Draft Decision

Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper

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Commissioners:
Samuel
Sylvan
King
Martin
McNeill
Willett

Contents

Glossary

AARR	Aggregate Annual Revenue Requirement
AC	Alternating Current
ACCC	Australian Competition and Consumer Commission
ACG	Allen Consulting Group
AER	Australian Energy Regulator
Background Paper	Statement of Principles for the Regulation of Transmission Revenues – Background Paper
Capex	Capital and Maintenance Expenditure
CAPM	Capital Asset Pricing Model
COAG	Council of Australian Governments
code	National Electricity Code
DC	Direct Current
Discussion Paper	Discussion Paper – 2003 Review of Draft Statement of Principles for the Regulation of Transmission Revenues
DORC	Depreciated Optimised Replacement Cost
Draft Background Paper	Draft Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper
Draft SRP	Draft Statement of Principles for the Regulation of Electricity Transmission Revenues
DRP	Draft Statement of Principles for the Regulation of Transmission Revenue (May 1999)
ECCSA	Electricity Consumers Coalition of South Australia
EUAA	Energy Users Association of Australia
Gas code	National Third Party Access Code for Natural Gas Pipeline Systems
GW	Gigawatt
IC	Industry Commission

KV	Kilovolt
MAR	Maximum Allowed Revenue
MRP	Market Risk Premium
NECA	National Electricity Code Administrator Ltd
NECG	Network Economics Consulting Group
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NERA	National Economic Research Association
NPV	Net Present Value
Opex	Operating and Maintenance Expenditure
RAB	Regulated Asset Base
SRP	Statement of Principles for the Regulation of Electricity Transmission Revenues
Supplementary Discussion Paper	Supplementary Discussion Paper – Review of the Draft Statement of Principles for the Regulation of Transmission Revenues: Capital Expenditure Framework
TNSP	Transmission Network Service Provider
TP Act	*Trade Practices Act 1974 (Cth)*
WACC	Weighted Average Cost of Capital

Executive Summary

Background

Since 1 July 1999, the Australian Competition and Consumer Commission (ACCC) has assumed responsibility for the regulation of transmission revenue in the National Electricity Market (NEM). The National Electricity Code (code) provides for the ACCC to set a revenue cap to apply to each Transmission Network Service Provider (TNSP).

The introductory explanation to chapter 6 of the code envisaged that the ACCC would publish a *Statement of Regulatory Intent* to establish guidelines as to how the ACCC would perform its regulatory function. Accordingly, in May 1999, the ACCC released its *Draft Statement of Principles for the Regulation of Transmission Revenue* (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 2003, the ACCC released its *Discussion Paper – 2003 Review of the Draft Statement of Principles for the Regulation of Transmission Revenues* (the Discussion Paper). The Discussion Paper outlined a number of key issues for review.

Following a period of extensive consultation, the ACCC has released for public comment this document, the *Draft Statement of Principles for the Regulation of Electricity Transmission Revenues – Background Paper* (Draft Background Paper). At the end of each chapter, the ACCC has set out a draft version of the revised regulatory principles. A consolidated version of these principles is set out in *Draft Statement of Principles for the Regulation of Electricity Transmission Revenues* (Draft SRP).

Context of the review

The focus of the ACCC is on improving incentives for efficiency, improving climate of investment through greater certainty and providing greater transparency about TNSPs' performance.

Improved incentive for efficiency

An objective of the code is to achieve an incentive-based regulatory regime that fosters efficient investment and operating practices. Consistent with this, the code requires the ACCC to set a revenue cap in the form of CPI – X or some incentive-based variant. Under an incentive regulation approach, TNSPs are generally compensated only for efficient costs in providing the transmission services to customers.

Adopting an incentive form of regulation also addresses to some extent the asymmetry of information that exists between the regulated firm and the regulator. This approach provides the TNSP discretion in how it carries out its activities, but subject to broad financial incentives that induce the TNSP to pursue socially desirable objectives.

In setting revenue cap, the ACCC seeks the following incentives to:

- enhance the quality or quantity of services
- select efficient capital projects
- provide the selected projects at minimum expenditure.

The ACCC also seeks to balance the incentives so that each TNSP selects efficient capital projects at a minimum cost for a given level of quantity and quality of services. For example it would be undesirable for the ACCC to adopt an operating and maintenance expenditure (opex) incentive scheme that resulted in the firm reducing expenditure to the point that service quality is threatened. The protection for quality of services comes through instruments such as existing state requirements and improved service standard schemes. The ACCC has convened an industry working group to further develop these service standard schemes by identifying the market impact of transmission networks and how to quantify that impact.

In setting a revenue cap, the ACCC generally adopts an incentive based approach within a CPI-X framework, in which a building block approach is used to determine the CPI-X parameters. The aim is to provide TNSPs with the incentive to operate more efficiently and undertake needed investment.

If the TNSP is able to outperform the benchmark costs used to set the revenue cap, it retains the additional profit and vice versa. If the TNSP can gain additional profit by beating the benchmark costs and the ACCC considers that profit to be efficient, it will carry over that additional profit into the next regulatory period.

The Draft Background Paper includes measures to increase incentives for efficiency. The first measure is a proposed opex efficiency carry-forward mechanism. The efficiency carry-forward mechanism allows TNSPs to retain the benefit of any opex savings in any given year for a five year period. This mechanism will provide stronger incentives for efficiency savings over time.

A second measure to increase efficiency is the ACCC's proposal to shift from an ex post assessment of capital expenditure (capex) to an ex ante approach What currently exists is in effect a rate of return approach where the costs of investment are included following an ex post assessment of the efficiency of the investment. With an ex ante approach the TNSPs can retain a share of any underspend against the investment cap as an efficiency dividend.

Improving investment through greater certainty

The ACCC, through its review of the *Draft Statement of Principles for the Regulation of Transmission Revenue* (DRP), has taken measures to increase certainty of investment for TNSPs and users through its decisions on the asset base, the ex ante capex framework and weighted average cost of capital (WACC).

Under the DRP, the asset base is periodically revalued on an Depreciated Optimised Replacement Cost (DORC) basis. This approach was useful as a transitional measure given the problems associated with the pre-existing historic cost values[1].

The problem with periodic revaluation is the level of uncertainty to which the TNSP might be subject. Revaluation could potentially lead to significant variations in the value of the asset base from one period to the next. That is, a revaluation might result in a windfall gain or loss for the TNSP.

The revaluation can subject the TNSP and users to unpredictable revenue streams and transmission prices. The risk for the regulated firm is that it invests now, but has its investment revalued downwards in the future and, as a result, may never fully recover its costs.

Consequently, the ACCC's preferred position is to adopt the initial jurisdictional valuation and add in new investment at cost. The attraction of this option is that a lock-in of the jurisdictional asset base is unlikely to deter new investment.

Secondly, the ACCC proposes to shift from an ex post assessment (optimisation) of capex to an ex ante approach. This provides the TNSP with greater certainty on its future capex profile.

Thirdly, the ACCC proposes 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 in investment. However, the ACCC reserves the right to change the value of the WACC parameters with refinement in the methodology and data.

Greater transparency

An important focus of the ACCC is greater transparency of TNSPs' performance. For example, as a consequence of recent revenue cap decisions, Appendix A to the Draft Background Paper sets out additional information that TNSPs should include in their revenue cap applications.

In a process separate from the review of the DRP, the ACCC is currently reviewing the *Service Standards Guidelines*. As noted earlier, the ACCC proposes to publish information on the market impacts and transmission constraints. This new information is intended to assist market participants to understand better the impact of the transmission network on market outcomes.

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[1] These problems include:
- historic cost values for existing assets might not exist
- the purchase price for these transmission businesses do not necessarily reflect efficient cost
- the circularity issue. This arises when trying to value a regulated asset on the basis of associated regulated revenue.

Summary of the Draft SRP

For the purposes of the Executive Summary, the ACCC has for each issue outlined in the Draft Background Paper, briefly summarised the main points.

Revenue Cap Decision Making Process

The ACCC has found the current 6 month regulatory review period inadequate, in all 5 previous revenue cap decisions. The ACCC proposes to extend the regulatory review period to facilitate greater consultation at all stages of the process. Further, after completing a number of revenue cap decisions, 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. Appendix A of this document sets out these additional areas.[2]

Summary

The ACCC proposes to extend the regulatory review period to twelve months.

The ACCC has identified areas, outlined in Appendix A, where further guidance is required on the type of information the ACCC requires a TNSP to provide in its revenue cap application.

Lock-in the Asset Valuation versus Revaluation of the Asset Base

In finalising the Draft Background Paper the ACCC will need to consider its approach to treating assets in at each of the next revenue resets. For all first round revenue caps the code stipulated the ACCC adopt values consistent with jurisdictional valuations of TNSPs' asset base values. For the second and subsequent revenue resets the code provides for the ACCC to determine the method by which the asset base is to be valued. Nevertheless, the ACCC does not have unlimited discretion in determining an asset valuation methodology, as the code requires the ACCC to have regard to a number of principles and objectives.

In the DRP, the ACCC advocated a periodic revaluation of the RAB using the DORC methodology for second round revenue caps. As the ACCC is currently in the process of considering the treatment of the RAB as it begins reviewing the second round revenue caps for TNSP's the ACCC's preferred position is to move away from the revaluation approach towards the lock-in approach.

The lock-in approach enables the regulator to tailor incentives. In particular, the extent to which the lock-in is based on out-turn rather than forecast expenditure. This is quite distinct from the revaluation approach were the regulator has less control over tailoring

[2] 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 may commence the process to amend the *Information Requirements Guidelines* to incorporate the information specified in Appendix A.

the incentives. The revaluation is based on an 'engineering' measure and given the changes in replacement cost over time there could be a deviation between the forecast end of period asset base and the actual revalued asset base.

The lock-in approach provides the TNSP with more certainty than a revaluation approach as it:

- addresses the potential risk to investment of periodic revaluation
- avoids the risk of changes in replacement costs
- is consistent with the Gas code.

Summary

The ACCC's approach to asset valuation will be to lock-in the RAB, consistent with the reasoning outlined in this document. Noting that the code provides the discretion to revalue assets in service before (existing assets) and after (new assets) 1 July 1999, the ACCC considers that it would be highly desirable to amend the code to formalise the lock-in approach to asset valuation. This would provide greater certainty for investment and would be consistent with the asset valuation approach of the gas code.

Capital Expenditure

The current framework for the regulation of capex requires the ACCC to assess the efficiency of a TNSP's investment program after the investments have been made. The potential for ex post optimisation results in considerable uncertainty for the TNSP and users. This regime is also potentially intrusive, as it requires a project by project assessment of a TNSP's expenditure.

In its Supplementary Discussion Paper – Review of the Draft Statement of Principles for the Regulation of Transmission Revenues: Capital Expenditure Framework (Supplementary Discussion Paper), the ACCC explored a different approach to transmission investment in the NEM – one that relies more on assessing a firm ex ante cap on investment where this is appropriate. This approach, similar to the approach being adopted to the treatment of asset valuation and places strong emphasis on delivering certainty for TNSPs and transmission customers.

There are three separate elements to the proposed capex incentive outlined in the Draft SRP.

The first element is the firm investment cap which will be established by the ACCC at the start of each regulatory period. This would be 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. If the TNSP invests less than that provided for under the cap, it would retain any underspend during the period. However, its actual level of investment would be rolled in to the RAB. 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. It is expected that the majority of a TNSP's spending will be covered by the cap. Formulations of the

cap proposed by TNSPs 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.

The second element of the regulatory incentive is an allowance for significant, but uncertain investment, which is excluded from the ex ante cap. The core principle underlying the approach to the design of the capex incentive is that possible projects should generally only be excluded from the ex ante cap to the extent that not doing so could 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 cap will therefore improve the accuracy of the ex ante cap and hence ensure that the cap 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. The investment allowance for excluded projects will be considered during the regulatory period.

The combination of the ex ante cap and separate provision for large but uncertain projects is intended to provide incentives for efficient investment during the regulatory period, assuming no significant unforeseeable events during the period of the control. However, if it becomes necessary to invest in response to such events, an allowance would not be provided by either of these two incentive mechanisms. The third element of the capex regulatory framework, the "off-ramps" provision, is, therefore, designed to deal with the unexpected unforeseeable event. Typical "off-ramps" will include force majeure events. The range of "off-ramp" events will be defined in consultation with TNSPs at the time of their revenue reset decisions.

Summary

The ACCC proposes to adopt capex 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 three elements: An ex ante cap: this will cover most or all expected investments during the regulatory period and will establish a cap on the level of investment, during the regulatory period, to be included in the regulatory asset base at the end of that period
- A mechanism for separate, project- specific regulation for very large and uncertain investments
- An "off-ramps" mechanism if unexpected events cause capex blow-outs during the regulatory

Operational and Maintenance Expenditure

Firm Specific Costs vs. Exogenous Costs - in setting the TNSP's revenue requirement for its opex the ACCC intends to continue with its current approach of relying on firm specific costs. The ACCC currently receives a proposal from the service provider of its forecasted actual costs. The ACCC then uses a combination of performance indicators to assess the efficiency of the firm's costs such as historical performance and forward-looking assessment of cost drivers. The ACCC appoints a consultant who in turn assesses the TNSPs' proposal. The ACCC relies heavily on the consultant's findings when making its own assessment of the TNSP's costs.

Currently the ACCC conducts some benchmarking exercises but this is on the basis of a sanity check rather than the objective of achieving quantifiable efficiency measures. The ACCC considers that greater reliance on the use of benchmarking may result in the TNSP achieving the lowest sustainable cost as benchmarking breaks the nexus with the firm's actual costs and revenues. However, there are a number of implementation issues with benchmarking that need to be resolved before the ACCC could adopt such an approach. The ACCC will establish a working group by April 2005 to benchmark the performance of TNSPs and report by October 2006. A decision will than be made as to what extent these benchmarks can be taken into consideration in subsequent revenue cap decisions.

Efficiency Carry-Forward Mechanism - the ACCC intends adopting an efficiency carry-forward mechanism. This mechanism rewards the TNSP with higher profits when the firm manages to lower its controllable costs.

Asymmetric risk: Self-insurance and pass through - expenditure on insurance by TNSPs is a rational part of their risk management strategy. The ACCC considers 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, 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 defined events. The Draft Decision provides guidance for determining when the inclusion of self-insurance allowances and pass through mechanisms in a revenue cap will be appropriate.

Summary

Firm Specific Costs vs. Benchmarking

The ACCC will continue with its current approach of relying on firm specific costs. However, the ACCC will establish a working group by April 2005 to benchmark the performance of TNSPs and report by October 2006. A decision will then be made as to what extent these benchmarks can be taken into consideration in subsequent revenue cap decisions.

Efficiency Carry-Forward Mechanism

The Draft Decision sets out the ACCC's proposed efficiency carry-forward mechanism. The mechanism will reward TNSPs with higher profits when it lowers its controllable costs.

Asymmetric risk: Self-insurance and pass through

The Draft Decision provides guidance for determining when the inclusion of self-insurance allowances and pass through mechanisms in a revenue cap.

Weighted Average Cost of Capital

The TNSP's WACC is one of the inputs in to the ACCC's revenue cap determination. The WACC for a firm is the weighted average of the costs of its equity and debt financing sources. The code requires that in determining a TNSP's revenue cap, the ACCC must have regard to the service provider's fair and reasonable WACC.

The WACC chapter considers various parameters within the WACC and CAPM framework. Amongst the more contentious parameters is the equity beta.

The equity beta measures the systematic (non-diversifiable) risk of a particular stock relative to the market portfolio. To date the ACCC's method of determining the equity beta has been a benchmarking approach with limited reference to actual domestic market evidence.

The ACCC has historically computed an equity beta of one for TNSPs. An equity beta of one implies that the firm has the same level of systematic risk relative to the average portfolio (irrespective of gearing). However, there is emerging market evidence from comparable firms that the appropriate equity beta for these firms may be much lower than one, after adjusting for capital structure.

There are currently limitations with this emerging market evidence. The time period of the market data is insufficient, and current statistical methods tend to produce volatile confidence interval and sample average estimates. Accordingly, in the near term the ACCC proposes to continue to use an equity beta of one for TNSPs. However, the ACCC reserves the right to change the value of the WACC parameters with refinement in the methodology and data.

Summary

The ACCC will continue to apply an equity beta of one; however, it will reserve the right to change the value of the equity beta with refinement in the methodology and data.

Process for DRP Review

Parties are invited to make written submissions to the ACCC on the Draft Background Paper and the Draft SRP. The closing date for submissions is **Friday 22 October 2004**.

This review is taking place at the same time as arrangements for the Australian Energy Regulator (AER) are being implemented. The AER will assume responsibility for this area of regulation. Depending on the timing of its establishment, the Draft SRP and Draft Background Paper may be finalised by the AER. The ACCC expects it (or the AER) will release a final version of the Background Paper and SRP by early 2005.

Submissions can be sent electronically to: electricity.group@accc.gov.au

Alternatively, submissions can be sent to:

Mr Sebastian Roberts
General Manager
Regulatory Affairs – Electricity
Australian Competition and Consumer Commission
GPO Box 520J
Melbourne VIC 3001

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

- clearly identify the information that is the subject of the confidentiality claim; and
- where only part of the submission is confidential, provide a non-confidential version of the submission.

All non-confidential submissions will be placed on the ACCC's website http://www.accc.gov.au.

Any enquiries about the Draft SRP and/or Draft Background Paper, or about making submissions, should be directed to Sarah Clancy on (03) 9290 1982 or Renate Vogt on (03) 9290 1969.

1 Introduction

In 1990, as part of the Commonwealth Government's commitment to micro-economic reform, the Industry Commission (IC) was requested by that Government 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 their 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 Governments[3] (COAG) agreed to examine a national approach to competition policy. The first step in this process was the establishment in the following year, of the National Competition Policy Review 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 extensive negotiations on implementation of 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 1995* when coupled with three inter-governmental agreements (the Competition Principles Agreement, the Agreement to Implement the National Competition Policy and Related Reforms and the Competition Code Agreement), resulted in a number of wide ranging reforms that included the agreement that all State and Territory Governments and the Commonwealth would review and, where appropriate, reform legislative restrictions on competition.

The broader competition policy reforms embodied in the three inter-governmental 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 the supply and purchase of electricity and it commenced operation in December 1998 in southern and eastern Australia.

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

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[3] 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.

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

1.1 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 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 minus 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 control period (being a period of at least five years). 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.

1.2 Review of the 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 as to how the ACCC would perform its regulatory functions. Accordingly, in May 1999, the ACCC released its 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 process of reviewing the DRP has involved the following steps:

- In August 2003, the ACCC released its Discussion Paper. The Discussion Paper outlined the key issues for review in the DRP

- In March 2004, the ACCC released its Supplementary Discussion Paper.

Following a period of extensive consultation, the ACCC has now released for public comment this document, the Draft Background Paper. At the end of each chapter, the ACCC has set out a draft version of the revised regulatory principles. A consolidated version of these principles is set out in the Draft SRP. The final version of the Draft SRP will be titled the *Statement of Principles for the Regulation of Electricity Transmission Revenues* (SRP).

1.3 Application of Draft SRP and SRP

The Draft SRP and SRP are intended to set out the ACCC's general approach to setting revenue caps under clause 6.2.4 of the code. Like the DRP, neither the Draft SRP nor the SRP form part of the code or are instruments made pursuant to the code. Accordingly, the application of the Draft SRP and SRP to particular TNSPs will depend on the individual circumstances of the case. The ACCC will depart from the Draft SRP and 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 be evolve in response to factors such as code amendments, changes in the industry, and improvements in regulatory models and best practice worldwide.

1.4 Transition to Draft SRP and SRP

Although the ACCC is seeking submissions on the Draft SRP, the Draft SRP provides a better guide to the ACCC's current thinking than that set out in the DRP. TNSPs that submit a revenue cap application after the release of the Draft SRP should refer to the Draft SRP rather than the DRP.[4] However, where the relevant TNSP is subject to a revenue cap set prior to the release of the Draft SRP, the following transitional issues apply:

- the approach outlined in chapter 5 of this Draft Background 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 Draft Background Paper

- the approach outlined in chapter 6 of this Draft SRP 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.

[4] Certain chapters of the Draft SRP will also be relevant to the ACCC's consideration of revenue cap applications submitted prior to, but not yet finalised by, the release of the Draft SRP (being the revenue cap reset applications submitted by TransGrid and EnergyAustralia).

1.5 Scope of Review of Draft Regulatory Principles

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) and *Reporting Guidelines* (23 October 2002)
- *Service Standard Guidelines* (12 November 2003)
- *Guidelines for the Negotiation of Discounted Transmission Charges* (3 May 2002)
- *Regulatory Test for New Interconnectors and Augmentations* (15 December 1999)
- *Review of the Regulatory Test for Network Augmentations* (11 August 2004)]

The ACCC is not seeking comment, as part of the review of the DRP, on the above documents as these documents are subject to separate processes for review (including public consultation). The documents, which are summarised below, are at http://www.accc.gov.au.

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. Amongst other things, the information provided by TNSPs pursuant to the Guidelines 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.

As discussed in Chapter 3, 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* impose certain obligations on TNSPs including a requirement 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. On 5 June 2002, the ACCC released its *Information Requirements Guidelines* under clause 6.2.5. These Guidelines require the separation of information between the TNSP's regulated and unregulated activities.

In the *Transmission Ring-Fencing Guidelines*, the ACCC stated that it did not intend to impose financial reporting obligations in addition to those already imposed under the *Information Requirements Guidelines*. Accordingly, the (Draft) *Reporting Guidelines* issued by the ACCC under the *Transmission Ring-Fencing Guidelines* on 15 August 2002, proposed to align the obligations of TNSPs under the *Transmission Ring-Fencing Guidelines* with the obligations imposed by the *Information Requirements Guidelines*. The ACCC released its (Final) *Reporting Guidelines* on 23 October 2002.

Service Standard 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 is required to have regard to 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.

On 12 November 2003, the ACCC issued its *Service Standards Guidelines*. The 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 Guidelines use a TNSP's own historical performance to set a performance benchmark. During the regulatory control 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 that calendar year.

The measures of performance that the ACCC adopted in its Guidelines are:

- Circuit availability, which is a measure of the percentage availability for service of a given set of assets.
- Outage duration, which is the average time of outages over the year.
- Frequency of loss of supply events, which is the number of outages that occur over the year.
- Hours of inter-regional constraints, which is the total time of constraints that limit power flows between regions.
- Hours of intra-regional constraints, which is the total time of constraints that limit power flows within a region.

The ACCC recognised that the Guidelines did not deal with the market impact of transmission networks, in particular transmission constraints. As a result, the ACCC has convened an industry working group to assist its thinking on this issue.

On 20 July 2004 the ACCC released a draft decision about what information it intends to publish about market impacts and transmission constraints. This paper does not propose to set financial incentives on TNSPs at this stage. Rather it focuses on identifying the market impact of transmission networks and how to quantify that impact.

The ACCC has called for interested party submissions on its draft decision and aims to release a final decision in September 2004.

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 *Discount Recovery Guidelines* were published in May 2002.

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.

Since its promulgation, a number of concerns were raised by interested parties 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 NECA, to consider the framework for essential new investment.

The ACCC released an Issues Paper on 10 May 2002 which highlighted the concerns raised with the operation of the regulatory test (version 1). From submissions received, the ACCC released a Discussion Paper on 5 February 2003 which outlined three options for the development of the test. The three options outlined included:

- Option 1 – making minor modifications to the regulatory test (version 1) to ensure consistency between it and the code
- Option 2 – introducing a number of definitions to be used by TNSPs when applying the regulatory test to ensure its consistent application across the NEM
- Options 3 – considering ways of ensuring the regulatory test includes the benefits of increased competition between generators.

The ACCC released its Draft Decision on 10 March 2004 proposing changes largely in line with those proposed in its Discussion Paper.

During the review process, the ACCC engaged consultants to assist it in considering the complex issue of *competition benefits*. The ACCC held a forum to provide interested parties the opportunity to discuss issues surrounding the definition and calculation of *competition benefits*.

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

regulatory test (version 2) includes transitional provisions which enable TNSPs to continue to use the previous version (version 1) where it has commenced consultation on an augmentation.

1.6 Draft Decision

1.1 Purpose

This document, *Draft Statement of Principles for the Regulation of Electricity Transmission Revenues* (Draft SRP), sets out the Australian Competition and Consumer Commission's (ACCC's) general approach to setting revenue caps to apply to Transmission Network Owners and Transmission Network Service Providers (TNSPs) under clause 6.2.4 of the National Electricity Code (code).

1.2 Application

The Draft SRP and SRP are intended to set out the ACCC's general approach to setting revenue caps under clause 6.2.4 of the code. Like the DRP, neither the Draft SRP nor the SRP form part of the code or are instruments made pursuant to the code. Accordingly, the application of the Draft SRP and SRP to particular TNSPs will depend on the individual circumstances of the case. The ACCC will depart from the Draft SRP and 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.

1.3 Transition to Draft SRP

Although the ACCC is seeking submissions on the Draft SRP, TNSPs that submit a revenue cap application after the release of the Draft SRP should refer to the Draft SRP rather than the Draft Statement of Principles for the Regulation of Transmission Revenues issued by the ACCC on 27 May 1999 (DRP). However, where the relevant TNSP is subject to a revenue cap set prior to the release of the Draft SRP, the following transitional issues apply:

- the approach outlined in chapter 5 of this Draft SRP 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 of the Draft SRP

- the approach outlined in chapter 6 of this Draft SRP 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.

1.4 Structure of Draft SRP

The ACCC's general approach to setting revenue caps is further outlined 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 Weighted Average Cost of Capital

Chapter 8 Financial indicators

Appendix A Information Requirements

Appendix B Transitional Capital Expenditure Arrangements

2 Regulatory Framework

2.1 Introduction

This chapter seeks to explain the main objectives, features and incentive properties of the regulatory framework the ACCC is adopting for TNSPs in Australia's NEM.

The subsequent chapters of this Draft Background Paper deal with the individual components of the overall regulatory regime including the setting of the regulatory asset base, the incentive regime for capex, the incentive regime for opex and the treatment of WACC. But a regulatory regime is more than the sum of its parts. The different parts of a regulatory regime must work together to form a single, consistent, coherent pattern of incentives which collectively achieve the code objectives.

Accordingly, this chapter sets out the ACCC's overall framework for the regulation of TNSPs revenues. Setting out the framework helps to ensure that consistency and coherency will be maintained in the future, as elements of the regulatory regime are reconsidered over time. Setting out the framework also helps to clarify why the ACCC has chosen an approach which, although internally consistent, may differ from the approach used in the regulation of other areas, such as electricity distribution or gas transmission.

The structure of this chapter is as follows. The chapter 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 seeks to make use of incentives to pursue desirable outcomes where possible. The use of incentives introduces a number of issues which need to be addressed. These are set out in a number of subsequent sections and their implications for the design of an incentive regulation framework are explained. The chapter then goes on to explain how these issues guide the design of the incentive framework used by the ACCC in the regulation of the electricity transmission industry – in particular, the design of the incentives for the promotion of service quality and incentives for reducing capex and opex.

2.2 The Regulatory Framework

In the case of the regulation of TNSP's, 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 control period (which must be 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, amongst other things:

- expected demand growth
- service standards 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 on-going 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 under the ACCC's revenue cap, is translated into prices for individual transmission services. This part of the code makes use of engineering concepts and a fully-distributed cost accounting approach for allocating costs in order to determine a set of transmission prices consistent with recovery of the MAR.

This chapter focuses, in particular, 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 quality of service
- 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 An Overview of the Electricity Transmission Industry

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

The electricity transmission sector is one component of the electricity supply industry. That industry is conventionally divided into four sub-sectors – generation, transmission, distribution, and retailing. Transmission represents about 8-10 percent of the total end-user price for electricity. At present the transmission networks in the National Electricity Market are owned by seven separate companies – ElectraNet, SPI-PowerNet, TransGrid, Powerlink, Transend, TransEnergie and EnergyAustralia.

There are two primary reasons for the existence of a transmission network:

- First, it is often cheaper to transport energy in the form of electricity than in certain other forms. For example, it is usually cheaper to convert coal into electricity at the mine mouth and then to transport electricity to major load centres, rather than to transport coal to the load centres and then convert it into electricity. In other cases (such as wind, or hydro generation) it is simply impractical to transport the energy in any other form closer to load centres. In other words, the electricity transmission sector provides energy transportation services (in partial competition with other energy transportation services such as gas pipelines).

- Second – by connecting generators to each other transmission networks are able to diversify the risk of generation failures. Without a network, the provision of an acceptable level of supply reliability in each load centre would require sufficient spare generation capacity to allow for the possibility of the sudden loss of the largest generating unit. However, if the load centres are connected by a transmission network with sufficient capacity, that extra generation capacity need only be provided once on the system – a significant potential saving.

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 the various monitoring and signalling (telecommunications) equipment necessary to monitor the state of the network and to make changes in network configuration remotely.

Electricity can be transported over either alternating current (AC) or direct current (DC) networks. The vast majority of the Australian transmission network is AC.[5] 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 node and withdrawn at another flows over all the possible paths between the two nodes. 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 entirely different parts of the network.

The electricity industry is characterised by significant economies of scale and scope. Hirst and Kirby (2001) note that: "The cost of new lines, including the land and necessary substations, increases with increasing voltage. However, the cost per GW-mile of new capacity declines with increasing voltage, demonstrating substantial economies of scale. For example, it costs less than half as much per GW-mile to build a 500-kV line than it does to build a 230-kV line"[6]. In effect, the electricity transmission industry is largely a natural monopoly. Although certain large producers or consumers may, on occasions, find it privately profitable to duplicate (i.e., "bypass") parts of the network, in general duplication of the transmission network is neither profitable nor socially desirable.

Electricity transmission companies are subject to some competition at the margin, in the form of merchant transmission companies, the threat of bypass, or embedded generation (as discussed below). However, none of these possibilities currently offers a viable threat for the bulk of the services provided by electricity transmission companies. This is the primary reason why this industry is subject to price and service regulation in Australia and around the world.

Electricity transmission is a capital intensive business. Capital expenditure typically accounts for more than half and as much as two-thirds of the total expenditure. An on-

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5 Murraylink, Directlink and Basslink (when it is completed) are all DC links.

6 Eric Hirst and Brendan Kirby, "Transmission Planning for a Restructuring US Electricity Industry", prepared for the Edison Electric Institute, Washington DC, June 2001, page 8.

going programme of capital expenditure is necessary to (a) expand the network in response to changing 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 and so on), the cost of land (including easements), and the cost of transmission lines and cables themselves. Operating expenditure accounts for between one-quarter and one-third of total expenditure. The primary components of operating expenditure are the costs of monitoring and maintaining the network assets, and corporate overheads.

Electricity transmission is both complementary to and a substitute for generation. Transmission can enhance the value of generation assets by facilitating the transportation of the output of those assets to the market. On the other hand, new transmission can undermine the business case of generation located to the load centres. In other words, transmission is a substitute for generation located in electricity-importing regions and a complement to generation located in electricity-exporting regions.

As just noted, transmission can be said to be in competition with generating assets and demand-side management in electricity importing regions. But electricity transmission is primarily a regulated industry, while the generation sector is primarily unregulated – that is, subject to the normal forces of competition. In order to sustain on-going investment in electricity generation (especially in electricity importing regions) it is therefore critically important to ensure that electricity transmission investments are economically efficient. In the absence of controls on transmission investment, inefficient regulated investment in transmission network augmentation could crowd out efficient private investment in generation.

One of the fundamental principles of economic regulation is that the (marginal) price paid for a service should, as far as possible, be equal to the marginal cost of providing that service. Most of the time, most of the power flows on a transmission network are within the network's limit[7]. In this case, the marginal cost of transporting another unit of electricity is simply equal to the marginal loss across the network brought about by the increase in power flow. This amount is usually relatively small. At other times, however, the power flows in one or more parts of the network are up against the network limits. At these times, the marginal cost of transporting additional electricity over the transmission network can be very high indeed. As a consequence, the most efficient form of pricing (at the margin) of the electricity transmission network is a form of "peak-load" or "real time" pricing. Since the demand for transmission services depends critically on overall supply and demand conditions (such as the ambient temperature, whether a generator has failed, or whether there is an outage on a related transmission element), the price for transmission services can vary substantially from one five minute interval to another.

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[7] The limitations on power flows on a transmission network are often divided into two categories: (a) Thermal limits – which arise from the need to ensure that particular network elements do not overheat either under the current network configuration or the network configuration that would arise if some other network element failed and the system operator could not take an action swiftly enough to prevent the overheating. (b) Stability limits – which arise from the need to ensure that the power flows on the network remain stable in response to network disturbances.

In the case of the NEM, electricity prices are set at five different nodes in each five-minute period of the day. These locational prices provide signals to generation as to where to invest, and to consumers, as to where to locate their loads. These prices also provide a partial signal of the cost of physical constraints on the transmission network. Consideration has been given to increasing the number of nodal prices that are set in the NEM, or changing the boundaries between regions. Some commentators have argued that given the value in the signal provided by real-time prices, there is a need for a move to a much larger number of nodes.[8]

Due to the presence of economies of scale these "marginal" prices reflecting congestion on the transmission network are not, in practice, large enough to cover the total revenue requirements of TNSPs. TNSPs also raise revenue through (primarily fixed) charges on generators and distribution companies. The sum total of this revenue is fixed by the ACCC for each five-year period in advance.

The physical characteristics and limits on the transmission network are represented to NEMMCO's central computer (known as the "dispatch engine") in the form of a series of equations known as constraint equations. These constraint equations are the link between the physical assets owned by TNSPs and the operating decisions of TNSPs and the effects on electricity dispatch and prices. In general, a relaxation of a constraint equation which binds (or which may bind with some probability) will have the effect of enhancing overall welfare. The extent to which these constraint equations bind, therefore, can be used as a measure of the service quality of the transmission network. A transmission network with limited capacity or reliability will restrict the dispatch engine to lower levels of overall welfare, than a transmission network with higher capacity or reliability.

An action by a TNSP which reduces the frequency with which a constraint equation binds or the severity of the constraint when it does bind – either due to an enhancement of the capacity of a network element or due to an enhancement in the reliability of a network element – improves overall economic welfare of the electricity industry and its customers and therefore the overall service quality. TNSPs can affect the constraint equations (and therefore service quality) in many different ways such as through the 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 An Introduction to Price Regulation

When it comes to designing economic policy, policymakers commonly pursue three objectives. Policymakers seek to ensure that: (a) the mix of goods and services available in the economy (and the quality of those goods and services) best matches consumers preferences and tastes and that those goods and services are priced in a manner which allocates them amongst consumers as efficiently as possible; (b) the mix

[8] See, for example, the deliberations of the Ministerial Council on Energy on regional boundaries.

of goods and services is produced as efficiently as possible; and (c) producers innovate in developing new goods and service, and new methods of pricing, production, distribution or marketing to ensure that (a) and (b) are, as far as possible, achieved over time.[9]

For the vast majority of goods and services produced in a market economy, policymakers rely primarily on competitive market forces to ensure that these three objectives are achieved. These competitive market forces operate within a set of economic laws[10] which provide the background or framework for a market economy.

However, it is well-known that in the case of certain goods and services, it is not possible to rely primarily on traditional competition in-the-market to deliver the objectives set out above. In particular, in some sectors, 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. The "natural" state of such industries is for all those goods or services to be provided by a single firm. These sectors are therefore known as "natural monopolies".[11]

As noted earlier, electricity transmission companies are subject to some competition at the margin, in the form of merchant transmission companies, the threat of bypass, or embedded generation. However, none of these possibilities currently offers a viable threat for the bulk of the services provided by electricity transmission companies – that is, electricity transmission companies are largely a natural monopoly.

In the absence of the normal competitive forces, a monopoly firm is able to increase the price above the competitive level. This leads to potentially substantial "monopoly profits" or "monopoly rents" passing to the firm from consumers, inducing an overall drop in economic welfare[12]. 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

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9 These objectives are commonly known as the objective of allocative efficiency, productive efficiency and dynamic efficiency.

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

11 It is worth emphasising at this point that 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.

12 The higher prices charged by the monopolist inefficiently induces some consumers who value the monopoly good at more than its marginal cost to inefficiently switch to other goods.

this form of intervention which applies to TNSP's (and most other infrastructure utilities) in Australia.

The objectives of such price and service regulation are directly derived from the broad objectives set out above. These objectives can be specified in different ways. One way to summarise the key objectives of price and service regulation is as follows:

- 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;[13]
- to ensure that the regulated firm produces the desired services at least cost (in net present value terms) and continually explores new ways of reducing expenditure;
- to ensure that services are priced so that they are used efficiently[14]

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

2.4.1 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, for example, specify the make and model of the transformers that must be used by the TNSP, the details of the firm's maintenance policies, the size and location of the firm's head office and so on.

In practice, however, the regulator is unlikely to be able to run the business of the regulated firm better than the firm itself – the regulated firm will almost always have access to information (e.g., about the price and quality of inputs, the level or forecast level of demand, and so on) that is not available to the regulator.[15]

In the presence of this "information asymmetry", it will often be preferable for the regulator to not seek to directly control key business decisions of the regulated firm, but to leave a substantial amount of discretion to the firm, while at the same time,

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13 This could imply that service standards are increasing over time, if consumer demand for quality is increasing. It could also imply providing different levels of service to different consumers where that is feasible.

14 This includes inducing efficient location decisions for generators and consumers.

15 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, page 14.

subjecting the firm to a system of broad financial incentives which induce the regulated firm to use that discretion to pursue desirable outcomes.

The term "incentive regulation" refers to primary reliance on the latter approach – that is, "incentive regulation" refers to a regulatory regime in which the regulated firm is allowed substantial discretion to make its own decisions subject to a set of broad financial incentives devised by the regulator.

The code requires the ACCC to adopt an incentive-based regulatory regime– that is, to make use of the principles of incentive regulation. 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 as to where to grant discretion and where to limit discretion is a key element of the design of a revenue cap.

The outcomes achieved under a regime of incentive regulation depend (of course) on the nature of the financial incentives established by the regulator. Depending on the nature of the financial incentives, the firm might have a very strong incentives to cut its costs or strong incentive to increase its costs. Alternatively, the firm could have a very strong incentive to enhance reliability or a strong incentive to reduce reliability. Subsequent sections therefore describe the key fundamental principles which should be taken into account when designing the incentives at the heart of the regulatory regime. First, however, this section discusses how financial incentives can be created within the context of the building block model.

2.4.2 The role of the "building block model"

The ACCC, like most other regulators in Australia, makes use of the building block model. This section draws the link between the building block model and the systems of financial incentives which will follow.

The building block model is primarily a tool to ensure that the regulated firm is adequately compensated in the long-run. Put another way, the building block model is a tool for amortising large expenditures over time. It is a feature of the building block model that, putting aside any rewards or penalties associated with financial incentives, provided the model is consistently applied in the long-term, and provided the regulator correctly estimates the firm's true cost of capital, the regulated firm will always receive a stream of revenues which is equal, in present value, to the present value of the stream of its expenditures. This result holds true no matter what methodology for depreciation (or path of the regulatory asset base) is chosen.

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, used together, 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 = return on capital + return of capital + opex + tax

*= (WACC * RAB) + D + opex + tax*

and

New RAB = previous RAB - depreciation + capex

Where:

MAR = maximum allowed revenue

WACC= weighted average cost of capital

RAB = regulatory asset base

D = depreciation

opex = operating and maintenance expenditure

tax = expected business income tax payable

A description of each of these cost components the 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 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	The expenditures of the TNSP which are amortised over time – i.e., which are added to the regulatory asset base, earn a return on capital as long as they are in the regulatory asset base 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.

Note that a "revaluation" of the RAB which is not anticipated in the depreciation schedule is almost always a break with the building block model equations – in other words, such a revaluation could lead to systematic over-compensation or under-compensation of the regulated firm. The ACCC has expressed its preference for not revaluing the RAB in this way. Rather the ACCC has expressed its preference for "rolling forward" the RAB using the equations set out below.[16]

As discussed above, 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. Efficiency incentives are incorporated in the building block model through service standards, opex and capex incentive schemes.

[16] See Chapter 3 below.

The equations below show how these incentive schemes could be included within the building block model:

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

$$\textit{Closing RAB}_{t-1} = \textit{Opening RAB}_{t-1} + \textit{Actual Capex}_{t-1} - \textit{Depreciation Allowance}_{t-1} + \textit{capex incentive scheme}$$

The design of the various incentive schemes in the equations above (i.e., the terms labelled "service standards incentive scheme", "opex incentive scheme" and "capex incentive scheme") are the focus of the chapters which follow. For now, it can be noted that the various incentive schemes are ignored, these equations ensure that the regulated firm receives precisely one dollar in revenue for every dollar in out-turn capital expenditure. This situation might be called "strict financial capital maintenance". The various incentive schemes could lead to a level of revenue which is higher or lower than this level, in order to induce the regulated firm to pursue desirable outcomes.

The equations above are expressed in a way which assumes they are applied every year. It is relatively straightforward to derive the building block model equations for a five-year regulatory period from the equations above.

Note that there is nothing implicit in the building block model which implies any one particular set of incentives over another. In particular it cannot be said that the building block approach inherently relies on firm-specific costs rather than industry-wide averages – the revenue stream of a firm regulated under the building block approach could depend exclusively on an industry-wide average – but in this case, the difference between the firm-specific cost out-turn and the industry-wide average is made up by the particular choice of incentive scheme. Neither can it be asserted that the building block model is inherently prone to "gaming". The incentives for gaming depend, as can be seen below, on the choice of incentive scheme.

The design of an incentive-regulation framework essentially involves the design of the various incentive schemes mentioned above. This is the focus of the rest of this chapter.

2.5 Factors to be taken into account in the Design of an Incentive Regime

There are a number of key issues and principles which should be taken into account when designing a coherent and effective system of incentives. These issues include the factors which affect the power of the incentive to pursue achieve a particular objective, the need for balance between the power of the incentive to pursue achieve different objectives and the effect of using past performance out-turns when setting future performance targets. These issues are discussed in the sections which follow.

2.5.1 Factors which influence the power of the incentive

The power of the incentive to enhance, say, service quality 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 reduce expenditure depends on the sensitivity of the profit stream to a change in effort to reduce the expenditure.[17]

The power of the incentive to pursue a particular objective need not be constant for different 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 symmetrically 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.[18]

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 cost out-turn. The ACCC in its regulation of TNSP's, uses a regulatory period of five or more years – that is, in general, regulated revenue is fixed 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.

A regulated firm may be able to influence the regulator to set a high expenditure target by, for example, arguing that the firm's situation will change in the future – that it will need to incur higher costs to meet an increase in demand, or to meet an increase in the quantity or quality of services.

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[17] 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*, page 39.

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

2.5.2 The need for balance between incentives to pursue achieve different objectives

Where (as is usually the case) there are multiple objectives the regulator would like the 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 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 can have a fundamental impact on the design of a regulatory regime. For example, if the incentives to enhance service quality are weak, the incentives to reduce opex and capex must also be weak. Otherwise, the firm will reduce expenditure to the point where service quality is threatened.[19]

Similarly, if the firm can easily substitute between capex and opex, the regulator must ensure that the incentives to reduce capex and opex are balanced – otherwise the firm will merely substitute from one to the other with no overall gain (and possibly a drop) in efficiency.[20]

In fact, if it is not at all possible to prevent a regulated firm substituting costs between two or more activities (such as opex and capex) the regulator has no alternative but to

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[19] This point is emphasised by Laffont and Tirole (2000): "A well-known drawback of high-powered schemes [to reduce expenditure] is that they make it very costly for firms to supply quality. … The firm may, therefore, decide to skimp on quality if quality is not minutely specified in the regulatory contract.[19] In contrast, low-powered schemes, by failing to make the firm accountable for its cost performance, make it very cheap to supply quality. This point is well known. Indeed, the U.S. Department of Defence has often invoked it to motivate the use of cost-plus contracts in contexts in which quality is a sensitive issue and its specifications are hard to pin down exactly … Similarly, the argument has been made several times that the introduction of incentive regulation for power companies conflicts with the safe operation of nuclear power plants. As a last illustration, quality started deteriorating shortly after British Telecom's 1984 privatisation and design of more powerful incentives in the form of a price cap, and quality standards and verification mechanisms had to be set up as a consequence". Laffont and Tirole (2000), page 54.

[20] Laffont and Tirole (2000) explain this problem as follows: "Suppose that a firm keeps 75 cents per dollar of cost reduction on activity 1 [opex, say] and only 25 cents per dollar of cost reduction on activity 2 [capex, say]. Then saving $1 on activity 1 and increasing the cost of activity 2 by $1 yields a net benefit of 50 cents for the firm. This cost transfer may occur in two ways. The first … involves *accounting cross-subsidies*. The firm benefits from allocating costs that are incurred in the provision of activity 1 to activity 2. This may involve reporting that personnel or other variable inputs that were used in activity 1 were dedicated to activity 2 or (and harder to detect) the firm may allocate a large share of jointly incurred costs to activity 2. In an attempt to prevent accounting cross-subsidies, regulators routinely impose "accounting separation" between activities, together with rigid (and arbitrary) rules for allocating the joint costs that are incurred in the simultaneous provision of these activities. Careful accounting procedures, however, cannot prevent… transfers associated with managerial decisions. … For example, the firm may allocate its inexperienced or underperforming personnel to the activity with the lower-powered incentive (activity 2) and the trained and best-performing employees to activity 1." Laffont and Tirole (2000), page 53.

regulate the firm in such a way that all the activities are subject to the same, uniform power.[21]

2.5.3 Repeating incentive schemes - the "Ratchet Effect"

It will almost always be the case that the regulator will take into account past performance out-turns 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).[22]

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. Later in this chapter an example is provided 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 out-perform today.

2.5.5 Higher-power is not always better

One immediate implication of these principles is that higher-powered incentives are not always better. Consider, for example, the incentive to reduce expenditure. 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 regulator may have to leave to the regulated firm. 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,

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21 Laffont and Tirole (2000) again: "Consider a high-powered incentive [to reduce costs] … It is clear that even though the firm is formally a residual claimant for its cost savings, an effort to reduce cost by $1 is not rewarded by $1 [increase in profit] overall. A lower cost will convince the regulatory authority of a higher efficiency and will make it more demanding … for the firm at the next regulatory review. So while a $1 cost reduction yields $1 to the firm in the short-run, it also entails a long-term penalty in the firm of higher performance requirements at the next review. This is the well-known ratchet effect. The ratchet effect imposes a bound on the incentives that can be provided even by formally high-powered incentives". Laffont and Tirole (2000), page 54.

22 Laffont and Tirole (2000), page 55.

which may not be desirable. For all these reasons, it may not always be desirable to choose high-powered incentives.[23]

2.5.6 The use of benchmarking to increase the power of the incentive to reduce expenditure

We saw earlier that the power of the incentive to reduce expenditure could be increased by fixing the regulated prices for a period of time (to defer the time at which a change in expenditure could be reflected in a change in prices). The power of the incentive to reduce expenditure can also be enhanced by basing the regulated prices on measures which are independent of the actions of the regulated firm (i.e., "exogenous" measures) rather than measures which depend on the action of the regulated firm (i.e., "endogenous" measures). The greater the dependence of the regulated revenue stream on the exogenous measures, the less sensitive the revenue stream is to the endogenous measures of cost, the greater the sensitivity of the profit stream to the firm's cost reducing effort and therefore the greater the power of the incentive to reduce expenditure.

The scope for basing the regulated revenue on exogenous measures depends on the information available to the regulator. In principle if the regulator had enough information it might be feasible to set the path of the allowed revenue for a TNSP for a reasonably long period of time (say 10-20 years) largely on the basis of exogenous factors, with little if any adjustment in the light of the firm's actual (endogenous) expenditure out-turns. For example, if (as is clearly not the case for transmission regulation) there were a number of virtually identical firms, the allowed revenue for any one firm might be set on the basis of the average of the expenditure out-turns of the other firms (perhaps after adjusting for certain firm-specific cost differences such as differences in the quantity or quality of output). Alternatively, the path of future revenue could be set on the basis of some initial level (perhaps based on a long-run historic average or trend) and then rolled forward each year according to some mechanistic formula which might include, for example, an allowance for demand

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[23] This is noted by Laffont and Tirole (2000): "High-powered incentives [to reduce expenditure] (price caps in a regulatory contract) have repeatedly been hailed as a breakthrough in the economics of regulation. While they indeed deliver a good cost performance, they are also likely to leave substantial profits to the firms' [firm's?] owners. There is no magic cure. Those who support or just accept the use of high-powered incentive schemes should be ready to refrain from forcing contract renegotiation when they observe large profits. Experience (the 1995 early review of the U.K. regional electricity companies is a case in point) shows that this point is not always understood." Laffont and Tirole (2000), page 41. They also point out that lower-powered incentives may be less susceptible to "regulatory capture" problems: "The delegated-monitoring view of regulatory agencies, therefore, leads to the following implication for incentive regulation: low-powered incentive schemes, because they are less discretionary (make less use of the regulator's private information) are more robust to regulatory capture; it is therefore advisable to lower the power of incentive schemes when the threat of capture by the regulated firm is serious. Or, put differently, the adoption of high-powered schemes must go hand-in-hand with the existence of political and bureaucratic institutions that alleviate the capture problem". Page 58.

growth less an average industry-wide forecast productivity enhancement. These approaches are often referred to as "benchmarking".[24]

In practice, the need to account for inter-firm differences makes benchmarking difficult. Regulatory regimes which base the allowed revenue entirely (or almost entirely) on exogenous factors are rare.[25] In practice, almost all regulatory regimes allow a periodic adjustment to the parameters of the regulatory regime in order to bring the revenue stream back into line with the firm's observed expenditure. This has the effect of reducing the power of the incentive overall.

At this stage it does not appear to be appropriate to rely primarily on exogenous benchmarks in setting the allowed revenue of transmission companies in the NEM. Such an approach would place great pressure on TNSPs to reduce total expenditure. This may place TNSPs under pressure to cut service quality. In addition, the ACCC has concerns that TNSPs in Australia may not be comparable because of their different scope and scale of activities. Considerable work would need to be done before a balanced comparison could be made and used as the basis of an incentive.

In the short term the ACCC will continue with its current approach of relying on firm specific (endogenous) costs. However the ACCC will establish a working group in the first part of 2005 which will, within 18 months, establish new benchmark measures of TNSP performance to allow more meaningful comparison of performance. The ACCC's intention in relation to benchmarks is discussed further in Chapter 6.

2.5.7 Some key inter-relationships between incentive schemes

It is possible to summarise some of the key elements of the framework set out above in figure 2.1. The building block model equations lie at the heart of the regulatory regime. The regulator chooses how it will vary these equations in such a way as to achieve the desired incentives. As set out earlier, there are two key objectives that the Code seeks to achieve – the promotion of service quality and the reduction of expenditure. As set out later in this chapter, it makes sense to distinguish two types of expenditure: recurrent expenditure and non-recurrent expenditure. These two categories relate to, but are not the same as, the traditional distinction between opex and capex.

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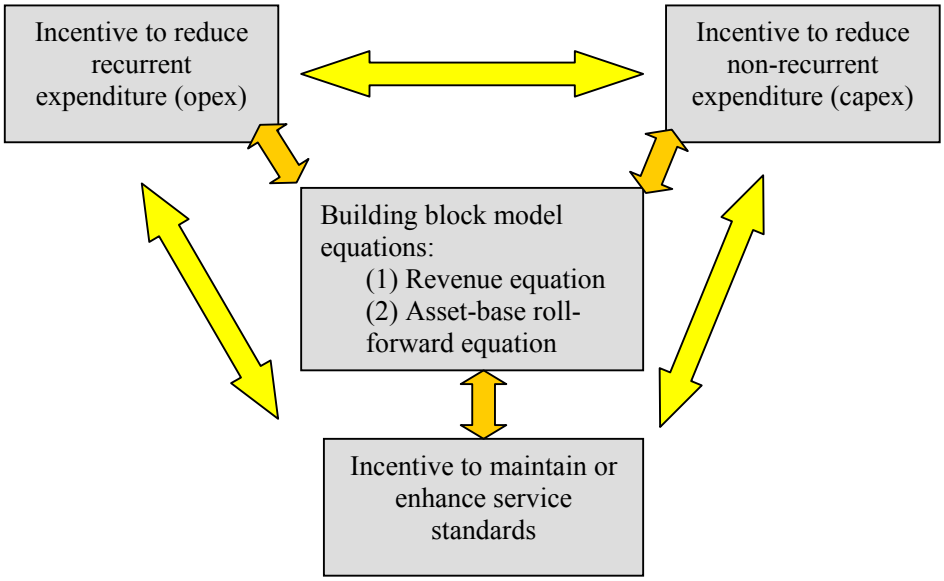
[24] Laffont and Tirole (2000) comment: "Benchmarking (or 'yardstick regulation' or 'relative performance evaluation') consists in comparing the performance of the firm with that of other firms facing a related (technically: correlated) situation. For example, other firms might produce the same public good in different geographic areas. To the extent that the technologies used to produce in different areas are similar, one can compare the performances of these firms to gather relevant information about the firm one is regulating. In particular, the government becomes suspicious if its contractor announces and produces at a very high cost while the supplier in a neighbouring area produces at a low costs. This comparison of performances of producers facing similar technological conditions thus reduces the asymmetry of information and enables the use of higher-powered incentive schemes". Laffont and Tirole (2000), page 52.

[25] "Despite high hopes, explicit contractual benchmarking is rare in regulation because of alleged heterogeneities. In the electricity sector, it underlies the 'Marco Estable' regulating the power companies in Spain; but the need for adjusting costs to each firm's specificities weakened the mechanism. It is used within Electricité de France, which has numerous identical nuclear power plants". Laffont and Tirole (2000), page 52.

The need for balance between these different incentives means that all of these elements of the regulatory framework are inter-related: the incentive to reduce opex must be balanced with the incentive to reduce capex; and the incentive to promote service standards must be balanced with the incentive to reduce both types of expenditure. This is illustrated in figure 2.1.

Figure 2.1: Key linkages between different elements of the regulatory framework



Having set out some broad principles governing the design of a regulatory regime, the following section looks at how these principles might be applied in the specific context of the regulation of TNSP's.

2.6 Incentives on TNSPs to Promote Service Quality

As just noted, in the context of transmission network services, service quality relates primarily to the frequency and severity of the constraints imposed by the constraint equations on the output of the NEMMCO "dispatch engine".[26] The frequency and severity of these constraints depends on the configuration, capacity and reliability of the existing network, how the TNSP carries out its maintenance practices and on how the constraint equations themselves are formulated.

[26] In addition, there may be another dimension of service quality which is not measured in the impact of the constraint equations – this dimension relates to how well the TNSP interacts with interested parties (such as response times for new connection requests, co-operativeness with distribution businesses and other TNSPs, responsiveness to health and safety concerns, etc.)

In the short-run service quality depends primarily on the operating and maintenance practices of TNSPs. In the longer-run service quality depends primarily on the capital expenditure programme – and whether or not new facilities are created in a timely manner to meet on-going growth in demand for transmission services.

There are many different sets of incentives operating on TNSPs to ensure that they meet these service standards. These incentives derive from:

- Statutory obligations which specify certain minimum standards of reliability to which the network must be constructed. These statutory obligations are specified in state legislation and vary from state to state
- Financial incentives created in the regulatory regime itself, such as the service standard regime which has been built into the revenue cap decisions for a number of TNSPs[27]
- Contractual obligations voluntarily entered into by the TNSP with end-users (such as generators or distribution businesses) which guarantee a certain level of service quality
- An implicit threat that the regulatory regime could change in an undesirable way if minimum standards are systematically unmet

The outcomes under any given regulatory regime will depend on the power of these incentives to deliver service quality in the short-run and capex necessary to maintain service quality in the long run, as discussed above.

Accurate assessment of the power of these different incentives is very difficult. The incentives are likely to vary from state to state. They are also likely to vary with the timeframe under consideration. For example, the incentives to pursue short-term service quality enhancements (perhaps by adjusting maintenance schedules) may be stronger or weaker than the incentive to improve service quality by making substantial new investments to expand the network in the face of growing demand.

However, the ACCC is increasingly placing emphasis on explicit service standard incentives. These explicit service standard incentives will complement state based planning standards as well as the ACCC's existing Service Standards Guidelines[28]. The Guidelines provide an economic incentive of plus or minus one percent of revenue, which is based on outages, circuit availability and constraints. The current regime does not account for the market impact of TNSP performance.

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[27] These service standards are based around measurements of five performance dimensions: transmission circuit availability, average outage duration, frequency of 'off-supply' events, inter-regional constraints, and intra-regional constraints. See ACCC, *Statement of Principles for the Regulation of Transmission Revenues: Service Standards Guidelines*, 12 November 2003

[28] ACCC, *Statement of Principles for the Regulation of Transmission Revenue: Service Standards Guidelines*, 12 November 2003.

A new proposed element of service standards is a measure based on the market impact of transmission outages and constraints. The first step in this direction is the publication of transparency measures. The second step will, if feasible, be the development of a market-based economic incentive, which is intended to build on the availability and other incentives already in place.

The ACCC intends to closely monitor both expenditure and service standard outcomes and will revise the regulatory design if it becomes clear that incentives are failing to encourage efficient investment and operation, or are delivering cost reductions at the expense of inefficient deteriorating service quality.

2.7 Incentives on TNSPs to Reduce Operating and Capital Expenditure

The above discussion noted that when current expenditure out-turns are taken into account when setting future expenditure targets, the regulated firm is likely to take this into account when making its decision as to how much effort to exert towards reducing expenditure. This can reduce the overall power of the incentive on the firm to reduce expenditure in the first place.

But not all expenditure decisions by the regulated firm are likely to have the same effect on future expenditure targets. For example, a rationalisation of the firm's labour force, leading to an expected on-going cost saving of $10 million, is much more likely to be taken into account by the regulator when setting future expected revenue than a $10 million cost saving in a one-off capital project which will not be repeated again in the foreseeable future.

It therefore makes sense to distinguish different types of expenditure according to whether or not the expenditure out-turn today will affect the expenditure target in the future. In particular, it makes sense to divide the expenditure of a regulated firm into two classes: "recurrent" expenditure, which is on-going and repetitive, and "non-recurrent" expenditure, which is one-off and unique.[29]

Since non-recurrent expenditure is, by definition, not likely to occur again, information about past expenditure out-turns provides little or no information about future expenditure targets. Therefore, the manner in which non-recurrent expenditure targets are set has little impact on the incentives for reducing this class of expenditure.

On the other hand, in the case of recurrent expenditure, past expenditure out-turns provides key information about likely future out-turns. An observed reduction in recurrent expenditure in the past (assuming a constant level of service quality) is therefore likely to signal a reduced need for recurrent expenditure in the future. Any efficiency saving in recurrent expenditure incurred by the regulated firm will therefore likely be reflected in future expenditure targets.

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[29] As discussed later in this chapter, it may also make sense to distinguish between expenditure which can be easily deferred and expenditure which cannot be easily deferred.

There is clearly some overlap between the concept of "recurrent" and "non-recurrent" expenditure and the traditional distinction between "operating expenditure" and "capital expenditure". Most operating expenditure is of an on-going and repetitive nature. Therefore, past opex out-turns provide useful information about likely expenditure out-turns in the future.

At the same time there are clearly some differences in these two approaches. Opex may include one-off components (such as the cost of entering the NEM for the Tasmanian TNSP). At the same time, capex may include elements which are highly repetitive and on-going (such as the "refurbishment expenditure" or the cost of replacing individual poles or transformers).

As already noted, if the regulator cannot easily prevent substitution between recurrent and non-recurrent expenditure, the balance principle suggests that the power of the incentives for reducing these two classes of expenditure should be balanced. For example, if a firm faces high-powered incentives to reduce its recurrent expenditure and low-powered incentives to reduce its non-recurrent expenditure, the firm is likely to seek to substitute between these two classes – for example, by introducing electronic monitoring and automation processes that reduce staffing levels. Such substitution may increase, rather than reduce total expenditure.

2.7.1 Incentives for efficiency: opex

Consistent with the code provisions concerning efficiency incentives, the ACCC's general approach is not to "claw back" any opex over-spend or under-spend that occurs during the regulatory period – the regulated firm is able to keep the full benefit of any cost-saving that occurs during the regulatory period until at least the end of the regulatory period. As a result, the incentive to reduce recurrent expenditure depends entirely on how the recurrent expenditure out-turns in the current regulatory period are taken into account when setting the recurrent expenditure targets in future periods.

For example, if a dollar reduction in expenditure leads to a dollar reduction in revenue in the next regulatory period, the firm will have less incentive to reduce expenditure than if a dollar reduction in expenditure was only partially taken into account by the regulator, leading to, perhaps only a 25 cent reduction in revenue.

There are a myriad of ways in which information on past recurrent expenditure out-turns could be taken into account in setting future targets. For example, past trends in recurrent expenditure could be extrapolated into the future. Alternatively, future targets could be set on the basis of some form of average of recurrent expenditure out-turns in the past (perhaps adjusted to reflect differences in forecast load conditions). Alternatively, greater weight could be given to expenditure out-turns earlier in the regulatory period or later in the regulatory period.

In any case, the incentive to reduce recurrent expenditure depends on the future behaviour of the regulator. Therefore, if the regulatory regime is to have incentive properties which are predictable the regulator should commit in advance to a particular approach to taking into account past expenditure information when setting future targets for recurrent expenditure.

Depending on the way that future expenditure targets are set on the basis of past expenditure out-turns, the power of the incentive to reduce recurrent expenditure could vary from year to year in the regulatory period. In some years the regulated firm may face an incentive to *increase* its recurrent expenditure. For example, suppose the regulator sets the target recurrent expenditure figures on the basis of the recurrent expenditure out-turn in a single year in the previous regulatory period, known as the "test year". Usually this is the last year for which audited expenditure figures are available (usually the second-to-last year of the previous regulatory period). If the regulator sets the recurrent expenditure targets in this way, the regulated firm has a strong incentive to reduce expenditure in each year of the regulatory period other than the test year and a strong incentive to *increase* the recurrent expenditure in the test year.

Such fluctuation in the power of the incentives to reduce expenditure is artificial and distortionary.

It is possible to set the expenditure targets in such a way that the regulated firm has constant incentives for reducing recurrent expenditure over time. Any mechanism which achieves this outcome has the property that the present value of the recurrent expenditure targets in the next regulatory period is equal to the present value of the recurrent expenditure out-turn in the previous regulatory period, plus or minus an amount which is independent of the cost out-turns of the regulated firm.[30]

For example, one way to ensure that the regulated firm has constant incentives for reducing recurrent expenditure over time is simply to set the expenditure targets (and therefore the allowed revenue) in the next regulatory period equal to a "weighted average" of the expenditure out-turns in the previous regulatory period. It is easy to verify that this yields constant incentives for reducing expenditure over time. In this case there is clearly no need for any form of "carry-forward" mechanism.

A number of regulatory authorities in Australia and increasingly overseas[31] have chosen to make use of a "carry-forward mechanism" which adjusts the recurrent expenditure targets for the next regulatory period by an amount which depends on the difference between target and actual expenditure out-turns from the previous regulatory period. An "efficiency carry-forward mechanism" is one form of carry-forward mechanism in which the regulated firm is able to keep the full amount of a reduction in expenditure in a given year for a fixed number of years. This is achieved by adjusting the recurrent expenditure targets upwards for the required number of years in the next regulatory period (the firm is already able to keep the benefits of any reduction in expenditure until the end of the regulatory period).

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[30] This result is discussed in the ACCC's Discussion Paper and is formally derived in Biggar, Darryl, "Incentive Regulation and the Building Block Model", May 2004.

[31] See ESC (2000b), page 19, ESC (2000a), section 6, and ESC (2004), section 4.2. The efficiency carry-forward mechanism has also been implemented by the ACCC (2002), section 10.1.5, ESCOSA (2002), OTTER (2003), section 3.10 and most recently by Ofgem in the UK, Ofgem (2004), page 21. The efficiency carry-forward mechanism has also been considered by IPART (2002), page 38 and is being considered by the QCA (2003), section 6.1.

The effect of the "efficiency carry-forward mechanism" is to reduce the incentive to reduce expenditure in the first four years of the regulatory period and to significantly increase the incentive to reduce expenditure in the last year of the regulatory period.

These carry-forward mechanisms can be viewed an adjustment to the recurrent expenditure targets for the next regulatory period. The "total" recurrent expenditure target therefore depends on both the "underlying" target and the adjustment brought about by the carry-forward.

The overall or total incentive to reduce recurrent expenditure obviously depends on both the "underlying" target and the efficiency carry-forward mechanism. If the regulator sets the target equal to the out-turn in the last year of the previous regulatory period the effect of the efficiency carry-forward mechanism is to precisely balance out the incentives mentioned above. In this case – and only in this case – the regulated firm has constant incentives for efficiency over time. In this case it is easy to check that the effect of the efficiency carry-forward mechanism is to make sure that the future targets are set equal to the present value of the expenditure out-turns in the past.

If, however, the regulator sets the underlying targets in some other way – such as the average of the out-turns in the past, or the out-turn in middle year of the previous regulatory period, the efficiency carry-forward mechanism will not lead to constant incentives for efficiency over time.

As already emphasised, the incentive properties of any regulatory regime depend on the future behaviour of the regulator. Therefore if the regulatory regime is to have incentive properties which are fully predictable the regulator should commit in advance to a particular approach to both the carry-forward mechanism and to setting the underlying targets for recurrent expenditure. For example, the regulator might, in principle commit to setting the underlying target for the subsequent regulatory period equal to the observed expenditure out-turn in the last year of the last regulatory period.

At this stage the ACCC considers that it is undesirable to set future expenditure targets in a mechanistic or formulaic manner. Although there are attractions to a mechanistic approach (it simplifies the task of the regulator) there may be a number of reasons why the past levels of expenditure may not be a very accurate indicator of future expenditure. For example:

- there is currently a very significant level of investment in networks particularly in Queensland and New South Wales. Higher levels of investment lead to higher asset accumulation which in turn leads to higher costs and higher opex
- there are changes in the available technologies. For example, greater use of automation and remote asset monitoring can change the opex requirements
- as the age profile of a TNSP's network assets change this will change opex requirements
- further, incentive regulation is still a recent phenomenon in the regulation of transmission in the NEM. TransGrid and EnergyAustralia – the transmission service providers in the NEM that have been regulated for the longest period – have only recently begun their second revenue controls.

For these reasons, at this point in the regulation of transmission network service providers, the ACCC considers that it would be inappropriate to rely only on historical information in setting future expenditure targets. Rather, the ACCC proposes in general to use a combination of historical information and firm-specific engineering-economic analysis to determine expenditure targets.

The ACCC considers that an efficiency carry-forward mechanism should in general be included in revenue caps. The efficiency carry-forward mechanism:

- will allow the efficiency benefit/loss to be carried forward for five years after the year in which the benefit/loss is incurred
- will only affect the opex in the subsequent regulatory periods which will be based on the ACCC's decision of efficient opex plus/minus the carry-forward of the efficient benefit/loss from the previous regulatory period.

2.7.2 Incentives for efficiency: capex

As noted above, the expenditure out-turn for an item of non-recurring expenditure provides little insight into likely future expenditure on future non-recurring items. The power of the incentive to reduce non-recurring expenditure therefore depends primarily on how the difference between the forecast and out-turn expenditure is "rolled into" the regulatory asset base going forward.

There are, of course, a myriad of ways in which the regulator could take into account differences between target and actual expenditure on non-recurring items when rolling forward the regulatory asset base. For example, suppose that the actual expenditure is lower than the forecast or target expenditure. If the regulator rolls into the RAB the higher target expenditure, the firm will have a high powered incentive to reduce expenditure. On the other hand, the regulator might roll forward the lower out-turn expenditure but allow the firm to keep the difference between the forecast and out-turn depreciation. This approach implies somewhat weaker incentives for reducing expenditure.

Finally, the regulator could set the RAB at a level which reflects the lower actual expenditure and also take away the difference between the forecast and out-turn depreciation which the firm received during the regulatory period. Under this approach the firm would have no incentive to reduce expenditure at all. In fact, if the regulator sets a WACC which is somewhat above the firm's "true" cost of capital, the firm has an incentive to expand the size of the RAB (that is, to increase, rather than reduce the non-recurrent expenditure which contributes to the RAB).

As already noted, the higher the power of the incentive mechanism, the greater the incentive the firm has to inflate the level of the expenditure target. In the case of transmission networks, non-recurring expenditure often takes the form of large projects which augment the network in some way. The higher the power of the incentive to reduce capex, the greater the incentive on the firm to argue for a higher capital expenditure target.

Furthermore, there may be a degree of discretion as to when capital investment projects are carried out – they can potentially be brought forward or deferred for some years

with relatively low risk. If the regulator takes into account the "need" for non-recurrent expenditure when setting the capital expenditure target for future periods, the regulated firm has an incentive to defer certain projects from the end of one regulatory period to the start of the next: doing so both reduces expenditure in the current period (for which the firm is rewarded under a higher-powered incentive) and increases the "need" for expenditure in the next period (for which the firm is rewarded with a higher target).

In other words, where the incentive to maintain or promote service quality is weak there is a risk that increasing the power of the incentive to reduce non-recurrent expenditure will create an incentive for the regulated firm to over-estimate its likely need for expenditure ex ante and to underspend ex post. The incentives to underspend are both the short-term financial payment for reducing capex and the longer-term higher capex target in the future.

The ACCC's current approach to capex does not rely on the use of incentives to induce the TNSPs to choose efficient projects or to carry them out efficiently. Under the current approach large projects are assessed, on an ex post basis, against the code provisions, in particular, clause 6.2.3(d)(4). This subjects the TNSP to the risk that a project which the TNSP considered to meet the code provisions at the time of construction will not be included by the regulator in the opening RAB at the next revenue cap reset.

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. As stated earlier, clause 6.2.3(d)(5) of 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. The ACCC is concerned that the current practice of reviewing projects ex post does not provide the needed certainty as to whether or not TNSPs will earn a reasonable rate of return on investment which they considered (at the time) to meet the code provisions.

The ACCC is proposing to shift to an approach in which the total capex allowance of the regulated firm is divided into two parts – a part which is linked to specific projects and an allowance which is not linked to carrying-out specific projects.

The first part of the total capex allowance to the regulated firm is an allowance which is conditional on carrying out specific, identified projects. The regulated firm would be required to carry out the regulatory test during the regulatory period for these projects in advance and to seek the opinion of the ACCC. If one of these projects is carried out, the ACCC's preferred approach, at the time of the next revenue cap reset, will be to roll into the regulated asset base the actual cost of that project. It should be noted however, that the ACCC is seeking views on whether the actual cost of the project or some pre-determined amount (such as the regulatory test cost of the project) should be rolled into the asset base.

This approach has two primary advantages. First, by carrying out the assessment in advance, the firm has greater certainty as to the revenue it will receive for carrying out the project ex post. Second, by separating the firm's revenue from the actual expenditure on the project, the firm retains strong incentives to minimise its

expenditure on the project. This approach is similar to that used by VENCorp for transmission planning in Victoria.

The second part of the total capex allowance is not linked to carrying out specific projects. Subject to chapter 5 of the code, the TNSP is free to spend this allowance on whatever projects it chooses or indeed it may not spend the total amount. If, at the end of the regulatory period, it is found the TNSP under-spent on this amount, the ACCC's approach will be to allow the TNSP to keep a share of the underspend as an "efficiency dividend". This provides the TNSP some incentive to reduce its expenditure within this category.

It will obviously be important to correctly forecast the size of the necessary capital expenditure. Some capital expenditure is likely to be recurrent – such as the routine replacement of common items. In determining the efficient allowance for such routine expenditure, a review of historic efficiency may be of some use. However, much of the capital expenditure during a five year control relates to one-off investments in augmentations or the infrequent replacement of large assets. In this case, historic expenditure information is likely to be of little use. Detailed ex ante firm-specific and project-specific evaluation is likely to be necessary to determine expected efficient expenditure levels.

The ACCC's intention in relation to providing incentives for efficiency in capex is set out in Chapter 5.

As with opex incentives the intention of capex incentives is to cut costs. However, it is recognised that a reduction in capex could threaten long-term service quality, security or reliability. As discussed above, the ACCC is attempting to balance incentives to reduce costs on the one hand against service standard requirements and incentives on the other.

2.8 Summary

The ACCC considers that, in general, the adoption of the overall framework set out in this Draft Background Paper should provide an appropriate balance between the different code provisions:

- The regime is primarily incentive-based. The TNSP has substantial discretion as to how it organises its affairs and how it meets the service standards. Regulatory controls on discretion are limited to direct controls on certain investment projects and possibly other disallowance of potential future expenditure items

- The regime fosters efficient operating and maintenance practices and gives TNSPs an incentive and opportunity to enhance their efficiency. The TNSP also has an incentive to minimise its capital expenditure

- The regime ensures that monopoly rents, to the extent that they become apparent, can be eventually eliminated through the process of re-adjusting the allowed revenues every regulatory period. The ACCC considers that, since consumers need wait no more than five years for efficiency gains to be reflected in prices, the implied sharing of the efficiency gains are equitable

- At the same time the process ensures that the TNSP receives a long-term sustainable revenue stream for those expenditures. Provided the ACCC is able to forecast the appropriate opex and capex requirements, even if the TNSP is unable to make any efficiency enhancements, the TNSP will receive a normal risk-adjusted rate-of-return on its investments

- The ex ante assessment of large capital projects during the regulatory period (including the application of the regulatory test) ensures that all non-transmission alternatives (such as generation) are fully considered

- 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 diagram set out in the following draft decision summarises how the overall regulatory framework fits together.

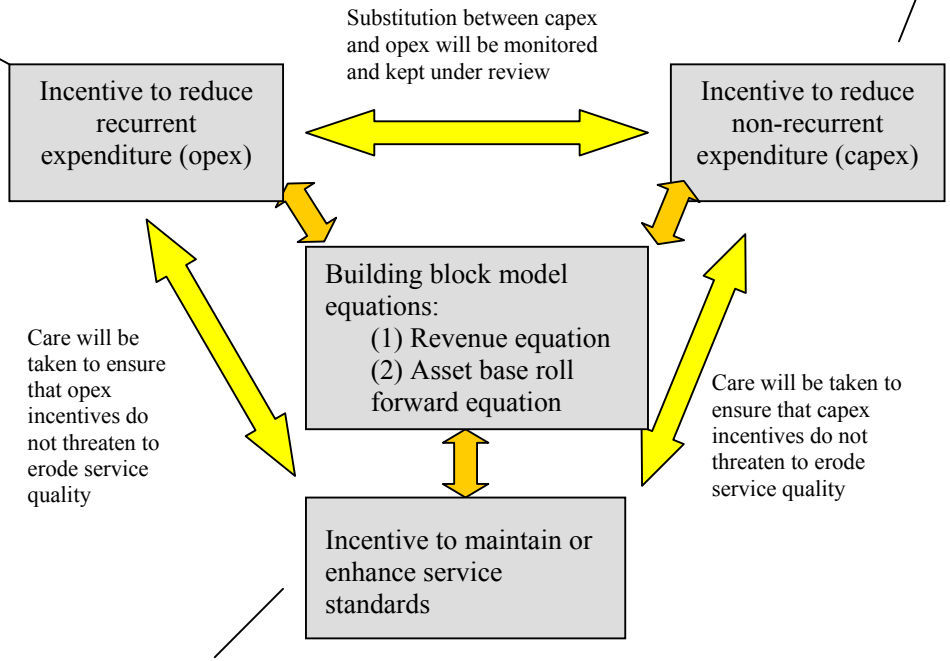
Opex Incentive Scheme:

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 out-turns, future demand forecasts and service standards requirements.

Efficiency carry-forward mechanism will be used.

ACCC's Framework for the Regulation of TNSPs



Capex Incentive Scheme:

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

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.

Ex ante cap is set taking into account historic out-turns, 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.

2.9 Draft Decision

2.1 Introduction

This section describes the broad framework which, in general, will be used by the ACCC for regulating transmission revenue.

2.2 Form of regulation

Clause 6.2.4(a) of the code provides that economic regulation is to be of the CPI minus 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 control period (being a period of at least five years). In setting the maximum allowed revenue for the regulatory control period, the ACCC makes use of the "building block model" to ensure that the expenditures of the firm are correctly amortised over time.

2.3 Building block approach

The building block approach is used to ensure that the expenditure of each TNSP is appropriately amortised over time in such a way as 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, used together, 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 = return on capital + return of capital + opex + tax

*= (WACC * RAB) + D + opex + tax*

and

New RAB = previous RAB - depreciation + capex

Where:

MAR = maximum allowable revenue

WACC= *post-tax nominal weighted average cost of capital*

RAB = *regulatory asset base*

D = *depreciation*

opex = *operating and maintenance expenditure*

tax = *expected business income tax payable*

A description of each of these cost components the 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 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	The expenditures of the TNSP which are amortised over time – i.e., which are added to the regulatory asset base, earn a return on capital as long as they are in the regulatory asset base 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:

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

$$\textit{Closing RAB}_{t-1} = \textit{Opening RAB}_{t-1} + \textit{Actual Capex}_{t-1} - \textit{Depreciation Allowance}_{t-1} + \textit{capex incentive scheme}$$

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 Standard 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 control period, the difference between its actual opex and the forecast costs used to set the revenue cap

(b) the mechanism by which the ACCC takes into account past expenditure out-turns when setting future expenditure targets

(c) the carry-forward mechanism.

Capex incentive scheme

The incentive to reduce capital expenditure is provided by:

(a) in the case of projects within the ex ante capex cap, allowing the TNSP to retain, during the regulatory control period, the difference between forecast and actual return on capital and depreciation for the component of the RAB that relates to forecast capex. This provides the TNSP with an incentive to reduce its expenditure for projects within the cap

(b) in the case of projects that are excluded from the ex ante capex cap, assessing, on an ex ante basis, the amount of capital that will be allowed in the RAB in the next revenue cap reset and allowing the TNSP to retain the difference between the allowed amount and the actual expenditure ex post.

2.5 Certainty and consistency

An objective of the regulatory regime is to provide certainty and consistency for TNSPs and users.

The ACCC's preferred position, when resetting a revenue cap, is to adopt the opening RAB from the previous regulatory period (described as the "lock-in" approach).

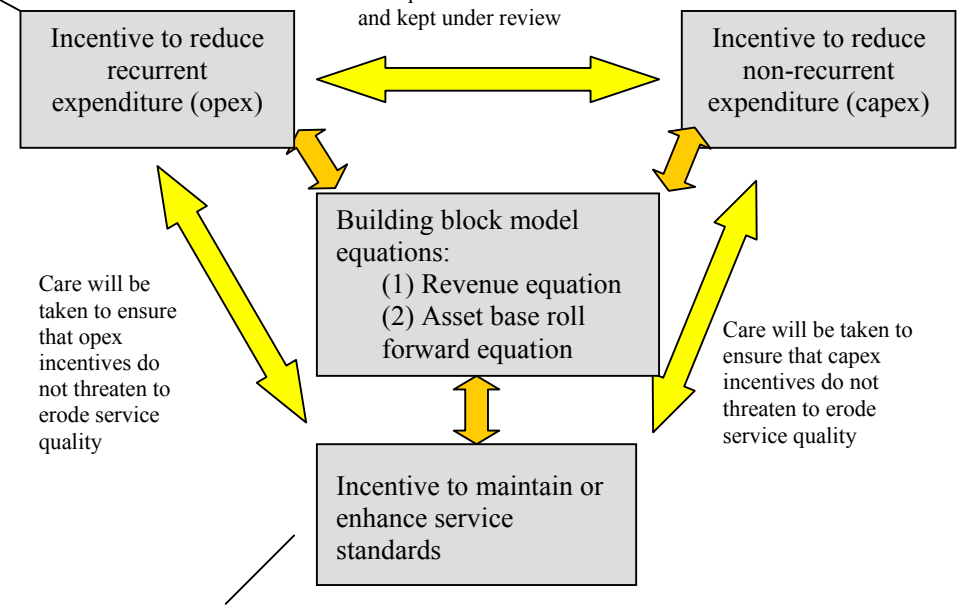
Opex Incentive Scheme:

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 out-turns, future demand forecasts and service standards requirements.

Efficiency carry-forward mechanism will be used.

ACCC's Framework for the Regulation of TNSPs



Capex Incentive Scheme:

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

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.

Ex ante cap is set taking into account historic out-turns, 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.

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:

- identifies issues arising from the ACCC's current regulatory process (section 3.2)
- notes the code requirements (section 3.3)
- sets out the options canvassed in the Discussion Paper and the ACCC's preferred position (section 3.4)
- summarises submissions from interested parties (section 3.5)
- outlines the ACCC's considerations (section 3.6)
- presents the ACCC's Draft Decision (section 3.7).

3.2 Issue

Chapter 2 of the DRP set out the process that the ACCC proposed to follow when setting a revenue cap. The ACCC has reviewed this process in light of the experience gained from the regulatory decisions taken to date. The regulatory process needs to be amended to provide a more realistic guide to the actual process that will be followed by the TNSPs and the ACCC.

3.2.1 Timelines

The DRP provides that the ACCC will take up to six months after an application has been accepted to issue a final decision, although this period will be extended if necessary. All five revenue cap decisions made by the ACCC to date have taken longer than six months.

3.2.2 Late submissions

The DRP states that the ACCC will usually require submissions to be provided within four weeks following public notice of the application, and four weeks following the draft decision (or, if a pre-decision conference is held, two weeks after the conference). 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 DRP states that any interested party who wishes to comment on the draft decision may request a pre-decision conference within two weeks of the release date. If a pre-decision conference is requested, it will be held within one month of the request date.

In practice, the need for a pre-decision conference needs to be considered on a case by case basis. It is also necessary to clarify that section 90A of the TP Act (which deals with conferences following draft authorisation determinations) does not apply to revenue cap decisions.

3.2.4 Information requirements

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.

Chapter 10 of the DRP sets out the ACCC's proposed information requirements including information to be provided by a TNSP in support of its revenue cap application. The ACCC subsequently 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)).

Chapter 2 of the DRP states that the ACCC will take up to 15 working days to review a TNSP's revenue cap application to ensure that it complies with Chapter 10 and, if not, the TNSP will be required to resubmit its application (following which the ACCC will issue a public notice calling for submissions).

There is an issue as to whether the information required under the *Information Requirements Guidelines* is sufficient for the purpose of setting a revenue cap.

3.2.5 Confidentiality

Clause 6.2.5 requires all information provided to the ACCC by a TNSP under clause 6.2.5 to be treated as confidential unless the TNSP provides written consent or the ACCC follows the procedure set out in clauses 6.2.6. The DRP also states:

> The issue of transparency in decision making is particularly important to the Commission. While the Commission is required to respect truly confidential information, any restriction on the dissemination of information in an application may interfere with the ability of the Commission to be able to base its judgement on the informed opinion of experts in the industry, and the views of other industry participants. Thus, the Commission will carefully examine any request for confidentiality and attempt to limit the portions of an application that must be considered confidential. The Commission will place all information and submissions on a public register except confidential information.
>
> … Absent any claim of confidentiality, all submissions and relevant documents will be placed on a public register.

The ACCC is reviewing its procedure for processing claims of confidentiality.

3.3 Code requirements

Clause 6.2.2 of the code provides that the regime must seek to achieve certain outcomes including:

- reasonable regulatory accountability through transparency and public disclosure of regulatory processes and the basis of regulatory decisions; and
- 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 control 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.

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; and
>
> (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 ACCC's Discussion Paper

3.4.1 Regulatory review timelines

In its Discussion Paper, 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 release of the draft and final decisions. The ACCC also proposed a similar process in relation to late submissions as that used by NEMMCO.

3.4.3 Pre-decision conference

The ACCC proposed that a pre-decision conference be termed a public forum.

3.4.4 Confidentiality

The Discussion Paper noted that confidentiality requests 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 Discussion Paper

3.5.1 Regulatory review timelines

Powerlink, National Generators Forum (NGF), Transend, Ergon Energy and VENCorp support the proposed extension of the regulatory review period to 12 months.

The Energy Users Association of Australia (EUAA) recommends that the ACCC:

- fix the commencement of each consultation period in advance so that end-users can better plan their participation
- link the consultation periods on the TNSP's application and the consultants' analysis of the application
- allow more time for end-users to consider issues raised in the TNSP's applications and the ACCC's consultants' reports concurrently
- fix an end date for the review process so that TNSPs can publish revised tariffs well before the start of the new fiscal year and end-users can budget for changes in transmission charges
- develop a regulatory principle to align the timing for review of all NEM TNSPs as soon as practicable
- undertake a regulatory review for a single, multi-company, NEM-wide transmission system.

ElectraNet and Transend contend the ACCC needs to improve accountability and transparency. Transend argues that the ACCC should:

- provide a statement of its publication standards for revenue cap decisions, over and above the requirements of the code

- provide TNSPs with a copy of the financial model used to calculate revenue caps and if possible make it publicly available
- update the SRP regularly. The process for updating should be made publicly available
- publish revenue cap formulae to clarify how the revenue cap decision applies in practice.

3.5.2 Late submissions

Powerlink states that the proposed method of dealing with late submissions is appropriate.

3.5.3 Public forum

Powerlink states that the ACCC's proposal regarding the running of public forums is appropriate.

3.5.4 Confidentiality

Powerlink does not agree with the ACCC's proposed use and treatment of confidential information. It states that some aggregate and summarised data could be used to perform a 'reasonableness check' of TNSPs, without jeopardising confidentiality. Powerlink also states that where the ACCC requires more detailed and intrusive information to supply to consultants or for detailed analysis, it should be kept out of the public domain.

3.6 ACCC's considerations

3.6.1 Regulatory review procedure

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

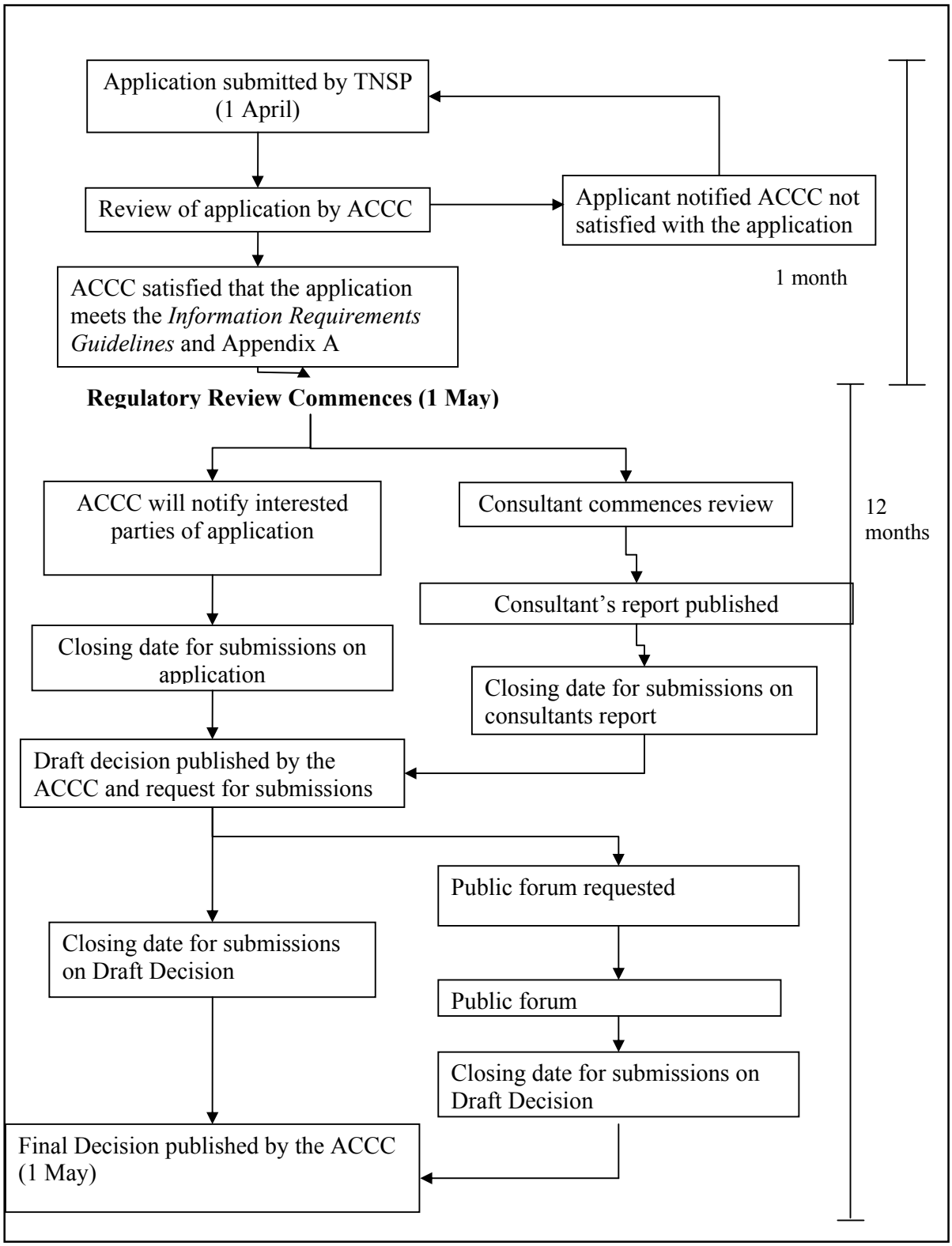
- reflect the needs of TNSPs to calculate and publish prices by 15 May each year
- allow more time for interested parties to analyse the information and make submissions
- allow more time for the ACCC to consider submissions, conduct its analysis and publish its reports.

The Draft Background Paper provides for the regulatory review process to commence 15 months prior to the end of the regulatory control period. That is, TNSPs must submit their 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. The revised timetable (set out in figure 3.1) 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.

Figure 3.1: Proposed ACCC Regulatory Review Procedure



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 draft and final decisions, 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 as to whether the ACCC will receive and consider the submission.

3.6.3 Public forum

The Draft Background Paper 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
- if a public forum is held, attendance or participation is not governed by section 90A(7).[32]

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 Draft Background Paper. As part of the review of the DRP, the ACCC is seeking comments on Appendix A on the basis that Appendix A does not amend the *Information Requirements Guidelines* or impose any obligations under clause 6.2.5 of the code. However, the ACCC may, in the future, commence the process to amend the *Information Requirements Guidelines* to incorporate the information specified in Appendix A.

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[32] 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.

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 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

As noted in the Discussion Paper, 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.

All submissions and other documents (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 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. As Powerlink notes, in some cases, it may be possible to resolve the issue by limiting disclosure of the confidential information to certain persons such as consultants, and releasing to the wider public an aggregate or summarised version of the data.

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 Draft 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 the particular circumstances justify a departure. Figure 3.1 outlines the proposed ACCC regulatory review procedure.

3.2 Submission of application

The TNSP must submit a revenue cap application by 1 April of the penultimate year of the regulatory control 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 Draft Background Paper.

Within four weeks of receipt:

- the ACCC will review the application for compliance with the Information Requirements Guidelines and Appendix A of the Draft Background Paper

- the ACCC will review any accompany requests that all or part of the application remain confidential (the procedure that will be followed is set out below under "Confidentiality")

- 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, 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 to be submitted within six weeks from the publication of the notice, and six weeks after publication of any consultants' reports.

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 as to whether the ACCC will receive and consider the submission.

3.5 Confidentiality

All submissions and other documents (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 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 judgements 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. The procedure that the ACCC will follow in relation to late

submissions and confidentiality claims is set out under “Submissions” and “Confidentiality”.

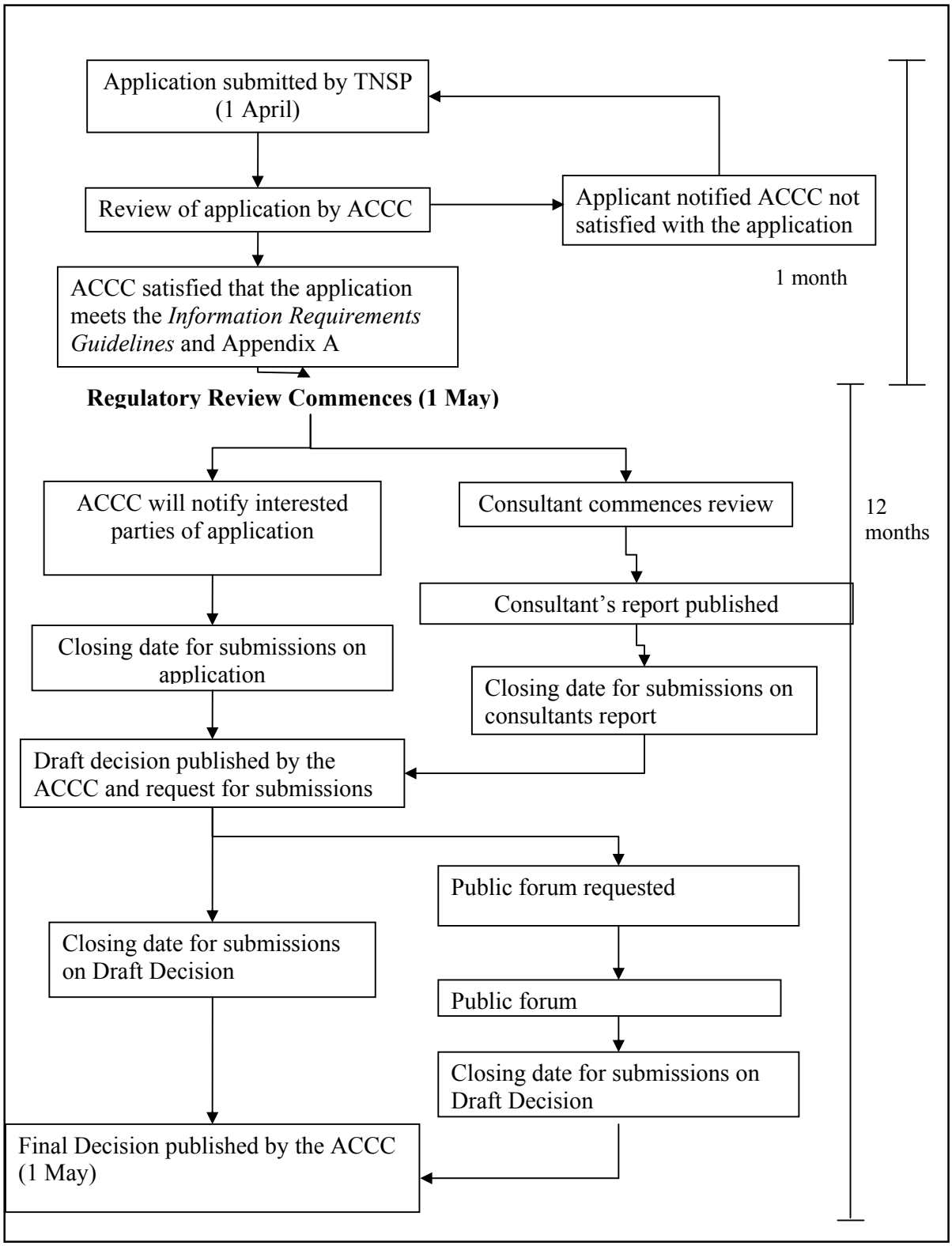
3.8 Final Decision

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

The Final Decision will satisfy the matters set out in “Assessment of the Application” and “Draft Decision”.

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.

Figure 3.1: Proposed ACCC Regulatory Review Procedure



4 Asset Base

4.1 Introduction

This chapter examines the ACCC's decision on the calculation of the RAB at the end of the regulatory period.

The RAB is the biggest 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 below illustrates how the RAB affects the calculation of the MAR:

MAR = return on capital + return of capital + opex + tax

= (WACC * RAB) + D + opex + tax

Where:

MAR = maximum allowed revenue

WACC= post-tax nominal weighted average cost of capital

RAB = regulated asset base

D = depreciation

opex = operating and maintenance expenditure

tax = expected business income tax payable

This chapter:

- summarises the issues for consideration (section 4.2)
- notes the code requirements (section 4.3)
- outlines the options considered in the Discussion Paper and the ACCC's preferred position (section 4.4)
- summarises submissions from interested parties (section 4.5)
- outlines the ACCC's considerations on updating the RAB (section 4.6)
- presents the ACCC's Draft Decision (section 4.7)

4.2 Issue

The calculation of the RAB is important as in capital-intensive industries such as electricity transmission, the return of and return on capital constitutes a large proportion of the MAR.

For all first round revenue caps the code required the ACCC to adopt values consistent with the jurisdictional asset base. However the code provides the ACCC the flexibility to revalue the RAB for subsequent revenue caps. The ACCC is reviewing the treatment of the RAB as it begins the second round revenue caps for TNSPs. This review includes options for revaluing easements and fixed assets and also considers the calculation of the RAB at the end of the regulatory period.

4.3 Code Requirements

The code's provisions on asset valuation are generally very broad. While a number of asset valuation methodologies are contemplated, the code requires the ACCC to give consideration to the deprival value.[33]

For the first regulatory review the code required the ACCC to value sunk assets at the value determined by the jurisdictional regulator or consistent with the RAB established in the jurisdiction, provided that the value of these existing assets did not exceed the deprival value.

The code provides that for subsequent regulatory reviews, existing and new assets can be revalued, on a basis determined by the ACCC. Nevertheless, the ACCC does not have unlimited discretion in determining an asset valuation methodology. 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 Council of Australian Government's (COAG) preference for deprival value.[34]

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.[35]

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[33] The deprival value is defined as the lesser of the replacement cost of the asset and the economic value of the asset. The ACCC defines economic value as, the maximum of the asset's net present value of financial returns to the asset (on a cash flow basis) or net realisable value.

[34] National Electricity Code, Clause 6.2.3(d)(4)(iii).

[35] Ibid, Clause 6.2.3(d)(5).

4.4 ACCC's Discussion Paper

In the DRP the ACCC advocates a periodic revaluation of the RAB using the DORC[36] methodology for second round revenue caps. However, the Discussion Paper raised the issue of moving away from the revaluation approach.

The Discussion Paper lists three main options for future reviews of the RAB. The first is to revalue assets on a periodic basis (for example each five-year regulatory period) using the DORC methodology. The second option is to set the RAB by adopting the initial jurisdictional valuation and adding in new investment at cost. This approach is consistent with the National Third Party Access Code for Natural Gas Pipeline Systems (Gas code). The third option is to conduct a one off revaluation of the jurisdictional asset base using DORC and roll in new investment at cost in subsequent regulatory periods.

The ACCC's preferred position was to lock-in the jurisdictional asset base including both fixed assets and easements. The ACCC noted that if it were to revalue the jurisdictional asset base it would revalue the fixed assets using the DORC methodology and easements using the historic cost approach.

4.5 Submissions by Interested Parties on Discussion Paper

Roll Forward versus Revaluation

Support for a roll forward of the jurisdictional asset base

ElectraNet, EnergyAustralia, SPI PowerNet, Transend, TXU and VENCorp all support a lock-in of the jurisdictional asset base. ElectraNet clarifies this support by stating that it would only support a lock-in once a fair and reasonable asset valuation had been established.

Periodic revaluation addresses concerns of possible over investment

Origin and the EUAA disagreed with the ACCC's proposal to lock-in the asset base. They consider that revaluing the asset base could help address the problem of over investment. They argue that rate-of-return regulated firms have an incentive to over-capitalise which encourages over-investment. If the asset base is revalued it ensures that the valuation reflects the actual replacement cost, not a valuation largely determined by the TNSPs themselves. Origin argues that it is irrelevant that a revaluation creates uncertainty for TNSPs, as retailers and generators also face uncertainty about future demand and prices.

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[36] 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 proves in DORC is about identifying the most efficient facilities necessary to produce a specified level of services.

Code change

EnergyAustralia, TransGrid and VENCorp all support a code change to ensure greater certainty regarding asset valuation.

Depreciation

Hypothetical new entrant model

The Australian Pipeline Trust (APT) considers that the ACCC's straight-line depreciation approach is inconsistent with the hypothetical new entrant model.[37] APT states that low rates of technological change cannot be used as a justification for the use of straight-line depreciation. Further, APT notes that the Net Present Value (NPV) approach reduces to straight-line only when the investor is indifferent between spending money now and in the future.

Easements

Problems with jurisdictional valuation

ElectraNet supports a lock-in of the jurisdictional asset base only once a fair and reasonable asset valuation had been established. ElectraNet states that should the ACCC elect to lock-in its asset valuation and adopt an asset base roll forward methodology then it must first allow for the correction of material omissions such as the easement value (specifically for compensation costs and transaction costs[38]) and interest during construction.

Depreciating easements

EnergyAustralia notes that where a line needs to be rebuilt, the transaction costs associated with the easement may need to be reincurred. Hence, EnergyAustralia considers that there is a case for depreciating at least that part of the easement value associated with transaction costs over the life of the transmission line.

SPI PowerNet and ElectraNet consider that given the perpetual nature of easements they should generally not be depreciated. However, if an easement has been identified as surplus to the requirements of the future system or is unlikely to be required after the removal of existing lines, then a TNSP should be able to depreciate the easement in order to recover the capital value.

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37 The hypothetical new entrant model defines DORC as the valuation methodology that would be consistent with the price charged by an efficient new entrant into an industry, and so it is consistent with the price that would prevail in the industry in long run equilibrium.

38 Compensation costs include the actual costs for easements. Transaction costs include the cost of purchasing easements, such as legal costs and environmental costs. ElectraNet, SPI PowerNet and Powerlink all proposed that transaction costs should be included in their easement valuations. ElectraNet state that the ACCC in its revenue cap decision excluded any correction for transaction costs on the premise that these costs were already included in the valuation of transmission lines – but that has been disputed by SKM who conducted the jurisdictional asset valuation for the state government.

DORC methodology applied to both fixed assets and easements

SPI PowerNet argues that if the ACCC adopts a DORC methodology to revalue fixed assets then for consistency it should use the same methodology for easements.

Easements valued at actual cost

The Electricity Consumers Coalition of South Australia (ECCSA) and BHP Billiton Petroleum consider that easements should be valued at the likely costs that would have been incurred *at the time of acquiring the easement*, with the recompense being that amount permitted *by the legislation applying at the time*. Further, the ECCSA and EUAA state that there was no basis for the acquisition costs to be escalated into current dollars, or for the easement value to increase in line with adjacent land values.

4.6 ACCC's considerations

The ACCC is currently considering is whether to revalue or lock-in the RAB as it begins reviewing the second round revenue caps for TNSPs.

The question of whether to lock-in or revalue the RAB is resolved by the impact it has on two fundamental aspects of the regulatory regime:

a) the principle of strict financial capital maintenance. This principle refers to the condition where the firm is perfectly reimbursed for its out-turn expenditure. In other words, as noted in Chapter 2, an increase of one dollar in the present value of the expenditure stream of the firm is precisely matched by an increase of one dollar in the present value of revenue stream of the firm. In terms of the building block strict financial capital maintenance will hold if:

$$Closing\ RAB_{t-1} = Opening\ RAB_{t-1} + Actual\ Capex_{t-1} - Depreciation\ Allowance_{t-1}$$

b) the objective of ensuring that each TNSP has adequate incentives to minimise its expenditure in producing a given quantity and quality of services.

It is worth noting that there can be a conflict between strict financial capital maintenance and incentive regulation. A TNSP which is fully compensated for all of its actual expenditure faces no particular incentive to provide services of a given quality and/or reduce its expenditure. Incentive regulation therefore, requires a deviation from financial capital maintenance if the actual expenditure is greater than the efficient expenditure. To illustrate this point, consider the case where not all of a TNSP's actual capital expenditure is efficient. The regulator will not compensate the TNSP for all of its expenditure but only that expenditure it deems to be efficient. If the TNSP is not compensated for all of its actual expenditure then strict financial capital maintenance will not hold.

Lock-in approach

The lock-in approach is simply a methodology to determine the closing RAB at the end of the regulatory period. Chapter 2 discusses this approach in terms of one way to express the building block model. The building block approach itself is only a mechanism either via the revenue stream or the asset base that ensures (assuming that all actual expenditure is allowed) strict financial capital maintenance will hold.

The lock-in approach is equally applicable to capex incentive schemes such as the ex-post framework (discussed in Appendix B) and the ex-ante framework (discussed in Chapter 5).

Under the ex-post framework the lock-in approach operates as follows:

a) At the beginning of the period the regulator forecasts a level of capex and chooses a level of (forecast) depreciation by a methodology such as straight line depreciation

b) At the end of the regulatory period the regulator observes the capex out-turn and makes a decision as to the amount of capex and depreciation that will be rolled into the RAB. The RAB is then updated using a version of the equation below. Namely:

$$Closing\ RAB_{t-1} = Opening\ RAB_{t-1} + Actual\ Capex_{t-1} - Depreciation\ Allowance_{t-1} + capex\ incentive\ scheme$$

Under the proposed ex-ante framework, the lock-in approach operates as follows:

a) At the beginning of the period the regulator will set a cap on investment over the period of control and choose a level of (forecast) depreciation by a methodology such as straight line depreciation

b) At the end of the regulatory period the regulator will roll into the RAB the lesser of the actual capital expenditure or the capped level of investment. The RAB is then updated using a version of the equation as above.

What is important is the design of the various incentive schemes such as the capex incentive scheme that the regulator applies to the lock-in approach, not the lock-in approach per say. To illustrate this point, the principle of strict financial capital maintenance will not hold in an ex-post review if the regulator considers that not all of the actual capital expenditure was efficient. In an ex-ante regime, the principle of financial capital maintenance will only hold if the TNSP's actual expenditure is equal to the capped level of investment set by the regulator.

Revaluation approach

There are two main methods for revaluing assets. The regulator could choose to revalue the asset base and any rise or fall in the value of the asset base could be accounted for by positive or negative depreciation. Such an approach operates as follows:

a) At the end of the period the regulator determines the closing RAB by a methodology such as the DORC methodology

b) At the beginning of the regulatory period the regulator sets the depreciation allowance on the basis of the likely (expected) end-of-period RAB, using the following equation.

$$\textit{Forecast Depreciation}_{t-1} = \textit{Forecast Capex}_{t-1} + \textit{Forecast change in RAB over the regulatory period}$$

This approach is equivalent to the lock-in approach where the forecast capex and depreciation are set in advance and, at the end of the period, the asset base is rolled forward using the forecast capex and forecast depreciation. As before, strict financial capital maintenance may or may not hold (if the TNSP overspends its capex allowance its revenue will be less than its expenditure and vice versa). However, this approach gives strong incentives to the TNSP to cut its capex to the minimum, even where this implies reducing the quantity or quality of services it offers.

In contrast the regulator could choose to revalue the RAB and not adjust the depreciation. Under such an approach the principle of strict financial capital maintenance will not hold. As noted in Chapter 2, a 'revaluation' of the RAB which is not anticipated in the depreciation schedule is almost a break with the building block model equation – in other words, such a revaluation could lead to systematic over-compensation or under-compensation of the regulated firm. In the case of upward revaluation of the asset base the TNSP will receive a revenue stream which is greater than its actual capital expenditure. In the case where there is a downward revaluation of the asset base the TNSP will receive a revenue stream which is less than its actual capital expenditure. This approach creates incentives for the TNSP to take whatever action it thinks necessary to induce the regulator to revise its RAB upwards or to prevent the regulator from revising its RAB downwards. This could lead to significant variations in the value of the asset base and price shocks.

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. All of the assets in the RAB are defined as fixed assets except for easements. 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 (i.e. certain distances from power lines).

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 are not like other capital assets as they don't wear out over time and, hence, do not need to be replaced. Assigning a deprecation 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 a TNSP's 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 will not depreciate easements 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.

The benefits of locking in the RAB compared with revaluation

The lock-in approach enables the regulator to tailor incentives. In particular, the extent to which the lock-in is based on out-turn rather than forecast expenditure (which is determined via the ex-post or ex-ante capex framework). This is quite distinct from the revaluation approach were the regulator has less control over tailoring the incentives. The revaluation is based on an engineering measure and the subjective nature of the DORC valuation could inevitably mean a large deviation between the forecast end of period asset base and the actual revalued asset base.

The lock-in approach further provides the TNSP with more certainty than a revaluation approach as it:

- addresses the potential risk to investment of periodic revaluation
- avoids the risk of changes in replacement costs
- is consistent with the Gas code.

These benefits are discussed below.

Potential risk to investment of periodic revaluation

The ACCC is concerned to provide an environment in which regulated firms can have a reasonable certainty as to earning at least a normal rate of return on their capital investment. As stated in Chapter 2, 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. Adopting a revaluation approach could jeopardise this code requirement as a revaluation on a periodic basis could 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 shocks to consumer prices. The uncertainty created by such an approach may deter investment.

This problem could arise because, under the DORC valuation methodology, some forms of capex would not be reflected in the revalued RAB. For example, refurbishment capex, which merely renews or refurbishes an existing asset, does not necessarily affect the cost of buying a modern equivalent asset. By analogy replacing the engine in a used car may be necessary expenditure but it does not change the cost of buying a new car.

A TNSP, facing the risk of an upcoming DORC valuation would 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.

Avoids the risk of changes in replacement costs

In locking-in the opening RAB from the previous regulatory period, the TNSP avoids the risk for changes in replacement costs over time. Furthermore, the ACCC has not published a DORC guideline; hence, the application of the DORC methodology is uncertain. There are decisions about replacement costs, depreciation schedules, estimates of useful life, engineering criteria and asset aggregation, amongst others which will all impact on the DORC valuation.

Given changes in replacement costs over time, it makes it very difficult to forecast the end of period asset base which in turn makes it difficult to set the required level of depreciation. Inevitably there could be a deviation between the forecast end of period asset base and the actual asset base. This difference could be a source of risk for a regulated firm.

Approach is consistent with the Gas Code

If the ACCC adopted the approach to locking-in the jurisdictional asset base it would provide consistency with the approach used by the ACCC in regulating gas pipelines. Neither the Gas code nor the National Electricity Code demands that the same methodology be used. However, the ACCC has endeavoured to maintain consistency between its approaches to regulation in gas and electricity transmission, as this helps achieve reasonable certainty and consistency over time and reasonable and well defined regulatory discretion. However it is important to note that the ACCC cannot set in stone a particular approach to asset valuation. The ACCC is unable to do this for the regulation of TNSPs, as the code provides it with the discretion to revalue the asset base after the first revenue cap. This is quite distinct from the Gas code which actually prohibits revisions to the initial capital base.

The only way to ensure that there is consistency with the regulatory approach between the two industries is to amend the code. Further, a code change to lock-in the jurisdictional valuation will ensure certainty for investment. A number of parties support a code change to ensure greater certainty regarding asset valuation.

Conclusion

The ACCC's approach to asset valuation will be to lock-in the RAB, consistent with the reasoning outlined in this chapter. Noting that the code provides the discretion to revalue assets in service before (existing assets) and after (new assets) 1 July 1999, the ACCC considers that it would be highly desirable to amend the code to formalise the lock-in approach to asset valuation. This would provide greater certainty for investment and would be consistent with the asset valuation approach contained in the gas code.

Lock-in of asset base to determine an opening RAB for the regulatory period

This section sets out the lock-in methodology that will be used to determine the TNSP's closing asset base at the end of the regulatory period and the opening RAB for the next regulatory period.[39] The methodology set out below will be used to set the opening asset base at the time of the second round re-sets[40]. This is consistent with the ex-post arrangements set out in the DRP. The ex-post methodology involves a two-step calculation:

- Step 1: Calculate the opening RAB on the basis of the forecast capex from the previous regulatory period.

- Step 2: Adjust the RAB calculated in Step 1 for the difference between forecast and out-turn (efficient) capex including the foregone return on capital on the difference.[41]

In terms of the building block components:

- Capital expenditure: TNSPs will only be compensated for efficient capex from the previous regulatory period. In other words, there will be an adjustment to take into account any difference between the forecast and actual out-turn that is deemed to be efficient under the ex-post assessment and hence included in the opening RAB.

- Depreciation: The ACCC considers that straight-line depreciation is the easiest approach. The ACCC has the discretion to adopt an annuity depreciation scheme which can respond to changes in demand and costs, i.e. the stranding of assets. An issue in determining the opening asset base is whether the lock-in calculation should reflect the forecast depreciation or the actual depreciation based on the actual (efficient) capital expenditure. In present value terms the two approaches should be equal (subject to the asset life calculation) but the choice of approach will affect the calculation of the MAR over a specified time period.

- Inflation: In order to calculate the nominal MAR for each year over the regulatory period the ACCC will use an inflation forecast. This raises the issue of whether the lock-in calculation to determine an opening RAB should use this inflation forecast or whether it should use the actual inflation over the period of control. The ACCC considers that both TNSPs and consumers should be protected from any difference between actual and forecast inflation. Therefore, the lock-in calculation should be based on actual inflation to determine the opening RAB for the regulatory period.

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39 The opening RAB for the current regulatory period should be equal to the closing RAB from the previous regulatory period. If the opening and closing RAB are not equal then the principle of financial capital maintenance will not hold.

40 The opening asset base for the current period is equal to the closing asset base for the previous period.

41 The ACCC will adopt the post-tax WACC in rolling forward the carried value of the prudent unforecast capex.

- WACC to determine the foregone return on capital: If the TNSP's actual (efficient) capital expenditure is greater than the forecast capital expenditure over the previous regulatory period then the TNSP should be compensated for the actual unforecast expenditure and the foregone return on the actual unforecast expenditure. The foregone return on capital is calculated by multiplying the unforecast actual expenditure by the nominal WACC over the previous regulatory period. The nominal WACC must be adjusted for actual inflation in each year of the regulatory period to ensure that there is no inflation risk. The ACCC considers that a post-tax WACC should be used to determine the foregone return on capital as there is no increase in tax liability due to the actual unforecast expenditure from the previous regulatory period. This is because, if tax depreciation is correctly calculated the unforecast expenditure which is only rolled-in to the RAB at the end of the regulatory period will not create a tax liability because it is only recognised in the TNSP's revenues once it is rolled-in to the RAB.

It is proposed that in subsequent revenue cap decisions the lock-in approach for capital expenditure will be determined on an ex-ante basis. Therefore, the methodology will differ slightly in order to reflect the use of an ex-ante framework. This is explained below.

- Step 1: Calculate the opening RAB on the basis of the forecast capex from the previous regulatory period.

The regulator will set a cap on investment over the period of control. The lesser of actual expenditure incurred plus possible allowances for investment outside the cap or the actual capped amount plus possible allowances outside the cap will be rolled into the RAB at the end of the regulatory period. This means that, in re-sets after the second round, Step 2 in the methodology set out above will be as follows.

- Step 2: Adjust the RAB calculated in Step 1 for:

    (a) the difference between the forecast capex and the actual capex incurred (up to the ex ante cap)

    (b) any additional capex outside of the cap that is approved in accordance with the ex ante framework, including the foregone return on capital on the additional amounts.

4.7 Draft Decision

4.1 Introduction

This section sets out the ACCC's approach to the lock-in of the asset base (also referred to as the "asset-base roll-forward") to determine an opening RAB for the regulatory period.

4.2 Lock-in

The ACCC's approach to asset valuation will be to lock-in the RAB, consistent with the reasoning outlined in this section. Noting that the code provides the discretion to revalue assets in service before (existing assets) and after (new assets) 1 July 1999, the ACCC considers that it would be highly desirable to amend the code to formalise the lock-in approach to asset valuation. This would provide greater certainty for investment and would be consistent with the asset valuation approach contained in the National Third Party Access Code Natural Gas Pipeline Systems (Gas code).

4.3 Lock-in of asset base to determine an opening RAB for the regulatory period

Under the ex-post framework (which will apply to all capex incurred during the first regulatory control period) the lock-in approach operates as follows:

a) At the beginning of the period the regulator forecasts a level of capex and chooses a level of (forecast) depreciation by a methodology (such as "straight line depreciation)

b) At the end of the regulatory period the regulator accepts the closing RAB from the pervious period. Further, the regulator observes the capex out-turn and makes a decision as to the amount of capex and depreciation that will be rolled into the RAB. The RAB is then updated using a version of the equation below. Namely:

$$Closing\ RAB_{t-1} = Opening\ RAB_{t-1} + Actual\ Capex_{t-1} - Depreciation\ Allowance_{t-1} + capex\ incentive\ scheme$$

Under the proposed ex-ante framework, the lock-in approach operates as follows:

a) At the beginning of the period the regulator will set a cap on investment over the period of control and choose a level of (forecast) depreciation by a methodology (such as "straight line" depreciation)

b) At the end of the regulatory period the regulator accepts the closing RAB from the previous period. Further, the regulator will roll into the RAB the lower of the present value of the total actual investment in that period and the present value of the profile of annual expenditure specified by the ex-ante cap). The RAB is then updated using a version of the equation as above.

For depreciation the ACCC will adopt:

- a straight-line depreciation approach. The ACCC has the discretion to adopt an annuity depreciation scheme which can respond to changes in demand and costs i.e. the stranding of assets.
- the forecast depreciation in determining the opening asset base.

The ACCC will determine the opening RAB for the regulatory period based on actual inflation.

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 below illustrates the components that determine the MAR:

MAR = return on capital + return of capital + opex + tax

= (WACC * RAB) + D + opex + tax

Where:

MAR = maximum allowed revenue

WACC= post-tax nominal weighted average cost of capital

RAB = regulated asset base

D = depreciation

opex = operating and maintenance expenditure

tax = expected business income tax payable

Capex is fundamental to the calculation of both the return on capital, through its impact on the RAB, and depreciation. These components will in turn flow through to the MAR and therefore transmission network charges.

As discussed in chapter 4 of this Draft SRP Background Paper, where the ACCC is resetting a revenue cap, the RAB for the regulatory control period is determined by:

- the opening RAB for that period (determined after taking into account the opening RAB used in setting the preceding revenue cap, and capital expenditure, depreciation and inflation during the preceding period)
- forecast capex for the forthcoming period.

Chapter 4 of the Draft Background Paper (which should be read in conjunction with this chapter 5) focuses on the roll forward, at a revenue cap reset, of the opening RAB used in the preceding revenue cap decision. This chapter 5 focuses on proposed capital expenditure for a forthcoming period and the treatment of that expenditure at the next revenue cap reset.

The ACCC's current approach is outlined in chapter 5 of the DRP. In summary:

- the RAB for the forthcoming period includes an allowance for future capex. In determining the allowance, the ACCC assesses the forecast capex provided by the TNSP in its revenue cap application

- at the next revenue cap reset, the opening RAB includes actual capex incurred by the TNSP in the preceding period where that expenditure satisfies certain principles.

Under this ex post approach (that is, the assessment occurs at the next revenue cap reset after the TNSP has already incurred the expenditure):

- capital expenditure within the allowance may still be excluded from the opening RAB at the revenue cap reset

- capital expenditure that exceeds the allowance may still be included in the opening RAB at the revenue cap reset

- any excess return and depreciation associated with forecast capex that did not eventuate is recovered at the revenue cap reset.

In the Discussion Paper, the ACCC proposed an approach where capex would be included in the opening asset base at the revenue cap reset if the TNSP, during the preceding regulatory control period, had assessed its proposed capex projects against the regulatory test using the procedure set out in chapter 5 of the code.

The experience to date suggests that this ex post approach to capex has certain limitations. First, optimisation creates significant uncertainty for TNSPs. A key driver in the ACCC's thinking on other regulatory issues has been to improve certainty for TNSPs. The approach proposed in chapter 4 of this Draft SRP Background Paper in relation to asset valuation, for example, has been to lock in the jurisdictional asset base in order to deal with the uncertainty inherent in an approach that relies on the periodic revaluation of assets.

However, to generate this certainty for capex the regulatory test and its application must be unambiguous, transparent and objective. The sensitivity of regulatory test modelling to input assumptions means that the regulatory test will not always provide unequivocal results, and therefore certainty for investors.

Secondly, the task of determining which projects are efficient requires a time and resource intensive analysis of the costs and benefits of each project. Such an approach implies a significant degree of intervention in the day-to-day decisions of TNSPs. This degree of regulatory intervention in the operation of commercial enterprise may be inappropriate in the context of a light-handed regulatory regime.

Given these concerns, the ACCC released a Supplementary Discussion Paper on 10 March 2004 that explores a different approach to transmission investment in the

NEM[42]. Under this approach, capex would be included in the opening asset base at the revenue cap reset if that expenditure did not exceed the allowance included in the preceding revenue cap for future capex. The ACCC invited comment on the Supplementary Discussion Paper and eight submissions were received.

This chapter considers whether this alternative approach should be adopted for setting forecast capex and determining how capex within a period affects the opening RAB in the following period. This alternative approach would be intended to reduce uncertainty (by assessing capex prior to the TNSP incurring the expenditure) and intrusiveness (by moving away from an assessment of individual projects).

The remainder of this chapter is structured as follows:

- Section 5.2 outlines the principles underlying the proposed capex approach
- Section 5.3 outlines code requirements in relation to capex
- Section 5.4 summarises submissions from interested parties
- Section 5.5 provides a brief overview of the proposed approach
- Sections 5.6 to 5.8 set out a more detailed discussion of aspects of the proposed approach
    - Section 5.6 outlines how the ex ante cap will be set
    - Section 5.7 outlines arrangements relating to significant but uncertain investments
    - Section 5.8 outlines circumstances in which the investment cap will be re-opened
- Section 5.9 outlines the arrangements applicable where there are separate network planners and owners
- Section 5.10 presents the ACCC's Draft Decision

[42] Due to differences between the gas and electricity transmission businesses and their respective Codes, the approach taken by the ACCC to capex differs. In particular, the Gas Code sets out detailed instructions for the treatment of capex. While capex is generally assessed retrospectively under the Gas Code, any uncertainty can be mitigated through section 8.21 which provides an avenue for service providers to gain certainty in advance of committing to specific capital expenditure. Further, ex-post assessment of capex for gas transmission is typically less intrusive than for electricity transmission given the relative magnitudes of investment as a proportion of regulatory asset values.

The approach outlined in this chapter only applies to the treatment of forward capex in revenue caps made after the release of this chapter. The approach to past capex in the initial regulatory period is outlined in Appendix B.

5.2 Issue

Chapter 2 of this document sets the framework for the ACCC's approach to establishing an incentive mechanism for capex. The incentive mechanism proposed places a strong reliance on setting an investment cap on an ex ante basis. The fundamental principles underlying this framework include:

- Incentive regulation – Under an incentive-based regime, the regulator does not seek to control key business decisions of the regulated firm and provides the firm with financial incentives to encourage the firm to pursue desirable outcomes. The proposed incentive mechanism for capex achieves this through providing an investment allowance which is not linked to the TNSP carrying out specified projects and which allows the TNSP to retain any underspend during the regulatory period.

- The need for balance – It is important that the incentive regime for capex does not result in the firm reducing expenditure to the point that service quality is threatened. The proposed mechanism for capex acknowledges that the information on this service standards balance in the NEM is incomplete, and therefore introduces a relatively "low powered" incentive mechanism.

- Certainty – In determining an investment allowance "ex ante", the ACCC is providing greater certainty to TNSPs on the maximum allowed investment during the regulatory period. The current ex-post review does not provide the needed certainty as to whether or not TNSPs will earn a reasonable rate of return on investments they have undertaken.

5.3 Code requirements

As discussed in section 5.1, there are three relevant points in time:

- setting, for the forthcoming regulatory control period, a revenue cap that includes an allowance for future capex;

- actual capex by the TNSP during the period; and

- when resetting the revenue cap for the next period, determining how that capex affects the opening RAB.

This section sets out the relevant code provision at each point in time.[43]

[43] Albeit in a different order from that set out in section 5.1.

Capital expenditure during a regulatory control period

Part B of chapter 6 of the code sets out the ACCC's functions with respect to the regulation of transmission revenue. Under clause 6.2.4(b), the ACCC is required to set (or reset) a revenue cap to apply to each TNSP for a regulatory control period. Clauses 6.2.4(d) and (e) set out the limited circumstances where the ACCC may revoke and remake the revenue cap during that period.

Capital expenditure by a TNSP during a regulatory control period is governed by chapter 5 of the code. Clause 5.6.5A requires the ACCC to issue a 'regulatory test'. The regulatory test is the prudence test set out in the code to assess the economic efficiency of investment decisions. In issuing the regulatory test, the ACCC is required to have regard to, amongst other things, the need to ensure that the test is consistent with the basis of asset valuation used to set a revenue cap. The ACCC released its regulatory test on 15 December 1999 and an amended version on 11 August 2004.

Clause 5.6 of the code sets out the process that a TNSP must follow in order to construct a 'new small network asset' (being an augmentation between $1 million and $10 million) or 'new large network asset' (being an augmentation in excess of $10 million).

Clauses 5.6.2 and 5.6.2A of the code require each TNSP to analyse the expected future operation of its transmission network and to prepare an annual report. In relation to proposed new small network assets, the annual report must consider alternative options and set out why the TNSP considers that the proposed approach satisfies the regulatory test. Interested parties are entitled under clause 5.6.6A(a) to make submissions to the TNSP and the TNSP may revise its report. At the next revenue cap reset, the ACCC is required to take into account the TNSP's report, all material submitted to the TNSP and whether the asset satisfies the regulatory test. Where the annual report does not address a proposed new small network asset, the TNSP is required to publish a report addressing similar matters to the annual report. The process then followed is similar to the annual report.

Under clause 5.6.6, a TNSP that proposes to establish a new large network asset must prepare an application notice (which, amongst other things, must consider alternative options and set out why the TNSP considers that the proposed approach satisfies the regulatory test). Interested parties are entitled under clause 5.6.6(d) to make submissions to the TNSP. The TNSP is then required to prepare a final report addressing the same matters as the application notice and responding to the submissions.

Certain aspects of the final report may be disputed by code participants and interested parties using a modified version of the dispute resolution process set out in clause 8.2 of the code. The TNSP is then required to prepare a final report incorporating any determination by the Dispute Resolution Panel. The Panel cannot determine whether the new large network asset satisfies the regulatory test. If a code participant or interested party disputes a finding in the report that the asset satisfies the regulatory test (except where the asset is a reliability augmentation), the TNSP must apply to the ACCC for determination of this issue prior to construction. The ACCC's determination applies to the end of the regulatory control period.

Chapter 5 of the code does not expressly provide that if the TNSP satisfies (or does not satisfy) clause 5.6, the capex is automatically included in (or excluded from) the opening RAB at the next revenue cap reset. Nor does the code allow the revenue cap to be reopened during the regulatory control period (unless the construction of the asset satisfies the limited circumstances set out in clause 6.2.4(d)).

Resetting the revenue cap: Determining the opening RAB

In setting a revenue cap in accordance with clause 6.2.4(b) of the code, the ACCC is required under clause 6.2.4(c) to have regard to a number of matters including 'the provision of a fair and reasonable risk-adjusted cash flow rate of return on efficient investment … subject to the provisions of clause 6.2.3(d)(4)'.[44]

Clause 6.2.3(d)(4) relevantly provides that the regime to be administered by the ACCC must have regard to the need to provide a fair and reasonable risk-adjusted cash flow rate of return to the TNSP on efficient investment where:

> (i) assets created at any time under a take or pay contract are valued in a manner consistent with the provisions of that contract;
>
> (ii) assets created at any time under a network augmentation determination made by NEMMCO under clause 5.6.5 are valued in a manner which is consistent with that determination;
>
> (iii) ….
>
> (iv) subject to clauses 6.2.3(d)(4)(i) and (ii), valuation of assets brought into service after 1 July 1999 ("new assets") … is to be undertaken on a basis to be determined by the ACCC and in determining the basis of asset valuation to be used, the ACCC must have regard to:
>
> A the agreement of the Council of Australian Governments of 19 August 1994, that deprival value should be the preferred approach to valuing network assets;
>
> B any subsequent decisions of the Council of Australian Governments; and
>
> C such other matters reasonably required to ensure consistency with the objectives specified in clause 6.2.2; and
>
> (v) benchmark returns to be established by the ACCC are to be consistent with the method of valuation of new assets and revaluation, if any, of existing assets and consistent with achievement of a commercial economic return on efficient investment.

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[44] Clause 6.2.4(c)(5). See also clauses 6.2.2(b)(2) & (d), 6.2.3(d)(1) & (d)(2) and 6.2.4(c)(3) & (c)(7).

'Deprival value' is defined as 'a value ascribed to assets which is the lower of economic value or optimised depreciated replacement value'.

Apart from the reference in clause 6.2.3(d)(4)(ii) to NEMMCO determinations under clause 5.6.5 (which is now superseded by the process set out in clauses 5.6.6 and 5.6.6A), compliance (or non-compliance) by a TNSP with clause 5.6 does not automatically determine whether the capex incurred in a period is included in (or excluded from) the opening RAB at the next revenue cap reset.

However, the terms of the preceding revenue cap and compliance with clause 5.6 are likely to be relevant to the resetting of the revenue cap. In setting the revenue cap, the ACCC is required to have regard to:

- the need to provide reasonable certainty and consistency and minimise regulatory costs (clauses 6.2.2(a), (g) & (i)-(k) and 6.2.3(d)(5)); and
- the on-going commercial viability of the transmission industry (clause 6.2.4(c)(8)).
- the matters raised during the procedure followed in respect of new small network assets (clause 5.6.6A). (In making the regulatory test, the ACCC is required to have regard to the need to ensure that the test is consistent with the basis of asset valuation determined by the ACCC for the purposes of clause 6.2.3 (clause 5.6.5A(b)).

Setting a revenue cap: Determining future capex

In addition to the matters discussed above, in setting a revenue cap, the ACCC is required to have regard to:

- the need to foster an efficient level of investment and provide for an equitable allocation between TNSPs and users of expected efficiency gains (clauses 6.2.2(b)(1), (d) & (f); 6.2.3(d)(1) & (d)(2); and 6.2.4(c)(3));
- payments to any generators providing network support services in accordance with clause 5.6.2 (clause 6.2.4(c)(7)); and
- any other relevant financial indicators (clause 6.2.4(c)(9)).

5.4 Summary of submissions[45]

This section provides a brief overview of submissions received in response to the Supplementary Discussion Paper. Submissions on specific issues are outlined in sections 5.5 – 5.9.

[45] As the Supplementary Discussion Paper proposes an approach to the treatment of capex fundamentally different to that proposed in the Discussion Paper, this summary focuses on the responses received in response to the Supplementary Discussion Paper.

TransGrid, Energy Australia, ElectraNet SA and Powerlink do not support the ACCC's proposed ex ante capital expenditure allowance regime. TransGrid and Energy Australia note that there are problems with the current ex-post review regime but believe these can be better addressed by establishing clearer criteria for the ex-post efficiency test.

ElectraNet SA and Powerlink are concerned that the ex ante regime will make it difficult for them to respond in a timely manner to meet mandated network reliability standards due to delays caused by the need to re-open the cap during the regulatory period. Both noted, however, that with modifications to the proposed arrangements these concerns can be addressed.

SPI Powernet, TXU and Transend support the proposed framework conditionally.

ESIPC states that the ex ante model has a number of positive features but that a pure ex ante framework may send the wrong incentive signals to TNSPs.

5.5 Overview of Proposed Investment Incentive

5.5.1 Introduction

This section discusses the consistency of an ex ante cap on investment with the code provisions discussed in section 5.3 above (in particular, the provisions relating to certainty for service providers and transmission users, and efficiency incentives). This section will focus firstly on the three elements of the proposed regulatory incentive – the ex ante cap, the allowance for significant uncertain (excluded) investment, and the "off-ramps" provisions. The rest of this chapter will specify these three elements in detail. This section will discuss the rationale for implementing this regulatory design, focusing on the principles that the ACCC has adopted.

5.5.2 Submissions by interested parties on supplementary discussion paper

In the supplementary discussion paper, the ACCC sought views of interested parties on the incentive properties of setting an ex ante investment allowance.

Safeguards against inefficient capex underspend

Energy Australia, Transend, ElectraNet and Powerlink believe that the statutory reliability requirements would be an adequate safeguard against inefficient underspending under the proposed ex ante framework. Transend notes, however, that Tasmania does not currently have statutory reliability requirements.

TXU states that the firm cap and efficiency carry over mechanism coupled with the application of the regulatory test should be an adequate safeguard against inefficient underspending.

SPI PowerNet and TransGrid do not believe reliability requirements are an adequate safeguard. SPI PowerNet suggests that a clearer definition of the service required from a TNSP is needed. TransGrid comments that the proposed ex ante framework offers very strong incentives to keep capex within the cap and this may lead to service degradation.

Adequacy of efficiency incentives/benefit sharing mechanisms

SPI PowerNet, TransGrid, Energy Australia, ElectraNet and Powerlink all commented that the ACCC's proposed benefit sharing is asymmetric in its treatment of underspending and overspending. They commented that retaining the benefit of underspending until the end of the current regulatory period is an insufficient incentive in light of the risk that any overspending would result in the loss of return on capital, even if the excess expenditure was prudently incurred.

ElectraNet suggests that an adjustment should be made to the cash flows in the next one or two regulatory periods to allow a TNSP to retain a share of any efficiency gain or loss beyond the current regulatory period.

Powerlink suggests that a more balanced approach would be to roll into the asset base for the next period an amount between the ex ante investment cap and the actual capitalisation. Powerlink suggests that this approach would share the long term benefits and risks between TNSPs and consumers more fairly.

Transend suggests that a middle ground approach would be most appropriate, whereby the regulatory asset value at the beginning of the next regulatory period would reflect actual additions, disposals and depreciation. It suggests that TNSPs should retain all of the additional return on and return of unspent capital for a defined period, such as five years from when the underspending occurs. If overspending occurs, the carry over penalty into the next period should be offset against future efficiency bonuses.

5.5.3 ACCC's considerations

After considering submissions from interested parties on the supplementary discussion paper, the ACCC considers that it is appropriate to implement a regulatory framework which combines an ex ante cap for the majority of expected investment with specific projects excluded from the cap. The discussion in this section highlights the elements of the proposed investment incentive and the principles underlying this proposed framework.

Proposed investment incentive

The proposed investment incentive consists of three elements – the ex ante cap, the allowance for significant uncertain (excluded) investment, and the "off-ramps" provisions.

Ex ante cap

- Depending on the TNSP involved, the ex ante investment cap should cover most or all expected investment during the regulatory control period, including more discretionary investment not related to statutory reliability obligations – such as investment to relieve constraints or investment in interconnectors. The ACCC expects that only in rare circumstances should specific projects be excluded from the cap.

- The ex ante cap should generally be determined on the basis of a probabilistic assessment of necessary investment. The cap, however, does not entail project-specific approval and there will no constraint on TNSPs investing in different projects to those included in the calculation of the cap.[46]

- An ex ante cap provides an incentive for TNSPs to find ways to defer expenditure. This is an efficient outcome since it means that the TNSP uses less input to deliver the same output (assuming of course that deferring expenditure did not lead to a reduction in service quality). Under the proposed ex ante incentive, TNSPs would capture all of the value of this incentive, until the next regulatory reset at which point consumers would benefit through a relatively lower RAB.

Exclusions

- The ACCC considers that the basis for excluding projects from the cap is that such projects could present a significant error in the calculation of the ex ante cap. Investments excluded from the cap should be clearly defined at the start of the regulatory period.

- Projects excluded from the cap will be subject to regulatory review during the control period if those projects are to be developed. This regulatory assessment will take account of TNSP investments during the regulatory period to determine the net additional investment needed to respond to the excluded events. In this way, greater certainty will be provided on the maximum allowed investment during the regulatory period.

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[46] There is an exception to this rule to deal with gaming of the regulatory incentive. This is discussed in section 5.6.4.

Off-ramps

- To ensure that TNSPs are able to flexibly respond to unforeseen events, there should be an "off-ramps" mechanism so that investment pursuant to those events would not automatically be excluded from the RAB.

Principles of proposed capex arrangements

In developing the proposed approach, the ACCC has been driven by the following principles:

Incentive-based regime

The ACCC is presenting a consistent overall package, by providing incentives in the form of CPI-X regulation. The proposed regime provides the TNSP with substantial discretion to make its own decisions concerning investment covered by the ex ante cap. This incentive-based regime avoids the problems inherent in an approach where the regulator "second guesses" the TNSPs' investment decisions.

Further, under the proposed regime, the TNSP is allowed to retain any underspend during the regulatory period with the actual level of investment rolled into the RAB. The ACCC believes that this arrangement has significant incentive properties.

The ACCC recognizes that it is highly unlikely that it will be able to determine, with perfect accuracy, the level of efficient investment during the period of a regulatory control. This would demand perfect foresight of all the factors that would affect the efficient level of investment, as well as knowledge on how an efficient service provider would optimally respond to those factors. As this is not achievable, some degree of "windfall" gain or loss may accrue.

The ACCC believes, however, that issues associated with windfall gains or losses need to be set against other possible benefits arising from the incentives provided by the ex ante cap including that the incentive will encourage TNSPs to reveal efficient costs – information that would not be provided other than in response to such incentives. The ACCC notes that this information can be used by the regulator to establish subsequent capex incentives more accurately.

Certainty

In determining an investment allowance "ex ante", the ACCC is providing certainty to TNSPs and transmission users (required by clause 6.2.2(j)) on the maximum allowed investment during the regulatory period. This has been discussed in chapter 2 and is consistent with the approach adopted for the asset base in chapter 4. The ACCC believes that the current practice of reviewing the prudence of projects "ex-post" does not provide sufficient certainty as to whether or not TNSPs will earn a reasonable rate of return on investments they have undertaken.

Balance

The ACCC notes that the strength of the efficiency incentive and the extent to which efficiency gains will be equitably shared between TNSPs and transmission users

(required by clause 6.2.2(b)(2)) will depend on service quality obligations and incentives, and the way that the RAB is determined at the end of the regulatory period.

The ACCC notes that there is a variety of possible responses to the incentives established by the ex ante cap. TNSPs may respond to the incentive created by the ex ante cap on investment by reducing the amount of investment needed to meet their outputs (or spending the same money more wisely) while at the same time maintaining or increasing outputs (such as the quality of service). If this were to occur then the efficiency of investment will increase.

However, TNSPs could achieve higher returns by cutting investment at the expense of service quality. Further, the ex ante investment cap could also deliver gains (or losses) to service providers not because they had invested efficiently, but because the cap was incorrectly set. These outcomes would potentially be inconsistent with clause 6.2.2(c), which requires the prevention of monopoly rent extraction, and clause 6.2.2(d), which requires that the regulatory regime should foster an efficient level of investment.

The ACCC believes that there are a number of distinguishing features which help shape the incentives that should apply to transmission capex. The ACCC notes that while some capex spending is ongoing and reasonably predictable, such as maintenance and replacement expenditures, a significant part of TNSP spending does not fall into this category. In particular, transmission investment is characterized by large projects with, in many cases, considerable uncertainty about the specification and costing of projects.

This means that the link between capex and service standards may be tenuous in the case of transmission. The lumpiness of transmission investment may mean that falls in capex may take some years to show up in the form of declining service standards. Distribution and opex spending is characterized by a more direct relationship between current spending and current service standards.

In the context of the NEM, the ACCC notes that statutory reliability requirements are in place for transmission and that the ACCC is developing a service standards incentive regime. However, planning standards would appear to differ from state to date and impose different obligations on TNSPs. In South Australia, more exacting statutory reliability requirements are in place than in other jurisdictions. Even where similar requirements exist, TNSPs would appear to interpret these requirements differently. SPI PowerNet notes that a clearer definition of the service required from a TNSP is needed.

Therefore the extent to which statutory reliability requirements provide safeguards against inefficient capex underspending is not entirely clear. While the majority of TNSPs believe that statutory reliability requirements provide an adequate safeguard against inefficient underspend, TransGrid's submission notes that the proposed arrangements provide strong incentives for cutting spending, potentially at the cost of service degradation. Further, Transend notes that there are no statutory reliability requirements in place in Tasmania.

Given the uncertainty associated with this service standards balance, the ACCC proposes a relatively 'low powered' incentive regime. The ACCC proposes a regime which allows TNSPs to retain any underspend during the regulatory period, with the actual level of investment rolled into the RAB, provided that this level does not exceed the cap.

Symmetry

As noted above, under the proposed capex framework the ACCC will allow the TNSP to roll in projects covered by the ex ante cap at cost, without further scrutiny by the regulator. Therefore, the ACCC is relying on incentives inherent in the CPI-X regime to minimize costs and encourage TNSPs to select the appropriate mix of projects. However, if a TNSP invests more than the cap, this additional investment will not be included in its RAB.

A number of submissions have argued that this incentive is asymmetric in that any overspend of the cap can not be included in the RAB. The ACCC believes that any discussion of the incentives of the proposed arrangements without reference to the level at which the cap is set is potentially misleading. A firm cap set conservatively provides greater incentives for the TNSP than one set less conservatively. A discussion of incentives created by a cap without any reference to the level of the cap, therefore, may give an incomplete picture.

While the ACCC does not accept that its proposed capex arrangements provide an asymmetric incentive, it notes that a low powered incentive regime with symmetrical treatment of overspend and underspend would potentially provide little deterrence to overspending against the cap. This is the case because any overspend will tend to be incurred towards the end of the regulatory period. With investments rolled in at cost in the subsequent regulatory period, the penalty suffered by the TNSP would be limited to an inability to earn a return on overspend for the current regulatory period – which may be for a period of less than a year.

The ACCC believes therefore that it is necessary that a firm cap on overspend be introduced. However, given that a firm cap is intended to be a fundamental element of the capex incentive, the ACCC is mindful of providing safeguards for the TNSP.

- The ex ante cap will be flexible enough to cater for changes in a TNSP's key investment drivers, such as changes in peak demand;
- The capex incentive will include a provision to exclude large, uncertain projects from the ex ante cap; and
- The capex incentive will include an "off-ramps provision" whereby unforecastable investment requirements are excluded from the ex ante cap.

By providing these safeguards, the potential for overspend on projects beyond the TNSPs' control is correspondingly reduced.

The ACCC acknowledges that its proposed regime potentially involves lower powered incentives than that in place in other jurisdictions. 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.[47]

Given the incomplete understanding of transmission service standards, the ACCC is reluctant to adopt a higher powered incentive for capex at this stage.

5.6 Ex ante cap

5.6.1 Introduction

The first element of the proposed investment incentive is the ex ante cap. This section discusses the major issues associated with the implementation of the ex ante cap. It focuses in turn on the form of the ex ante cap; the impact of investment under the ex ante cap on revenues during the regulatory period and the calculation of the closing RAB; and the approach to establishing the cap.

5.6.2 ACCC's Supplementary Discussion Paper

In the Supplementary Discussion Paper, the ACCC argued that it may be appropriate to move to an approach based on a firm ex ante cap on the total investment for the forecast period.

The ACCC outlined some of the features of the proposed ex ante cap in the Supplementary Discussion Paper. The ACCC noted that the ex ante approach would involve the TNSP proposing a five-year capex allowance, which would be assessed by the ACCC. The ACCC would establish a firm cap at the start of each regulatory control period. This would be expressed as a profile of spending for each year of the control period rather than as a specified list of investments and their expected costs. TNSPs would be free to decide which projects to build and when to build them with the knowledge that as long as the aggregate cost of those projects is less than the cap, then they are authorised to recover the cost of these investments through regulated charges. However, if a TNSP invests more than the cap, this additional investment will not be included in its regulated asset base.

The ACCC noted that the investment cap would be established on the basis that it represents the level of spending necessary to ensure that an efficient TNSP is able to meet its statutory and code obligations, taking account of the likely changes in the factors driving the need for and cost of investment. The profile of capped spending will be included in the determination of revenues for the regulatory control period.

The Supplementary Discussion Paper also sought views on issues associated with the implementation of an ex ante cap.

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

5.6.3 Submissions by interested parties on Supplementary Discussion Paper

How Ex Ante Capex Cap should be set

SPI Powernet suggests the cap should be set conservatively initially and should tighten over time as the ACCC responds to observed parameters at future reviews.

Transend, ElectraNet SA and Powerlink suggest the ex ante capex should be set differently depending on the individual TNSP. They suggest that each TNSP would be prepared to accept different risk levels depending on the environment they operate in and would therefore be prepared to include different types of capex in their ex ante cap.

ElectraNet SA and Powerlink suggest setting a pre-agreed formularised ex ante cap that adjusts automatically to changes in one or more key variables.

Alternatively Transend and ElectraNet SA suggest that a probabilistic assessment of proposed projects should be used to set the ex ante capex cap. Transend, however, comments that if this approach is adopted, annual or end of period adjustments to the cap would need to be made to reflect the difference between actual and forecast capex.

TransGrid and EnergyAustralia both indicate that they imagine the process of setting the ex ante cap and reviewing investments which fall outside of the cap will be just as resource intensive for the ACCC and intrusive for the TNSP as the current ex post regime.

5.6.4 ACCC's considerations

Form of the cap

As discussed in section 5.5, the objective of the ex ante cap is to establish certainty and incentives for efficiency. This requires that the cap be reasonably aligned with efficient costs over the period.

The ACCC notes that there are many ways to formulate the cap. It could take the form of a fixed annual amount for each year of the control 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 would be a cap 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 cap can have a fixed element and an element that changes in line with key cost drivers. A TNSP could, in its revenue cap application, propose a cap in the following form:

Allowable capital expenditure = $A + \Sigma (Bi * Xi(actual))$

Where:

A	=	a fixed amount ($million) per year
Bi	=	a $/cost driver amount representing the variation in investment for a change in cost driver i
Xi(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 Xi(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:

Allowable capital expenditure = $A + \Sigma (Bi * Xi(forecast))$

Where:

A	=	a fixed amount ($million) per year
Bi	=	a $/cost driver amount representing the variation in investment for a change in cost driver i.
Xi(forecast)	=	the forecast level of the cost driver i over the regulatory period

At the end of the revenue control period there would need to be an adjustment to allowed revenues equal to $\Sigma Bi*(Xi(actual)- Xi(forecast))$ to take account of differences between the actual and forecast level of the cost drivers.

The ACCC expects that TNSPs will propose a structure of the cap 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.

Impact of investment under the ex ante cap on revenues during the regulatory period and the calculation of the closing RAB

Impact on calculation of allowed revenues

The calculation of the rate or return and depreciation will take account of the annual profile of capital expenditure established by the cap. The calculation will generally be undertaken according the existing Post Tax Revenue Model methodology.

Calculation of the closing RAB

In principle, the calculation of the closing RAB at the end of the regulatory control period (other than for investments described in sections 5.7 and 5.8) will 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 ACCC notes that if in present value terms the total capital expenditure during the regulatory period is above the present value of the expenditure specified in the cap, then it will be necessary to adjust the level of expenditure, so that in present value terms it is not greater than the level specified by the cap. A simple way to make such an adjustment is to uniformly adjust the actual level of expenditure in each year (as a constant percentage) so that the present value of expenditure equals the level established in the cap. Such an adjustment mechanism does not require the ACCC to make a judgement of when the over-spending occurred. The following example describes this calculation.

Imagine that the ex ante cap specified an annual stream of investments equivalent to $100m per year for the five years of the control. In present value terms (discounted at an assumed 6 per cent WACC) this is worth $421m. Imagine that the TNSP actually spent $136m in the first year but only $91m in the subsequent years. In the case the total expenditure for the five years of the control is $500m – equal to the level of the cap, but the present value of the expenditure is $426m - $5m above the level of the cap. Therefore an adjustment of $5m (in present value terms) needs to be made to the total actual expenditure over the control period to bring it down to the level of the cap. In this case a uniform downward adjustment of the actual expenditure of around 1% per year will ensure that only expenditure up to the level of the cap is recorded in the RAB.

Approach to establishing the cap

A "firm" ex ante cap will provide a TNSP with greater certainty about its allowed investment during a period. The ACCC notes that this cap must be correctly set so that TNSPs can meet their statutory and code obligations while delivering value for the funds invested. The ACCC acknowledges that establishment of the cap will therefore require thorough analysis. However, the ACCC questions whether it will require the same degree of analysis of a TNSP's decision making process as the current ex-post regime.

Capital expenditure 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 cap 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:

a) Projects currently under construction

b) Projects very likely to be built during the coming regulatory period

c) Possible 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 control 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 (what are 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 etc. 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 follow from asset management processes and procedures. Therefore an assessment of such capex may need to focus on the appropriateness of such processes and procedures, rather than on the efficiency of specific investments. It will be useful for the ACCC to have 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 may 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 have a good understanding of the validity and history 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 ACCC expects that the individual assessment of the efficiency of substantial replacement projects will remain an important task, 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 would be 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 could be 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 would expect 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.

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.

5.7 Allowance for significant but uncertain (excluded) investment

5.7.1 Introduction

The second element of the regulatory incentive is an allowance for significant but uncertain investment, which is excluded from the ex ante cap. As discussed in section 5.5, the core principle underlying the approach to the design of the capex regulatory incentive is that possible projects should generally only be excluded from the ex ante cap 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 cap will therefore improve the accuracy of the ex ante cap and hence ensure that the cap 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. The rest of this section outlines the conditions under which this mechanism will be invoked and the proposed approach.

5.7.2 ACCC Supplementary Discussion Paper

In the Supplementary Discussion Paper, the ACCC noted that while much capex is predictable (for example, replacement capex), other investment is lumpy and cannot be accurately predicted. Therefore, the ACCC noted that a project specific assessment of certain "significant" projects may be appropriate, with a firm ex ante cap on remaining capex.

The Supplementary Discussion Paper noted that there are a number of possible ways to distinguish which projects should be subject to project-specific approval. For example:

- intra-regional projects be included in the cap, but inter-regional projects be subjected to project-specific approval
- small network projects be included in the cap, but large network projects be subjected to project-specific approval
- investment to replace aged assets (i.e. non-augmentation investment) be included in the cap, but augmentation investment be subjected to project-specific approval
- investment planned to meet statutory planning standards be included in the cap, but non-planning standard investment be subjected to project-specific regulation
- highly certain future projects be included in the cap, but less certain investments be subjected to project-specific regulation.

5.7.3 Submissions by interested parties on Supplementary Discussion Paper

SPI PowerNet, EnergyAustralia and Transend submit that the ACCC should negotiate directly with a TNSP to determine what should be included or excluded from the ex ante cap on an individual basis. They argue that each TNSP operates in a different environment and faces different risks so there should be no specific criteria set for exclusions. EnergyAustralia suggests that an individual TNSP would need to assess its proposed future projects and then demonstrate to the ACCC why these projects should be excluded from the ex ante cap. Transend, while maintaining that the decision to include or exclude types of capex should be up to the individual TNSP, suggests that inter-regional and large projects could be excluded in some circumstances.

SPI PowerNet suggests that an alternative to determining a detailed list of exclusions would be to adopt an automatically adjustable cap on capex which adjusts with demand.

ElectraNet SA and Powerlink suggest that all reliability augmentations must be included in the ex ante cap in order to avoid delays which would put the TNSP at risk of failing to meet mandatory service standards. However, Powerlink notes that it may be necessary to exclude one-off step increases in load reliability augmentations from the ex ante cap. They both suggest that market benefit augmentations should be excluded from the ex ante cap.

TXU agrees that inter-regional investments and large investments (greater than $20 million) should be excluded from the ex ante cap. TransGrid suggest that only relatively unpredictable projects should be excluded and that the rules need to be drafted to clarify the identification of 'predictable projects'.

TransGrid also raised the issue of what would occur if a project initially thought to be within the parameters for inclusion in the ex ante cap evolved into a project that should be excluded from the ex ante cap.

EnergyAustralia commented that approximately 60% of its planned portfolio would need to be excluded from the ex ante cap. It argues that this illustrates that a firm ex ante cap is not an appropriate method to determine its revenue.

5.7.4 ACCC's considerations

The ACCC notes the argument that the exclusions regime should be flexible, with the ACCC negotiating directly with the TNSP to determine what should be included or excluded from the ex ante cap on an individual basis. While the ACCC believes that the approach to specifying exclusions needs to be well defined to minimise the potential of regulatory gaming, it is proposing an exclusions regime that is flexible enough to deal with the different environments in which the TNSPs operate.

As discussed, the key consideration in deciding whether a project should be excluded from the ex ante cap relates to the extent to which including the project in the ex ante cap would cause a substantial misalignment of the cap with efficient costs over the period of the regulatory control. When such misalignments occur, it will give rise to windfall gains (if the cap is too low) or losses (if the cap is too high) not attributable to the actions of the TNSP. This points to the need to exclude projects if their inclusion would lead to a significant error in the ex ante cap.

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 cap – if the project was developed.

The ACCC proposes to exclude projects from the ex ante cap if the expected error presented by the inclusion of that project in the cap, is equal to more than 10% of the ex ante cap. The detailed specification of this criterion is set out in the box below.

Under the existing regulatory arrangements where revenues (and hence capital allowances) 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 control period by setting the revenues for the subsequent regulatory period. This means that the calculation of the expected error in the ex ante cap attributable to any single project should 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 would be zero if the project was 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 cap. In particular, a project is excluded from the ex ante cap if:

Expected Error/Allowed Revenue < 10%

Where

- *Allowed Revenue* is the total depreciation plus return on the investment included within the ex ante cap (excluding any potentially excluded projects) during the *Regulatory Control Period*
- *Expected error* = Maximum (*A,B*)
- *A* = Total Depreciation plus Return on the *Expected Value of the Project* during the Regulatory Control 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 Control 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 Control Period* is the period for which the ex ante investment cap is determined.

While the ACCC expects the majority of excluded projects to satisfy this threshold, TNSPs can apply to the ACCC for other specific projects to be excluded from the ex ante cap. It will be at the ACCC's discretion as to whether these projects will be considered as excluded projects.

In addition to this "value" exclusion criterion it is also necessary to consider the nature of projects to be excluded from the cap. Specifically, in the development of the ex ante cap, the ACCC expects that TNSPs will undertake a probabilistic assessment of capex requirements. This approach takes account of different systemic cost drivers such as trend rates of demand growth, and uncertainty in the need for investment and uncertainty in the cost of projects, and delivers a probabilistic capital expenditure allowance related to those systemic cost drivers.

The *expected values* that derive from this probabilistic assessment are intended to ensure that allowances for projects that are not developed (or that cost less than expected to develop) offset allowances for projects that are developed (or that cost more than expected). The error across the portfolio is determined by the extent to which the offset is distorted one way or the other. The greater the size of the portfolio, the greater the diversification and the lower the expected error – assuming no systematic under or over-estimation of the cost or probability of development of projects.

The ACCC considers that projects should in general only be specifically excluded from the ex ante cap 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 value exclusion criterion means that possible future projects should only in rare circumstances be excluded from the ex ante cap.

Regulatory mechanism

The ACCC has considered three ways of regulating projects excluded from the ex ante cap. They differ based on whether the regulatory determination of the allowed investment in such projects takes place before, during or after the regulatory period in which the investment begins.

- **Before:** At the start of the regulatory period, define investment triggers for excluded projects and establish maximum investment allowances (caps) linked to those triggers.

- **During:** Determine the allowed investment on such projects during a regulatory period once the probability of the project and its expected costs become known with greater certainty, but before investment is committed.

- **After:** Determine the efficiency of investment in excluded projects after the regulatory period.

This rest of this sub-section considers the advantages and disadvantages of each approach and then concludes on the preferred approach.

Determining an investment cap at the start of the regulatory period

This approach can be illustrated by example as follows: At the time of the revenue cap determination, there is a strong probability that a large point load (estimated between 500 and 1000 MW) will locate in one of three locations. If this load occurs, the TNSP expects that it will need to invest between $100m and $180m over four years depending on the size of the load and its location. The determination of the investment cap at the start of the period would need to define specific triggers for the investment. In this example, triggers would be based on the size and location of the investment. The necessary project and the expected cost of this project would be defined for each trigger. Depending on the trigger that was pulled, the investment cap would therefore be established and the TNSP would be able to automatically include

in their RAB their actual expenditure on the project up to the level of the cap for that project

The main advantage of this approach is that specifying the cap on investment at the start of the regulatory period will provide certainty on the maximum investment; and an incentive to invest efficiently in the same way as established in the main ex ante cap.

The main disadvantage of this approach is the potential complexity of specifying the investment triggers and the expected investment in response to those triggers, at the start of the regulatory period, with sufficient accuracy. For example, at the start of the regulatory period, the size and location of the new load is uncertain. Depending on these outcomes, the necessary network augmentation could vary significantly. Furthermore, the necessary investment could be affected by other generation and load developments that would only be known as the regulatory period progressed. A "menu" of investment triggers and resulting investments could be developed to take account of different permutations and combinations of business drivers. Nonetheless, there may still be a concern as to whether a sufficiently accurate investment allowance could be established at the start of the regulatory period.

Determining the allowed investment during the regulatory period

With this approach, once it becomes clear where the point load will locate and its size, the TNSP would develop the specification and cost of the project that it considers is needed to efficiently provide the necessary capacity. It would be expected to conduct the Regulatory Test as required by chapter 5 of the code. It would then apply to the ACCC during the regulatory period to assess the efficiency of the proposed investment. Once the ACCC is satisfied that the proposed investment is efficient it will advise the TNSP.

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.

The main disadvantage of this approach is that it will require the ACCC to look into the TNSP's investment during the regulatory period and the investment provided for by the ex ante cap to determine whether provision for the necessary investment had already been made under the ex ante cap. For example, if the ex ante cap had already provided for investment in projects that would have gone a long way towards meeting the additional needs of the new point load, then the allowance for the additional investment to meet the new point load should be net of the amount already deemed to be have been provided by the ex ante cap. Effectively – and unavoidably – this means that aspects of the ex ante cap may be "re-opened", with the consequence of decreasing certainty.

Determining the allowed investment at the end of the regulatory period

Under this approach, the ACCC would determine the efficiency of investment in excluded projects at the end of the regulatory period – after such investment has

started. The advantage of this approach is that it avoids the need for regulatory assessment during the regulatory period. However, there are considerable disadvantages of an ex post regulatory approach. These issues were fundamental to the ACCC's decision to examine the regulatory framework for capex, commencing with the Supplementary Discussion Paper.

Proposed approach

A comparison of the advantages and disadvantages of the approaches described above suggests that a major consideration is the trade-off between:

- the detriment of windfall gains or losses that would arise if the incentive is established at the start of the regulatory period; and
- the detriment of reduced certainty and potentially weaker efficiency incentives that will arise if the allowance is determined during the regulatory period.

Excluded projects are by definition large and uncertain. A more complex and sophisticated ex ante incentive could help to mitigate the risk of significant windfall gains or losses, but this risk will still remain. Significant windfall gains or losses are undesirable to TNSPs and transmission users. Furthermore, significant windfall gains or losses on individual excluded projects will undermine the ex ante regulatory approach that will apply to the vast bulk of investment included under the ex ante cap. For these reasons, the ACCC considers that establishing the investment allowance for excluded projects during the regulatory period will generally be the preferred approach.

Impact of excluded investment on the calculation of allowed revenues during the regulatory period and on the calculation of the closing RAB

The code precludes the ACCC from resetting allowed revenues during the period of a revenue control 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 allowance for investment in excluded 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 re-opening of the revenue cap to deal with excluded investment would address this issue. The ACCC considers that there is a strong case to amend the code, as it would provide absolute certainty to TNSP's as to the treatment of excluded projects. However, given the current provisions of the code, this issue could be addressed by providing an allowance for expenditure on excluded projects at the start of the regulatory control period. This could be calculated on the basis of the expected value of the expenditure (i.e. the product of the probability of proceeding and the expected cost). If an allowance is made, then at the end of the regulatory period an adjustment will need to be made to the RAB depending on whether or not the investment occurred and how its cost compared to the allowance.

The choice of whether to make an allowance should be driven by concerns over price changes and TNSPs' cash flow requirements over the period of a five year control. The ACCC will ensure that in present value terms there is no benefit or detriment

depending on whether or not an allowance was made at the start of the regulatory period.

A final issue concerns the closing RAB calculation for an excluded project. The ACCC considers that the closing RAB calculation could be determined by taking into account either:

- the views expressed by the ACCC during the regulatory period on the efficient level of investment. This may take the form of the cost of the project as determined in a regulatory test assessment, or
- the actual cost of undertaking the project.

The ACCC seeks views of interested parties on which of these approaches they believe is appropriate. The ACCC's current thinking is that the actual cost approach provides greater certainty for TNSP's and is therefore favored.

Approach to establishing efficient investment in excluded projects

The determination of efficient investment on excluded projects will generally be established using the same assessment criteria as will be used to establish the estimate of efficient investment for the determination of the ex ante cap. That is, the ACCC will consider the need for the investment and whether the proposed project/s most efficiently meets that need. The same rigour of review procedures will apply.

5.8 Off-ramps provision

5.8.1 Introduction

The combination of the ex ante cap and separate mechanism for large but uncertain projects is intended to provide incentives for efficient investment during the regulatory control period, assuming no significant unforecastable events during the period of the control. This means that if it becomes necessary to invest in response to such events, such capital would not be provided by either of these two incentive mechanisms. It is therefore necessary to consider a separate mechanism to respond to the unexpected unforecastable event. This mechanism, which has been called the "off-ramps" mechanism, is the third element of the regulatory incentive proposed in this chapter. This mechanism is consistent with the code (clause 6.2.2(d)) which requires the determination of revenues taking account of efficient investment. This section discusses the proposed "off-ramps" arrangements and the process to be followed when this mechanism is invoked.

5.8.2 Supplementary Discussion Paper

In the Supplementary Discussion Paper the ACCC proposed an "off-ramps" regime which would establish conditions under which the investment cap will be "re-opened" during or after the regulatory control period. The ACCC noted that the principle of the "off-ramps" is that they should protect the TNSP from losses attributable to factors that have caused changes in the necessary (efficient) level of investment, which could not have been foreseen at the time that the cap was established, and over which the

TNSP has little or no control. In the Supplementary Discussion Paper, the ACCC noted that "off-ramps" may include force majeure events and other specific, identifiable events, such as unexpected load growth or unexpected location of new generation.

5.8.3 Submissions on Supplementary Discussion Paper

What should constitute an off-ramps event?

Transend and TransGrid support using the "off-ramps" to deal with unforeseen or uncontrollable events. Transend also notes that these events should be defined as "any external event which is outside of the reasonable control of a party, and could not have been anticipated by any experienced and competent TNSP at the time of the relevant revenue cap decision". TXU similarly argues that "off-ramp" events should be limited to events that are truly outside of management's control and which have a pronounced magnitude of effect on the TNSP's investment decisions such as a change in taxation legislation or changes in service standards. Alternatively EnergyAustralia proposes that the "off-ramps" be used to respond to changes in demand.

In terms of how it should be taken into account in the TNSPs revenue, EnergyAustralia, Powerlink, Transend, and TransGrid support a formularised adjustment to the revenue cap to deal with the off-ramps. These parties also suggest that "off-ramps" should operate in a similar manner to the way pass-through events occur for operating expenditure.

Should off-ramp events be triggered where there is an unspent portion of the ex ante cap?

TransGrid indicates that ideally any additional expenditure should be funded from any unspent portion of the cap, excluding any unspent portion due to the TNSP's efficiency. However, it acknowledges that there are difficulties in determining the portion of a TNSP's revenue cap arising from genuine efficiencies. It notes that it is up to the ACCC to decide whether to take the unexpected investment out of the unspent portion of the cap, but that the ACCC should be prepared to change the approach it decides to take if it discovers it is not working.

In contrast, Transend and ElectraNet state that "off-ramp" or pass-through events should not be funded from any capex underspend as this would undermine the efficiency incentive properties of the ex ante framework.

5.8.4 ACCC's considerations

Design considerations

The purpose of the "off-ramps" mechanism is to allow TNSPs to recover, through regulated charges, efficient investment needed to respond to unexpected exogenous events. In the design of the "off-ramps" mechanism it is necessary to consider the extent to which provision for some risks covered by the "off-ramps" mechanism have already been covered by the ex ante cap or treatment of excluded projects. For example, the ex ante cap would typically include provision for capital expenditure to prevent the damage of assets by lightning or terrorist threat. Terrorist actions or

lightning are typical exogenous risks that the "off-ramps" mechanism is meant to cover and yet provision for such risks – at least in terms of their mitigation and prevention – is likely to already have been made to some extent through the ex ante cap. This suggests that the design of the "off-ramps" provision should take account of the link to the capex already provided under the ex ante cap. The ACCC will also need to ensure that there is no overlap between the "off-ramps" and the opex pass through events it has already approved.[48]

A second design consideration is whether the "off-ramps" mechanism could be triggered by both TNSPs as well as transmission users and/or the ACCC. Specifically some unexpected exogenous events could reduce (rather than increase) the level of efficient investment during a regulatory period. For example a major customer may unexpectedly go out of business, thus freeing up network capacity and deferring the need for network augmentation that would otherwise have been necessary (and which could, for example, already have been provided for in setting the ex ante cap). In this case, the unexpected event presents a windfall gain to the TNSP. It would be unrealistic to expect a TNSP to volunteer to return the windfall gain to consumers. In this case, unless the "off-ramps" mechanism can be invoked by customers as well as TNSPs, TNSPs would obtain a windfall gain that should rightfully have accrued to transmission users.

A third design consideration is the gaming opportunities presented by the "off-ramps" mechanism. Specifically, if an "off-ramp" event occurs, the possibility exists that in proposing the necessary investment in response to that event, a TNSP could redefine investment that it would otherwise have undertaken under the ex ante cap (or as an excluded project). In this way, the TNSP could obtain the benefit of beating the ex ante cap, while also relying upon the "off-ramps" mechanism, to recover the cost and earn the regulated return on investment that it would have undertaken anyway.

These considerations suggest that the key challenge in designing the "off-ramps" mechanism is to ensure that it adequately protects TNSPs against adverse unexpected shocks, while making certain that it does not inadvertently undermine the integrity of the incentives under the ex ante cap and the arrangement for excluded investment. The ACCC considers that the key to this challenge is dealing effectively with information asymmetries that exist on the extent to which a provision to prevent or mitigate "off-ramps" events has already been made in the ex ante cap, and information asymmetries that exist in assessing the efficient level of investment in response to an "off-ramps" event.

Proposed mechanism

The proposed mechanism is summarized as follows:

- *Definition of "off-ramps" events*: an "off-ramps" event is an exogenous and possibly unforeseeable event that occurs during the regulatory period. While provision may have been made (in the ex ante cap) to prevent or mitigate the

[48] For example, under the pass through rules as currently drafted, the MAR is adjusted for expenditure (capital or otherwise) arising from a terrorist attack.

impact of such events, no specific allowance will have been made for the detriment that may arise if that event occurred. Typical "off-ramps" events will include commonly defined force majeure events but may also include other defined events, such as changes in taxation legislation or changes in applicable service standards. The ACCC expects that "off-ramps" events will need to be defined in consultation with TNSPs at the time of their revenue reset decision. The ACCC notes, however, that changes in trend events should not be considered under the "off-ramps" mechanism. As discussed in section 5.6, it is intended that they will be built explicitly into the cap.

- *Triggering the "off-ramps" mechanism:* The ACCC anticipates that the "off-ramps" mechanism will generally be triggered by the TNSP to deal with unexpected events that increase the level of efficient investment required in a regulatory period. However, the ACCC acknowledges that unexpected exogenous events could also reduce the level of efficient investment during a regulatory period. To deal with these situations, an "off-ramps" event can also be invoked by the ACCC or third party.

- *Compensation for "off-ramps" events*: If the cost of the event during the period of a regulatory control exceeds 5% of the capex allowance for the regulatory period, this cost will be recoverable from consumers, and subject to any cap to be determined by the ACCC.

In setting this in-principle requirement, the ACCC is mindful that it must preserve the integrity of the incentive properties of the ex ante cap by not setting the threshold for triggering the "off-ramp" provisions at too low a level.

Process to be followed when an "off-ramps" event is invoked[49]

The process to be followed when an "off-ramps" event requiring further investment is invoked is similar to the process to be followed in the treatment of excluded investment. Specifically, when a TNSP notes that an "off-ramps" event has occurred, it should develop the specification and cost of the project that it considers is needed to efficiently rectify the damaged infrastructure following that event. It would be expected to conduct the Regulatory Test as required by chapter 5 of the code. It would then apply to the ACCC during the regulatory period to assess the efficiency of the proposed investment. Once the ACCC is satisfied that the proposed investment is efficient it will advise the TNSP.

The determination of efficient investment arising from "off-ramp" events will be established using the same assessment criteria as will be used to establish the estimate of efficient investment for the determination of the ex ante cap or for excluded projects. That is, the ACCC will consider the need for the investment and whether the proposed project/s most efficiently meets that need. The same rigour of review procedures will apply.

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[49] As the ACCC anticipates that the off-ramps mechanism will generally be invoked by TNSPs, this section focuses on these processes.

It should be noted that the assessment of the appropriate level of investment following "off-ramps" events will require the ACCC to look into the TNSP's investment during the regulatory period and the investment provided for by the ex ante cap and any excluded projects, to determine the extent to which the provision for additional investment following an "off-ramps" event is necessary. For example, if the ex ante cap had already provided for investment in projects that would have gone a long way towards meeting the need for additional investment in response to an "off-ramps" event then the allowance for the additional investment should be net of the amount already deemed to be have been provided by the ex ante cap. As with the regulatory treatment of excluded projects this means that effectively – but unavoidably – aspects of the ex ante cap may be "re-opened", with the consequence of decreasing certainty.

The impact of "off-ramps" events on the calculation of allowed revenues during the regulatory period and on the calculation of the closing RAB

As noted in section 5.7, the code precludes the ACCC from resetting allowed revenues during the period of a revenue control except under three specific circumstances. Invoking the "off-ramps" mechanism is unlikely to qualify as one of these circumstances. This means that if the ACCC expresses a view on an allowance for investment following an "off-ramps" events, there is no mechanism for this allowance to be included in regulated charges during the regulatory period in which the event occurs. However, the calculation of the RAB at the end of the regulatory period will take account of the views expressed by the ACCC during the regulatory period on the efficient level of investment. Inclusion of a return on such investment will take place in the usual way.

5.9 Arrangements applicable to separate network planners and owners

5.9.1 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, the Victorian Energy Network Corporation (VENCorp), is given the sole 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 transmission network service providers 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. SPI PowerNet's 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.

5.9.2 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 maximum allowable aggregate revenue for a relevant regulatory period must not exceed VENCorp's statutory electricity transmission related costs; and

- the maximum allowable aggregate revenue must be determined on a full costs 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 make a full costs recovery.

5.9.3 ACCC's Supplementary Discussion Paper

The ACCC's view, as set out in the Supplementary Discussion Paper, is that the new ex ante capex framework should apply to SPI PowerNet in the same way as for other TNSPs with the cap covering maintenance, refurbishment and replacement capex.

Given that the code explicitly recognises VENCorp's not-for-profit status via the derogation the ACCC considers that VENCorp's budget should not be subject to a fixed cap.

5.9.4 Submissions by interested paries on Supplementary Discussion Paper

SPI PowerNet broadly supports the proposal of the ACCC to keep the augmentation capital expenditure uncapped while placing an ex ante cap on SPI PowerNet's maintenance and replacement capital expenditure. However, SPI PowerNet argues that the ACCC must be prepared to negotiate directly with SPI PowerNet on the detail

of the ex ante scheme to be applied to SPI PowerNet's maintenance and replacement capital expenditure. SPI PowerNet believes that it should be offered higher incentives in order for it to take on the extra risks of such a regime.

5.9.5 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 rest of the NEM.

The ACCC proposes to set an ex ante cap 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 cap.

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

5.10 Draft Decision

5.1 Introduction

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 three elements:

- An ex ante cap: this will cover most or all expected investments during the regulatory period and will establish a cap on the level of investment, during the regulatory period to be included in the regulatory asset base at the end of that period
- A mechanism for separate, project- specific regulation for very large and uncertain investments
- An "off-ramps" mechanism if unexpected events cause capital expenditure blow-outs during the regulatory period.

5.2 Ex ante cap

The ex ante investment cap should cover most or all expected investment during the period of a regulatory control, including more discretionary investment not related to statutory reliability obligations. The cap will be determined on the basis of a probabilistic assessment of expected investments during the regulatory period. However, the cap does not entail project-specific approval and although an expected

project may have been included in the determination of the cap, this does not oblige the TNSP to develop that project during the regulatory period.

The ACCC expects TNSPs to propose the form of the cap suited to their circumstances. It is expected that in most cases the cap will reflect the change in total investment in response to a change in the main investment drivers. TNSPs are expected 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 will be measured and audited.

In respect of investments covered by the ex ante cap, the calculation of the closing RAB at the end of the regulatory control period will be the lower of the present value of the total actual investment in that period and the present value of the profile of annual expenditure specified by the ex ante cap.

5.3 Significant but uncertain (excluded) investment

The ACCC proposes to exclude a project from the ex ante cap if the expected error presented by the inclusion of that project in the cap – quantified in terms of the revenue required to cover depreciation and the return on investment in that project - is equal to more than 10% of the revenue required to cover depreciation and return on investment of all projects included in the calculation of the ex ante cap.

The TNSP can apply to the ACCC for specific projects to be excluded from the ex ante cap, 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 excluded projects.

Projects excluded from the ex ante cap 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).

In the calculation of the MAR, an allowance for expenditure on excluded projects during the regulatory control period could be made on the basis of the expected value of the expenditure (i.e. the product of the probability of the project proceeding and the expected cost of the project). If such an allowance is made, then at the end of the regulatory period an adjustment will need to be made to the RAB depending on whether or not the excluded project was developed.

The choice of whether to make an allowance in the calculation of the MAR should be driven by concerns over the path of prices, and TNSPs' cash flow requirements over the period of a five year control. The ACCC will ensure that in present value terms there is no benefit or

detriment, whether or not an allowance was made at the start of the regulatory period for any excluded projects.

5.4 Off ramps

An "off-ramps" event is a possible but unlikely exogenous event that occurs during the regulatory period. While provision may have been made (in the ex ante cap) to prevent or mitigate the impact of such events, no specific allowance will have been made for efficient investment that may be needed if such an event occurs. Typical "off-ramps" events will include commonly defined force majeure events but may also include other defined events, such as changes in taxation legislation or changes in applicable service standards. The ACCC expects that "off-ramps" events will need to be defined in consultation with TNSPs at the time of their revenue reset decision. The ACCC notes, however, that changes in trend events will not be considered under the "off-ramps" provisions.

An "off-ramps" event can be invoked by a TNSP, ACCC or third party.

If the cost of the event during the period of a regulatory control exceeds 5% of the capex allowance for the regulatory period, this cost will be recoverable from consumers.

When a TNSP notes that an "off-ramps" event has occurred, it should develop the specification and cost of the project that it considers is needed to efficiently invest in response to that event. The ACCC will consider the need for the investment and whether the proposed project/s most efficiently meets that need. Once the ACCC is satisfied that the proposed investment is efficient, this will be officially communicated to the TNSP.

5.5 Arrangements applicable to separate network planners and owners

The ACCC proposes to set an ex ante cap 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 cap.

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 operating and maintenance expenditure (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 and the opex allowance does not provide any return to the TNSP. This is illustrated below:

MAR = return on capital + return of capital + opex + tax

= (WACC * RAB) + D + opex + tax

Where:

MAR = maximum allowable revenue

WACC= post-tax nominal weighted average cost of capital

RAB = regulatory asset base

D = depreciation

opex = operating and maintenance expenditure

tax = expected business income tax payable

The key features of the opex arrangement are as follows:

- the opex allowance for the regulatory control 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 expenditure out-turns from the previous regulatory period and other information about likely future expenditure
- where jurisdictional arrangements allow, there is a commitment to an efficiency carry-forward mechanism.

This chapter:

- summarises the issues (section 6.2)
- sets out the code requirements (section 6.3)

- sets out the options considered in the Discussion Paper and the ACCC's preferred approach (section 6.4)
- summarises submissions from interested parties (section 6.5)
- outlines the ACCC's considerations (section 6.6)
- presents the ACCC's Draft Decision (section 6.7).

6.2 Issue

Chapter 2 of this document sets the theoretical underpinnings for establishing an incentive mechanism for opex. Opex is largely of an on going and repetitive nature. Therefore past opex out-turns provides useful information about likely expenditure outturns in the future. Given this characteristic it will almost always be the case that the elements of this framework include consideration of:

- *The power of the incentive*

  The incentive properties of any regulatory regime depend on the future behaviour of the regulator. Therefore, if the regulatory regime is to have incentive properties which are fully predictable the regulator must commit in advance to a particular approach to both a carryover mechanism and to setting the underlying targets for the recurrent expenditure. However the approach the ACCC has taken is to adopt a mechanism that provides a higher level of flexibility in order to accommodate a range of factors identified more precisely later in this document.

- *The need for balance*

  It is important that when establishing an opex incentive regime the regulator balances a number of objectives such as quality of service and reduction in expenditure. For example it would be undesirable for the ACCC to adopt an opex incentive scheme that resulted in the firm reducing expenditure to the point that service quality is threatened. Similarly if the firm can easily substitute between capex and opex, the regulator must ensure that the incentives to reduce capex and opex are balanced – otherwise the firm will merely substitute from one to the other with no overall gain in efficiency.

- *The use of benchmarking*

  The regulator may want to adopt benchmarking which can increase the power of the incentive to reduce expenditure. It does this by basing the regulated prices on measures which are independent of the actions of the regulated firm (i.e. "exogenous" measures) rather than measures which depend on the action of the regulated firm (i.e. "endogenous" measures).

  However, as the ACCC does not currently have an appropriate comparative data set for regulatory purposes it will work to establish such a data set in the future. In

this regard it will establish a working group by April 2005 to benchmark the performance of Australian TNSPs and report by October 2006. These benchmarks will then be taken into consideration in subsequent revenue cap decisions.

Benchmarking

In setting a revenue cap, the ACCC seeks to determine what the TNSP's expected actual and efficient opex will be over the regulatory period. In doing so, the ACCC assesses the forecast actual costs provided by the TNSP in its revenue cap application by looking at consultant's assessments, past opex and forward looking assessment of cost drivers. The ACCC also uses benchmarking as a 'sanity check' on the reasonableness of TNSP's opex proposals.

There is a high degree of information asymmetry in the process outlined above. The firm's actual costs can differ from the forecast costs, as they depend on factors such as the level of cost reducing effort, the quantity and quality of output, the price of inputs, changes in technology, weather and other random events (such as accidents) and the age and quality of capital stock. The TNSP is far more aware of its own costs, and, hence, the ACCC relies heavily on the TNSP providing the necessary information.

Over time the ACCC obtains additional information about the firm's actual costs. At each regulatory reset the ACCC will have information on the firm's actual costs over the past regulatory period. This gives the ACCC an indication of the TNSP's expected costs for the next regulatory period. However, new factors may emerge that affect the firm's future opex costs which can not be predicted from the firm's past opex.

The review of the DRP considers whether the regulatory regime can be improved by placing greater reliance on the use of benchmarks (exogenous costs) to determine the opex allowance. Chapter 2 states that the power of the incentive to reduce expenditure can be enhanced by basing the regulated prices on measures which are independent of the actions of the regulated firm (i.e. "exogenous" measures) rather than measures which depend on the action of the regulated firm (i.e. "endogenous" measures). This may result in more efficient practice, as benchmarking breaks the nexus with the firm's actual costs and revenues.

Incentive mechanism

Chapter 7 of the DRP advocates an incentive mechanism, referred to as the glide path. The intent of an incentive mechanism is to reward a TNSP with higher profits when it outperforms the allowance used to set the revenue cap. The review of the DRP considers the form of incentive mechanism that should apply to the opex allowance under the revenue cap.

Asymmetric risk: self-insurance and pass through

Uncertainty is a characteristic of business and is common to all firms. Uncertain events may be classified as:

- systematic (that is, common to all firms). These risks are reflected in the CAPM parameter beta. An investor cannot eliminate systematic risk by holding a

diversified portfolio because it is a risk associated with all firms (that is, systematic risk is not diversifiable)

- non-systematic (that is, specific to a particular firm). These risks are independent of the market and as such are not reflected in the beta. For an investor, exposure to the specific risk related to a firm can be addressed by holding a diversified portfolio of investments.

A specific risk may be:

- symmetric. That is, possible downside (upside) events are compensated by possible upside (downside) events. As a result, there is no net impact on the firm's expected revenue; or

- asymmetric. That is, possible downside (upside) events are not compensated by possible upside (downside) events. As a result, there is a net impact on the firm's expected revenue. Where the net impact is negative, compensation to the firm may be required so that the expected returns are met. Similarly, where the net impact is positive, the firm should be penalised to ensure that the expected returns are met.

Asymmetric (specific) risks may be compensated for by:

- the TNSP insuring against the risk, and the cost of the insurance policy being including in the opex allowance;

- the TNSP self-insuring against the risk, and a notional insurance premium being included in the opex allowance. If the risk eventuates, no additional compensation is required to cover the expenses associated with the event;

- including, in the revenue cap, a pass through mechanism for defined risk. If the risk eventuates, the MAR would be adjusted for the financial effect of the event in accordance with the terms of the pass-through mechanism; or

- in very limited cases, the ACCC may be able to revoke and remake the revenue cap under clauses 6.2.4(d) and (e) of the code.

The ACCC's determination of the Powerlink revenue cap (1 November 2002) included a pass through mechanism with respect to grid support payments. However, until the ACCC's decision on GasNet's access arrangement for (17 January 2003) and SPI PowerNet's revenue cap (11 December 2002), the ACCC had not been presented with detailed claims for self-insurance allowances or a pass through mechanism. The review of the DRP considers how these arrangements should be specified in order to maintain incentives and protect TNSPs against risks beyond the TNSP's control.

6.3 Code requirements

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 setting a revenue cap, the ACCC is

required to take into account the TNSP's revenue requirements during the regulatory control period, having regard for, amongst other things:

- the ACCC's reasonable judgment of the potential for efficiency gains to be realised by the TNSP in expected operating, maintenance and capital costs, taking into account expected demand growth and service standards;[50]
- the provision of a fair and reasonable risk-adjusted cash flow rate of return on efficient investment;[51] and
- the on-going commercial viability of the transmission industry.[52]

Under clause 6.2.3, the regulatory regime administered by the ACCC must have regard to the need to, amongst other things:

- provide TNSPs with incentives and reasonable opportunities to increase efficiency;[53]
- provide a fair and reasonable risk-adjusted cash flow rate of return to TNSPs on efficient investment given efficient operating and maintenance practices;[54] and
- provide reasonable certainty and consistency over time of the outcomes of regulatory processes, having regard for the need to balance the interests of users and TNSPs[55] and to minimise the economic cost of regulatory actions and uncertainty.[56]

Clause 6.2.2 provides that the regulatory regime must seek to achieve certain outcomes including:

- an efficient and cost-effective regulatory environment;[57]
- an incentive-based regulatory regime which provides an equitable allocation between users and TNSPs of efficiency gains reasonably expected by the ACCC to be achievable by the TNSP;[58]

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50 National Electricity Code clause 6.2.4(c)(3). See also clauses 6.2.4(c)(1) and (2).

51 Ibid, clause 6.2.4(c)(5).

52 Ibid, clause 6.2.4(c)(8).

53 Ibid, clause 6.2.3(d)(1).

54 Ibid, clause 6.2.3(d)(4).

55 Ibid, clause 6.2.3(d)(5)(i).

56 Ibid, clause 6.2.3(d)(5)(iii).

57 Ibid, clause 6.2.2(a).

58 Ibid, clause 6.2.2(b)(1).

- an incentive-based regulatory regime which provides for a sustainable commercial revenue stream which includes a fair and reasonable rate of return to TNSPs on efficient investment, given efficient operating and maintenance practices;[59]
- prevention of monopoly rent extraction by TNSPs;[60]
- an environment which fosters efficient operating and maintenance practices within the transmission sector;[61]
- reasonable regulatory accountability through transparency and public disclosure of regulatory processes and the basis of regulatory decisions;[62]
- reasonable certainty and consistency over time of the outcomes of regulatory processes;[63] and
- reasonable and well defined regulatory discretion which permits an acceptable balancing of the interests of TNSPs, users and the public interest.[64]

While these 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 ACCC's Discussion Paper

Benchmarking

The ACCC's current approach to the determination of an opex allowance is to focus largely on a firm-specific analysis. Benchmarks have been used as a 'sanity-check' for determining an opex allowance rather than as the basis for setting that allowance.

The ACCC asked interested parties to comment on the merits and draw-backs with benchmarking. Specifically, comment was invited on:

- whether benchmarking should be applied to individual opex components and if it is feasible or sensible to do so

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59 Ibid, clause 6.2.2(b)(2).

60 Ibid, clause 6.2.2(c).

61 Ibid, clause 6.2.2(e).

62 Ibid, clause 6.2.2(i).

63 Ibid, clause 6.2.2(j).

64 Ibid, clause 6.2.2(k).

- whether it is possible to develop a reasonable cost model for TNSPs to determine their primary cost drivers

- how the cost model's outputs should be used when determining the opex allowance.

Incentive mechanism

Attachment B to the Discussion Paper[65] considered the role and specification of a carry-forward mechanism so that the allowance for opex in each period is the sum of two components:

- the underlying opex allowance as determined at the start of the current regulatory period

- a carry-forward of any efficiency gains or losses from the previous period.

An unambiguous assessment of the properties of an opex incentive mechanism requires a clear specification of how the future opex target is to be established. Comment was invited on:

- what criteria an opex incentive mechanism should satisfy. The Discussion Paper pointed to the importance of providing constant incentives for cost efficiencies over time

- whether the present value of regulated prices should be a function of the present value of cost out-turns in the previous regulatory period

- whether the outlined approach would still apply if the ACCC could not correctly distinguish between controllable and uncontrollable costs, and if not, how the approach should be altered.

Finally, Attachment B discussed the potential of substitution between capex and opex. An incentive mechanism yields balanced incentives if service providers derive equal benefit from opex and capex reductions. Comment was invited on:

- whether the ACCC should be concerned about the incentive on TNSPs to substitute between capex and opex

- whether the proposed mechanism achieves balanced incentives for capex and opex efficiencies

- how much flexibility TNSPs have to substitute between capex and opex.

Asymmetric risk: self-insurance and pass through

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[65] Attachment B of the Discussion Paper is available on the website at http://www.accc.gov.au.

The Discussion Paper considered two matters:

- the case for including self-insurance allowances and cost pass throughs under an incentive based regulatory regime

- developing guidelines to ensure that only appropriate self-insurance and pass through events are incorporated into the revenue caps of TNSPs.

There are three types of insurance cover available to TNSPs from a regulatory view point:

- external-insurance. This is where a TNSP purchases insurance cover from an insurance company and pays a premium for that cover. The advantage of this from a regulatory point of view is that the premium represents a market price, verifiable by the ACCC. The economies of scale from the pooling of risks and expertise of the insurance company may mean that external insurance cover is a low cost form of insurance.

- self-insurance. This is where a TNSP pays an insurance premium to itself at a level which has regard to the likelihood of the event occurring and an assessment of its likely cost if that event occurs. This type of insurance has the advantage of avoiding paying for the administration costs and profit of an insurance business if external insurance would otherwise be acquired.

- pass through. A pass through is where a TNSP does not take out insurance for a particular type of risk but where the consumer pays for the pass though event (if it occurs) directly through higher charges. A pass through may be accepted by the ACCC if it believes it should not be more efficient for the TNSP to insure against the risk.

A consideration in the proper operation of insurance and pass throughs for TNSPs is that there should not be any overlap between the three types of cover. For example, if a TNSP chooses to insure externally against a particular risk then it cannot also claim an allowance for self-insurance of that risk.

Guidelines for dealing with insurance and pass through events have been developed in various ACCC decisions to date:

- external-insurance. An allowance in opex for external insurance has been accepted and established in the ACCC's decisions since the commencement of its regulation of gas and electricity transmission networks

- self-insurance. An allowance for self-insurance was first included in the GasNet access arrangement (2003) and the SPI PowerNet revenue cap (2002)

- pass throughs. The Powerlink (2001) revenue cap established a pass through mechanism. More detailed pass through rules were included in the GasNet access

arrangement (2003)[66] and SPI PowerNet (2002), ElectraNet (2002), Murraylink (2003) and Transend (2003) revenue caps.

The Discussion Paper noted the ACCC's support for cost pass throughs in limited circumstances. The ACCC considered that it is important that the three approaches to risk management are adequately scoped and defined to ensure there is no overlap between them.

In relation to external insurance and self-insurance, comment was invited on whether:

- the TNSP's insurance arrangements, both external and self-insured, should be subject to actuarial review
- the insurance guidelines provide the correct incentives to achieve efficient costs
- the risks faced by TNSPs are adequately addressed by the insurance guidelines
- the list of excluded insurance items needs to be varied and the excluded items covered under another area.

In relation to pass through, comment was invited on whether the pass through guidelines:

- strike an appropriate balance between the interests of TNSPs and their customers
- should include currently unidentified events
- adequately address the TNSPs' overall risk management requirements.

6.5 Submissions by Interested Parties on Discussion Paper

Benchmarking

Peer population

Powerlink, Origin, EnergyAustralia and Ergon state that with only a small population of peers upon which to build a benchmark, the current approach of using endogenous forecasts to set opex targets is the best approach. Transend supports the current approach of high level exogenous benchmarking. TransGrid notes the difficulties in adjusting for different cost drivers across businesses. The EUAA only supports exogenous benchmarking if it clearly delivers greater efficiency benefits to end users than the current approach.

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[66] It should be noted that the gas and electricity regimes vary in a number of important respects. In particular, under the code, a revenue cap may only be reopened during the regulatory period in limited cases under clauses 6.2.4(d) and (e). In contrast, under section 2.28 of the *National Third Party Access Code for Natural Gas Pipeline Systems*, a service provider may submit proposed revisions to its access arrangement at any time.

Unexpected events

SPI PowerNet, EnergyAustralia and ElectraNet state that protection against unexpected events is needed to adequately reward for efficiency gains.

Future work

The EUAA suggests the ACCC should collect and publish data as a naming and shaming exercise, noting similar work has been done by the UK water regulator – Office of Water Services. TransGrid believes benchmarking is of limited use but encourages the ACCC to undertake further work in this area. SPI PowerNet and ElectraNet support continued work to develop a cost model by an industry benchmarking group. They believe a cost model should focus on non-system costs where different operational environments do not result in differences in efficient costs.

Transend states that cost models are not a light-handed form of regulation and are not consistent with the concept and philosophy of total factor productivity (TFP) approaches. SPI PowerNet and ElectraNet state that benchmarking measures such as TFP are unreliable for TNSPs as 80 percent of revenue is generated through the return on sunk capital which is variable over time.

The NGF supports an external benchmarking approach incorporating a market impact report which can be used as an input to a benchmarking process.

Development of an operating cost function

Powerlink, Transend, TransGrid, ElectraNet and SPI PowerNet state that any efficiency mechanism should establish efficient base costs normalised for company specific factors, and forward cost estimates should incorporate cost drivers.

Incentive mechanism

Consistent incentives

ElectraNet, SPI PowerNet, NGF, TransGrid and VENCorp all point to the value of constant incentives over time.

Benefit sharing

NERA states that the power of the incentive relates to the length of time that the benefit is retained. TransGrid and VENCorp sought equitable sharing of benefits, and Powerlink suggested that the period of efficiency gains should be increased by two regulatory cycles.

Use of past opex levels to establish future opex targets

Views differ on the validity of the use of historic information to establish future opex targets. Transend states that the past is not a good indictor generally, but that recent out-turns will provide better information than an average from previous periods. Other TNSPs point to the value of developing a cost function, rather than simply using actual historic out-turns to establish future expenditure levels. The EUAA suggests that past opex is usually a good indicator of future opex.

Self-insurance and pass through

Self-insurance guidelines

Powerlink and ElectraNet support the ACCC's self-insurance guidelines but state that if a high impact low probability event occurs before a sufficient self-insurance provision has been built up then costs over the amount provided by the self-insurance provision must be recoverable via pass through. EnergyAustralia states that if no allowance is made for a company's self-insured costs then a business may over-insure its risks. Hence TNSPs should not be penalised for selecting the most appropriate insurance program for its diversifiable risks.

SPI PowerNet and EnergyAustralia support the requirement to provide an actuarially determined amount for self-insurance. Transend believes that the ACCC's approach to insurance issues is soundly based but the ACCC should allow TNSPs to seek an insurance allowance in its opex to smooth the impact of pass through events.

Employment practices self-insurance

SPI PowerNet supports the inclusion of an allowance for employment practices self-insurance.

Pass through mechanism

EnergyAustralia believes that there is a need for a pass through mechanism to address unanticipated cost increases that are outside a TNSP's control. Ergon Energy believes that pass throughs should only be allowed in exceptional circumstances and should not be used to recover losses associated with poor management or inadequate risk/insurance cover. The NGF agrees that there should be pass through but only in very limited circumstances.

Defining pass through events

Origin supports the ACCC's views on establishing pass through rules. Powerlink proposes that the criteria for a pass through event must be defined and published (rather than just the scope of the event). It states that this will ensure that unidentified events are included within the mechanism. Transend believes that it is important that pass through arrangements are formally codified in a revenue control formula. TXU states that pass through events should be clearly identified in advance and cover events clearly beyond the control of the network operator. VENCorp states that pass throughs should only be permitted in limited circumstances and the ACCC's pass through guidelines provide a reasonable foundation for the development of the

framework. The EUAA notes that ACCC should minimise opportunities for TNSPs to seek cost-of-service pass throughs.

6.6 ACCC's considerations

Benchmarking

The ACCC proposes to establish a process to facilitate greater use of benchmarking data in determining the opex allowance to be included in a revenue cap.

The problem with using an exogenous benchmark to assess a TNSP's opex out-turns is deciding what adjustments to make for firm specific circumstances. Decisions about firm specific circumstances by the regulator will involve a degree of subjectivity and as such carry a risk for the TNSP. Chapter 2 notes that regulatory regimes which base the allowed revenue entirely (or almost entirely) on exogenous factors are rare. In practice, almost all regulatory regimes allow a periodic adjustment to the parameters of the regulatory regime in order bring the revenue stream back into line with the firm's observed expenditure. This has the effect of reducing the power of the incentive overall.

The ACCC does not currently have an appropriate comparative data set for regulatory purposes. However the ACCC will work to establish a comparative data set in the future. The ACCC intends to establish a working group by April 2005 to benchmark the performance of Australian TNSPs and report by October 2006. A decision will than be made as to what extent these benchmarks can be taken into consideration in subsequent revenue cap decisions.

Incentive mechanism

An opex incentive mechanism should:

- if appropriate provide constant and predictable efficiency incentives over time
- take into account the changing circumstance of TNSPs in estimating the target level of opex (which represents the regulator's estimate of efficient spending).

Both of these objectives were widely supported in submissions to the Discussion Paper. However, the objectives of providing constant incentives and setting opex targets that take account of TNSPs changing circumstances may conflict. This means that the ACCC must rank these objectives and then consider whether any form of efficiency carry forward mechanism would be beneficial or not.

Chapter 2 states that to achieve the objective of predictable efficiency incentives over time, it would be necessary to mechanistically relate the future opex allowance to the opex out-turn in the current regulatory period. In addition, to achieve constant incentives the present value of the future opex allowance would be a linear function of the present value of the opex out-turns in the current regulatory period. This can be achieved by setting the future opex allowance equal to the:

- out-turn in the penultimate year of the current regulatory period, and carrying-forward efficiency gains from the current regulatory period or

- the weighted average of opex out-turns in the current regulatory period.

However, there are a number of reasons why it would be undesirable to mechanistically link future opex targets to past outcomes for the electricity industry. In particular:

- a number of TNSPs are undertaking significant investment in the network. The network is expanding and the nature of the assets is changing, and hence changing the opex requirement

- there are changes in the available technologies. For example greater use of automation and remote asset monitoring can change the 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 recent bush fires in NSW led to a considerable spike in operating costs in 2002 and 2003.

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

- past opex

- any reasons as to why future opex may be different from past opex.

In the context of gas transmission regulation, the ACCC has accepted a mechanism that places more weight on the objective of predictability than flexibility. The ACCC's approach is described in the GasNet Final Decision of 13 December 2002. Broadly speaking, the ACCC bases opex targets on past opex out-turns 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 out-turns 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.

The combination of the rolling carryover mechanism and the basing of the opex targets on actual cost out-turns provide a constant and predictable incentive

mechanism. In-turn the step and trend adjustments if required provides the flexibility to accommodate changing circumstances.

The ACCC believes that 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 over an access period 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 is proposing a mechanism that provides a higher level of flexibility in order to accommodate the nature of the electricity transmission sector. The ACCC will take into account past opex (but not in a mechanistic fashion) and the reasons as to why future opex is different from the past when setting future opex targets.

In summary, the ACCC considers that the benefit from retaining discretion on how future opex targets are to be set exceeds any detriment arising from an unpredictable future opex target, and hence potentially inconsistent efficiency incentives over time.

Given this approach, the second issue to consider is whether an efficiency carry-forward mechanism that would involve TNSPs retaining efficiency gains (the difference between the target and actual opex) for periods longer than the regulatory period would be beneficial.

Without an efficiency carry-forward mechanism, there may be stronger incentives to reduce opex in the early years of a regulatory 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.

An efficiency carry-forward mechanism that allows TNSPs to retain the benefit of any savings (exposes them to the detriment of any losses) for the same length of time regardless of when in the regulatory period the savings are made (losses are incurred), would be expected to provide more consistent incentives for efficiency savings over the regulatory period.

Mechanism design

There are a number of ways to design an efficiency carry-forward mechanism.

The DRP suggested a glide-path calculation where gains and losses are gradually reduced/increased so that at the end of the next regulatory period any benefits/losses (actual minus target) from the current regulatory period are passed on to customers.

The calculation of the loss or benefits is usually done 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 for TNSPs to shift expenditure around during the regulatory period so that it is able to maximize the benefit that is carried forward without achieving any lasting saving. For this reason, the glide path approach has been rejected by other regulators and the ACCC in the regulation of gas pipelines.

The widely accepted formulation of an efficiency carry-forward mechanism is to carry-forward losses and benefits from each year of the current regulatory period into the coming regulatory period. 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 proposes, in general, to use.

The exact formulation of the efficiency gain or loss that is carried forward can be expressed mathematically 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 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. However the 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.

One issue is how any benefits/losses should be distributed between TNSPs and customers. This amounts to deciding the length of time for which efficiency benefit/losses in the current period should be carried forward into the next period. There is likely to be a trade-off between productivity improvements by TNSPs and the proportion of their share of the benefits. On the one hand 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 ACCC has considered the appropriate balance between the interests of the TNSPs and users and considers this balance can, in general, be achieved by the carry-forward of benefit/losses for five years after the year in which the benefit/loss is incurred.

A further 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.

The ACCC is aware of the effect that inflation can have on the value of benefit/losses carried forward. In order to preserve the incentive effect of the carry-forward mechanism, benefit/losses will be adjusted for inflation, maintaining the value of the benefits/losses to the TNSP.

Asymmetric risk: self-insurance and pass through

Self-insurance

The high cost and restricted availability of some external insurance cover commonly leads businesses to consider self-insurance for certain categories of risk. By self-insuring, a business may save on the costs relating to administration and the profit margin that is built into external premiums.

The ACCC considers that the same allowance for an insurance item should be granted, whether it is externally insured or self-insured, to provide the same incentive to TNSPs to control costs. The ACCC is aware that analysis of TNSPs' insurance decisions will increase regulatory costs facing the TNSP, including actuarial and administration costs. However, the ACCC believes that such costs would be reasonably incurred through prudent management and as such will not significantly increase the regulatory burden faced by TNSPs.

If a TNSP seeks to include, in its opex, an allowance for self-insurance, it should set out its proposed allowance in its revenue cap application. The ACCC considers that the following matters should, in general, be established prior to accepting a self-insurance application:

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

  The resolution should include explicit acknowledgement that, if the risk were to eventuate, the TNSP would not be able to seek a pass through under the pass through rules adopted as part of the revenue cap for any loss or expenditure resulting from the event, nor could the TNSP seek to carry forward any loss or expenditure resulting from the event and recover it in future regulatory periods. (The relevant premiums have already been compensated for within the opex

element of the MAR and funded by customers. Thus if a one in a 100 year event occurs in year one the business will have to restore assets out of its own resources).

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 credibly 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 categories of risk for which the TNSP has resolved to self-insure.

  Such details need to establish clearly 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 actuariallist verifying the calculation of risks and corresponding insurance premiums.

- confirmation that the risk is not already compensated for in the forecast opex or other revenue cap costs.

  For example, where opex is based on costs experienced in prior years, it will cover the event where the event has occurred in the past. Consequently, opex may already provide for future occurrence of similar events. Similarly, contingencies such as repair and maintenance teams may already be provided for in opex. In these cases, no additional compensation for asymmetric risk is required as this would result in double counting.

- confirmation that the allowance takes account of positive asymmetric risks as well as negative.

  An addition to the cash flow should only reflect a negative net impact of the asymmetric risk factors on the firm's expected returns.

Pass through

Cost pass throughs provide a mechanism for dealing with costs that are outside the control of the TNSP. As an alternative to receiving an allowance in its cash flows, a TNSP may directly transfer the financial impact of a pass through event to customers, if and when such an event occurs.

If a TNSP seeks to include a pass through mechanism in its revenue cap, it should set out its proposed pass through rules in its revenue cap application (including definitions of the proposed pass through events). To assist TNSPs, the ACCC has developed a standardised set of pass through rules. Prior to submitting its revenue cap application, the TNSP should obtain a copy of the most recent version of the rules from the ACCC.

A pass through is generally only appropriate where the TNSP cannot reasonably be expected to bear the risk itself, for example, uncontrollable events that may otherwise affect the commercial viability of the business.

The particular events to be included in a pass through mechanism will be determined on a case by case basis. However, the ACCC considers that a pass through event should in general have the following characteristics:

- it should be identified in advance with its scope precisely defined
- it should be beyond the control of the TNSP
- its financial impact should be better borne by parties other than the TNSP
- it should affect the TNSP, but not the market generally (systematic or market risk should be addressed in the WACC parameters)
- it should not already be compensated for in the forecast opex or other revenue cap costs
- it should not be more efficient for the TNSP to insure against the risk
- its financial impact should be material.

The ACCC considers that a pass through mechanism should, in general, have the following features:

- the pass through rules form part of the revenue cap. Any pass through amount determined under the rules forms part of the MAR determined by the revenue cap.
- in the interests of both TNSPs and customers, the rules should accommodate both positive and negative pass through amounts.
- provision by the TNSP, in support of any pass through application, of documentary evidence which substantiates that the aggregate costs facing the TNSP have increased or decreased as a consequence of the claimed pass through event. Wherever possible, the documents should also be provided in the public domain.
- a requirement on the TNSP to provide annually to the ACCC a copy of insurance policies, cover notes and premium invoices, irrespective of whether a pass through event application has been submitted in that year.

- a two month assessment period (which can be extended where necessary) including provision for public consultation by the ACCC.

In general, the ACCC would expect the pass through rules proposed by a TNSP to be consistent with the standardised set of pass through rules, except where justified by reference to the Code provisions or the particular circumstances of the TNSP.

6.7 Draft 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 Benchmarking

The ability of the ACCC to make use of high-powered incentives to reduce expenditure depends on developing high-quality indicators of the likely expenditure requirements of each TNSP which are independent of the costs actually incurred by each TNSP. One approach is to make use of industry-wide measures of cost, efficiency and productivity changes. This approach is informally known as "benchmarking".

To facilitate greater use of benchmarking data in determining the opex allowance to be included in a revenue cap, the ACCC intends to establish a working group by April 2005 to benchmark the performance of TNSPs and report by October 2006. A decision will then be made as to what extent these benchmarks can be taken into consideration in subsequent revenue cap decisions.

In the interim 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.

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 out-turn operating expenditure which arise during the regulatory period;

(b) the manner in which the ACCC makes use of information on past expenditure out-turns when setting future expenditure targets; and

(c) the carry-forward mechanism.

The ACCC has decided that for a variety of reasons it will not commit, at this stage, to a mechanistic or formulaic approach to making use of past expenditure information when setting future expenditure targets.

6.4 The carry-forward mechanism

The efficiency gain or loss in a year may be expressed mathematically 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 control period.

Since the actual opex for the last year of the regulatory control period will usually not be known at the time when the revenue cap is set for the next regulatory control 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 Relationship with Other Incentive Schemes

The ACCC considers that the incentive schemes described here will give rise to some incentives on each TNSP to reduce its operating expenditure. The intention is for this incentive to be broadly balanced with the incentive to reduce capital expenditure. The ACCC will continue to monitor outcomes to ensure that a reduction in operating expenditure is not achieved at the cost of an increase in capital expenditure or vice versa.

At the same time, the ACCC is concerned to ensure that any reduction in operating expenditure does not come at the expense of a reduction in service quality or reliability. The ACCC will continue to monitor outcomes to ensure that any reduction in operating expenditure is not achieved at the expense of service quality.

6.6 Self-insurance

The ACCC recognises that it may, on occasion, be efficient for a TNSP to self-insure against certain risks. This section seeks to ensure that there is not a systematic bias against self-insurance (for which the annualised costs are more difficult to assess) compared with third-party insurance (for which observing the efficient costs is more straightforward).

If a TNSP seeks to include, in its opex, an allowance for self-insurance, it should set out its proposed allowance in its revenue cap application. The ACCC considers that the following matters should, in general, be established prior to accepting a self-insurance application:

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

2. confirmation that the TNSP is in a position to undertake credibly self-insurance for the event

3. self-insurance details setting out the categories of risk for which the TNSP has resolved to self-insure

4. a report from an appropriately qualified insurance consultant verifying the calculation of risks and corresponding insurance premiums

5. confirmation that the risk is not already compensated for in the forecast opex or other revenue cap costs

6. confirmation that the allowance takes account of positive asymmetric risks as well as negative.

6.7 Pass through

In some circumstances it will be more appropriate for certain risks to be borne by customers rather than by the TNSP. For this reason the ACCC allows the TNSP to pass through the costs of certain pre-agreed events.

If a TNSP seeks to include a pass through mechanism in is revenue cap, it should set out its proposed pass through rules in its revenue cap application (including definitions of the proposed pass through events). To assist TNSPs, the ACCC has developed a standardised set of pass through rules. Prior to submitting its revenue cap application, the TNSP should obtain a copy of the most recent version of the rules from the ACCC.

In general, a pass through event should have the following characteristics:

1. it should be identified in advance with its scope precisely defined

2. it should be beyond the control of the TNSP

3. its financial impact should be better borne by parties other than the TNSP

4. it should affect the TNSP, but not the market generally

5. it should not already be compensated for in the forecast opex or other revenue cap costs

6. it should not be more efficient for the TNSP to insure against the risk

7. its financial impact should be material.

The pass through rules to be included in the revenue cap should in general have the following features:

1. the pass through rules form part of the revenue cap. Any pass through amount determined under the rules forms part of the MAR determined by the revenue cap

2. the rules should accommodate both positive and negative pass through amounts

3. provision by the TNSP, in support of any pass through application, of documentary evidence which substantiates that the aggregate costs facing the TNSP have increased or decreased as a consequence of the claimed pass through event. Wherever possible, the documents should also be provided in the public domain

4. a requirement on the TNSP to provide annually to the ACCC a copy of insurance policies, cover notes and premium invoices, irrespective of whether a pass through event application has been submitted in that year

5. a two month assessment period (which can be extended where necessary) including provision for public consultation by the ACCC.

   In general, the ACCC would expect the pass through rules proposed by a TNSP to be consistent with the standardised set

of pass through rules, except where justified by reference to the code provisions or the particular circumstances of the TNSP.

7 The Weighted Average Cost of Capital

7.1 Vanilla WACC

7.1.1 Introduction

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 regulatory asset base.[67] The building block formula below illustrates how the WACC is one of the components that determine the MAR:

MAR = return on capital + return of capital + opex + tax

= (WACC x RAB) + D + opex + tax

where:

MAR = maximum allowable revenue

WACC = weighted average cost of capital

RAB = regulated asset base

D = depreciation

opex = operating and maintenance expenditure

tax = expected business income tax payable.

Electricity transmission is a capital intensive industry where the return on capital (WACC x value of asset base) 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, the 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.[68]

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

68 This can take the form of Averch-Johnson over-capitalisation or gold plating. The Averch-Johnson analysis states that under rate of return regulation, a regulated firm will tend to select the mix of inputs to give it a desired rate of return rather than the mix of inputs that represents the most efficient method of production. This means that the firm is encouraged to use more capital than is necessary or efficient to produce its product.

The ACCC has historically adopted a WACC which is a weighted average of post-tax return on equity and pre-tax cost of debt. This is known as the 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.[69]

The vanilla WACC formula can be seen below:[70]

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

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.

Sections 7.1.1-7.1.7 discusses 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 7.2.

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 7.3
- market risk premium in section 7.4
- equity beta in section 7.5
- cost of debt in section 7.6
- gearing in section 7.7
- imputation credits-gamma in section 7.8

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69 Previous revenue cap decisions include Queensland (Powerlink 2001), Victoria (SPI PowerNet 2002), South Australia (ElectraNet 2002), Murraylink (2003), Tasmania (Transend 2003) and New South Wales (TransGrid and EnergyAustralia 2004).

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

- debt and equity raising costs section 7.9.

A summary of the ACCC's draft decisions is presented in section 7.10.

7.1.2 Issue

For the purposes of determining a fair and reasonable rate of return, the ACCC must consider whether the absolute level of WACC is appropriate.

7.1.3 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.[71] 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.[72]

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:

> 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.[73]

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.[74]

7.1.4 ACCC's Discussion Paper

The ACCC noted its preference for continuing 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.

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

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

73 National Electricity Code, schedule 6.1(2.1).

74 Ibid, Clause 6.2.3(d)(5).

Consistent with the application of a benchmark WACC in previous revenue cap decisions, the ACCC considered the continued use of a vanilla WACC as the most suitable method for determining the return on assets.

7.1.5 Submissions by Interested Parties on Discussion Paper

International comparison of WACC

Network Economics Consulting Group (NECG)[75] argues that WACC allowances for Australian TNSPs are not generous in international terms, and certainly not excessively so.[76] It states that even if Australian rates are comparable with overseas rates, the evidence in some key sectors such as the USA electricity transmission sector supports the view that comparability is not a sufficient condition for ensuring appropriate levels of investment.

The EUAA and ECCSA state that the allowed WACC in Australia is still set too high. They argue that international benchmarking shows Australian regulators are using higher WACC parameters (such as the market risk premium) compared with overseas counterparts. It states that this would mean financial markets see Australian utilities as being less efficient or more costly than their foreign counterparts.

Encouraging investment

NECG states that the regulated rate of return is the single most important factor in determining the strength of incentives for investment provided by the regulatory framework. If the regulated rate of return is too low efficient levels of new investment will not occur.

ElectraNet supports the current approach for determining the WACC, including the use of CAPM, provided that the focus of the regulator in implementing this approach is to achieve a fair and reasonable return that encourages investment.

The Queensland Government Office of Energy states that the combined effect of the various components of WACC is important and whether or not as a whole they represent a fair and reasonable rate of return is essential. It believes the rate of return should provide the right incentives for adequate, efficient and timely investment. It states that a review of the adequacy of rates of return in Australia needs to be undertaken.

'Line in the sand'

NECG argues that to satisfactorily deal with the uncertainty of an allowed WACC, the ACCC should draw a 'line in the sand' around each WACC parameter. This would

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75 The NECG provided a submission on behalf of the TNSPs: ElectraNet, SPI PowerNet, Transend, TransGrid, EnergyAustralia and Powerlink.

76 NECG, *2003 Review of Draft Statement of Regulatory Principles for the Regulation of Transmission Revenues-Submission to the ACCC for the electricity TNSPs*, November 2003, pp.9-22.

provide a value or a transparent process for setting each WACC parameter with a view that only under exceptional circumstances would these values change. This would also remove the current disincentive to invest because of the threat of constant lowering of returns by the regulator at future revenue decisions.

7.1.6 ACCC's considerations

The ACCC notes NECG's view that WACC allowances for Australian TNSPs are not generous in international terms and that even if there was comparability this is not a sufficient condition for ensuring appropriate levels of investment. The ACCC believes that the WACC levels set for its revenue cap decisions are sufficient to ensure appropriate levels of investment. This view is confirmed by a recent study by the Allen Consulting Group (ACG) which found that the regulatory WACC is sufficient to ensure appropriate levels of investment.[77]

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

Interested parties in the past have raised the question about whether or not international markets judge the Australian economy to be less efficient (i.e. more costly to finance) than overseas markets. However, the ACCC is not in a position to make a judgement on how international markets value the efficiency of Australian investments. The ACCC determines benchmark rates of return for equity and debt, not on the international market but on the basis of the TNSP adopting efficient policies with respect to financing, debt management and taxation. In this context, a benchmarked WACC will offer a TNSP an incentive for efficient financing.

Further, 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 make a judgement that is a balance between a fair rate of return which will provide TNSPs sufficient incentives to reinvest but not induce 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. ACG, on behalf of BHP Billiton, provided the Productivity Commission's review of the Gas Access Regime with an analysis of Tobin's q[78] for regulated entities.[79] ACG found that the Tobin's q for regulated entities

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77 Allen Consulting Group, *Review of studies comparing international regulatory determinations*, March 2004.

78 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.

79 ACG, *Review of the Gas Code, Commentary on Economic Issues*, August 2003.

was consistently above the value of one which suggested that the rates of return were sufficient for new investment.

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.[80] The 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.

The ACCC notes NECG's comments about drawing a 'line in the sand' on WACC parameters to provide regulatory certainty. In previous revenue cap decisions, where possible, the ACCC has maintained several WACC parameters for the purpose of regulatory consistency. For example, the ACCC has held constant the values for the market risk premium, beta, gearing and gamma across all electricity revenue cap decisions.

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 are different 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. Therefore, the ACCC reserves the right to change the value of WACC parameters based on new information.

The ACCC notes the international benchmarking referred to by the EUAA and ECCSA. However, the ACCC considers caution must be exercised in interpreting WACC parameters from different jurisdictions because of differences between financial markets and institutional arrangements.

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

- 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.

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[80] NECG, *Critique of ACG Report on Tobin's q, Submission to the Productivity Commission's Review of the Gas Access Regime*, May 2004.

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. Rather, allowances must be made for differences in financial markets and institutional arrangements across countries. However, 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.[81]

7.1.7 Draft Decision

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

7.2 Capital asset pricing model

7.2.1 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 shown below:

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

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.

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 minimum return expected by investors on their equity investment in the firm.

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

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[81] ACG, *Review of studies comparing international regulatory determinations*, March 2004, p.38.

derive forward looking estimates are generally perceived of as being too subjective or imprecise.

A common approach used to determine the cost of equity capital is to apply the CAPM.[82]

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.

7.2.2 Issue

The ACCC must consider whether the CAPM is the most appropriate model to estimate the expected return on equity. The ACCC must also determine the most appropriate approach to establishing the value of each component of the CAPM.

7.2.3 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 a CAPM formula.

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[82] The ACCC uses the Sharpe-Lintner version of the CAPM which, *inter alia*, requires the risk free rate of return.

7.2.4 ACCC's Discussion Paper

In the discussion paper the ACCC noted alternatives to the CAPM (such as Arbitrage Pricing Theory, Fama-French Model) but states it is appropriate to continue using the CAPM to estimate the cost of equity.

7.2.5 Submissions by Interested parties on Discussion Paper

Use of CAPM

Powerlink appreciates that the ACCC uses an academic model like CAPM to calculate the cost of equity but it believes that there is a need to test the reasonableness of the theoretically computed outcome against the real world. Powerlink states the WACC margin (being the vanilla WACC above the risk free rate) must be high enough to encourage discretionary investment.

TXU states that the asset pricing model used to estimate the cost of capital should only be used as a guide as the inputs cannot be observed or estimated with a high degree of precision.

Similarly, the EUAA notes that the use of the CAPM should be based on sound and well balanced regulatory judgement.

Asymmetric risk

Powerlink states that since the CAPM does not recognise the asymmetric risks faced by regulated companies, there needs to be some form of adjustment made to the regulatory returns either through the CAPM model or through explicit cash flows.[83]

7.2.6 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.[84] 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.

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[83] Asymmetric risks have been argued to include increased competition from gas transmission, asset stranding risk, self insurance and regulatory risk.

[84] 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.

Asymmetric 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 expected net impact on earnings can be accounted for in a transparent manner through the projected cash flows (see Chapter 6 on self-insurance and pass-throughs).

WACC Margin

The ACCC notes Powerlink's comment about the WACC margin, which was on the basis of NECG's effort to make international comparisons of regulatory decisions in 2003.[85] 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.[86]

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. As discussed above, the ACG report states that there is no evidence to suggest Australia's regulatory framework is deterring investment.[87]

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

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

87 ACG, *Review of studies comparing international regulatory determinations*, March 2004, p.113.

7.2.7 Draft decision

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

7.3 Risk Free Rate

7.3.1 Introduction

This section discusses how the risk free rate fits into the WACC formula and the approach in 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:

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

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.

As noted, the risk free rate is necessary to estimate the cost of 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 = cost of debt

r_f = risk free rate of return

d_m = 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) and the debt margin which is added to the risk free rate to determine the return on corporate debt.

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. 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 Australia[88]
- 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 risk free 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.

7.3.2 Issue

Term to maturity of risk free rate

The ACCC's discussion paper flagged that its preferred position on the risk free rate maybe subject to the Tribunal's findings. Given the Tribunal's decision, the ACCC will adopt a 10-year government bond rate as the risk free rate.

Length of period used in moving average of risk free rate

The ACCC must decide whether to use an on the day rate or an averaged bond rate to estimate the risk free rate.

7.3.3 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.[89]

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[88] 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.

[89] National Electricity Code, schedule 6.1(3.1).

7.3.4 ACCC's Discussion Paper

The ACCC noted its preference to adopt a government bond rate that matches the regulatory period as a proxy for the risk free rate, because:

- the use of a 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.

The ACCC also noted that its preferred position may be subject to the Tribunal findings in relation to GasNet's appeal against the ACCC's 2002 access arrangement.[90]

The ACCC proposed that period (five to 40 days) used to calculate the moving average of the risk free rate should be left to the discretion of the TNSP when making its application.

Comment was invited on the:

- appropriate term to maturity of the risk free rate
- length of period used in calculating the moving average of the risk free rate.

7.3.5 Submissions by interested parties on discussion paper

Term to maturity of risk free rate

The ECCSA has referred to the recent GasNet decision in which the Tribunal supported the view that the risk free rate should be the 10-year bond rate. However, it notes that the Tribunal did not comment on what adjustments should be made to other factors which modify this basic risk free input, such as the debt margin, the MRP, the debt beta and equity beta. In accepting the Tribunal's decision, the ECCSA suggest that the ACCC adjust other input parameters to the CAPM formula in order to not reward returns which are not in keeping with benchmarking.

NECG, on behalf of the TNSPs, states that the ACCC is wrong to base the maturity of the risk free rate in the costs of debt and equity on the basis of the length of the regulatory period. It states that in estimating the cost of debt, it is appropriate to use a government bond with a maturity of half the life of the assets employed by the entity. However, for estimating the cost of equity, the maturity of the government bonds should be equal to the life of the assets employed.

The Queensland Government Office of Energy states that the longest dated liquid Commonwealth bond should be used as the proxy for the risk free rate because the time horizon is consistent with long-lived assets.

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[90] ACCC Decision, GasNet Access Arrangement 2004/05 – 2008/09, January 2002.

The Queensland Treasury Corporation supports the use of the 10-year Commonwealth bond rate as the estimate for the risk free rate.

Length of period used in moving average of risk free rate

ElectraNet, Powerlink and SPI PowerNet support the ACCC's preferred position that the length of period (between 5 and 40 days) used to calculate the moving average of the risk free rate should be left to the discretion of the TNSP when making its revenue application.

The Queensland Treasury Corporation states that the use of at least 20 days for averaging is preferred to the use of shorter term measures, provided the dates of this averaging period are (confidentially) provided upfront. However, this still encourages portfolio management strategies that are inconsistent with prudent business practice and also does not completely remove the risk of short term shocks influencing the risk free rate outcome.

7.3.6 ACCC's considerations

Term to maturity of risk free rate

In December 2003, the 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 did not cite the long lived nature of the assets as the basis for the decision but rather that the traditional application of the CAPM and estimation of the MRP was based on a 10-year time horizon. 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.

The ACCC's discussion paper flagged that its preferred position on the risk free rate may be subject to the Tribunal's finding. Given the Tribunal's decision, the ACCC will adopt a 10-year government bond rate as the risk free rate.

Length of period used in moving average of risk free rate

A 40 day or a 10 day moving average has been adopted by the ACCC in previous revenue cap decisions. The ACCC considers that:

- the TNSPs should have a better understanding of their 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.

Therefore, the ACCC considers the period (between 5 to 40 days) used to calculate the moving average of the risk free 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.

7.3.7 Draft Decision

Term to maturity of risk free rate

The ACCC will adopt a 10-year government bond rate as a proxy for the risk free rate.

Length of period used in moving average of risk free 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.

7.4 Market Risk Premium

7.4.1 Introduction

This section describes how the MRP fits into the CAPM equation and 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:

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

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

r_m = The expected return on the market portfolio. The market portfolio represents the group of risk assets held by investors in equilibrium.

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. Historical 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.[91] However, this approach is sensitive to the relevant period for taking an average.[92]

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.

7.4.2 Issue

The ACCC must determine whether a MRP of 6 percent remains appropriate.

7.4.3 Code requirements

Guidance on the appropriate value of the MRP can be obtained by:

- using historical data
- using supply side models (ex-ante method)
- benchmarking international data
- considering survey data.

The code provides:

> The equity market risk premium can be observed by considering the historical data of yield gaps between returns on equity, Rm and returns on risk-free debt, Rf, namely:
>
> MRP = Rm – Rf
>
> The Australian market risk premium has averaged around 6.6 percent in the period from 1952 to the present.[93]

7.4.4 ACCC's discussion paper

The ACCC noted its preference for maintaining its current approach to estimating the MRP. This provides a long term historical value for the MRP of 6 per cent. This value

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91 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.

92 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).

93 National Electricity Code, schedule 6.1(3.2).

is consistent with a study by Associate Professor Lally for the ACCC, which recommended a MRP of 6 per cent as reasonable.

7.4.5 Submissions by interested parties on discussion paper

Historical and forward looking MRP

The ECCSA argues that the historical MRP has declined over recent times, due to fundamental changes occurring in the competitive environment now operating in Australia. It further contends that as CAPM is intended to be a forward looking model for setting regulated returns, the use of average figures using data extending over 100 years ago does not adequately reflect the current and expected future conditions.

The ECCSA states that over recent years the MRP has averaged 3-4 per cent, which is consistent with the recent surveys by Mercer Consulting.

ElectraNet states that the appropriate range for a forward looking MRP to be between 6 per cent and 8 per cent. It states that given any estimate of the MRP is a matter of judgement, the asymmetric consequences favour choosing a rate that is tilted to overestimating the MRP.

Transend states that the ACCC should adopt an estimate of the MRP that is consistent with empirical evidence, on the basis that this approach is consistent with practice in the capital markets and statistically more robust than any other approach. It argues that the consequences of regulatory intervention favour choosing a rate that is tilted to over estimating the MRP rather than under estimating it. Transend believes a forward-looking MRP of at least 7 per cent should be applied.

TransGrid and Powerlink state that an MRP of 6 per cent is appropriate and consistent with estimates of historical MRP.

MRP used by UK regulators

The EUAA believes the Australian MRP allowed in regulatory decisions is too high (compared with United Kingdom regulators using 3.5 per cent MRP).

7.4.6 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 and also arguments for both higher and lower values from interested parties.

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.[94]

The ACCC notes the ECCSA's comment that the MRP has fallen to around 3-4 per cent over recent years.[95] 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

As noted above, regulatory decisions in the UK have used an MRP of 3.5 per cent.[96] However, it is unclear whether the MRP in Australia should be similar to other markets and the value of linking the assumed MRP to overseas practice is questionable:

- despite there being some degree of integration of global markets, a perception of segmented stock markets still exists and investors appear to require a higher risk premium to invest in the Australian market. This idea of segmented stock markets is consistent with commonly held views of investors exhibiting a home asset bias, favouring their own domestic market portfolio rather than choosing to be fully diversified internationally.[97] This suggests that markets are not fully integrated

- a domestic version of CAPM is used by the ACCC in estimating the required cost of equity capital. This means that it would be inappropriate to apply a MRP based on other markets as a direct proxy for the Australian MRP.

The UK regulators appear to use a forward looking MRP based on an ex-ante 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.[98] 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.

Thus, the ACCC considers a comparison between Australian and UK MRP figures (in regulatory decisions) is of limited value. This is because of differences in financial market conditions and institutional arrangements between the two countries.

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94 There appears to be consensus that the MRP cannot be easily predicted over shorter periods and is likely to have poor statistical properties.

95 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.

96 OFGEM, *Review of Transco's price control from 2002*, Feb 2001.

97 That is, investors would require a premium to invest in markets other than their own domestic market. Other factors like differences in tax treatment can also affect investor preferences.

98 Lally, *The Cost of Capital Under Dividend Imputation,* June 2002, pp.29-34.

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:[99]

- 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 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. 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.[100] 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.[101]

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. [102]

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99 Bowman, *Estimating Market Risk Premium*, J A S S A, Issues No. 3, 2001.

100 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.

101 Lally, *The Cost of Capital Under Dividend Imputation,* June 2002, p.34.

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 maintain its current estimate of 6 per cent for the MRP but will continue to monitor the available research. The ACCC reserves the right to change the value of WACC parameters with refinement in the methodology and data.

7.4.7 Draft decision

The ACCC will:

- use a value of 6 per cent for the MRP in its TNSP revenue cap decisions
- monitor the available research and reserve the right to change the value of the MRP with refinement in the methodology and data.

7.5 Betas

7.5.1 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:

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

where:

r_f = expected risk free rate of return over the period

[102] ACG, *Review of studies comparing international regulatory determinations,* 2004, p.113.

$(r_m - r_f)$ = 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 = equity beta, a measure of investors' perceived systematic risk of the individual company's equity relative to the market.

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 one indicates that the stock has a low systematic risk relative to the market (the market portfolio beta being equal to one). 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 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).[103]

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).

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:

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[103] 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.

$$\beta e = \beta a + (\beta a - \beta d)\left[1 - \left(\frac{rd}{1+rd}\right)(1-\gamma)Te\right]\frac{D}{E}$$

where:

β_e = equity beta

β_a = asset beta

β_d = debt beta

r_d = cost of debt

γ = gamma

T_e = the effective tax rate

D = market value of debt

E = market value of equity.

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 1.0 for TNSPs.[104] However, market evidence from the sample of comparable Australian firms shows that regulated firms listed on the ASX have an equity beta of less than 1.0 (after adjusting for capital structure) and thus do not face the same market risks relative to the market portfolio beta of 1.0.[105]

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[104] The revenue cap decisions have generally stated that this figure of 1.0 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 1.0.

[105] The core sample of firms included Australian Pipeline Trust, Envestra, AlintaGas, Australian Gas Light and United Energy. If consideration is only given towards the 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.

7.5.2 Issue

The ACCC must consider whether to rely more extensively on market evidence when setting the equity beta for a TNSP.

7.5.3 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.

7.5.4 ACCC's Discussion Paper

The ACCC noted its preference to move towards benchmarking an equity beta from current market evidence and incorporating an upper confidence interval.

Comment was invited on:

- the ACCC's proposed approach in deriving an equity beta from market data. Also, given the limited availability of market data, the estimation of the equity beta in the future and in the interim
- the appropriate debt beta to use in the de/re-levering process.

7.5.5 Submissions by Interested Parties on Discussion Paper

Use of market data

TransGrid and TXU are of the opinion that the ACCC's preferred approach to estimating the equity beta from market data is inconsistent with ensuring sufficient and stable investment incentives, and introduces significant variability and non-transparency in the allowed equity beta. In particular, an equity beta is likely to vary with:

- factors used to determine which businesses are comparable
- sample-size and degree of comparability between businesses
- estimation procedure, (eg. Ordinary Least Squares)[106] and the circumstances for their use
- sampling period

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[106] For example, Ordinary Least Squares (OLS) is a procedure for estimating the parameters of any linear model. This can be illustrated by simply fitting a straight line to a set of data points.

- definition of market and returns.

Transend, SPI PowerNet, Powerlink and ElectraNet argue that an equity beta value of 1.0 should be maintained. This is on the basis of:

- a high degree of statistical uncertainty and paucity of the market data
- a high degree of subjectivity involved in estimating equity betas
- the asymmetric risk of underinvestment as opposed to overinvestment and the greater cost associated with underinvestment to society when a low equity beta is applied
- comparisons of equity betas with the market beta as a whole adjusted for different gearing levels
- international beta estimates
- the ACCC's statistical confidence level analysis when correctly applied
- the negative impact on incentives for investment that would result from the increased variability and uncertainty associated with estimating equity betas from statistical analysis of market data.

Ergon Energy contends that an equity beta of less than 1.0 is appropriate as TNSPs should not be rewarded for market risk which they are not exposed to. Furthermore, Ergon Energy believes that optimisation risk is the only risk faced by TNSPs and this is not market risk.

The Queensland Government Office of Energy states that the proxy equity beta for an unlisted company is calculated with a large degree of subjectivity which can have a significant impact on the rate of return.

The ECCSA suggests that the equity beta used by regulators assume that regulated businesses are average. It notes that the market accepts that regulated businesses exhibit a conservative rating, recognising that while providing a lower return, there is enhanced certainty of return. The ECCSA argues that the market assess regulated firms as exhibiting a lower equity beta of less than 1.0. It states that an equity beta for regulated electricity transport businesses should be in the range of 0.5-0.7.

Use of confidence intervals

NECG recognises the ACCC's attempts to address the imprecision of beta estimation by estimating confidence intervals[107] from a sample of listed firms. However, it has

[107] In estimating any parameter, the question of how reliable the estimate is must be raised. Due to sampling functions, a single estimate is likely to differ from the true value, although in repeated sampling its mean value is expected to be equal to the true value. Now in statistics the reliability of a point estimator is measured by its standard error. Therefore, instead of relying on the point estimate alone, we may construct an interval around the point estimator say within two or three standard errors on either side of the point estimator such that this interval has, say, 95 percent

concerns that the approach is flawed and will create significant regulatory uncertainty for the following reasons:

- beta estimates have poor statistical properties
- the approach of pooling estimates is open to gaming and abuse by both regulated entities and the regulator
- the choice of appropriate level of confidence to apply is inevitably ad hoc.

TransGrid, based on NERA's advice, believes that the confidence interval based on the population mean of the sample firms, not the individual firm, produces a narrower confidence interval than the actual population confidence interval. In addition, the use of a two-tailed rather than single-tailed confidence interval leads to a higher level of the upper confidence interval beta.

TransGrid states that the proposed method of estimation by the ACCC suggests no covariance between the return to businesses and the return to the market based on general economic conditions.

The TNSPs and TXU express further concerns that the ACCC's preferred approach to estimating an equity beta from market data will not give rise to a sufficient regulatory return to give businesses an incentive for efficient investment.

Market gearing

The TNSPs consider the average equity beta risk of the market as a whole should take into account the average gearing of the market, which is significantly lower than the ACCC assumed benchmark gearing for TNSPs. Based on the average market gearing of 36 per cent, it provides an average asset beta of 0.64 for the market which is higher than the asset beta provided for TNSPs.

Debt beta

The Queensland Treasury Corporation states that the debt beta is a highly theoretical concept which does not provide any useful measure of the riskiness associated with debt. There are appropriate alternatives to the Monkhouse formula that does not require a debt beta and these should be used.

NECG states that the debt beta should be greater than zero. Therefore zero can regarded as a lower bound. However, what is critical is for the de-levering and re-levering process to be undertaken consistently with the same debt beta value.

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probability of including the true parameter value. This is roughly the idea behind the confidence interval.

7.5.6 ACCC's considerations

Market evidence

The ACCC agrees with 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 1.0 (after adjusting for capital structure) and thus do not face the same market risks relative to the market portfolio beta.

In its analysis and for illustrative purposes, the ACCC also constructed 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 acknowledges that this assumption is simplistic and it may be more accurate to consider the confidence intervals for individual equity betas. 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 1.0. 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.[108]

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 market evidence. It should be noted that this analysis by ACG was qualified with the need for regulatory judgement in applying the empirical evidence.[109]

Market gearing and equity beta

The ACCC notes TNSPs 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 1.0 implies. If a stock has an equity beta of 1.0, 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 1.0 (and does not require any gearing assumption).[110]

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[108] 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.

[109] ACG, *Empirical evidence on proxy beta values for regulated gas transmission activities, final report for the ACCC*, July 2002, p.46.

[110] The definition of the portfolio beta (β_i) represents the risk of the portfolio relative to the market and is described as:

$$\beta_i = cov_{im}/\sigma_m^2$$

where: cov_{im} = the covariance between the return of portfolio i and the return of the market portfolio

σ_m^2 = variance of portfolio m

As the covariance of a portfolio with itself is equal to its variance then:

$$Cov_{mm} = \sigma_m^2$$

The literature concerning the determinants of beta is extensive and points out that the following factors should be considered:

- the nature of a firm's output
- duration of its contracts
- regulation
- monopoly power
- operating leverage
- real options
- industry size
- capital structure.

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. Among these adjustments it is only those involving gearing that receives 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 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 discussed 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 1.0.

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

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Combining these two equations, the beta of the market is one:

$$\beta_m = \sigma_m^2 / \sigma_m^2$$
$$= 1$$

(See Brailsford and Heaney, *Investments*, 1998, p.204)

value is used in the de-levering and re-levering process. This is consistent with the views expressed by NECG and Professor Davis.

The ACCC notes the Queensland Treasury Corporation's comment that there are appropriate alternatives to the Monkhouse formula that do not require a debt beta. However, the Monkhouse formula is specified for use under the imputation tax system and is as suitable as any other available formula for levering.

Summary

In previous revenue cap decisions, an equity beta estimate of 1.0 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.

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. In saying this, the ACCC will continue to use market evidence as a sanity check in determining TNSP's equity beta.

In recognition of these shortcomings, the ACCC will continue to exercise 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 1.0. However, the ACCC reserves the right to change the value of WACC parameters with refinement in the methodology and data.

7.5.7 Draft Decision

The ACCC will:

- apply an equity beta of 1.0.
- monitor empirical evidence and reserve the right to change the value of the equity beta with refinement in the methodology and data.

7.6 Cost of Debt

7.6.1 Introduction

This section sets out the cost of debt in the WACC framework and 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:

$r_d = r_f + d_m$

where:

r_d = cost of debt

r_f = risk free rate of return

d_m = debt margin.

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 CBA Spectrum database on 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:

- collecting the debt margin, corresponding to the determined benchmark credit rating and term to maturity, by taking the 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.

7.6.2 Issue

The ACCC must determine the appropriate benchmark credit rating for a TNSP to use to estimate the cost of debt.

7.6.3 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. [111]

7.6.4 ACCC's Discussion Paper

The ACCC noted its preference not to vary the approach it takes in benchmarking the debt margin on the basis of current financial market data. Consistent with its preferred position on the term of the risk free rate, the ACCC proposed to adopt a cost of debt based on a 5-year term, which matches the regulatory period.

7.6.5 Submissions by Interested Parties on Discussion Paper

Stand-alone credit ratings

ElectraNet, Powerlink and SPI PowerNet state that the ACCC should only consider businesses that have a stand-alone credit rating in determining an appropriate benchmark for the cost of debt.

Powerlink believes a more diverse range of companies should be considered if a debt margin that is comparable with private sector investments is to be established.

SPI PowerNet believes that the ACCC should use stand-alone companies as a benchmark and interpret the available (limited) evidence by adopting a credit rating benchmark for electricity transmission of 'BBB+'.

Advice of credit rating agencies

Transend states that the ACCC should estimate an efficient credit rating for the firm in question, based on cash flow modelling and the advice of rating agencies.

TransGrid states that a debt margin based on a benchmark credit rating of A- is appropriate. Alternatively, once every five years the ACCC can request an independent credit rating agency to provide a credit rating for a 60 per cent geared TNSP that is stand-alone and privately owned, then adopt this credit rating for all regulatory decisions within that five year period.

7.6.6 ACCC's considerations

In the DRP, the ACCC stated that it will 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.

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.

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[111] National Electricity Code, schedule 6.1(4.2).

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.

The ACCC notes that in the DRP discussion paper, the sampling of relevant electricity companies provided an average 'A' credit rating which the ACCC regarded as representing an appropriate proxy credit rating for the benchmark electricity network company.

The ACCC considers relevant samples of Australian electricity transmission and distribution companies should be used as the basis for calculating a benchmark TNSP's credit rating. Standard and Poor's considers that it is appropriate to provide an industry snapshot that includes both electricity distribution and transmission companies in its Australian and New Zealand Credit Stats 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.[112]

Further, there are an insufficient number of 'transmission only' entities with publicly available credit ratings to get a reliable industry snapshot.

The ACCC notes that the available credit ratings of electricity companies are published by independent ratings agency such as Standard and Poor's and Moody's. Table 7.1 sets out the long term credit rating assigned by Standard and Poor's for ten Australian electricity network companies.

[112] Standard and Poor's, 'Australia and New Zealand Credit Stats', June 2004, p.g. 17.

Table 7.1 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	55.4
SPI PowerNet	A+	79.8
Australian Gas Light	A	36.5
Citipower Trust	A-	54.1
ETSA Utilities	A-	63.5
Powercor Australia	A-	38.1
ElectraNet	BBB+	72.6
Average	**A to A+**	**56.9**

Source: Standard and Poor's, *Australia and New Zealand Credit Stats. June 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.

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.[113] The ACCC 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.[114]

However, government ownership and/or 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:[115]

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[113] If the criteria of private and stand-alone firms is strictly considered then the sample list would reduce to only include ElectraNet.

[114] Standard and Poor's, *Australian and New Zealand Electric and Gas Utilities Ripe for Rationalization*, May 2002,p.1.

[115] Standard and Poor's, *Energy-Australia & New Zealand*, November 2001, p.18.

- 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 FitchRatings who state:

> …the 'A' rated entities are generally stable network or transmission businesses.[116]

> …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.[117]

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, is consistent with the overall environment in which TNSPs operate.

Once the relevant credit rating is established the debt margin can be determined. The debt margin should reflect the prevailing market rates 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 7.3, 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 cost 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.

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[116] Standard and Poor's, *Australian and New Zealand Electric and Gas Utilities Ripe for Rationalization*, May 2002,p.1.

[117] FitchRatings, *Australian Electricity Sector-At That Awkward Adolescence Stage*, March 2004, p.40.

7.6.7 Draft 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
- calculate a benchmark debt margin, corresponding to a 10-year term and a benchmark A credit rating for a TNSP.
- monitor empirical evidence and reserve the right to change the value of the credit rating with refinement in the methodology and data.

7.7 Gearing

7.7.1 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).[118]

In previous revenue cap decisions, the ACCC has consistently used a benchmark gearing assumption of 60 per cent.

7.7.2 Issue

The ACCC needs to assess whether a gearing level at 60 per cent for a benchmark TNSP remains appropriate.

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[118] This is an illustration of the Modigliani-Miller proposition that a company's value is invariant with changes in its capital structure.

7.7.3 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.[119]

7.7.4 ACCC's Discussion Paper

The ACCC noted its preference to 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.

7.7.5 Submissions by Interested parties on Discussion Paper

Retained cash

The ECCSA provides an analysis which highlights that implied gearing for a company is much higher than 60 per cent and that this comprises a mix of interest bearing debt (60 per cent of total capital) and non-interest bearing debt such as retained cash (15 per cent of total capital), with an equity element of 25 per cent of total capital. It argues that using a higher level of equity and not providing for non-interest bearing debt in the CAPM framework incorrectly inflates the WACC calculation.

Industry benchmark gearing

Powerlink and TransGrid support a gearing assumption of 60 per cent as it demonstrates consistency in the regulatory process.

The Queensland Treasury Corporation has concerns that all regulated firms are treated the same and hence the same gearing level being applied across industries. The benchmarking of gearing should be considered as the level that would be appropriate for a regulated firm operating in that particular industry (eg. electricity transmission) but not across regulated firms as a whole.

7.7.6 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.

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[119] National Electricity Code, schedule 6.1(5.1).

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.[120] 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.[121]

Further, as set out in Table 7.1 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 7.2) also show an average gearing of approximately 57 per cent which is close to the assumed benchmark gearing of 60 per cent.[122]

Table 7.2 Gearing of electricity companies

Company	Actual Gearing (%)
Aurora Energy	52
Australian Gas Light	36.5
Citipower Trust	54.1
Country Energy	68.3
ElectraNet	72.6
Energex	55.3
EnergyAustralia	51.4
Ergon Energy	49.3
ETSA Utilities	63.5
Integral Energy	55.4
Powercor Australia	38.1
SPI PowerNet	79.8
TransGrid	55.3
Western Power	62.5
Average	**56.7**

Source: Standard and Poor's, *Australian Report Card Utilities*, March 2004.
Standard and Poor's, *Australia and New Zealand CreditStats*, June 2004.

The ACCC notes the ECCSA's comments but considers that it departs from the accepted practice of calculating the WACC based on a benchmark capital structure of equity and debt financing. The ACCC further notes that even retained cash would have an opportunity cost which can be attributed to either debt or equity.

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120 Officer, *A Weighted Average Cost of Capital for a Benchmark Australian Electricity Transmission Business-A Report for SPI PowerNet*, February 2002, p.38.

121 Standard and Poor's, Rating Methodology for Global Power Companies, 1999.

122 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.

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. However, the ACCC reserves the right to change the value of WACC parameters with refinement in the methodology and data.

7.7.7 Draft Decision

The ACCC will:

- maintain the use of a gearing level at 60 per cent for a benchmark TNSP
- monitor the available market evidence and reserve the right to change the gearing level with refinement in the methodology and data.

7.8 Imputation Credits – Gamma

7.8.1 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:

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

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.

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 1.0 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.[123]

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.

7.8.2 Issue

The ACCC needs to consider whether an average gamma of 0.5 remains appropriate.

7.8.3 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.[124]

7.8.4 ACCC's Discussion Paper

The ACCC noted the debate among Australian academics and practitioners concerning the appropriate adjustment to apply for imputation credits. The ACCC stated its preference to retain the current assumed average value of 0.5 for gamma.

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[123] Conversely, a gamma of 0 reflects no imputation which means that shareholders receive no benefit from dividend imputation.

[124] National Electricity Code, schedule 6.1(5.2).

7.8.5 Submissions by Interested Parties on Discussion Paper

Appropriate value of gamma

ElectraNet and Powerlink support the ACCC's position to retain the current assumed value of 0.5 for gamma.

TransGrid states that a gamma of zero is consistent with empirical evidence and theoretical expectations in an integrated capital market.

7.8.6 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.

Associate Professor Lally argues in favour of adopting a higher gamma, particularly when considering study on this matter.[125] Associate Professor Lally states that the use of the standard version of the CAPM which assumes national equity markets are segmented (rather than globally integrated) requires that foreign investors be disregarded. Consistent with this, most investors that would be recognised by the model would be able to fully use imputation credits. This suggests that gamma should be set at or close to 1.0.

Associate Professor Lally went on to recommend that the ratio of imputation credits assigned to company tax paid should be set at the relevant industry average. Having regard to the imputation credit/tax ratio of the eight largest listed entities in Australia, he concluded that the ratio of imputation credits to tax is close to one for most industries.[126]

The ACCC notes TransGrid's arguments that in a fully integrated capital market the marginal investor is foreign. Since foreign investors are unable to use imputation credits to offset their tax liabilities, a gamma of zero would be more appropriate. 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.[127]

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125 Lally, *The Cost of Capital under Dividend Imputation*, June 2002, p.43.

126 Telstra, News Corporation, NAB, BHP, Rio Tinto, Westpac, Commonwealth Bank and ANZ.

127 Lally, *The Cost of Capital under Dividend Imputation*, June 2002, p.12.

Further, if the ACCC was to adopt an international CAPM, other parameters of the CAPM (in particular, the MRP and beta) should reflect or be defined against the world rather than a national market portfolio. As Associate Professor Lally indicated, the result is likely to be a significantly lower rate of return.[128] Additionally, choice of the appropriate international benchmark and estimation of these parameters is likely to be more contentious and will introduce uncertainty.

In contrast, estimation of the parameters for the domestic CAPM is comparatively settled.[129] Associate Professor Lally's point does not rely on a perception of the actual value of gamma that may be revealed by ever more detailed analysis of the data. Rather, whatever the composition of the investors the assumption of an Australian domiciled average investor with a gamma of close to 1.0 will not lead to a cost of capital estimate which is understated.

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 the assumed value of 0.5 for gamma is in keeping with the code and the available empirical evidence. However, the ACCC reserves the right to change the value of WACC parameters with refinement in the methodology and data.

7.8.7 Draft Decision

The ACCC will:

- use an average gamma of 0.5
- monitor market developments and reserve the right to change the value of gamma with refinement in the methodology and data.

7.9 Debt and Equity Raising Costs

7.9.1 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 the arrangement of debt.[130] The debt financing arrangement

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[128] Lally, *The Cost of Capital under Dividend Imputation*, June 2002, pp.10-11.

[129] For example, the tax regime facing Australian domiciled is known whereas the tax status of foreign investors is unknown and may even be free of tax liabilities due to the use of tax havens.

[130] Macquarie Bank, *Issues for debt and equity providers in assessing greenfields gas pipelines,* report for the ACCC, May 2002, p.21.

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.

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. In addition, on occasions TNSP's may also be required to pay a dealer swap margin for the transfer from a floating to a fixed rate facility.[131]

Equity raising costs

Equity raising cost 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.[132]

7.9.2 Issue

The ACCC must consider whether debt and equity raising costs should be taken into account in setting the TNSP's allowed revenue.

7.9.3 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…[133]

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).

7.9.4 ACCC's Discussion Paper

Debt raising costs

The ACCC noted its preference to provide a benchmark debt raising cost as an opex allowance rather than as an addition to the debt margin. The explicit treatment of debt raising costs in opex has the potential to provide a more transparent regulatory

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131 Macquarie Bank, *Issues for debt and equity providers in assessing greenfields gas pipelines,* report for the ACCC, May 2002, pp.16, 21.

132 Macquarie Bank, *Issues for debt and equity providers in assessing greenfields gas pipelines,* report for the ACCC, May 2002, p.10.

133 National Electricity Code, 6.2.4(c)(3).

process for interested parties. This treatment would have the effect of being revenue neutral and the allowance provided should be based on current market evidence on debt raising cost.

Equity raising costs

The ACCC noted its preference to maintain the approach in providing a cash flow allowance for equity raising cost. In 2002, the ACCC researched equity raising costs and in particular collected the latest information about equity raising costs for several major Australian infrastructure equity raisings. The equity raising costs generally fell between 2.10 and 5.77 per cent of total equity raised. On the basis of those data collected by the ACCC, a benchmark allowance for equity raising costs (per year) was provided for TNSPs in the opex category.

7.9.5 Submissions by Interested Parties on Discussion Paper

Debt raising costs

NECG states that the empirical evidence (from the USA) is consistent with a total debt issuance cost, stated as a rate of return, of being in the order of up to 0.50 per cent. The impact in the cash flows depends on the regulated asset base and gearing assumptions.

Equity raising costs

NECG states that there are two alternatives for an amortisation period of the equity raising cost; life of the assets or in perpetuity. For many infrastructure investments, the life of the assets is fundamental to the formation of the business and should be the period of amortisation. Further, since equity has been raised to finance assets, the period over which equity raising costs should be amortised is the average life of the assets rather than perpetuity.

7.9.6 ACCC's considerations

In previous revenue cap decisions, a benchmark allowance for debt and equity raising costs have been provided.[134] More recently, in the Transend and TransGrid revenue cap decisions, 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.[135] 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 Victorian Essential Services Commission (ESC)

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[134] See Revenue Cap decisions - SPI PowerNet and ElectraNet 2002

[135] The ACCC has only provided equity raising costs for privatised firms.

(ORG at the time) in the context of its 2001-2005 Price Determination for the distribution business of United Energy. United Energy appealed this decision by the ESC 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, ACCC has decided to undertake a review of this issue in a study. The study 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.

7.9.7 Draft Decision

The ACCC will:

- treat debt and equity raising costs as opex items
- undertake a further review of debt and equity raising costs and hedging costs

7.10 Draft Decisions

7.1 Introduction

This section sets out the ACCC's view on each of the parameters of the WACC. As part of the review of the DRP the ACCC has taken various measures such as through its decision on WACC to increase certainty of investment for TNSPs. The ACCC proposes 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 in investment. However the ACCC reserves the right to change the value of the WACC parameters with refinement in the methodology and 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.*

7.2 Weighted Average Cost of Capital

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

7.3 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:

$re = rf + \beta e(rm - rf)$

where:

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

(rm – rf) = *expected market risk premium (MRP), defined by the expected premium of return of the market (rm) as a whole over the risk free return for the same period*

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

7.4 Risk free rate

Term to maturity of risk free rate

The ACCC will adopt a 10-year government bond rate as a proxy for the risk free rate.

Length of period used in moving average of risk free 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.

7.5 Market risk premium

The ACCC will:

- use a value of 6 per cent for the MRP in its TNSP revenue cap decisions
- monitor the available research and reserve the right to change the value of the MRP with refinement in the methodology and data.

7.6 Equity beta

The ACCC will:

- apply an equity beta of 1.0
- monitor empirical evidence and reserve the right to change the value of the equity beta with refinement in the methodology and data.

7.7 Cost of debt

In determining the cost of debt, which comprises the debt margin and the risk free rate, the ACCC will:

- use a 10-year government bond rate as a proxy for the risk free rate
- calculate a benchmark debt margin, corresponding to a 10-year term and a benchmark A credit rating for a TNSP.
- monitor empirical evidence and reserve the right to change the value of the credit rating with refinement in the methodology and data.

7.8 Gearing

The ACCC will:

- maintain the use of a gearing level at 60 per cent for a benchmark TNSP
- monitor the available market evidence and reserve the right to change the gearing level with refinement in the methodology and data.

7.9 Gamma

The ACCC will:

- use an average gamma of 0.5
- monitor market developments and reserve the right to change the value of gamma with refinement in the methodology and data.

7.10 Debt and equity raising costs

The ACCC will:

- treat debt and equity raising costs as opex items
- undertake a further review of debt and equity raising costs and hedging costs.

8 Financial Indicators

8.1 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.

8.2 Issue

The ACCC is reviewing its use of financial indicators. Currently, the ACCC calculates and analyses various financial indicators when setting a revenue cap. The purpose of this analysis is to predict the effect of a revenue cap decision on the TNSP's financial viability and ability to obtain credit.

8.3 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".

8.4 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 the TNSP. The ACCC uses an approach similar 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.

8.5 Draft Decision

8.1 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.

8.2 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* (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 may commence the process to amend the *Information Requirements Guidelines* to incorporate the 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 Information Requirements

A.2.1. 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.2.2. 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 control period (see Chapter 4).

(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 the same asset classes

(iii) forecast and actual disposals broken down into the same asset classes

(iv) forecast depreciation broken down into the same asset classes

(v) actual CPI adjustment for each asset class

(vi) closing asset values for each asset class at the end of the current regulatory period.

A.2.3. 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) reliability 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 outs 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 asset needed replacing (including comprehensive 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.2.4. Forecast capital expenditure

(a) Introduction

In contrast to an ex-post capex regime, an ex-ante regime places greater emphasis on conducting a rigorous review of forecast investment before the investment is undertaken. This increases the information required in a TNSP's revenue cap application (see Chapter 4).

(b) 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.

(c) The forecast capex costs should be rigorous and as accurate as possible. Where forecasts cannot be supplied to a precise standard, this should be highlighted and an explanation provided.

(d) 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) possible projects (not identified above).

(e) 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.

(f) 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.

(g) 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.

(h) In relation to large replacement projects (that is, projects exceeding $10 million), the TNSP should provide an explanation as to why the asset needs replacing (including comprehensive condition based assessments).

(i) In relation to 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.2.5. 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 as set out in Chapter 6.

(d) If the TNSP is requesting a pass through mechanism as part of its revenue cap, it should address the pass through guidelines as set out in Chapter 6.

A.3 Draft 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 control period (see Chapter 4 of the Background Paper.

(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 the same asset classes

(iii) forecast and actual disposals broken down into the same asset classes

(iv) forecast depreciation broken down into the same asset classes

(v) actual CPI adjustment for each asset class

(vi) closing asset values for each asset class 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) reliability 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 outs 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 asset needed replacing (including comprehensive 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) Introduction

In contrast to an ex-post capex regime, an ex-ante regime places greater emphasis on conducting a rigorous review of forecast investment before the investment is undertaken. This increases the information required in a TNSP's revenue cap application (see Chapter 5 of the Background Paper).

(b) 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.

(c) The forecast capex costs should be rigorous and as accurate as possible. Where forecasts cannot be supplied to a precise standard, this should be highlighted and an explanation provided.

(d) 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) possible projects (not identified above).

(e) 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.

(f) 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.

(g) 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.

(h) In relation to large replacement projects (that is, projects exceeding $10 million), the TNSP should provide an explanation as to why the asset needs replacing (including comprehensive condition based assessments).

(i) In relation to 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.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 as set out in Chapter 6 of the Draft Background Paper.

(d) If the TNSP is requesting a pass through mechanism as part of its revenue cap, it should address the pass through guidelines as set out in Chapter 6 of the Draft Background Paper.

Appendix B Transitional Capital Expenditure Arrangements

This chapter 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 during the first control period from subsequent capex, this paper refers to this capex as historic capex.

This Appendix:

- summarises the issues (section B.1)
- notes the code requirements (section B.2)
- outlines the options considered in the Discussion Paper and the ACCC's preferred position (section B.3)
- summarises submissions from interested parties (section B.4)
- considers the existing regulatory framework and the approach to the assessment of historic capital expenditure (section B.5)
- presents the ACCC's Draft Decision (section B.6).

B.1 Issue

The ACCC will apply the ex-post prudency framework for capex during the first revenue control period in assessing the amount of capex out-turns to be rolled into the RAB. The issue considered in this section is 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 ACCC's Discussion Paper

In the DRP the ACCC advocated an ex-post assessment of the prudency of capex. However, the Discussion Paper raised the issue of whether the Regulatory Test[136] should be adopted as the criteria for assessing the amount of capex to be rolled-into the RAB.

B.4 Submissions by Interested Parties on Discussion Paper

The ACCC received submissions on the issue of whether or not it should adopt the Regulatory Test as the basis of the assessment of the prudency of both augmentation and non-augmentation capex. Since the release of that Discussion Paper, the ACCC has given further consideration to the broader design of the regulatory regime. As noted, the ACCC released the *Supplementary Discussion Paper – Capital Expenditure Framework* which proposed an ex-ante regime. This paper supersedes the issue of whether or not the Regulatory Test should be used as the basis of the prudency assessment. In view of this, the ACCC has discussed the proposed capex framework going forward in Chapter 5.

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

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136 The Regulatory Test was promulgated in December 1999 under clause 5.6.5(q) of the code. The relevant provisions dealing with the Regulatory Test are now established in clause 5.6.5A of the code.

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. For example, if an investment was justified on the basis of demand increases that did not subsequently eventuate, the TNSP should not be penalised for making the investment if its demand forecast at the time the investment was made reflected the available information consistent with what would be expected if the TNSP applied "good industry practice". 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. In this case, should the ACCC penalise TNSPs for poor decision-making (by disallowing the inclusion of all or part of investment in the RAB) even if the investment turns out to be efficient? 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.[137] 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.

- Second, assuming the need for an investment is recognised, assess whether the TNSP proposed the most efficient investment to meet that need. The content of the assessment here is 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 indeed developed, and if not, whether the difference reflects decisions that are consistent with good industry practice. The analysis in this third step 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.

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137 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-in to 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.

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. This is the prudency test that the ACCC will apply to such investment.

B.6 Draft Decision

B.1 Introduction

The ACCC will apply the ex-post prudency test for investment during the first revenue control period in assessing the amount of capex out-turn to be rolled-into the RAB. The ACCC for subsequent revenue caps 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 principle 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 Draft Statement of Principles for the Regulation of Transmission Revenues, May 1999, 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 prudency of TNSP's capex.

B.4 Application of Prudency 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. At this stage, 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.

Second, assuming the need for an investment is recognised, assess whether the TNSP proposed the most efficient investment to meet that need. The content of the assessment here is 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 indeed developed, and if not, whether the difference reflects decisions that are consistent with "good industry practice". The analysis in this third step 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 prudency 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.