exceeds 20 per cent of last year's turnover.

7.6.3 IPART

In its 2004 draft decision on the regulation of prices to be charged by NSW electricity distributors, IPART rejected the implementation of a cost pass through mechanism because it felt that it would be difficult to design a cost pass through mechanism that could:

- provide a clear definition of eligible costs
- keep administrative costs to a manageable level
- balance the interests of customers and DNSPs in terms of incentives for efficiency
- allow the change in costs to be readily distinguished from costs already allowed for.²¹

However, this position was opposed by the NSW distributors and the ENA. IPART then introduced a number of specific and general cost pass-throughs.

It is clear from the presentation of the final report that IPART was concerned about the detrimental impact on efficiency incentives that would result from such pass throughs. For example, it highlights that IPART:

... has attempted to partially mitigate any adverse efficiency impacts by limiting the scope of the costs that can be passed through, to those that the DNSPs have little ability to influence. This limitation also reflects its desire to ensure that the regulatory framework does not become a cost-plus based regime. Such an outcome would not only provide poor incentives for DNSP efficiency, it would also be inconsistent with the Tribunal's obligation under the Code to maintain an incentive-based regulatory framework. ... (T)he Tribunal has also attempted to mitigate the cost and adverse efficiency impacts of the general pass-through mechanism by establishing a materiality threshold.²²

IPART specifically rejected terrorism and insurance events as pass throughs on account of the moral hazard that their inclusion as pass through events would pose.

The pass-through scheme that IPART ultimately decided to implement consists of specific pass throughs and general pass throughs. The incremental costs to be passed through to consumers via either of these mechanisms (or cost savings in the case of the general pass through mechanism) was required to be approved by the Tribunal.

²¹ IPART 2004, 'NSW Electricity Distribution Pricing 2004/5 – 2008/9', Final Report, chapter 11.

²² op. cit. p. 128.

For the specific pass throughs, there is no materiality threshold. Specific pass through events are defined to include²³:

- changes in occupational health and safety requirements governing liveline working procedures
- potential amendments to the Electrical Supply Act seeking to clarify the definition of electrical installation and point of supply
- possible introduction of additional expected payments linked to Guaranteed Customer Service Standards as a result of IPART’s recommendations to the Minister for Energy and Utilities to introduce payments linked to network reliability
- possible changes in the government’s policy on interval/time based metering, which may entail a more widespread roll-out of interval or other meters to customers.

General cost pass-throughs exist for changes in costs associated with tax changes and regulatory changes. For these pass-throughs, IPART applies a non-cumulative threshold per event calculated on the basis of one percent of the average annual smoothed revenue requirement.

Tax pass-through events are defined to include any change in tax other than changes in income or capital gains taxes, demand management levies or late payment levies or penalties. Regulatory change events include any regulation by any authority that substantially affects minimum standards, the nature or scope of services provided or varies the manner in which the DNSP is required to undertake its business.

It is notable that IPART considers that the cost pass-through mechanism it has established “is more limited than the one applied by the ACCC in recent transmission decisions, but is broader than the one applied by the ESC in Victoria in its electricity distribution and gas decisions.”²⁴

7.6.4 Office of Gas and Electricity Markets

The Office of Gas and Electricity Markets (Ofgem) allows two specific cost pass-throughs: business rates raised by local governments, and the levy that Ofgem applies to market participants to fund its activities.

However, Ofgem has been pragmatic in dealing with costs that are unambiguously exogenous but uncertain at the time of the determination of the Price Control. For example, in the concluding stages of the determination of Transco’s (the gas network monopoly) Price Control in 2002, a few specific exogenous and uncertain costs were identified. These included:

²³ ibid p. 125.

²⁴ ibid pg 128

- the potential for charges for lane rentals under the *New Roads and Streetworks Act 1991*
- the Health and Safety Executive’s Fundamental Review of Gas Safety
- the Energy Review
- the treatment of tax in relation to replacement expenditure
- the position on pensions.

In all of these cases, Ofgem indicated that it would be prepared to consider reopening the price control if there was a material impact on Transco’s ability to finance its activities. In the case the price control was to be reopened Ofgem would be prepared to increase Transco’s revenues to reflect the additional costs, subject to verifying that these additional costs were efficiently incurred.

However, Ofgem’s tendency was to seek solutions that would not involve re-opening the price control where this was possible. For example in relation to the treatment of tax changes, Ofgem proposed changes to gearing assumptions, as a way to avoid re-opening the price control. In the case of pensions, while Ofgem indicated that it would be ‘be happy to discuss with Transco any problems associated with the pensions shortfall’, Ofgem also stated that “additional pension costs were a normal business risk and the automatic re-opening of the price control for a material change would not be appropriate”²⁵.

7.6.5 ACCC’s approach

By comparison to these other regulators, the ACCC’s approach set out in the draft SRP places considerable weight on the ability to:

- separate exogenous costs from endogenous costs
- determine how much incremental expenditure should be allowed in response to pass through events.

For the reasons discussed above, the ACCC now considers that this approach underestimates the difficulty of distinguishing between endogenous and exogenous costs, and calculating the extent to which risks have been compensated in the determination of allowed expenditure and returns.

It now considers that such an approach is likely to add a considerable administrative burden particularly if there are several pass through applications within one regulatory period. The ACCC is also concerned that consumers could end up paying the same cost twice, and efficiency incentives could be significantly impaired.

Furthermore, while the draft SRP envisaged that pass throughs should take account of cost increases as well as cost decreases due to exogenous events, in practice there is

²⁵ Ofgem, February 2002: ‘Summary of “Letter of Comfort” from the Chairman of the Gas and Electricity Markets Authority, to Sir John Parker, the Lattice Group Chairman’.

an inevitable information asymmetry. Automatic cost pass throughs as envisaged in the draft SRP are likely to result in cherry-picking—whereby cost increases are passed through to consumers while cost decreases, being unobserved by the regulator and consumers, are retained by the TNSP.

For these reasons the ACCC now considers that the arrangement set out in the Draft SRP will not provide the correct balance between the preservation of the integrity of efficiency incentives, and ensuring that TNSPs are provided with sufficient revenue to fund efficient investment and earn a regulatory return on that investment.

In its place, the ACCC believes that it should be able to take account of other events that could significantly alter the allowed efficient expenditure level by allowing the revenue cap to be re-opened during the regulatory period.

The revenue cap would only be reopened if the regulated firm is materially adversely affected by the price determination as a result of an event beyond the firm's control which was not contemplated at the time the revenue decision was made and, on balance the benefits of revoking the revenue cap outweigh the detriment to the TNSP's customers.

There is no limitation on the nature of the event that could cause the revenue cap to be reopened. This means that TNSPs are assured that if there is a significant, exogenous (or largely exogenous) event during a regulatory control that adversely affects expenditures and profitability; it will be able to seek an adjustment to its allowed revenues to take account of this.

However, reopening the revenue cap would effectively allow reconsideration of all costs (not just those attributable to the events). This means that the ACCC will take account of unexpected events that had been to the TNSPs detriment. But similarly, if there were unexpected events that were to the TNSP's benefit, these too would be taken into account, in calculating the net change in allowed expenditure. This feature, combined with the administrative burden of re-setting allowed revenues is likely to provide a disincentive to spurious claims and cherry picking by TNSPs.

It should be noted that the ACCC would use its discretion in deciding the adjustment to revenues following a reopener. For example, it is not necessarily the case that reopening the revenue cap will automatically trigger a reconsideration of all expenditure targets. If the ACCC is convinced that the reopener is attributable to an exogenous event which the TNSP has no ability to mitigate, then subject to the absence of off-setting factors, the ACCC may choose not to reconsider all expenditure targets in re-establishing the revenue control. In this case, the practical operation of reopening the revenue cap would be akin to an automatic cost pass-through.

The ACCC notes ESIPC's comments on the asymmetrical nature of re-opening the revenue cap—i.e. only TNSPs can propose that the revenue cap be re-opened. The ACCC appreciates these concerns but considers that if a party other than the TNSP can propose to reopen the revenue cap there would always be a threat of a downwards adjustment of the revenue allowance. By not providing sufficient certainty for the TNSP, the ACCC believes that such an approach could deter necessary investment.

The code does not provide for revenue cap to be opened in response to events that materially impact TNSPs. Code changes will need to be made to give effect to the arrangements discussed here.

7.7 Decision

7.1 Introduction

This section sets out the ACCC's decision on taking account of events that could significantly alter the allowed efficient investment level.

7.2 Reopening the revenue cap

To take account of events that could significantly alter the allowed efficient investment level, the ACCC believes there should be provision for the revenue cap to be reopened during the regulatory period. In some circumstances the ACCC would consider passing the cost of the event through without reopening all aspects of the revenue cap.

Only TNSPs would be able to propose that the revenue cap be reopened. There is no proposed limitation as to the nature of the event that could give rise to a reopening of the cap.

However reopening the revenue cap would be conditional on:

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

Finally it should be recognised that at present the revenue cap can only be reopened in limited circumstances. These circumstances do not include those envisaged in this section. Therefore a code change will be needed to give full effect to the reopening provisions specified here.

8 The weighted average cost of capital

This chapter sets out the ACCC's discussion on the WACC. The WACC is a commonly used measure for determining an appropriate return on an asset base and has been consistently used by regulators in Australia. The WACC for a firm is the weighted average of returns on its equity and debt financing. To establish an appropriate return on capital for a TNSP using the building block formula, the ACCC multiplies the benchmark WACC by the RAB.²⁶ The building block formula below illustrates how the WACC is one of the components that determine the MAR:

$$\begin{aligned} \text{MAR} &= \text{return on capital} + \text{return of capital} + \text{opex} + \text{tax} \\ &= (\text{WACC} \times \text{RAB}) + D + \text{opex} + \text{tax} \end{aligned}$$

Electricity transmission is a capital intensive industry where the return on capital (WACC x RAB) accounts for about half of the annual revenue allowed. Relatively small changes to the WACC can have a substantial impact on the total revenue requirement and ultimately on end-user prices. Therefore, correctly assessing the return on capital is very important.

If the return is too low, a regulated TNSP will be unable to recover the efficient and fair costs of service, thereby reducing its incentive to reinvest in the business. Conversely, if the return is too high, TNSPs not only achieve monopoly rents but also have a strong incentive to overcapitalise, thus creating inefficient investment and high cost to users.

8.1 Vanilla WACC

The ACCC has historically adopted a WACC which is a weighted average of the nominal post-tax return on equity and nominal pre-tax cost of debt. This is known as the nominal vanilla WACC. The vanilla WACC does not include the impact of business income tax. The ACCC explicitly models the tax liabilities in the cash flow model and adjusts the amount to account for the utilisation of imputation credits. This approach has been used by the ACCC to set allowed revenues for TNSPs.²⁷

The vanilla WACC formula is:²⁸

$$\text{WACC} = r_e (E/V) + r_d (D/V)$$

²⁶ That is, the parameters within the WACC framework reflect benchmark values.

²⁷ New South Wales (TransGrid and EnergyAustralia 1999), Queensland (Powerlink 2001), Victoria (SPI PowerNet 2002), South Australia (ElectraNet 2002), Murraylink (2003), and Tasmania (Transend 2003). The ACCC has recently released draft decisions for the revenue resets for the TNSPs in New South Wales (TransGrid and EnergyAustralia 2004).

²⁸ The partially grossed-up return on equity is the expected return after company tax has been paid, grossed up to reflect the value of imputation credits. In a classical tax system this is equivalent to the post-tax return requirement.

where:

r_e = required rate of return on equity or cost of equity

r_d = cost of debt

E = market value of equity

D = market value of debt

V = market value of equity plus debt.

Sections 8.1.1 – 8.1.7 discuss the use of the vanilla WACC.

The debate over the appropriate rate of return generally centres upon the individual parameters within the WACC framework. Some of the key issues revolve around the estimation of the cost of equity capital which is calculated by the ACCC using the capital asset pricing model (CAPM). The discussion on CAPM is set out in section 8.2.

The remainder of this chapter will address the issues raised regarding the individual parameters (and related matters) found in the WACC and the CAPM as follows:

- risk free rate in section 8.3
- market risk premium in section 8.4
- equity beta in section 8.5
- cost of debt in section 8.6
- gearing in section 8.7
- imputation credits-gamma in section 8.8
- debt and equity raising costs in section 8.9.

A summary of the ACCC's decisions is presented in section 8.10.

8.1.1 Code requirements

One of the objectives of the regulatory regime is to provide a fair and reasonable rate of return to TNSPs on efficient investment, given efficient operating and maintenance practices.²⁹ The code requires that the ACCC must consider the WACC of the TNSP, having regard to the risk adjusted cash flow rate of return required by investors in commercial businesses facing similar business risks to those faced by that TNSP.³⁰

The term WACC is defined in the code as 'an amount determined in a manner consistent with schedule 6.1.' Schedule 6.1 relevantly states:

²⁹ National Electricity Code, clause 6.2.2(b)(2).

³⁰ National Electricity Code, clause 6.2.4(c)(4).

The weighted average cost of capital is a "forward looking" weighted average cost of debt and equity for a commercial business entity. Accordingly, the Network Owner's weighted average cost of capital will represent the shadow price or social opportunity cost of capital as measured by the rate of return required by investors in a privately-owned company with a risk profile similar to that of the network company.³¹

Chapter 2 notes that the ACCC is concerned to provide an environment in which regulated firms can have reasonable certainty as to earning at least a normal rate of return on their capital investment. The code requires the ACCC to have regard to the need to provide consistency and certainty in outcomes of regulatory processes over time, having regard to the capital intensive nature of the business.³²

8.1.2 Draft SRP

The ACCC stated that it would continue with its current approach to determining a fair and reasonable WACC applicable to TNSPs. The ACCC considered that using the vanilla WACC, where the tax impact of interest expense and the value of franking credits are dealt within the cash flows, provides an appropriate return on capital.

8.1.3 Submissions by interested parties on Draft SRP

Origin Energy states that the ACCC's approach to setting WACC parameters is appropriate. It also states that there is little evidence to suggest that returns to date have been insufficient to maintain the viable operation of, and investment in, transmission networks.

International comparison of WACC

EnergyAustralia maintains that the ACCC's decision on the WACC is a lower allowance than that implicit in comparable decisions adopted by overseas regulators.

Conversely, the EUAA states that the Australian regulators' decisions on WACC are overly generous when compared with those of overseas regulators. It believes that putting any numbers in the SRP would most likely work to the disadvantage of energy users and could stifle debate of what the real numbers should be.

WACC margin

EnergyAustralia states that the vanilla WACC margin is the most credible approach to comparing international WACC allowances, in the absence of a superior approach to analysing WACC allowances in regulatory decisions.

Regulatory certainty

SPI PowerNet agrees that on balance the ACCC's draft SRP does provide a more predictable approach to setting the appropriate rate of return. However SPI PowerNet believes that greater certainty can be provided if it is stated that any proposed changes to WACC in the future be applied only after the second round of decisions ending with Transend in 2008/09. In this case, the only variation between decisions would be

³¹ National Electricity Code, schedule 6.1(2.1).

³² National Electricity Code, clause 6.2.3(d)(5).

changes to market variables such as the real and nominal risk free rates, and the debt margin. This ensures equitable treatment for each TNSP. ElectraNet and Powerlink similarly raise this issue in terms of providing even greater certainty.

8.1.4 ACCC's considerations

Fair and reasonable rate of return

The ACCC is interested in ensuring that the allowed rate of return is not creating an environment where TNSPs have the incentive to undertake inefficient investments. Ultimately in determining a WACC, the ACCC has to strike a balance between a fair rate of return which provides TNSPs sufficient incentives to reinvest while not inducing the TNSPs to overcapitalise their networks.

The ACCC is aware of two recent studies on rates of return and the level of investment in regulated infrastructure. The Allen Consulting Group (ACG), on behalf of BHP Billiton, provided the Productivity Commission's review of the Gas Access Regime with an analysis of Tobin's q ³³ for regulated entities.³⁴ ACG found that the Tobin's q for regulated entities was consistently above one, which suggests that the rates of return are sufficient for new investment.

Network Economics Consulting Group (NECG), in response to the ACG report, provided a supplementary submission to the Productivity Commission and stated that the ACG report has mistakenly substituted average q 's for marginal q 's and this had the effect of biasing the q ratio upwards.³⁵ NECG's analysis of the bias suggests that rates of return are by no means generous.

The ACCC will continue to monitor this research in its formulation of the appropriate rates of return for regulated entities.

Regulatory certainty

The ACCC notes the attraction of the TNSPs' suggestion that changes to WACC be applied only after a round of decisions is completed. It is argued that this provides equitable treatment for each TNSP; less duplication of effort and cost in WACC debates; and allows sufficient time for new market evidence to accumulate.

In previous revenue cap decisions, where possible on the basis on available evidence, the ACCC has maintained several WACC parameters for the purpose of regulatory consistency. For example the ACCC has held constant, on the basis of the best available information, the values for the market risk premium, beta, gearing and gamma across all electricity revenue cap decisions.

³³ Tobin's q is a ratio of the market value of a firm's assets to their replacement value. It provides an indication of future investment needs.

³⁴ Allen Consulting Group (ACG), *Review of the Gas Code, Commentary on Economic Issues*, August 2003.

³⁵ Network Economics Consulting Group (NECG), *Critique of ACG Report on Tobin's q , Submission to the Productivity Commission's Review of the Gas Access Regime*, May 2004.

However, the ACCC also notes that changes in the WACC (whether an increase or decrease) can occur due to a change in market conditions. For example, government and corporate bond rates move according to economic cycles/conditions. Consequently, the WACC allowances for TNSPs in previous revenue cap decisions have varied primarily due to changes in the interest rates at the time of the relevant decisions. Notwithstanding this, further information or empirical evidence that arises in relation to the calculation of WACC parameters can also affect the applicable rate of return. The ACCC believes that where appropriate these WACC parameters should be amended to reflect updated information or evidence. Further, restricting any changes to WACC to only occur after the end of a round of decisions, may stifle research and debates over financial issues.

The ACCC will continue to establish the WACC on the basis of benchmark parameters to enhance certainty in investments. In saying this, the ACCC will continue to undertake further review and monitoring in this area with close consultation with industry and user groups. The ACCC also proposes to continue with exercising judgment in its application of empirical evidence from the market. The ACCC reserves the right to change the value of the WACC parameters with refinement in the methodology and data and in light of new available data.

WACC margin

The ACCC notes EnergyAustralia's comment about the WACC margin, which was based on NECG's international comparisons of regulatory decisions.³⁶ As discussed by ACG in its assessment of the NECG study however, the vanilla WACC margin is not considered by investors. Rather, investors are concerned with the return on equity or real returns on equity, after taking account of the relative risk of investments and payments to debt holders.³⁷

In other words, the relative vanilla WACC margins measured by the NECG report have no bearing on the actual relative costs of capital in Australia, the United States of America or the United Kingdom.

The ACCC considers that the WACC levels set for its revenue cap decisions are sufficient to ensure appropriate levels of investment. This view is confirmed by the recent ACG study.³⁸

The study examined a wide range of financial indicators (including international comparisons) and concluded that there is no evidence to suggest that Australia's regulatory framework is deterring investment. Instead the evidence suggests that the Australian regulatory framework is providing adequate scope for companies to earn appropriate returns in the energy infrastructure sector. The study also noted that the

³⁶ NECG, *International comparison of WACC decisions, Submission to the Productivity Commission Review of the Gas Access Regime*, September 2003.

³⁷ ACG, *Review of studies comparing international regulatory determinations*, March 2004, p.111.

³⁸ ACG, *Review of studies comparing international regulatory determinations*, March 2004.

energy sector's strong historical performance and current market fundamentals were likely to see a high demand for investment opportunities in energy infrastructure.

International comparison of WACC

The ACCC notes EnergyAustralia's comment about the current trend in comparing the WACC parameters from different countries. The ACCC considers caution must be exercised in interpreting WACC parameters from different countries because of differences between financial markets and institutional arrangements.

The ACCC notes specific differences need to be taken into account when comparing WACC parameters across countries, including:

- differences in the size and composition of share markets
- varying taxation regimes between countries
- differences in market average levels of gearing
- different incentive mechanisms and regulatory approaches.

Therefore, the apparent differences between the WACC allowed by Australia and overseas regulators are not in themselves indicative of excessive (or unduly modest) returns on the part of Australian firms. As discussed in detail in the report by ACG, international comparisons in this field are problematic and inevitably imprecise:

There are significant measurement and interpretation problems in undertaking any analysis of regulatory determinations, particularly when these are attempted across different countries and regulatory frameworks.³⁹

8.1.5 Decision

The ACCC will determine a WACC that provides a fair and reasonable rate of return applicable to TNSPs.

8.2 Capital asset pricing model

8.2.1 Introduction

This section outlines the CAPM which is used to estimate the cost of equity capital in the WACC framework. The ACCC's position on the use of CAPM is also discussed below. The vanilla WACC formula is repeated below:

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

The cost of equity capital is the expected return required to compensate investors for bearing the risk associated with investing in a firm's equity. The cost of equity is a forward looking concept, and measures the perceived opportunity cost of the investor purchasing equity in the firm, taking account of the risks involved. As such, it determines the return expected by investors on their equity investment in the firm.

³⁹ ACG, *Review of studies comparing international regulatory determinations*, March 2004, p.38.

The cost of equity capital can be calculated using historical input data as a proxy for ex-ante returns due in part to the subjective nature of future estimates. Historical outcomes data are commonly used as the basis of estimates because methods used to derive forward looking estimates are generally perceived as being too subjective or imprecise.

A common approach used to determine the cost of equity capital is to apply the CAPM.⁴⁰

As illustrated in the following formula, CAPM yields the required expected return on equity given the return on the market portfolio, the market's own volatility and the systematic risk of holding equity in the particular company:

$$r_e = r_f + \beta_e(r_m - r_f)$$

where:

r_f = *expected risk free rate of return over the period*

$(r_m - r_f)$ = *expected market risk premium (MRP), defined by the expected premium of return of the market (r_m) as a whole over the risk free return for the same period*

β_e = *a measure of investors' perceived systematic risk of the individual company's equity relative to the market.*

8.2.2 Code requirements

The code provides for the use of the CAPM. Section 2.2 of schedule 6.1 provides:

There is [sic] a variety of methods which can be applied to estimate the cost of equity capital of a business enterprise. The Capital Asset Pricing Model (CAPM) remains the most widely accepted tool applied in practice to estimate the cost of equity.

The CAPM is a model based on the proposition that the required rate of return on equity is equal to the risk-free rate of return plus a risk premium.

The theory underlying the CAPM is rigorous. However, in applying the CAPM, there should be a recognition of the limitations of the model. The limitations of the CAPM, as with any model, relate mainly to the measurement and estimation of relevant input variables.

Consequently, the CAPM should be regarded as providing an indication of the cost of equity, rather than a firm and precise measurement.

Section 3 of schedule 6.1 states 'the network owner's required rate of return on equity is estimated using the CAPM.' Section 3 also sets out the CAPM formula.

8.2.3 ACCC's draft SRP

In the draft SRP the ACCC noted alternatives to the CAPM (ie. Arbitrage Pricing Theory) but stated that it is appropriate to continue using the CAPM to estimate the cost of equity.

⁴⁰ The ACCC uses the Sharpe-Lintner version of the CAPM which the risk free rate of return.

Submissions by interested parties on Draft SRP

Asymmetric business risk

VENCorp notes that the assessment of WACC should take account of a TNSP's fairly limited exposure to stranded asset risk in the proposed regulatory framework.

8.2.5 ACCC's considerations

Use of CAPM

In previous revenue cap decisions, the ACCC used the domestic CAPM (which includes only domestic market parameters) to determine the required rate of return on equity due to its relative simplicity (it explains stock returns by their sensitivity to a single factor – returns on the market portfolio) and wide application.⁴¹ Alternative models tend to suffer from greater ambiguity in empirical testing than the CAPM. Additionally, problems with estimating parameters appear to be considerably less for the CAPM than for other multi-factor models such as the Arbitrage Pricing Theory. These considerations favour the CAPM and are consistent with its dominance in practice.

Asymmetric business risk

The ACCC views the CAPM as being the appropriate framework for determining the required return on equity and notes that its use is consistent with the code. The CAPM implies that:

- the required rate of return for an investment increases in direct proportion to its beta
- investors, in pricing common stocks, are concerned exclusively with systematic risk.

The distinction between systematic (also known as market or non-diversifiable risk) and non-systematic (also known as specific or diversifiable risk) is a fundamental aspect of the CAPM. It assumes that investors are able to eliminate the impact of specific risks (such as asset stranding, unexpected decrease in demand for services and operations risk) on any one asset by holding a well diversified portfolio of assets. Consequently, the risks faced by the holder of a well diversified portfolio are those that are common to the market as a whole.

The ACCC needs to apply the CAPM robustly and limit the compensation available to equity holders for systematic risk. Inclusion of non-systematic risk would be inconsistent with the underlying principles of the CAPM and may lead to significant bias of the model's output. Nevertheless, some non-systematic risks of an asymmetric nature can be recognised in the regulatory framework but not through the CAPM. The ACCC considers that where these risks can be identified and quantified, then the

⁴¹ The ACCC has previously noted that the use of an international version of CAPM tends to be more complex and consequently more difficult to implement. This may explain why they are not generally used in practice, despite the accumulating evidence of greater market integration.

expected net impact on earnings can be accounted for in a transparent manner through the projected cash flows (i.e. self-insurance, chapter 6 and pass throughs, chapter 7).

8.2.7 Decision

The ACCC will use the CAPM to estimate the cost of equity capital.

8.3 Risk free rate

8.3.1 Introduction

This section discusses the approach which the ACCC will take in considering an appropriate value for the risk free rate.

The risk free rate is a component of both the CAPM and the cost of debt. As illustrated in the following formula, the CAPM yields the required expected return on equity given the return on the market portfolio, the market's own volatility and the systematic risk of holding equity in the particular company:

$$r_e = r_f + \beta_e(r_m - r_f)$$

As noted, the risk free rate is necessary to estimate the cost of debt. The debt margin is added to the risk free rate to determine the return on corporate debt. The cost of debt is an important component in the derivation of the WACC, as shown by the formula:

$$r_d = r_f + d_m$$

where:

$$r_d = \text{cost of debt}$$

$$r_f = \text{risk free rate of return}$$

$$d_m = \text{debt margin.}$$

In addition to the CAPM and cost of debt, the risk free rate is a component of the MRP which is added to the risk free rate to ascertain returns to the market portfolio (r_m).

Term to maturity of risk free rate

In practice, yield to maturity on government bonds is used as a proxy for the risk free rate because the risk of default on government bonds is considered negligible. Although there is inflation risk involved with holding government debt, this is accounted for elsewhere in the regulatory model and does not negate the usefulness of government debt as a proxy for the risk free rate.

In previous revenue cap decisions, the ACCC has used government bond rates with terms matching the regulatory period as the proxy risk free rate. The ACCC adopted this approach because:

- the use of the bond rate that matches the regulatory period does not reward additional interest rate risk which is not being borne

- the regulatory asset value is supported by the expected cash flows which are fairly priced in net present value terms during the regulatory period.

In determining the risk free rate, the ACCC:

- obtains the government bond yield corresponding to the relevant term to maturity and published daily by the Reserve Bank of Australia⁴²
- averages the government bond yields for a period (typically 10 or 40 days)
- applies the (averaged) government bond yield as a proxy for the risk free rate.

Length of period used in moving average of bond rate

In determining the risk free rate to apply to the WACC calculation it is theoretically correct to use the on-the-day rate as it fully reveals the latest information available.

However, using the on-the-day rate exposes the TNSP to day-to-day volatility. For this reason, an averaging methodology is used to smooth out the volatility.

8.3.2 Code requirements

On the issue of estimating the risk free rate, the code states:

The risk free rate is normally taken to be the yield to maturity on long term (10 year) Commonwealth bonds, with the equity market risk premium also measured historically from such a benchmark.⁴³

8.3.4 ACCC's draft SRP

The ACCC stated that it would adopt a 10-year government bond rate as a proxy for the risk free rate.

The ACCC also stated that the period (5 to 40 days) used to calculate the moving average of the bond rate should be left to the discretion of the TNSP when making its application.

8.3.5 Submissions by interested parties on draft SRP

Term to maturity of risk free rate

Powerlink and Transend support the use of the 10-year government bond rate as a proxy for the risk free rate.

⁴² Government bonds with a 5 or 10-year term to maturity do not generally exist for an arbitrary date. Consequently, in practice, a synthetic estimate of a 5 or 10-year bond rate is estimated by interpolating the rate with respect to the two government bond series closest to the 5 or 10-year term and which also straddle the notional 5 or 10-year expiry date respectively.

⁴³ National Electricity Code, schedule 6.1(3.1).

Length of period used in moving average of bond rate

The EUAA recommends that the ACCC set the length of period used in calculating the moving average to 40 days rather than provide TNSPs with the flexibility of choosing between 5 to 40 days. It argues that a 40 day moving average will be less volatile and therefore less susceptible to ‘gaming’.

Powerlink supports the proposal that a TNSP may elect the length of the averaging period, between 5 and 40 days, for calculating the risk free rate.

8.3.6 ACCC’s considerations

Term to maturity of risk free rate

In December 2003, the Australian Competition Tribunal (Tribunal) handed down its decision on its review of the ACCC’s tariff determination for transportation services on GasNet’s Victorian natural gas transmission network.

Although the ACCC used a 5-year rate, the Tribunal accepted GasNet’s approach to calculating the risk free rate on the basis of a 10-year government bond rate. The Tribunal cited the traditional application of the CAPM and estimation of the MRP which was based on a 10-year time horizon as the basis for its decision. It therefore considered that the service provider, under the terms of the Gas code, was entitled to use a CAPM calculation based on a 10-year horizon as a legitimate basis for estimating the cost of equity.

Given the Tribunal’s decision, the ACCC has adopted a 10-year government bond rate as the risk free rate.

Length of period used in moving average of bond rate

A 40-day or a 10-day moving average has been adopted by the ACCC in previous revenue cap decisions to use as a short term average of the bond rate. The ACCC notes the EUAA’s comments on this issue. However, the ACCC considers that:

- TNSPs should have a better understanding of their bond portfolio management strategies
- there is no basis to believe that a TNSP would be advantaged or disadvantaged by the length of the sampling period, so long as the TNSP can appropriately hedge over the sample period
- the ability of TNSPs to game with the length of period used in calculating the moving average is minimal because a TNSP has to specify the averaging period at the time of submitting its application for a revenue reset and can not change it afterwards.

Professor Davis has similarly stated on this issue:

Provided that the averaging period is well specified in advance, there is little risk of ‘gaming’ behaviour by participants in periods when there have been significant trends in interest rates.⁴⁴

Therefore, the ACCC considers the period (between 5 to 40 days) used to calculate the moving average of the bond rate should be left to the discretion of the TNSP when making its application. However, the TNSP will not be allowed to change the averaging period after the application is lodged.

8.3.7 Decision

Term to maturity of risk free rate

The ACCC will use a 10-year government bond rate as a proxy for the risk free rate.

Length of period used in moving average of bond rate

The ACCC will accept the period used to calculate the moving average of the risk free rate (between 5 and 40 days) submitted by a TNSP in its application.

8.4 Market risk premium

8.4.1 Introduction

This section outlines the ACCC’s consideration of what value represents an appropriate benchmark MRP.

As illustrated in the following formula, CAPM yields the required expected return on equity given the return on the market portfolio, the market’s own volatility and the systematic risk of holding equity in the particular company:

$$r_e = r_f + \beta_e(r_m - r_f)$$

The MRP represents the additional return investors expect to earn for investing in a well diversified portfolio of risky assets as compared with investing in risk free instruments. Because the MRP is an expected return premium it is not observable.

Estimates such as the historical difference between realised return of the stock market and risk free rate are commonly used to provide an indicator of the forward looking MRP.⁴⁵ However, this approach is sensitive to the relevant period for taking an average.⁴⁶

⁴⁴ Davis, *Report of Risk Free Interest Rate and Equity, and Debt Beta Determination in the WACC, August 2003*, p. 16.

⁴⁵ The listed equity market returns are usually taken as a proxy for r_m even though r_m should comprise of a market portfolio of all risky assets and not just listed equity shares. However, the market portfolio is not observable due to a lack of value and returns on many of its composite assets such as risky debt, unlisted equity, residential and commercial properties, and over the counter financial instruments.

⁴⁶ An alternative method is to use expected data from financial analysts to estimate the MRP. (See Harris and Marston, *Expectational estimates using analyst’s forecasts, Financial Management*, 1992). See also Lally, *The Weighted Average Cost of Capital for electricity lines businesses*, January 2003).

The ACCC has accepted a figure of 6 per cent for the MRP in its previous revenue cap decisions. This figure reflects the ACCC's best estimate on the basis of the available evidence which includes the observed long run historical returns on the Australian stock market, in addition to more recent observations and forward looking assessments.

8.4.2 Code requirements

The code provides:

The equity market risk premium can be observed by considering the historical data of yield gaps between returns on equity, R_m and returns on risk-free debt, R_f , namely:

$$\text{MRP} = R_m - R_f$$

The Australian market risk premium has averaged around 6.6 percent in the period from 1952 to the present.⁴⁷

8.4.3 Draft SRP

The ACCC stated its preference for using a 6 per cent value for the MRP in its TNSP revenue cap decisions. The ACCC also stated that it would continue to monitor the available research and reserved the right to change the value of the MRP with refinement in the methodology and data.

8.4.4 Submissions by interested parties on draft SRP

Powerlink and Transend support the ACCC's approach in adopting a value of 6 per cent for the MRP.

8.4.5 ACCC's considerations

Although there is a substantial amount of research undertaken on the MRP, there is debate as to the appropriate value for the MRP. The ACCC notes that there is support for a MRP of 6 per cent in submissions received in response to the Draft SRP. However, arguments for both higher and lower values were received from interested parties earlier in the consultation process.

Historic measures

The rationale for using historical data as a measure of the expected MRP is that investors' expectations will be framed on the basis of their experience. The ACCC considers the value of the MRP, based on a traditional long term view using historic measures (ex-post measure), remains around 6 per cent.⁴⁸

⁴⁷ National Electricity Code, schedule 6.1(3.2).

⁴⁸ There appears to be consensus that the MRP cannot be easily predicted over shorter periods and is likely to have poor statistical properties.

The ACCC notes that the MRP has fallen to around 3-4 per cent over recent years.⁴⁹ However, the ACCC is cautious that this may partially reflect short term market trends. Further, statistical estimates over the shorter periods tend to provide standard errors which are typically higher than the mean estimates. This suggests that caution must accompany the interpretation of these results.

UK MRP and the ex-ante method

The ACCC notes the UK regulators appear to use a forward looking MRP based on an ex-ante (supply side) approach. The ex-ante approach estimates the MRP as the sum of the expected dividend yield and the expected capital gain from shares. The MRP estimates from an ex-ante approach are generally lower than historic estimates of MRP. Australian applications of similar ex-ante approaches have arrived at an estimate of 4–5.7 per cent.⁵⁰ A major part of the differential appears to be driven by the Australian assumption of a significantly higher long run growth in gross domestic product.

Most of the research on the ex-ante approach has been undertaken in the USA market. Given the relatively limited research on the Australian application of the ex-ante approach, the ACCC considers caution must accompany the interpretation of these results. Therefore the ACCC considers it is not appropriate to rely exclusively on the ex-ante approach for the purpose of estimating a MRP.

Benchmarking of international data

An alternative approach for determining the Australian MRP is through the benchmarking of international data. A study by Bowman estimated the Australian MRP to be 7.8 per cent from using the benchmarking approach on the basis of:⁵¹

- a USA MRP in the range of 6 to 9 per cent
- making adjustments for incremental risk factors of 0.1 to 2.4 per cent on the USA MRP for differences in taxation, market differences, country risk and time horizon.

The ACCC is cautious about this approach. Apart from the issues associated with estimating the USA MRP, the benchmarking approach also involves the estimation of adjustment factors which are arbitrary and add more doubt to the accuracy of the estimation.

Survey data

Another approach to determining the MRP is using survey data. The ACCC considers that there are problems associated with survey data because surveys are conducted at a specific point in time and may only reflect transient market sentiments. The

⁴⁹ Headberry Partners and Bob Lim, *Further capital markets evidence in relation to the market risk premium and equity beta values-for ECCSA*, December 2003, p. 48.

⁵⁰ Lally, *The Cost of Capital Under Dividend Imputation*, June 2002, pp. 29–34.

⁵¹ Bowman, *Estimating Market Risk Premium*, J A S S A, Issues No. 3, 2001.

reliability of survey data is also a concern. Common issues include obtaining a representative sample and framing the survey so as not to induce bias in respondents. Due to general concerns about the reliability of survey data, the ACCC will consider but tend not to place much weight on survey data.

Consultancies

A study undertaken by Associate Professor Lally, on behalf of the ACCC, assessed various approaches and estimates of the MRP.⁵² Associate Professor Lally determined that across four different approaches (including historic based and ex-ante methods) the average estimate for the MRP in Australia was 6.1 per cent.⁵³ He concluded that:

... the range of methodologies examined give rise to a wide range of possible estimates for the market risk premium and these estimates embrace the current value of 6%. Accordingly the continued use of the 6 % estimate is recommended.⁵⁴

ACG has also reviewed the empirical evidence on the Australian MRP. Based on the evidence presented which includes an analysis of international trends in MRP, the ACG concluded that:

... there is no justification for applying an MRP different from 6 %, as is the practice of Australian regulators.⁵⁵

ACG noted that while the point estimate of the MRP provided by historical evidence suggests a higher figure, the qualitative and empirical evidence from ex-ante models provide persuasive evidence that 6 per cent overstates the expected MRP.

Summary

The ACCC considers that the consultancies prepared by Associate Professor Lally and the ACG demonstrate that 6 per cent is an appropriate balance of the available evidence on the MRP. Although historical premiums typically suggest a higher MRP than 6 per cent, further estimates of the MRP over more recent periods and forward looking estimates typically suggest a lower MRP than 6 per cent. Therefore, the ACCC will use its current estimate of 6 per cent for the MRP but will continue to monitor the available research.

8.4.6 Decision

The ACCC will use a value of 6 per cent for the MRP in its TNSP revenue cap decisions.

⁵² Associate Professor Martin Lally is an academic staff member of The School of Economics and Finance, Victoria University of Wellington.

⁵³ This was the average derived using: historical averaging of the Ibbotson type (0.07); historical averaging of the Siegel type (0.056); the Merton methodology (0.07); and 0.04 – 0.057 from the forward looking approach with a point estimate of 0.048.

⁵⁴ Lally, *The Cost of Capital Under Dividend Imputation*, June 2002, p. 34.

⁵⁵ ACG, *Review of studies comparing international regulatory determinations*, 2004, p. 113.

8.5 Betas

8.5.1 Introduction

This section describes the three different beta measures in the CAPM framework: equity beta; asset beta and debt beta. As discussed below, the equity beta is the relevant measure for use in the CAPM and is important in setting the appropriate regulatory WACC. This section will also discuss the ACCC's consideration of what represents an appropriate value of an equity beta to adopt for regulatory decisions in the near term.

As illustrated in the following formula, CAPM yields the required expected return on equity given the return on the market portfolio, the market's own volatility and the systematic risk of holding equity in the particular company:

$$r_e = r_f + \beta_e(r_m - r_f)$$

The equity beta is a measure of the sensitivity of the return of a particular stock relative to the return on the market portfolio. That is, the risk that cannot be eliminated in a balanced and diversified portfolio. An equity beta of less than 1 indicates that the stock has a low systematic risk relative to the market (the market portfolio beta being equal to 1). Conversely, an equity beta of more than one indicates the stock has a higher risk relative to the market.

Betas are forward looking estimates and hence are unobservable. The equity beta is often estimated using historical data. Calculating the historic equity beta for publicly listed firms is straightforward, though the results for individual firms may vary over time. A firm's return is calculated by adding dividend payments to changes in the value of the stock. This is regressed against the market return, which is calculated in the same way, i.e. by adding the dividends and changes in values of all the firms listed on the stock market index. The result is based on the All Ordinaries Index which is compiled by the Australian Stock Exchange (ASX) as the All Ordinaries Accumulation Index.

Calculating an equity beta for unlisted firms is more complicated, as there is no readily traded market from which to examine their returns. In Australia, many regulated energy firms are not listed. Hence, common practice is to take the equity beta of a similar listed firm, or the average equity beta for the sector, and then adjust it through a process of de/re-levering to determine an estimated equity beta for a given gearing level (total debt/total capital).⁵⁶

The first step in the de/re-levering process is to de-lever an equity beta for a firm with observable returns from the market. The market equity beta is taken from a listed comparable firm and is then de-levered using the listed firm's actual gearing level to determine the asset beta of the firm (the beta of the firm without debt financing).

⁵⁶ Among other things, the value of an equity beta is dependent on the amount of debt that a firm has: the higher the level of debt (or gearing), the higher the equity beta tends to be (all things being equal). Therefore to estimate the equity beta of an unlisted firm, the equity beta of a comparable (listed) firm has to be adjusted for differences in capital structure.

The asset beta represents the sensitivity of the operating cash flows generated by the assets. If a firm is financed entirely by equity (i.e. no debt) then the asset beta is equal to the equity beta.

The asset beta is then used to re-lever with a benchmark gearing level to obtain a comparable benchmark equity beta for the regulated firm. While there are a number of levering formulae, the ACCC has consistently applied the formula developed by Monkhouse:

$$\beta_e = \beta_a + (\beta_a - \beta_d) \left[1 - \left(\frac{rd}{1+rd} \right) (1-\gamma) T_e \right] \frac{D}{E}$$

where:

β_e	=	<i>equity beta</i>
β_a	=	<i>asset beta</i>
β_d	=	<i>debt beta</i>
r_d	=	<i>cost of debt</i>
γ	=	<i>gamma</i>
T_e	=	<i>the effective tax rate</i>
D	=	<i>market value of debt</i>
E	=	<i>market value of equity.</i>

The debt beta measures the systematic risk of debt. It represents that part of systematic risk in business operations transferred from equity holders to providers of debt. Hence, the impact of the debt beta is to diminish the estimated value of the equity beta based on a particular value for the asset beta. While there are a variety of approaches to estimating the debt beta, there is limited empirical information available as the parameter is generally not used by investors. Further, the different approaches to its estimation tend to yield different outcomes. However, provided the same value is used for de-levering and re-levering the observed equity betas, it does not have a significant impact on the resulting benchmark equity beta.

Although the debt beta and asset beta are used in the Monkhouse formula, it is the equity beta that is used in the CAPM and is important in setting the appropriate regulatory WACC. In previous revenue cap decisions, the ACCC has consistently applied an equity beta of 1 for TNSPs.⁵⁷ However, market evidence from the sample of comparable Australian firms shows that regulated firms listed on the ASX have an

⁵⁷ The revenue cap decisions have generally stated that this figure of 1 is approximately equal to re-levering an asset beta of 0.4, based on the assumed 60:40 gearing ratio and a debt beta of 0. However, the de/re-levering process is not actually undertaken from observed market data to obtain an equity beta of 1.

equity beta of less than 1 (after adjusting for capital structure) and thus do not face the same market risks relative to the market portfolio beta of 1.⁵⁸

8.5.2 Code requirements

Schedule 6.1(3.3) of the code allows for estimating equity betas by direct measurement using historical data, or by consideration of comparable companies, where company returns are unobservable:

Beta factor measurements for all listed Australian companies are publicly available. Where beta data is not available (because the network owner is not a listed company), it is necessary to estimate a beta factor. This can be done by observing the beta factors of listed companies (in Australia and overseas) which have business risk profiles and capital structures similar to those of Australian network owners.

8.5.3 Draft SRP

The ACCC stated that emerging market data suggested the appropriate equity beta for TNSPs may be less than 1. However current statistical methods for estimating the equity beta from market data tend to produce varying confidence interval (and sample average) estimates. The ACCC also noted that the time period of the market data is not long enough to satisfy the ACCC that market derived equity betas would not systematically under compensate the TNSPs.

The ACCC stated that it would apply an equity beta of 1 for TNSPs and would monitor available empirical evidence.

8.5.4 Submissions by interested parties on draft SRP

AGL, Powerlink and Transend support the ACCC's proposal to apply an equity beta of 1, given the lack of consistently reliable quantitative market data.

Market evidence of equity betas

EnergyAustralia states that when considering future reviews of the equity beta to apply to TNSPs, the following should be examined:

- assessment of comparable companies in Australia and overseas
- regulatory decisions and associated regulatory risks
- assessment of factors that impact on the sensitivity of the TNSP's returns to movements in the economy.

⁵⁸ The core sample of firms included Australian Pipeline Trust, Envestra, AlintaGas, Australian Gas Light and United Energy. If consideration is only given towards an expanded combined sample, then the result is likely to bias towards the TNSP because the combined sample included firms that do not operate in a similar line of business such that the systematic risk of the underlying assets is unlikely to be of similar magnitude.

Market gearing and equity beta

ElectraNet maintains that the average equity beta risk of the market as a whole should take into account the average gearing of the market. Based on the average gearing of 36 per cent in the Australian market, it provides an average asset beta of 0.64 for a company listed on the market which is higher than the asset beta provided for TNSPs.

8.5.6 ACCC's considerations

Market evidence

The ACCC agrees with previous submissions that the estimation of individual equity betas can be imprecise regardless of the statistical method by which it is determined. However, market evidence shows regulated firms listed on the ASX have an equity beta of less than 1 (after adjusting for capital structure) and thus do not face the same market risks relative to the market portfolio beta.

In its discussion paper the ACCC constructed, for analytical and for illustrative purposes, small sample confidence intervals (upper bound) based on the assumption that the market derived equity betas are random variables within a population mean. The ACCC acknowledged that this assumption was simplistic and maybe it would be more accurate to consider the confidence intervals for individual equity betas.

However, regardless of which formulae are used to construct confidence intervals it is clear that the core sample market data (after adjusting for gearing differences) provides an equity beta of less than 1. This market evidence is also supported by NERA's estimation of the equity beta in the core sample of firms, with levels of confidence up to 99 per cent.⁵⁹

Further, work conducted by ACG in 2002 suggested an equity beta for Australian transmission companies in the gas industry of just below 0.7, based on pooled market evidence.⁶⁰

Market gearing and equity beta

The ACCC notes TNSPs' previous comments that in determining the average market beta, the average gearing of the market must be taken into account.

The issue concerning leverage (gearing) raised by the TNSPs seems to be a misinterpretation of what an equity beta of 1 implies. If a stock has an equity beta of 1, it simply implies that the equity returns on the stock have the same systematic risk as the market portfolio. By definition, the market portfolio beta has a value of 1 (and does not require any gearing assumption).⁶¹

Regulatory practice for estimating an equity beta of an unlisted firm is usually based on estimating the betas of other comparable listed firms. However, it is often difficult to match firms on the full range of underlying factors, therefore adjustments are usually required.

The adjustments usually considered are:

- the nature of a firm's output
- duration of its contracts
- regulation

⁵⁹ NERA, *Evaluation of the ACCC's proposed approach to statistical estimation of equity betas for TNSPs, a report for TransGrid*, November 2003, Table 3, p.8.

⁶⁰ ACG, *Empirical evidence on proxy beta values for regulated gas transmission activities, final report for the ACCC*, July 2002, p.46.

⁶¹ The definition of the portfolio beta (β_i) represents the risk of the portfolio relative to the market and is described as:

$$\beta_i = \text{cov}_{im} / \sigma_m^2$$

where: cov_{im} = the covariance between the return of portfolio i and the return of the market portfolio

$$\sigma_m^2 = \text{variance of portfolio m}$$

As the covariance of a portfolio with itself is equal to its variance then:

$$\text{Cov}_{mm} = \sigma_m^2$$

Combining these two equations, the beta of the market:

$$\beta_m = \sigma_m^2 / \sigma_m^2 = 1$$

(See Brailsford and Heaney, *Investments*, 1998, p.204)

- monopoly power
- operating leverage
- real options
- industry size
- capital structure.

Among these adjustments it is only those involving gearing that receive much attention. This focus reflects the lack of mathematical models (on other factors) or general acceptance of them. If there are other factors which impact differently on individual firms, the advantage of pooling beta estimates is that the impact of any one of these other factors will be minimised.

Consequently, it is typical to use comparable firms in a similar line of business so that the systematic risk of the underlying assets could be regarded as similar. Following the selection of comparable firms, gearing is assumed to be a remaining factor for adjustment. Therefore, if the market beta is to be adjusted for gearing, then it is arguable that the market beta should also be adjusted for the factors listed above.

Furthermore, the leverage for the sample of firms used in the discussion paper is similar to the benchmark gearing ratio used by the ACCC and the re-levered equity betas are still considerably below the benchmark equity beta of 1.

Debt beta

The debt beta represents the systematic risk of debt and not the systematic risk of default. Given that the systematic risk of debt is minimal, a range for the debt beta between 0.1 and 0.2 is reasonable. For the purposes of determining an appropriate equity beta for TNSPs and given the uncertainty associated with the estimation of equity betas, the ACCC considers that the debt beta is immaterial as long as the same value is used in the de-levering and re-levering process. This is consistent with the views expressed by NECG and Professor Davis.⁶²

Summary

In previous revenue cap decisions, an equity beta estimate of 1 has been used suggesting that the equity holders of TNSPs experience the same volatility as the market portfolio.

In considering the equity betas of comparable firms from market data, the ACCC will apply the Monkhouse formula with a debt beta between 0 and 0.2 in the de/re-levering process, noting that the actual value within that range will have an immaterial impact if applied consistently.

⁶² Professor Kevin Davis is the Commonwealth Bank Group Chair of Finance, Department of Finance, The University of Melbourne.

The code clearly provides for consideration of market data, and the emerging data suggests the appropriate equity beta for TNSPs may be less than 1. However current statistical methods for estimating the equity beta from market data tend to produce varying confidence interval (and sample average) estimates. The ACCC also notes that the time period of the market data is not long enough to satisfy the ACCC that market derived equity betas would not systematically under-compensate the TNSPs.⁶³ That is, the current decline in the measures of market derived equity betas may reflect a short term deviation from normal trend. In saying this, the ACCC will continue to use market evidence to check the reasonableness of a TNSP's equity beta.

In recognition of these shortcomings, the ACCC proposes to continue with exercising judgement in its application of empirical evidence from the market. The ACCC will also monitor the market evidence on equity betas. In the near term, the ACCC proposes to adopt an equity beta estimate of 1. However, the ACCC will continue to undertake further work in this area.

8.5.7 Decision

The ACCC will apply an equity beta of 1.

8.6 Cost of debt

8.6.1 Introduction

This section sets out the ACCC's approach for estimating the cost of debt.

The WACC comprises the cost of debt and cost of equity, weighted by the assumed gearing level. The cost of debt on commercial loans is typically the debt margin over the risk free rate as illustrated by the formula:

$$r_d = r_f + d_m$$

This section focuses on determining an appropriate debt margin. The debt margin varies depending on the entity's gearing, its credit rating and the term of the debt. Applying the cost of debt to the asset base, using the assumed gearing, will generate the interest costs (the cost of debt) for regulatory purposes.

In previous revenue cap decisions, the ACCC has adopted a debt margin with a corresponding term equal to the regulatory period. This position was consistent with the ACCC's use of a risk free rate matching the regulatory period.

The ACCC has determined the debt margin by reference to the CBASpectrum database on fair estimates of corporate bond yields. The process in which the ACCC obtains the debt margin is similar to that for the risk free rate. More specifically, the ACCC calculates the cost of debt by:

⁶³ The estimated re-levered equity betas from a sample of comparable Australian energy firms have fallen from around 1 in 2000 to around 0.3 in 2003. (see ESCOSA, *Electricity Distribution Price Review: Return on Assets-Preliminary Views*, January 2004, p.56). This analysis is consistent with the ACCC's estimates of market derived equity betas shown in recent regulatory decisions.

- collecting the debt margin corresponding to the determined benchmark credit rating and term to maturity, by taking the estimated fair corporate bond yield and subtracting the Commonwealth government bond yield
- averaging the debt margins for the same length of period as for the risk free rate
- adding the (averaged) debt margin to the (averaged) risk free rate.

8.6.2 Code requirements

The code states that:

The cost of debt is estimated with reference to current prices in domestic and overseas corporate debt markets. Given the long lives of network assets, the cost of debt should reflect the cost of a long-dated debt portfolio (Schedule 6.1, section 2.3).

The code further states:

... cost of debt should be estimated, taking into account the maturity and duration characteristics of the portfolio and the associated current market yields. Market yields applicable to the debt should reflect fully the Network Owner's credit risk.⁶⁴

8.6.3 Draft SRP

The ACCC stated that in determining the cost of debt, it would calculate a benchmark debt margin which corresponds to a 10-year term and a benchmark 'A' credit rating for a TNSP. The ACCC also would monitor the empirical evidence and reserved the right to change the benchmark credit rating with refinement in the methodology and data.

8.6.4 Submissions by interested parties on draft SRP

Benchmarking the credit rating

EnergyAustralia states that the method of calculating the credit rating appears flawed because it inappropriately includes non network information. It argues that caution needs to be exercised when reviewing the benchmark assumptions to ensure that only the relevant network information is used to derive the credit ratings.

ElectraNet believes that the government owned entities should be removed from the sample of credit ratings and would result in a lower benchmark 'A-' credit rating for TNSPs. Powerlink similarly states that the inclusion of government owned companies in the sample distort the credit rating and results in a higher rating than is appropriate.

8.6.5 ACCC's considerations

In the DRP the ACCC stated that it would not reference a TNSP's actual cost of debt because the actual cost of debt may not reflect efficient financing. A WACC based on an industry wide benchmark cost of debt may deter inefficient debt financing, as the revenue cap will only contain a return on capital allowance consistent with the return requirements of efficient financing.

⁶⁴ National Electricity Code, schedule 6.1(4.2).

The ACCC considers the reference to electricity network companies generally (rather than the actual position of the firm in question) should provide an incentive for the TNSP to establish least cost financing arrangements within the regulatory period.

Benchmarking the credit rating

The cost of debt is primarily dependent on the credit rating of the debt issuer. As a general rule, debt attached with a lower credit rating has greater default risk and therefore attracts a higher risk premium. The ACCC considers that adopting a benchmark credit rating for the TNSP rather than an actual credit rating provides the firm with the incentive to minimise inefficient financing. Therefore the cost of debt should be determined through reference to a benchmark credit rating and the (market) debt margin associated with that rating.

Table 8.1 sets out the long term credit rating assigned by Standard and Poor's for ten Australian electricity network companies.⁶⁵

Table 8.1 Credit ratings of electricity companies

Company	Long-term rating	Actual gearing (%)
Ergon Energy	AA+	49.3
Country Energy	AA	68.3
EnergyAustralia	AA	51.4
Integral Energy	AA	51.3
SPI PowerNet	A+	76.8
Australian Gas Light	A	40.8
CitiPower Trust	A-	54.1
ETSA Utilities	A-	64.1
Powercor Australia	A-	38.1
ElectraNet	BBB+	71.9
Average	A to A+	56.6

Source: Standard and Poor's, *Industry Report Card: Australian Utilities*, October 2004.

The table illustrates the average credit rating of these entities is about 'A' to 'A+' and their average gearing is approximately 57 per cent which is close to the benchmark of 60 per cent.

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

⁶⁵ United Energy (now United Energy Distribution) and TXU Electricity (now SPI Electricity) are not included in the sample because they were recently acquired and undergoing restructuring which would have an impact on their long term credit ratings. However in the future, once their business operations stabilise or restructuring is complete, these firms may be included in the sample.

TNSP's credit rating.⁶⁶ Standard and Poor's considers that it is appropriate to provide an industry snapshot that includes both electricity distribution and transmission companies in its *Australia and New Zealand CreditStats* publication. This is because Standard and Poor's is of the view that electricity distribution and transmission have similar business and operating characteristics such as:

- natural monopoly features
- stability, predictability and transparency of the regulatory regime, providing stable cash flows
- low operational risk and the sound condition of assets
- aggressiveness of financial profiles.⁶⁷

Further, there are an insufficient number of 'transmission only' entities with publicly available credit ratings to provide a reliable industry snapshot. It could be argued that the inclusion of distribution companies in the sample may provide a lower credit rating (i.e. have the effect of biasing the sample towards TNSPs) because distribution is regulated by way of a price cap rather than a revenue cap (which is more likely to provide a stronger business profile). According to Fitch Ratings, while distribution operations typically involve a low business risk similar to transmission operations:

... they have more exposure to volume risk than transmission companies (eg. volumes are sensitive to mild winters or summers).⁶⁸

Therefore a transmission company is expected to have a stronger credit rating than other players in the electricity industry.⁶⁹

In its sampling of the average credit rating for electricity network companies, the ACCC has included both private and government owned entities. The ACCC considers that by using stand alone and private entities, it would provide too small a sample to obtain an average credit rating for the electricity industry.⁷⁰ The ACCC

⁶⁶ The ACCC has drawn a distinction between electricity and gas companies for the purpose of sampling credit ratings for the following reasons. In assessing the credit worthiness of Australian gas companies, Standard and Poor's would consider a number of key issues. They relate specifically to regulatory risk; counterparty risk and overall volume of demand for gas. (see Standard and Poor's, *Energy Australia and New Zealand*, November 2001, p. 14)

⁶⁷ Standard and Poor's, *Australia and New Zealand CreditStats*, June 2004, p. 17.

⁶⁸ Fitch Ratings, *Australian Electricity Sector-At That Awkward Adolescence Stage*, March 2004, p.47.

⁶⁹ The ACCC notes ElectraNet's comment that excluding government owned companies from the sample would result in a credit rating of 'A-'. In this case the 'A-' credit rating mostly reflects the distribution companies in the reduced sample. Accordingly an 'A' credit rating for a benchmark TNSP is consistent with the expectations that TNSPs have stronger credit ratings in the electricity chain.

⁷⁰ The ACCC understands the complexity of the number of factors which are considered by ratings agencies when determining a credit rating for a company. If the criteria of private and stand-alone

acknowledges that the inclusion of some government owned companies in the sample is likely to create an upward bias to the credit rating. For instance, Standard and Poor's has stated that the stronger 'AA' credit rating is predominantly given to a government owned utility.⁷¹

Offsetting this is the inclusion of distribution companies in the sampling of credit ratings. In most Australian states, other than South Australia and Victoria, the distribution companies are bundled with retail operations. Retailers operate in a highly competitive market and its credit quality will always be at the riskier end of the credit spectrum.⁷² Further, it is Fitch Ratings' experience that there would be only limited situations where the existence of a retailing capacity would strengthen a distributor's stand-alone credit profile.⁷³ Therefore the ACCC's sampling, which includes the credit ratings of bundled distribution network companies, is likely to provide a conservative credit rating for the purpose of a benchmark TNSP.

Notwithstanding this, government/parent ownership is only one factor which may affect a credit rating. According to Standard and Poor's, the method used to rate power companies incorporates an assessment of both the financial and business risk characteristics of the entity. The financial risk assessment focuses upon the ability of an entity to generate sufficient cash flows to service its debt and therefore involves consideration of the stability of an entity's revenue and gearing levels. The business risk assessment typically considers a broader range of issues which affect the key business or operating characteristics such as:⁷⁴

- regulation
- markets
- operations
- competitiveness.

By taking into account these additional factors, the ACCC is satisfied that the Standard and Poor's credit rating does not simply reflect the ownership structure but considers more broadly the stability of the entity's operations. This conclusion can also be seen in statements made by both Standard and Poor's and Fitch Ratings who state:

network firms are strictly considered then the sample list would reduce to only include ElectraNet. It could also be argued that because ElectraNet is 40 per cent owned by the Queensland government through Powerlink, the available number of firms for the sample list would be zero.

⁷¹ Standard and Poor's, *Australia and New Zealand CreditStats*, May 2002, p.20.

⁷² Standard and Poor's, *Energy-Australia & New Zealand*, November 2001, p.9.

⁷³ Fitch Ratings, *Australian Electricity Sector-At That Awkward Adolescence Stage*, March 2004, p. 47.

⁷⁴ Standard and Poor's, *Energy-Australia & New Zealand*, November 2001, p. 18.

... the 'A' rated entities are generally stable network or transmission businesses.⁷⁵

... the transmission company should enjoy stronger credit ratings than other players in the electricity chain, because of the strong regulatory environment and low operating risks currently evident in Australia.⁷⁶

On balance, the ACCC considers its use of an average 'A' credit rating for a benchmark TNSP, based on a sample Australian electricity network companies and the statements of credit rating agencies, is consistent with the overall environment in which TNSPs operate.

Benchmark debt margin

Once the relevant credit rating is established the debt margin can be determined from financial market sources. The debt margin (short term averaging period equal to the averaging of the risk free rate) should also reflect the prevailing rates which represent current market expectations for debt issues at the benchmark maturity and credit rating for the regulated entity.

In previous revenue cap decisions, the ACCC has assumed a benchmark debt margin with a term equal to the regulatory period for the regulated entity. This position was consistent with the ACCC's use of a risk free rate matching the regulatory period. However, as discussed in section 8.3, the ACCC now recognises that the 10 year bond rate can be used as a proxy for the risk free rate. To maintain consistency between the two costs of debt components, the ACCC considers that the benchmark term of the relevant corporate bond rate should match the term of the risk free rate being used.

The ACCC notes that there is a limited number of long dated (i.e. 10 year maturity) corporate bonds in the Australian debt market. Therefore the ACCC proposes to use a 10 year debt margin subject to practical application of available data.

8.6.7 Decision

In determining the cost of debt the ACCC:

- will use a 10 year government bond rate as a proxy for the risk free rate
- will calculate a benchmark debt margin, corresponding to a 10-year term and a benchmark 'A' credit rating for a TNSP. This would be subject to practical application of available benchmark data on long dated Australian corporate bonds.

⁷⁵ Standard and Poor's, *Australia and New Zealand CreditStats*, May 2002, p. 20.

⁷⁶ Fitch Ratings, *Australian Electricity Sector-At That Awkward Adolescence Stage*, March 2004, p. 40.

8.7 Gearing

8.7.1 Introduction

This section discusses the use of gearing when formulating the WACC and the ACCC's consideration of what represents an appropriate benchmark gearing value for TNSPs.

Gearing refers to the ratio of debt to equity and is used to weight the costs of equity and debt when formulating a WACC. Capital structure can have a major bearing on the cost of debt and the required return on equity (although generally it is unlikely to affect the cost of capital or the WACC).

The greater the level of gearing (other things being equal) implies the greater the risk of both debt and equity and therefore the greater the required returns. However, over reasonable ranges, the risk of the total assets does not change and neither would the cost of capital change for the firm's assets.

This is because the change in the weighting of capital from equity to debt maintains a constant risk level for the assets as a whole and can offset the relative increase in equity and debt costs such that the asset cost of capital or the WACC remains unchanged (even though both the cost of debt and cost of equity will increase as the proportion of debt in the capital structure increases).⁷⁷

In previous revenue cap decisions, the ACCC has consistently used a benchmark gearing assumption of 60 per cent.

8.7.2 Code requirements

The code states:

Gearing should not affect a government trading enterprise's target rate of return, which implies that shareholder value will also be insensitive to varying levels of debt. For practical ranges of capital structure (say less than 80 per cent debt), the required rate of return on total assets for a government trading enterprise should not be affected by changing debt to equity ratios.⁷⁸

8.7.3 Draft SRP

The ACCC stated that it would maintain its current approach to benchmarking the gearing of a TNSP at 60 per cent. The gearing level of 60 per cent also has substantial regulatory precedent where it has consistently been applied as the appropriate benchmark for TNSPs.

8.7.4 Submissions by interested parties on draft SRP

Powerlink supports the use of a benchmark gearing ratio for TNSPs of 60 per cent.

⁷⁷ This is an illustration of the Modigliani-Miller proposition that a company's value is invariant with changes in its capital structure.

⁷⁸ National Electricity Code, schedule 6.1(5.1).

8.7.5 ACCC's considerations

In calculating a required rate of return, the ACCC adopts the accepted practice of calculating the WACC based on a capital structure of equity and debt financing. Therefore a gearing ratio is needed to be establish a TNSP's appropriate weighted average cost of debt and equity. The ACCC can choose the actual gearing of the service provider or an appropriate benchmark.

A typical capital structure assumed by regulators has been 60 per cent debt as a proportion of total assets. In theory, the asset cost of capital should be stable within the range of 40–70 per cent.⁷⁹ The ACCC notes that a survey conducted by Standard and Poor's suggested that gearing ratios for transmission and distribution companies are between 55 per cent and 65 per cent.⁸⁰

Further, as set out in table 8.1 the ACCC's sample of ten electricity network companies provides an average gearing level of 57 per cent. A larger sampling of electricity network companies (table 8.2) also show an average gearing of approximately 57 per cent which is close to the assumed benchmark gearing of 60 per cent.⁸¹

⁷⁹ Officer, *A Weighted Average Cost of Capital for a Benchmark Australian Electricity Transmission Business-A Report for SPI PowerNet*, February 2002, p. 38.

⁸⁰ Standard and Poor's, *Rating Methodology for Global Power Companies*, 1999.

⁸¹ The electricity companies listed in the table are not only operating in the regulated transmission and distribution sectors but some also operate in unregulated areas such as retail and generation.

Table 8.2 Gearing of electricity companies

Company	Actual gearing (%)
Aurora Energy	52.0
Australian Gas Light	40.8
Citipower Trust	54.1
Country Energy	68.3
ElectraNet	71.9
Energex	55.3
EnergyAustralia	51.4
Ergon Energy	49.3
ETSA Utilities	64.1
Integral Energy	51.3
Powercor Australia	38.1
SPI PowerNet	76.8
TransGrid	55.3
Western Power	62.5
Average	56.5

Source: Standard and Poor's, *Industry Report Card: Australian Utilities*, October 2004.
Standard and Poor's, *Australia and New Zealand CreditStats*, June 2004.

On balance, given the average level of gearing in the electricity network industry and that most regulators have assumed a gearing of 60 per cent, there is no reason to vary from this benchmark at this point.

8.7.6 Decision

The ACCC will use a gearing level of 60 per cent for a benchmark TNSP

8.8 Imputation credits—gamma

8.8.1 Introduction

This section describes how gamma fits into the ACCC's modelling of taxation liabilities in the cash flow model and also the ACCC's consideration of an appropriate value for gamma. The ACCC adopts a vanilla WACC in which the parameters relating to business income tax are removed from the WACC formula.

The vanilla WACC is expressed as the weighted average of the partially grossed-up return on equity and the pre-tax cost of debt:

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

The ACCC explicitly models the tax liabilities in the cash flow model and adjusts the amount to account for the utilisation of imputation credits. Under the imputation tax system, Australian resident taxpayers can claim a credit against income tax payable

on dividends received from Australian companies, to the extent of the income tax that has been paid by those companies.

Gamma (γ) represents the proportion of franking credits which can, on average, be used by shareholders of the company to offset tax payable on other income. The gamma parameter can be seen as a composite of the proportion of company tax paid that is issued as imputation credits to shareholders and the use of these credits by shareholders to offset their own tax liabilities. For example, a gamma of 1 reflects full imputation which means that shareholders receive the full benefit of tax paid at the company level so that the company's pre-tax rate of return is the same as its post-tax rate of return as perceived by shareholders.⁸²

To accommodate dividend imputation, while ensuring the regulatory cost of capital is achievable on average, the cash flow allowance for expected tax liabilities requires adjustment. If the total value of tax liabilities is included in the cash flows, the regulatory framework would over compensate for tax liabilities where investors are able to use franking credits because of the tax paid at the company level.

In previous revenue cap decisions, the ACCC has used an average value for gamma of 0.5. This implies that the cost of capital is assessed on the assumption that on average only half of the TNSP's company tax payable is used as imputation credits by shareholders to offset tax payable on other personal income or rebated by other mechanisms in the tax system.

8.8.2 Code requirements

The code states that empirical research has shown that franking credits are on average valued at approximately 50 cents in the dollar. It states that this would be a reasonable assumption for the calculation of a TNSP's WACC. The code also notes that for government businesses, taxpayers would value their equity on exactly the same basis as they would value an investment in any other corporate tax paying entity. Therefore the gamma adopted for such entities should also be the average franking value of 50 per cent:

As the ultimate owners of government business enterprises, tax-payers would value their equity (and post corporate tax cash flows) on exactly the same basis as they would value an investment in any other corporate tax-paying entity. On this basis, it would be reasonable to assume the average franking credit value (of 50%) in the calculation of the Network Owner's pre-tax weighted average cost of capital.⁸³

8.8.3 Draft SRP

The ACCC noted the debate concerning the appropriate adjustment to apply for imputation credits. The ACCC stated that it would retain the current assumed average value of 0.5 for gamma which reflects the code provision and the available empirical evidence.

⁸² Conversely, a gamma of 0 reflects no imputation which means that shareholders receive no benefit from dividend imputation.

⁸³ National Electricity Code, schedule 6.1(5.2).

8.8.5 Submissions by interested parties on draft SRP

Powerlink states that there is no justification for a gamma of less than 0.5. It supports the use of a benchmark value of 0.5 for gamma.

8.8.6 ACCC's considerations

The gamma factor incorporates not only the proportion of earnings that is paid out as dividends with imputation credits, but also the proportion of the imputation credits that taxpayers can use. Regarding the proportion of imputation credits used, foreign investors are typically assumed to not benefit fully from imputation credits. Their presence thereby reduces the average gamma to the extent that they are unable to get a benefit from imputation credits.

In previous revenue cap decisions, the ACCC noted that the relevant benchmark for regulatory purposes should be based on Australian ownership. The capital markets would transfer ownership to those who have the greatest competitive advantage in investing in Australian utilities. Therefore, in applying the domestic CAPM, the ACCC assumes that markets are segmented. This assumption is consistent with the observed home market bias of investors.⁸⁴

The ACCC notes that there is no consensus on the appropriate value to adopt for gamma. The ACCC further notes that the selection of gamma is ultimately a matter of judgement, having regard to the empirical evidence. The ACCC considers that maintaining the average value of 0.5 for gamma is in accordance with the code and the available empirical evidence.

8.8.7 Decision

The ACCC will use an average gamma of 0.5

8.9 Debt and Equity Raising Costs

8.9.1 Introduction

This section covers the ACCC's treatment of benchmark debt and equity financing costs in recent regulatory decisions. It also sets out the ACCC's proposal to undertake a further review of this issue in a study.

Debt raising costs

To raise debt, a service provider has to pay debt financing costs over and above the debt margin. One cost that is incurred is the additional payment made to a bank or financial institution for arranging debt.⁸⁵ The debt financing arrangement and bank fees are likely to vary between each debt issue and also over time with market conditions. Nevertheless, a benchmark needs to be established to determine a reasonable allowance for revenue calculation.

⁸⁴ Lally, *The Cost of Capital under Dividend Imputation*, June 2002, p. 12.

⁸⁵ Macquarie Bank, *Issues for debt and equity providers in assessing greenfields gas pipelines*, report for the ACCC, May 2002, p. 21.

The benchmark approach for the transaction cost of raising debt is the transaction cost associated with re-financing fixed rate bonds to the value of the notional gearing component of the firm measured against its RAB, assuming a consistent notional credit rating. It does not relate to acquisitions by the firm or any non-core investment activities that are being undertaken.

According to a consultancy undertaken by Macquarie Bank on behalf of the ACCC, TNSPs often incur advisory fees, agency fees, arrangement fees, credit rating costs and syndication expenses. On occasions TNSPs may also be required to pay a dealer swap margin for the transfer from a floating to a fixed rate facility.⁸⁶

Equity raising costs

Equity raising costs must be paid by an entity when it raises capital. These costs are paid to equity arrangers for services such as structuring the issue, preparing and distributing information and undertaking presentations to prospective investors.⁸⁷

8.9.2 Code requirements

The code does not specifically state the requirements for allowing financing costs. However, the code does state that in setting a revenue cap, the ACCC must take into account the TNSP's revenue requirements, having regard for:

... the potential for efficiency gains to be realised by the Transmission Network Owner...in expected operating, maintenance and capital costs, taking into account the expected demand growth and service standards...⁸⁸

In 2002 the ACCC established an allowance for benchmark debt and equity raising costs on the basis that they represented legitimate costs in the GasNet tariff determination. This was also granted in the SPI PowerNet and ElectraNet revenue cap decisions (2002).

8.9.3 Draft SRP

The ACCC stated that it would provide benchmark debt/equity raising costs as opex items. The ACCC also stated that this would be subject to a proposed study reviewing these costs. The ACCC noted that the allowance of debt and equity raising costs should be considered on a case by case basis because of inevitable variations between TNSPs.

⁸⁶ Macquarie Bank, *Issues for debt and equity providers in assessing greenfields gas pipelines*, report for the ACCC, May 2002, pp. 16, 21.

⁸⁷ Macquarie Bank, *Issues for debt and equity providers in assessing greenfields gas pipelines*, report for the ACCC, May 2002, p. 10.

⁸⁸ National Electricity Code, 6.2.4(c)(3).

8.9.4 Submissions by interested parties on draft SRP

Powerlink believes in the principle that debt raising costs should form part of the debt margin. However it notes that a TNSP will be neutral to the way that these costs are recovered, provided that the benchmarks are accurate.

8.9.5 ACCC's considerations

In previous revenue cap decisions a benchmark allowance for debt and equity raising costs have been provided.⁸⁹ More recently, in the Transend revenue cap decision and the TransGrid draft decision, the ACCC provided a benchmark allowance for debt raising cost as an opex item but did not provide an allowance for benchmark equity raising costs on the basis that the TNSPs would be unlikely to incur equity raising cost during the regulatory period.⁹⁰ The ACCC notes that the allowance of debt and equity raising costs should be considered on a case by case basis because of inevitable variations between TNSPs.

In addition to debt and equity raising costs some interested parties have argued that an allowance for hedging costs should be included in opex forecasts. The ACCC notes that this issue was considered by the ESC in the context of its 2001–2005 price determination for United Energy's distribution business. United Energy appealed this decision on a range of issues including the omission of an allowance for hedging costs. The appeal panel ruled against United Energy on this issue and affirmed the ESC's determination.

Given the relatively new nature of capital costs in the context of regulatory decisions, the ACCC has decided to undertake a review of this issue. The review is likely to consider issues such as:

- determining which capital raising costs should be recovered
- developing a benchmark which can be updated over time
- determining the appropriate approach for recovering these costs.

8.9.6 Decision

The ACCC will treat debt and equity raising costs as opex items and will undertake a further review of debt and equity raising costs and hedging costs.

⁸⁹ See Revenue Cap decisions - SPI PowerNet and ElectraNet 2002

⁹⁰ The ACCC has only provided equity raising costs for privatised firms.

8.10 Decisions

8.1 Introduction

This section sets out the ACCC's view on each of the parameters in the WACC.

The ACCC will continue to establish the WACC on the basis of benchmark parameters to enhance certainty in investments. In saying this, the ACCC will also undertake further review and monitoring in this area with close consultation with industry and user groups. The ACCC also proposes to continue with exercising judgment in its application of empirical evidence from the market. The ACCC reserves the right to change the value of the WACC parameters with refinement in the methodology and data and in light of new available data.

The WACC is expressed as the weighted average of the return on equity and the return on debt:

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

where:

r_e = required rate of return on equity or cost of equity

r_d = cost of debt

E = market value of equity

D = market value of debt

V = market value of equity plus debt.

8.2 Weighted average cost of capital

The ACCC will determine a WACC that provides a fair and reasonable rate of return applicable to TNSPs.

8.3 Capital asset pricing model

The ACCC will use the CAPM to estimate the cost of equity capital. As illustrated in the following formula, CAPM yields the required expected return on equity given the return on the market portfolio, the market's own volatility and the systematic risk of holding equity in the particular company:

$$r_e = r_f + \beta_e (r_m - r_f)$$

where:

r_f = expected risk free rate of return over the period

$(r_m - r_f)$ = expected market risk premium (MRP), defined by the expected premium of return of the market (r_m) as a whole over the risk free return for the same period

β_e = *a measure of investors' perceived systematic risk of the individual company's equity relative to the market.*

8.4 Risk free rate

Term to maturity of risk free rate

The ACCC will use a 10 year government bond rate as a proxy for the risk free rate.

Length of period used in moving average of bond rate

The ACCC will accept the period used to calculate the moving average of the risk free rate (between 5 and 40 days) submitted by a TNSP in its application.

8.5 Market risk premium

The ACCC will use a value of 6 per cent for the MRP in its TNSP revenue cap decisions.

8.6 Equity beta

The ACCC will apply an equity beta of 1.

8.7 Cost of debt

In determining the cost of debt the ACCC will use a 10 year government bond rate as a proxy for the risk free rate and proposes to calculate a benchmark debt margin, corresponding to a 10 year term and a benchmark 'A' credit rating for a TNSP. This would be subject to the practical application of available benchmark data on long dated Australian corporate bonds.

8.8 Gearing

The ACCC will maintain the use of a gearing level at 60 per cent for a benchmark TNSP.

8.9 Gamma

The ACCC will use an average gamma of 0.5.

8.10 Debt and equity raising costs

The ACCC will treat debt and equity raising costs as opex items and will undertake a further review of debt and equity raising costs and hedging costs.

9 Financial indicators

9.1 Introduction

This chapter sets out the ACCC’s use of financial indicators when setting a revenue cap. A financial indicator is a measure of a TNSP’s financial viability and ability to obtain credit.

9.2 Code requirements

The code sets out the objectives for the transmission revenue regulatory regime. Clause 6.2.2(b)(2) of the code states the regime should seek to achieve the outcome of an incentive-based regulatory regime which:

provides for, on a prospective basis, a sustainable commercial revenue stream which includes a fair and reasonable rate of return to [TNSPs] on efficient investment

Under clause 6.2.4(c), the ACCC, in setting a revenue cap, is required to take into account the revenue requirements of each TNSP, having regard for a number of matters including the “on-going commercial viability of the transmission industry” and “any other relevant financial indicators”.

9.3 Submissions by interested parties on Draft SRP

Powerlink supported the ACCC’s adoption of financial indicators as a guide to the appropriateness of their regulatory decisions. However, Powerlink noted that such indicators are only used as a guide and in no way form the basis of any benchmarking between companies.

9.4 ACCC’s considerations

The ACCC recognises that, in setting the revenue cap, it must take into account the possible impact the revenue cap will have on the TNSP’s financial viability and its ability to obtain credit. Financial indicator analysis can provide the ACCC with a means of assessing the likely impact of its decisions on the financial standing of TNSPs. The ACCC uses a similar approach to that used by banks and credit rating agencies to analyse financial and performance indicators of a business.

In previous revenue cap decisions, the following indicators have been presented:

- i) earnings before interest and tax (EBIT) to revenues (per cent)
- ii) earnings before interest, tax and depreciation (EBITD) to revenues (per cent)
- iii) EBIT to funds employed (per cent)

- iv) EBIT to regulated assets
- v) pre-tax interest cover
- vi) funds flow net interest cover
- vii) internal financing ratio
- viii) gearing
- ix) payout ratio.

These ratios are compared to the key indicators used by Standard & Poor's, to assess the effect of the revenue cap on the credit rating and the financial viability of the TNSP. The ACCC is of the view that the above indicators will usually provide an adequate profile of the TNSP in order to perform such an assessment.

9.6 Decision

9.1 Introduction

This chapter sets out the ACCC's use of financial indicators when setting a revenue cap. A financial indicator is a measure of a TNSP's financial viability and ability to obtain credit.

9.2 Financial indicators

In general, the ACCC will use the following financial indicators, compared to the key indicators used by Standard & Poor's, to assess the effect of revenue cap decisions on the financial viability of TNSPs:

- EBIT to revenues (per cent)
- EBITD to revenues (per cent)
- EBIT to funds employed (per cent)
- EBIT to regulated assets
- pre-tax interest cover
- funds flow net interest cover
- internal financing ratio
- gearing
- payout ratio

Appendix A Information requirements

A.1 Introduction

This appendix A sets out the ACCC's information requirements in addition to the *Information requirements guidelines* for setting a revenue cap.

Clause 6.2.5 of the code requires TNSPs to submit certified annual financial statements to the ACCC in a form and by a date determined by the ACCC. In addition, the ACCC may require a TNSP to provide any other information the ACCC reasonably requires to perform its regulatory functions. In accordance with clause 6.2.5, on 5 June 2002, the ACCC issued its *Information requirements guidelines* setting out the information to be provided by TNSPs.

The guidelines specify the financial information the ACCC requires to model a TNSP's MAR. The guidelines note that the information disclosure requirements will continue to be developed over time to reflect, amongst other things, changes that occur in the transmission sector and in regulatory practices.

As discussed in chapter 3, after completing a number of revenue cap decisions (including draft decisions on the first revenue cap resets), the ACCC has identified areas where further guidance is required on the type of information the ACCC requires a TNSP to provide in its revenue cap application. This appendix A sets out these additional areas.

A TNSP should, in its revenue cap application, include the information specified below. Appendix A does not amend the *Information requirements guidelines* or impose any obligations under clause 6.2.5 of the code. However, at a future point in time, the ACCC will commence the process in consultation with industry and users groups to amend the *Information requirements guidelines* to incorporate the appropriate information specified below.

The *Information requirements guidelines* and this appendix A are not an exhaustive list of information requirements. The actual information required to set a revenue cap will need to be determined on a case by case basis. Ultimately, the TNSP should submit any information in its application that it considers would assist the decision-making process.

A.2 Draft SRP

The draft SRP set out the additional information requirements that would assist the ACCC in its decision making process. The information requirements are outlined below.

A.3 Submissions by interested parties on draft SRP

EnergyAustralia and Powerlink supported the ACCC's intention to clarify the information requirements for a revenue cap application.

A.4 Decision

A.1 Introduction

This appendix A sets out the additional information that a TNSP should include in its revenue cap application with respect to:

- (a) asset base roll forward
- (b) past capital expenditure
- (c) forecast capital expenditure
- (d) operating and maintenance expenditure
- (e) weighted average cost of capital.

A.2 Asset base roll forward

- (a) For revenue cap resets, the TNSP should prepare a schedule that rolls forward its asset values from the date of the last revenue cap decision to the end of the current regulatory period.
- (b) The roll forward schedule should set out the following:
 - (i) opening asset values at the start of the current regulatory control period broken down into individual asset classes
 - (ii) forecast and actual capex broken down into individual asset classes
 - (iii) forecast and actual disposals broken down into individual asset classes
 - (iv) forecast depreciation broken down into individual classes
 - (v) actual CPI adjustment for individual asset classes
 - (vi) closing asset values for individual asset classes at the end of the current regulatory period.

A.3 Past capital expenditure

- (a) For revenue cap resets, the TNSP should provide:
 - (i) information on actual capex projects undertaken over the course of the current regulatory control period
 - (ii) a comparison between the actual capex projects built in the regulatory control period and those forecast in the revenue cap decision

- (iii) an explanation for any variations between forecast and actual expenditure.
- (b) In relation to:
 - (i) augmentations that:
 - (1) exceed \$10 million, the TNSP should supply the regulatory test applications
 - (2) cost between \$1 and \$10 million, the TNSP should provide the annual planning report which sets out its regulatory test assessments of these projects
 - (ii) replacement/refurbishment capex, the TNSP should provide details on:
 - (1) its overall asset management processes and procedures
 - (2) how its individual investment decisions fit within this strategy
 - (iii) large replacement projects (that is, projects exceeding \$10 million), the TNSP should provide an explanation as to why the assets need replacing (including condition based assessments)
 - (iv) business support capex (for example, information technology and communications), the TNSP should provide a comprehensive and robust assessment of the need for these investments (including a business case showing the analysis undertaken to support the investment).

A.4 Forecast capital expenditure

- (a) The TNSP should include in its revenue cap application a clear statement outlining:
 - (i) expected investment
 - (ii) the factors affecting the need for the investment.
- (b) The forecast capex costs should be as accurate as possible. Where forecasts cannot be supplied to a precise standard, this should be highlighted and an explanation provided.
- (c) In relation to reliability augmentations, the TNSP should categorise its investments into the following groups:
 - (i) projects under construction
 - (ii) projects very likely to be built

- (iii) other possible projects.
- (d) In relation to each forecast project, the TNSP should provide:
 - (i) a detailed description of the project
 - (ii) the regulatory test application (if one has been conducted)
 - (iii) details on why the project is required
 - (iv) the timing and costs of the project (and how these were derived)
 - (v) details on the options considered in addition to the preferred option (including the estimated cost of the alternative options considered)
 - (vi) the methodology and analysis used to select the preferred option.
- (e) In relation to projects that are neither under construction at the time of the revenue cap application nor very likely to be built, the TNSP should provide details on:
 - (i) the methodology used to forecast these projects (including their estimated cost)
 - (ii) any scenario modelling utilised in developing the TNSP's forecast capex plans.
- (f) In relation to replacement/refurbishment capex, the TNSP should provide details on:
 - (i) its overall asset management processes and procedures
 - (ii) how its individual investment decisions fit within this strategy.
- (g) In relation to large replacement projects (that is, projects exceeding \$10 million), the TNSP should provide an explanation about why the asset needs replacing (including comprehensive condition based assessments).
- (h) In relation to business support capex, the TNSP should provide a comprehensive and robust assessment of the need for these investments (including a business case showing the analysis undertaken to support the investment).

A.5 Operating and maintenance expenditure

- (a) The TNSP should provide:
 - (i) its actual opex spend (historical) over the first four years of the current regulatory control period

- (ii) a reasonable forecast of the opex spend for the final year of the current regulatory control period
 - (iii) the assumptions on which its opex forecasts are based
 - (iv) full and detailed explanations of the basis for its preparation of its opex forecasts
 - (v) if the opex classification (or allocation framework) has changed during the current regulatory control period:
 - (1) an explanation of the change
 - (2) the historical annual opex presented using both the old classification and the new classification methodologies.
- (b) To assist the ACCC in the consideration of partial indicator (ratio) analysis of opex, the TNSP should provide measures of its:
- (i) line length (circuit kilometres)
 - (ii) number of substations
 - (iii) energy delivered (gigawatt hour)
 - (iv) energy demand (megawatt).
- (c) If the TNSP is requesting a self-insurance allowance as part of its revenue cap, it should address the self-insurance guidelines set out in chapter 6.

Appendix B Transitional capital expenditure arrangements

This appendix sets out the ACCC's treatment of capex incurred during the first revenue control period. For such capex the ACCC will apply the ex-post prudency arrangements set out in the DRP. For subsequent revenue controls the ACCC will assess capex on an ex-ante basis as discussed in chapter 5. To distinguish the treatment of capex incurred during the first control period from subsequent capex, this paper refers to this capex as historic capex.

This appendix:

- section B.1 summarises the issues in treating capex incurred during the first revenue control period
- section B.2 provides an overview of the code requirements
- section B.3 outlines the discussion in the draft SRP
- section B.4 summarises submissions from interested parties on the treatment of past capex
- section B.5 considers the existing regulatory framework and the ACCC's approach to the assessment of historic capital expenditure
- section B.6 presents the ACCC's decision.

B.1 Issue

The ACCC will apply the ex-post prudency framework for capex during the first regulatory period in assessing the amount of capex out-turns to be rolled into the RAB. This section explains how the ACCC will assess the prudency of capex within the ex-post prudency framework.

B.2 Code requirements

While there are a range of principles and objective in clause 6.2 of the code that impact upon regulating capex, the ACCC's principal obligation is set out in clause 6.2.3(d)(4) of the code. This provides that the regulatory regime administered by the ACCC must:

provide a fair and reasonable risk-adjusted cash flow rate of return to ... *Transmission Network Service Providers* ... on efficient investment given efficient operating and maintenance practices on the part of the ... *Transmission Network Service Providers*

B.3 Draft SRP

The draft SRP stated that the ACCC will apply the ex-post prudency test for investment as advocated in the DRP for investment during the first revenue control

period. The ACCC for subsequent revenue caps will apply an ex-ante framework. The draft SRP outlined the ACCC's implementation of the ex-post prudency test. The implementation of the test involved a three stage assessment which is outlined in section B.5.

B.4 Submissions by interested parties on Draft SRP

EnergyAustralia and Powerlink supported the clarification to the process of reviewing historic capex.

B.5 ACCC's considerations

In assessing the amount of capex that should be rolled into the RAB, the ACCC is guided by the principles that consumers should only pay for efficient (or prudent) investment and that TNSPs should meet their statutory obligations.

A defining characteristic of the capex regime outlined in the DRP is that it requires the assessment of prudency ex-post. That is, the assessment of prudent investment and the determination of the amount of expenditure to be included in the RAB are to be determined after the investment has been made. The amount of expenditure to be included in the RAB is determined by the prudency test as outlined by the DRP. The DRP defines prudency in terms of a TNSP acting efficiently in accordance with good industry practice to achieve the lowest sustainable cost of delivering services.

The ACCC considers that an assessment of whether a TNSP developed a project in accordance with good industry practice necessarily requires the exercise of judgement, taking account of the specific engineering and economic facts and circumstances of the investment.

In addition the ACCC needs to weigh the political, organisational, environmental, strategic and administrative constraints facing the TNSP when making decisions and delivering on a project. In the ACCC's view, a simplistic and doctrinaire interpretation of good industry practice that fails to take account of the real world constraints faced by the TNSP is contrary to the spirit and letter of the code.

The ACCC also believes the assessment of good industry practice should take into account the information and analysis available to the TNSP at the time it made the decision to invest. The ACCC wants to encourage TNSPs to take account of the most accurate information available when designing projects even if the project eventually delivered differs from the project first envisaged.

However it is much less clear what should be done if the TNSP conducts an inadequate analysis and invests in a project that does not reflect an economically sensible investment on the basis of the information available at the time, but which subsequently proves to be economically justifiable. The approach in such circumstances is not to automatically disallow such investment, as this could be inconsistent with the ACCC's code obligations. However, this is obviously not to condone inadequate investment appraisal by TNSPs. The network planning and development requirements of the code are designed to ensure that TNSPs only undertake efficient investment that has been approved through a public consultation

process that is subject to dispute resolution and review. Failure to comply with these procedures will often cast doubt on whether a project is economically justifiable.

In undertaking the ex-post prudency assessment of capex, the essence of the ACCC's task is to step into the TNSP's shoes at the time the investment decisions were taken and assess whether, a prudent TNSP would have made the same decisions.

If the ACCC determines that different decisions would have been made by a prudent operator than were actually made by the TNSP, then the task is to quantify the difference in investment under each set of decisions. By implication, this difference represents the cost of inefficiency to be excluded from the RAB. In this way, the ACCC is able to maintain consistency with the code.

It should be noted that this approach is designed to ensure that the prudency test is properly applied having regard to the assessment of the efficiency of investment for the purposes of asset valuation under clause 6.2 of the code. Different approaches may be appropriate if a prudency test is being applied in other contexts or other purposes.

The application of the prudency test to augmentation investment

There may be a number of ways to implement prudency assessments. The methodology that the ACCC proposes to adopt is based on a systematic chronological examination of the critical decisions in selecting and delivering investment. The purpose of the examination is to establish whether the TNSP made decisions at each stage consistent with good industry practice. The examination will consist of three sequential stages, which are to be applied to projects that have been assessed under the regulatory test, and to projects that have not been subjected to the regulatory test.⁹¹ The approach is as follows:

- First, assess whether there is a justifiable need for the investment. This stage examines whether the TNSP correctly assessed the need for investment against its statutory and code obligations. The assessment focuses on the need for investment, without specifically focussing on what the correct investment to meet that need should be. An affirmation of the need for an investment does not imply acceptance of the specific project that was developed.

⁹¹ The role of the regulatory test and the ACCC's determination of prudent investment has changed over time. Before the "Network and Distributed Resources" (NDR) code changes gazetted in March 2002, the ACCC was required to automatically roll-in to a TNSP's RAB any investment that had passed the regulatory test as applied by NEMMCO in a network augmentation determination under clause 5.6.5. Since the NDR code changes, NEMMCO's power to make such a determination has been removed. Therefore, there is no explicit link between the outcome of the regulatory test and amount of the investment to be rolled into the RAB. The ACCC is not expressly bound to accept the outcome of the regulatory test as the definitive statement on the amount to be rolled in to the RAB. Nevertheless, the ACCC has adopted the regulatory test as the starting point for assessing the prudency of TNSP's capex.

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

A structured examination of the project through each of these stages will provide the content and rationale for the prudency assessment and any possible reduction in the total cost of the project to be rolled-in to the RAB.

The application of the prudency test to non-augmentation investment

A significant proportion of a TNSP's capex relates to investments that support the business such as investment in business systems and IT, and investment to maintain and replace old assets.

The assessment of the prudency of such investments will principally consist of a review of the processes the TNSP has used to assess the need for investment, to select the appropriate project and then to deliver that project.

B.6 Decision

B.1 Introduction

The ACCC will apply the ex-post prudency test for investment during the first regulatory period in assessing the amount of capex to be rolled into the RAB. For subsequent revenue caps the ACCC will apply an ex-ante framework. In assessing the amount of capex that should be rolled into the RAB, the ACCC is guided by the principles that consumers only pay for prudent investment and that TNSPs meet their statutory obligations.

B.2 Prudency-test

The ACCC will assess the prudency of actual capital expenditure subject to S5.1 of the DRP, which outlines the test for prudent investment, '...the amount that would be invested by a prudent TNSP acting efficiently in accordance with good industry practice'.

The ACCC will apply the prudency test to augmentation investment which has been assessed under the regulatory test, and to projects that have not been subjected to the regulatory test, by following a three stage process.

B.3 Regulatory test

The ACCC is not expressly bound to accept the outcome of the regulatory test as the definitive statement on the amount to be rolled-in to the RAB. Nevertheless, the ACCC has adopted the regulatory test as the starting point for assessing the prudence of TNSP's capex.

B.4 Application of prudence test

First, assess whether there is a justifiable need for the investment. This stage examines whether the TNSP correctly assessed the need for investment against its statutory and code obligations. An affirmation of the need for an investment does not imply acceptance of the specific project that was developed.

Second, assuming the need for an investment is recognised, assess whether the TNSP proposed the most efficient investment to meet that need. The assessment reviews whether the TNSP objectively and competently analysed the investment to a standard that is consistent with good industry practice.

Third, assess whether the project that was analysed to be the most efficient was developed, and if not, whether the difference reflects decisions that are consistent with good industry practice. This analysis examines in detail the factors that caused changes in the project design and/or delivery and assesses how the TNSP responded to those factors in comparison to what could be expected of a prudent operator.

The ACCC will apply the prudence test to non-augmentation and support the business investment by reviewing the processes conducted by the TNSP in assessing the need for investment, selecting the appropriate project and then delivering that project.

Appendix C Revaluation of easements

In accounting terms, the RAB can be divided into fixed assets and easements. A fixed asset is an asset that is part of the transmission network system. An easement is a right to use a portion of land owned by another party. In the case of TNSPs, an easement usually gives the holder of the easement the right to erect transmission lines on an area of land usually defined in terms of size by the land occupied by the transmission tower, and by safety considerations.

Why are easements different?

There are a number of reasons why easements have been regarded as different to other assets for the purposes of valuation:

- There does not appear to be a market in which easements are sold or traded, restricting the use of market based valuations for easements.
- Depreciation is an important feature of DORC valuations given that the depreciation schedule can have a substantial effect on the valuation result. The ACCC will not depreciate easements given that easements don't wear out over time and, hence, do not need to be replaced. Assigning a depreciation schedule to them raises problems of potentially large variations in results based on the arbitrary choice of depreciation schedule. However, to not depreciate easements could lead to problems of TNSPs' not recovering the full expenditure of the assessed value of easements.
- The fact that easement acquisition is backed by compulsory acquisition legislation means that valuations that assume free negotiation between two parties in a market could produce inaccurate results.
- Valuations which require estimates of land values, market based or based on costs of easement acquisition can contain a large margin for error given the many subjective judgements involved in valuing easements.

These characteristics mean that it may be inappropriate to value easements according to the DORC methodology which applies to fixed assets.

What is the most appropriate asset valuation methodology for easements?

The ACCC considers that a historic cost approach is the most appropriate asset valuation methodology for easements. This is because a historic cost approach uses the TNSPs' actual expenditure incurred when acquiring easements. The ACCC notes that most TNSPs have records of the costs incurred in the process of acquiring easements and these can be used to establish historic cost valuations. Such a process was used in establishing several jurisdictional valuations.

The benefits of this approach are that it:

- accurately compensates TNSPs for their expenditure on easements

- is relatively easy to determine a figure
- maintains continuity with jurisdictional valuations where historic cost valuations were used by the jurisdictions.

A variant on the historical cost approach is to use a benchmark approach. This would establish benchmarked costs for TNSPs' easements based on its own records for those TNSPs with relatively complete records, and then impute a value to cover easements for which records are unavailable or incomplete.

This approach would provide the additional benefit of delivering values for TNSPs which lack historical records. This approach would also maintain consistency between the valuations methods used for TNSPs.

The ACCC concurs with Transend and SPI PowerNet that easements should not be depreciated given that easements are not like other capital assets as they don't wear out over time and, hence, do not need to be replaced. However, if the easement is released for some reason, the ACCC considers it appropriate that the TNSP should be able to depreciate or write down the easement value in order to recover its investment.

Appendix D Capex—categories of capex covered by cap and supporting information

Capex can be classified as ‘augmentation’ (investment justified to increase the capacity of the network); ‘replacement’ (investment to replace old or defective infrastructure with its nearest modern equivalent) and ‘support-the-business’ (investment in IT, communication infrastructure, business systems etc.). The ACCC considers that the ex ante allowance should cover investment under all of these categories.

Augmentation capex

The ACCC believes that it will be beneficial for TNSPs to develop a database of relevant information on all possible projects to be developed during the regulatory period. Projects could be classified as follows:

- projects currently under construction
- projects very likely to be built during the coming regulatory period
- other future projects (excluding those identified above).

The ACCC notes that scenario modelling or other forms of probabilistic assessment may be useful to take account of uncertainty over future spending requirements. The probabilistic assessment could be used to derive a single number for the expected future investment during a regulatory period, or a range, where necessary investment is a function of the outcome of one or more uncertain investment drivers such as uncertain future demand growth.

Scenarios could be developed in a variety of ways. In general, in conducting such probabilistic assessments it is important to have a clear understanding (and to be able to clearly communicate):

- how scenarios have been constructed (ie. the underlying input assumptions)
- how those assumptions are modelled to give rise to expected future load flows
- how the resulting investment in response to different load flows has been estimated (i.e. specification, cost, timing and justification of all the projects that are deemed to be needed to respond to the expected new load flows)
- how the probabilities of those scenarios have been calculated.

Replacement capex

The ACCC expects that much of a TNSP’s replacement capex is likely to be determined by asset management processes and procedures. Therefore an assessment of such capex should focus on the appropriateness of the processes and procedures, rather than on the efficiency of specific investments. It will be useful for the ACCC to be provided with a good understanding of the methodology employed in the

development of long, medium and short term asset management plans, and in particular the asset replacement philosophy underpinning the plans.

The ACCC recognises that in many cases, the line between replacement and augmentation capex can be a fine one. For example, replacing old technology with new technology may involve an augmentation in capacity attributable to the evolution of technology over time. In other cases an augmentation investment may also include an element of replacement. In most cases this will not be a problem since a similar investment analysis would apply if it were an augmentation or a replacement decision. However, it is helpful to attempt to clearly draw the line between replacement and augmentation investment and to ensure that this definition is consistently applied, not least to ensure comparability over time.

Furthermore, the ACCC should be provided with a good understanding of the data supporting the outcomes, the predictive methodology employed, and the basis and reliability of the yearly cost projections included in the capex application. The assessment of the efficiency of substantial replacement projects will remain important, not only to ascertain their consistency with the over-arching processes and procedures, but to ensure that the fundamental justification for the project is sound. For example, comprehensive condition assessments which demonstrate the risks of the asset remaining in service should be provided, rather than just a statement that the asset exceeds its regulatory life. It will also be helpful to clearly understand capitalisation processes that will affect the recovery of costs through opex or capex charges. The ACCC notes that access to databases and other supporting information are likely to support a TNSP's case.

The ACCC considers that disaggregating capex by asset type (e.g. cables, lines, transformers, switchgear, etc) and benchmarking these against total replacement capex is useful. For example, ratios of the proportion of replacement expenditure by asset category as a percentage of total replacement expenditure; expressed as ratio of the net book value of assets in those categories as a percentage of the total book value of all assets are useful elements of a refurbishment capex application.

Support-the-business capex

Capex needed to support the business can seldom be directly attributed to the performance of statutory obligations. However, in most cases the ACCC expects that significant support-the-business investments, such as in IT systems or communication infrastructure should be supported by a business case showing the analysis undertaken to support the investment decision.

Like significant network investments, the ACCC would like to see evidence of a comprehensive and robust assessment of proposed significant support-the-business investments. The ACCC expects TNSPs to clearly identify the benefits that any support-the-business investment would bring, such as reduced opex, more efficient

processes, or higher quality service. Information relating to the timing of these benefits and the magnitude of the benefits over the life cycle of the project will generally be required.

For other, more routine support-the-business investments, the ACCC would like to clearly understand the investment assessment procedures. The ACCC would also need to understand the rules governing the capitalisation of support-the-business investment, and how these have been applied.

Appendix E Capex—possible construction of a dynamically adjusting cap

As discussed in section 5.7.1, a capex allowance may be proposed by a TNSP that is contingent on specified variables. Powerlink, for example, has suggested a revenue cap that dynamically adjusts to changes in demand. Therefore, a formulation of the allowance could have a fixed element and an element that changes in line with key cost drivers. A TNSP could, in its revenue cap application, propose an allowance in the following form:

$$\text{Allowable capital expenditure} = A + \Sigma (B_i * X_i(\text{actual}))$$

where:

A = a fixed amount (\$million) per year

B_i = a \$/cost driver amount representing the variation in investment

for a change in cost driver i

$X_i(\text{actual})$ = the actual level of cost driver i over the regulatory period

In this case, the actual level of the capex allowance would only be known at the end of the regulatory period once the parameter $X_i(\text{actual})$ was known. However, to establish the MAR and hence prices during the regulatory period, it would be possible to determine the MAR based on the formula:

$$\text{Allowable capital expenditure} = A + \Sigma (B_i * X_i(\text{forecast}))$$

where:

A = a fixed amount (\$million) per year

B_i = a \$/cost driver amount representing the variation in investment

for a change in cost driver i .

$X_i(\text{forecast})$ = the forecast level of the cost driver i over the regulatory period

At the end of the regulatory period there would need to be an adjustment to allowed revenues equal to $\Sigma B_i * (X_i(\text{actual}) - X_i(\text{forecast}))$ to take account of differences between the actual and forecast level of the cost drivers.

Appendix F Capex—expected error formulae

Under the existing regulatory arrangements where revenues are reset every five years, any error arising from under or over provision for specific projects can be corrected at the end of the regulatory period by adjusting the revenues for the subsequent period. This means that the expected error in the ex ante allowance attributable to any single project can be calculated over five years based on the difference between the revenue allowed for that project (based on its expected value), and the actual cost of the project that was developed (which is zero if the project is not developed). The exclusion criterion is based on the ratio of this expected error to the allowed revenues based on the investment covered by the ex ante allowance. In particular, a project is excluded from the ex ante allowance if:

Expected error/allowed revenue > 10%

Where

- *Allowed Revenue* is the total depreciation plus return on the investment included within the ex ante allowance (excluding any potentially contingent projects) during the *Regulatory Period*
- *Expected error* = Maximum (A,B)
- *A* = Total depreciation plus return on the *Expected Value of the Project* during the regulatory period taking account of *Timing of Investment*
- *B* = *Upper Bound of Expected Project Cost* less *Expected Value of the Project*
- *Expected Value of the Project* is the product of the probability of the project proceeding and the *Expected Project Cost*
- *Timing of Investment* is the annual expenditure during each year of the *Regulatory Period*
- *Expected Project Cost* is the mean of the probability distribution of the cost of the project
- *Upper Bound of Expected Project Cost* is the cost of the project with 10% probability of exceedance (i.e. one standard deviation from the mean of the distribution of the expected project cost)
- *Regulatory Period* is the period for which the ex ante investment allowance is determined.

Appendix G Capex—implementation process for contingent projects

The implementation of the contingent project arrangements requires the identification of contingent projects and preparation of information on these projects at the time of the revenue reset. Procedures for the operation of the incentive if a contingent project event occurs during the regulatory period are then established. The specific arrangements to apply in each of these areas are set out in the rest of this section.

Activities at the time of the revenue reset

The ACCC considers that the first task is to identify which projects, if any, should be excluded from the main ex ante capex cap. This should be implemented with reference to the error threshold calculation specified in section 5.7.3 and consideration whether there are special circumstances that justify excluding a project that would otherwise fail to satisfy the error threshold.

For projects that are excluded from the main ex ante allowance, an appropriate specification of those projects should be developed. The ACCC recognises that projects that are to be excluded from the main allowance are, by definition, uncertain and therefore accurate specifications of such projects in terms of their design and expected construction costs will be difficult. Nevertheless, in many cases investments in contingent projects could substitute, at least in part, for investments covered by the main ex ante allowance. Therefore it will be important to obtain as clear a specification of contingent projects, their main investment drivers and the inter relationship between investment in contingent projects and investment in the main allowance.

Steps when a contingent project event occurs

The main steps that the ACCC envisages for the implementation of a contingent project are summarised as follows:

- Step 1: The TNSP notifies the ACCC of its intention to invoke a contingent project event. This should occur when the TNSP becomes certain that investment in the contingent project will be needed. The ACCC then decides whether a bona fide contingent project event has occurred and notifies the TNSP accordingly. This is intended to provide certainty that the ACCC will recognise the investment as a contingent project (i.e. in addition to the investment provided in the main ex ante allowance). This means that the TNSP can proceed to develop project designs, seek environmental and other approvals with the knowledge that, subject to the contingent project incentive, the costs will be recognised by the ACCC.
- The TNSP should then apply the regulatory test (if applicable) or other investment appraisal processes to the investment in the contingent project. While primary responsibility rests with the TNSP to undertake the project assessment, this assessment should be conducted in consultation with the ACCC. This means that the ACCC expects to closely monitor key assumptions and the analytical approach adopted with the TNSP. The ACCC has decided to adopt this approach to ensure that incentives can be expeditiously developed. This recognises that, in

setting an incentive for investment in the contingent project, the ACCC will need to cover the same ground that would have been covered in the regulatory test. It will be possible to avoid unnecessary duplication by consulting with the ACCC during this evaluation. The ACCC expects to undertake consultation with interested parties throughout the assessment. This may involve consultation over and above that already provided for in chapter 5 of the code. The ACCC considers that an indicative time frame of four months would be appropriate depending on the length of time required to complete the regulatory test process in accordance with the code.

- Step 2: After completion of the regulatory test process in accordance with the code (including any appeals), the ACCC will establish an incentive for the contingent project. The incentive will specify:
 - when the incentive period is to begin (under the preferred incentive design it ends five years from the date the incentive begins to apply);
 - the profile of target annual expenditure on the contingent project;
 - the calculation of the annual regulated revenue to cover depreciation and return on the investment in the contingent project on the basis of the annual investment allowances determined by the ACCC;
 - the calculation of the closing RAB for the investment in the contingent project at the end of its 5 year incentive period.
- Step 3. The TNSP invests in the contingent project. The appropriate adjustments to the closing RAB and the capex allowance for the following period will need to be made at the re set of the TNSP's revenue cap. The code currently prevents the ACCC from resetting allowed revenues during the regulatory period except under three specific circumstances. The proposed treatment of excluded investment is unlikely to qualify as one of these circumstances. This means that if the ACCC expresses a view on an efficient allowance for investment in contingent projects during the regulatory period (rather than at the start of the period), there is no mechanism for this allowance to be included in regulated charges during the regulatory period in which the investment commences.
- An amendment to the code which allowed a reopening of the revenue cap to deal with excluded investment would permit the necessary adjustments to be made during the regulatory period. The ACCC considers that there is a strong case to amend the code, as it would provide absolute certainty to TNSPs as to the treatment of contingent projects.
- These steps assume that the project is certain to proceed and that once the target has been established, TNSPs will begin investment on the project as planned. It may be the case that in some circumstances the need for the investment or the optimal investment to respond to that need will change measurably from what was expected at the time that the regulatory test/investment appraisal was undertaken. In this case, the ACCC believes that it may be appropriate to consider re-establishing the allowance to ensure that the allowance reasonably relates to

the expected investment. Conducting such re-assessments is unlikely to be problematic if the investment has not started. However, re-opening the revenue cap during the regulatory period, risks undermining the certainty and efficiency incentives that a set regulatory period is intended to provide. The ACCC therefore believes that re-establishing a contingent project allowance should only be considered in extreme circumstances.

Appendix H Submissions from interested parties on draft SRP

Australian Gas Light Company

Electricity Supply Industry Planning Council

ElectraNet SA

EnergyAustralia

Energy Users Association of Australia

Origin Energy Limited

Powerlink Queensland

SPI PowerNet

Transend

TransGrid

TXU

Victorian Energy Networks Corporation