



Decision

Snowy Mountains Hydro-Electric Authority Transmission Network Revenue Cap 1999/00-2003/04

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Glossary

ACT	Australian Capital Territory
CAPM	Capital Asset Pricing Model
CoAG	Council of Australian Governments
Code	The National Electricity Code
Commission	Australian Competition and Consumer Commission
CPI	Consumer Price Index
GST	Goods and Services Tax
KV	Kilo Volts
MAR	Maximum Allowable Revenue
MGCC	Murray Group Control Centre
MoEU	Ministry of Energy & Utilities (NSW)
MRP	Market Risk Premium
NEM	National Electricity Market
NSW	New South Wales
SIG	Snowy Implementation Group
SMHEA	Snowy Mountains Hydro-Electric Authority
The Act	Trade Practices Act 1974
UTGCC	Upper Tumut Group Control Centre
WACC	Weighted Average Cost of Capital

Executive summary

The Australian Competition and Consumer Commission (Commission) commenced regulation of the transmission networks in the National Electricity Market (NEM) under the National Electricity Code (Code) on 1 July 1999. This decision is for the non-contestable elements of the Snowy Mountains Hydro-Electric Authority (SMHEA). The members of the Snowy Mountains Council requested that the Commission provide a revenue cap decision for the SMHEA's 132kV and 330kV transmission network. This request and the Commission's decision are in accordance with the principles contained in the Code and the SMHEA's access undertaking. The revenue cap will be conducted over a regulatory period beginning 1 July 1999 on the basis of the information provided to the Commission and in accordance with the request from the members of the Snowy Mountains Council.

The Commission conducted a public consultation process on the draft decision, which was published on 6 June 2000. Interested parties were invited to comment on the draft decision. Additionally, the Commission conducted a public forum on 22 June 2000 in Canberra to discuss the elements of the draft decision.

The Commission's approach to setting the revenue caps

The Code requires the Commission to set a revenue cap with an incentive mechanism (such as CPI-X or some variant) for non-contestable transmission network services. The Commission's role as regulator of those services is limited to determining the maximum allowed revenue (MAR).

The Code outlines the general principles and objectives for the transmission revenue regulatory regime to be applied by the Commission. The Code grants the Commission the flexibility to use alternative, but consistent, methodologies. In fulfilling its role as regulator, the Commission's aim is to adopt a process which eliminates monopoly pricing, provides a fair return to network owners, and creates incentives for owners to pursue ongoing efficiency gains through cost reductions.

The Commission is developing the regulatory framework through its *Statement of Principles for the Regulation of Transmission Revenues (Regulatory Principles)*. A draft of the *Regulatory Principles* was released in May 1999¹. In that context, the Commission sees this revenue cap decision for the SMHEA as being part of the transition towards the Commission's *Regulatory Principles* framework. Consequently, this decision encompasses many, but not all, of the draft *Regulatory Principles*. As a result, future revenue caps may be different to this decision.

In this decision the Commission has adopted an accrual building block approach in a post-tax nominal formulation, which the Commission considers best reflects the Code's regulatory principles. This decision allows for a pass through of the Goods and Services Tax (GST) and a possible pass-through of income tax. Should the SMHEA be required to pass through GST related costs, or income tax payments, these will need to

A copy of the draft *Statement of Principles for the Regulation of Transmission Revenues* is available from the Commission's website (<http://www.accc.gov.au>)

be submitted to the Commission for approval. Consistent with this approach, the revenue cap in this decision is the sum of:

- a *return on capital* — which is the written down (depreciated) value of the asset base multiplied by the post-tax nominal return on capital;
- the *return of capital* — depreciation allowance;
- an allowance for *operating and maintenance expenditure*;
- *tax* — a pass-through of any expected business income tax payable; and
- *GST* — a pass-through of the net impact of the GST on the businesses.

The building block approach to setting the revenue cap determines the maximum revenue that a network can earn from its regulated assets on an annual basis. The Code provides the Commission with the discretion to choose the length of the regulatory period. While choosing a longer regulatory period would provide a network with revenue certainty, this would be on the basis of increasingly uncertain estimates of future needs. On balance, the Commission has chosen to apply a regulatory period of five years from 1 July 1999 to 30 June 2004, consistent with that for the *NSW and ACT Transmission Network Revenue Caps (NSW and ACT Revenue Caps)* decision². This decision is also presented in a CPI-X format, where X is a smoothing, not efficiency, factor.

Revenue cap for the SMHEA

The Commission's assessment of the various components of the revenue cap, in the context of the building block framework, is discussed below.

Asset value

In order to establish the appropriate return on the funds invested in the SMHEA's transmission assets, the Commission has modelled the SMHEA's asset base over the life of the regulatory period and estimated a post-tax nominal return on equity based on the most recent financial information.

The closing value of the SMHEA's asset base is constructed by taking the opening, real, value of the asset base, converting it to a nominal figure by adding in an inflation adjustment, adding in any capital expenditure and subtracting disposals and depreciation for the year. The closing value for one year's asset base becomes the opening value for the following year's asset base.

Section 6.2.3(4)(iii) of the Code states that the assets in existence and in service from 1 July 1999 are valued at the value determined by the jurisdictional regulator. On the basis that the Commonwealth Government owns the SMHEA, the Commission has undertaken the function of jurisdictional regulator.

² A copy of the *NSW and ACT Transmission Network Revenue Caps* is available from the Commission's website (<http://www.accc.gov.au>)

The Commission engaged PB Power to undertake a review, which provides an analysis of and comments on the assumptions, methodology and findings contained in a 1998 valuation undertaken for the NSW Department of Treasury. That earlier NSW review and the PB Power assessment were of all of the SMHEA's assets, including the connection assets. The PB Power review broadly supported the 1998 valuation, of \$47 million, however, it disagreed with the conservative approach to asset valuation used in the report, extending the useful life assumptions used to value the transmission wires and switching stations. Adopting the useful life assumptions proposed by PB Power, the Commission has modelled the opening asset value for the SMHEA's transmission network at \$62.45 million.

Capital expenditure

At the outset of this review the SMHEA indicated that it has plans for a modest capital expenditure program (capex) of \$10.47 million over the regulatory period. This figure was later revised down by the SMHEA to \$9.47 million with the reclassification of the surge arrester equipment to the generation business.

Subsequent discussions with the SMHEA clarified the classification of the Upper Tumut Group Control Centre (UTGCC) and the Murray Group Control Centre (MGCC). In those discussions, the SMHEA indicated that these two control centres will not be transferred upon corporatisation and will remain with the generation business. Therefore, the upgrade of sewage treatment facilities and the proposed replacement of fire protection services for the UTGCC and the MGCC are excluded from the capex program.

Therefore, based on the Commission's approach to recognising capex at the date of commissioning, a nominal capex of \$7.06 million is recognised over the regulatory period, of which about \$0.5 million is attributable to interest during construction.

Depreciation

Using a post-tax nominal framework, the Commission has made allowance for "economic depreciation" which adds together the (negative) straight line depreciation with the (positive) annual inflation effect on the asset base.

This economic depreciation has been used to model the movements of asset values over the life of the regulatory period (table 1) and for determining the return of capital (table 2). Calculation of the applicable straight-line depreciation component has been based on the remaining life per asset class.

On the basis of this approach the Commission has calculated a straight-line depreciation allowance that trends from \$2.90 million in 1999/00 to \$3.02 million, \$3.09 million, \$2.89 million, and \$3.00 million in each of the following years.

Cost of capital

In determining the SMHEA's revenue cap, the Commission must have regard to its cost of equity capital. The cost of equity capital is a method commonly used for determining the returns expected on an asset base.

The Commission has given careful consideration to the value that should be assigned to the SMHEA's assets given the nature of its business and current financial

circumstances. Accordingly, the parameter values used are those considered most appropriate.

The Commission considers that the appropriate rate of return to apply to the SMHEA's transmission assets is a post-tax nominal return on equity of 11.20 per cent.

The Commission has decided to adopt a nominal risk free interest rate of 5.19 per cent, reflecting the short-term average yield on the five year government bonds. The Commission has arrived at a debt margin of 1.0 per cent above the nominal risk free interest rate. This provides a cost of debt of 6.19 per cent.

The Commission has maintained consistency with recent regulatory decisions in setting the market risk premium at 6.0 per cent.

For the tax and gamma parameters, the Commission utilised the same approach adopted in *the NSW and ACT Revenue Caps*, that is, a tax rate of 30% and a gamma of 0.5.

The Commission has examined the risks faced by SMHEA and the betas of similar businesses in arriving at an asset beta of between 0.30 and 0.50. This range was derived from the average asset beta for the infrastructure and utilities industry group listed on the Australian Stock Exchange. Using the debt beta in a range between 0.30 and 0.50, this converts to an equity beta of between 0.75 and 1.25 with a mid point of 1.00.

Return on capital

Based on the above components, the Commission has modelled SMHEA's asset base over the life of the regulatory period (see table 1).

Table 1: SMHEA's return on capital - 1999/00 to 2003/04 (\$million)

	1999/00	2000/01	2001/02	2002/03	2003/04
Opening asset base	62.45	59.55	57.76	56.51	55.82
Capital expenditure	-	1.23	1.84	2.20	1.79
Economic depreciation	2.90	3.02	3.09	2.89	3.00
Closing asset base	59.55	57.76	56.51	55.82	54.61
Return on capital	5.11	4.87	4.73	4.63	4.57

Operating and maintenance expenses

In preparing for corporatisation, the SMHEA has undertaken significant cost reductions and the Commission considers that it is unlikely that the SMHEA will be able to sustain similar levels of cost savings over the regulatory period. Therefore, the Commission recognises opex of \$14.29 million over the regulatory period.

Estimated taxes payable

In estimating a tax position for the SMHEA, the Commission has undertaken an assessment of the SMHEA's tax paying position, based on the assumptions underlying the building block approach, the SMHEA's tax depreciation profile, and the taxation arrangements, implemented as a result of the Ralph business taxation review. Currently, the SMHEA does not pay any tax, or tax equivalence component. However, this situation will alter after corporatisation, where it is proposed that the transmission network assets will be transferred to TransGrid as set out in Section 14(1) of the Snowy Corporatisation legislation. To account for this, the Commission will allow a pass through of income tax payable should the transfer occur during the regulatory period. Given that the new taxation provisions will apply, the income tax payable would be calculated using straight-line depreciation.

Total revenue

Based on the various elements of the Commission's building block approach, the Commission has derived an unadjusted and smoothed revenue allowance (see table 2). Accordingly, the Commission proposes a smoothed annual revenue, using an X factor, a smoothing not efficiency X, of 3.54, for the SMHEA which trends down slightly from \$10.79 million in 1999/2000 to \$10.66 million in 2003/04.

Table 2: MAR for the SMHEA – 1999/00 to 2003/04 (\$ million)

	1999/00	2000/01	2001/02	2002/03	2003/04
Return on capital	5.11	4.87	4.73	4.63	4.57
Return of capital	2.90	3.02	3.09	2.89	3.00
Operating expenses	2.77	2.84	2.90	2.97	3.04
Unadjusted revenue allowance	10.79	10.73	10.72	10.48	10.61
Smoothed MAR	10.79	10.75	10.71	10.68	10.66

Service standards

In establishing the revenue cap, the Commission is aware that it creates the incentive for the SMHEA to minimise costs, perhaps at some detriment to the level of services provided. While the NEC provides some detail on the level of service standards appropriate for transmission networks in the NEM, these service standards are not comprehensive.

On the basis that the SMHEA network assets are to be transferred to TransGrid, the Commission will adopt the same approach to the SMHEA's service standards as was adopted for TransGrid's service standards. That is, as the licensing body in NSW, the Ministry of Energy and Utilities (MoEU) will be requiring identified service standards as part of the transmission and distributions network's reporting requirements under the licensing arrangements, and will be publishing its report on service standard performances annually. The Commission understands that the transmission reporting

requirements will need to be met by the SMHEA, in addition to TransGrid and EnergyAustralia as foreshadowed in its discussion paper released in May 1999.

The Commission will consider the administrative efficiencies of relying on the reports published by the MoEU to satisfy itself that the revenue cap is commensurate with the level of service actually provided. The Commission will also continue to develop its views on service standards in the *Regulatory Principles*.

1. Introduction

The National Electricity Code (Code) was developed out of a number of resolutions made by the Council of Australian Governments (COAG) concerning the large potential for efficiency gains to the Australian economy available from reform of the electricity industry.

The Code provides the framework for the National Electricity Market (NEM) which establishes a single wholesale market across southern and eastern Australia and an access regime for the transmission and distribution networks in participating jurisdictions. The NEM commenced on 13 December 1998. The Code also establishes a regulatory framework which:

- provides that the Australian Competition and Consumer Commission (Commission) will determine the revenue caps to be applied to the non-contestable elements of participating transmission networks; and
- sets out how those regulated revenues, combined with the networks' contestable revenues, will be translated into network charges.

The Code states that the Commission will assume responsibility as transmission network regulator beginning from 1 July 1999 on a progressive basis in accordance with the derogations of each individual jurisdiction. All transmission networks within the NEM will come under the Commission's regulation by 31 December 2002.

This document sets out the Commission's decision in respect of the revenue cap, which will apply from 1 July 1999 to the non-contestable elements of the Snowy Mountains Hydro-Electric Authority's (SMHEA) transmission network. The revenue cap will apply for a period of five years; that is until 30 June 2004. This period is consistent with the regulatory period for TransGrid, which is likely to acquire the SMHEA's assets on corporatisation.

The remainder of this chapter sets out:

- the regulatory framework according to which the Commission will determine the revenue caps to be applied to the SMHEA's transmission assets (section 1.1);
- the results of several regulatory reviews and their relationship to the Commission's decision (section 1.2);
- the review and public consultation processes followed by the Commission in reaching its decisions (section 1.3); and
- an overview of the SMHEA's transmission network (section 1.4).

1.1 The Commission's role as regulator of transmission revenues

1.1.1 Scope of the regulatory review

The NEC outlines the general principles and objectives for the transmission revenue regulatory regime to be applied by the Commission (see Box 1 for further details). It also grants the Commission the flexibility to use alternative methodologies, providing they are consistent with the Code's 'objectives, principles, broad forms and mechanisms, and information disclosure requirements'.

Using the principles and objectives outlined in the Code, the Commission has set a revenue cap for the non-contestable elements of the SMHEA transmission network. That is, the Commission has determined the maximum allowable revenues (MAR) which the owners of those assets can earn from the use of those non-contestable elements.

Note that, to the extent that those assets also provide contestable services, the revenues associated with those services can be competitively sourced. Such revenues are therefore excluded from the revenue capping process and may be determined separately by the SMHEA.

1.1.2 Form of transmission revenue regulation

In assuming its role as the regulator of the NEM transmission networks, the Commission aims to adopt a regulatory process which eliminates monopoly pricing, provides a fair return to network owners and creates incentives for managers to pursue ongoing efficiency gains through cost reductions. In achieving the aims the Commission is aware of the need to ensure compliance costs are minimised and that the regulatory process is objective, transparent and as light handed as possible.

As this review was being undertaken, the Commission was also finalising its Statement of the Principles for the Regulation of Transmission Revenues (*Regulatory Principles*) which sets out how the Commission proposes to regulate transmission revenues in the longer term. A draft of that document was released in May 1999 and a summary of the proposed framework is set out in Section 1.2.1 below. The Commission is currently considering submissions on the draft made by interested parties.

However at this time, the Regulatory Principles remains unfinalised and it has not been possible to apply all the elements of that approach to this decision. This document sets out the methodology used to determine the revenue caps for the SMHEA's transmission revenues during the first regulatory revenue cap period between 1 July 1999 and 30 June 2004. Nevertheless, it should be noted that there are significant areas of consistency between the proposed *Regulatory Principles* framework and the methodology applied in this decision.

Box 1: Objectives and principles of the transmission revenue regulatory regime

The NEC establishes that:

1. the transmission revenue regulatory regime must achieve outcomes which:
 - (a) are efficient and cost effective;
 - (b) are incentive based, including the sharing of efficiency gains between network users and owners as well as the provision of a reasonable rate of return (without monopoly rents) to network owners;
 - (c) foster efficient investment, operation, maintenance and use of network assets;
 - (d) recognise pre-existing government policies on asset values, revenue paths and prices;
 - (e) promote competition; and
 - (f) are reasonably accountable, transparent and consistent over time;
2. the regulation of aggregate revenue of transmission networks must:
 - (a) be consistent with the regulatory objectives (see 1 above);
 - (b) address monopoly pricing concerns, wherever possible, through the competitive supply of network services but otherwise through a revenue cap;
 - (c) promote efficiency gains and a reasonable balance between supply and demand side options;
 - (d) promote a reasonable rate of return to network owners on an efficient asset base where:
 - (i) the value of new assets is consistent with take-or-pay contracts or NEMMCO augmentation determinations;
 - (ii) the value of existing assets are determined by jurisdictional regulators and must not exceed than their deprival value; and
 - (iii) any asset revaluations undertaken by the Commission are consistent with COAG decisions;
3. the form of the economic regulation shall:
 - (a) be a revenue cap with a CPI-X incentive mechanism, or some other incentive based variant, for each network owner;
 - (b) have a regulatory control period of not less than five years;
 - (c) take into account expected demand growth, service standards, weighted average cost of capital, potential efficiency gains, a fair and reasonable risk adjusted return on efficient investment and ongoing commercial viability of the transmission industry; and
 - (d) only apply to those assets the Commission does not expect to be offered on a contestable basis.

Similar to the proposals in the draft *Regulatory Principles* and the approach adopted in the *NSW and ACT Revenue Caps* decision, the Commission has adopted a post-tax nominal accrual building block approach in this decision.

In its post-tax nominal form, the accrual building block approach calculates the MAR as the sum of the return on capital, the return of capital and an allowance for operating and maintenance (non-capital) expenditure and income tax payable, that is:

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

where WACC = weighted average cost of capital;
WDV = written down (depreciated) value of the asset base;
D = depreciation allowance;
opex = operating and maintenance expenditure; and
taxes = allowance for estimated tax liabilities.

The MAR formula will also take into account the Commonwealth Government's new Goods and Services Tax (GST).

1.1.3 Structure of this document

The remainder of this document broadly follows the structure inherent in the building block methodology set out in section 1.1.2. That is, in relation to the SMHEA draft decision:

- Chapter 2 deals with the network's return on equity;
- Chapters 3 and 4 detail the SMHEA's asset base (respectively, the initial asset base as at 1 July 1999 and the network's projected future capital requirements);
- Chapter 5 outlines operating and maintenance expenditure;
- Chapter 6 summarises the Commission's assessment of each element of the building block (including depreciation);
- Appendix 1 provides a brief analysis of the WACC formulation used by the Commission.

1.2 Other regulatory decisions

There are two decisions that are influential in the Commission's considerations for determining the SMHEA's transmission network revenue caps. These include:

- The draft *Regulatory Principles*, which outlines the Commission's longer term approach to the regulation of transmission networks; and
- The final decision on the *NSW and ACT Revenue Caps 1999/00 – 2003/04* released by the Commission.

In light of the *Regulatory Principles*, the Commission's approach to future revenue determinations may change from the approach adopted in this review of the SMHEA transmission network revenue caps. Comments in response to the draft *Regulatory Principles* will further develop the Commission's regulatory approach and may ultimately change the decisions in the future determinations. This decision must be read in the context of the draft *Regulatory Principles*.

1.2.1 Draft Regulatory Principles

Chapter 6 of the Code envisages that the Commission will develop a set of guidelines outlining how it will exercise its power to regulate transmission network revenues in

the NEM. As mentioned above, those guidelines are contained in the draft *Regulatory Principles* document, which the Commission released in May 1999.

In summary, the Commission proposes determining future transmission revenues according to the following principles:

- an accrual building block approach based on forecast costs of service;
- use of depreciated optimised replacement cost (ODRC) as a cap on the initial asset valuation as part of an optimised deprival valuation assessment;
- at each regulatory reset, networks being given the opportunity to identify assets subject to bypass risk — such assets would be subject to accelerated depreciation to compensate the network for that risk prior to their removal from the asset base;
- planned capital expenditures being subject to an *ex ante* prudence test and an *ex post* examination of the actual expenditure which has taken place;
- the rate of return on the asset base being determined using a post-tax nominal framework;
- return of capital will be determined by way of competition depreciation which links the long-term depreciation profile of the assets to a measure of the rate of technological change;
- the required efficiency regime will be of the CPI-X form;
- operating and maintenance expenditures will be subject to a one regulatory period glide path while other components of the building block will face a P0 adjustment;
- the revenues determined will be ‘sanity checked’ through the use of financial indicator analysis; and
- each network will be required to provide a set of service standards for approval by the Commission — those standards will be included in the revenue cap decision and a penalty system will apply if the network fails to comply with those standards.

A number of submissions were received in response to the draft *Regulatory Principles*. As noted, the Commission is currently reviewing that material and working towards finalising the *Regulatory Principles*.

1.2.2 NSW and ACT Transmission Network Revenue Caps

On 25 January 2000, the Commission finalised its revenue cap decision for the electricity transmission networks in NSW and the ACT. The Commission’s decision was in accordance with the principles in the Code and NSW’s transitional rules and will apply for the period 1 February 2000 to 30 June 2004. That decision was the first made by the Commission as the economic regulator of electricity transmission networks in the NEM.

The Commission adopted an accrual building block approach to determining the revenue caps for TransGrid’s and EnergyAustralia’s transmission networks. In

finalising that decision, the Commission used a post-tax nominal formulation and allowed for a pass through of costs to take account of the GST and a possible pass-through increase in third party liability insurance premiums.

TransGrid

After considering a consultant's review of TransGrid's asset base, the Commission set the opening value of TransGrid's assets at \$1 935 million. TransGrid has planned an extensive capital expenditure program (\$946 million) over the coming years. However, on considering a consultant's review of TransGrid's capital expenditure program, the Commission calculated TransGrid's revenue cap based on \$881 million of capital expenditure which includes interest during construction.

The Commission considered that the appropriate rate of return to apply to TransGrid was a post-tax nominal rate of return on equity of 13.85 per cent. This equated to a post tax nominal weighted average cost of capital of 8.30 per cent. At that time, the Commission indicated that it believed that these figures were towards the higher end of the feasible range.

Based on the Commission's assessment of both the financial parameters operating in the Australian economy at that time as well as TransGrid's expenditure program, the Commission determined a maximum allowable revenue for TransGrid which trended up in nominal terms from \$329.63 million in 1999/00 to \$393.12 million in 2003/04. The smoothing X factor used in that decision was positive 1.30 per cent per annum.

EnergyAustralia

On considering a consultant's review of EnergyAustralia's asset values, the Commission used an ODRC value for its network assets (\$384.9 million) and an indexed historic cost for its easements (\$72.5 million). The Commission accepted the prudence of EnergyAustralia's proposed \$80 million capital expenditure program for its parallel transmission network.

Consistent with the TransGrid decision, the Commission adopted a post tax nominal return on equity of 13.85 per cent for EnergyAustralia. However, this equated to a post-tax nominal WACC of 8.1 per cent, arising from the tax shield afforded to EnergyAustralia from proportionately smaller depreciation.

Based on the various elements of the Commission's building block approach, the Commission derived a revenue allowance for EnergyAustralia's parallel transmission network that trends up from \$73.10 million in 1999/00 to \$78.12 million in 2003/04. Consistent with the TransGrid decision, these numbers were expressed in CPI-X format where the smoothing X factor was positive 1.43 per cent.

1.3 Review processes and public consultation

The key aspects of the public consultation and review processes that have occurred as part of this decision are:

- *The Commission conducted a public consultation process.* This involved the Commission calling for the registration of interest in the SMHEA revenue cap decision process and inviting submissions from interested parties on the Commission's website.
- *The Commission engaged a consultant to review recent valuations of the SMHEA transmission asset base.* PB Power was engaged to conduct this asset valuation review. A copy of the final report appears on the Commissions website.
- *The SMHEA provided a submission for the Commission's consideration.* This submission outlines the views on key elements of the revenue cap decision, and is also placed on the Commissions website.
- *The Commission conducted discussions with the members of the Snowy Mountains Council and the SMHEA.* The information provided by the SMHEA subsequent to the submission was used in the decision.
- *The Commission invited written submissions in response to the draft decision.* Submissions were received from the SMHEA, TransGrid, EnergyAustralia, and a joint submission from the Snowy Implementation Group (SIG) on behalf of the NSW, Victorian and Commonwealth Governments.

1.4 Overview of the SMHEA's network

Operating over an area 8,200 square kilometres, the Snowy Mountains Scheme includes:

- seven power stations;
- a pumping station at Jindabyne and pump storage capacity at Talbingo;
- sixteen dams;
- 145 kilometres of trans-mountain tunnels;
- 80 kilometres of aqueducts; and
- transmission assets.³

The transmission assets form a small part of the Snowy Mountain Scheme, covering an area of 3,200 square kilometres, largely within the Kosciusko National Park. The

³ The Snowy Mountains Hydro Electric Authority, 1997-98, Annual Report, p 100

SMHEA's transmission assets function separately from the electricity generation facilities and constitute approximately 4 per cent of the SMHEA's total asset base.

The transmission assets of the SMHEA form part of the interconnection between Victorian and NSW in the national grid. The assets consist of a triangle of switching stations (Murray, Upper Tumut, and Lower Tumut) connected by approximately 160 km of 330kV lines. Radial 330kV lines connect the SMHEA's Murray and Tumut Power stations to their respective switching stations whilst a 132kV line connects Guthega Power Stations and the Jindabyne pumping station to the Murray Switching station.

The SMHEA is a statutory authority owned by the Commonwealth Government operating on a cost recovery basis. In line with both the micro-economic reforms being pursued by the COAG for the electricity supply industry and the electricity reform principles of separation of generation and transmission businesses, the SMHEA is moving towards becoming a corporatised organisation operating within the NEM. Upon corporatisation, it is expected that the transmission assets will be transferred to TransGrid under Section 14(1) of the Snowy Corporatisation legislation. Once corporatised, the SMHEA will be solely responsible for its management structures and long term planning, earning its own income through the sale of energy and related services, and managing its own costs.

2. The Cost of Capital

2.1 Introduction

Clause 6.2.2(b)(2) of the Code requires the Commission to seek to achieve a fair and reasonable rate of return on efficient investment as one of the objectives of economic regulation. Further guidance is provided in Clause 6.2.4(c)(3) of the Code in which it states that the Commission must have regard to the WACC of the transmission network. In addition, the Commission is to have regard to the risk adjusted cash flow rate of return required by investors in commercial enterprises facing similar business risks to the transmission network.

The importance of correctly assessing, and expressing, the return on capital is highlighted by the capital intensive nature of the electricity industry, illustrated by the *NSW and ACT Revenue Caps* decision where the return on capital accounted for around two thirds of the MAR. Therefore, relatively small changes to the cost of capital can have a significant impact on the total revenue requirement and, ultimately, end user prices.

The importance of the return on equity is that, if it is too low, the regulated network will be unable to recover the efficient (and fair) costs of service provision and perhaps, more importantly, may not have adequate incentive to augment facilities when appropriate. Conversely, if the return on equity is too high, the network will have a strong incentive to over-capitalise ('gold plate') thus affording it the opportunity to derive monopoly rents.

In the draft *Regulatory Principles* the Commission outlines its view on the appropriate expression of the return on equity that is to be achieved, and how it is to be used for deriving the regulated revenues. This view is summarised in the proposed statement 6.3:

The Commission will apply the nominal post-tax return on equity as a benchmark. The revenues will be calculated on the basis of the cash-flows associated with the regulatory accounts necessary to deliver this return after taking into account liabilities and the assessed value of franking credits based on existing tax provisions and foreshadowed tax changes due to occur during the regulatory period.⁴

For this decision, the Commission has chosen to adopt the cash flow modelling approach outlined in the draft *Regulatory Principles*. This approach extracts the parameters relating to business income tax from the WACC formula. It explicitly models the impact of tax and franking credits on the required post-tax distributions in the cash flows. The remaining WACC formula, which has been termed the vanilla WACC, is merely the weighted average of the gross post-tax returns on debt and equity.

⁴ ACCC, *Draft Statement of Principles for the Regulation of Transmission Revenues*, 27 May 1999, p. 84.

There are several regulatory benefits provided by the post-tax cash flow approach. The first of these is the elimination of the need to utilise a conversion sequence. There has been significant discussion and divided opinion on the appropriateness of the sequences which the post-tax cash flow modelling is not required to tackle as it does not attempt to convert the revenues into real terms. In addition the cash flow modelling enables exogenous changes that may impact upon the accruing, and recovery, of income taxes.

The modelling of income taxes in the cash flows enables the Commission to adjust for changes in the tax regime that alter the tax liabilities of a transmission network to ensure that it achieves the benchmarked return on equity over the life of the assets. The Commission's approach also ensures that pre-payments of, or deferrals in, the recovery of income tax liabilities under previous regulatory regimes applied to the transmission network are also appropriately accounted for to ensure that it achieves the benchmarked return on equity.

The Commission first adopted the cash flow modelling approach in the final *NSW and ACT Revenue Caps* decision. The Commission, in its other regulatory roles, has subsequently used the process.

The remainder of this Chapter:

- discusses the methodology for determining the cost of equity capital (Section 2.2);
- outlines the key parameters used in estimating the cost of equity and summarises the Commission's considerations (Sections 2.2.1 to 2.2.4);
- addresses the general impact of income taxes and franking credits on the cost of equity and cash returns to equity holders, and discusses the Commission's considerations (Section 2.2.5);
- provides a discussion of financing structures, the cost of debt and the Commission's assumptions (Sections 2.3 and 2.4);
- presents a feasible return on equity range and the summarises the Commissions findings (Section 2.5).

2.2 The cost of equity capital

As stated in Schedule 6.1(2.2) of the Code there are a variety of methods to estimate the cost of equity capital (R_e). One such model is the Capital Asset Pricing Model (CAPM). The CAPM is a linear equilibrium asset pricing model that expresses the cost of equity capital as a function of the opportunity cost of investing in the market, the market's own volatility and the systematic (undiversifiable) risk of holding equity in the particular company.

The formula for the CAPM is given by:

$$R_e = R_f + \beta_e(R_m - R_f)$$

where R_f = the risk free rate of return (usually based on government bond rates of an appropriate tenure);

$(R_m - R_f)$ = the market risk premium — the return of the market as a whole less the risk free rate; and

β_e = the relative systematic risk of the individual company's equity.

The CAPM expresses the rate of return as the post-tax nominal return on equity that can be debt adjusted to derive the corresponding return on assets.

On this issue Statement 6.2 of the draft *Regulatory Principles* states:

The CAPM will be used to estimate the benchmark return on equity required by investors.

Other models to estimate the return on equity, such as the dividend growth model, are not ruled out and may be submitted by the TNSP. However, such analysis must be backed with evidence and the TNSP must be willing to have the results and analysis subject to public and academic scrutiny.

Despite criticism for its theoretical shortcomings, the CAPM is used extensively in overseas regulatory jurisdictions including the United Kingdom where it is adopted by the transmission assets regulator OFGEM. The CAPM is also widely used in both corporate finance and industry regulation throughout Australia.

In light of the widespread appeal of the CAPM model, the Commission is adopting it for determining the cost of equity capital for this decision. This is consistent with the approach adopted in the *NSW and ACT Revenue Caps* decision.

In determining the value of the dividends required to meet the cost of equity the Commission subtracts other forms of return on equity, such as the value of franking credits, from the dollar value of the return on equity.

The remainder of this section examines the various elements of the CAPM formula

2.2.1 The risk free interest rate

Historical average or use of 'on the day' rate

Inherent in the CAPM model is the risk free rate, which is used to determine both the market risk premium and the opportunity cost of investing in the market. The finance theory underlying the CAPM model explicitly employs *expected* or *ex ante* returns, whereas all that is observed is *realised* or *ex post* returns. However, given the inherent difficulties of using *ex ante* information some compromise is required. One such compromise is the use of historical trends for the risk free rate and whether to use an historical average or an on the day rate.

On this issue Statement 6.7 of the draft *Regulatory Principles* states:

The risk free rate will be estimated from the (nominal) observable rate on five year Commonwealth bonds.

The risk free rate will be normally based on a 40 trading day moving average covering the eight weeks prior to the reset date unless there is evidence to suggest that the current rate of the day represents a transition to a new level which is expected to be maintained.

The Commission adopted the forty trading day average in the *NSW and ACT Revenue Caps* decision.

While the SMHEA did not request a specific length of an historical trading average, it did advocate a smoothing process that accounts for the current direction of the interest rates, rather than the “on the day” rate.

Commission’s draft conclusions

In the draft decision, while the Commission acknowledged that the finance theory underlying the CAPM explicitly specifies the use of *ex ante* returns, it also acknowledged the risk associated with using forecasted information. Although using both an “on the day rate” and a “historical average” approach are theoretically inconsistent with the workings of the CAPM, the Commission understands the need to ensure that the information provided can be justified. For regulatory purposes regulators traditionally adopt an historical average when dealing with the risk free rate. This is to ensure that market volatility and recent trends are not borne out in the decision. For the purposes of the draft decision, the Commission used an historical trading average to model the risk free rate.

Consistent with proposals in the draft *Regulatory Principles* and the methodology adopted in the *NSW and ACT Revenue Caps*, the Commission adopted a forty trading day average for the draft decision.

Issues arising from the draft decision

The SIG commented that the appropriate risk free rate should be the “on the day” rate.

Commission’s considerations

The Commission acknowledges that using the forward forecasts of the risk free rate is in line with the theoretical underpinnings of the CAPM. However, as noted in the draft decision, given that historical information is traditionally used, the Commission’s preference is to use a short term average to avoid aberrations that may occur in a random fluctuation in an “on the day” rate. Therefore, in line with recent Commission decisions and the proposals in the draft *Regulatory Principles*, the Commission will use the forty day historical average for this decision.

Selecting the bond rate

Determining the appropriate historical average for the bond rate is only one of the Commission’s considerations. There is also considerable debate regarding the most appropriate bond rate to use for regulatory purposes.

For the purpose of Australian regulatory decisions, the risk free rates available for use in the CAPM ranges from thirty day Bank Bills to twenty year Treasury Bond Rates. The short-term rates are more liquid but are subject to short term volatility. Alternatively, the medium to longer term rates reflect the debt structuring of the regulated entity, or - in the case of the five year bond rate - it reflects the regulatory period. The Australian market for rates longer than ten years is illiquid and immature.

The draft *Regulatory Principles* proposes a five year bond rate, on the basis that this accords with the regulatory period. In Commission decisions, there has been a movement towards adopting a rate that accords with the period of the regulatory decision. For instance, in the *Draft Assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access Services* (draft *Telstra undertaking*) a two year rate was used which accords with the period of the undertaking⁵.

In a consultancy to the Commission for the Regulatory Report on Perth Airports, Professor Davis proposed that the Commission use a bond rate other than the 10 year bond rate⁶. Professor Davis argued that:

Given the anticipated life of the assets and the likely time pattern of the resulting cash flows, it would seem very difficult to sustain an argument for use of a risk free interest rate of maturity greater than 10 years. Use of a shorter maturity rate would not be inappropriate – particularly if there were to be regular regulatory pricing reviews⁷.

In its submission the SMHEA supported the use of the 10 year bond rate, advocating a bond range between 6.25 per cent and 6.5 per cent.

Commission's draft conclusions

In line with the movement towards the proposals in the draft *Regulatory Principles*, in the draft decision the Commission adopted a five year bond rate. The five year bond rate accorded with the regulatory period and maintains a consistency with other Commission decisions at the time, although this was in contrast to the ten year rate proposed in the *NSW and ACT Revenue Caps* decision. However, it was noted in that decision that the ten year rate maintains regulatory consistency with IPART's regulatory decisions in NSW. It was further noted that the decision did not reflect the final position of the Commission and would be addressed further in the *Regulatory Principles*.

At the time of the draft decision, the five year, forty day moving average for bond rates provided a rate of 6.39 per cent.

Issues arising from draft conclusions

The SIG advocates calculating the appropriate risk free rate with reference to the ten year government bond rate, noting that a transmission entity's optimal capital structure would include significant long-term debt. It contends that a five year

⁵ ACCC, *A draft report on the assessment of Telstra's undertaking for the Domestic PSTN Originating and Terminating Access services*; April 2000

⁶ ACCC, *Regulatory Decision, Perth Airports*, December 1999

⁷ Professor Kevin Davis, *Analysis of the cost of capital for necessary new investment at Perth International Airport: Submission to ACCC Western Airports Corporation* 9 January 1999.

government bond rate would introduce term-related basis risk between the entity's optimal capital structure and that assumed by the Commission.

In a consultancy for TransGrid, Professor Bruce Grundy notes that a move to a 5 year government bond rate has implications for both the market risk premium and the debt margin which need to be considered by the Commission.

Commission's considerations

The Commission notes the SIG's arguments regarding long-term debt. However, the Commission considers that using a bond rate corresponding to the regulatory review period is the appropriate measure of the risk free rate. Under this method, the inflation risk faced by asset owners will be exactly compensated by an inflation risk premium implicit in the yield on the corresponding government bond. Since revenue decisions are reviewed every five years, revenues will be re-adjusted to take account of the actual inflation. Therefore, the risk of actual inflation diverging from anticipated inflation is limited to a five-year period. To compensate the asset owners exactly for this inflation risk, the return of a bond subject to similar risk must be used. The yield on ten year government bonds will include compensation for inflation risk of a ten year period. Similarly, the yield on five year bonds will include a premium for inflation risk of a five-year period. Using a ten year yield will over compensate the inflation risk faced by the transmission network owner. Therefore, the Commission considers that for this decision the appropriate term to approximate the risk free rate in regulatory decisions of five year is the five year government bond rate.

The most recent five year, forty day moving average for bond rates provides a rate of 5.19 per cent for this decision.

2.2.2 The market risk premium

The market risk premium (MRP) is the premium above the risk free rate of return that investors expect to earn on a well diversified portfolio, namely:

$$\text{MRP} = R_m - R_f$$

On this issue Statement 6.8 of the draft *Regulatory Principles* states:

The Commission will adopt what it perceives to be the accepted value of the market risk premium available at the time of the regulatory decision.

Under a classical tax system, conventional thinking suggests a value for the MRP of around 6.0 per cent. In a consultancy to the Commission, Professor Davis derives figures based on a dividend growth model of between 4.5 per cent and 7.0 per cent with further indication that the MRP may be trending downward. Professor Bob Officer provides additional support for the downward trend in the MRP⁸.

In the *NSW and ACT Revenue Caps* decision the Commission adopted a MRP of 6.0 per cent. An MRP of 6.0 per cent was also adopted in the draft *Telstra undertaking* decision.

⁸ ACCC, *Access Arrangements by Transmission Pipelines Australia, Final Decision*, October 1998

In its submission, the SMHEA supported the use of a market risk premium of 6.0 per cent.

Commission's draft conclusions

The Commission draft conclusions noted the evidence that the MRP has been consistently falling in the last twenty to thirty years. However, the Commission was mindful not to be short sighted in the use of recent data, which may reflect short term market trends. The Commission's assessment of the MRP suggested that it lay between 5.0 per cent and 7.0 per cent, and for the purposes of the draft decision, the Commission chose the mid point of this range, that is an MRP of 6.0 per cent. This figure was in keeping with Commission assessments and the SMHEA's proposal.

Issues arising from the draft conclusions

As noted previously, Professor Grundy notes that the move to a five year government bond rate would have an effect on the MRP compared with the *NSW and ACT Revenue Caps*. He notes that estimates of the MRP are typically based on historical average differences between the market risk premium and the 10 year rate. He contends that the draft decision's use of an MRP of 6.0 per cent is an estimate relative to the 5 year rate and should be adjusted upward by the difference between the historical average between the 5 year and 10 year government bond rate.

Commission's considerations

The Commission notes the issues raised by Professor Grundy. However, in the *NSW and ACT Revenue Caps* the Commission stated that:

In light of the diversity of views...the Commission cautions against the use of this particular assessment as a precedent for future regulatory decisions⁹.

Therefore, the Commission considers that an MRP of 6.0 per cent is still appropriate for this decision. This is in line with recent Commission decisions.

2.2.3 Expected inflation rate

While the expected inflation rate is not an explicit parameter in the return on equity calculation, it is an inherent aspect of the risk free rate and is also implicit in the cost of debt. There are two sources of information for determining inflationary expectations, financial markets and government estimates. The financial markets indicator of inflation is derived from the difference between the nominal and indexed bonds over a corresponding period. Alternatively, the Commonwealth Treasury releases inflationary forecasts based on internal modelling. On this issue Statement 6.10 of the draft *Regulatory Principles* states:

The Commission will estimate the cost of debt for a firm conforming to the financial structures implied by the regulatory accounts in consultation with relevant financial agencies.

The Commission adopted this approach in the *NSW and ACT Revenue Caps* decision. However, the maturity dates on the nominal and indexed bonds rarely correspond,

⁹ NSW and ACT Transmission Network Revenue Caps: final decision, p 18

requiring realignment using either interpolation or extrapolation. The process of interpolation and extrapolation performs a mathematical line of best fit, estimating an indexed bond rate at a given point in time.

In its submission, the SMHEA supported using the difference between the nominal and inflation indexed bonds as an indicator of the prospective inflation rate. However, it also noted that this proxy is not an unbiased estimator of the actual inflation rate, since indexed bonds are priced at an illiquidity premium to nominal bonds. It further suggested that the illiquidity premium is in the order of ten to twenty basis points.

Commission's draft conclusions

Consistent with the proposal in the draft *Regulatory Principles*, the *NSW and ACT Revenue Caps* decision and the SMHEA's proposal, in the draft decision the Commission used the financial markets expectations of inflation. For the draft decision, the Commission forecast inflation of 3.11 per cent.

Issues arising from draft conclusions

Professor Grundy notes that the draft decision does not explicitly state whether the Commission recognises both illiquidity and expected inflation as determinants of the difference between the yield on nominal and indexed bonds.

The SIG supports the Commission's method of calculating the expected inflation rate. However, it contends that the impact of the GST should be explicitly modelled in the third quarter of 2000.

Commission's considerations

In modelling the inflation rate over the regulatory period, the Commission accounts for the illiquidity by using the process of interpolation and extrapolation. This ensures that the bond rate corresponds exactly with the timing of the decision. With regard to explicitly modelling the impact of the GST on the expected inflation rate, finance theory suggests that in a rational market, expectations of the effect of the GST has already been incorporated in the government bond rates. Therefore, the Commission does not consider it necessary to make an additional adjustment to account for the impact of the introduction of the GST on the return on equity. The issue of GST pass through is discussed in Chapter 6.

Based on this approach the most current financial market inflation forecast is 2.35 per cent.

2.2.4 Betas and risk

The beta of a company is a relative risk measure of a company's systematic, or undiversifiable, risk to the systematic risk of the market. In Australia, the All Ordinaries index is a common proxy for the market returns. The equity beta of the market as a whole is equal to one. Therefore, on average, a beta greater than one indicates the stock has a high systematic risk relative to the market, whereas, on average, an equity beta of less than one indicates the stock has a lower systematic risk relative to the market.

Empirical derivation of an equity beta can be determined using econometric analysis of past information. However, for unlisted companies, this is not possible requiring some form of benchmarking. In Australia, there are few reference stocks for regulated electricity utilities. International benchmarking is frequently suggested as a comparison, however it may be inappropriate due to the relative nature of the beta value. An analysis of the beta follows.

The asset beta

The asset beta provides a comparison of the risk associated by asset class rather than by the independent gearing levels of the firm. In its submission to the Commission, the SMHEA stated that while it is difficult, in the absence of market based evidence, to propose a single estimate with a degree of confidence, an asset beta in the order of 0.55 would appear to be intuitively reasonable. This beta value was argued on the grounds that the SMHEA's transmission assets as an interconnector and generation connection point have potentially two or three state wide impacts for failure. Additionally, it noted that many generators including the Snowy generator, could potentially be constrained off the market and exposed to inter-regional risks.

The equity beta

The equity beta adjusts the asset beta for the gearing of the entity. In the special case where the firm is 100 per cent equity funded the equity beta is equivalent to the asset beta. To obtain the equity beta from the asset beta an appropriate conversion methodology is required.

On this issue Statement 6.9 of the draft *Regulatory Principles* proposes the use of the Monkhouse formula and states:

The Commission will use a benchmarked asset beta and derive a levered beta or equity beta according to the following formula:

$$\mathbf{b}_e = \mathbf{b}_a + (\mathbf{b}_a - \mathbf{b}_d) \left\{ 1 - \left[r_d / (1 + r_d) (1 - \mathbf{g}) T \right] \right\} \frac{D}{E}$$

or a related formulation which more accurately reflects the constraints of the regulatory framework.

In its submission, the SMHEA proposed an alternative model. The model, which eliminates the uncertainty of estimating a debt beta, is given as:

$$\mathbf{b}_e = \mathbf{b}_a \left[1 + (1 - T(1 - \mathbf{g})) \frac{D}{E} \right]$$

Market evidence suggested that the average gearing level for stocks listed within the utilities and infrastructure group has risen over the last few years, whereas average gearing levels within the telecommunications group has fallen. This has resulted in a lower equity beta for the former group (0.34) and a significantly higher beta for the latter (0.50) widening the potential feasible range for the SMHEA.

Risk

William M Mercer (Mercer) was engaged by the SMHEA to provide advice in relation to the nature and size of commercial risks faced by the SMHEA with respect to its transmission assets. It is argued that under the building block approach adopted by the Commission, allowance needs to be made for the commercial risk position of the transmission assets. Additional allowances need to be made for asymmetric cash flow risk and any self-insured risks. The discussion on asymmetric risk in the Mercer report is summarised below:

The report identifies four groups of commercial risk faced by the SMHEA:

- Stranded asset risk - the optimisation of assets;
- Forecast risk – the revenue cap is based on forecasts;
- “Insurable” risks – major unpredictable occurrences; and
- Regulatory Uncertainty – determination of the revenue cap in advance for each regulatory period.

Overall, Mercer considered that the potential impact on the SMHEA or stranded assets and forecast differences to be negligible over the regulatory period. However, it argued the SMHEA is exposed to significant “insurable” risks and there is considerable regulatory uncertainty.

It also notes that on average an entity exposed to asymmetric revenue risks will not receive its expected cost of capital unless allowances are made for these risks. Therefore, Mercer argued that the asymmetric cash-flow risks are most appropriately dealt with when setting the level of WACC¹⁰.

Commission’s draft conclusions

Given the relatively low risk faced by transmission networks, in its draft decision the Commission argued that it is difficult to justify a high asset beta for the SMHEA, and hence a high equity beta. The Commission considered an asset beta in the region of 0.34 to 0.50 to be appropriate for estimating the return on equity for SMHEA’s transmission network revenue caps. For the purposes of the draft decision, the Commission used an asset beta of 0.42, the mid point of the range. This figure converted to an equity beta of approximately 1, when using the Monkhouse formula assuming a debt beta of 0.00.

With respect to the discussion provided by Mercer, the Commission considered that the scope for regulatory risk was less than that faced by TransGrid due to increased regulatory history of its post tax regulatory regime, across the Commission’s regulatory functions.

¹⁰ Which would occur via the required return on equity.

Issues arising from the draft conclusions

Professor Grundy questions the reduction in the lower bound for the asset beta, and the Commission's exact choice of the nominal post-tax return on equity.

The SIG notes that, the gearing ratio has no effect on asset betas and a higher gearing ratio results in higher, not lower equity betas. The SIG also notes that it supports the SMHEA's recommendation of an asset beta of 0.55. It contends that the SMHEA's assets face greater expected systematic risk due to its importance in the NEM.

Commission's considerations

The lower bound for the asset beta used in the draft decision was calculated using the market values of the asset beta at the time of the decision in the telecommunications, infrastructure and utilities industries listed on the Australian Stock Exchange. The Commission used a process to deleaver the equity beta's using a gearing ratio of 60 per cent. This method is also used in this decision. Based on this methodology, the Commission calculates a range between 0.30 to 0.50

The Commission acknowledges the comments raised by the SIG regarding the Commission's interpretation of the gearing ratio's effect on the equity beta. However, with regard to the SIG's recommendation of an asset beta of 0.55, the Commission notes that this is outside of the range estimated by the Commission. The Commission considers that the SMHEA faces lower, not higher, systematic risk given its importance to the NEM.

Using the asset beta range of 0.30 to 0.50, the Commission derives an upper and lower bounds for the equity beta of 0.75 to 1.25, with a mid point at 1.00.

2.2.5 Treatment of taxation and the value of franking credits

In the draft decision, the Commission noted that the cash flow modelling approach the Commission adopted in relation to taxes paid and franking credits means that with the exception of the impact on the betas these elements of the building block do not impact upon the cost of capital.

The return on equity measures the total benefits required to be derived from the investment, therefore any benefits received via franking credits will impact upon the cash dividends that are necessary to ensure that total benefits received meet the required return on equity. Taxation and franking credits have been included with the discussion of the return of equity to ensure that all of the CAPM parameters have been addressed and to enable comparisons in WACC parameters with other regulatory decisions.

In its submission to the Commission the SMHEA supported the use of a corporate tax rate of 36 per cent and a franking credit utilisation ratio of 50 per cent.¹¹

¹¹ The submission was received by the Commission prior to the finalisation of the recommendations of the Ralph Review.

Commission's draft conclusions

For the purposes of determining the cost of capital, the NEC requires the Commission to maintain competitive neutrality. Therefore, the Commission adopted an effective tax rate of 30 per cent, in line with the corporate tax rate under the newly introduced taxation regime, and use a franking credit utilisation ratio of 50 per cent, which accords with other regulatory decisions.

Issues arising from draft conclusions

The SMHEA states that for regulatory consistency the Commission should provide pre and post corporatisation MARs, with the latter to include taxes payable. This issue is also raised in TransGrid's and the SIG's submission. However, both TransGrid and the SIG ask that the Commission consider a pass through of taxes.

Commission's considerations

As in the draft, the Commission will not make allowances for income tax payable, given the SMHEA's current tax paying position. However, given the impending corporatisation of the assets, the Commission will allow a pass through of any income tax payable, should the assets be transferred within this regulatory period. However, for calculating the return on equity, the Commission has modelled an effective tax rate of 30 per cent, in line with the corporate tax rate and uses a franking credit utilisation ratio of 50 per cent.

2.3 Gearing

In deriving the return on equity and cost of debt it is necessary to make a judgement on the appropriate capital structure of the transmission network. The level of gearing will influence the assumed value of the equity invested and therefore the required return on equity in dollar terms. Similarly the gearing is used to determine the assumed value of interest payments on debt. The gearing ratio is also included in the derivation of the equity beta and hence the gearing will also determine the risk adjusted returns that will be applied to the assumed value of equity invested.

On this issue Statement 6.5 of the draft *Regulatory Principles* states:

The commercial return on assets will be set on the basis of financial market benchmarks noting the level of commercial risk involved. As an example industry benchmarks will be used to determine an appropriate level of gearing.

Schedule 6.1 (5.1) of the NEC states that:

Gearing should not affect a government trading enterprise's target rate of return.... 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.

The Commission adopted a gearing ratio of 60 per cent in the *NSW and ACT Revenue Caps* based on industry wide benchmarking.

Although the SMHEA did not explicitly propose a gearing ratio in its submission, it used a 60 per cent gearing ratio in its WACC calculations, which conforms to industry benchmarks.

Commission's draft conclusions

In the draft *Regulatory Principles* the Commission noted that it would not be using the actual gearing of a transmission network, instead it would utilise an appropriate benchmarked ratio. In the draft decision, the Commission was of the view that such a benchmark will better promote efficient sourcing of capital as the transmission network will only receive returns commensurate with the efficient level of gearing assumed.

Therefore, consistent with regulatory decisions and the SMHEA's methodology the Commission adopted a gearing ratio of 60 per cent for the draft decision.

Issues arising from draft conclusions

There were no issues raised regarding the Commission's use of a 60 per cent gearing ratio.

Commission's considerations

Consistent with the Commission's approach in the draft decision, a gearing ratio of 60 per cent, will be used in this decision.

2.4 Cost of debt

The cost of debt is the debt margin over the risk free rate on commercial loans. The cost of debt factor varies depending on the entity's gearing, its credit rating and the term of the debt. The application of the cost of debt to the asset base using the assumed gearing will generate the interest costs for regulatory purposes.

On this issue Statement 6.10 of the draft *Regulatory Principles* states:

The Commission will estimate the cost of debt for a firm conforming to the financial structures implied by the regulatory accounts in consultation with relevant finance agencies.

Concerning the credit rating of the industry, Standard and Poor's noted in a report on Electric Infrastructure in the Asia-Pacific region that:

Transmission and distribution network operators generally exhibit low business risk because of their natural monopolies. A lack of competition provides stable revenues, with the primary risk being regulated price resets.¹²

Therefore, the low risk faced by the transmission network will subsequently result in lower rates on commercial loans.

In the *NSW and ACT Revenue Caps* decision the Commission used a debt margin of 100 basis points, being the mid point of the feasible range of 80 to 120 basis points. This is also consistent with the Commission's draft *Central West Pipeline* decision and the draft *Telstra undertaking*.

¹² Standard and Poor's; *Asia Pacific Electric Power Survey: Infrastructure Finance Ratings, 1999* p. 16

The SMHEA considered that since it is a relatively small entity it is unlikely to be able to raise the debt finance at the same rates as companies of the size and structure of TransGrid. Therefore, it proposed a debt margin of 125 basis points.

Commission's draft conclusions

In considering an appropriate debt margin the Commission adopted industry wide benchmarking. This provides an incentive for minimising inefficient debt financing. The Commission was of the view that a benchmarked industry wide cost of debt, in the region of 80 to 120 basis points above the nominal risk free rate of return, is appropriate for the SMHEA's transmission assets. Although the SMHEA argued for a debt margin that lies above the Commission's feasible range on the grounds of its small operations, the Commission did not agree with this assessment. The Commission noted in the Standard and Poor's assessment of the risk faced by transmission networks, transmission networks exhibit low commercial risk. Accordingly, for the purposes of the draft decision, the Commission chose to use a margin of 100 basis points, the mid-point of the range.

Issues arising from draft conclusions

The SIG contends that the Commission's use of a debt margin of 100 basis points is inconsistent with the debt beta used in the *NSW and ACT Revenue Caps* and consequently should be raised by between 10 to 30 basis points. On this basis, it claims that a reasonable lower bounds for the SMHEA's transmission assets is a debt margin of around 120 basis points.

Commission's considerations

The Commission has used industry wide benchmarks to assess the appropriate level cost of debt to apply to transmission networks. In its latest assessment of the risks faced by transmission networks, Standard and Poor's still concur with its original assessment. The Commission also considers that it cannot justify a higher debt margin, based on the government involvement in the SMHEA. The Commission therefore considers that the debt margin lies between 80 and 120 basis points. The Commission will use 100 basis points for this decision, being the mid point of the feasible range.

With the nominal risk free rate of 5.19 per cent this equates to a nominal cost of debt of 6.19 per cent.

2.5 Conclusion

The Commission has given careful consideration to the values that should be assigned to the SMHEA's cost of equity given the nature of its business and current financial circumstances. Accordingly, the parameter values used are those considered most appropriate. Mostly these fall near the middle of a range based on the information available.

The Commission has decided to adopt a nominal risk free interest rate of 5.19 per cent, reflecting the forty day moving average on the five year government bonds. The Commission has arrived at a debt margin of 1.0 per cent above the nominal risk free interest rate. That is, a cost of debt of 6.19 per cent.

The Commission has looked at market evidence and accepted the advice of financial experts in determining a market risk premium of 6.00 per cent.

The Commission has examined the risks faced by SMHEA and the betas of similar businesses in arriving at an asset beta of 0.40. This figure is close to the average asset beta for the infrastructure and utilities industry group listed on the Australian Stock Exchange. This asset beta converts to an equity beta of 1.

In estimating the return on equity, the NEC specifies that the Commission maintains competitive neutrality, therefore, for the tax and gamma parameters, it utilised the same approach adopted in *the NSW and ACT Revenue Caps*, that is a corporate tax rate of 30 per cent and a franking credits utilisation ratio of 50 per cent.

The Commission has estimated a feasible range for the cost of capital parameters, which are illustrated in Table 2.1 below. Within that range, and consistent with the discussion above, the Commission has adopted a post-tax- nominal return on equity of 11.20 per cent for the purposes of this decision. This translates to a post-tax nominal WACC of 8.65 per cent and a pre tax real WACC of 6.45 per cent.

Table 2.1: Comparison of cost of capital parameters proposed by the Commission

Parameter	SMHEA's proposal	Draft decision	Final decision
Nominal Risk Free Interest Rate (R_f) %	6.25 – 6.5%	6.39%	5.19%
Expected Inflation Rate (F) %	2.25%	3.11%	2.35%
Debt margin (over R_f) %	1.25%	0.80% – 1.20%	1.00%
Cost of debt $R_d = R_f + \text{debt margin}$ %	7.5% – 7.75%	7.19% – 7.59%	6.19%
Market Risk Premium ($R_m - R_f$) %	6.00%	4.5% – 7.00%	6.00%
Debt Funding (D/V) %	60%	60%	60%
Asset Beta β_a	0.55	0.34 – 0.50	0.40
Debt Beta	n.s	0.00 – 0.06	0.00
Equity Beta	1.27	0.75 – 1.25	1
Nominal Post Tax Return on Equity	13.6% – 13.9%	10.2% - 14.65%	11.25%
Post Tax Nominal WACC			8.65%
Pre Tax Real WACC			6.45%

3. Opening Asset Base

3.1 Introduction

Section 6.2.3(4)(iii) of the Code states that the assets in existence and in service from 1 July 1999 are valued at the value determined by the jurisdictional regulator. On the basis that the Commonwealth Government owns the SMHEA, the Commission has undertaken the function of jurisdictional regulator. The Commission engaged PB Power to undertake a review, which provides an analysis of and comments on the assumptions, methodology and findings contained in a 1998 valuation undertaken for the NSW Department of Treasury (NSW Treasury) by a Consortium (the Consortium) of consultants - Arthur Andersen, GHD and Worley. A copy of PB Power's review is available on the Commission's website¹³.

The remainder of this Chapter:

- Summarises the asset valuation methodologies used for the assessment of network assets (Section 3.2);
- Outlines the issues raised in the draft decision including the SMHEA's initial proposals, the SKM and Consortium asset valuation reports and the PB Power asset valuation (section 3.3)
- Presents the Commission's draft conclusions (Section 3.4);
- Discusses the issues arising from the draft conclusions (Section 3.5); and
- Summarises the Commissions considerations and conclusions (Section 3.6)

3.2 Relevant asset valuation methodologies

While the Code does not specify a methodology for the valuation of assets, it does advocate the use of Optimised Deprival Value (ODV). ODV is designed to take into account the most efficient method of providing asset services if the asset is to be replaced. The process for determining the ODV of a network is defined at the minimum of ODRC and the Economic Value of the network. Determining the Economic Value of a network is reliant upon assessing the net present value of the expected cash flows generated from the use of the assets, which in itself is determined by the regulator, thereby creating a circularity. The ODRC methodology is designed to value networks by determining the most efficient cost at which the system can be replicated, taking into account its service capabilities and the age of existing assets.

Therefore, as set out in Statement 4.2 of the draft *Regulatory Principles*, for the purposes of valuing the SMHEA's network assets the Commission will adopt the

¹³ <http://www.accc.gov.au>

ODRC methodology. This maintains consistency with the approach adopted in the *NSW and ACT Revenue Caps* decision.

3.3 Draft decision

3.3.1 SMHEA's original proposals

In its submission to the Commission, the SMHEA identified several issues that it believed should be considered in the asset valuation review by PB Power. These issues included:

- CPI adjustment;
- Acquisition and disposals;
- Cost of constructing assets;
- Asset lives;
- Optimisation;
- Easements;
- Land and Buildings; and
- Future Revaluations.

CPI adjustment

In its submission to the Commission the SMHEA stated:

As the [National Electricity] Code requires a valuation to be determined by jurisdictional regulators at the start of each regulatory period, it is necessary to adjust past valuations to account for the times since initial valuation and any additions or disposals of assets since that date. Hence, as a minimum adjustment, past asset values should be inflated for the intervening time period.

The SMHEA proposed using the CPI indexes published by the Australian Bureau of Statistics and to have the valuations adjusted from the time of the SKM asset valuation, which was conducted in December 1995 to the beginning of the proposed regulatory period, June 1999.

Acquisitions and disposals

Since the time of the last asset valuation by the Consortium, the SMHEA undertook the disposal of air blast circuit breaker and replaced them with SF6 breakers. However, it noted that as the SF6 breaker costs were used in the optimisation process of the valuation, these disposals did not change the valuation. Additionally, the installation of revenue meters was carried out in 1998/99 at a cost of \$0.5 million, and, therefore, was not accounted for in the Consortium asset base review.

Construction cost

There are three issues that the SMHEA suggested contributed to relatively higher construction costs that needed to be accounted for in the asset valuation review.

First, the SMHEA argued that due to the difficulty of access to the transmission networks caused by the remote and rugged terrain its ability to undertake construction is impinged and there is an associated increase in the cost of constructing assets. It also argued that this is compounded by the climatic conditions, with restriction on access to prevent bushfires in the summer and the snow prevents access in the winter. Additionally, the terrain requires the use of specialised equipment, as the necessary machinery cannot gain access to the transmission networks.

Secondly, due to the majority of the transmission networks operating within the bounds of the Kosciusko National Park, the SMHEA must be mindful of stringent environmental planning, negotiation and construction limitations. It noted that many assets are on the edge of wilderness areas, with plans to extend the wilderness areas, encroaching further on the transmission assets. The SMHEA, therefore, proposed a modern day equivalent construction cost methodology be adopted in the PB Power valuation to account for the environmental factors.

Thirdly, the SMHEA also argued for the inclusion of access tracks in the asset valuation. It stated in its submission that access tracks are imperative for maintenance as severe weather conditions restrict the use of necessary equipment.

In summary, the SMHEA argued that these factors combined justify and support the use of a high terrain factor to be incorporated into the asset base review.

Optimisation

With respect to the optimisation process adopted in the SKM and the Consortium reviews, the SMHEA did not contest the results and supported the use of the ODRC valuation technique. As noted by the SMHEA, according to the draft *Regulatory Principles*, the transmission network is required to identify the possibility of by-pass risk to enable accelerated depreciation. In the case of the SMHEA's transmission networks, it is envisaged that this is unlikely to occur within the next regulatory period. However, the SMHEA did argue that increased business risk environment requires recognition in the asset beta of the company.

Easements

The SMHEA argued that the valuation of easements is materially important to the overall asset valuation, given the majority of the transmission assets for the SMHEA run through State and National forests. It noted that the asset valuation of the Consortium include a valuation for easements outside of the Kosciusko National Park and State Forests, but did not include a valuation for easements within these boundaries. The SMHEA supports the ideas forwarded in the draft *Regulatory Principles* dealing with the valuation of easements.

Land and Buildings

The SMHEA pointed out that the Lower Tumut Switching Station (LTSS) Group Control Centre was not included in the SKM valuation, however, an allowance for building sheds at each site had been included. It had previously been assumed that the Control centre would be transferred to the owner of the transmission networks and the transmission network equipment would be housed in the other two control centres. However, although arrangement will need to be made at the other group control centres (the Upper Tumut Group Control Centre (UTGCC) and the Murray Group Control Centre (MGCC)) the SMHEA did not make any provision for the rental of office space at the UTGCC and MGCC.

In relation to the valuation of land for the Upper Tumut Switching Station, which is wholly within the bounds of Kosciusko National Park, the SMHEA stated that it is willing to forgo a valuation of this land based on materiality grounds.

Future Revaluations

The SMHEA noted that the transmission network asset valuations have not included sales tax in the replacement cost and it understands that the replacement cost adjustment will be made when the GST is introduced.

3.3.2 The SKM and Consortium reviews

In 1997 DGJ Projects (DGJ), the organisation assigned the task of advising and implementing the proposed corporatisation process of the SMHEA, on behalf of the, NSW, Victorian and Commonwealth Governments, engaged SKM to conduct an evaluation of the network transmission assets using the ODRC methodology. The valuation was conducted in accordance with the Guidelines released by NSW Treasury. In 1998 NSW Treasury engaged the Consortium to conduct a similar evaluation of the network assets adopting the same valuation methodology following the specified Guidelines.

Both the SKM and Consortium reviews categorised the SMHEA's transmission network assets as follows:

- Core Transmission Assets; which can be further divided into:
 - (A) Three 330kV Switching Stations;
 - (B) One 132kV Switchyard;
 - (C) One 132kV Substation; and
 - (D) 330kV and 132kV transmission lines;
- Support Systems;
- Plant and Equipment;
- Transmission Documentation, know how & technical data;
- Intellectual Property;
- Statutory Licences;

- Land and Buildings;
- Easements; and
- Benefit of Material Contracts, Property Leases, Plant Leases etc.

The main differences between the two reports is noted in the Consortium report:

- SKM report produced two values one for standard remaining lives and the other for estimated remaining life based on asset condition. The latter is closer to the depreciation method used in the 1991 GHD B&V valuation and results in higher ODRC. SMHEA advised that SKM estimated remaining life ODRC value was \$77 million. The Consortium noted that this methodology is not in accordance with the NSW Treasury Guidelines.
- SKM used a residual life of 5 years. The Treasury Guidelines refer to 3 years.
- SKM report did not include transfer of Lower Tumut Group Control Centre. An allowance was made at each switching station for a suitable building to house support systems.
- SMHEA advised spare holdings had increased from \$564,000 in 1997 to \$612,000 at 30 June 1998.
- SKM included \$700,000 for incomplete circuit breaker replacement work at UTSS. The work is now complete.

In the SKM report, using a five year residual period, the replacement cost methodology valued the assets at \$155 million. The Consortium report specified a replacement cost valuation of \$138 million, using the residual specified in the Guidelines of three years period.

However the SKM review stated that all of the assets reflected industry best practice maintenance standards, which provides the basis for using “Estimated Remaining Life” valuations as opposed to the “Standard Remaining Life” methodology. Using the “Estimated Remaining Life” methodology a valuation of \$77 million is proposed in the SKM review. This is in contrast to the figure of \$47 million ODRC valuation proposed in the Consortium report.

This discrepancy largely arises from the Consortium report using the NSW Treasury Guidelines, for which the primary purpose appears to be the valuation of distribution networks. On the basis of this discrepancy the Commission considered it necessary to engage a consultant to conduct an independent review of the assumptions used in the Consortium valuation.

3.3.3 The PB Power review

The Commission engaged PB Power to review the ODRC valuation conducted by the Consortium. In particular, PB Power was asked to comment on:

- the appropriateness of the assumptions, methodologies and findings of the most recent valuation of SMHEA’s transmission asset base in terms of meeting the requirements of the Code;
- reconciliation of variations between past and revised ODRC valuations and the most recent valuation;

- the appropriateness and the results of using alternative valuation methodologies where such alternatives are consistent with the requirements of the Code; and
- provide advice on such other matters as are necessary to enable the Commission to make a Code-compliant valuation of the non-contestable assets of SMHEA expected to be in service on 1 July 1999.

The main findings of the PB Power were:

- Due to uncertainties surrounding the forecasting of costs and pricing trends PB Power recommended that the 1998 ODRC valuations should not be indexed forward to July 1999;
- At 0.5% of the total valuation of SMHEA's transmission assets a revaluation of the land values to attribute a greater opportunity value to the easements within the National Park would have little impact on the ODRC valuation;
- On the basis of information provided further study was required to determine whether it would be appropriate to optimise switching station configurations; and
- The SMHEA's transmission assets are readily and separately identifiable from the SMHEA financial register asset register.

Overall, PB Power concurred with the valuations presented in the Consortium report. However, it noted the asset lives used by the Consortium in the valuation were in some cases conservative, given the condition and the expected remaining life of the assets. It recommended that the life of the 330kV steel lines be increased from 50 years to 70 years, and the increasing the life of the switchyards from 40 to 45 years. PB Power's reasoning is outlined below.

PB Power indicated that in its experience that the environment of a steel tower transmission line significantly affects its life. It noted that in New Zealand, the normal life of an asset is 55 years. In coastal regions, the environment reduces the life of the asset to 35 year, whereas for inland lines, in an environment similar to that faced by the SMHEA, the useful life is considered to be 70 years. For this reason, it considered the asset lives for the steel towers proposed in the Consortium report to be short and proposed using a useful life of 70 years.

With respect to the asset lives of the switching stations, PB Power noted that in both the SKM and Consortium reports, a high voltage air blast circuit breaker is used, with a useful life of 40 years. In New Zealand, the air blast circuits are considered to have a life of 35 years, after which replacement is usually carried out with modern technology breakers, which do not require expensive ongoing maintenance. In the U.K, this type of high voltage breaker is given a life of 50 years, after which they are refurbished, which is cheaper than replacing the equipment. Given the SMHEA's proposed replacement of air blast circuit breakers with SF6 units, and PB Power's New Zealand and U.K. experience, a useful life of 50 year would be appropriate.

It notes that items like batteries, battery charges and some protection and control equipment can have asset lives considerably less than 40 years, and are typically in the

order of 15 years. However, due to the small cost of these items, with respect to the total substation asset cost, these items do not have a material affect.

Additionally, in PB Power's experience, the life of the buildings of around 50 years would be more appropriate than the 40 years allowed under the Consortium report. For example, in New Zealand, building codes require all buildings to have a minimum design life of 50 years. Therefore, for the reasons outlined above, PB Power recommended that an average switching station life of 45 years would be appropriate.

3.4 Commissions draft considerations conclusions

In the draft decision, the Commission accepted the recommendations of the PB Power asset valuation. The report detailed PB Power's assessment on the degree of optimisation, the remaining asset live assumption, treatment of easements and indexing of the valuation forward. The PB Power review considered that the asset lives used in the Consortium report were in some cases conservative, extending the remaining life assumptions on the 330kV steel line from 50 to 70 years and the switching stations from 40 to 45 years. PB Power recommended that the opening asset valuation be set at approximately \$63 million. Adopting PB Power's recommendations, the Commission set the opening asset base at \$62.45 million in the draft decision¹⁴. This valuation included the installation of revenue metres in 1998/99.

3.5 Issues arising from the draft decision

The SMHEA indicated that it was concerned about including the connection assets in a transfer of the transmission network to a third party and that it was investigating the costs, benefits and risks of only transferring the interconnection assets upon corporatisation. The SIG subsequently advised the Commission that all of the connection assets will be transferred to a third party so they should be included in the Commission's final decision.

EnergyAustralia contends that the Commission's approach to the valuation of the SMHEA's transmission assets does not account for the manner in which the Snowy Mountains Scheme was created. EnergyAustralia states that it believes that the agreement between NSW, Victoria and the Commonwealth Governments regarding the fixed shares of the electrical output is under a "take or pay" provision. It notes that under Clause 6.2.3(a)(4)(i) of the Code, assets that are created under a take or pay contract must be valued in a manner consistent with the provisions of that contract.

TransGrid asks that the Commission clarify its position on the risks to future owners from uncertain optimisation principles in terms of future revaluations, the ACCC's stance on appropriate sales tax inclusion for replacement cost adjustment with the introduction of the GST.

¹⁴ The difference between the Commission's valuation and PB Power's recommendation was attributable to rounding.

3.6 Commission's considerations and conclusions

It is important to note the terms upon which the Commission was approached to conduct an assessment of the appropriate revenues to apply to the non-contestable elements of the SMHEA's transmission network. The SMHEA asked that the Commission use the ODRC methodology for the purposes of this decision. The Commission has complied with the SMHEA's request on the basis that this methodology maintains consistency with the provisions as set out in 6.2.4(i) and (ii) of the Code.

With regard to the issues raised by TransGrid, the Commission does not consider that this decision is the appropriate forum in which to discuss the issues of optimisation principles. This is best addressed in the *Regulatory Principles*. As for the GST, the Commission will allow a pass through of the GST after discussions with Commission staff on this matter.

Therefore, on the basis of the recommendations in the PB Power review, the Commission has determined that the value to be attributed to the SMHEA's opening asset base as at 1 July 1999, is \$62.45 million.

4. Capital expenditure

4.1 Introduction

In setting the SMHEA's MAR, the Commission must form a view on the prudence of the SMHEA's proposed capital expenditure (capex) program, with regard to future demand and service quality as well as the efficiency of past capital expenditure (optimisation). The Commission is mindful that it is examining the SMHEA's proposed capex program for the purpose of establishing a revenue cap and for creating the appropriate economic drivers for investment. Under the Code, the Commission is removed from the network planning processes which is largely the responsibility of the networks, the Inter-Regional Planning Committee (IRPC) and the National Electricity Market Management Company (NEMMCO).

In examining the SMHEA's proposed capex program, the Commission is also mindful that alternatives to capex proposals can include improvements in operating expenditure (opex) programs, demand side management and new generation. The Commission will also consider whether or not the SMHEA has struck an appropriate balance between capex, opex and overall reliability. Finally, the Commission is aware that a careful distinction needs to be made between ongoing opex programs on the one hand and the asset renewal portion of capex on the other. Some judgement is needed as to whether such proposals should be expensed or capitalised.

These issues are included in the Commission's consideration of both the proposed capex and opex programs and their significance to the overall revenue cap.

This Chapter:

- Describes the Code requirements the Commission must consider in assessing the network revenue caps (Section 4.2);
- Discusses the initial SMHEA's proposals for capex and the Commission's draft considerations (section 4.3);
- Outlines the issues arising from the draft decision (Section 4.4); and
- Summarises the Commission's draft considerations and conclusions (Section 4.5).

4.2 Code requirement

The Commission's task in assessing SMHEA's capex is specified in the Code. In particular, Part B of Chapter 6 of the Code requires *inter alia* that:

- in setting the revenue cap, the Commission must have regard to the potential for efficiency gains in expected operating, maintenance and capital costs, taking into account the expected demand growth and service standards; and

- the regulatory regime seek to achieve an environment which fosters efficient use of existing infrastructure, efficient operating and maintenance practices and an efficient level of investment.

To undertake its task, the Commission needs to make an informed decision on the adequacy, efficiency and appropriateness of the capital expenditure planned by the SMHEA to meet its present and future service requirements.

4.3 Draft decision

4.3.1 The SMHEA's proposal

Criteria for including capex in the asset base

In assessing the appropriateness of the capex program to be included in the MAR, the SMHEA submitted:

The Commission must form a view on the prudence of the Snowy's proposed capital expenditure and the balance between Operating expenditure and Capital Investments. These expected capital expenditures should be recognised in the regulated asset base at the time of the start of the delivery of benefits irrespective of the timing of the regulatory reset period. To restrict return until the next review period would penalise investors and create a lumpy investment profile just before a regulatory reset date.¹⁵

Furthermore:

The Snowy agrees that only prudent asset capital expenditure be included in the asset base. This concurs with the optimisation process which would remove gold plating should that occur¹⁶.

Proposed capex program

Table 4.1 provides the proposed capex for the five year regulatory period by the SMHEA.

This figure had been revised down by the SMHEA from its initial submission to the Commission. The revision reflects the reclassification and subsequent exclusion of the surge arrester equipment to the generation business.

From the table below, it is noticeable that the SMHEA's capex program consists predominantly of replacement and upgrades of existing equipment. The SMHEA indicated that it is studying fault levels that will be incorporated in future capex requirements, although it is unlikely that these will be conducted over the forthcoming regulatory period.

Subsequent discussions with the SMHEA clarified the classification of the UTGCC and the MGCC. In these discussions the SMHEA indicated that these two control centres will not be transferred upon corporatisation and will remain with the generation business. Therefore, the upgrade of sewage treatment facilities and the proposed

¹⁵ The SMHEA, *Regulation of Snowy Mountains Hydro-Electric Authority Transmission Assets: Issues paper for the Australian Competition and Consumer Commission*, 28 July 1999, p20,

¹⁶ *ibid*

replacement of fire protection services for the UTGCC and the MGCC should be excluded from the capex program. The cost of these exclusions comes to \$0.19 million over the regulatory period.

Table 4.1: SMHEA’s proposed capital expenditure

Project title	Cost (\$'000)	Timing
MSS Group Line 330kV Circuit Breaker	2290.1	1999/00-2000/01
UTSS Group 7/8 VT Replacement	147.3	1999/00
MSS – Khancoban Sub Switchyard Replacement	295	2000/01
MSS – Install ‘DEF’ Protection for Dederang Lines	60	2000/01
GCC and Switchyard Replacement Fire Protection System	110	2000/01
LTSS – Group Line 330kV Circuit Breaker Replacement	1900	2001/02
GPS – Munyang 132kV Line Circuit Breaker Replacement	100	2001/02
MGCC – Upgrade Sewage Treatment Facilities	60	1999/00
UTGCC – Upgrade Sewage Treatment Facilities	60	2000/01
LTCCC – Upgrade Sewage Treatment Facilities	80	2001/02
UTSS – Tie Line/Interconnector 330kV Circuit Breaker Replacement	1600	2002/03
330kV Line ratings Upgrade (MSS-LTSS/ MSS – UTSS)	1200	2002/03–2003/04
MSS-Tie line/Interconnector 330kV Circuit Breaker Replacement	1550	2002/03–2003/04
Total	9,452.4	

Commission considerations

In the draft decision, the Commission noted that its role as economic regulator of the transmission networks is to create the appropriate economic drivers for investment and for the efficient use of existing infrastructure. However, the Commission recognised that a key issue in attempting to create such an environment is that SMHEA and the other networks have an incentive to exclude competitive alternatives when performing their network planning functions. Similarly, forward estimates of capital expenditure are often subject to greater uncertainty than estimates of operations and maintenance expenditures. Consequently, the Commission was also wary of encouraging overestimates of forward capital expenditure which, if not undertaken, the regulated business may try to claim as efficiency gains in the future.

The Commission noted that, in the longer term, it will develop an incentive based regulatory regime through its *Regulatory Principles*. However, at the time of the draft decision, in terms of setting the SMHEA’s revenue cap, the Commission needed to be confident that the planned network investments are prudent.

Consequently, the Commission's assessment of the prudence of SMHEA's proposed capex program was conducted for the purpose of establishing a revenue cap which was commensurate with its cash flow needs. As was indicated by the SMHEA, it is possible that SMHEA will undertake some additional projects, which are not currently included in its capex program. It is also quite possible that not all the projects proposed by SMHEA will be undertaken - for some projects the need may no longer exist while for others a more efficient alternative may arise. In the latter case, where SMHEA implements a lower cost project, the savings could be partly retained by the network as an 'efficiency dividend' with the remainder shared with network users at the next review period.

The Commission, therefore, accepted that prudence of including the proposed capex in the SMHEA's revenue cap over the regulatory period, with a few minor alterations. The Commission recognised a capex of \$7.06 million over the regulatory period, of which about \$0.5 million was attributable to interest during construction.

4.4 Issues arising from the draft considerations

TransGrid argues that due to the extension of the physical lives of the assets, there needs to be a corresponding link with the level of capital expenditure. It recommends that the Commission publish the SMHEA's asset management strategies and action plans. It also asks that the Commission clarify its position on whether the SMHEA has provided adequate provision for:

- the circuit breaker replacement programs;
- protection and control system refurbishment;
- line upgrading associated with ground clearance problems;
- replacement of other switchyard equipment; and
- miscellaneous substation items.

The SMHEA notes that the Commission's approach to modelling capex introduces capital projects in the year of commissioning, on the basis that the full use of the capital item is not achieved until the end of the project program. The SMHEA contends that this not apply in the case of circuit breakers in switchyards, where each breaker is a discrete unit and become fully operational coincident with the capital expenditure. It suggests that the Commission recognise the MSS circuit breakers in 2000/01 in the capital base.

4.5 Commission's considerations and conclusions

The Commission considers that the issues raised by TransGrid are relevant. However, the Commission notes that PB Power, in its assessment of the opening asset base, commented that the SMHEA's capex proposal appeared reasonable. The Commission has also brought forward the capital expenditure on the MSS in line with the SMHEA's request.

Therefore, on the basis of its considerations in relation to the matters discussed above, the Commission proposes to accept the initial prudence of including the items outlined in table 4.1, less the reclassification's as presented by the SMHEA, with a value of \$7.06 million, of which approximately 0.5 million is attributable to interest during construction.

5. Operating and maintenance expenditure

5.1 Introduction

In setting the SMHEA's revenue requirement, the Commission must assess the network's capacity to achieve realistic efficiency gains in its proposed operating and maintenance expenditure (opex) with regard to future demand and service quality.

At the same time, because it represents a large proportion of the network's variable costs, opex can be an important source of savings and productive efficiencies over the short to medium term.

An important focus of the Commission's assessment is the use by the SMHEA of benchmarking, based on domestic or international best practice, as a guide to setting, testing and adjusting targets in the planning and management of opex programs. In addition, the Commission will consider whether or not the SMHEA has struck an appropriate balance between opex and capital expenditure. Finally, efficient opex is a key source of the overall productivity gains that the Commission will consider in determining the incentive outcomes for the SMHEA's revenue cap.

This Chapter:

- Describes the Code requirements the Commission must consider in assessing the network revenue caps (Section 5.2);
- Outlines the SMHEA's initial proposals, discusses the GST and presents the Commission's draft considerations (Section 5.3);
- Discusses the issues raised by interested parties (section 5.4); and
- Summarises the Commission's considerations and conclusions (Section 5.5).

5.2 Code requirement

The Commission's task in assessing the SMHEA's opex is specified in the Code. In particular, Part B of Chapter 6 of the Code requires *inter alia* that:

- in setting the revenue cap, the Commission must have regard to the potential for efficiency gains in expected operating, maintenance and capital costs, taking into account expected demand growth and service standards; and
- the regulatory regime must seek to achieve an environment which fosters efficient use of existing infrastructure, efficient operating and maintenance practices and an efficient level of investment.

5.3 Draft decision

5.3.1 The SMHEA's proposal

Previous opex

The SMHEA operates as an integrated generation and transmission network. It has achieved significant efficiency gains in the past 10 years in both the transmission and generation sides of the business in preparation for corporatisation. There has been an efficiency gain with a reduction in overall expenditure from \$69.5 million to \$47.6 million, which translates to 32 per cent in real terms. The operational expenditure reductions have arisen from a combination of increased productivity in the industry overall and increased efficiency by the SMHEA in preparation for the corporatisation process.

With the ringfencing of the generation from the transmission sides of the business the SMHEA has been able to maintain accurate records of the efficiency gains derived solely from the transmission activities of the business.

Over the past four years there has been a significant reduction in the operating costs of the transmission aspects of the business. The SMHEA has achieved a reduction in transmission operating costs from \$3.9 million in 1995/96 to \$2.0 million projected for 1999/00. This equates to a reduction in operating expenditure by 52 per cent over the period or a 13 per cent reduction in expenditure per annum.

5.3.2 Benchmarking

The SMHEA provided evidence that its efficiency gains compare favourably with its competitors. However it notes its special requirements in terms of maintenance practices due to the mountainous and remote terrain, which subject the SMHEA to strict environmental requirements.

In terms of labour costs the SMHEA used a labour overhead cost of 43 per cent compared with 55 per cent in the Treasury Guidelines specification. The SMHEA also uses an overhead allocation of 15 per cent of direct costs, which compares favourably with the Treasury Guidelines specification of 17 per cent.

5.3.3 Risk position of transmission assets

The SMHEA engaged William M. Mercer to conduct a study on the Risk Position of Transmission assets.

The report proposes allowances be made for:

- Any asymmetric cash-flow risks; and
- Any self insured risks.

A discussion on asymmetric risk appears in Chapter 2. This report was provided to the Commission prior to the SMHEA obtaining liability insurance on its transmission assets.

5.3.4 Opex proposal

The SMHEA has submitted a list of proposed operational expenditure for the forthcoming regulatory period. These opex proposals are presented in the following table.

Table 5.1: SMHEA’s proposed operating expenditure

Project title	Cost (\$'000)	Timing
LTSS Tie Line/Interconnector 330kV Circuit Breaker	500	2000/01-2002/03
MSS No. 2 Interbus Transformer Bushing Replacement	150	2000/01
LTSS/LTGCC Repairs to Fencing/Drainage and Buildings	45	1999/00
MSS/MGCC Repairs to Fencing/Drainage and Buildings	65	1999/00
UTSS/UTGCC Repairs to Fencing/Drainage and Buildings	100	1999/00
330kV Tower Design Accuracy Review/Strengthening	830	2002/03 –2003/04
Total	1790	

Of note is the substantial expenditure on circuit breaker overhauls over the regulatory period and on tower design accuracy review strengthening.

At the time of its submission the SMHEA noted that it had been unable to obtain liability insurance for its transmission networks. However, in subsequent discussions the SMHEA indicated that it obtained insurance for its networks at a cost of \$0.5 million per annum.

It also provided information to the Commission on the lease arrangements it had negotiated for access to tracks within the Kosciusko National Park. Currently, the Authority occupies the Kosciusko National Park under its existing Act and Agreement. These arrangements allow the Authority to undertake activities associated with the continued maintenance of the transmission lines. The fee paid to NSW National Parks and Wildlife Services is for all the activities that the SMHEA undertakes in Kosciusko National Park. The current fee is approximately \$60,000 per annum.

As for the proposed arrangements, the effective date is corporatisation and no fee has been negotiated between the parties for the lease fee. The basis of the fee calculation has also yet to be determined. It is unclear whether it will reflect some market value concept or other principle. Therefore, given that the cost of the future arrangements has not been specified the Commission will only recognise the cost of the current arrangements, that is \$0.06 million per annum.

Consequently, the revised real opex comes to \$4.59 million over the regulatory period.

5.3.6 Goods and services tax

The Commission understands that the SMHEA is currently wholesale sales tax exempt. The SMHEA did not include information relating to the application of the GST in its submission. Therefore, it appears that, the GST may result in an increase in the cost of inputs to the SMHEA by close to the full 10 per cent. However, the Commission has not estimated this amount as part of the provision of revenue for opex.

5.3.7 Draft considerations

In its draft decision the Commission accepted the opex efficiency gains proposed by the SMHEA for the entire regulatory period and accepted the additional information provided to the Commission. The Commission noted that, given the significant levels of cost cutting and rationalisation undertaken by the SMHEA, it decided not to impose further cost cutting requirements on the SMHEA. Therefore, the Commission accepted the SMHEA's revised proposals and used an opex figure of \$4.59 million for calculating the SMHEA's draft MAR.

5.4 Issues arising from draft decision

In responding to the draft decision the SMHEA noted that the opex figure should be revised to include \$2.0 million per annum in base opex.

In its submission, TransGrid sought confirmation that:

- Overhead costs have been allocated correctly between the SMHEA's generation and transmission activities;
- There is adequate provision for opex associated with the Lower Tumut Switching Station;
- Refurbishing the circuit breakers rather than replacing them is the appropriate strategy;
- The absence of any transmission line maintenance is justifiable; and
- There is a transparent basis for arriving at a total opex.

5.5 Commission's considerations and conclusions

The Commission notes the exclusion of the base opex in its draft decision and has included it in this decision. With regard to TransGrid concerns, the Commission has undertaken an analysis of the ringfencing provisions of the SMHEA's assets, and considers that opex has been apportioned to the appropriate activities. The Commission also notes that the SMHEA has made provision for opex on the Lower Tumut Switching Station. The Commission understands that the refurbishment strategy of the circuit breakers undertaken by the SMHEA conforms with the expectations of PB Power. The Commission also understands the transmission line maintenance has been included in the base opex.

The Commission, therefore, accepts the information provided by the SMHEA and provides an opex figure of \$14.29 for all networks over the regulatory period.

6. Total revenue

The previous chapters discussed each of the major elements of the Commission's building block approach to setting the SMHEA's revenue cap. This chapter brings this work together, along with a discussion of depreciation and taxes, to set out the Commission's decision on the SMHEA's revenue cap for the period 1 July 1999 to 30 June 2004.

6.1 Code requirement

As explained in Chapter 1, the Code requires the Commission to set a revenue cap with an incentive mechanism for non-contestable transmission network services. The Commission's role as regulator of transmission revenue is limited to determining the MAR.

The Code outlines the general principles and objectives for the transmission revenue regulatory regime to be applied by the Commission. The Code also grants the Commission the flexibility to use alternative, but consistent, methodologies. In fulfilling its role as regulator, the Commission's aim is to adopt a process which eliminates monopoly pricing, provides a fair return to network owners, and creates incentives for owners to pursue ongoing efficiency gains through cost reductions. The Commission is developing the regulatory framework through its draft *Regulatory Principles*.

6.2 The accrual building block approach

As explained in Chapter 1, the Commission's decision on the SMHEA's MAR has relied on the accrual building block approach. In its post-tax form, the accrual building block approach calculates the MAR as the sum of the return on capital, the return of capital and an allowance for operating and maintenance (non-capital) expenditure and taxes, that is:

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

where

WACC	=	weighted average cost of capital;
WDV	=	written down (depreciated) value of the asset base;
D	=	depreciation allowance;
opex	=	operating and maintenance expenditure; and
taxes	=	allowance for estimated tax liabilities.

6.3 Commission's assessment of building block components

The Commission's assessment of the various components of the revenue cap, in the context of the building block framework, is discussed below.

Asset value

In order to establish the appropriate return on the funds invested in the SMHEA's transmission assets, the Commission has modelled the SMHEA's asset base over the life of the regulatory period and estimated a post-tax nominal return on equity based on the most recent financial information.

The closing value of the SMHEA's asset base is constructed by taking the opening, real, value of the asset base, converting it to a nominal figure by adding in an inflation adjustment, adding in any capital expenditure and subtracting disposals and depreciation for the year. The closing value for one year's asset base becomes the opening value for the following year's asset base.

Section 6.2.3(4)(iii) of the Code states that the assets in existence and in service from 1 July 1999 are valued at the value determined by the jurisdictional regulator. On the basis that the Commonwealth Government owns the SMHEA, the Commission has undertaken the function of jurisdictional regulator.

The Commission engaged PB Power to undertake a review, which provides an analysis of and comments on the assumptions, methodology and findings contained in a 1998 valuation undertaken for the NSW Department of Treasury. That earlier NSW review and the PB Power assessment were of all of the SMHEA's assets, including the connection assets. The PB Power review broadly supported the 1998 valuation, of \$47 million, however, it disagreed with the conservative approach to asset valuation used in the report, extending the useful life assumptions used to value the transmission wires and switching stations. Adopting the useful life assumptions proposed by PB Power, the Commission has modelled the opening asset value for the SMHEA's transmission network at \$62.45 million.

Capital expenditure

At the outset of this review the SMHEA indicated that it has plans for a modest capital expenditure program (capex) of \$10.47 million over the regulatory period. This figure was later revised down by the SMHEA to \$9.47 million with the reclassification of the surge arrester equipment to the generation business.

Subsequent discussions with the SMHEA clarified the classification of the Upper Tumut Group Control Centre (UTGCC) and the Murray Group Control Centre (MGCC). In those discussions, the SMHEA indicated that these two control centres will not be transferred upon corporatisation and will remain with the generation business. Therefore, the upgrade of sewage treatment facilities and the proposed replacement of fire protection services for the UTGCC and the MGCC are excluded from the capex program.

Therefore, based on the Commission's approach to recognising capex at the date of commissioning, a nominal capex of \$7.06 million is recognised over the regulatory period, of which about \$0.5 million is attributable to interest during construction.

Depreciation

Using a post-tax nominal framework, the Commission has made allowance for "economic depreciation" which adds together the (negative) straight line depreciation with the (positive) annual inflation effect on the asset base.

This economic depreciation has been used to model the movements of asset values over the life of the regulatory period (table 1) and for determining the return of capital (table 2). Calculation of the applicable straight-line depreciation component has been based on the remaining life per asset class.

On the basis of this approach the Commission has calculated a straight-line depreciation allowance that trends from \$2.90 million in 1999/00 to \$3.02 million, \$3.09 million, \$2.89 million, and \$3.00 million in each of the following years.

Cost of capital

In determining the SMHEA's revenue cap, the Commission must have regard to its cost of equity capital. The cost of equity capital is a method commonly used for determining the returns expected on an asset base.

The Commission has given careful consideration to the value that should be assigned to the SMHEA's assets given the nature of its business and current financial circumstances. Accordingly, the parameter values used are those considered most appropriate.

The Commission considers that the appropriate rate of return to apply to the SMHEA's transmission assets is a post-tax nominal return on equity of 11.20 per cent.

The Commission has decided to adopt a nominal risk free interest rate of 5.19 per cent, reflecting the short-term average yield on the five year government bonds. The Commission has arrived at a debt margin of 1.0 per cent above the nominal risk free interest rate. This provides a cost of debt of 6.19 per cent.

The Commission has maintained consistency with recent regulatory decisions in setting the market risk premium at 6.0 per cent.

For the tax and gamma parameters, the Commission utilised the same approach adopted in *the NSW and ACT Revenue Caps*, that is, a tax rate of 30% and a gamma of 0.5.

The Commission has examined the risks faced by SMHEA and the betas of similar businesses in arriving at an asset beta of between 0.30 and 0.50. This range was derived from the average asset beta for the infrastructure and utilities industry group listed on the Australian Stock Exchange. Using the debt beta in a range between 0.30 and 0.50, this converts to an equity beta of between 0.75 and 1.25 with a mid point of 1.00.

Return on capital

Based on the above components, the Commission has modelled SMHEA's asset base over the life of the regulatory period (see table 6.1).

Table 6.1: SMHEA's return on capital - 1999/00 to 2003/04 (\$million)

	1999/00	2000/01	2001/02	2002/03	2003/04
Opening asset base	62.45	59.55	57.76	56.51	55.82
Capital expenditure	-	1.23	1.84	2.20	1.79
Economic depreciation	2.90	3.02	3.09	2.89	3.00
Closing asset base	59.55	57.76	56.51	55.82	54.61
Return on capital	5.11	4.87	4.73	4.63	4.57

Operating and maintenance expenses

In preparing for corporatisation, the SMHEA has undertaken significant cost reductions and the Commission considers that it is unlikely that the SMHEA will be able to sustain similar levels of cost savings over the regulatory period. Therefore, the Commission recognises opex of \$14.29 million over the regulatory period.

Estimated taxes payable

In estimating a tax position for the SMHEA, the Commission has undertaken an assessment of the SMHEA's tax paying position, based on the assumptions underlying the building block approach, the SMHEA's tax depreciation profile, and the taxation arrangements, implemented as a result of the Ralph business taxation review. Currently, the SMHEA does not pay any tax, or tax equivalence component. However, this situation will alter after corporatisation, where it is proposed that the transmission network assets will be transferred to TransGrid as set out in Section 14(1) of the Snowy Corporatisation legislation. To account for this, the Commission will allow a pass through of income tax payable should the transfer occur during the regulatory period. Given that the new taxation provisions will apply, the income tax payable would be calculated using straight-line depreciation.

Total Revenue

Based on the various elements of the Commission's building block approach, the Commission has derived an unadjusted and smoothed revenue allowance (see table 6.2). Accordingly, the Commission proposes a smoothed annual revenue, using an X factor, a smoothing not efficiency X, of 3.54, for the SMHEA which trends down slightly from \$10.79 million in 1999/2000 to \$10.66 million in 2003/04.

Table 6.2: MAR for the SMHEA - 1999/00 to 2003/04 (\$ million)

	1999/00	2000/01	2001/02	2002/03	2003/04
Return on capital	5.11	4.87	4.73	4.63	4.57
Return of capital	2.90	3.02	3.09	2.89	3.00
Operating expenses	2.77	2.84	2.90	2.97	3.04
Unadjusted revenue allowance	10.79	10.73	10.72	10.48	10.61
Smoothed MAR	10.79	10.75	10.71	10.68	10.66

6.4 Conclusion

The Commission is proposing to establish a smoothed revenue cap for the SMHEA that trends down slightly from \$10.79 million in 1999/00 to \$10.75 million, \$10.71 million, \$10.68 million and \$10.66 million in consecutive years. These revenues are exclusive of the pass through provisions relating to any income tax payable and the GST. The Commission will need to assess any tax liability should the SMHEA's assets be transferred to a tax paying entity during the regulatory period.

6.5 Service Standards

It is important for the Commission to determine the SMHEA's revenue cap in the context of a set of defined service standards. Although revenue cap regulation provides an incentive for networks to improve productivity it also provides the transmission networks with an incentive to lower service standards to reduce costs and increase profits.

The SMHEA submitted its current and proposed service standard arrangements for the forthcoming regulatory period.

The SMHEA proposes the use of two high level measures to monitor the service level provided on their system to ensure competitive neutrality:

- **system availability** — is calculated by summing annual undelivered energy to the market place for Snowy Hydro due to unplanned outages and dividing by installed capacity of Generation; and
- **system minutes** — is calculated by summing all circuit hours available for all transmission network elements and dividing by total possible circuit hours available.

In establishing the revenue cap, the Commission is aware that it creates the incentive for the SMHEA to minimise costs, perhaps at some detriment to the level of services provided. While the NEC provides some detail on the level of service standards appropriate for transmission networks in the NEM, these service standards are not comprehensive.

As the licensing body in NSW, the Ministry of Energy and Utilities (MoEU) will be requiring its identified service standards as part of the transmission and distribution networks reporting requirements under the licensing arrangements, and will be publishing its report on service standard performances annually. The Commission understands that the transmission reporting requirements will need to be met by SMHEA, in addition to TransGrid and EnergyAustralia as foreshadowed in its discussion paper released in May 1999.

The Commission will consider the administrative efficiencies of relying on the reports published by the MoUE to satisfy itself that the revenue cap is commensurate with the level of service actually provided. The Commission will also continue to develop its views on service standards in the *Regulatory Principles*.

Appendix 1 The WACC formula

While the above sections dealt with the issues of determining the appropriate parameters to incorporate into the Commission's return on capital allowance in the revenue cap, there has also been considerable debate regarding the most appropriate WACC model to adopt.

The standard post tax nominal WACC formula, proposed in the NEC and the draft *Regulatory Principles* is given by:

$$WACC = \frac{R_e(1-T)}{1-T(1-g)} \times \frac{E}{V} + R_d(1-T) \times \frac{D}{V}$$

This formula is used in the *NSW and ACT Revenue Caps* for expressing the revenues in terms of a WACC.

The SMHEA propose an alternate model to use in determining the WACC, which expressed in post tax form is given by:

$$WACC = R_e \times \frac{E}{V} + R_d(1-T) \times \frac{D}{V}$$

The essential difference between the two models is the first model uses the statutory tax rate, whereas the later uses an effective tax rate. The first model also assumes equity returns take the form of dividends, ignoring capital growth. Additionally, R_e in the first model is partially grossed, which is inconsistent with the CAPM model, whereas in the latter model R_e is fully grossed up.

Given the tax position of the SMHEA and the consistency of the prior model with the R_e in the CAPM, the Commission will adopt the first model for expressing the SMHEA's return on capital in terms of a WACC.