Draft

Statement of Principles for the Regulation of Transmission Revenues

Date: 27 May 1999

File No:
CG98/25

Commissioners:
Fels
Asher
Shogren

Contents

Abbreviations

AAS	Australian Accounting Standards
AASB	Australian Accounting Standards Board
ABS	Australian Bureau of Statistics
ACA	Australian Cogeneration Association
ADJR	Administrative Decisions (Judicial Review) Act 1977
BCA	Business Council of Australia
CAPM	capital asset pricing model
COAG	Council of Australian Governments
Commission	Australian Competition and Consumer Commission
CPI	consumer price index
DAC	depreciated actual cost of an asset
DORC	depreciated optimised replacement cost of an asset
DPIE	Department of Primary Industries and Energy
Draft Regulatory Principles	Commission's Draft Statement of Principles for the Regulation of Transmission Revenues
ESI	electricity supply industry
EUG	Energy Users Group
FERC	Federal Energy Regulatory Commission
IPART	Independent Pricing and Regulatory Tribunal, New South Wales
MAR	Maximum allowed revenue
MEE	modern engineering equivalent
National Gas Access Code	National Third Party Access Code for Natural Gas Pipeline Systems
NEC	National Electricity Code
NECA	National Electricity Code Administrator
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
ODV	optimised deprival value of an asset
ORC	optimised replacement cost of an asset
ORG	Office of the Regulator-General, Victoria
RAB	regulatory asset base
Regulatory Principles	Commission's Statement of Principles for the Regulation of Transmission Revenues
SKM	Sinclair Knight Merz

SNNS	Specification and Negotiation of Network Services
SRC	standard replacement cost
TFP	total factor productivity
TNSP	transmission network service providers / owners
TPA	Trade Practices Act 1974
UIG	Urgent Issues Group
WACC	weighted average cost of capital

Overview

1. Commission's role as regulator of transmission revenues

In a process coordinated through the Council of Australian Governments (COAG), the relevant jurisdictions (New South Wales, Victoria, Queensland, South Australia and the Australian Capital Territory) have created a National Electricity Market (NEM) in southern and eastern Australia. The NEM commenced on 13 December 1998, establishing a single wholesale market for electricity and an access regime for the transmission and distribution networks in participating jurisdictions. The arrangements for the operation of the NEM are set out in the National Electricity Code (NEC).

In general the electricity reforms which culminated in the commencement of the NEM have sought to create an environment where the contestable parts of the industry are exposed to competition in order to improve the efficiency of production and resource allocation, investment decisions and to minimise costs. However, those elements of the electricity industry that are not currently susceptible to competitive pressures, such as elements of transmission and distribution network service provision, are instead subject to regulatory supervision. This regulatory supervision is directed at facilitating competition in upstream and downstream markets, in part through eliminating monopoly rent taking by transmission network service providers/owners (TNSPs).

The Australian Competition and Consumer Commission (the Commission) will assume responsibility for the regulation of transmission revenues in the NEM, on a progressive basis, with effect from 1 July 1999. Consistent regulation of transmission networks according to the provisions of the NEC and the framework set out in the *Statement of Principles for the Regulation of Transmission Revenues* (*Regulatory Principles*) will occur from 1 January 2003.[1]

The NEC envisages that the Commission will develop a set of guidelines outlining how it will exercise its power to regulate transmission revenues. The *Draft Statement of Principles for the Regulation of Transmission Revenues* (*Draft Regulatory Principles*) is issued in response to this provision of the NEC.

In developing the *Draft Regulatory Principles*, the Commission has drawn heavily upon the principles and objectives outlined in clause 6.2 of the NEC, which are reproduced in Box 1.

---

[1] The Commission is the regulator of transmission revenues in NSW and ACT from 1 July 1999, and has recently released a draft revenue cap decision: *Draft Decision, NSW and ACT Transmission Network Revenue Caps 1999/00-2003/04*, 12 May 1999. The Commission will take on regulation of Queensland electricity transmission networks from 1 January 2002. The Commission will commence administration of the Victorian Tariff Order and the South Australian Electricity Pricing Order from 1 January 2001. Therefore, it will not be until 1 January 2003 that the Commission will be the regulator of transmission revenues in these jurisdictions according to the provisions of Chapter 6 of the NEC and the framework set out in the *Regulatory Principles*.

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

The NEC establishes that:

1. the transmission pricing 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 are consistent with take-or-pay contracts or NEMMCO augmentation determinations;
      ii) the value of existing assets are determined by jurisdictional regulators and must be lower 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 at least 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;
4. the TNSPs must provide the Commission with annual financial statements, and other information as required, so the Commission can monitor compliance with the revenue cap and assess cost allocation.

Source: National Electricity Code, Version 1.0, 1998, clauses 6.2.2 – 6.2.5.

In formulating the *Draft Regulatory Principles*, the Commission has also been directed by the following principles of best practice regulation. The Commission believes that:

- effective communication and consultation should take place between the regulator and all stakeholders, so as to encourage transparent decision making processes;
- the regulatory process should be predictable, so regulated businesses can feel confident that consistent, well defined decision making criteria will be adopted by the regulator;
- the regulatory process should be flexible, to allow for the regulatory approach to evolve over time in response to new developments and innovations; and
- as the regulatory regime should be effective and efficient, it will need to assess the cost effectiveness of the proposed regime and alternative regulatory options.

As the regulator of transmission revenues the Commission is committed to consistency in its decision making across and within industries, unless there are compelling arguments for pursuing different approaches. The Commission, however, recognises that tradeoffs may need to be made between providing regulatory certainty and working with the flexibility required to deliver the best regulatory outcomes. The Commission will need to balance the interests of customers and investors, service standards and price, and the need to provide incentives for long term efficient investment and the desirability of setting prices which track efficient costs as closely as possible.

The Commission is also conscious of the need to develop a consistent national regulatory framework. Important sources that have guided the Commission in its preparation of the *Draft Regulatory Principles* include its experience in the electricity, gas and telecommunications industries. The *Draft Regulatory Principles* also takes into consideration submissions from interested parties made in response to the *Regulation of Transmission Revenues Issues Paper*, May 1998.

The *Draft Regulatory Principles* indicate to interested parties the Commission's position on the issues to be addressed in the regulatory process. The *Draft Regulatory Principles* are statements of the Commission's intent with regard to regulation of each TNSP's revenue cap, as required by the NEC. The *Regulatory Principles* are not intended to be legally binding and it must be accepted that, in line with achieving best practice regulation, the Commission's position on some issues is not final. Further, as other regulators develop and implement alternative regulatory models, both in Australia and overseas, the Commission may choose to modify its approach. Moreover, it is envisaged that the *Regulatory Principles* will continue to evolve in response to improvements in regulatory models worldwide.

Changes to the *Regulatory Principles*, however, will not be implemented without undertaking a public consultation process.

2. Form of transmission revenue regulation

The NEC outlines the general principles and objectives for the transmission revenue regulatory regime to be applied by the Commission. It also allows the Commission the flexibility to use alternate methodologies, providing they are consistent with the NEC's 'objectives, principles, broad forms and mechanisms, and information disclosure requirements'. For example, the NEC requires the Commission to set a revenue cap for TNSPs, that is to determine the maximum allowable revenue (MAR) they can earn. However, if the Commission considers that there is sufficient competition to warrant a more light handed regulatory approach it may determine and apply such an approach.

In assuming its role as the national regulator of transmission revenue in the NEM, the Commission's aim is 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 these 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.

In setting up a framework for transmission revenue regulation the Commission has been acutely conscious of the deficiencies of existing regimes. In its Final Decision on the Victorian Gas Access Arrangements, the Commission made a commitment to address the

issues of concern raised in the context of that decision within the *Draft Regulatory Principles*.[2] The Commission has therefore used the *Draft Regulatory Principles* as an opportunity to propose a regulatory framework which, while building on the experience of existing regimes, avoids some of the major regulatory problems associated with those regimes.

The transmission regulation framework outlined in the *Draft Regulatory Principles* is an accrual building block approach based on forecasts of the cost of service over the regulatory period. The building block approach calculates the MAR as the sum of the return on capital, the return of capital, and operating and maintenance expenditure, that is:

MAR = return on capital + return of capital + O&M

MAR = (WACC * WDV) + D + O&M

where WACC = weighted average cost of capital;

WDV = written down (depreciated) value of the asset base;

D = depreciation allowance; and

O&M = operating and maintenance expenditure (including administrative costs).

While the assessment of operating and maintenance expenditures is relatively straight forward, assessment of the other elements is not. Determining these elements of the accrual building block raises significant issues with respect to providing TNSPs with a fair and reasonable return while at the same time promoting economic efficiency and an objective, transparent regulatory process.

Each of these elements of the accrual building block and the issues that it raises are discussed in the sections below. The regulatory framework adopted is studied in greater detail in Chapters 3-7 of the *Draft Regulatory Principles*. This overview also discusses the position the Commission has adopted in the *Draft Regulatory Principles* on other elements important to the regulatory process, such as service standards, information requirements, the regulatory period, the treatment of new interconnectors, and ring fencing.

3. Asset valuation

Under the building block approach, the value of fixed assets is fundamental to the calculation of the allowance for both the return on capital and return of capital and will flow directly through to the MAR and therefore transmission network prices.

While there is a wide range of asset valuation methodologies, there is no single approach that is appropriate in all circumstances. It is also true that questions of equity connected with the past pricing of services to users can also be important considerations. Such issues were thoroughly discussed in connection with the Victorian Gas Access Arrangements Decision.

Except for asset values set for the first regulatory review, the NEC provides that existing and new assets can be revalued, on a basis to be determined by the Commission. Nevertheless, the Commission does not have unlimited discretion in choosing an asset valuation methodology, as the NEC requires the Commission to give consideration to the Optimised

---

[2] ACCC, 1998, *Final Decision, Victorian Gas Access Arrangements*, October, Appendix E. Copies of this report are available from the Commission's website: http://www.accc.gov.au (under gas).

Deprival Value (ODV) methodology.[3] In the *Draft Regulatory Principles* the Commission considers that given the circularity that would be associated with any deprival value assessment, a depreciated optimised replacement cost (DORC) valuation should be adopted for any initial valuation. The DORC of a network is the sum of the depreciated cost of assets that would be used if the system were notionally reconfigured so as to minimise the forward looking costs of service delivery.

In the *Draft Regulatory Principles*, the Commission has adopted the DORC valuation methodology as the approach it will use to set the *cap* on the valuation of the asset base. The Commission considers that a well defined DORC approach has some significant advantages as a valuation methodology on economic efficiency grounds.

First, regulators often look to competitive or contestable markets for guidance on efficient decision rules for regulating natural monopoly markets. Such comparisons can provide a number of guiding principles for a range of complex regulatory problems.

Second, the maintenance of revenue streams over time at a level that is consistent with a DORC asset valuation will minimise the likelihood of significant shocks to tariffs as the replacement of assets becomes necessary. As the existing assets will dominate the capital base and therefore tariffs for a number of years, this objective of minimising shocks to tariffs can only be achieved if the existing assets are valued at or close to DORC.

Thirdly, any value that is in excess of DORC is likely to imply pricing of services that will expose the service provider to being by-passed. While the significant entry and exit costs that characterise electricity transmission make large-scale duplication of the existing system unlikely, by-pass may be feasible at the edges of the network. In such circumstances, some of the cost that gave rise to the by-pass will inevitably be absorbed by the remaining customers who do not have by-pass options.

The Commission will undertake DORC valuations in a consistent manner. To this end, the Commission will be releasing a guideline on its approach to DORC valuations before the end of 2002.

Given that the NEC requires the Commission to consider ODV, service providers will be given the opportunity to identify at the start of each regulatory review those assets that are subject to by-pass risk and to nominate a more appropriate asset base valuation. If a DORC is performed and assets are stranded, they will be optimised out of the regulatory asset base without any return of investment to the network. However, assets that have been identified by the service provider as at risk of by-pass will be subject to accelerated depreciation prior to removal from the regulated asset base. The Commission may also write down part of the transmission system below DORC in recognition of evidence suggesting that the regulatory asset base valuation currently exceeds the ODV of the system.

Concerning asset base roll forward, the approach adopted in the *Draft Regulatory Principles* provides that only capital expenditures deemed to be prudent may be added to the regulatory asset base. Clearly if the full amount of the investment is not required and is not prudent, the regulator should not add the full cost to the regulatory asset base. Where additional capability/capacity is included to allow for demand growth, some overbuilding may be

---

[3] Clause 6.2.3(d)(4)(iv) of the NEC states that the Commission must have regard to the agreement of the Council of Australian Governments of 19 August 1994, that deprival value should be the preferred approach to valuing network assets.

considered prudent given the quantum nature of expansion and scope for economies of scale. Where there is doubt that any overbuilding is prudent, a lesser amount will be added to the regulatory asset base corresponding to what would be considered clearly identifiable demand (including a margin sufficient to satisfy normal redundancy or safety requirements). In most cases, the bulk of expenditures will be included because economies of scale would mean that a smaller capacity addition to infrastructure would be at a higher unit cost. This approach parallels that outlined in the National Gas Access Code.

Additions to the regulatory asset base will be timed to occur when the asset becomes operational. However, where construction times are protracted, the amount added to the regulatory asset base may be increased by an amount equivalent to the return that would be achieved on funds employed during construction.

4. Determining a fair rate of return on the asset base

In determining a rate of return, the NEC specifically requires the Commission to consider the weighted average cost of capital (WACC) for each transmission network. In the *Draft Regulatory Principles*, the Commission has adopted a nominal post-tax WACC approach. The WACC is the weighted average of the cost of equity and the cost of debt, each cost weighted by its proportion in the company's financial structure. The WACC is set on the basis of financial market benchmarks, taking into account the level of commercial risk involved in establishing the transmission infrastructure.

The WACC is a commonly used method for determining a return on an asset base. Its adoption, along with the building block approach, was strongly endorsed in submissions received in response to the *Regulation of Transmission Revenues Issues Paper*. The building block approach combines a rate of return with a regulatory asset value. Given the capital intensive nature of electricity network businesses, the return on capital component of the regulated revenue could account for 50 per cent or more of annual aggregate revenue. As relatively small changes to the rate of return can have a significant impact on the total revenue requirement and ultimately end user prices, it is important that the regulator sets the rate of return at a level which reflects a commercial return for the regulated businesses. Setting a rate of return below the cost of funds in the market could make continued investment in developing the network difficult or unattractive for the owner. This would create pressure for the regulated business to reduce maintenance and capital expenditure below optimum levels and undermine the quality of service offered to users. Conversely if the rate of return were set too high by the regulator, the regulated businesses would earn a return in excess of their cost of capital. This would distort price signals to consumers and investors, resulting in a misallocation of resources and sub-optimal economic outcomes.

Chapter 6 of the *Draft Regulatory Principles* sets out the approach that the Commission will use in determining the WACC. Many aspects of the WACC analysis are complex and contentious, as evidenced by the extensive debate encountered during the Commission's and the Office of the Regulator General's assessment of the Victorian Gas Access Arrangements.

At that time, the use of a pre-tax rate of return was advocated by many parties on the grounds that it avoids the need to explicitly add into the 'cost of service' calculation an amount to compensate for tax obligations of the service provider. The Commission believes that such arguments are misguided in that the tax calculation still needs to be carried out in order to convert from the post-tax rate of return indicated by CAPM benchmarks to the corresponding pre-tax real rate required for the regulatory framework.

Since both pre-tax and post-tax approaches require tax liabilities to be assessed, the primary issue is how best to account for tax liabilities. There are two options – on a short term (period by period) basis or a long term basis. The Commission considers that there are significant flaws associated with a long term assessment of tax liabilities, including:

- the difficulty in calculating a long term effective tax rate. Errors of judgement in estimating the long term effective tax rate can lead to over or under compensation in the rate of return and create perceptions of risk;
- the fact that the WACC will be expressed in nominal post-tax terms, meaning that it will need to be converted to come up with pre-tax real figures. In a pre-tax real framework the conversion formula is complex, as no analytical formula exists to cover all TNSPs. Conversion is not conducive to a transparent regulatory framework; and
- the S-bend problem. Regulated businesses will receive cash advances before their actual tax liabilities eventuate, thus being over-rewarded in the early years but under-rewarded later on. Therefore, the regulated entity will not always receive the rate of return set by the regulator. This may lead to 'gold-plating' in early years and under investment later on.

Given the deficiencies associated with a long term assessment of tax liabilities, the Commission believes that tax liabilities should be assessed on a period by period basis. In so doing, transparency is achieved by adopting a post-tax approach.

A post-tax approach eliminates the need to consider conversion from a pre-tax approach as taxes are passed through in the cash flows. In the United States, this treatment of tax is no longer a controversial issue. Similarly in the United Kingdom, Ofwat, Oftel and Orr use a post-tax approach, while Offer has indicated a preference for the post-tax approach.[4] The use of a post-tax approach was also supported by experts in the field that the Commission consulted, including Professors Bob Officer and Kevin Davis and Dr Neville Hathaway.

This leaves a choice between whether the cash flow analysis should be completed in real or nominal terms. Although it can be proven mathematically that nominal and real frameworks based on a CPI-X framework are equivalent, the Commission is of the view that the nominal framework has some significant advantages that warrant is adoption.[5] The *Draft Regulatory Principles* propose the use of a nominal framework at this time because of two major advantages associated with its adoption.

First, a nominal rate of return is better understood by financial markets. A nominal WACC can be directly compared with other financial benchmarks such as interest rates, and the nominal return on equity – irrespective of the inflationary environment. Financial markets typically express earnings and rates of return in nominal (post-tax) terms. Using a nominal post-tax rate of return therefore eliminates uncertainty over the meaning of what rate of return the Commission has provided.

Second, depreciation in a nominal framework is transparent and there is no confusion regarding the extent of recovery. In a nominal framework accumulated depreciation allowances equate to the change in the regulatory asset base valuation over time. This is not

---

[4] Ofwat is the Office of Water Services; Oftel is the Office of Telecommunications; Orr is the Office of the Rail Regulation; and Offer is the Office of Electricity Regulation.

[5] A CPI-X regime is one where the TNSP is guaranteed inflation protection, so that the risks associated with inflation are passed onto users.

the case for a real framework, where depreciation allowances include adjustments for inflation, so that in numerical terms accumulated depreciation may substantially exceed the actual cost of the asset. This creates difficulties in explaining to non-economists that TNSPs are not recovering well in excess of their original infrastructure costs.

5. Return of capital

The objective of encouraging continuing investment in privately owned natural monopoly industries will require investors to be provided with an assurance that they will earn a reasonable (risk adjusted) return on their investment capital, as well as the return of capital provided the market continues to value the services produced with that capital.

The building block approach for determining the MAR for TNSP's includes an allowance for depreciation. Such an allowance recognises the need to recoup the outlay involved in the purchase of the asset, over its useful life. Under the building block approach total revenue earned from the regulated assets consists of the depreciation charge and the allowed return on assets.

Traditional linear depreciation schedules, whether applied in a nominal or a real framework, do not always provide a suitable revenue profile. The key problem associated with the use of linear depreciation profiles is that there is typically a jump in tariffs/revenues when a major asset reaches the end of its useful life and is replaced by another.

The Commission therefore proposes a *competitive depreciation* profile in the *Draft Regulatory Principles*. The *Draft Regulatory Principles* sets out how the competitive depreciation approach is to be applied.

There are two aspects to the proposed depreciation profile:

- the smoothing of revenue paths (via the competitive depreciation approach) designed to avoid inter-generational pricing disparities; and
- adjustments to reflect the impact of future potential stranding of identified assets (i.e. possible redundant assets).

The Commission considers it important to adopt this approach, given that substantial transmission system augmentations are expected in a number of jurisdictions in the next few years.

The proposed approach allows the TNSP to identify assets that are subject to by-pass risk, and voluntarily write down its asset base at a faster than normal rate. In the event that such write down does not occur and the asset base is optimised, then those assets will be removed from the asset base with the service provider losing both the return of and return on capital.

The approach links the long term depreciation profile to a measure of the rate of technological change. The revenue smoothing minimises inter-temporal price distortions (inter-generation price shocks). It also minimises potential geographical price distortions linked to the vintage of assets serving neighbouring systems. Further, it will maintain the consistency requirements of any framework; that is, there will be no double counting of depreciation. Under a nominal approach this means that the accumulated depreciation should not exceed the change in the valuation of the assets over time.

6. Benefit sharing

The Commission appreciates that the form of regulation used and the incentives it creates will have a major impact on market outcomes. The regulatory regime adopted should ensure that efficiency gains are passed on to final consumers, while providing effective incentives to the service provider to maximise efficiency.

With the ability to retain cost reductions as profits, the Commission considers that the service provider has a strong incentive to be more efficient in the provision of network services. However, effective natural monopoly regulation involves not only providing positive incentives for improved efficiency but also ensuring there is sufficient disincentive to avoid inefficiency and poor quality service. These incentives can be achieved by offering financial rewards for improvements in long term cost efficiency above those determined by the regulator, and penalising, through reduced profits or losses, failure to achieve service standards and benchmark efficiency improvements.

If the TNSP can achieve efficiencies greater than those allowed for in the X factor it retains the higher level of profits. In other words the benefits of efficiency gains are shared between the consumer (those gains achieved up to the X factor) and the TNSP (the gains achieved in excess of the X factor). The strength of the incentive effect will be determined in part by both the level of the X factor and the type and timing of sharing arrangements that the regulator puts in place.

Consistent with the broad approach of other Australian regulators and in accordance with NEC requirements, the Commission has adopted a CPI-X approach in the *Draft Regulatory Principles*. Under this arrangement the revenue cap set for each regulated TNSP will increase each year in line with general price increases (as measured by CPI) but decrease each year by the X factor, as determined by the Commission. The Commission also wishes to increase the magnitude of the incentive that the TNSP has to introduce cost savings and for this reason it proposes a form of glide path to enhance the pursuit of efficiencies.

The Commission has decided to implement a glide path for one regulatory period beyond the regulatory period in which the efficiency gains accrued. This form of glide path allows for the gradual sharing of the benefits of efficiency gains between users and the TNSP in the form of lower prices. However, not all components of the building block will be glide pathed. Where no additional benefit is considered justified there will be an immediate readjustment of costs at the beginning of the next regulatory period – a so called P_0 adjustment. The Commission will make the following adjustments to the components of the building block at the end of each regulatory period, to apply in the next regulatory period:

- rate of return – full P_0 adjustment;
- operations and maintenance expenditure – straight line glide path for the next regulatory period; and
- capital expenditure – full P_0 adjustment.

The Commission has decided not to glide path capital expenditure because it believes that to do so creates a perverse incentive for the TNSP to systematically over-forecast capital expenditures. However, the *Regulatory Principles* do allow for a TNSP to make a case to the Commission that it has implemented efficiencies that justify glide pathing of capital expenditures. Where it is clearly demonstrated by the TNSP that capital expenditure

shortfalls are the result of management efficiencies or innovation, the capital expenditure efficiency gains may be subject to a glide path.

7. Service standards

Under a CPI-X revenue cap regulatory approach, there is a risk that a monopoly TNSP may try to reduce costs and hence increase profits by reducing the quality of services offered. Quality of service monitoring by a regulator, assisted by penalties for non-performance, can ensure that TNSPs maintain service quality. The Commission believes that effective incentive-based regulation should include an explicit level of service, for which the TNSP has been provided by the regulator sufficient income to maintain the assets necessary to provide that level of service.

Consequently in the *Draft Regulatory Principles*, the Commission requires TNSPs to propose a single set of service standards, and proposed benchmarks for each standard, as part of their regulatory review application. The Commission will review the TNSP's application and establish a set of service standards with performance benchmarks, and a quality of service monitoring program for each TNSP under its jurisdiction. The Commission will include the resulting set of service standards and benchmark levels of performance in the *Draft Decision* and *Final Decision* on the TNSP's application. The Commission will also publish annual statistics comparing the operating performance of TNSPs it regulates. To achieve this, the Commission will require the data outlined in Annex 8.1 of the *Draft Regulatory Principles* to be collected.

Penalties for non-performance of service standards will be developed and will be imposed during a regulatory review for a TNSP that does not, in the opinion of the Commission, maintain its service to customers at the benchmark level.

8. Information requirements

The Commission is conscious of the information asymmetry problem that it will face in both determining the revenue cap and monitoring the performance of the regulated TNSPs. The TNSPs will always have more information than the Commission about their businesses, their costs, their capacity to make efficiency improvements and their future market prospects. This problem has the clear potential to distort regulatory outcomes.

Clauses 6.2.5 (a) and (c) of the NEC require TNSPs and/or owners to submit to the Commission certified annual financial statements (in a form to be determined by the Commission) and any other information the Commission reasonably requires to perform its regulatory functions.

The information that the Commission believes that it requires to efficiently regulate TNSPs is outlined in Chapter 10 of the *Draft Regulatory Principles* and in Appendices 1-5. The Commission's objective in using its information gathering powers will be to gain a true and accurate reflection of the financial operations of the TNSP, in order to determine and monitor compliance with a revenue cap. The Commission is concerned that if incomplete, and/or misleading information is used in the determination of a revenue cap, regulatory outcomes may be inappropriate.

The Commission is, however, also aware of the costs of complying with information requests. There is a need, therefore, to balance information requests, ensuring that relevant

and accurate information is supplied, without excessive or unnecessary detail. The Commission believes that by adopting the principles of best practice regulation, a regulator can foster a co-operative environment, with well informed participants, and in doing so reduce the overall regulatory costs, without increasing the risks of information asymmetry.

It is true that initially there are significant information requirements for the TNSP in applying this regulatory regime. Regardless of the regulatory approach adopted, the Commission understands that some will see the approach as heavy handed. However, it is important that the Commission has the ability to regulate transmission networks effectively, because as natural monopolies the operation of these networks impact on the wider community. It is also important to note that once certain regulatory parameters have been determined, they will not have to be constantly revisited. It is therefore possible that information requirements will not be so intensive for TNSPs in the future.

9. Regulatory period

The regulatory period refers to the length of time between regulatory reviews and is integral to the effectiveness of incentive based regulation. The length of the regulatory period will impact on the incentives facing the regulated TNSP, and the predicability and stability of the regulatory environment. Clause 6.2.4(b) of the NEC specifies that the regulatory period must be at least five years.

The appropriateness of five yearly reviews depends upon a number of factors such as the rate of technological change, and likely changes in the industry structure and growth rates. Given that the electricity transmission industry is not operating in a static environment, the Commission has argued that the five yearly review period provides a compromise between providing regulatory certainty and stability to TNSPs and also enabling consumers to share the benefits of efficiency gains within a relatively short period of time.

However, the Commission is also of the view in the *Draft Regulatory Principles* that in the future it may be appropriate to extend the length of time between regulatory reviews in some cases. Factors to be considered may include the expected growth of the transmission network under review and the likelihood and expected size of future efficiency gains.

The Commission will consider extending the regulatory review period when requested to do so by the TNSP. In its proposal the TNSP must justify extending the regulatory review period beyond five years, and demonstrate that any such change will not disadvantage users of network services and consumers. The Commission will then consider the merits of the application and address the issue of the length of the regulatory period as part of its revenue cap decision.

A related issue concerns the risk of within period regulatory review (or regulatory recontracting) and the impact this will have on regulated TNSPs facing an incentive based regulatory regime. Implementing within period reviews would lead to increased regulatory risk and could conflict with the principle of regulatory predicability. The Commission proposes that regulatory recontracting should only occur where the benefits of such intervention outweigh its costs. The Commission considers that in general the trigger for initiating a within period review should come from the regulated TNSP affected, but will reserve the right to initiate a review, where the information provided to the Commission is found to have been false or misleading, a material error was made in the regulatory decision, or there is a change of ownership and this may materially change the revenue requirement.

10. The treatment of new interconnectors

Clause 6.2.3(c) of the NEC provides the Commission with the flexibility to determine whether sufficient competition exists to warrant the application of a more 'light handed' regulatory approach than revenue capping, and if so, the form of that regulation.

The Commission has formed the view that a light handed regulatory approach may be applied to the regulation of new interconnectors in the NEM. It will allow the MAR for new interconnectors to be determined through a competitive tender process. The Commission considers that an approach whereby the MAR for new interconnectors is determined through a competitive tender process has the potential to enforce some market discipline to the regulation of a new interconnector.

Chapter 12 of the *Draft Regulatory Principles* largely outlines the conditions and process under which the Commission will be willing to allow a competitive tender process determine the MAR for a new interconnector in the NEM. The competitive tender arrangements outlined in this Chapter are similar to those in the National Gas Access Code. The Commission is keen to ensure that the light handed approach, if permitted, delivers acceptable network pricing outcomes. Therefore, the Commission must be satisfied that the number and character of tenders likely to be received would be such as to ensure a competitive outcome. It will also need to be satisfied that the selection criteria applied in conducting the tender process will ensure that the successful tender will be selected primarily on the basis that the tender will deliver the lowest MAR and will result in allocation of costs between users that is fair and reasonable.

11. Ring fencing arrangements

Part G of the NEC requires the Commission to develop ring fencing guidelines for the accounting and functional separation of the provision of prescribed services from the provision of other services by the TNSP.[6] The NEC states that the transmission ring fencing guidelines may include, but are not limited to:

- provisions defining the need for and the extent of legal separation;
- establishment and maintenance of consolidated and separate accounts for prescribed services and other services provided by the TNSP;
- allocation of costs between prescribed services and other services;
- limitations on the flow of information between the TNSP and other persons;
- limitations on the flow of information between the TNSP and other persons where there is the potential for a competitive disadvantage; and
- provisions allowing the Commission to add to or waive a TNSP's obligations.

In developing the ring fencing guidelines in the *Draft Regulatory Principles* the Commission's objective has been to attempt to reinforce the effectiveness of the regulatory processes by limiting the ability of the transmission networks to extend their monopoly powers from the network business into the contestable parts of the industry. In particular, the Commission is seeking to ensure that regulated activities do not cross-subsidise contestable

---

[6] Prescribed services are defined by the NEC as transmission services provided by transmission network assets or associated connection assets which are determined by the regulator as not being contestable.

activities and that information flows between regulated and contestable activities are appropriately restricted.

The Commission recognises that the electricity industry has undergone structural reform that has reduced the likelihood that regulated activities could be used to subsidise contestable activities. However, it is possible that the networks of the future will grow into businesses quite unlike the electricity networks of the past and will provide a range of contestable services.

Therefore, the possibility exists for incidental and/or related work to be subsidised by expensing such items against regulated components of the business, while recording income as unregulated revenues, not subject to the revenue cap.

Ring fencing arrangements have been developed with varying degrees of success in the context of other monopoly industries. Most recently ring fencing arrangements were developed by the National Gas Reform Task Force and included in the National Gas Access Code. In summary, the National Gas Access Code's ring fencing arrangements establish a number of minimum obligations, provide the regulator with the ability to waive certain obligations, and establish a mechanism for the regulator to impose additional obligations.

The Commission proposes to adopt a set of ring fencing arrangements for electricity transmission networks which are based on the National Gas Access Code's ring fencing arrangements. The majority of interested parties were supportive of the development of ring fencing guidelines along the lines of those in the National Gas Access Code.

In addition the Commission has selected a set of arrangements that provide the flexibility for the Commission to waive the ring fencing arrangements where the costs of compliance outweigh any apparent benefit from imposing the ring fencing provisions. The arrangements also provide for additional ring fencing provisions to be applied where the benefit outweighs the costs.

12. Consultation prior to finalising the Regulatory Principles

One of the Commission's objectives in publishing the *Draft Regulatory Principles* is to provide an opportunity for transmission customers, TNSPs and other stakeholders to participate in the development of the regulatory framework.

The *Draft Regulatory Principles* present to interested parties the Commission's position on the issues to be addressed in the regulatory process and describe the processes by which the Commission will undertake its regulatory task. Interested parties are invited to respond to the *Draft Regulatory Principles* before 30 July 1999. Submissions can be sent to:

The Senior Assistant Commissioner
Electricity Group
Australian Competition and Consumer Commission
PO Box 1199
Dickson ACT 2602

Phone: (02) 6243 1249 Fax: (02) 6243 1260

Each submission should clearly indicate a contact person and contact details. If the submission is more than five pages, please include an Executive Summary highlighting the issues being commented upon in the submission.

The Commission requests that five hard copies of each submission be provided and also supplied in electronic format compatible with Microsoft Word 97 for Windows. Copies can be e-mailed to the following address:

electricity.group@accc.gov.au

The Commission will treat all submissions as public unless otherwise indicated.

Copies of all submissions will be placed upon the Commission's public register relating to this matter, and this register can be perused at Commission offices.

The Commission will also hold public information sessions, to present key aspects of the regulatory framework as follows:

Brisbane:	Tuesday 15 June 1999
Melbourne:	Wednesday 16 June 1999
Sydney:	Thursday 17 June 1999

The Melbourne information session will also provide a video link to Adelaide.

Details regarding the times and venues can be obtained from Ms. Maxine Helmling. Interested parties must register to attend an information session by contacting Ms. Helmling on (02) 6243 1246, before Thursday 10 June 1999.

The Commission may also hold a public forum to discuss its position as described in the *Draft Regulatory Principles*. If required, details of the public forum will be placed on the Commission's website.

The Commission will consider the issues raised at the public information sessions, the public forum and in any submissions received and publish its final *Regulatory Principles* later in the year.

1. The regulatory terms of reference

1.1 Reasons to regulate

The electricity supply industry (ESI) plays a key role in the Australian economy and provides an important input into all Australian industry.

The successful introduction of competitive reforms to the ESI is important to provide incentives to participants to improve the efficiency of their production, resource allocation and investment decisions, and to minimise costs. Benefits from the successful introduction of competitive reforms are not limited to the ESI but could flow to all Australian industry, influencing the ability of firms to compete both domestically and internationally.

However, not all elements of the ESI can be successfully exposed to competitive pressures. In markets in which competition is unlikely, such as electricity transmission, there exists an imbalance in the relative bargaining position of providers of the service and users of the service, and information asymmetry between the regulator, the transmission network service provider (TNSP), and its customers. Consequently, prices can be distorted above economically efficient levels resulting in an adverse impact on economic efficiency. In such circumstances, governments have attempted to rectify these market failures by intervening through public ownership, regulation or some combination of both.

The network pricing chapter of the National Electricity Code (NEC) attempts to deal with these problems by removing from TNSPs a significant amount of discretion in terms of price setting. The NEC proposes establishing uniform mechanisms for pricing access to transmission networks whereby the Australian Competition and Consumer Commission (Commission) will determine asset values, rates of return and revenue caps. The NEC also outlines principles, objectives and cost allocation procedures to guide the Commission and the TNSPs through this process.

The aim of this regulatory regime is to remove the ability of TNSPs to charge monopoly prices, but at the same time provide the owners with a fair return on their investment and create the correct incentives for managers to pursue ongoing efficiency gains through cost reductions.

The NEC specifically requires that a form of incentive based regulation be used, instead of rate of return regulation which has been adopted by some countries.[7] Effective regulation in this framework involves not only providing positive incentives for improved efficiency but also ensuring there is sufficient disincentive to avoid inefficiency and poor quality of service. This can be achieved by offering financial rewards for improvements in long term cost efficiency above those determined by the regulator, and penalising, through reduced profits or losses, failure to achieve service standards and benchmark efficiency improvements.

The objective of the regulatory framework is to act as a surrogate for the rewards and disciplines normally provided by a competitive market. The challenge the Commission faces

---

[7] Rate of return regulation embodies micro management of the regulated entity, and is a form of cost plus regulation in that the company normally can only persuade its regulator to change its prices and revenue if it can show that its costs have changed. Revenue requirements are derived from operating costs plus capital costs plus a return on capital, with the latter being the company's only source of profits. The incentives for cost economy in rate of return are weak, and economists have criticised rate of return's efficiency properties.

as regulator of the natural monopoly[8] electricity transmission networks, in applying this framework, is to secure a menu of incentives and disciplines that replicates as far as possible the operation of a competitive market.

1.2 The Commission's role in electricity transmission network regulation

The NEC sets out that the Commission is to be the regulator of transmission network services, in each jurisdiction participating in the National Electricity Market (NEM), according to the timetable set out in Chapters 6 and 9 of the NEC. Given this timetable, consistent regulation of national electricity networks by the Commission will not take place until 1 January 2003 (Table 1.1).

Table 1.1: NEC transmission network regulation timetable

Jurisdiction	Commission transmission regulation start date
New South Wales	1 July 1999
Victoria	1 January 2003*
Queensland	1 January 2002
South Australia	1 January 2003**
Australian Capital Territory	1 July 1999

* The Commission will commence administration of the Victorian Tariff Order from 1 January 2001.
** The Commission will commence administration of the South Australian Electricity Pricing Order from 1 January 2001.

The Commission's powers to perform this regulatory task stem from Part IIIA of the *Trade Practices Act 1974* (TPA). Access undertakings submitted to the Commission by each TNSP require the network service provider to provide access in accordance with the NEC.

The NEC sets out that it is envisaged the Commission will publish a *Statement of Principles for the Regulation of Transmission Revenues* (*Regulatory Principles*) which will establish guidelines as to how it will exercise its regulatory powers. These *Draft Regulatory Principles* are issued in response to that provision of the NEC. In developing the *Draft Regulatory Principles* the Commission has drawn heavily on Chapter 6 of the NEC, in particular the principles and objectives espoused in clause 6.2, and set out in Box 1.1 below. The Commission has also been directed by the principles of best practice regulation, as discussed in section 1.3. A number of other equally important sources including experience in the electricity, gas and telecommunications industries have also guided the Commission.

The *Regulatory Principles* are a statement of the Commission's intent with regard to regulation of each TNSP's revenue cap, as required by the NEC. The *Regulatory Principles* are not intended to be legally binding and it must be accepted that, in line with achieving best practice regulation, the Commission's position on some issues is not final. Further, as other regulators develop and implement successful alternative regulatory models, both in Australia and overseas, the Commission may choose, subject to the constraints imposed upon it by the NEC, to modify its approach to accommodate these changes. The Commission also

[8] The term natural monopoly is used to describe a situation where it would be uneconomic for more than one firm to supply the market because of the existence of economies of scale and scope in the production of the good or service. Competition is not feasible in those circumstances and regulation is required to prevent the monopoly business from exercising market power to the disadvantage of its customers.

recognises that the framework proposed in the *Regulatory Principles* may not be appropriate in all the circumstances facing all regulated entities, especially those in different sectors of the economy. Thus, while the Commission will endeavour to achieve consistency across the industries and sectors in which it has a regulatory role, the Commission reserves the right the implement different regulatory frameworks where these are shown to be appropriate.

The Commission expects that the *Regulatory Principles* will evolve in response to improvements in regulatory models and best practice worldwide. It is the Commission's view that such evolution and flexibility will be supported by interested parties because of a common desire to achieve the best possible regulatory outcomes.

This is not to say the Commission will unilaterally implement changes without undertaking a public consultation process. The form of public process for changes to the *Regulatory Principles* will include an opportunity for interested parties to provide written submissions, the issuing of draft changes and further public consultation prior to any changes being incorporated into the *Regulatory Principles* - similar to the process set out in Chapter 2 of these *Draft Regulatory Principles*. In fact some approaches to regulation may need to be revised shortly in light of the outcomes of the National Electricity Code Administrator (NECA) Transmission and Distribution Pricing Review (NECA Pricing Review).[9]

As the regulator of transmission revenues, the Commission is committed to consistency in its decision making across and within industries, unless there are compelling arguments for pursuing different approaches. The Commission believes that consistency can be achieved between the gas and electricity industries because they have a number of similar characteristics (i.e. long lived assets, network industries, low rates of technological change and so on). Therefore, the Commission's experience with respect to regulation of the gas industry is of particular relevance to the Commission's regulatory task in electricity transmission.

The Commission is also conscious of the need to develop a consistent national regulatory framework that includes jurisdictional energy regulators. The then Commonwealth Department of Primary Industries and Energy[10] (DPIE) submission reiterated the Commonwealth position supporting the need for uniform regulation to ensure that integrated and compatible national frameworks for gas and electricity are achieved, consistent with national energy market objectives. Further, the DPIE submission expressed concern over the continued operation of multiple State regulators and suggested that regulation of distribution wires should have the same regulatory cover in due course to add to commercial certainty.

The *Regulatory Principles* have been developed in consultation with jurisdictional regulators via the Commission's Energy Committee.[11] Therefore, the Commission sees the *Regulatory*

---

[9] The NECA Pricing Review (required by clause 6.1.6(a) of the NEC) has made recommendations on 'who pays' for the existing network and new investment in network augmentation. The *Draft Regulatory Principles* have not considered the recommendations of the draft NECA Pricing Review. The Commission will consider the final NECA Pricing Review, and may revise the *Regulatory Principles* where it considers the decisions of the NECA Pricing Review have implications for its regulatory role .
National Electricity Code Administrator, 1999, *Transmission and Distribution Pricing Review*: *Draft Report*, March.

[10] Commonwealth Department of Primary Industries and Energy, 1998, *Response to the Regulation of Transmission Revenues Issues Paper*, June.

[11] The Energy Committee has been established to advise the Commission on matters relating to energy. It is chaired by the Commission's Deputy Chairman Allan Asher and its other members include ex-officio Associate Commissioners who currently hold positions as independent State and Territory regulators.

Principles as an important statement that the jurisdictional regulators may take into account in their decision making and in this way promote consistency in energy market regulation.

Box 1.1: Objectives and principles of the transmission revenue regulatory regime

The NEC establishes that:

1. the transmission pricing 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 are consistent with take-or-pay contracts or NEMMCO augmentation determinations;
     - ii) the value of existing assets are determined by jurisdictional regulators and must be lower 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 at least 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;
5. the TNSPs must provide the Commission with annual financial statements, and other information as required, so the Commission can monitor compliance with the revenue cap and assess cost allocation.

Source: National Electricity Code, Version 1.0, 1998, clauses 6.2.2 – 6.2.5.

1.3 Principles of best practice regulation

In a regulated environment, the actions of the regulator could influence the assessment of risk and expected returns by introducing elements of uncertainty and risk. Regulatory uncertainty weakens existing incentives for efficient behaviour, so that a higher rate of return is required for investment.

In order to minimise regulatory risk, the Commission is committed to achieving best practice regulation and has adopted a set of guiding principles that will underpin its regulatory work. The principles set out below have been identified by the Regulators' Forum[12] as essential elements required to achieve best practice regulation, and have been adopted by the Commission.

The principles describe high level goals for regulators to aim at, rather than specifying quantifiable performance measures. The Commission intends to be guided by these principles but recognises that it is possible for them to conflict, for example flexibility and predictability may not always appear to be jointly achievable. In such cases the Commission will use discretion in making its decisions, although always with the aim of achieving the best possible regulatory outcome, appreciating though that such an outcome will need to trade-off competing interests.

The four key principles are:

- Communication and consultation:

  Effective communication assists stakeholders to understand regulatory initiatives and requirements. Proper communication is educative and informative and can help to build commitment to regulatory initiatives through better understanding. The Commission will attempt to achieve effective communication by ensuring that information is accessible, timely and inclusive of all stakeholders. For this reason particular attention has been paid in the *Draft Regulatory Principles* to the information disclosure provisions, and the preparation of schedules for reporting.

  The Commission will also consult with stakeholders to understand the implications of its decisions, and enable stakeholders to discuss the impact of regulation and suggest alternatives and improvements. To achieve this objective the Commission is committed to a consultative process similar to the authorisation process in the TPA and the National Third Party Access Code for Natural Gas Pipeline Systems (National Gas Access Code). By adopting processes similar to these the Commission further hopes to achieve transparency in its decision making.

  Effective communication and consultation also requires a commitment from the TNSP to the process and objectives. In particular, providing stakeholders with appropriate and timely information will result in suitable regulatory outcomes.

---

[12] In 1997 the Commission, in conjunction with a number of Commonwealth and State/Territory regulatory agencies and policy advisers, established a Public Utility Regulators Forum. The purpose of the Forum is to foster understanding of the activities of various regulators operating in different jurisdictions and industries. The Forum is an acknowledgment of the fact that, in certain circumstances, there are clear benefits to regulators, regulated firms and consumers from an integrated approach to regulation.

- Predictability:

  Predictability is essential for regulated businesses to feel confident that they can plan for the future and that their investments will not be threatened by unexpected changes in the regulatory environment. Moreover predictability is necessary for consistent treatment of entities, over time, and across jurisdictions.

  Key elements for providing predictability in regulation include establishing well defined decision making criteria and providing clear timelines for the review of standards and regulations. The Commission believes that the publication of the *Draft Regulatory Principles* and the objectives set out in Chapter 6 of the NEC go a long way to achieving this objective.

- Flexibility:

  Key mechanisms for providing flexibility in regulation include being open to alternative regulatory tools, and recognition of local and changing market conditions by the regulated entity and the regulator.

  In setting up the regulatory framework the Commission, and no doubt stakeholders, want a flexible regime that allows the Commission to use a mix of regulatory tools and for the regulatory approach to evolve over time in response to new developments and innovations. This principle may conflict with the need to be predictable in decision making, however it needs to be kept in mind that regulation is an evolving field.

- Effectiveness and efficiency:

  The Commission will need to assess the cost effectiveness of the proposed regulatory regime and alternative regulatory options. Application of this principle will require regulatory judgement, as for example there is a tradeoff between comprehensiveness and the need for timeliness. In exercising this judgement the Commission will consider the costs and benefits of alternative regulatory options.

The Commission intends to use the *Regulatory Principles* as a guide and recognises that tradeoffs may need to be made between providing regulatory certainty and working with the flexibility required to deliver the best regulatory outcomes. In delivering regulatory outcomes the Commission is conscious of its need to strike a balance between the interests of customers and investors, between service standards and price, and between the need to provide incentives for long term efficient investment and the desirability of setting prices which track efficient costs as closely as possible.

Responsibility for taking final decisions on each of these issues rests with the Commission. While the Commission intends to conduct an open consultative process leading up to the review of a revenue cap, its decision-making will be an arms length process. The review outcomes will not be decided by negotiation. Rather, the Commission will seek to make decisions that draw attention to the trade-offs, explain the key judgements that have been made, and the reasons for those judgements.

1.4 Appeals process

The NEC does not provide for any specific right of appeal by participants against the merits of a Commission regulatory decision. However, Commission decisions are subject to judicial review under the *Administrative Decisions (Judicial Review) Act 1977* (Cth) (ADJR). This

review does not go to the question of the merits of the decision but rather the process by which the decision was made.

Furthermore a person may apply under s. 163A of the TPA to the Federal Court for a declaration in relation to the validity of any act or thing done, proposed to be done or purporting to have been done under the TPA.

1.5 Consultation prior to finalising the Regulatory Principles

One of the Commission's objectives in publishing the *Draft Regulatory Principles* is to provide an opportunity for customers, TNSPs and other stakeholders to participate in the development of the regulatory framework. For this reason the Commission issued the *Regulation of Transmission Revenues Issues Paper* in May 1998, and at that time called for submissions from interested parties. Thirty written submissions (Annex 1.1) were received in response to the *Issues Paper*. These submissions have been placed on a public register relating to the matter.

The *Draft Regulatory Principles* sets out the Commission's current position on key issues and describes the processes by which the Commission will undertake its regulatory task. Interested parties are invited to respond to this *Draft Regulatory Principles* before Friday 30 July 1999. Submissions may be sent to:

Senior Assistant Commissioner
Electricity Group
Australian Competition and Consumer Commission
PO Box 1199
Dickson ACT 2602

Phone: (02) 6243 1249 Fax: (02) 6243 1260

Each submission should clearly indicate a contact person and contact details. If the submission is more than five pages, please include an Executive Summary highlighting the issues being commented upon in the submission.

The Commission requests that five hard copies of each submission be provided, and that the submission also be supplied in electronic format compatible with Microsoft Word 97 for Windows. Submissions can be emailed to the following address:

electricity.group@accc.gov.au

The Commission will treat all submissions as public unless otherwise indicated.

How to obtain copies of submissions

Copies of all submissions will be placed upon the Commission's public register relating to this matter, and this register can be perused at the Commission's Canberra office.

A list of interested parties who have made submissions will be placed on the Commission's website (under electricity). The Commission's website address is:

http://www.accc.gov.au

Consultations

The Commission will hold three public information sessions presenting key aspects of the regulatory framework. The public information sessions will be held as follows:

Brisbane: Tuesday 15 June 1999

Melbourne: Wednesday 16 June 1999

Sydney: Thursday 17 June 1999

The Melbourne information session will also provide a video link to Adelaide.

Details regarding the times and venues can be obtained from Ms. Maxine Helmling. Interested parties must register to attend an information session by contacting Ms. Helmling on (02) 6243 1246, before Thursday 10 June 1999.

The Commission may also hold a public forum to discuss its position as described in the *Draft Regulatory Principles*. If required, details of the public forum will be placed on the Commission's website.

The Commission will consider the issues raised at the public information sessions, the public forum and in any submissions received and publish its final *Regulatory Principles* later in the year.

1.6 Statement of Regulatory Principles

Proposed Statement – S1.1

The Commission will adopt the following principles of best practice regulation:

- Communication and consultation
- Predictability
- Flexibility
- Effectiveness and efficiency

The Commission notes that these principles may at times conflict and recognises that they do not provide a quantitative yardstick against which to measure performance.

Proposed Statement – S1.2

The *Regulatory Principles* are not legally binding. Despite this the Commission will endeavour to conform to the intentions stated therein.

Proposed Statement – S1.3

When reviewing and updating its regulatory framework, the Commission will implement a process similar to that set out in Chapter 2 of the *Draft Regulatory Principles*.

Annex 1.1

List of submissions received by the Commission

ACTEW Corporation Ltd, 26 June 1998

Australian Cogeneration Association, 9 September 1998

Basslink Development Board, 31 July 1998

BHP Power Pty Ltd, 3 August 1998

Business Council of Australia, 26 August 1998

CitiPower Pty, 28 October 1998; 24 December 1998

Department of Primary Industries and Energy, 25 June 1998

Department of Treasury and Finance (Victoria), Energy Projects Division, 5 August 1998

Energex, 7 August 1998

EnergyAustralia, 31 July 1998; 11 January 1999

Energy Users Group, 1 December 1998

Ergon Energy, 29 June 1998

GPU PowerNet Pty Ltd, 11 August 1998

La Trobe Shire, 11 August 1998

Monash University, Department of Electrical and Computer Systems Engineering, 27 July 1998

National Electricity Market Management Company Limited, 31 July 1998

National Generators Council, 25 June 1998

NSW Treasury, NSW Electricity Reform Taskforce, 3 September 1998

Powerlink Queensland, 30 July 1998

Siemens Ltd, 27 July 1998

Sinclair Knight Merz, 26 June 1998

South Australian Department of Treasury and Finance, 30 July 1998

Transend Networks Pty Ltd, 3 August 1998

TransGrid, 6 August 1998

United Energy, 6 August 1998

Victorian Power Exchange, 12 August 1998

Warburg Dillon Read Australia Ltd, 31 July 1998

Western Power Corporation, 3 August 1998

2. The decision making process

2.1 Introduction

The Commission will use a transparent and open process in the determination of revenue caps for TNSPs similar to that in the National Gas Access Code and TPA authorisation procedures.

The regulatory process proposed by the Commission conforms to the requirements of the NEC and is designed to foster the principles of best regulatory practice.

Clause 6.2.2(i)-(k) of the NEC requires the Commission to achieve:

- regulatory accountability through transparency and public disclosure of regulatory processes and the basis of regulatory decisions;
- reasonable certainty and consistency over time, while maintaining flexibility; and
- well defined regulatory discretion which balances the interests of the transmission network owners and/or transmission network service providers, transmission network users and the public interest as required of the Commission under the provisions of Part IIIA of the TPA.

The Commission is also conscious of the need to maintain the principles of best regulatory practice in terms of communication by offering interested parties an opportunity to comment on both the applicant's proposal and the Commission's decisions.

2.2 Commission considerations

Many of the submissions the Commission received in response to the *Regulation of Transmission Revenues Issues Paper* stated that the Commission should adopt one or more of the principles of best practice regulation, such as accountability, transparency and consistency in the decision making process.[13] This chapter fulfils the call for best practice and the requirements of clause 6.2.4(b) of the NEC (which requires the Commission to provide a description of the process and timetable for resetting the revenue cap of regulated TNSPs).

The Commission has been careful to ensure that it will be provided with sufficient information prior to the commencement of a regulatory review. It also seeks to ensure that all affected parties have adequate notice to prepare for, participate in and respond to the issues raised in connection with a regulatory review. The timing will permit a full airing of concerns and an assessment of those concerns by the Commission prior to the commencement of a regulatory period to which a new revenue cap is to apply.

The issue of transparency in decision making is particularly important to the Commission. While the Commission is required to respect truly confidential information, any restriction on the dissemination of information in an application may interfere with the ability of the Commission to be able to base its judgement on the informed opinion of experts in the

[13] For example, GPU PowerNet submission 11 August 1998; EnergyAustralia submission 31 July 1998; CitiPower submission 28 October 1998; Transend submission 3 August 1998; TransGrid submission 6 August 1998.

industry, and the views of other industry participants. Thus, the Commission will carefully examine any request for confidentiality and attempt to limit the portions of an application that must be considered confidential. The Commission will place all information and submissions on a public register except confidential information. This issue is further discussed in Chapter 10.

2.3 Statement of Regulatory Principles

The procedures to be adopted by the Commission for the establishment of the revenue constraints imposed on a TNSP comprises a number of stages. These are summarised in Figure 2.1.

The Commission will endeavour to make a *Final Decision* on a revenue cap within six months of an acceptable application being approved and lodged.

Proposed Statement – S2.1

The application

The TNSP must submit an application to the Commission at least eight months prior to the expiry of the current regulatory period.

The application must comply with the information requirements set out in Chapter 10. That is, it must be accompanied with sufficient information to support the maximum allowed revenue (MAR) which is to apply over the forthcoming regulatory period. The information provided to the regulator must also include copies of any computer models embodying the relevant calculations.

The Commission will take up to 15 working days to review the application to ensure that it complies with the information requirements set out in Chapter 10. If it is not satisfied the Commission will provide written notice to the TNSP that the application is unsatisfactory and has not been accepted as an application. The TNSP must resubmit the application addressing the issues outlined in the notice.

Once satisfied that the application has sufficient information to proceed, the Commission will publish a notice in a national daily newspaper which:

- describes the TNSP to which the application applies;
- states how copies of the non-confidential parts of the application may be obtained; and
- requests submissions by a date specified in the notice.

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

The Commission will call for submissions to be submitted within a reasonable period of time, usually within four weeks from the publication of the notice.

Absent any claim of confidentiality, all submissions and relevant documents will be placed on a public register.

Proposed Statement – S2.2

Assessment of the application by the Commission and Draft Decision

The Commission will assess the application against the objectives set out in clause 6.2.2 of the NEC and the principles of best practice regulation: communication and consultation, predictability, while noting the need to maintain flexibility**.**

As a procedural matter and as required by clause 6.2.6 of the NEC, the Commission will publish full and reasonable details of the basis and rationale for the decision, including but not limited to:

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

The assessment will also consider whether the application meets all information requirements as set out in Chapter 10, and if appropriate provide interested parties with the opportunity to comment upon information adequacy.

The methodology and underlying framework for the Commission's assessment is outlined in the following chapters of the *Draft Regulatory Principles*.

Proposed Statement – S2.3

Pre-decision conference

Any interested party who wishes to comment on the Commission's *Draft Decision* may request a pre-decision conference within two weeks of the release of the *Draft Decision*. A pre-decision conference, if requested, will be held within one month of the request date.

Interested parties may make submissions following the release of the *Draft Decision* and the pre-decision conference. Submissions must be provided within four weeks of the release of the *Draft Decision* or if a pre-decision conference is held, two weeks after the conference.

Proposed Statement – S2.4

Final Decision

The Commission will reconsider the application – taking into account the additional information presented at the pre-decision conference and any submissions made following the release of the *Draft Decision* and publish a *Final Decision* on the application.

The *Final Decision* will also satisfy the procedural matters set out in Porposed Statement S2.2 above.

Proposed Statement – S2.5

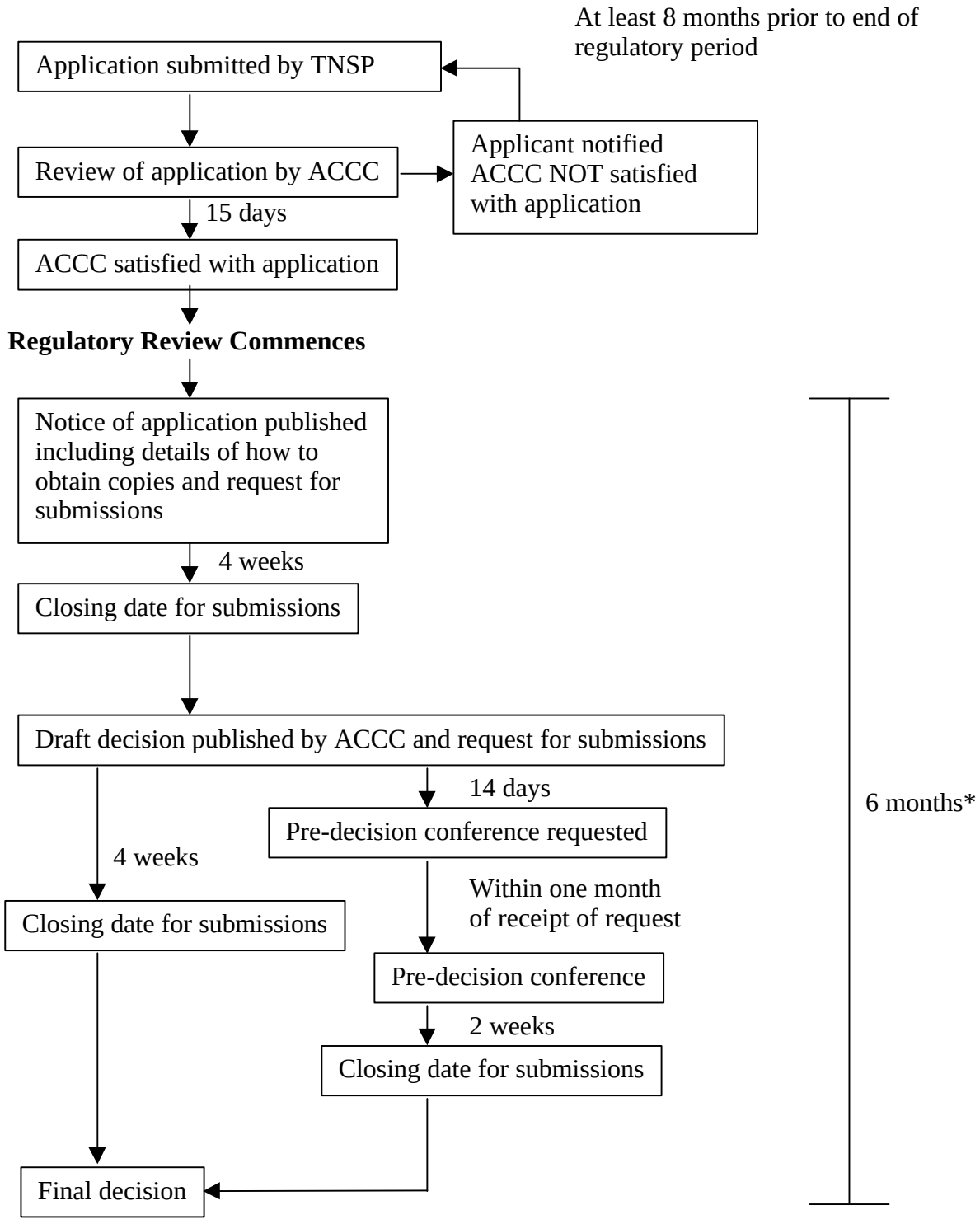
Period of assessment

The Commission will take up to six months after an application has been accepted to issue a *Final Decision*.

The Commission, by notification, may increase this period by up to two months on one or more occasions.

The TNSP may also seek an extension of the time period for review once an application has been lodged for periods of up to two months on one or more occasions, provided it has sought the Commission's agreement. The TNSP in conjunction with the Commission will give notice of the decision to increase the period.

Figure 2.1: ACCC Regulatory Review Procedure



* unless extended by ACCC or applicant

3. A regulatory compact for electricity transmission regulation

3.1 Introduction

In composing the *Draft Regulatory Principles* the Commission must determine a framework/structure which it will use to set transmission revenues. This chapter sets out a conceptual overview of the regulatory framework that the Commission proposes to adopt, while leaving the details of the implementation of this framework to the proceeding four chapters.

The key elements of the Commission's framework are:

- a revenue cap based on forecasts of the cost of service;
- CPI-X adjustment of the revenue cap and inflation adjustment of the regulatory asset base on an annual basis. This feature is designed to minimise any inflation risk to the business;
- the return on assets determined on a post-tax nominal basis with estimated tax relevant to the regulatory period treated explicitly as a component of the cost of service;
- flexibility in the arrangements to allow for periodic revaluation of assets; and
- an approach to depreciation (return of capital) which equates in a meaningful way to economic depreciation.

The primary advantages of this framework are that:

- it incorporates the best features of the real and the nominal approaches i.e. the minimisation of inflation risk of a real framework with the direct application of nominal rate of return benchmarks;
- the nominal post-tax framework eliminates the need to consider the conversion problem (i.e. from a nominal post-tax rate of return to a real pre-tax rate of return);
- it provides for a rate of return, post-tax nominal, that is more familiar to financial markets, and is therefore comparable with other everyday financial benchmarks;
- long term revenue smoothing via a competition driven approach to depreciation which minimises inter-temporal price distortions (inter-generational price shocks);
- at the same time the competitive approach to depreciation minimises potential geographical price anomalies linked to the different vintages of assets serving neighbouring systems;
- it visibly satisfies the consistency requirements of any framework that there must be no double counting of depreciation – under a nominal approach this means that the accumulated depreciation will never exceed the cost of the assets; and
- it provides incentives for the TNSP to achieve efficiencies.

3.2 Constraints on the regulatory framework

In developing a framework for transmission revenue regulation the Commission faces a number of constraints. These are:

- an awareness of the deficiencies of existing regimes;

- constraints imposed by the NEC; and in particular
- the need to formulate an internally consistent framework in a cost of service/building block approach.

Each of these constraints is discussed below.

Identification of the deficiencies of existing approaches

In setting up a framework for transmission revenue regulation the Commission has been acutely conscious of the deficiencies of existing regimes. In particular, in its Final Decision on the Victorian Gas Access Arrangements (Appendix E) the Commission made a commitment to address the issues of concern raised in the context of that decision.[14] The Commission has therefore used the *Draft Regulatory Principles* as an opportunity to propose a regulatory framework which, while building on the experience of existing regimes, avoids some of the major regulatory problems associated with those regimes.

To aid the discussion the Commission has produced a supplementary document that includes a technical working paper that explores the deficiencies of existing regimes, and the foundations of the Commission's regulatory framework. The supplementary document also includes a consultancy report by NERA that reviews overseas experience relating to the cost of capital and the treatment of taxation.[15]

Limitations imposed by the NEC

The Commission has been conscious of the objectives of the NEC and competition reforms. The NEC imposes upon the Commission a number of constraints and directions. Significant among these is the fact that the NEC states that the Commission *must* have regard to the COAG agreement that deprival value is the preferred asset valuation methodology. This in turn has implications for the approach used to derive the rate of return and how depreciation should be handled.

Another key requirement of the NEC is that the framework should incorporate an incentive mechanism for the efficient provision of services based on CPI-X adjustment of the revenue cap. A CPI-X adjustment mechanism has two purposes, first and foremost it is designed to remove inflation risk from the business irrespective of whether the rate of return is expressed in real or nominal terms. The second feature is that an incentive based regime based on a revenue cap has the potential to stimulate economic efficiencies that will advantage both TNSPs and users.

The NEC also explicitly requires the Commission to consider revenue caps (clause 6.2.3(b)) as distinct from price caps. Revenue caps can be defined as a class of regulatory device that caps revenue rather than prices. It can be shown that revenue caps do not have the same properties as price caps.[16] Given that the NEC goes into some detail as to how costs should be allocated and how prices are to be determined from the revenue cap (Part C, Chapter 6 of

---

[14] ACCC, 1998, *Final Decision, Victorian Gas Access Arrangements*, October. Copies of this report are available from the Commission's website: http://www.accc.gov.au (under gas).

[15] Copies of the supplementary working papers can be found on the Commission's website: http://www.accc.gov.au (under electricity). Alternatively, copies are available from the Commission upon request.

[16] Crew, M.A. and Kliendorfer, P.R. 1996, Price caps and revenue caps; Incentive and disincentives for efficiency, in *Pricing and Regulatory Innovations Under Increasing Competition,* edited by Crew, M.A.

the NEC), it would appear that the intention is to maintain a one to one link between prices and the revenue cap so that the arrangement will work in the manner of a price cap.

Notwithstanding the regulatory requirement to develop a revenue cap as opposed to price caps, there is an issue of maintaining consistency between the prices developed from the revenue cap and the actual compliance with the revenue cap over time. This issue is not considered as part of the *Regulatory Principles* given that the matter should not be addressed independently of the NECA Pricing Review. However, for the purpose of noting the significance of the issue and the nature of related concerns, Box 3.1 discusses the concerns and avenues for addressing them in the context of revenue cap principles.

Box 3.1: Price determination and revenue cap compliance

The derivation of prices from the revenue cap requires forecasts of demand for each specified service to ensure consistency between proposed pricing and the revenue cap. This immediately raises the issue of the accuracy of the demand forecasts and the potential for actual revenues to fall short or significantly exceed the imposed revenue cap.

Chapter 6, Part C of the NEC details how the aggregate annual revenue requirement is allocated across assets and subsequently assigned to specific services. The prices are subsequently determined so that the assumed demand levels do not exceed the revenue cap assigned to each type of service. To illustrate the issues of concern, consider that service j which is assigned maximum allowed revenue MAR_{jt} and the price has the simple structure linked to each unit of demand. If the expected demand for the service in period t is Y_{jt} then the price for the service is

$$P_{jt} = MAR_{jt} \ / \ Y_{jt} \qquad \text{(Eqn 3.1)}$$

And expected revenues ($P_{jt} \, . \, Y_{jt} = MAR_{jt}$) will satisfy the revenue cap.

However, if demand proves to be greater than expected then the revenue cap will be exceeded. Although, such an outcome may be totally unintended it will represent a violation of the regulatory framework. If it was known that costs actually increased linearly with the supply of services and the cost of service calculations were carried out on the basis of the same demand forecasts, it could be argued that the principle of the regulatory framework had been complied with, since a costs of service based on actual demand would have yielded a 'dynamic' revenue cap consistent with the outcome. However, in electricity transmission, costs exhibit significant economies of scale and overall cost of service is insensitive to actual demand which eventuates in any year, and it will be rare that the 'dynamic' revenue cap will be matched by revenues. If over and under recovery of revenues could be expected to even out over the course of the regulatory period that would be considered satisfactory. However, this cannot be assured.

To the extent that demand is significantly less than forecast, the commercial returns to the business will be compromised in a way which was not intended by the regulatory framework. To minimise this risk, the TNSP has an incentive to base its prices on deliberately low demand forecasts so that, on average, the revenue cap will be exceeded. Such a perverse incentive is considered an undesirable feature of a regulatory framework and should be avoided. Heavy handed sanctions available to the regulator to ensure full compliance with the cap ex post, are also considered unsatisfactory. Rather, the Commission favours an adjustment mechanism to ensure compliance with the revenue cap on average over the longer term, in a way which removes both the need for regulatory intervention and the incentive for the service provider to deliberately distort its demand forecasts used to calculate prices.

Such measures have already featured as part of the regulatory framework set up and applied to GPU PowerNet in Victoria. In that case any under or over-recovery is passed forward in the common service costs to be recouped from distributors in the following year. One approach for doing this is by the development of correction factor (K). The K factor for the year t could be defined as

$$K_t = (Y_{t-1}/MAR_{t-1}) \text{ where } Y_{t-1} \text{ is the actual revenue in year t-1.}$$

The 'K' factor allows an averaging out of the maximum revenue over the period between revenue caps reviews.

The K factor is then used to adjust the revenue cap or, equivalently, price in the subsequent period. That is, the price formula Eqn 3.1 above is modified to become

$$P_{jt} = MAR_{jt} \ / \ (K_t \ . \ Y_{jt}) \qquad \text{(Eqn 3.2)}$$

So over-recovery in year t-1 will lead to a relative reduction in prices in period t. In this example the K factor has been calculated for a specific service. However, it could be equally well developed for revenues in aggregate, reflecting the net impact of over and under recoveries over all regulated services. The aggregate approach will normally require less drastic adjustments to individual prices, and to that extent is a preferred option.

Under existing regulations TransGrid cannot recoup its under-recovered revenue in any year while distributors in NSW can do so. TransGrid prefers the introduction of a 'K' factor 'as an annual adjustment to prices ... to achieve the permitted revenue'.[17] The fact that revenue caps applied to GPU PowerNet in Victoria, to Telstra, AGL gas companies and privatised airports all have adjustment factors which provides ample precedent for the approach.

There is some concern that the 'K' factor will limit the incentive for productivity improvement by taking away the gain linked with higher utilisation of the network. However, this is not so much a problem with the 'K' factor, but is linked more to the inherent properties of a revenue cap. Consequently, TransGrid favours the introduction of a price cap in preference to the revenue cap.[18] However, the NEC is explicit in its preference for a revenue cap and the Commission has accepted this as a starting point.

NECA is currently reviewing the pricing requirements applying to transmission networks and their associated connection assets. The final arrangements proposed by NECA will commence in participating jurisdictions when the Commission commences regulation of

---

[17] TransGrid, submission to IPART, September 1995, p. 38.
[18] TransGrid, submission to Commission, 6 August 1998, p. 43.

transmission networks. Therefore, to obtain a complete picture of transmission regulation the Commission's *Regulatory Principles* must be considered in conjunction with the conclusions of the NECA pricing review.

Need to develop an internally consistent framework

The preferred framework utilises the building block approach, which aggregates identifiable costs associated with the provision of services to derive transmission revenues.[19] Such costs cover not only administration, operations and maintenance expenditure but also include the required commercial return on assets employed (return on capital) and the depreciation of those assets (return of capital). While the assessment of administrative, operations and maintenance expenditures is fairly straight forward, the other elements are not. A major reason for this is that the remaining elements are not independent of one another. With this in mind the Commission has paid considerable attention to ensuring that the methodology adopted takes full account of the mutual interdependence of these elements of the cost of service.

While a number of integrated, internally consistent approaches are available; each implies a specific and different time path for tariffs/revenues. Therefore one of the principal decision criteria in the choice of a regulatory framework has been the desire to achieve an efficient time profile of tariffs/revenues.

Determining the elements of the building block raises the issue of balancing the need to provide each TNSP with a fair and reasonable return while at the same time promoting economic efficiency and an objective, transparent regulatory process.

Each of the elements of the building block and the issues that the Commission considers need to be addressed are discussed in the sections below.

3.3 The rate of return

The building block approach combines a rate of return with a regulatory asset value. Given the capital intensive nature of electricity transmission businesses, the return on capital component of the regulated revenue could account for 80 per cent or more of annual aggregate revenue. Therefore relatively small changes to the rate of return can have a significant impact on the total revenue requirement and ultimately end user prices.

It is important that the rate of return be set at a level which reflects a commercial return for the regulated TNSP. Setting a rate of return below the cost of funds in the market could make continued investment in developing the network difficult or unattractive for the owner. This would create pressure for the regulated business to reduce maintenance and capital expenditure below optimum levels and undermine the quality of service. Conversely if the rate of return were set at too high a level by the regulator, the regulated businesses would

---

[19] The building block approach calculates the MAR as the sum of the return on capital, the return of capital and operating and maintenance expenditure, that is:

MAR = return on capital + return of capital + O&M

MAR = (WACC * WDV) + D + O&M

where
- WACC = weighted average cost of capital;
- WDV = written down (depreciated) value of the asset base;
- D = depreciation allowance; and
- O&M = operating and maintenance expenditure (including administrative costs).

earn a return in excess of their cost of capital. This would distort price signals to consumers and investors, resulting in a mis-allocation of resources and sub-optimal economic outcomes.

The basis for determining what the rate of return will preferably be is through the application of the well-known and well-accepted capital asset pricing model (CAPM).[20] This model uses stock market data to suggest what commercial rate of return is appropriate for the investments made by the TNSP given the business risks involved (that take account of the regulatory framework). The model expresses the rate of return as the prospective **post-tax nominal return on equity** but is readily adjusted to allow for debt to derive the corresponding post-tax return on assets otherwise known as the **weighted average cost of capital** (WACC), post-tax nominal.

Within the CPI-X framework, to drive the component of costs corresponding to the return on capital, there is a choice between whether the rate of return concept used should be expressed in post-tax terms (as is CAPM) or converted to a pre-tax form. There is also a choice between:

- a nominal rate of return (henceforth CPI-X/nominal); or
- a real rate of return (henceforth CPI-X/real).[21]

3.3.1 A post-tax or a pre-tax rate of return

Under the pre-tax approach, the calculated return on assets includes an amount to cover tax liabilities of the business while under the post-tax approach the amount corresponding to tax liabilities must be added as a separate item within the cost of service calculation. The use of a pre-tax rate of return is frequently advocated on the grounds that it avoids the need to explicitly add into the 'cost of service' calculation an amount to compensate for tax obligations of the TNSP. Such arguments are misguided in that the tax calculation still needs to be carried out in order to convert from the post-tax rate of return indicated by CAPM benchmarks to the corresponding pre-tax real rate required for the regulatory framework. Therefore, both approaches require tax liabilities to be properly assessed and, on this basis, there is little to choose between a post-tax and a pre-tax formulation of WACC.

Since both approaches require tax liabilities to be properly assessed the issue is not so much whether to use a post-tax or a pre-tax approach but how best to estimate the effective tax rate.

The first question is whether tax liabilities should be based on actual tax payments, or estimated tax liabilities based on assumptions (such as that for gearing) consistent with the regulatory accounts. The latter is the more generally accepted approach since such calculations are independent of the financial character of the owner, its non-regulated operations and is not subject to manipulation (e.g. tax liabilities are easily transferred within a larger corporate entity by the restructuring of debt).

The key question then becomes whether tax liabilities should be assessed on a year by year basis, or estimated on the basis of an average effective tax liability over the lifetime of the

---

[20] It is to be noted that regulators have applied other models and the Commission will continue to monitor alternative approaches that could be used to supplement the CAPM in determining an appropriate rate of return.

[21] Pre-fixing by CPI-X is to emphasise that whether a real approach or a nominal approach is chosen, inflation risk is mitigated. This is to be distinguished from 'nominal' and 'real' approaches where no compensation is provided from inflation risk.

assets. However, there are a number of obvious and significant problems associated with the use of a WACC based on a long-term assessment of tax, they include:

- The difficulty in calculating a long term effective tax rate. The tax system is not static. Errors of judgement in estimating the long term effective tax rate can lead to over or under compensation in the rate of return and create the perceptions of risk. Moreover, as the tax system changes, compensating adjustments would need to be made to the estimated long term effective tax rate to reflect changes in the tax system.
- The outcome of the CAPM model is a post-tax nominal WACC. To translate this number to a pre-tax real number a conversion has to be instituted. However, the conversion formula is complex, as no analytical formula exists to cover all TNSPs. This feature means that conversion is not conducive to a transparent regulatory framework; and
- Tax concessions associated with the debt shield and accelerated depreciation have the effect of deferring tax liabilities. This means that the effective tax rate paid by a business changes over time and a stylised representation of the time profile of the effective tax rate paid by a regulated business is provided by the S-bend. That is, the business pays an effective tax rate of zero in the initial years, with the effective tax rate rising above the statutory rate in later years. The S-bend problem implies a number of serious regulatory problems:
  - A newly privatised regulated business will receive a cash advance before its actual tax liabilities eventuate in the initial years because it is paying very little tax. While the business is over-rewarded in the early years it will be under-rewarded later on. Basically the deferral of tax liabilities means that the regulated entity is not receiving the rate of return set by the regulator.
  - The above mentioned problem may lead to gold plating in early years and under investment in later years. This may create an enforcement of the regulatory compact issue in later years.

  It is to be appreciated that these problems gain added complexity in a CPI-X/real framework, and stem from:

  - a fundamental tension between regulation on the basis of CPI linked real revenues and a taxation system which operates in nominal terms; and
  - differences in timing between the depreciation allowed for taxation and that allowed for regulatory purposes.

  Thus in a CPI-X/real framework conversion must account for the interaction between inflation, the effective tax rate and the net impact of taxation deferrals on the post-tax return on equity.

  The controversy over conversion from a nominal to a real WACC is an issue that is not unique to regulation in Australia. In fact these complexities are manifest in overseas regulatory regimes. In the UK, various conversion formulae have been proposed but none of these, due to the impact of taxation liabilities, has been comprehensive enough to fully capture all of the interactions of the key variables. Overseas regulatory regimes using a real approach have therefore made compromises regarding the complexity of the formula and its degree of accuracy.

These tax driven complexities may be avoided in a regulatory regime which is based on a post-tax return. A post-tax approach, where taxes are estimated period by period, eliminates

the need to consider conversion from a post-tax to a pre-tax rate of return. This is because taxes are passed through in the cash flows.

In the US there is a wealth of literature on the issue of the treatment of tax. In the US, where the regulatory system is in a nominal framework (i.e. a nominal rate of return applied to a historic cost asset base) one of two approaches is used to overcome the S-bend problem - normalisation or pass through. It is felt by most commentators that the treatment of tax is no longer a controversial issue in the US. Moreover, in the UK Ofwat, Oftel and Orr use a post-tax approach, while Offer has indicated a preference for the post-tax approach.[22]

In considering the Victorian Gas Access Arrangements the Commission consulted with experts in the field, including Professors Bob Officer and Kevin Davis and Dr Neville Hathaway. The unanimous view of these experts was that a post-tax approach should be adopted, and that the more effective way to address the treatment of tax and conversion was to adopt a relatively simple WACC formulation and deal with tax and imputation credits items in the cash flows. Based on this advice, this is the approach that the Commission has chosen.

Summary

The Commission has determined that the short term-post-tax approach makes more direct and transparent use of basic input assumptions and requires only short-term (5-year) considerations of tax and financial forecasts. There are some slight inconveniences of using a framework which seeks to explicitly capture commercially significant aspects of the financial and taxation system, such as the uneven pattern of tax liabilities over time and its impact on revenue/tariff profiles. However, these are readily accommodated in an easily understood fashion as an integral part of the cash-flow analysis used to assess other cost-of-service components.

3.3.2 A nominal or a real rate of return

Once a post-tax rate of return approach is accepted (applying CPI-X adjustments to revenues and inflation adjustments over time to the regulatory asset base to maintain its real value), either a real or nominal rate of return framework can be applied. It can be shown simply, and it is intuitively evident, that a real and a nominal framework are equivalent. This is because the steps in the calculation of the revenue cap are essentially the same.

Accepting that CPI-X/nominal and CPI-X/real are equivalent, the Commission proposes the use of a nominal framework because of a number of significant advantages associated with its adoption. These include:

- the fact that a nominal WACC is directly comparable with other financial benchmarks particularly the nominal rate of return on other investments. Financial markets are also familiar with such benchmarks as:
  - financial markets typically express earnings and rates of return in nominal (post-tax) terms. Using a nominal post-tax rate of return therefore eliminates confusion over the meaning of what rate of return the Commission has provided because interested

[22] Details of these approaches can be found in Supplementary Papers, Paper B.

parties may not understand the economic relationship between real/nominal, pre/post-tax benchmarks.[23]

  - given that financial market commentators appreciate current post-tax nominal benchmarks, the Commission believes that it should adopt an approach that is consistent with such benchmarks and market understanding.

- depreciation in a nominal framework is transparent and there is no confusion regarding the extent of recovery. In a nominal framework accumulated depreciation allowances equate to the change in the RAB valuation over time. This is not the case for a real framework, where depreciation allowances include adjustments for inflation so that in numerical terms accumulated depreciation may substantially exceed the actual cost of the asset. This creates difficulties in explaining to non economists and users that revenues are not recovering well in excess of the original infrastructure costs.

The Commission notes that economists tend to express a preference for a real framework. Part of this preference arises from a desire to compare decisions over time. However, given the equivalence of the models transformations to real numbers are readily made and time series values can be constructed. The Commission will use its judgement in reporting real and nominal figures.

Summary

The Commission is of the view that there are advantages in favour of the nominal post-tax approach associated with producing a regulatory decision consistent with financial market benchmarks. However, for consistency purposes the real post-tax rate of return will also be published.

3.4 The regulatory asset base

The initial regulatory asset value

One of the most contentious topics is the valuation assigned to existing infrastructure assets that are being introduced to the regulatory framework for the first time. There is no clear economic answer and questions of equity connected with the past pricing of services to users can also be important considerations. Such issues were thoroughly discussed in connection with the Victorian Gas Access Arrangements Decision. Except for asset values set for the first regulatory review, the NEC provides that existing and new assets can be revalued, on a basis determined by the Commission. However, the Commission does not have unlimited discretion in choosing an asset valuation methodology.

The NEC states that the Commission must have regard to the COAG agreement that deprival value is the preferred approach to valuing network assets. However, given the circularity that would be associated with any deprival value assessment one approach would be to interpret the methodology as a optimised replacement cost (ORC) valuation. An economic interpretation of ORC would mean that it sets the cap on the valuation of the RAB (regulatory asset base). The ORC valuation would have to be adjusted to take account of depreciation (D), resulting in a DORC valuation.

[23] It is pertinent to note that the application made by the Victorian Energy Projects Division in relation to the Victorian Gas Access Arrangements requested a real pre tax WACC. When the Draft Decision was released the Commission became aware that its decision was not readily understood by all interested parties.

The Commission understands that the application of ORC does require judgement. Therefore, when the RAB is revalued by the Commission it must be done according to DORC guidelines which will be developed and published by the Commission.

Redundancy of assets

Assets may from time to time become redundant or partially redundant and there is an issue as to what action needs to be taken in terms of depreciation and the RAB. These assessments should be made at each regulatory reset even if a full ORC re-valuation is not warranted on such a regular basis. There may however be circumstances, such as where the risk of by-pass is imminent, where ODV is more appropriate. Also, given that the NEC explicitly provides for such circumstances to be taken into account the Commission has explicitly provided for this in its regulatory framework. The Commission proposes that a TNSPs be given the opportunity to identify, at the start of each regulatory review, those assets that are subject to by-pass risk and to nominate a more appropriate asset base valuation.

Thus the Commission's preferred approach is for the TNSP to anticipate potential asset redundancy as it believes that the TNSP is in the best position to identify such redundancy. The Commission will then appropriately provide for the redundancy of the identified assets via depreciation allowances. Provided that the regulatory rate of return is adequate there will be no incentive for deception on the part of the TNSP directed towards achieving a faster return of capital.

Those assets that have been identified by the TNSP will receive accelerated depreciation allowances, and once fully depreciated will be removed from the regulatory asset base.

The opportunity to identify redundant assets will only be provided at the start of each regulatory review period. Should the Commission decide to revalue the transmission system at the end of the regulatory period (the start of the next), efficiency considerations require that any redundant assets be removed from the RAB. This would occur automatically if an ORC valuation were done.[24] However, there is a question as to whether depreciation (or return of capital) should be permitted in association with the reduction in the RAB value. Although the NEC is silent on the matter its endorsement of ODV tends to suggest that there need not be any compensation. This should not be a big issue since full redundancy is likely to be rare. Nevertheless, it is likely to be highlighted as a potential source of regulatory risk by some interested parties. However, such arguments need to recognise that redundancy is a normal business risk which is, at least partially, taken into account within the WACC calculation (via the equity beta benchmark derived from the financial performance of similar firms).

Partial redundancy, although also rare, is more likely and may arise for example from the need to recognise economies of scale. The assessment of economies of scale will require some discretion on the part of the Commission. There may be some justification for extending the discretion to the sharing of the costs of redundancy between users and asset owners in some circumstances. This would include cases not reflective of normal (competitive) business risks, for example where the redundancy is a by-product of regulatory market enhancements designed to generate overall broadly based gains. The compensation

[24] The regulatory accounts provide for a record of redundant assets to be maintained so that in the event they become operational again an assessment can be made as to what return the assets could be assigned reflecting an accumulated return while idle. This treatment parallels that of new assets which may not be included in the RAB in their entirety on completion if the investment is not deemed prudent at the time.

would take the form of some portion of the write-down being treated as depreciation within the regulatory period.

Such compensation would be the exception rather than the rule since compensation diminishes the incentive for efficient investment decisions.

Given the Commission's proposed framework if redundancy actually occurs it probably represents a error of judgement on the part of the TNSP. That is, if redundancy is a result of curtailment of demand (e.g. resource depletion, or market changes) such events are generally known well in advance and can be catered for by assigning an economic life to the assets for depreciation purposes less than the technical life of the assets. In this way when the redundancy occurs the valuation of the affected assets already reflects its diminished utility. Similarly, when there is potential by-pass by a competing service provider or alternative final product supply in end markets, there is usually quite a time lag between initial recognition of the problem and actual occurrence. These time lags provide the opportunity for a faster rate of depreciation in the interim so that the TNSP is able to respond to the by-pass threat with lower prices or has at least achieved a substantial return of investment capital. If the increased depreciation allowances lead to prices greater than the market can accommodate the TNSP may need to accept the diminished returns achieved as a normal business risk.

These issues are further considered below in association with depreciation provisions.

Additions to the asset base

The valuation of new capital expenditure is more straightforward. Normally new capital expenditure will be introduced to the regulatory asset base on the basis of actual costs incurred up to the point at which the assets become operational. There seems little point in introducing infrastructure to the asset base until it becomes operational as there are no customers to support associated revenues and the burden would fall to users who are, at least to that stage, not receiving any of the benefits.

This raises the question of how the TNSP should be compensated for expenditure on partially completed assets. One option is to simply add 'bridging' finance costs to the eventual value of the asset. However, this may not appropriately compensate for the risks involved. Another option is for expenditures already incurred to be rolled forward with an accumulated rate of return equal to that for operational assets to reflect final cost. The accumulated amount would be the amount added to the regulatory asset base when the assets become operational. This is the approach that the Commission has taken for the *Draft Regulatory Principles*.

There is also the question of prudent investment when considering whether the full cost of new investment should be added to the RAB. Clearly if the full amount of the investment is not required and is not prudent, the regulator should not add the full amount to the RAB. The amount to be added will require judgement.

Where additional capability/capacity is included to cater for demand growth some overbuilding may be considered prudent given the quantum nature of expansion and scope for economies of scale in construction. Where there is doubt that overbuilding is prudent, a lesser amount will be added to the RAB corresponding to that proportion identifiable with demand (including a margin sufficient to satisfy normal redundancy requirements). In most cases the bulk of expenditures will be included because economies of scale would mean that a smaller capacity addition to infrastructure would be at a higher unit cost.

To ensure fairness, any portion of capital expenditure not incorporated in the RAB may be rolled forward with the regulatory rate of return in the same way as expenditure on infrastructure under construction. This accumulated amount may be added to the RAB when the assets are deemed by the regulator to be fully utilised. If the assets are never fully utilised, or the accumulated cost exceeds the costs associated with constructing the necessary infrastructure in multiple stages, that would be strong prima facie evidence that the initial expenditure was not prudent. As a consequence the accumulated cost should not be added to the RAB in its entirety at any stage. Such an approach will discourage unnecessary over-investment while still providing adequate incentive for prudent overbuilding.

Depreciation

Depreciation is generally interpreted as the means by which a return of capital is achieved for assets of limited economic life. Depreciation is one of the key components of the building block approach and is a significant determinant of revenues available to the regulated firm. Depreciation and the methodology to account for it can have a pervasive influence on the profile of revenues and tariffs over time.

Over the economic lives of assets, the present values of total revenues to investors will be independent of their depreciation profile, provided that allowable revenues are calculated consistently on the net asset base throughout the period. In theory this implies that the TNSP should be indifferent to the depreciation profile chosen. However, other factors being equal, investors often prefer a more rapid return of capital or higher rates of depreciation due to perceptions of risk. Nevertheless, to the extent that the TNSP regards the regulatory rate of return to be above its perceived cost of capital, the rapid return of capital via an accelerated depreciation profile means that the asset base is written down quickly, decreasing the long term value of the business.

Traditional linear depreciation schedules, whether applied in a nominal or a real framework, do not always provide a particularly suitable revenue profile. The key problem associated with the use of linear depreciation profiles is that there is typically a jump in tariffs/revenues when a major item of capital reaches the end of its useful life and is replaced by another. Some have argued that a real framework (where a non linear deprecation profile is achieved via inflation indexation of a nominal linear depreciation profile) minimises the potential for such shocks. However, it is to be appreciated that the depreciation profile in a real framework represents just as much an ad hoc adjustment as does any accounting provision for depreciation.

The choice of traditional depreciation profiles gives rise to inter-temporal and possible geographic economic distortions that would not be observed in competitive business activities. For example, two otherwise similar TNSPs under the same regulatory framework and using similar equipment may have different prices due purely to the age of the equipment.[25] Such discontinuities create unnecessary economic distortions.

To avoid problems such as these, the Commission has adopted an approach that assigns depreciation in an economically meaningful way. In a competitive environment this would correspond to assets values being depreciated in line with changes in replacement costs or the

[25] For example, the cost of freight services has little to do with the age of the trucks used – indeed the customer would not normally be aware of the age of the truck or its market value when arranging transport of his or her goods. Competition generally forces the charges to a common level so that the service prices or potential revenue associated with a new truck is much the same as for an old truck. Nevertheless, all the truck owners will be aware that they need to cover all their costs including capital costs over its useful life.

costs of alternative (competing) technologies. One of the primary motives for this approach is that in a competitive environment pricing of services is independent of the vintage of the assets which provided those services. Adopting this approach, revenues will assume a time profile which is closely related to the replacement costs of assets or alternative technologies where these exist.

In addition, the approach adds the feature that the RAB is a continuously updated DORC valuation, at least conceptually. The mechanics of the long term revenue levelisation approach are closely related to the mathematics of an annuity or a housing loan.[26] An additional adjustment is made to account for changes in replacement cost (possibly associated with technological change and/or by-pass).[27] This approach to depreciation is termed *competition depreciation* by virtue of the fact that pricing linked to such depreciation mimics important features of competitive behaviour. The calculations may not be as simple as the linear framework but they are readily derived and can be adjusted to accommodate changing expectations regarding technology and potential by-pass. Practical implementation of the approach is considered further in Box 3.2 below.

Box 3.2: Regulatory asset base valuations and depreciation

Depreciation

Assume that the value of the RAB at the start of the regulatory period is A_1 and A_6 is its forecast value at the start of the next regulatory period (5 years later). A_6 is determined by the application of a conceptual DORC valuation taking account of likely changes in replacement costs over the period, making adjustments for identified asset redundancies and the increased age of the asset. The accumulated forecast depreciation over the regulatory period, noting the direct link between the change in value of existing assets and depreciation, is A_1-A_6. Rather than attempt to repeat such an exercise for each year of the regulatory period it is a reasonable to assign the forecast accumulated depreciation for the asset on a pro-rata basis to each year of the regulatory period. Thus depreciation is set at $(A_1-A_6)/5$ each year and the RAB value at the start of year t becomes $A_t = A_1 – (t – 1) . (A_1-A_6)/5$.

Depreciation on forecast capital expenditure is done in exactly the same way. However, depreciation should only be pro-rata'd over the period it was actually in use. For example, if the capital expenditure (inclusive of accumulated rolled in return) during construction was \$15m and the forecast DORC at the end of the regulatory period is \$10m after operating for 2.5 years, the \$5m should be allocated to the years of operation on a pro rata basis. That is \$1m in year 3, and \$2m in years 4 and 5.

Inflation error adjustment

The adjustment of the RAB at the end of the period to take account of inflation forecast errors can also be simplified. The adjusted RAB for the start of the next regulatory period becomes

$$A_6' = A_6 \times AI5/I5$$

where I5 is an index of the forecast increase in the CPI over the regulatory period, and AI5 an index of the observed increase in the CPI over the same period.

[26] In this context a particular version of DORC is considered where the depreciation is non-linear but based on annuitising the revenue stream linked to the asset. The formula is identical to that for principal repayments associated with a housing loan where the revenues correspond to the instalments on the loan, and depreciation the principal reductions.

Actual DORC valuation

A DORC valuation may be performed as part of the regulatory review. If this were used as the basis for A_1 rather than the value based on depreciation of previous asset values there may be a windfall capital gain or loss involved. This is not intended, rather the preferred approach is to use the DORC valuation as the basis for reassessing A_6 in the above analysis. In this way, the RAB experiences a smooth transition to its assessed long term path with changes in value reflected appropriately in depreciation allowances. Where the depreciation allowances involved create price shocks which are considered inappropriate, the regulator may use its discretion to allow transition over a number of regulatory periods. In some cases the allowance for depreciation may be negative reflecting an augmentation of asset value.

With the application of a competitive approach to depreciation it is also relatively straight forward to accommodate actual DORC re-assessments that may be periodically performed. When this occurs the RAB is not simply reset as this may involve a price shock and a windfall gain or loss to the TNSP. Instead there would be a gradual transition to what is perceived to be the more appropriate RAB time path. The time for transition would be sufficient to avoid major price shocks associated with the changed level of depreciation required as a result of transition.[28]

It may be suggested that the competition depreciation approach resolves an unimportant issue because most service providers have a portfolio of assets of different ages/vintages and replacement schedules. This is true, but only if there are compensating errors which make the issue less obvious. There are cases where price shocks associated with changes in the depreciation profile are important and have to be dealt with. These cases include single purpose assets and the range of businesses currently being privatised, which will be treated for regulatory purposes as new operations. Of more immediacy the Commission is aware that Tasmania, NSW and Queensland are currently going though very substantial augmentations of their transmission networks, where price shock concerns may be become major issues.

Perhaps more importantly, the approach is critical to industries where technological change may be much greater but with considerable uncertainty on timing of its introduction (for example telecommunications). The robustness of the competition depreciation approach to regulatory depreciation over a range of industries and its capacity to incorporate aspects of competition which can occur even within a natural monopoly industry provide additional arguments for its adoption within the *Draft Regulatory Principles*.

---

[27] Such modifications are similar to those involved in a low start loan where instalments increase over time in line with incomes.

[28] This is to avoid double counting or under provision for depreciation.

3.5 Benefit sharing

The Commission's approach merely provides a means of assessing what revenues will be required to sustain a commercially viable operation on the basis of forecast costs. These 'target' revenues will then form the basis for a revenue cap linked to CPI-X. To the extent that the TNSP is then able to provide services at a lower cost, its rate of return is not limited within the regulatory period. This is the main incentive mechanism for efficiency gains. Moreover, the CPI component of the CPI-X regime protects the TNSP from any inflation risk – this risk being borne by users.

At the next regulatory reset, cost reductions will lead to a reassessment of future forecast costs and the appropriate revenue cap set by the Commission. At this stage users may begin to share in the benefits of efficiency gains. However, the extent such gains should be shared between the users and the TNSP is a matter of regulatory judgement. The regulators decision on the timing and extent of benefit sharing in turn influences the TNSPs incentive to pursue efficiencies.

At this stage the Commission has chosen a glide path approach to specific components of the building blocks, where the glide path applies only over the subsequent regulatory period. The Commission is of the view that this approach achieves what it considers to be a reasonable balance between the incentives for efficiency gains and the transfer of those gains to the benefit of end markets.

3.6 Transitional issues

If infrastructure assets already subject to a regulatory framework are introduced to a different regulatory framework, transitional difficulties are expected to arise and need to be catered for in a way which preserves the underlying principles associated with each framework. The Commission's framework is no different in this regard and a number of transitional problems have already been identified linked with the adoption of a post-tax framework in both Victoria and Tasmania.

The Victorian privatisation valuations were based on a pre-tax real model derived by examining the cash flows over the expected life of the assets. A simple move to a post-tax approach would in effect provide a windfall gain to the new owner. This arises because the post-tax based revenues would reimburse the business for estimated tax liabilities as they arise, whereas under the pre-tax arrangement revenues already include an allowance for future tax liabilities. In this case transition to the post-tax framework can be readily achieved without leaving the new owners worse off than they would be under the continuation of the previous regulatory framework. An approach that would achieve the desired outcome is readily apparent. One possibility is to recalculate the revenues for the first regulatory period that would have emerged using the post-tax approach and treat any surplus from the pre-tax approach as a return of capital (or depreciation) which should be reflected in a reduction in the value of the RAB moving into the next regulatory period. Alternatively, if the TNSP wishes to restore the value of the RAB (to what it would have been without the transition) it can do so by accepting lower depreciation in the new regulatory period.

Clearly the owner would have preferred the transition to the post-tax framework without having to effectively give back the revenues it had already received as compensation for expected future tax liabilities which will now be funded explicitly as part of the post-tax framework. This is necessary to be equitable to users who would otherwise be paying twice

to compensate for the tax liabilities involved. It would be difficult to argue that the TNSP has been significantly disadvantaged as it would otherwise have to fund its own future tax liabilities from retained earnings.

The new owners may also see the post-tax framework as enhancing the market value of their business so that for them the transition may represent a windfall gain. This would occur if the cost of capital as perceived by the owner is less than that implied by the regulatory rate of return as the higher post-tax revenues in the later years would be attributed a higher value in net present value terms. The fact that the sale prices for the businesses were well above the RAB suggests that owners perceived a relatively low cost of capital.

The Tasmanian situation is somewhat similar but is more extreme in that the businesses are now at the far end of the S-bend, that is, having had tax assessed on a long term basis a move to assessment of tax in the cash flows would be based on tax payments above the long term average in the final years of economic life. A simple move to a post-tax approach without other adjustments would imply a substantial windfall gain to the business. However, the remedy suggested in the Victorian situation would be impractical given the magnitude of the tax liabilities involved and the difficulties in unravelling previous compensation for tax in revenues over the earlier life of the assets.

In such situations it may be just as well to persevere with the existing regulatory framework, but adopt the post-tax framework for any new capital expenditures in conjunction with a separate set of regulatory accounts. Older assets could be transferred to the new framework based on their market value (ODV) at the time of transfer using the assumption that their associated revenue stream is linked to the pre-tax regulatory framework.[29] Any subsequent reassessment of those assets as a result of a regulatory review involving a DORC can be accommodated through the depreciation based adjustment mechanisms proposed in Chapter 4 while preserving the principles underlying both frameworks (i.e. the net present value of the cash flows associated with assets will be as intended by each regulatory framework).

3.7 Overall assessment

The preferred framework uses a building block approach based on forecasts of cost of service over the regulatory period. These represent target revenues that are smoothed through a CPI-X mechanism designed to create efficiency incentives for cost reduction. The return on capital will be based on a nominal post-tax WACC with benchmark tax estimates specific to the assets during the regulatory period being allowed as a pass-through item. Depreciation costs will be strictly linked to the change in asset values, in nominal terms during the regulatory period (with the exception of redundancy write-downs). Adjustments to asset values over time will be based on a modified DORC concept designed to provide a smooth transition of revenues/tariffs over the longer term.

Further it can be shown that the regulatory framework can be expressed in nominal or real terms yet achieve the same regulatory outcomes. Therefore, it may be argued that it does not matter which benchmarked rate of return is chosen provided that the corresponding changes to asset revaluation are also made. For transmission regulation the Commission has proposed that a specification in nominal terms is likely to be more readily understood.

---

[29] In a sense this is equivalent to the Victorian solution, where the return of capital reduction of the RAB attributes an appropriate ODV value to the RAB at that time.

The traditional justification for the use of the real framework is that it generates a more desirable revenue profile over time. However, it can be shown that this is due to the depreciation profile selected rather than the application of a real framework per se. The other traditional justification is the real framework frees the business from inflation risk. However, it can be demonstrated that this does not come about by virtue of the real framework, but rather the CPI-X adjustment mechanism that is often packaged with it.

Some support for a real approach seems to rest on the preference of economists for real numbers which abstract from inflation possibilities. Such transformations are readily done given the equivalence of the models and will be calculated by the Commission in its revenue cap decisions.

A final argument in favour of expressing the rate of return in real terms has been that it allows consistency from one regulatory decision to the next, because the number is unaffected by inflation levels that may be prevailing at the time. This assertion is doubtful given the influence of inflation on the effective tax rate and therefore the appropriate real pre-tax WACC.

Arguments for expressing the rate of return in nominal terms

A key argument in favour of the use of a nominal rate of return within a regulatory framework is that financial market commentators and the business community better understand it. Even if it varies as a result of the inflationary environment prevailing at the time of a decision, that aspect is well understood by the markets and maintains consistency with other published rates of returns in financial journals and newspapers. The nominal approach in conjunction with the CPI-X adjustments removes inflation risk for the business in just the same way as for the real framework.

Another key argument in favour of the nominal framework is that the calculations involved in deriving target revenues are more direct and transparent. The post-tax nominal return on equity used as the starting point for the revenues comes directly from the CAPM benchmarks which are normally estimated within a nominal framework using nominal data. Also other data from the business such as running costs and capital expenditures and their accounts are normally expressed in nominal terms and can be used directly. Further, when assets are revalued for regulatory purposes such valuations have traditionally been expressed in dollars of the day while any real framework requires a conversion of all nominal data. Secondly, no inflation adjustments are required in the assessment of tax liabilities.

It has been argued that the market now understands real pre-tax rates of return. However, this has yet to be tested in a different inflationary environment in Australia. In any event it only applies to a long term-real-pre-tax rate of return framework which presents major regulatory problems and inconsistencies.

The Commission would argue that the use of a real rate of return approach confers no advantage over the use of a nominal rate of return. Therefore, taking account of the somewhat more direct approach made possible by the application of a nominal rate of return and the greater transparency and market understanding of nominal rates of return the Commission had adopted it as the appropriate framework.

3.8 Overview

In summary the primary advantages of the Commission's framework are that:

- it incorporates the best feature of the real and the nominal framework i.e. the minimisation of price shocks under the real framework and the simplicity of the nominal;
- the nominal framework eliminates the need to consider the conversion problem (post-tax nominal to a pre-tax real return);
- it provides for a rate of return (post-tax nominal) that is easier to understand by financial markets;
- the tariff/revenue smoothing via the annuity growth approach to depreciation minimises inter-temporal price distortions (inter-generational price shocks);
- at the same time it minimises potential geographical price distortions linked to the vintage of assets serving neighbouring systems;
- it satisfies consistency requirements of any framework that there must be no double counting of depreciation – under a nominal approach this means that the accumulated depreciation should not exceed the valuation of the assets; and
- it provides incentives for the TNSP to achieve efficiencies.

Annex 3.1

Practical implementation of the regulatory framework

Much of the discussion of issues to date has been conceptual in character. To ensure that the essential characteristics of the conceptual framework are preserved considerable care needs to be taken in specifying implementation aspects of the framework, for example, how the revenue cap should be adjusted on an annual basis when inflation outcomes actually vary from the forecasts made. One important aspect of these adjustments is the need to minimise inflation risk imposed on the TNSP and this is a key feature of the conceptual framework. In addition to the annual adjustments to revenue it is equally important to reassess the implications of forecast errors for the value of the regulatory asset base at the start of the next regulatory period.

This section describes the implementation features of the proposed framework and how they preserve the integrity of the conceptual framework. The exposition will also clarify why certain options (such as the treatment of taxes) within the conceptual framework were preferred over others.

Establishing target revenues

The first step in establishing the revenue cap is to estimate the TNSP's target revenue requirements. The target revenues are those which cover forecast costs including a prospective return on capital consistent with the business risk involved. In some frameworks such target revenues are forecast only for the initial year of the regulatory period. This then represents the revenue cap for the first year. The revenue cap in each subsequent year is then calculated by making the CPI-X adjustments to the cap in the previous years. This begs the question as to how the X factor should be set.[30] This simple approach also has difficulty in addressing factors which may require a significant change in revenues mid way through a regulatory period. Such events could include the commissioning of significant new capital or the de-commissioning of existing assets (e.g. as a result of by-pass, obsolescence, closedown of generators/customers).

To overcome such difficulties the Commission's approach is to forecast the target revenue for each year of the regulatory period. In doing this there is an explicit account for forecast changes in operating and maintenance expenses due to wages growth and productivity factors, including those associated with the introduction of labour saving equipment. At the same time there is an explicit accounting for new capital equipment forecasts to be introduced during the regulatory period. The return on both new and existing capital expenses together with depreciation of that capital along with forecast operating and maintenance expenses in aggregate constitute the total target revenue requirement in each year (TR_1, TR_2, etc).

Calculation of the X factor

With the target revenues calculated for each year of the regulatory period the calculation of X becomes a straight forward matter. The CPI-X formula needs to generate prospective revenues (R_1, R_2, etc) providing an expected return commensurate with the business risk involved. However, that is precisely what the target revenues were designed to achieve.

---

[30] Since the CPI-X adjustments relate to revenues and are not necessarily linked to output measures, the X is not strictly a productivity measure in the normal sense and the application of a total factor productivity measure may be inappropriate.

Therefore the CPI-X based revenues and the target revenues should have the same value to the firm with the main difference being the time path associated with each. Therefore the X is calculated so that the net present value of expected returns (i.e. revenues less operating and maintenance expenditure and depreciation) is exactly the same as the target revenues established using the same CPI/inflation forecasts. A range of Xs could fulfil this requirement, however there is only one value that also gives a particular revenue forecast in the first year of the regulatory period. In the initial regulatory period this would normally be set equal to the target revenue calculated for the first year. In subsequent regulatory periods, the same approach can be used. However, the Commission will retain some discretion to link the initial revenue with that achieved in the last year of the previous regulatory period. Such discretion may be exercised in the interests of minimising any surprise revenue/tariff jumps between regulatory periods.

The way in which the X factor may be calculated from the target revenue calculations is also illustrated in Flowchart 1. It should be noted that although CPI-X is usually expressed in its simplest formulation, the Commission will apply a mathematical adaptation which achieves more precisely the intended objective.

This is rather than adjusting the revenue cap of the previous year by a factor equal to:

(1+ percentage change in CPI - X)

The preferred formula is:

R_t = (1+percentage change in CPI) x (1-X) x R_{t-1}

This latter formulation preserves the intended relationship between target revenues and the revenue cap regardless of the CPI forecasts used. For small rates of inflation the differences in the outcomes are minor, however the regulatory framework needs to cater for potential blow-outs in inflation. In any event the formulation is essential to retain the net present value equalisation property of X when making adjustments for errors in inflation forecasts (see below).

Correcting for errors in inflation forecasts

The revenue caps (R_1, R_2, R_3, R_4, R_5) derived in this way prior to the commencement of the regulatory period still only represent a forecast of the revenue caps to apply to the TNSP. As such they would only protect the TNSP from inflation risk to the extent that the forecasts prove to be correct. To compensate for errors in inflation forecasts an adjustment is made to the cap in the second year based on actual inflation which occurred in the first. That is the revised revenue cap R'_{t+1} is calculated as:

R'_{t+1} = actual CPI(end of year t)/forecast CPI(end of year t) x (1-X) x R_{t+1}

Such adjustments do not remove all inflation risk since the adjustment involves a lag. However, providing the initial inflation forecast for year 1 was not biased there is no reason to believe that the service provider will be advantaged or disadvantaged by the approach and over a number of regulatory periods errors caused by the lagged adjustment will become insignificant.

To illustrate how such adjustments shield the TNSP from inflation risk it is helpful to assume that the inflation were known one year in advance and the adjustments could be made for inflation in the year in which it occurred. With such adjustments the revenue caps would be

identical to those that would have been derived with perfect foresight of future CPI increases prior to the commencement of the regulatory period.

Adjustment of the regulatory asset base for inflation and capital expenditure

As part of the calculation of the target revenues, the RAB is adjusted on an annual basis for forecast inflation and forecast capital expenditures. Within the regulatory period the CPI-X adjustments of the revenue cap achieves the same outcome as if the relevant inflation adjustment of the RAB had been made prior to calculation of the target revenues. However, there is also a need to correct the RAB for actual inflation over the course of the regulatory period to provide the appropriate value of the regulatory asset base at the start of the next regulatory period. This is done as part of the regulatory review prior to commencement of the next regulatory period.

The simple inflation adjustment is important to preserve the real value of the asset base and remove associated inflation risk for the TNSP. Inflation forecasts are not the only forecasts subject to error. The forecast capital expenditures may also be under or overstated at the outset of the regulatory period. It is not part of the proposed regulatory framework to allow the impact of such forecast errors to persist over multiple regulatory periods.

Therefore, if for example, forecast capital expenditure had been overstated the RAB would be recalculated on taking account of actual inflation and relevant levels of depreciation. To the extent that forecast capital expenditures were overstated so would any allowances in revenues for asset depreciation. The Commission does not favour a framework that claws back past revenues. However, it notes that depreciation represents a return of capital already spent, and it is not unreasonable to regard any excess depreciation allowances as applying to existing infrastructure assets. For this reason the Commission considers that there should be a pro-rata adjustment (reduction in this case) of the written down value of the RAB in line with depreciation allowances incorporated in the revenue calculations of the preceding regulatory period.

Flowchart 1: Establishment of revenue caps and CPI-X adjustment

Regulatory decision parameters	
Step 1.	
Decision parameters at start of period: - the regulatory asset base (A) - post-tax WACC	Collect forecast variables for each year of the regulatory periods: - O&M (OM) - Capital expenditure (K) - Change in CPI (ΔCPI) *That is estimate:* *OM(i), K(i), DCPI(i), A(I) for i= 1,2,..5*
Step 2.	
Compute Target Revenues (TR) on the basis of forecasts	Sum forecast elements of cost for each year (taking into account any forecast efficiency improvements) to determine total revenue for each year: i.e total revenue = O&M + Depreciation + WACC*regulatory asset base(including new capex K, less disposals) *That is:* *TR(i) = OM(I) + A(i)+K(i) - A(i+1)+ r* x *A(i) + Tax*
Step 3.	
Choose the revenue cap for Year 1 Usually select RC(1)=TR(1)	The chosen revenue cap that will be used as the basis for the revenue cap in the following years via the CPI-X adjustment mechanism *That is:* *RC(i) = RC(i-1)* x *(1+DCPI(i))*x*(1- X)*
Step 4.	
Calculate X	Determine the revenue caps to give same net present value as the target revenues (net of O&M) – using WACC as discount rate *That is:* *NPV(TR(1),..TR(5)) = NPV(R(1),…R(2))*

Adjustments At End Year i

Establish Actual Revenue Cap for Year i+1 ie AR(i+1) Given: AR(1)=R(1)	Re-apply CPI-X adjustment using CPI outcome for year just past ΔACPI (i) *That is:* *AR(i+1) = AR(I)* x *(1+DACPI(I))* x *(1- X)*

Adjust Regulatory asset base for next regulatory period

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

Notes

(1) In steps 1 and 2, the effective tax rates required to estimate r are based on cash flow estimates. The cash flows and the taxes are derived to give revenues consistent with the WACC.

(2) In both real and nominal framework some residual inflation risk remains due to lagged adjustment of CPI. However, there is no systematic bias and the net effect should be minimal over the longer term.

4. The regulatory asset base

4.1 Introduction

Under the building block approach the value of fixed assets is fundamental to the calculation of the allowance for both the return on capital and the return of capital and will flow directly through to the AARR and therefore transmission network prices.

For the initial price reviews, the NEC (clause 6.2.3(d)(4)) puts a cap on the value of sunk assets (assets in place on 1 July 1999). It states that the value of these assets is to be determined by the Jurisdictional Regulator or to be consistent with the regulatory asset base established in the participating jurisdiction, provided the value does not exceed the assets' deprival value. The NEC provides the Commission with the right to independently verify the opening asset values through a process agreed to by the National Competition Council (clause 6.2.3(4)(iii)).

As the Commission assumes the role of regulating transmission revenues for a particular TNSP, the NEC provides that existing and new assets can be revalued, on a basis determined by the Commission. However, the Commission does not have unlimited discretion in choosing an asset valuation methodology, as the NEC stipulates that the Commission must have regard for:

- the COAG agreement that deprival value is the preferred approach for network assets;[31]
- any subsequent COAG decisions;
- providing TNSPs with a fair and reasonable rate of return; and
- any other matters to achieve consistency with NEC objectives – e.g. TNSPs can earn a reasonable rate of return but not extract monopoly rents, and there must be a reasonable recognition of pre-existing government policies regarding asset values, revenue paths and prices (clause 6.2.3(4)(iv)).

The NEC further goes on to require the regulatory process to provide reasonable certainty and consistency over time for the outcomes of the regulatory process.

4.2 Overview of Chapters 4 and 5

In order to determine the TNSP's return for each regulatory review the Commission will need to track asset values as shown in Figure 4.1.

Figure 4.1:

Opening value of assets	–	Depreciation over the period	+	Capital expenditure	–	Asset disposals	=	Closing value of assets

[31] Council of Australian Governments' Meeting, Darwin, 19 August 1994.

Chapters 4 and 5 of the *Draft Regulatory Principles* examines each component of Figure 4.1 and its treatment in the Commission's proposed regulatory framework, as outlined in Chapter 3. The components discussed are the valuation of the asset base, asset revaluation, capital expenditure and depreciation.

4.3 An asset valuation methodology

In determining an appropriate asset valuation methodology economic principles and analysis do not provide an unambiguous decision rule for the valuation of existing sunk assets. Rather economic principles provide lower and upper bounds – scrap value and replacement cost. Within these bounds there is opportunity for regulatory judgement.[32]

Although the NEC also does not specify a methodology for the initial valuation of sunk assets, it does advocate the use of deprival value for regulatory purposes. Moreover, the NEC says that in reaching a decision on an asset valuation methodology the Commission shall provide a fair and reasonable risk adjusted cash flow rate of return on efficient investment. Other aspects of the objectives and principles set out in Chapter 6 of the NEC (clause 6.2.2) also bear upon the determination of the asset base. These include the need to promote incentives for efficient investment, maintenance and the use of the network, and the affects on different interest groups of the regulatory decision.

The main economic principle for assessing the economic value of any assets is that their value to investors is equal to the net present value of the expected future cash flows generated by those assets. The practical difficulty in making this assessment for regulated monopoly businesses is that the future revenue derived from the assets is itself determined by the regulator – hence the issue of circularity associated with the use of ODV as a methodology to value sunk assets.

This potential circularity is eliminated by the use of DORC. The DORC of a network is the sum of the depreciated replacement cost of the assets that would be used if the system were notionally reconfigured so as to minimise the forward looking costs of service delivery. There are two definitions of what DORC attempts to measure:

- One interpretation of DORC is that it is the valuation methodology that would be consistent with the price charged by an efficient new entrant into an industry, and so it is consistent with the price that would prevail in the industry in long run equilibrium.
- The second interpretation is that it is the price that a firm with a certain service requirement would pay for existing assets in preference to replicating the assets.

ODV amounts to an extension of the DORC concept, by recognising that, as a result of being deprived of an asset, the economic value foregone may be less than its DORC value.[33] In

---

[32] There is extensive literature on the appropriate opening asset value – a discussion of asset valuation methodologies and issues is to be found in:
Regulation of Transmission Revenues Issues Paper (May 1998);
Submissions to the Commission's assessment of the Victorian Gas Access Arrangements: Final Decision (6 October 1998); and
King, S.P., 1996, *Asset Valuation and Access: Competition and Regulatory Policy Program*, Centre for Economic Policy Research, Australian National University, Canberra.

[33] ODV is also based upon the asset value that is consistent with the prices that would prevail in a competitive market, and is defined as the lesser of the replacement cost of an asset and the valuation of an asset (on a cash-flow basis) given market prices. Thus, in long-term equilibrium, where equilibrium prices would be consistent with the replacement cost of assets, it reduces to replacement cost.

principle, the difference relates to the accuracy of the assumed depreciation profile in reflecting the decline in the service potential or the demand for the service potential provided by the existing system. With this qualification, the two concepts are consistent.

Clearly, in using DORC, if the future income streams were solely derived from a return on the assessed DORC value the economic value will be the same as the DORC. However, if revenue streams are limited by any mechanism to a lower value then economic value, ODV will be lower than DORC. This could arise, for example, from the threat of by-pass, loss of markets or the imposition of external regulatory requirements by jurisdictions. In these cases, the Commission's regulatory framework provides for the asset owner to request a write down of the value of the asset to below DORC under certain circumstances (as discussed in Chapter 5). The Commission's may also write down part of the system below DORC in recognition of evidence suggesting that the regulatory asset base valuation currently exceeds the ODV of the system.

Features of depreciated optimised replacement cost

The two definitions of the DORC methodology stated above suggest that it has a number of attractions from the viewpoint of economic efficiency.

First, while the outcomes of competitive or contestable markets do not provide all of the answers, regulators often look to competitive or contestable markets for guidance on efficient decision rules for regulating natural monopoly markets. Such comparisons can provide useful guiding principles for certain regulatory problems. In addition, the establishment of broadly symmetrical pricing and incentive structures across regulated and unregulated markets has attractions on general resource allocation grounds. It is noted in this regard that one of the objectives is to replicate the desirable outcomes of a competitive market.

Second, the maintenance of revenue streams over time at a level consistent with a DORC asset valuation will minimise the likelihood of significant shocks to tariffs as the replacement of assets becomes necessary. As the existing assets will dominate the capital base and therefore tariffs for a number of years, this objective of minimising shocks to tariffs will be most easily achieved if the existing assets are valued at or close to DORC.

Thirdly, as noted above, any value that is in excess of DORC is likely to imply pricing of services that will expose the service provider to being by-passed. While the significant entry and exit costs that characterise electricity transmission make large-scale duplication of the existing system unlikely, by-pass may be feasible at the edges of the network. In such circumstances some of the cost that gave rise to by-pass will inevitably be absorbed by the remaining customers who do not have by-pass options.

Finally, another justification for DORC setting the upper limit to valuations comes from what a DORC valuation actually is attempting to measure. This is the maximum price that a firm would be prepared to pay for 'second-hand' assets with their remaining service potential, higher operating costs, and (old) technology - given the alternative of installing new assets which embody the latest technology, and which generally have lower operating costs, and which will have a greater remaining service potential. Therefore, if prices reflect a value that is in excess of DORC, then users would be better off if the existing system were scrapped and replaced by new assets. Similarly, if assets are sold for prices above the DORC valuation, then this implies that scarce investment funds are being inefficiently applied: in this case, it would have been a more efficient use of investment funds for the existing assets to be scrapped and a duplicate system installed.

Given the above considerations the Commission has decided to adopt the DORC valuation methodology as the approach it will use to set the cap on the valuation of the asset base. In adopting the DORC methodology the Commission has been guided by submissions received in response to the *Regulation of Transmission Revenues Issues Paper*.[34] The Commission has also noted the interest of the accountancy profession in exploring market related approaches to valuation as a basis for mainstream reporting purposes and management accounts.[35]

Past levels of recovery and revaluation

The extent to which past pricing policies have provided for the return of capital raises questions of equity. Just as there is no economic answer to the valuation of sunk assets, questions of equity connected with the past pricing of services requires judgement. In applying judgement the Commission will need to balance the interests of the TNSP, users and prospective users.

Such issues were thoroughly discussed in connection with the Victorian Gas Access Arrangements Decision. In that decision it was noted that information shortcomings made a thorough assessment of the issues difficult. It was also conceded that there was a wide range for the 'fair' economic value of the asset base. It is not expected that the data for the transmission networks will be any better than that for the Victorian Gas Access Arrangements Decision, making an assessment of what is a 'fair value' of the opening asset base, given past levels of recovery problematic.

This does not undermine the economic rational for DORC, and logical support for the DORC methodology is provided by the economic efficiency features of DORC, as discussed above.

Valuations based on historic cost

A number of submissions raised the possibility of using historic cost, or book value. While historic cost, if available, offers (or appears to offer) a firmer base than DORC, there are many aspects which make it unsuitable as a method of establishing a cost base consistent between different network owners. Some issues are the following:

- inconsistent past accounting practices with respect to how much of an asset was capitalised e.g. in the past network assets had a high day labour content which was not treated in a common way between TNSP's;
- the industry has been subjected to structural change which has often been done without sufficient attention to asset valuation;

---

[34] DORC is preferred by Victorian Dept of Treasury and Finance submission 5 August 1998; NSW Treasury submission 3 September 1998; South Australian Department of Treasury and Finance submission 30 July 1998; EnergyAustralia submission 31 July 1998; and Powerlink submission 30 July 1998.
ODV is the asset valuation methodology generally preferred by Transend, TransGrid (which would support DORC if ODV is not practical), Western Power, GPU PowerNet and Victorian Power Exchange.
The Australian Cogeneration Association and the Energy Users Group consider that efficient and fair asset valuations would tend to lie in a range between DORC and DAC. The Business Council of Australia said that the current market value or selling price of the assets was the only valuation that had any economic significance at the time of acquisition and after, and that depreciated historic costs might provide a reasonable surrogate for market value or selling price. It is to be appreciated that this second step of logic requires that the accumulated depreciation involved approximates what would be considered the economic depreciation of the assets over the period.

[35] Ravlic, T., 1999, *Measure for Measure – new issues or old problems*, Australian CPA, March.
Australian Accounting Research Foundation 1999, *Measurement in Financial Account: Accounting Theory Monograph 10*.

- very similar assets in different networks can have different historic values due to different purchasing practices; and
- attempts to inflate historic costs to current costs are fraught with problems and will frequently result in a much higher value than a depreciated current replacement cost based on modern equipment of equivalent capacity. Because of technological improvements and economies of scale the cost in real terms of most electricity assets has fallen consistently over time.

Therefore, the Commission will not consider historic cost as an asset valuation methodology.

However, actual costs are relevant and capital expenditure within a regulatory period will be added to the regulatory asset base at its actual cost provided it meets the required prudency criteria.

Application of the DORC methodology

As discussed above the economic properties attributed to the DORC valuation methodology make it suitable for determining the maximum value of the RAB. It is therefore important that procedures adopted by valuers when calculating DORC values are consistent with the preservation of these properties. In this section the DORC approach is reviewed with a view to making it quite clear that discretion needs to be limited if DORC valuations are to maintain the economic properties frequently attributed to them.

The DORC process although basically a straightforward technical process requires a number of sequential judgements to be made, many of which can effect outcomes. Therefore, it is necessary to assess the way in which the methodology is applied in practice.

The determination of a valuation for transmission system assets on the basis of DORC involves three stages. The standard approach has been for these steps to comprise:

- Optimisation – determine the optimal configuration and sizing of transmission assets;
- Replacement costs – a modern engineering equivalent (MEE) is established for each asset in the optimised system and a standard replacement cost (SRC) established; and
- Depreciate those assets (usually straight line) using the standard economic life (SEL) of each asset together with an estimate of the remaining life (RL) of each asset.[36] For example, if the standard economic life of an asset is 40 years and its remaining life is 10 years, the asset would be depreciated to 25 per cent of the replacement cost of the MEE.

Each of the above points raises a number of measurement issues. This section raises issues associated with valuation for each of the stages noted above. Given the scope for alternative approaches within the DORC methodology it is clear that in order to apply an objective methodology across different networks it is necessary to establish and publish the principles under which a DORC methodology should be conducted. The Commission intends to produce such a document by 31 December 2002. The document will address the full range of issues concerning application of the DORC methodology, but in the main the depreciation aspects will be based on the approach outlined in this section.

---

[36] RL is calculated as the economic life of the asset less the estimated age of the asset.

Further to facilitate consistency, transparency, as well as produce a historically verifiable record, when a TNSP's assets are revalued the DORCs will be published. This is to promote consistency in the regulation of networks and to reduce any perceived uncertainty.

Optimisation

Optimisation provides the market discipline of write-down of inappropriate investment or assets susceptible to by-pass. Optimisation may provide for the removal of an amount from the capital base to:

- ensure that assets which cease to contribute in any way to the delivery of services are not reflected in the capital base; and
- share costs associated with a decline in capacity on that part of the network.

Discretion is available in deciding how the optimal system configuration should be determined. Even in the absence of alternative technologies there is an issue as to what level optimisation should be considered and whether it should be done in respect of each item of infrastructure or on a system-wide basis. There is clearly an important trade-off involved in the level of detail considered and the cost of conducting the evaluation. The concept of a MEE for identifiable segments or modules of infrastructure is a practical application of this trade-off. For the most part it is expected that technological change will manifest itself through incremental reductions in the cost of MEEs.

Generally, a top-down approach, which considers infrastructure from a system–wide perspective is important since it allows majors differences from existing infrastructure to be quickly identified. Moreover, the top-down approach can more readily accommodate the impact of new or alternative technologies. For example, an optimal solution may do away with existing types of infrastructure and may involve a totally different transport mechanism or product to satisfy associated final demand in end markets. Such solutions may only be apparent when the customer base and services provided are considered in the broadest possible perspective.

Further, in relation to optimisation there is an issue of timing. This occurs because capital expenditures are based on demand projections for certain periods of time. Overbuilding of the system may well be a reflection of anticipated growth in demand. The question for the valuer therefore is what level of overbuilding should the optimisation consider, based on projected demand growth? The options include considering only current demand, that is, paying no attention to future growth, or some other length of time.

In developing its guideline on DORC the Commission will consider issues relating to optimisation, particularly the configuration of the system and timing issues.

Replacement costs

Technological change is not the only factor effecting the ORC of assets. The actual magnitude of replacement costs results from the combined effects of:

- improved efficiencies associated with alternative technologies; and
- changes in manufacture and installation costs.

Normally, these factors determine the valuation placed on the SRCs. However, a number difficult issues are involved in their assessment. For example, should SRCs be calculated on the basis that 'brownfields conditions' exist, that is, basic existing infrastructure (e.g. roads, footpaths and other services) are already in place, or should they be on the basis of

'greenfields' assumptions so that the replacement of transmission system assets would therefore not need to work around such structures?

In practice, feasible reconstruction of infrastructure may depend on simultaneous development of otherwise unrelated infrastructure (e.g. roads and bridges). Generally, such fortuitous circumstances cannot be assumed and given the objective for the replacement cost valuation to reflect the current cost of establishing infrastructure the 'brownfields' assumption seems to be the more realistic assumption. The interpretation that the DORC valuation should reflect the costs faced by a new entrant also supports the approach. However, judgement is required where the 'brownfields' assumption may imply costs which are commercially untenable but where it is known that windows of opportunity (e.g. new road construction) emerge over time that would allow an alternative supplier to develop infrastructure at a reduced cost.

Only by identifying the lowest cost alternatives that may emerge will the DORC approach be able to claim that it reflects the costs of a potential new entrant and the impact on the asset value of potential by-pass. If the RAB valuation reflects the capital cost of a potentially lower cost new entrant, the incumbent should be able to retain its market position while still achieving a commercial rate of return on its assessed RAB.[37]

Not all technological change or potential cost reductions will be reflected in lower capital costs. In fact, it is not unreasonable that some optimisation may involve increased capital costs which are more than offset by reductions in operating and/or maintenance costs. Such developments clearly diminish the value of existing infrastructure relative to the optimised approach. This diminution of value could be captured by adjustment of subsequent depreciation. However, there remains the more general issue of comparing valuations of capital infrastructure alternatives which involve different operating and maintenance costs. One solution is to capitalise, in net present value terms, the accumulated operating and maintenance savings associated with each alternative and reduce its assessed capital cost by this amount. Of course such savings must be relative to some benchmark. Since the objective is to value existing assets the relevant benchmark operating and maintenance costs against which such savings can be made are those linked with existing infrastructure. In this way the optimised valuation will more accurately reflect the market value of existing infrastructure prior to depreciation.

Refurbishment assets

A related issue concerns assets which do not require full replacement in order to regain full utility at the end of their technical life. These could be classified as refurbishment assets. The well known example of this is distribution gas pipelines originally based on cast-iron pipes laid underground. Full refurbishment of such assets typically involves relining the pipes with nylon inserts, a procedure which does not require expenditure in digging up the ground or involve extra expenditure to accommodate existing 'brownfields' infrastructure.

The normal DORC procedure would involve valuing the assets as if the pipelines had to be re-laid from scratch as this identifies the potential costs for a competitor of duplicating the system (a property of the DORC approach). However, the DORC valuation of such refurbishment assets seriously overstates the long run capital costs associated with related

[37] If the new entrant sought to gain market share it could only do so with prices giving below commercial returns on its investment.

service provision. This is seen as potentially leading to long run cost estimates which are overstated and may lead to inefficient pricing.

The solution to this dilemma is not to adjust the DORC valuations downwards but to recognise that, with such assets, the residual value of assets at the end of their technical life is not their scrap value, rather it is the savings that their availability represents over having to reconstruct the infrastructure from scratch. The natural conclusion then is that in determining the depreciation allowances contributing to price formation, the accumulated depreciation needs only account for the fall in asset value from its initial ORC value to the market value just prior to refurbishment. Such reduced depreciation allowances provide for pricing which better reflects true long run incremental costs. It is not inconceivable that similar 'refurbishment' opportunities exist for other infrastructure assets and the refurbishment approach should be applied.

A treatment of refurbishment costs, which the Commission will develop in consultation with experts and key stakeholders, will be considered in the Commission's guideline on DORC.

Easements

Also creating concern is the relevant treatment of non-system assets, in particular easements. Easements are essentially access corridors which have been granted to the TNSPs, however once granted there is an issue as to how they should be valued. It is questionable what their value in an alternative use is? In obtaining these corridors compensation has in some circumstances been paid to land owners or there are lease arrangements on the land acquired for the easement.

Another issue is whether it should be assumed that the network is built instantaneously to a configuration that is optimal for existing and projected demand, or whether it should be assumed that the network has grown incrementally - as it would in the normal course of business to meet current and prospective demand. For consistency it would seem appropriate to value the optimised portfolio of easements as an integral part of the broader optimisation assessment.

To the extent that the acquisition of easements requires expenditure by the TNSP it would be improper for the regulator to ignore their existence or deny a reasonable return on the funds employed. However, such assets do not deteriorate in the same way as mechanical assets and it would not seem to be appropriate to write–off the assets over time. Indeed, some easement rights may be resold at a price exceeding their initial cost. Such a capital gain would reflect a return in addition to the normal regulatory rate of return on assets. This raises issues regarding the rate of return that should apply to such assets and how such assets should be reflected in the RAB on a continuing basis.

The normal DORC methodology would assign values to such assets reflective of their market value. Given the strong link with real estate values there is a likelihood that the value of easements will escalate continuously over time, at times in excess of the rate of increase in the CPI. The question is how to introduce such assets into the regulatory framework in a consistent way. One consistent approach would require:

- The contribution to the RAB be based on the actual cost to the TNSP of obtaining the easement rights updated periodically in line with what would be the DORC based valuation of easements. On the basis of legislated mechanisms for purchase of easements both of these valuations would normally be in line with what was considered the loss of amenity to the previous owner of conceding the easement right (that is its social cost).

- To the extent that easement valuations are judged to vary over time, the variations in value should be reflected in depreciation allowances linked with the asset in precisely the same way as other assets. If the easement appreciates in value over time then the allocated depreciation would be negative in nominal terms and serve to offset the higher capital returns associated with an appreciating asset value.
- If the easement right is resold, the RAB value should be close to the sale price given the basis for valuation updates. Hence, the issue of return associated with possible capital gain, and its effect on overall regulatory return, disappears. Should there be a residual capital gain or loss it will be hopefully small enough in magnitude to be accommodated by depreciation adjustments to the regulatory asset base at the start of the next review period in a way similar to that used to account for errors in depreciation associated with forecast capital expenditure that does not take place as planned.

The advantage of this approach is that the valuation remains comparable to costs faced by a potential entrant while maintaining cost of service pricing which takes full account of the social cost of the resources employed. Inclusion of the easement value within the RAB provides the incentive for the TNSP to acquire easement rights to expand the network as required. If the value in the alternative use of the easement (its social value) exceeds the cost of alternatives such as underground cabling – the TNSP has an incentive to realise its market value and adopt the lower cost alternative since the DORC basis for the RAB means that it will only reflect the lower cost alternative.

The Commission is attracted to this approach and proposes to adopt it as the basis for the treatment of easements in the guideline on DORC valuations which the Commission will develop.

Depreciation

Once the optimised replacement cost (ORC) is determined, it remains to be determined how much the value should be written down to reflect the useful life of the existing assets given that their remaining useful life is likely to be less than that of the replacement assets which were the basis of the ORC estimate. Different valuers have adopted different approaches for doing this. One approach is to consider the present age of existing assets and then depreciate the ORC value by the proportion that this age represents of the potential life of the new assets. A deficiency with this approach is the state of repair of the existing assets and the possibility that their useful life may be more or less than calculated. Therefore, an alternative approach is to consider the likely remaining life of existing assets and set the DORC value in proportion to the remaining life of the assets relative to the expected life of new assets.

Assessing the life, or remaining economic life, of an asset may not be straight-forward. It will depend on the level of maintenance assumed and likely wear and tear it is subjected to. Perhaps more significantly, the useful economic life of an asset may have very little to do with the feasible technical life of the equipment. It may be more dependent on the period over which the services it provides will be needed. For example, if the infrastructure is designed to service a resource (e.g. gas field or generator) with a limited life, that may be what determines the economic life of the asset. Alternatively, the downstream market for the end product may have a life limited by the nature of its market or anticipated technological developments. While assessments of useful life may be difficult, the uncertainties will tend to decline over time and successive DORC valuations should be able to better reflect the more likely scenario in the final demise of the assets being used.

In common with the traditional approach used by valuers, the above description calculates the write down of the ORC value to obtain the Depreciated (D) ORC, by assuming a linear relationship between accumulated depreciation and the age of the asset relative to its expected economic life.

This approach amounts to assuming that economic depreciation of an asset is equivalent to straight-line depreciation of an asset. It makes sense that the approach to depreciation taken within the DORC methodology should match that utilised within the regulatory framework. In traditional regulatory frameworks straight-line depreciation is the norm and the use of straight-line depreciation as part of DORC is consistent with those frameworks.

However, in the *Draft Regulatory Principles* an alternative approach is taken to assessing depreciation which also needs to be reflected in any associated DORC valuations of the RAB. It is argued as a major feature of the *Regulatory Principles* that straight line depreciation fails to capture the important features of economic depreciation that are evident from the sale value of assets or the pricing of products over the life-cycle of productive assets. For example, where there is rapid technological change or diminishing demand for an asset's output its market price can decline much faster than suggested by linear depreciation of its real value. The most common concern leading to more rapid reduction in prices is to avoid by-pass by a new entrant able to take advantage of a different (lower cost) technology.

In product pricing to the extent that depreciation is recognised as a cost of production along with the cost of capital and other input costs (in parallel with the cost of service approach), linear real depreciation would imply costs, and therefore prices, depend on the age of the productive assets being used (assuming no technological change). In a competitive market a much flatter time profile of pricing is observed relative to the age of the assets used to supply the goods or services. For example, the pricing of airline tickets bears little relation to the age of the aircraft used by the airline.

The approach to depreciation which is proposed by the *Draft Regulatory Principles*, and which is developed further in the next chapter, is made up of two aspects, these are:

- the smoothing of revenue paths (via an annuity approach) designed to avoid anomalous pricing associated with the vintage of the assets employed e.g. inter-generational pricing disparities; and
- adjustments to reflect the impact of future potential stranding of identified assets (and possible redundancy of assets).

The first of these implies depreciation allowances are greater at the end of an assets life, while the latter requires depreciation to be greater at the start of the assets life. The factor that dominates depends on the expected rate of technological change and anticipated pressures for potential by-pass.

Both aspects are motivated by the desire to replicate the pricing that would occur in the presence of competitive forces. For this reason the approach to depreciation which integrates both of these features is called *competition depreciation*. For overall consistency of the proposed regulatory framework it is important that depreciation of ORC to obtain the DORC valuation should adopt the same approach. However, the approach in this case also serves to ensure that the DORC valuation retains the competition and market valuation linked properties earlier attributed to the DORC methodology.

This approach to the DORC methodology is also directly applicable as part of the regulatory framework in terms of how depreciation should be determined on an annual basis. It is conceptually possible to consider a notional DORC revaluation of the regulatory asset base on an annual basis as the main basis for assessing how the RAB should move over time and what allowance should be made for depreciation within the cost of service calculations. This has several advantages. First, the revenues and prices behave more like those emanating from a competitive market. Second, there are less likely to be shocks associated with any reassessment of the RAB or from by-pass. Third, the RAB will generally reflect its market value. Rather, than follow the path suggested by periodic DORC re-valuations, the regulatory framework is better suited to gradual adjustments in depreciation and asset values towards what may be considered the appropriate DORC based asset values over the longer term. Actual DORC valuations performed in respect of existing assets would be catered for similarly by gradual adjustment to the new level (as suggested in Box 3.2 earlier).

Thus the Commission's guideline on DORC valuations will depart from the use of traditional straightline depreciation schedules. The guideline will set out a methodology for the treatment of depreciation in valuations that will be consistent with the *Regulatory Principles*.

Service standards and valuation

Critically any application and definition of DORC embodies inherent assumptions, which includes those on service standards. Thus the revenue cap set for a service provider must contain an adequate definition of the level of service that is assumed in the determination of the revenue cap. It is difficult to verify objectively that the DORC valuation has been based upon correct assumptions about future service levels unless a description of the current level of service provided is in place and being monitored by the Commission to ensure that no decline in the level of service provided occurs over time (service standards are outlined and discussed in Chapter 8).

Conclusions

The Commission recognises that no single asset valuation methodology will provide a uniquely appropriate valuation in all cases. However, the Commission is limited by the requirements of the NEC in determining a methodology.[38]

In setting out a valuation methodology, DORC will provide the maximum asset value. This value may then be adjusted downwards by the service provider (as discussed in the next section), on the basis of identified by-pass threats. The valuation may also be adjusted by the Commission below DORC in recognition of evidence suggesting that the regulatory asset base valuation currently exceeds the ODV of the system.

In order to provide for consistent and transparent valuations, the Commission will publish a guideline setting out how DORC valuations are to be conduced, prior to 31 December 2002. The Commission considers that a well defined DORC approach has some significant advantages as a cap to asset valuation from the viewpoint of economic efficiency. The Commission notes the criticisms to the effect that it is a less auditible value than DAC, and that it may overvalue assets or re-value assets that have already been fully depreciated. The Commission considers however, that these points relate to the manner in which the methodology is implemented in practice rather than to whether it is an appropriate valuation methodology in principle. Also, to the extent that DORC valuations are used primarily as a

[38] Clause 6.2.3(d)(4) of the NEC.

guide for the time path of the RAB, and that movements in values are linked to depreciation in the regulatory accounts both of these criticisms have diminished ongoing significance.

4.4 Revaluation of the regulatory asset base

The NEC does not preclude the regulator from periodically revaluing the regulatory asset base according to a valuation methodology such as DORC.

Revaluations based on DORC are made up of two components:

- the replacement of the asset with an asset providing a similar service to the asset in question (technological change i.e. replacement cost); and
- the removal from the regulatory asset base of assets that no longer contribute to the delivery of services (redundant assets i.e. optimisation).

As discussed, revaluing the asset base based on DORC has a number of benefits, in particular, it would ensure that the regulated tariffs are never set at a level that is consistent with an asset value above DORC – this ties in with the definition of DORC i.e. that it represents the maximum value that would be reflected in prices in a competitive market. At the same time optimisation removes from the asset base assets that are no longer in service.

Changes in either of the two components i.e. changes in replacement costs or an increasing redundancy of assets, may trigger a revaluation of the asset base.

Triggers for revaluation

The long term nature of network assets and stability of associated markets makes it unlikely that rapid change would unexpectedly strand common assets in less than a five year time frame. Therefore, the Commission may not need to consider a full DORC every regulatory period although there may well be a case for every 10 years.

The potential triggers for reassessment of the RAB include:

- a major advance in technology such as the development of new materials;
- mergers or change of ownership of transmission assets;
- major expansions or contractions of the network such as may arise due to the development of a by-pass option;
- evidence that the TNSP is unable or unwilling to recover the full cost of service calculated for some sub-system; and
- a request by the TNSP facing by-pass for a significant economic write-down of part of its asset base.

It is clear that the Commission cannot set precise criteria for when a revaluation will be required as this will require some judgement. However, this should not be a major issue given that:

- the depreciation framework provides for the gradual impact of technological change; and
- any revaluation will not necessarily have an immediate impact on the RAB but rather provide a longer term target for its value over the course of the regulatory period.

Optimisation

The alternatives available to users to taking transmitted supply over the monopoly grid in theory include:

- construction of anther transmission system in parallel with the network owner's system but from the same source of supply. This would fully or partially strand main grid assets.
- take supply fully or in part from another source such as a local generator, once again with the effect of stranding.

Where there is a high potential for full or partial stranding to occur it needs to be considered whether an economic value lower than DORC should be set. In such a situation the regulator is unlikely to be as well placed as the TNSP to identify assets at risk of by-pass well in advance of the threat actually materialising.

It is considered unlikely potential by-pass risks exist at the present time to a degree which would materially affect the overall valuation of a TNSP. However, as the gas transmission network develops with greater potential to deliver gas for local generation at a price to compete with transmitted electricity this may change and by-pass options may become more prevalent. This could happen at regional centres with high transmission costs, which are favourably located with respect to gas. It could also happen at major load centres where high cost transmission re-enforcement needs to take place.

Where an asset has the potential to become unused or stranded the TNSP has the option of reducing its tariffs to remain competitive. Generally, the Commission is not in favour of the TNSP seeking to recover the reduced revenue from the rest of the network when other users do not commensurately benefit from the existence of the stranded assets in question.[39] However, if the reduced revenues are achieved as a result of a reduction in the RAB, and are fully consistent with the commercial returns permitted there is no issue of cross-subsidy. If the reduction in the RAB can be achieved by a return of capital or depreciation prior to the actual emergence of by-pass the TNSP does not necessarily suffer a windfall loss.

When the Commission undertakes a DORC or an ODV valuation as part of its decision process, the valuation will be provided to the TNSP for consideration.[40] The TNSP then has the option of requesting a write-down of components of the asset base from the values established by the DORC - for consideration by the Commission. The TNSP may similarly suggest a write-down of its existing RAB at a regulatory review even in the absence of a DORC valuation.

As noted earlier the Commission believes that the TNSP is the best placed to identify the likelihood of redundancy. Accordingly, the TNSP will be required to identify the particular assets that it wishes to have written down and to justify the write down. The evidence would need to identify the nature of the threat, the extent of writedown required and the time frame involved. Such write-downs may involve an immediate write-down incorporating a windfall

---

[39] The *Draft Regulatory Principles* do not include guidelines for tariff formation to ensure that this does not occur - but must rely on the requirements specified for deriving tariffs from the overall revenue cap as required by the NEC, and any subsequent pricing guidelines developed by NECA.

[40] The valuation may include a write down of part of the system below DORC in recognition of evidence suggesting that the regulatory asset base valuation currently exceeds the ODV of the system.

loss to the TNSP or a faster rate of depreciation for a specific period.[41] The Commission will then consider the proposed write down as part of the regulatory decision for the period ahead. The Commission proposes that accelerated depreciation for the identified assets would apply only to the point at which the by-pass risk is removed. After the threat of stranding has receded a more normal rate of depreciation should apply for the remaining life of the asset.

A possible adverse consequence of this approach is that it may have the flow-on effect of higher prices for present users in comparison with later users. This may be unfair to current users who would be paying a higher than justified proportion of costs creating inter-generational inequity. Further, if investor capital is returned too soon, there is a possibility that the business will be less inclined to maintain full productive capacity and service standards.

For the TNSP, unless there is genuine by-pass risk, accelerated depreciation, even in the absence of an immediate writedown of value, means that the TNSP effectively diminishes its potential return on capital i.e. if it perceives the regulatory rate of return to be favourable it would be effectively 'throwing money away'. Since there is evidence that rates of return granted by the regulatory authorities are normally regarded as generous, the Commission does not expect a TNSP to volunteer early write-down of their RAB in a capricious manner.[42]

The service provider will have to identify the assets which are to be written down in the regulatory accounts. These assets will be monitored as:

- future capital expenditure to replace the assets that have been the subject of more rapid depreciation may be deemed inappropriate; or
- in a more likely scenario, involving a request for re-instatement of the assets, if the by-pass threat diminishes it is important that the magnitude of the writedown and any depreciation allowances be properly accounted for.

If optimisation leads to a reduction in the RAB and the redundant assets are not appropriately identified in the accounts then it may be much more difficult to reinstate the assets at a later date if the by-pass circumstances change.

Optimisation of assets back into the regulatory asset base

Where assets are optimised out of the asset base, at some future time they may be brought back in. This situation may arise where for example there was over building of the network in a particular area in anticipation of future growth. This growth may not have occurred in a timely manner and the assets are removed from the asset base. Sometime in the future these assets may be added back into the asset base as they become utilised.

The Commission will carry assets that have been optimised out of the system forward in the regulatory accounts at the regulatory rate of return, but if optimised back into the RAB their value will be at the lessor of the depreciated replacement cost and their value in the regulatory accounts.

---

[41] An immediate write-down of asset without compensation by way of depreciation may be necessary where the threat is immediate or existing customers could not sustain the higher tariffs implied by augmented depreciation.

[42] The market value of TNSPs and sale prices of the business well above their RAB value strongly suggests that the cost of capital perceived by the equity holders is well above the regulatory rates of return approved by regulators.

In adding assets back into the RAB, an assessment of 'fair value' is required i.e. an assessment of past levels of recovery (return of capital).

Regulatory risk

The potential for further reviews of the asset base and re-optimisation could create the perception of increased regulatory risk. Under the National Gas Access Code there is limited scope to revise the opening asset base. While, under the NEC the Commission has the scope to revisit asset values, moreover the NEC would appear to provide for asset revaluation.

In a competitive market, enterprises have to face and manage the risk of stranded asset cost due to competition and technological advancement. Where assets are stranded as a result of poor investment decisions or adverse circumstances, a full commercial return on the investment will not be achieved. While the Commission does not wish to increase uncertainty, it believes it is not appropriate to shield natural monopolies totally from business risk.

While regulatory risk is a legitimate concern for a regulated entity, the Commission needs to have procedures in place to ensure that a regulated capital base includes only assets in service. Avoiding such tests could allow the regulated entity to inflate its asset base. In particular the Commission does not wish to allow a full commercial return on assets that are under-utilised or stranded as a result of poor investment decisions or adverse circumstances. It is to be appreciated that the UK and US experience suggests that it is rare in practice for assets to be deemed to be stranded by the regulator. The probability of stranding may be still less for integrated network assets than for upstream production facilities or energy purchase contracts.

Despite the apparent rarity of asset stranding in practice, exposing the entity to a stronger redundant capital test shifts the risk from the customers to the business. It may also have the desirable economic effect of improving the firm's asset management. To the degree that the firm bears a greater risk of redundant capital and stranded assets, the firm will take more care when making initial investments. However, the flexibility in depreciation arrangements described earlier means that most reductions in RAB value due to re-optimisation or redundancy will be reflected in depreciation without the need for immediate write-offs of asset values and therefore will not represent a financial loss to the TNSP. For such arrangements to work efficiently it will be important for the TNSP to advise the regulator well in advance of by-pass risk actually occurring. To the degree that the approach imposes some residual risks on the regulated entity, this is normally reflected in the return on capital.

The Commission notes the comments made in its Victorian Gas Access Decision that stranded cost or redundant capital exposure may lead to an increase in the investor's required rate of return. This could not be viewed as a favourable regulatory outcome. On the other hand, it could be argued that it is unfair to write-off redundant assets which were initially built in good faith but only prove to be ill-advised with the benefit of hindsight. The Commission is sympathetic to such views but considers the mechanisms in place to provide for faster return of capital (depreciation) on assets at risk, places the means and decision to significantly diminish any possible commercial loss in the hands of the TNSP. To the extent that a residual risk of loss remains, the beta factor used to develop the regulatory rate of return already reflects many elements of commercial risk via the benchmark basis for its determination. If the anticipatory write-down option is not exercised the TNSP has made a choice to enjoy the fruits of the regulatory rate of return on assets at risk against the capital

loss associated with by-pass. To the extent the choice reflects a regulatory rate of return which is over-generous it is hard to argue that any additional compensation is warranted.

4.5 Statement of Regulatory Principles

Proposed Statement – S4.1

In accordance with clause 6.2.3 of the NEC, the Commission will take the opening asset value for each TNSP as that determined by the Jurisdictional Regulator or consistent with the regulatory asset base established in the participating jurisdiction provided that the value of these existing assets does not exceed the deprival value of the assets. The Commission may require the opening asset values to be independently verified through a process agreed to by the National Competition Commission (clause 6.2.3(d)(4)(iii)).

Subject to clauses 6.2.3(d)(4)(i) and (ii) of the NEC any subsequent revaluation of any new assets and any subsequent revaluation of assets existing and generally in service on 1 July 1999 may be undertaken by the Commission having regard to the elements set out in 6.2.3(d)(4)(iv)(A)-(C) of the NEC.

Proposed Statement – S4.2

For future periods, prior to the commencement of a regulatory review the Commission may notify the TNSP that its asset base is to be revalued. As a basis for revaluation the Commission will conduct a DORC valuation to establish the maximum value of the asset base.

Revaluations and resets will be conducted according to a pre-disclosed DORC guideline. This guideline will be developed by the Commission prior to 31 December 2002. The guideline will include a treatment of easements where the change in the value of easements is reflected in depreciation.

Should the Commission conduct an asset revaluation it will produce a report. The report, as a minimum, will show the derivation of the valuation and the assumptions made.

Proposed Statement – S4.3

The Commission's valuation may include a write down of part of the system below DORC in recognition of evidence suggesting that the regulatory asset base valuation currently exceeds the ODV of the system.

Proposed Statement – S4.4

The service provider may decide to suggest an ODV valuation profile i.e. a valuation less than DORC. Where the service provider suggests a potential write down of the asset base, it must identify the particular assets and provide evidence of the potential

for economic by-pass. The Commission will monitor capital expenditure in relation to these assets.

Should the service provider not do this and optimisation leads to write down of the assets base, then the TNSP may incur a windfall loss of capital on these assets following any subsequent valuation.

Proposed Statement – S4.5

Assets which are optimised out of the regulatory asset base will be carried forward at the rate of return. If they are optimised back into the regulatory asset base, their value will be the lessor of the carry forward value or depreciated optimised replacement cost.

Where assets are reinstated into the asset base the Commission will take into account past levels of recovery (that is, the written down value when removed for the regulatory asset base).

5. Changes to the regulatory asset base over time

5.1 Introduction

The objective of encouraging continuing investment in privately owned natural monopoly industries will require investors to be provided with an assurance that they will earn a reasonable (risk adjusted) return on their investment capital, as well as the return of capital provided the market continues to value the services produced with that capital.

The NEC is silent on how new or proposed capital expenditures are to be reflected in the RAB, but an approach can be inferred from the NEC. According to the principles of best practice regulation the Commission needs to set out a process for the treatment of assets and how their value should be adjusted over time. Chapter 4 dealt with the issue of valuation generally and how such valuations need to be adjusted in response to changes in circumstances where parts of the asset base is no longer required or becomes under-utilised. This chapter considers the more regular adjustments to the RAB necessitated by new capital expenditures (capex) and the effects of the passage of time on the RAB due to depreciation and technological obsolescence.

5.2 The treatment of capital expenditure

Information asymmetry

There is a serious information asymmetry present that must be acknowledged at the outset in relation to capital expenditure. The regulator will not accurately know the appropriate amount of capital expenditure required by the TNSP, and will rely on the regulated entity to supply this information. In this case, there may be incentives for the regulated entity to inflate the reported capital expenditure relative to the true cost.[43]

A key incentive device in the hands of the Commission is the ability to base the RAB on the value of an optimised system. In relation to future investment the threat that an asset may be treated as stranded or partially stranded in the future will provide an incentive on the regulated entity to only undertake efficient investment. Such an incentive is necessary because the regulated entity is likely to have more information than the Commission about the efficiency of a proposed investment. Therefore, by making the regulated entity accept the consequences of its investment decision, the likelihood that inefficient investment will take place should be lessened. At the same time it is recognised that there may be capital expenditures undertaken in good faith that prove to be imprudent with the benefit of hindsight. This raises the question of whether the TNSP or users should pay for such mistakes.

It is worth discussing the analogous situation for a competitive market. A firm in a competitive market will likewise face an investment decision based on incomplete information and will need to make an assessment of the risks of undertaking the investment. This assessment will consider the expected return, potential for by-pass and rate of

[43] Chapter 5 of the NEC (clause 5.6) provides steps that a TNSP must follow in the planning and development of its network. At present there is no corresponding provision in the NEC for the Commission to assess the prudency of an investment prior to its commissioning.

technological change – where the potential for by-pass and rate of technological change will impact on the expected commercial life of the asset.

In a competitive market, once the investment has been undertaken the business bears all the risk. Should technological change or by-pass occur the business bears the cost of obsolescence or reduced returns. In the event that there is no technological change or the by-pass does not eventuate the business obtains a return on the asset for a longer period of time than initially expected. Thus for a business operating in a competitive market there will be times when it under recovers on expected returns and times when it over recovers on expected returns.

The Commission's approach is to develop a regime that replicates competitive market outcomes in relation to the treatment of capex.

Roll forward of capital expenditure

In relation to capex the dilemma is how should actual and forecast capex be treated at the start of the regulatory period given knowledge of forecast and actual capex for the previous regulatory period and forecast capex for the next regulatory period.[44] However, whether benefit sharing is appropriate in relation to underspending on forecast capital investment during the regulatory period is a separate issue and is discussed in Chapter 7.

There is no simple solution to the treatment of capital expenditure as each option must be considered in the context of its incentive implications. Hence the Commission at this point in time will adopt the following procedures:

- At the start of the regulatory period the Commission proposes to roll into the asset base projected capital expenditure for the regulatory period when it is scheduled to become operational. The reason for this proposal is that only once the asset is operational do users receive a service from it. Hence, it is inappropriate to require users to pay for an asset that they receive no service from.

  Any expenditure incurred prior to commencement may be rolled forward at the rate of return.

  It is to be noted that the forecast basis for asset inclusion provides an incentive encouraging the entity to inflate its capital expenditure forecasts. This is because the TNSP gets to keep the return on the difference between forecast and actual expenditure.

- In relation to capex at the start of the next regulatory period for the previous regulatory period, the Commission proposes that only actual capital expenditure since the previous review be included in the asset base.

  However, this may encourage the entity to spend what has been allowed, knowing that it will earn a return and not seek to achieve efficiencies in capital expenditure.

The Commission may review the prudency of large capital expenditures and may seek assurance that the TNSP has complied with the requirements of clause 5.6 of the NEC.

Ultimately, the TNSP is responsible for the capex it undertakes and will be subject to the sanction of periodic re-optimisation.

---

[44] Issues relating to the roll-forward of capital expenditure are elaborated upon in:
IPART 1999, *Rolling forward the regulatory asset bases of the electricity and gas industries: Discussion Paper*, January.

Prudency test for capital expenditure

Another feature of capital expenditure that should be recognised is that investment may be lumpy i.e. the next technically appropriate increment in capacity is large relative to existing capacity. As a result, investment in new capacity to meet growing demand may result in apparent excess capacity. The extent and period of the apparent excess capacity will depend on, among other factors, the pace and volatility of load growth.

Under the National Gas Access Code, new facilities investment must pass a prudent investment test to be included in the capital base (clauses 8.15-8.18).

The Commission proposes that a similar test be implemented for electricity transmission assets. Clearly if the full amount of the investment is not deemed prudent, the regulator should not add the full amount to the RAB. Where additional capability/capacity is included to cater for demand growth, some overbuilding may be considered prudent given the quantum nature of expansion and scope for economies of scale. Where there is doubt that overbuilding is prudent, a lesser amount should be added to the RAB corresponding to what would be considered clearly identifiable demand (including a margin sufficient to satisfy normal redundancy or safety requirements). In most cases the bulk of expenditures will be included because economies of scale would mean that a smaller capacity addition to infrastructure would be at a higher unit cost.

To ensure fairness, any portion of capital expenditure not incorporated into the RAB may be rolled forward with the regulatory rate of return in the same way as expenditure on infrastructure in progress. This accumulated amount may be added to the RAB when the assets are deemed by the Commission to be fully utilised. If the assets are never fully utilised, or the accumulated cost exceeds the costs associated with constructing the necessary infrastructure in multiple stages, that would be strong prima facie evidence that the initial expenditure was not prudent. As a consequence the accumulated cost should not be added to the RAB in its entirety at any stage. Such an approach will discourage imprudent over-investment while still providing adequate incentive for prudent over-building.

Benchmarking capital expenditure

Over time the Commission may consider undertaking benchmark analysis of capital investment. The objective of such an exercise may be to check that proposed investments are efficient in that they represent the minimum investment required to maintain the required service levels and represent best practice technology and costs.

5.3 Depreciation

The building block approach for determining the AARR for TNSPs includes an allowance for depreciation. Such an allowance recognises the need to recoup the outlay involved in the purchase of the asset over its useful life. Under the building block approach total revenue earned from the regulated assets consists of a depreciation charge and the allowed return on assets. The time profile of revenue will vary depending upon the regulatory depreciation profile chosen. However, it is not to be forgotten that over the economic lives of assets, the present value of total revenues to investors in many companies may bear little relationship to the book value of assets.

The accounting profession has a number of approaches for constructing the depreciation schedule. These include:

- nominal (or historic cost) accounting method – usually straight line or diminishing balance reductions of the original cost over time;
- current cost accounting method (based on replacement cost estimates) – again straight line or diminishing balance depreciation based on the age of the asset is applied;
- more flexible arrangements whereby depreciation is adjusted to complement other components of return so that the revenue stream mirrors the behaviour of an annuity; and
- variations on these.

Given that an asset's productivity may change over its life, it is somewhat arbitrary to assign a specific depreciation schedule whether it is a linear schedule, a diminishing balance schedule or some other variation. Therefore, as depreciation is merely a book entry in the financial accounts of a company, the choice of a depreciation profile is largely immaterial to the financial behaviour of the company.[45]

Given that depreciation and the methodology adopted to account for it is a critical element of a regulatory framework, an arbitrary approach is not an option. In Chapter 3 it was noted that the Commission believes that it is possible to achieve the advantages of a nominal (i.e. simplicity) and a real framework (i.e. a more appropriate profile of revenues) by adopting a more flexible approach to the treatment of depreciation schedules. That is, a nominal rate of return is applied to the regulatory asset base in conjunction with a non-linear depreciation schedule designed to yield a desirable time profile of revenues. The flexibility required by this approach has the side benefit that it is more easily adapted to accommodate situations where the regulatory asset base is periodically reset on a basis other than a simple CPI adjustment. For example, DORC based revaluation adjustments, as suggested by the NEC, are readily accommodated.

The adoption of a nominal approach places a number of constraints on how depreciation should be assessed.

The first constraint is that accumulated depreciation should not exceed the initial cost of the assets. Another way of viewing this is that in economic terms depreciation should match exactly the change in the regulatory asset value at the start of the period to the value assigned to the same assets at the beginning of the next (i.e. excluding the value of capital expenditure taking place during the period).[46] This is simply because any other outcome will imply a rate of return different from that intended in the calculation of the return on capital component of the cost of service.[47] The overall return is modified by what is an effective capital gain or loss associated with the regulatory asset value.

The second major constraint on the determination of regulatory depreciation is the need to achieve a time profile of revenues that is economically efficient. Traditional regulatory approaches to depreciation are deficient when considered in the context of attempting to

---

[45] Provided that managers and analysts are well aware of the approach being used when they are making their decisions. Tax accounts where the ATO provides prescriptive guidelines is a somewhat different situation. The accounting profession has set a number of standards which help to maintain some consistency but these are not necessarily appropriate for regulatory purposes.

[46] The one exception to this is where redundant assets have been removed from the regulatory asset base without depreciation compensation. In a probabilistic sense such losses are already included in the permitted rate of return.

[47] This requirement ensures that the NPV of the business is independent of the RAB/depreciation path taken over the life of the assets.

encourage economic efficiency. A nominal rate of return in conjunction with a linear depreciation schedule based on historical costs generates inefficient pricing outcomes. A real framework provides a simple mechanism for creating a non-linear depreciation schedule (when interpreted within a nominal framework). However, even this approach is really an ad hoc solution and does not directly focus on the question of economic efficiency. Given the deficiencies of traditional approaches, the Commission believes that there are arguments to reconsider the issue of depreciation.

This requires an economic assessment of depreciation quite different in focus from the simpler approaches proposed by accountants and the need to develop a profile of depreciation that is expected in a competitive market.

The competition depreciation approach

The adjustment of regulatory asset values and depreciation is the primary determinant of the revenue/tariff profile over time. Accordingly, the ideal mechanism for adjusting asset values is found by identifying the efficient time profile of revenues/tariffs. In Chapter 4 it was noted that the depreciation profile used was an important feature which could be used to give the desired economic properties of the DORC valuation methodology. Precisely, the same considerations apply if the depreciation allowances permitted within the regulatory framework are to have a meaningful interpretation. It was previously noted that in competitive or contestable markets prices tend to be relatively stable in a static demand environment and do not depend on the vintage of the assets used to supply the service or product (e.g. airline tickets). Volatility of tariffs is not only undesirable within the life of the asset but also between different generations of assets. If this is to be avoided so is disparity between the pricing associated with network assets of differing vintages (but subject to the same regulatory framework). Such pricing anomalies are illustrated in Figures 5.1 and 5.2.

Figure 5.1: Revenue volatility associated with linear depreciation (both nominal and real) for asset with 20 year life

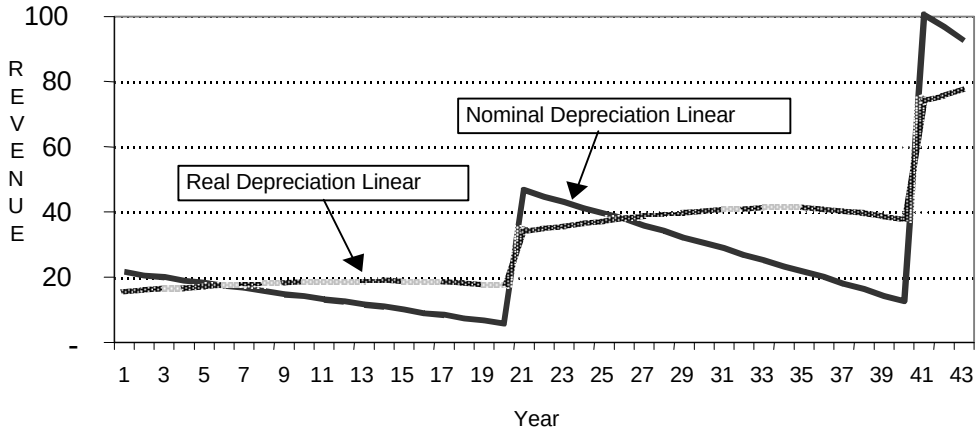
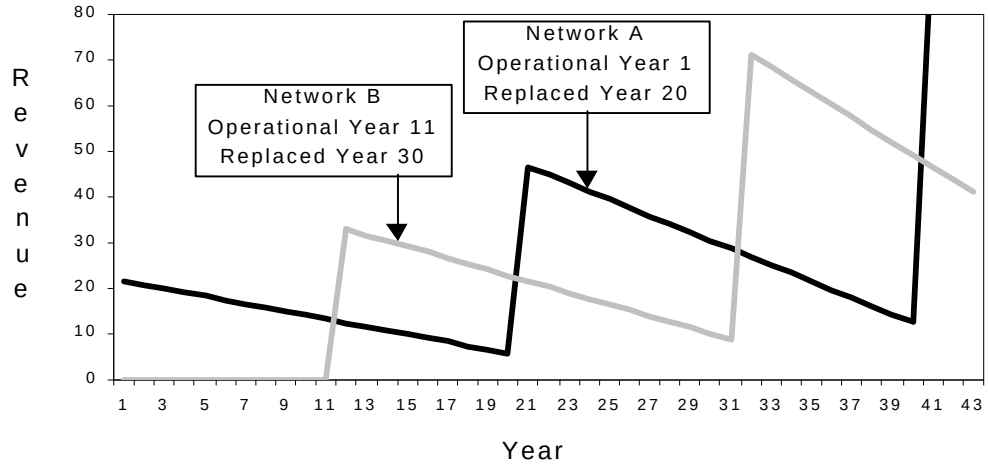


Figure 5.2: Vintage related revenue anomaly associated with linear depreciation (nominal) for assets with 20 year life but built 10 years apart

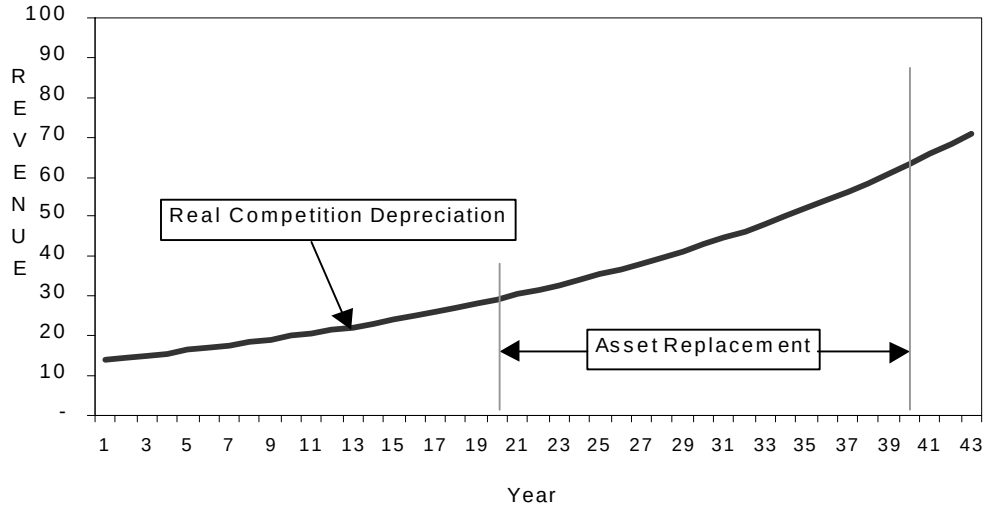


As noted in Chapter 4 pricing anomalies associated with the vintage of the asset are removed if depreciation is adjusted so that the revenue provided by the combination of depreciation allowances and return on capital takes the form of an annuity over the lifetime of the assets.[48] Such an approach is analogous to a housing loan where instalments are constant and the interest component corresponds to the return on capital and principal reductions correspond to depreciation.

As a contrast to the volatility exhibited in Figures 5.1 and 5.2, Figure 5.3 illustrates the smooth transition of revenues (and hence tariffs) over time when applying the annuity approach.

[48] Here we abstract from the inclusion of administration, operations and maintenance expenditures which are regarded as pass through items.

Figure 5.3: Time profile of revenues arising from the application of depreciation based on the annuity approach



Note: In this illustration the annuity was levelised in real terms so that the upward trend in the graph reflects the general rise in price levels in nominal terms. Also note that revenues for any identical network also coincide with the revenue profile regardless of construction date.

Use of the annuity approach means that overall expenses are levelised between generations of asset users, providing for a more equitable framework which mimics the behaviour of competitive market pricing. If the replacement cost of the assets at the end of their life were the same as the original cost, this would be an ideal solution. More likely, the replacement cost will change over successive generations of assets and such a solution would be susceptible to price changes whenever a substantial portion of the infrastructure is replaced if no account is taken of price inflation and rate of technological change. The mechanics of the annuity aspect of competition depreciation are described in more detail in Box A5.1.

Given the objective of making regulatory depreciation keep pace with economic depreciation, the TNSP should not be placed in a position where the market value of the assets are likely to fall below the regulatory asset base, and thus be vulnerable to economic or regulatory imposed stranding. Thus the simple annuity needs to be augmented with an assessment of the rate of price variation and technological change, this way the asset base is readjusted on an annual basis in a way consistent with a conceptual re-ODV valuation of the assets employed.

Indexation

A more difficult question is the assessment of how costs of infrastructure are likely to vary over time. This will depend on the nature of technological change in the industry and the rate of inflation. Fortunately, the rate of technological change in electricity transmission is relatively slow and as far as the regulatory framework is concerned it is only necessary to look ahead as far as the next regulatory period.

Over this period, the CPI-X framework already requires forecasts of inflation. Hence the only additional requirement is an indication of changes in the cost of replacement assets. Abstracting from depreciation and optimisation, this should essentially be identical to the expected change in the DORC valuation over the period. The difference from the CPI forecast would be attributable to the impact of technological change and the relative pricing of materials and labour required for capital construction. Alternatively it is possible to index

solely to the CPI, but this could cause the asset base and the rate of productivity to diverge creating the potential for rate shock when the assets are revalued. This indexation means that if the rate at which the cost of replacing assets is falling the rate of economic depreciation is rising.

The Commission proposes to establish an initial asset base and apply an indexation factor to it for each year based on forecasts of the rate of technological change and inflation.

Writedowns due to potential competition

The indexation approach described above means that if a potential entrant is restricted to the same new technology as the incumbent (or if optimisation only involves adopting new lower cost technology) the value of the RAB will imply overall costs that allow the incumbent to effectively retain its market. If this is the only potential source of competition the competition depreciation approach incorporating the indexing feature will effectively set the RAB at a conceptual DORC valuation on a continuing basis. On the other hand there may be other by-pass threats where competition capable of stranding part of the incumbent's asset base are not limited by the use of the same technology.[49] As noted in the previous chapter, it is important to recognise the potential for such competition in the RAB so that the revenues and consequent prices will be responsive to such threats in the same way that they would in a contestable market. Generally such threats can be identified well in advance and will be recognised by an appropriate adjustment of the depreciation schedule over the course of the regulatory period as described earlier.

In practice, the re-adjustment of the asset base on an annual basis will not be necessary. A more practical approach is to assess the likely valuation of the asset base at the end of the regulatory period by applying the DORC/ODV principles. Such five-year reassessments will greatly simplify the systematic incorporation of an allowance within the framework to take account of potential by-pass opportunities and major technological developments. Over the regulatory period it is known that the accumulated depreciation must equate precisely with the decrease in the regulatory asset base over the period plus any capital expenditures that have been added to the regulatory asset base during the period. In determining the depreciation allowance that should form part of the cost of service calculation in any year, the aggregate depreciation can be evenly allocated over the five years of the regulatory period as described earlier in Box 3.2. The allocation is not a critical issue since the CPI-X smoothing procedure will effectively even out the allocation.

Overall summary

The difference between the traditional frameworks and an annuity type framework is the way depreciation is calculated. Each of the more standard approaches calculates asset values and depreciation based on a linear interpolation between its (index adjusted) initial cost and zero linked to the age of the asset. This includes the traditional DORC approach where linear interpolation is used to determine residual value. In applying the annuity approach, the interpolation becomes a non-linear one designed so that the revenue stream (associated with the depreciation and return on capital) follows the respective indices applied to the revaluation of the asset base.

---

[49] Such threats may involve cherry picking of customers which can be serviced at a lower cost or may involve totally different technologies such as co-generation facilities embedded within a distribution system.

This translates into specific revenue streams. In the simple historical cost case this translates to a constant stream over the life of the asset. In the case of the real rate of return framework the revenues increase strictly in line with CPI. In the case of the current cost accounting framework the revenue stream increases in line with increases in capital costs. DORC revaluations would generate an identical outcome in the absence of re-optimisation. Depending on the rate of technological change and inflation some of these outcomes can be very similar. However, only in the case of the competition approach to deprecation will the revenues associated with the last days of an existing asset match those associated with its optimised replacement. Thus, the annuity growth approach to depreciation ensures a smooth transition of revenues/tariffs over time.

5.4 Statement of Regulatory Principles

Proposed Statement – S5.1

Prudent investment

The capital base may be increased to recognise additional capital costs incurred in constructing new facilities for the provision of services.

The amount by which the capital base may be increased is the amount of the actual capital cost incurred provided that:

- the amount does not exceed the amount that would be invested by a prudent TNSP acting efficiently in accordance with good industry practice and to achieve the lowest sustainable cost of delivering services; and
- one of the following conditions is satisfied:
  - the anticipated incremental revenue generated by the capital expenditure exceeds the investment cost;
  - the TNSP or users satisfy the Commission that the new capital expenditure has system wide benefits that in the Commission's opinion justify its inclusion in the capital base; or
  - the new capital expenditure is necessary to maintain safety, integrity or is approved under the NEC.

Should the actual capital cost incurred be deemed excessive by the Commission then the prudent amount of expenditure will be added to the regulatory asset base. The excess amount may be recorded in the regulatory accounts and rolled forward at the regulatory rate of return for possible transfer to the regulatory asset base at a later date.

Proposed Statement – S5.2

Forecast capital expenditure at each regulatory review will be independently assessed.

In relation to large capital expenditure projects the TNSP must provide sufficient evidence in its application to satisfy the Commission that the provisions of clause 5.6 of the NEC have been complied with prior to undertaking the capital expenditure.

This capital expenditure may still be subsequently subjected to an optimisation assessment.

Forecast capital expenditures will be included in the forecast asset base only when they come into service – prior expenditure (construction in progress) may be rolled forward cumulatively, augmented by the regulatory rate of return to determine the overall augmentation of the regulatory asset base.

Proposed Statement – S5.3

At the start of a regulatory period only actual capital expenditure in the previous regulatory period will be included (retained in the case of previously forecast expenditures) in the asset base. At the commencement of the regulatory period this means that:

- Prudent expenditures that were required and took place, but were not previously forecast, will be rolled in to the regulatory asset base.
- Any excess depreciation associated with forecast capital expenditures that did not eventuate will be applied as a reduction in the value of remaining items within the regulatory asset base at the start of the next regulatory period.

Proposed Statement – S5.4

In evaluating capital expenditure the Commission will benchmark capital expenditure forecasts.

Proposed Statement – S5.5

Depreciation will be linked to the change in regulatory asset values, in nominal terms during the regulatory period (with the exception of redundancy write-downs).

Changes in the regulatory asset value will be calculated according to the competition depreciation approach taking a five year perspective with respect to likely changes in a DORC based valuation of the regulatory asset base – which will require an assessment of technological change and potential by-pass threats to be provided by the TNSP.

Annex 5.1

Competition based approach to depreciation and practical implementation of the depreciation framework

A depreciation profile which gives rise to cost of service based prices over time that behave as if the industry was contestable is desirable. In this regard, it is noted that in a competitive market that prices do not depend on the age of the producing asset and that as a consequence revenues and prices do not jump when worn out assets are replaced.

Prices or revenues which are independent of the age of assets is a situation similar to that involved in paying off a housing loan - where instalments are fixed but the capital reductions vary depending on what portion of the instalment must be set aside to cover interest. In this analogy the instalment amount comprising both interest and capital payments (analogous to return on capital and depreciation combined) corresponds to the price and is independent of the how much of the loan has been paid-off (analogous to accumulated depreciation). From the perspective of the TNSP the revenue stream takes on the qualities of an annuity which is maintained over the life of the assets. Just as with a housing loan, principal reductions tend to be small initially and increase as the loan is paid off. The same thing happens with regulated assets, depreciation is initially small (or even negative) and increases substantially towards the end of the assets' life resulting in what could be described as 'back-end-loaded' depreciation.[50] Over time, the return on capital declines with the value of the RAB and the depreciation allowance increases by an offsetting amount so that total cost of service remains steady. The calculations underlying this approach are shown in Box A5.1.

Following the example described above, there are two aspects to the proposed depreciation profile:

- the smoothing of revenue paths (via the annuity approach) designed to avoid anomalous pricing associated the vintage of the assets employed e.g. inter-generational pricing disparities; and
- adjustments to reflect the impact of future potential stranding of identified assets (i.e. possible redundant assets).

Both aspects are motivated by noting the likely outcome if industry pricing is to follow what would be likely to occur in the presence of competitive forces. For this reason the approach to depreciation which integrates both of these features is called *competition depreciation*.

These aspects are illustrated and compared with the traditional straight-line depreciation in Figures A5.1, A5.2(a) and A5.2(b) below.

[50] If the life expectancy of the asset changes the depreciation schedule can be recalculated in a way similar to a home loan which has been renegotiated.

Box A5.1: The mathematics of competition depreciation

Annuity calculations

There are two approaches that can be used to derive the depreciation allowances required by the competition depreciation approach.

(a) The first is to simply rely on the analytical formulae which can be derived and are presented here; and

(b) The second is to utilise the power of modern spreadsheet programs calculating the depreciation as a residual after imposing the constraints on the revenues and asset values implied by the competition depreciation principles.

The levelisation can be achieved in either nominal or real terms. If levelisation is desired in nominal/real terms then all the rate of return and asset values need to be expressed in nominal/real terms.

Notation and formulae

A_t - asset value at start of period t

L - remaining life of the assets from start of period t

r - regulatory rate of return (pre-tax) (real or nominal as required)

The simple annuity calculation ignores the impact of productivity growth and price inflation so that in strict correspondence with the housing loans annual revenues (linked to combined return on and of capital – instalments) in each period is given by

$$R_t = A_1 \cdot r / [1-(1/1+r)^L] \text{ for } t \leq L$$

Which includes the return on capital

$$A_t \cdot r$$

And depreciation is given by the difference

$$R_t - A_t \cdot r$$

On this basis the time profile for the value of the RAB is defined by

$$A_t = A_1 [(1+r)^L - (1+r)^{t-1}]/[(1+r)^L - 1]$$

Integrating impact of technological change on capital costs

Incorporating the impact of productivity improvements on depreciation allowances can similarly be handled either analytically or computationally as part of spreadsheet based analysis of cash flows.

The formulae presented here express all quantities in nominal terms. For a real framework it is necessary to adjust the parameters to derive the corresponding quantities expressed in real terms. For example r would become the real WACC and f would be set to zero so that g becomes –p etc.

Notation and formulae

f - inflation rate

p - trend productivity growth

g - estimated rate of asset price inflation

$$g = (1+f) \cdot (1-p) - 1$$

Over time the replacement costs of assets (RC) is assumed to be governed by changes in asset based productivity

$$RC_t = RC_1 (1+g)^{t-1} \quad \text{(nominal), and}$$

$$RC_t = RC_1 (1-p)^{t-1} \quad \text{(real)}$$

The corresponding influence on revenue is given by

$$R_t = A_1.(r-g) /\{1-Z^L\} \text{ for } t \leq L$$

where $Z = (1+r)/(1+g)$ in a nominal context

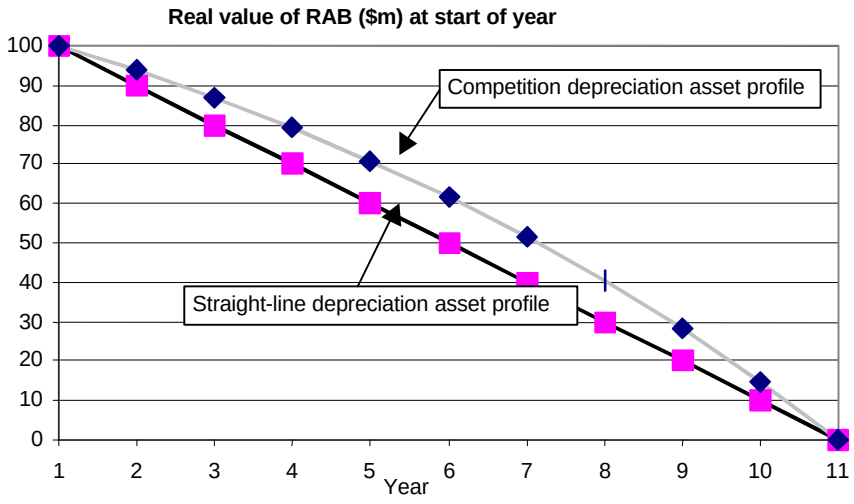
and $Z = (1+r)/(1-p)$ in a real context

and the path for the RAB (based on the conceptual DORC) is defined by

$$A_t = A_1.(1+g)^{t-1} \cdot [Z^L - Z^{t-1}]/[Z^L - 1]$$

Figure A5.1: Comparison traditional straight-line depreciation with competition depreciation profile (assuming 10 year life and 10 per cent real ROR)

(a) Regulatory asset valuation profiles



(b) Corresponding depreciation profiles

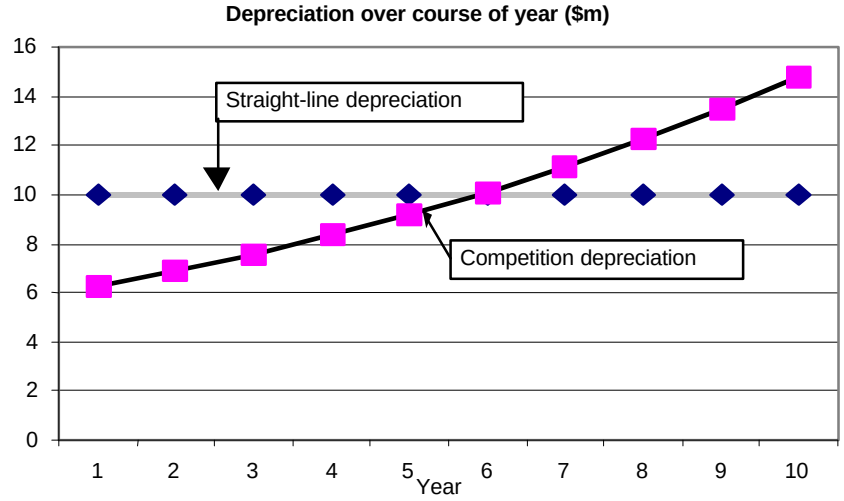
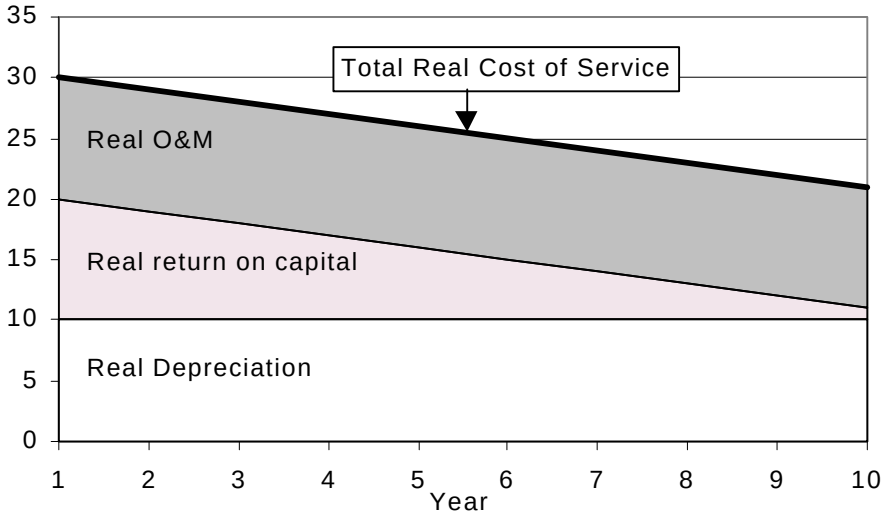
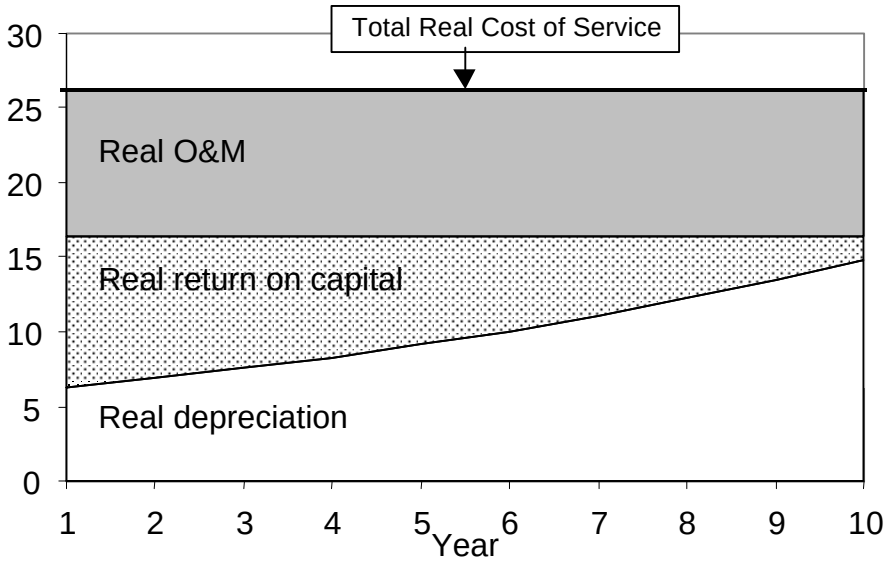


Figure A5.2(a): Traditional straight-line depreciation approach*



* Components contributing to real cost of service based revenue cap assuming 10 per cent real ROR and constant depreciation of asset over 10 years

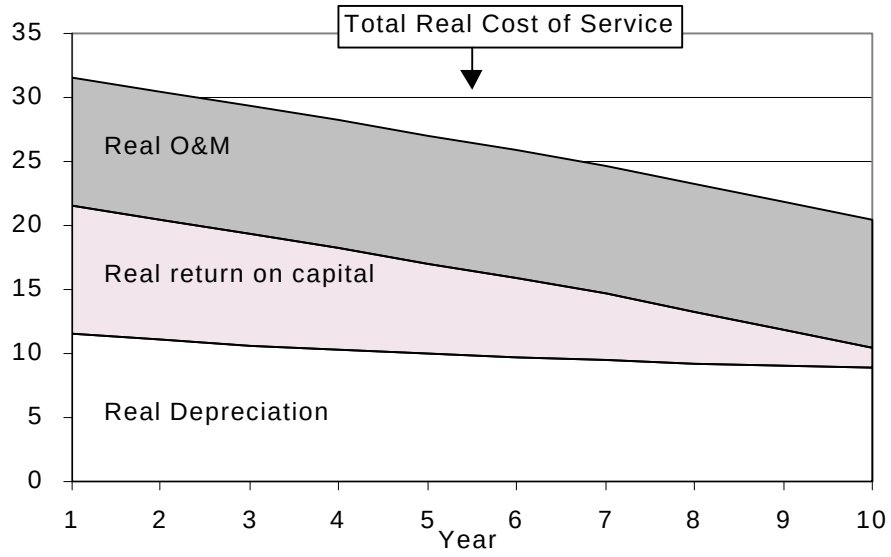
Figure A5.2(b): Competition depreciation approach*



* Components contributing to real cost of service based revenue cap assuming 10 per cent real ROR and competition depreciation profile of asset over 10 years (note that the combined return on and of capital remains constant)

The annuity aspect of the depreciation schedule can be combined with the technological change factors and by-pass concerns discussed earlier to give a DORC based valuation which is economically meaningful in terms of a market valuation. It is the value that the business would buy the existing assets at as an alternative to acquiring a new set of assets installed in an optimal way. The combined approach is referred to as the *competition based approach to depreciation*, the 'competition' term referring to the responsiveness of associated pricing to changes in replacement costs taking account of general price increases and technological change in a manner which mimics competitive market behaviour. The mathematics of the approach were indicated in Box A5.1. However, as an illustration, if the effect of technological change or potential by-pass meant that the tariffs/revenues in Figure A5.2(b) needed to reduce by 5 per cent per year for the NSP services to remain competitive, this can be achieved by an adjustment to the depreciation schedule. The end result is illustrated in Figure A5.3.

Figure A5.3: Depreciation profile that achieves 5 per cent per annum reduction in tariffs



This approach to the DORC methodology is also directly applicable as part of the regulatory framework in terms of how depreciation should be determined on an annual basis. It is conceptually possible to consider a DORC revaluation of the regulatory asset base on an annual basis as the main basis for assessing how the RAB should move over time and what allowance should be made for depreciation within the cost of service calculations. This has several advantages. First, the revenues and prices behave more like those emanating from a competitive market. Second, there are less likely to be shocks associated with any reassessment of the RAB or from by-pass. Third the RAB will generally reflect its market value. Rather, than follow the path of valuations suggested by periodic DORC/ODV re-valuations, the regulatory framework is better suited to gradual adjustments in depreciation and asset values towards what may be considered the appropriate DORC based asset values. Actual DORC valuations performed in respect of existing assets would be catered for similarly by gradual adjustment to the new level (as suggested in Box 3.2 earlier).

Example:

Suppose the residual value of the RAB at the end of the last regulatory period was $100m but that a recent DORC reassessment suggested that optimised replacement cost was $200m and the remaining life of existing assets was 30 years compared to the expected life of new assets of 60 years. Assume a regulatory rate of return of 10 per cent and ongoing reductions in capital costs of approximately 2.6 per cent per annum (2.5 per cent forecast inflation more than offset by 5.0 per cent per annum productivity gains).

The assessed DORC value at the start of the next regulatory period would be using the analytical formulae for competition depreciation (r= 0.1, p= 0.05, f= 0.025, g= -0.02625, and Z = 1.129653). So that applying the formulae in Box A5.1 the DORC value at the start of the regulatory period is $90.08m, compared to the value assigned to the RAB of $100m. In keeping with the philosophy that the regulatory framework does not seek to make instantaneous changes to the RAB involving windfall gains or losses, but allow most changes to be reflected through depreciation as the RAB continuously moves towards what is perceived to be the long term ODV profile. Consistent with the approach described in Box 3.2 dealing with a reassessment of the RAB in response to a by-pass threat, the same 5 year adjustment mechanism can also be adopted for a revaluation based on a DORC valuation.

Applying the parameters above the ORC can be used to forecast the DORC valuation at the end of the regulatory period just as easily as at the beginning, it is $78.86m. Using this as the target for the RAB it is clear that over the regulatory period it would be necessary for accumulated depreciation (in the absence of capex) to total $21.14m (or $4.22m per annum). If this allowance for depreciation leads to unacceptable price escalation the calculation could have been re-done with the objective of targeting the long-term DORC value over 10 years rather than 5. This would have resulted in annual depreciation amounts of $3.09m. This compares with annual depreciation of $3.33m per year if the original RAB value was depreciated over its remaining life and with depreciation of around $2.4m if the RAB was already at its DORC valuation. It is worth noting that the 21 per cent reduction in the RAB over the period means that a lower average return on capital (roughly $1m per annum less) will partially offset higher revenues linked to increased depreciation so that overall the volatility observed in tariffs will be relatively minor.

Notes:

1. The competition depreciation approach is designed to reduce long term (inter-generational) revenue volatility not necessary short–term inter-regulatory period volatility – that is the purpose of the CPI-X smoothing procedure. Hence, no additional benefit is perceived in complicating the procedure by attempting to calculate competition depreciation on an annual basis rather in 5 year lumps corresponding to regulatory periods.
2. In most cases value of the parameters to be used will come from the assumptions forming part of the regulatory framework or, in the case of the trend change in productivity, as a side consultancy or benchmark study. The regulatory return r only has a significant influence towards the end of an assets life and before that a rough approximation will suffice (e.g. a 100 per cent error will be likely to affect the assessed DORC by less than 1 per cent with 50 per cent of its life to go). The main difficulty in obtaining an accurate pre-tax estimate of the WACC is the effective tax rate to use in its calculation. However, near the end of its life historic data can be used as a very good basis for making the effective rate calculation relevant to the expiring assets.

6. The weighted average cost of capital and the return on capital

6.1 Introduction

The NEC requires the Commission to consider a regulated entity's need for a fair and reasonable rate of return when determining the maximum allowed revenue (MAR). In determining a rate of return the NEC also requires the Commission to consider the WACC for each transmission network.[51] The WACC is a commonly used measure for determining a return on an asset base and its adoption, along with the building block approach, has been endorsed overwhelmingly by submissions received in response to the *Regulation of Transmission Revenues Issues Paper.*

To establish an acceptable level of return on capital for the network business owner the building block approach combines a rate of return with a regulatory asset value. Given the capital intensive nature of electricity networks, the return on capital and return of capital component of regulated revenue could account for more than 80-90 per cent of the annual aggregate revenue. Therefore relatively small changes to the rate of return can have a significant impact on the total revenue requirement, and ultimately end user prices.

It is important that the rate of return be set at an appropriate level which reflects a commercial return for the regulated businesses. Setting a rate of return below the cost of funds in the market could make continued investment in developing the network unattractive for the network owner. This might create pressure for the regulated business to reduce maintenance and capital expenditure below optimum levels thus degrading the quality of service provided. Conversely, if the rate of return were set at too high a level by the regulator, the regulated business would earn a return in excess of its cost of capital. This would distort investment decision and price signals to consumers and investors, resulting in a misallocation of resources and a sub-optimal economic outcome.

This chapter of the *Draft Regulatory Principles* defines the approach for setting an appropriate rate of return that promotes certainty and predicability in the regulatory environment. The chapter sets out the principles and framework that the Commission will use in determining a WACC. However, many aspects of the WACC approach are complex and contentious, and issues relating to estimating the WACC have recently been discussed in a number of publications (IPART,[52] ORG[53] and the Commission[54]). In fact, the determination of the rate of return was the most complex and contentious issue in the Commission's and the ORG's assessment of the Victorian Gas Access Arrangements (6 October 1998). It was the

---

[51] A method for calculating WACC is outlined in Schedule 6.1 of the NEC.

[52] Independent Pricing and Regulatory Tribunal 1998, *Pricing for electricity networks and retail supply, Issues Paper*, September.
Independent Pricing and Regulatory Tribunal 1998, *Draft Decision, Access Arrangement Great Southern Energy Gas Networks Pty Limited*, September.
Independent Pricing and Regulatory Tribunal 1998, *The rate of return for electricity distribution networks, Discussion paper*, November.

[53] Office of the Regulator-General 1998, *Consultation Paper No.1, 2001 Electricity Distribution Price Review, Framework and Approach*, June; Office of the Regulator-General 1998, *Access Arrangement – Multinet, Westar, Stratus: Final Decision*, October.

[54] ACCC 1998, *Victorian Gas Access Arrangements, Final Decision*, 6 October; ACCC 1998, *Regulation of Transmission Revenues Issues Paper*, May, and ACCC 1998, *TransGrid Issues Paper*, December.

subject of significant public comment both before and after the release of the Draft Decision.[55]

Financial theory is constantly evolving to meet the challenge provided by ever more sophisticated analysis of investor returns. For example, at present there is substantial acceptance of the theoretical underpinnings of the CAPM, which is used as the benchmark for determining what rate of return may be appropriate. However, there is no unambiguously best approach to its application within the confines of normally available financial data. As a consequence, judgement must play an important role in the determination of several key parameters. Moreover, the robustness of well established theoretical models is increasingly being questioned by new empirical work and observations. For this reason the Commission has endeavoured to develop a flexible framework for the determination of WACC and its parameters in order to accommodate any evolution of the debate.

6.2 The capital asset pricing model

The NEC notes that a variety of methods which can be applied to estimate the cost of equity capital of a TNSP. CAPM remains the most widely accepted tool in practice. The basis of CAPM is the relationship between risk and return. According to the CAPM risks are classified into:[56]

- Systematic risk – the risk applicable to the market as a whole, such as level of economic activity, inflation, tax rises, and interest rates; and
- Specific risk – the residual risk unique to an individual firm or a small group of companies that form a subset of the market.

The theory requires that specific risks that can be eliminated through diversification are not to be compensated. Consistency with the WACC/CAPM framework requires that the net impact on earnings of specific risks be factored into projected cash-flows and not the cost of capital.[57]

CAPM specifies the required return on equity given the opportunity cost of investing in the market, the market's own volatility, and the systematic risk of holding equity in the particular company, that is according to the relations:

---

[55] A public forum was held specifically to address rate of return issues**.** A transcript of this forum and copies of submissions received prior to and following release of the Draft Victorian Gas Access Arrangements Decision are available on the Commission's public register relating to the matter.

[56] Discussion of the risk/return relationship can be found in:
Brealey, R.A. and Myers, S. C. 1996, *Principles of Corporate Finance*, McGraw-Hill, New York, International Fifth Edition, Chapter 8.

[57] In relation to this matter the Commission's Victorian Gas Access Arrangements Decision was criticised for not taking into account all the relevant risk factors. It was argued that unique risk needs to be accounted for via the cash flows or an adjustment to the WACC. However it is not a straight forward calculation to obtain a valuation of all diversifiable risk.

$$r_e = r_f + \beta_e(r_m - r_f) \qquad \text{(Eqn 6.1)}$$

where: r_f = the risk free rate of return (usually based on government bond rates of an appropriate term);

$(r_m - r_f)$ = the market risk premium — the return of the market as a whole less the risk free return; and

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

Whilst CAPM has widespread support, it has its critics. However, it should not be assumed that the application of alternative approaches would be any less controversial.[58] Despite its drawbacks, CAPM is frequently used by practitioners because of its relative simplicity in defining and measuring risk factors. Its supporters argue there is extensive empirical evidence that the model provides a reasonably accurate estimate of returns required by the market.

For these reasons the Commission will use CAPM, but does not rule out the option that the TNSP may consider alternative models to derive a value for the return on equity. However, where alternative models are used they must be backed by evidence and the service provider must be willing to subject the results obtained to academic and public scrutiny. In the event that there is any material doubt or noteworthy contention the Commission will, in the absence of a more generally accepted approach, revert to the use of the CAPM.

6.3 The establishment of equity returns and formulation of the WACC

The basic rate of return critical to the regulatory framework is the expected nominal post-tax return on equity (r_e) for the business since it is what determines whether investors will be willing to advance equity to finance the capital infrastructure required to provide the network services. It is important to note that this return is the net return likely to be achieved by investors after taking account of all the costs involved in running the business including costs associated with complementary sources of capital, other factors of production and payment of tax liabilities. The major complementary source of capital is borrowed funds, the cost of which is the interest rate applying to the loans involved.[59] It is common practice to summarise the overall cost of capital as the WACC in nominal post-tax terms as:

$$W = r_e \frac{E}{V} + r_d (1 - T) \frac{D}{V} \qquad \text{(Eqn 6.2)}$$

where: r_e = required rate of return on equity, after company tax;

r_d = pre-tax weighted average cost of debt;

T = effective tax rate;

E = market value of equity;

D = market value of debt; and

V = market value of debt plus equity.

---

[58] Other methods used to estimate the cost of equity include price/earnings ratio, dividend growth models and arbitrage theory. A discussion of alternative approaches can be found in:
Davis, K. and Handley, J. 1998, The cost of capital and access arrangements, in *Infrastructure Regulation and Market Reform: Principles and Practice, joint PERC and Commission publication*.

[59] Other sources of capital are possible (e.g. converting debentures) and these can be included within the framework if appropriate.

Since interest payments are a tax deduction for the business, the effective cost of debt is reduced in *after-tax-terms* by the factor (1-T) in formula (Eqn 6.2). This tax reduction is often referred to as the *tax debt shield*. Provided the asset as a whole is expected to achieve the correctly derived WACC, equity holders will assess r_e to be their expected rate of return.

Australian tax payers also gain benefit from imputed tax credits linked to the issue of franked dividends by Australian firms.[60] Since this is a tangible benefit to investors, the CAPM relation for the r_e may overstate the after-tax return required by investors. There is an alternative formulation analogous to (6.2) derived by Officer for the nominal post-tax WACC which makes an adjustment for the effect of imputation credits utilised by shareholders.[61] This formulation introduces a parameter γ with a value between 0 and 1 to reflect the fact that an investor may not benefit to the full value of the imputation credit implied by the tax payments of the company.[62] The value chosen for γ is a matter of judgement for the regulator and is one of the regulatory parameters discussed later in this chapter.

The post-tax nominal WACC as defined by the formula proposed by Officer is:

$$W = r_e \frac{(1 - T)}{(1 - T(1 - \gamma))} \frac{E}{V} + r_d (1 - T) \frac{D}{V} \qquad \text{(Eqn 6.3)}$$

Some regulatory frameworks require the use of a real and/or pre-tax WACC measure. A pre-tax nominal WACC may be obtained by grossing up the post-tax estimate on the basis of an effective tax rate applying to equity and the debt shield.[63]

To obtain a real WACC estimate it is necessary to make a further adjustment to take account of the anticipated rate of inflation. For example, the WACC in the formulation proposed in the Victorian Gas Access Arrangements and by a number of UK regulators requires the application of a real pre-tax version of the WACC. This raises a difficult issue concerning a valid conversion to deduce what the corresponding real pre-tax WACC needs to be within that regulatory framework to yield the required return on equity.

The appropriate conversion requires a number of steps. First, the formula needs to take account of the effective tax rate of the firm, and this requires forecasts of tax arrangements and inflation well into the future. This represents a source of considerable uncertainty. Second, since the effective tax rate depends on the rate of inflation, a simple procedure to adjust first for the effective tax rate and then for inflation does not necessarily give the desired result. Similarly, the reverse procedure to obtain a required real pre-tax rate of return is also compromised by the interaction between the effective tax rates and anticipated

---

[60] The Australian tax system does not seek to impose double taxation of company income. Hence tax credits can be associated with dividends by virtue of the fact that the business has already paid tax on its income. In the absence of imputation credits income is potentially taxed twice, first as company earnings and secondly as dividend income in the hands of shareholders. Franking credits associated with dividends can be up to the amount of tax paid by the company on a per share basis.

[61] Officer R.R. 1994, The cost of capital of a company under an imputation tax system, *Accounting and Finance*, 34 1, May.

[62] This may be due to the investor having insufficient tax liabilities against which the imputed credits may be offset. In addition the company may choose to retain some of the taxed earnings so that the benefits are deferred for a period and need to be discounted.

[63] It should be noted that the effective tax rate T_e applicable to equity earnings on average may be considerably less than the corporate tax rate and also the effective tax rate applying to the tax deductibility of interest (normally equal to the corporate tax rate). Hence the formulation requires the two different effective tax rates to be used in conjunction with the equity (T_e) and debt (T_d) return terms.

inflation. In this latter case, a simple formula based conversion is inaccurate due to depreciation allowances for tax purposes having a different timing from depreciation for regulatory purposes. These issues were comprehensively discussed during the course of the assessment of the Victorian Gas Access Arrangements (Appendix E of Final Decision). In that decision the Commission concluded that none of the formulations for the real pre-tax WACC proposed delivered to investors the return suggested as appropriate by the CAPM. Instead of choosing a formula based WACC the Commission, in that instance, used cash-flow modelling to deduce what real-pre-tax WACC, when applied within the regulatory framework, was likely to deliver the required return on equity. This is equivalent to having available the correct conversion formula for the WACC, if an analytical expression of such a formula exists.

The issues and the preferred way of dealing with the problem are discussed in the Supplementary Paper attached to these *Draft Regulatory Principles*.[64] The outcome of the Commission's analysis, which is supported by the opinion of financial experts, is that:

- post-tax rates of return directly available from the CAPM benchmarks should be used as the basis for assessing the necessary revenue streams to support the return on equity; and
- tax liabilities and potential imputation credits can be estimated directly from the cash-flows based on the regulatory accounts, known tax law and inflation forecasts relevant to the regulatory period immediately ahead.

With this approach, no long term forecasts are required and the tax liabilities of the business can be treated as a cost of business in a natural extension of the building block approach. Also the approach assures the investor of the necessary post-tax return on equity in every period and there is no issue over deferred benefits or liabilities that might otherwise compromise the regulatory compact.

The Commission has chosen to implement this approach, that is, using the nominal rate of return on equity directly available from the CAPM. In this way, the approach totally avoids issues of conversion and the difficulty of explaining regulatory rates of return expressed in real terms when financial benchmarks are expressed in nominal terms. Information revealed in the cash-flow analysis makes the subsequent calculation of the corresponding WACC a relatively simple exercise. However, it is to be noted that because the cash-flow approach considers taxes against the regulatory accounts for each regulatory period, the pre-tax equivalent WACC will vary from one regulatory period to the next and from one service provider to another.

Although the approach is more direct, it is no surprise that most of the regulatory parameters and assumptions required in any WACC formula approach are also relevant for developing a cash-flow based analysis.

The remainder of this chapter discusses these parameters and how they should be determined for the purposes of the regulatory framework. In particular, it is necessary to estimate future expectations of parameters relevant to the CAPM model such as the equity beta relevant to

---

[64] The Supplementary Papers include a commentary by NERA summarising the regulatory frameworks adopted in Australia and overseas, focussing on the difficulty of conversion and related problems identified in those frameworks. Also included is a paper by the Commission (Part A) which is of a more technical nature and addresses the specifics of the conversion problem and other aspects of the regulatory framework which create difficulties for revenue and price cap regulation. Copies of the Supplementary Paper are available from the Commission upon request or from the Commission's website.

the business, the relevant risk free rate of return and the market risk premium as well as the parameters determining other items in the cash-flow analysis. These parameters together with other parameters of the WACC based formulae will be collectively referred to as the WACC parameters in the discussion below.

The debate on the appropriate value of individual parameters is extensive and there is no universally accepted value for each parameter. Where there is any doubt the Commission will consider a sensible range of parameter values. However the Commission will still be required to decide on a final regulatory outcome with an implicit value for the WACC, and the final choice will be the result of informed judgement in the context of the proposed regulatory framework. This judgement may be informed by the results of alternative models for assessing the cost of capital, assessment of risk specific to the utility, evidence of market expectations and financial indicator analysis (as outlined in Chapter 9).

Use of a benchmarked rate of return

The rate of return and other parameters can be determined and applied on an industry-wide basis, or can be determined for each TNSP and benchmarked against other TNSPs or other companies with similar risk profiles. The NEC appears to allow for the WACC to be determined on an industry-wide and/or individual TNSP basis.[65]

A benchmarked rate of return assumes the adoption of efficient policies by the TNSP with respect to financing, debt management and taxation. The market normally values a stream of income based upon the actual position of the investor and the actual position of the target firm. The calculation of a benchmarked rate of return is however based upon assumptions about the average investor and about an average or benchmarked firm. This implies that it is possible that the calculated rate of return may be above or below the regulated entity's true cost of capital.

The Commission considers, however, that the use of a benchmark rate of return is appropriate as that approach is consistent with the general approach under incentive regulation, whereby firms are permitted to retain any additional value that flows from outperforming predetermined benchmarks (and similarly, are not rewarded for simply achieving the benchmark performance). It is also consistent with the view that the market would not compensate a business with a higher rate of return to meet the cost of sub-optimal debt management, taxation management and financing policies.

Gearing levels

A gearing (debt/assets) ratio needs to be established to identify the appropriate weighted average cost of debt and equity in the WACC. The Commission notes the Modigliani-Miller theorem suggests the relevant cost of capital should be invariant over a broad range of gearing possibilities and therefore the gearing assumption used is not a critical one.[66]

The Commission considers the nature of regulation means there is relatively low commercial/financial risk to these businesses and the gearing for these businesses could be correspondingly high without adverse credit consequences. Hence, while the actual level of debt is at the discretion of the TNSP, the Commission will consider a benchmark for the gearing level.

---

[65] Clauses 6.2.2(b)(2) and 6.2.4(c)(4) of the NEC.

[66] This view is endorsed by Schedule 6.1 (clause 5.1) of the NEC.

The impact of ownership on WACC parameters

There has been considerable debate over whether weight should be given to the possibility of foreign ownership of a business and the implications this would have for the parameters used in the WACC estimation (such as the gamma). The Commission considers this debate to be somewhat misguided. For example, if the possibility of foreign ownership is used to moderate the value of γ, it would seem also appropriate to modify other parameters such as the gearing, the perceived beta values and the effective tax rate on the same basis. Clearly, the different perceptions, tax treatment and opportunities are major factors which could lead a foreign purchaser to value the business more (or less) highly than an Australian operator. So although a foreign firm may not be able to take advantage of imputation credits, the business could be counter cyclical to its domestic operations and therefore provide shareholder benefits in other ways (effectively the foreign firm may perceive a lower beta). This in turn may mean that optimal leverage is also higher for the foreign firm. Such effects may be amplified if the foreign firm is able to derive more generous tax depreciation concessions than an Australian owner.

On the basis of the above arguments the Commission proposes to assume that the operator of any regulated business is Australian owned with the WACC related parameters determined accordingly. The alternative of assuming foreign ownership may also be methodologically sound, but is less feasible given the difficulty of assessing the correspondingly relevant WACC parameters. If there is a concern that a foreign owner is able to justify a higher purchase price for the assets, that is not a regulatory issue. Similarly, the prospect that a foreign owner may, after exhausting its own tax concessions, sell to an Australian owner which then takes advantage of the imputation credits that typically accumulate after the other tax concessions have been exhausted, is not an issue relevant to regulation. However, this final point provides another mechanism to support the view that a non-Australian mainstream investor may not have to forgo any of the value of benefits/concessions exclusive to Australian shareholders.

Further on the basis of competitive neutrality the Commission will abstract from government ownership and develop commercial return estimates based on private ownership. This is consistent with the approach outlined in Schedule 6.1 (clause 2.1) of the NEC.

6.4 The risk free rate

The most commonly used proxy for the risk free rate is the ten year government bond yield, and this is endorsed by Schedule 6.1 of the NEC. The benefit of using this contemporaneous measure of the risk free rate is that the value is readily measurable and the resulting revenue requirements and network prices tend to reflect current costs. A superior alternative may be the five year Government bond rate since it corresponds to the regulatory period. There is some tension in the choice since the ten year rate is the benchmark risk free rate used in some key studies of the market risk premium which is also a CAPM parameter. However, undermining this rationale is the fact that in beta estimation short term interest rates (e.g. the 90 day bank bill rates) are frequently used.

Another factor that may influence the selection of the risk free rate is the frequency of regulatory decisions for which WACC is applied. Arguably, if the allowable WACC is revised periodically, then it is not necessarily appropriate to use a longer term cost of capital as a benchmark. Some argue that an appropriate term for calculating the risk free interest rate for CAPM is the term between regulatory reviews. For practical purposes, the choice

between a 5 year and 10 year interest rate is largely immaterial since it is the real interest rates that matter. As the difference between short and longer term real interest rates is small, there will be only minor differences in the WACC estimates. However, to ensure consistency with other parameters having a term structure linked to the regulatory period the five year Government bond rate is the preferred measure.

While it is theoretically correct to use the 'on the day' rate under CAPM, the Commission acknowledges a practical difficulty in that use of the 'on the day' rate introduces a degree of short term variability at times of market uncertainty. Therefore, the Commission considers it appropriate to adopt an average over a relatively short period to smooth daily variations. The Commission also understands the benchmark of a has a degree of acceptance in financial markets. In conclusion the Commission will adopt a 40 day moving average of the 'on the day' five year government bond rate.

6.5 Market risk premium

The market risk premium represents the return that investors expect the market as a whole to deliver in excess of the expected risk free return.[67] The NEC notes that the market risk premium (MRP) can be observed by considering the historical data of yield gaps between returns on equity, r_m and returns on risk free debt, r_f, namely:

$$MRP = r_m - r_f \qquad \text{(Eqn 6.4)}$$

The MRP is a parameter in the CAPM which, together with the risk free rate and firm specific beta, determines the expected return on equity in the business.

Theoretically the market risk premium is an ex-ante premium based on a forward view of the market. However, for practical reasons much of the analysis of its value has relied on the premium historically achieved, as a proxy measure. Historical estimates are contentious as, for example, the more stable inflationary environment now prevailing may mean that the relevant market risk premium is less than has been observed over recent years. Also following the introduction of imputation, the premium, as measured in the conventional way in Australia, would have fallen to reflect the additional value of franking credits. However, this is not a material factor since the return relevant to the formulation is one which includes the value of imputation credits.

'Conventional market wisdom' favoured by many financial analysts indicates the market risk premium lies in the region of six to seven per cent under a classical tax system. Professor Kevin Davis suggests this may not be in keeping with a forward looking CAPM framework favoured by the Commission.[68] For example, the more stable inflationary environment now prevailing may mean the relevant market risk premium is less than has been observed over recent years. Also following the introduction of imputation, the premium as measured in the conventional way, would have fallen to reflect the additional value of franking credits. In a consultancy for the Commission relating to the Victorian Gas Access Arrangements, Professor Davis derived figures based on a dividend growth model. With this approach he estimated a range of between 4.5-7.0 per cent for the market risk premium.

---

[67] IPART, *The Rate of Return for Electricity Distribution Networks, Discussion Paper*, November 1998, p. 15.

[68] Professor Kevin Davis, *The Weighted Average Cost of Capital for the Gas Industry*, report prepared for the Commission and the Office of the Regulator General, pp. 11-12.

The perceived downward trend in the market risk premium is a global perception and is not confined to the Australian economy. There are a number of articles supporting a downward reassessment of the market risk premium over recent years, some based on a re-assessment of the appropriate methodology, others focussing on trends in financial markets.[69]

In summary, the market risk premium is an inherently poorly defined parameter with considerable uncertainty associated with its estimation. Ways to measure the market risk premium are evolving, and there is an ongoing debate. The Commission will use its judgement in setting the market risk premium, noting the views of market participants as to its value are just as important as its statistically determined value. The Commission considers that in view of the evidence available from financial markets and the direction of the ongoing debate there is good reason to believe the value should be reduced below what may have been considered conventional wisdom a year or so ago. For example, it is probable that a market risk premium of say 5 per cent is more appropriate now, than, say the 6 per cent considered as appropriate, at the time of the Victorian Gas Access Arrangements Decision.

6.6 Equity beta

Beta is a measure of the expected volatility of a particular stock relative to the market as a whole. It measures the systematic risk of a stock, that is the risk that cannot be eliminated in a well balanced diversified portfolio.

The process of beta estimation is very sensitive to the period used, frequency of observation, the statistical technique applied, and a variety of other factors. A low beta indicates the stock has low risk relative to the market. Conversely a high beta (greater than one) indicates the returns vary significantly more than the market average. It is expected that the equity beta (provided that gearing is not exceptionally high) for TNSP's will be below one because this industry is a low risk industry, that is, it is subject to a regulated income set in a transparent and consistent regulatory framework, with the demand for services relatively resistant to changes in overall economic activity.

Generally, the Australian Stock Exchange is used as a proxy for the whole market. Where a company is not listed, conventional practice is to use other companies or sector averages as proxies. Overseas proxies can be used, for example, in the US and UK, however, adjustments are necessary because of differences in market and country risks.

A matter of significant debate in the Commission and ORG's Victorian Gas Access Arrangements Decision was the treatment of diversifiable risk. Under normal CAPM assumptions the equity beta is meant to reflect only market related or non-diversifiable risks. It has been suggested that an allowance for unique diversifiable risk could be accommodated by increasing the value of beta or providing a specific allowance in the cash-flow. However, consistency with the WACC/CAPM framework requires that specific risks be factored into projected cash-flows and not the cost of capital, and this is the approach that the Commission will normally adopt with respect to identified and quantified specific risks.[70]

---

[69] For example see:
Jenkinson, T. 1998, *The Equity Risk Premium: Another Look at History*, The Utilities Journal, April.
Kortian, T. 1999, *Australian Sharemarket Valuation and the Equity Premium*, Working Paper, Department of Finance, University of Sydney.

[70] The usual assumption is that upside and downside risk balance out leaving the regulatory rate of return as the expected return.

Gearing effect

The risk adjusted returns required by investors in a business when the assets are financed totally by equity investment provide one measure of the returns required on the assets as a whole. In this situation the CAPM is still valid however, the relevant equity beta β_e is referred to as the asset beta β_a, since it reflects the risk associated with the assets as a whole and not just the equity returns. The asset beta is a useful concept since it provides a more fundamental reflection of risk which can be compared across asset classes independent of the financial structure of the owners of the businesses. When using comparable businesses as the basis for determining regulatory rates of return, the relevant asset beta is the usual starting point.

However, few businesses rely totally on equity financing and it is necessary to find the equity beta β_e appropriate to the financial structure of the business. Generally, the borrowed funds gear up the returns available to investors but also increase risks by a similar multiple. The risk premium sought by equity investors will be a function of:

- the underlying market risk of the pre-debt cash-flows of the asset; and
- the level of financial risk, which in turn depends on the capital structure of the entity.

While risks are multiplied one aspect of risk is reduced, namely the amount of funds at risk in the event of total business failure. This is because the lender assumes the risk associated with the loss of borrowed funds. A formula which relates the asset beta and equity beta and reflects these features is given by

$$\beta_e = \beta_a [1 + (1-T_e(1-\gamma)) D / E] - \beta_d D/V \qquad \text{(Eqn 6.5)}$$

In theory the debt/equity mix assumed in calculating the WACC must be consistent with the debt/equity mix assumed in the derivation of the equity beta. The debt/equity mix is likely to vary from one reference stock to another and from one measurement period to the next.

Given that a similar relationship will also hold for stocks used to establish benchmark asset betas it is important that the analysis uses the corresponding relationship to derive the asset betas from the statistically derived equity betas.[71] This process is sometimes referred to as *de-levering* and the process to generate the equity beta from asset beta benchmarks for a particular business is called *re-levering*.

There are various criticisms made of this formula and approach.[72] Submissions received by the Commission in respect of its Victorian Gas Access Arrangements Decision suggest some uncertainty over the gearing assumptions and how these should impact on regulatory returns. The Commission does not share these concerns.

However, recognising the relationship between the asset and equity beta is of fundamental importance. The Modigliani-Miller theorem suggests that the value of a firm should be independent of its financing decision. Interpreted another way, this suggests the appropriate WACC is independent of the gearing assumption. This formulation for the equity beta

---

[71] When overseas companies are used as the basis for estimating comparable asset betas, the allowance for the value of imputation credits may be irrelevant and the γ should be set to zero in the formula adopted to *de-lever* the equity beta estimates in these cases. However, the *re-levering* to obtain the comparable equity beta for an Australian based entity the γ needs to be set at its relevant value.

[72] See for example:
IPART, *The Rate of Return for Electricity Distribution Networks, Discussion Paper*, November 1998, p. 15.

closely approximates an algebraic relationship insuring compliance with the Modigliani-Miller theorem. This is doubly fortunate since it is a business decision over which a regulator has little control but must make an assumption for the purposes of determining regulatory returns. The Modigliani Miller relationship ensures that the gearing assumption is not a critical one within reasonable bounds.

Obtaining a value for the asset beta is problematic. Overseas studies indicate that the asset beta is higher for utilities subject to incentive regulation compared with asset betas observed for comparable entities regulated under a rate of return regime. The Commission appreciates that given the different characteristics of overseas markets compared to Australia, ready comparisons cannot be made.

The Commission is aware of alternative levering and de-levering formulae, some of which may be better suited to the relationship defined above. For example, a relationship established by Appleyard and Strong on the assumption that the business has an active debt management policy to ensure a constant level of gearing may be more appropriate, given the constant gearing assumption of most regulatory frameworks. Monkhouse developed this formulation further to take account of imputation credits.[73] The formula is similar to equation 6.5 but results in some minor adjustments as implied by the following relationship:

$$\beta_e = \beta_a + (\beta_a - \beta_d)\{1 - [r_d/(1+r_d)](1-\gamma)T_e\} D/E \qquad \text{(Eqn 6.6)}$$

In conclusion the Commission will use judgement in establishing the asset beta and how the equity beta is derived from it. The Commission does not preclude the TNSP from considering other formulations, but will require alternative formulations to be subject to public and academic comment.

6.7 Imputation credits - gamma

The WACC estimate must be adjusted to properly reflect the returns provided to shareholders via franked dividends. Gamma is included in the WACC calculation to represent the proportion of franking credits which can, on average, be used by shareholders of the company to offset tax payable on other income. The higher the gamma, the lower will be the required return to equity holders and therefore the lower the estimated WACC. This approach is widely accepted as a means of adjusting for the effects of dividend imputation on the WACC used to set target revenues.

There is little empirical doubt that franking credits do have some value. However, there is considerable debate as to the value which should be ascribed. As with all other inputs to the WACC and CAPM equations, selection of a value for this parameter is ultimately a matter of judgement, having regard to the available empirical evidence.

The analysis of imputation credits and their impact on assessed cost of capital in Australia is a developing field and thus far the measurement of the average value of Australian franking

[73] For a discussion of alternative formulations of the equity beta based on different gearing scenarios see, Macquarie Risk Advisory Services Limited, *Weighted Average Cost of Capital – Further Issues*, Consultancy Study Commissioned by the ORG and available on the ORG web site.

credits to the owner of Australian firms is imprecise. Estimates of the average value once distributed range from around 50 per cent to as high as 90 per cent.[74]

The Commission notes the views expressed in submissions on the issue of the value of franking credits to overseas investors. However, the Commission remains of the view that there is no well founded basis for discriminating in favour of one type of investor or another – such discrimination may lead to different network pricing outcomes emerging purely on the basis of ownership. An overseas investor may not be able to take advantage of imputation credits and therefore has a zero gamma. However, this may well be offset by access to foreign taxation benefits not available to Australian investors.

As suggested earlier, if the regulatory framework is adjusted to take account of disadvantages faced by one group of investors, it should also take account of advantages that those investors may have over others. Thus, the Commission remains of the view that the relevant benchmark for regulatory purposes should be based on an assumption of private Australian ownership. It is left to the capital markets to transfer ownership to those who have the greatest competitive advantage in investing in Australian based utilities.

The Commission will seek to ensure parameter values are chosen to reflect an Australian owner assumption. Such an approach implies an estimate of γ towards the high end of ranges discussed by commentators. One reason for the higher valuation is that the post-tax based cash-flow framework explicitly recognises that imputation credits will only generate benefits when tax becomes payable by the firm.

6.8 Cost of debt

The cost of debt varies depending on the degree of gearing of a business, the TNSP's credit rating and the term of the debt. As a general rule, debt with a longer maturity has greater interest rate risk, and hence attracts a higher risk premium.

Generally, the Commission will abstract from reference to a TNSP's actual cost of debt as the actual cost of debt may not reflect efficient finance sourcing. Thus a WACC based on an industry-wide cost of debt will act as a deterrent against inefficient debt financing as the revenue cap will only contain a return on capital allowance consistent with the return requirements of efficient sourcing of finance.

The Commission will set the cost of debt relevant to the type of business assuming it maintains the financial structure implied by the financial accounts. Financial indicator analysis will provide a check on the credit rating likely to apply to the TNSP. The likely interest rates and form of financing will be assessed in consultation with relevant institutions investing in the financial markets. For the purpose of developing revenues or assessing the cost of capital, the effective cost of debt will be expressed as a debt margin augmenting the risk free rate.

---

[74] According to IPART Australian industrial stocks currently show an average dividend payout ratio of approximately 70 per cent. IPART, *The Rate of Return for Electricity Distribution Networks, Discussion Paper*, November 1998, p. 22.

6.9 Inflation

While the inflation rate is not an explicit parameter in the basic WACC formulae, it is an inherent aspect of the average revenue cap, the risk free rate and cost of debt parameters. All information for deriving the rate of return should be as up to date as possible at the time a revenue cap determination come into effect. In the case of interest rate and inflation expectations, parameters are set by the financial markets on a daily basis and are readily determined, so that there seems little justification for using historical data.

An indication of the inflation rate anticipated by financial markets is provided by the difference in the nominal bond rate and inflation indexed bond rates for the same term. The rate of inflation derived from this comparison may not correspond to official inflation forecasts. Differences may simply reflect a different time horizon under consideration. However, the Commission believes that the inflation figure implied by the difference in nominal and indexed bond rates covering the term of the regulatory period should be used in establishing the revenue cap. This measure is market based and therefore more likely to maintain internal consistency with other important financial parameters such as the cost of debt.

When adjusting nominal rates of return or growth rates by the inflation rate to derive their real counterparts, and visa versa, the Fisher relationship is used as a matter of course within the proposed framework, that is:

$$X_{nominal} = (1+X_{real}) \times (1 + \text{inflation rate}) - 1$$

6.10 Overall assessment

The basic rate of return critical to the regulatory framework is the expected nominal post-tax return on equity for the business since that is what determines whether investors will be willing to advance equity to finance the capital infrastructure required to provide network services. The Commission, in accordance with the advice of the financial experts (Prof Bob Officer and Kevin Davis, and Dr Neville Hathaway, as presented at the conclusion of the Commission's assessment of the Victorian Gas Access Arrangements) will adopt a cash-flow approach based on the nominal post-tax return on equity. Using this approach, information revealed by a cash-flow analysis makes the subsequent calculation of the corresponding WACC a relatively simple exercise. Therefore, the Commission will publish the implied WACCs (real and nominal) given by the cash-flows and all relevant parameters.

Finally, there is little objective financial market data or analysis available currently in Australia on regulated utilities. In its Victorian Gas Access Arrangements Decision the Commission was therefore forced to rely on beta estimates from other countries and on qualitative judgments about the weight to be given to elements of risk unique to the market. The Commission expects that experience in the administration of the regulatory regime over the next five years will bring significant data to light on the valuation and management of diversifiable risk that will provide a greater level of confidence in future regulatory decision making.

6.11 Statement of Regulatory Principles

Proposed Statement – S6.1

The revenue cap should provide a return which is commensurate with prevailing conditions in the market for funds and the risk involved in delivering the services provided by the TNSP.

Proposed Statement – S6.2

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.

Proposed Statement – S6.3

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 account of tax liabilities and the assessed value of imputation credits based on existing tax provisions and foreshadowed tax changes due to occur during the regulatory period.

Proposed Statement – S6.4

Asymmetric idiosyncratic risks that can be identified and associated with a project may be factored into projected cash-flows, as provided for by clause 6.2.4(c)(4) of the NEC - rather than via any adjustment to the WACC parameters.

Proposed Statement – S6.5

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.

Proposed Statement – S6.6

An Australian private ownership assumption will be used when considering WACC related parameters, such as gamma, unless the Commission can be convinced otherwise.

Such values will be estimated by reference to evidence available from financial market studies.

Proposed Statement – S6.7

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 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.

Proposed Statement – S6.8

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.

Proposed Statement – S6.9

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

$$\beta_e = \beta_a + (\beta_a - \beta_d) \{1 - [r_d/(1+r_d)](1-\gamma)T_e\} D/E$$

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

Proposed Statement – S6.10

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.

Proposed Statement – S6.11

The forecast inflation rate will be deduced from the difference in the nominal bond rate and inflation indexed bond rates, and will be deduced for the term corresponding to the duration of the regulatory period. Alternatively, official inflation forecasts may be used.

Proposed Statement – S6.12

For each revenue cap decision the Commission will publish the implied WACCs (post-tax real and post-tax nominal) given by the cash-flows and all relevant parameters.

7. Benefit sharing

7.1 Introduction

Regulation is effectively used as a substitute for the discipline of a competitive market and aims to replicate the beneficial effects of a competitive market.[75] The form of regulation used and the incentives it creates will have a major impact on market outcomes. The regulatory regime used will be most effective where it provides positive incentives for the TNSP to improve efficiency but also provides appropriate disincentives for the business to avoid inefficiency and poor quality of service.

Chapter 6 of the NEC specifies that the Commission must determine a revenue cap to apply to each TNSP (or owner, as appropriate), for regulatory control periods of not less than five years. The NEC (clause 6.2.4) also mandates that the Commission use CPI-X regulation, or some incentive based variant of CPI-X. Under this arrangement the revenue cap set for each regulated TNSP will increase each year in line with general price increases (as measured by CPI) but offset each year by the X factor, as determined by the Commission.

If the TNSP can achieve efficiencies greater than those allowed for in the X factor it retains the higher level of profits for at least the remainder of the regulatory period. In other words within the regulatory period the saving already reflected in the value of X accrue to the user, while the gains achieved in excess of the X factor directly accrue to the TNSP. The strength of the incentive effect will be determined in part by both the level of X and the type and timing of sharing arrangements that the regulator puts in place.

Under CPI-X regulation there is a risk that the regulated business may try to reduce costs and hence increase profits through reducing the quality of services offered to users. The issue of determining and including explicit service standards in the revenue cap is addressed in Chapter 8.

A major issue in incentive regulation is commitment by the regulator to its revenue cap decision. If the TNSP is concerned that the regulator will penalise it at the end of or even during, the regulatory period, it may not pursue efficiencies as strongly as implied by the apparent incentives in the regulatory regime. The Commission acknowledges the importance of the regulatory compact, that is the notion that the regulator must not renege on the terms of the regulatory regime. By setting out the process of incentive regulation, the Commission will endeavour to achieve the principles of best practice regulation of a predicable regime and commitment to the process. However there may be circumstances where a review is necessitated and the criteria for within-period review are set out in Chapter 11.

7.2 Commission considerations

In establishing an incentive based regime, the Commission's experience and analysis is limited – but it is clear to the Commission that:[76]

---

[75] Competitive markets are believed to achieve optimal efficiencies in terms of production, pricing and economic welfare.

[76] There is evidence from the UK analysing the impact of incentive regulation, however the UK experience needs to be considered in light of the overall framework and structure that underlies regulation in that country.

- whatever incentive model is chosen it in turn will influence the economic behaviour of the TNSP;
- by its nature incentive regulation provides scope for gaming of the regulator by the TNSP because the regulator is at an information disadvantage compared to the TNSP; and
- the choice of incentive based regimes entails a tension between the information requirements of the regulator and the associated risk of micro-management.

The Commission notes that there is general support among interested parties and other Australian regulators for CPI-X regulation and a glide path approach. This is in recognition of the beneficial impact such an approach can have on the incentives facing the regulated business.[77] Overseas, a CPI-X approach has been adopted in regulatory regimes of the United Kingdom, New Zealand and in some areas of the United States. The State based regulators, the ORG, IPART and IPARC are also proposing to use some variant of CPI-X incentive regulation, as set out in their current regulatory review consultation papers.[78]

Consistent with the broad approach of other Australian regulators and in accordance with NEC requirements, the Commission will adopt a CPI-X approach. The Commission also wishes to increase the magnitude of the incentive that the TNSP has to introduce cost savings. For this reason the Commission proposes a form of glide path to drive the TNSPs pursuit of efficiencies. The form of glide path chosen by the Commission explicitly recognises that not all parameters of the building block approach are amenable to a glide path.

The components of the Commission's regime for incentive regulation both within (CPI-X) and between (glide paths) regulatory periods are discussed below.

7.2.1 Components of the CPI-X framework

Economy wide price changes

Use of a measure of price changes (CPI) is in recognition of the fact that the cost of goods and services used in the production process will change over time. The proposed regulatory framework allows the revenues of the regulated business to change in response to general price variations, while maintaining real revenues. This means that the risks associated with inflation are borne by users and not the TNSP (which is also generally the case with competitive markets).

The general consensus is that it is appropriate to use a measure of economy wide price fluctuations rather than an industry specific measure or other derived price index. It is to be appreciated that the Consumer Price Index (CPI) does have a number of limitations, however

---

[77] Basslink Development Board submission 31 July 1998; Energex submission 7 August 1998; GPU PowerNet submission 11 August 1998; Powerlink submission 30 July 1998; TransGrid submission 6 August 1998; Transend submission 3 August 1998; Siemens submission 27 July 1998; EUG submission 1 December 1998; United Energy submission 6 August 1998; the Victorian Dept of Treasury and Finance submission 5 August 1998; Western Power submission 3 August 1998.

[78] There is a vast amount of literature on the topic of incentive regulation particularly CPI-X. The issues are summarised and discussed in the following papers released by the State Regulators:
Independent Pricing and Regulatory Tribunal 1999, *Regulation of Electricity Network Service Providers: Incentives and Principles for Regulation*, Discussion Paper DP-31, January.
Office of the Regulator-General 1998, *2001 Electricity Distribution Price Review: Efficiency Measurement and Benefit Sharing*, Consultation Paper No 2, December.
Independent Pricing and Regulatory Commission 1999, *ACTEW's Electricity, Water and Sewerage Charges for 1999/2000 to 2003/2004*, Draft Price Direction, February.

the CPI is a widely accepted compromise measure. The CPI produced by the Australian Bureau of Statistics (ABS) has a further advantage of not being revised. Moreover, it also provides a measure of economy wide price changes that equity investors in a regulated business must consider when undertaking an investment decision.

Therefore, consistent with its earlier regulatory decisions, the Commission will use the eight capital city, all groups CPI measure, as produced by the ABS as the measure of inflation to be used in the CPI-X component of the regulatory framework.

Determining the X

In a departure from the traditional interpretation of CPI-X the Commission has decided to adopt an X factor that takes into account both the potential efficiency gains of the regulated TNSP but also enables revenue smoothing to be undertaken. The effect of smoothing and efficiency are therefore combined in the X component of the CPI-X formula. This aggregate X factor represents an amalgam of what is happening with a broad range of cost elements averaged over the regulatory period, while smoothing the revenue path within the regulatory period.

X as a efficiency measure

Broadly the X factor is included in the CPI-X framework in explicit recognition that a TNSP's input costs do not typically rise as fast as the CPI. This is for many reasons, with productivity change in the business being only a partial explanation. Other factors of importance include economies of scale and increased competition which leads to a reduction in the prices of basic inputs such as labour. The regulatory framework does not seek to capture all these effects, but incorporates a broadly determined X factor to capture the general features of market behaviour during the course of a regulatory period.

Since CPI-X adjustments relate to revenues and are not necessarily linked to output measures, the X is not strictly a productivity measure in the normal sense. Therefore determining X requires considerable judgement. If X is set at too high a level it may result in a decline in the maintenance of the infrastructure being regulated. Setting X at too low a level may result in failure to put enough pressure on the TNSP to make it strive for efficiencies.

To the extent that X is a proxy for efficiencies, a combination of firm-specific and industry-wide performance measures are appropriate. This in turn will require the Commission to make an informed judgement on the potential for efficiencies. However, it will be some time before the Commission will have sufficient evidence to measure and compare performance. Thus, for its initial reviews the Commission will consider a combination of performance indicators based on historical performance, international benchmarks and forward-looking

ssessments of cost drivers. In making its judgement the Commission will be conscious of the limitations of the measures used.[79]

In order to assist its judgement, the Commission also invites TNSPs to submit in their regulatory review applications an assessment of achievable efficiencies and how these compare with benchmark data.

X as a smoothing factor

The second use of the X factor is to smooth revenue streams under revenue cap regulation. With the target revenues calculated for each year of the regulatory period the calculation of X becomes a straight forward matter. The CPI-X formula needs to generate prospective revenues (R_1, R_2, etc) providing an expected return commensurate with the business risk involved. However, that is precisely what the target revenues were designed to achieve. Therefore the CPI-X based revenues and the target revenues should have the same value to the firm with the main difference being the time path associated with each. Hence, the X is calculated so that the net present value of expected returns (i.e. revenues less operating and maintenance expenditure and depreciation) is exactly the same as the target revenues established using the same CPI/inflation forecasts. Practically this means that the TNSP's forecast average annual revenue stream will increase each year by CPI-X per cent.

A range of Xs could fulfil this requirement however there is only one value that also gives a particular revenue forecast in the first year of the regulatory period. In the initial regulatory period this would normally be set equal to the target revenue calculated for the first year. In subsequent regulatory periods, the same approach can be used. However, the Commission will retain some discretion to link the initial revenue with that achieved in the last year of the previous regulatory period. Such discretion may be exercised in the interests of minimising any surprise revenue/tariff jumps between regulatory periods.

Application of CPI-X

It should be noted that although CPI-X is usually expressed as a simple formula, the Commission will actually apply a mathematical adaptation of this formula.

---

[79] Total Factor Productivity (TFP) is one of the methods that may be used to determine a firm's level and rate of productivity growth historically. TFP measures the rate of change of technological progress, economies of scale and scope and managerial improvements of a single firm over time. The limitations of TFP have been well documented – in the proposed regulatory framework its use to forecast future productivity improvements is somewhat limited – especially the further out in time to which the estimates are applied. Moreover there is ample debate surrounding the practicalities of deriving TFP measures and the manner in which they are applied. See for example:
Waters, W.G. and Street J. 1998, Monitoring the performance of Government Trading Enterprises, *The Australian Economic Record*, Vol 31, Number 4, December, pp. 347-371.
The techniques for measuring industry technical efficiency are evolving, the most widely discussed at present being Data Envelope Analysis. Other measures include the calculation of an industry wide TFP (or multilateral TFP's), and the use of industry partial performance indicators. Although comparative benchmarking is theoretically attractive, there are problems owing to a lack of comparable data and entities in Australia, and the historic nature of estimates which can be made. This means that comparative benchmarking analysis will have to be supplemented by judgement. There is a wealth of literature regarding to pitfalls of benchmarking. See for example:
Foti, D.A. 1998, Voodoo, Perhaps. Econometrics, No, *Public Utilities Fortnightly*, November pp. 30-31.
Although the article particularly addresses a benchmarking study of generation, the same issues apply to the benchmarking of transmission.

That is, rather than adjusting the revenue cap of the previous year by a factor equal to:

(1+ percentage change in CPI - X)

The preferred formula is:

$$MAR_t = (1+\text{percentage change in CPI}) \times (1-X) \times MAR_{t-1}$$

This latter formulation preserves the intended relationship between target revenues (R_t) and the revenue cap regardless of the CPI forecasts used.

For small rates of inflation the differences in the outcomes are minor. However, the regulatory framework needs to cater for potential blow-outs in inflation. In any event the formulation is essential to retain the net present value equalisation property of X when making adjustments for errors in inflation forecasts.

7.2.2 Using glide paths to improve incentives

In the *Regulation of Transmission Revenues Issues Paper* the Commission discussed alternative benefit sharing arrangements such as a full P_0 adjustment, glide paths or a combination of the two.

With a P_0 adjustment the TNSP receives all the benefits within the regulatory review period while users receive, at the beginning of the next regulatory review period, all ongoing benefits. This is because a P_0 adjustment occurs at the beginning of the next regulatory period.[80] Although P_0 it attractive because of its simplicity, its disadvantage is its perceived reduced impact on efficiency incentives since all on-going efficiency gains are taken away at the end of the regulatory period.

Under a glide path regime all gains/losses are shared between the regulated business and consumers in the subsequent regulatory period by the gradual phase out of gains/losses irrespective of their source. The form of glide path (such as the length of time over which it is implemented, which variables of the building block to which it is applied etc) is a matter of judgement and will impact on the sharing of benefits between users and the TNSP, which in turn will impact on the behaviour of the TNSP.[81]

Given the possible diminution of the pursuit of efficiencies with a P_0 adjustment at the beginning of a regulatory period, the Commission has decided to implement a glide path for one regulatory period beyond the regulatory period in which the efficiency gains accrued. The Commission has chosen this length of time for a number of reasons but principally because of constraints imposed by a commitment to the regulatory compact. This is linked with the present inadequacy of information, limited experience as a regulator of transmission networks, and the evolving nature of incentive regulation.

This form of glide path allows for the gradual sharing of the benefits of efficiency gains between users and the TNSP in the form of lower prices. Further, for reasons of simplicity the glide path will be a simple straight line phase out of efficiency gains. That is, for a

---

[80] A P_0 adjustment is a one off adjustment to the revenue cap at the start of the regulatory period to bring the revenues in line with those indicated by updated parameter and cost data.

[81] No doubt the length of the regulatory period and the glide path will influence the timing of when efficiencies are implemented.

regulatory period of five years, efficiency gains beyond the X factor would reduce at a rate of 20 per cent per year. Thus, the TNSP will keep 100 per cent of excess efficiency gains for the first year of the next regulatory period, 80 per cent of the excess efficiency gains for the second year, and so on, until all of the excess efficiency gains are phased out by the end of the regulatory period.

Not all components of the building block approach will be subject to a glide path. Where a glide path approach is not considered justified, there will be an immediate readjustment of costs at the beginning of the next regulatory period.[82] This is referred to as a P_0 adjustment, and the components subject to P_0 adjustment are discussed below. Moreover, although the discussion is in terms of glide pathing of benefits, the form of glide path applied by the Commission will not be asymmetric.

In order to clarify the Commission's proposed regulatory framework it is appropriate to consider the key components that influence the cost of service and decide in respect of each, whether a glide path or P_0 is more appropriate in each case. The components of the building block approach of most relevance are:

- the regulatory rate of return;
- operations and maintenance expenditure; and
- the asset base, particularly capital expenditures and depreciation.

Each of these is discussed in turn below.

The regulatory rate of return

There is a view that the returns provided to the capital related elements (in particular, the regulatory WACC) will have a significant effect on the incentive for the TNSP to pursue efficiency gains generally. The argument proceeds that providing a higher return than otherwise warranted will attract the types of managers and owners who are more likely to strive hard to make efficiency gains. This is justified by the casual observation that the more innovative and efficient firms can often make higher returns than others can for a sustained period of time. The outcome of this view is that there is an argument for providing a higher return than otherwise would be justified.

This argument has a number of logical flaws, however. First, it is more likely that the innovative and efficient firms make higher returns because they are more innovative and efficient. The argument that they earn higher returns, which then spurs a search for efficiency improvements appears to confuse cause and effect. It is noted that the CPI-X regime coupled with benefit sharing will permit the TNSP to make greater returns than expected if they make efficiency gains, which would appear to mimic the operation of actual markets. Secondly, it is far from clear that rewarding TNSPs in advance for making efficiency gains will provide the desired incentives. It is equally plausible that such a regime will have a perverse effect on the pursuit of efficiency gains.

The rate of return on capital will be determined by the Commission based primarily on financial parameters that are beyond the discretion of the TNSP. Therefore, no additional

[82] It should be noted that this does not necessarily imply a quantum movement in prices at the beginning of the next regulatory period. Any potential change in excess of normal CPI movements can be eliminated by setting the combination of the initial revenue cap and the X parameter appropriately within the CPI – X adjustment mechanism.

incentive will be provided by glide pathing the regulatory rate of return from one regulatory period to the next, and indeed a P_0 adjustment is appropriate. Nevertheless, some have suggested the glide path alternative.

To clarify that any glide pathing would be inappropriate it is helpful to reconsider the parameters that go towards the establishment of the rate of return and how these interact with the regulatory framework.

Inflation

A major factor effecting the nominal rate of return at any point in time is the rate of inflation, which in turn impacts on the nominal return on equity and nominal interest rates. Forecasts of inflation are made at the start of the regulatory period and errors in such forecasts could potentially result in the cost of capital being different from that proposed at the start of the regulatory period. However, the CPI - X adjustment mechanism proposed as part of the Commission's regulatory framework effectively adjusts for such errors on an annual basis (albeit with a lag).

Hence, there can be no over or under performance on costs due to the inflation outcome, nor is there any case for compensation or clawback associated with inflation forecast errors. This is not really different from a competitive market where suppliers all tend to raise prices in line with general price pressures.

Real interest rates

Real interest rates may change during the course of the regulatory period and this may impact on the return on equity and the cost of debt. However, such changes in the short term reflect a business risk for which the TNSP is already compensated through the benchmark value chosen for the beta. In a competitive market, businesses face the same risk and adjust prices on the basis of any associated change in costs as soon as they can. Hence there would seem little justification in deferring these adjustments for consumers through a glide path when this would not happen in a competitive environment.

Actual debt costs

While costs such as interest on debt and tax payments are captured in the regulatory framework through the regulatory WACC, they are of direct relevance to the way a business will look at costs and it is worth considering them separately.

The financing of debt is a cost faced by the TNSP and varies with both real interest rates and inflation. Notably the TNSP also has the option of choosing the nature of its financing arrangements independently of the regulatory framework. Such discretion may enable a TNSP to achieve reductions in such costs below those forecast as part of the regulatory framework.

If a TNSP has financed its debt in a more efficient fashion, might there not be scope for enhancing the incentive to do so by applying a glide path to such expenses? The answer is no. This is because actual debt costs do not form part of the regulatory accounts, hence there is no adjustment in the forecast costs in the following regulatory period to recognise a superior (possible temporary) financing option by the TNSP. That is, financing costs, which contribute to revenues, are always based on the benchmark debt assumptions forming part of the regulatory accounts and are not influenced by what the TNSP actually does. Therefore the TNSP has a much stronger incentive than a glide path - it retains the full benefit of any

reduction in financing arrangements it is able to achieve and may retain these benefits in full from one regulatory period to the next.

Taxation costs

Taxation also impacts on the regulatory rate of return. Taxation is similar to debt in that the TNSP may have discretion to arrange its affairs in a way that lowers tax costs below those assumed in the regulatory accounts. However, taxation costs forming part of the revenue cap are also based on the benchmark assumptions used in the regulatory accounts and are again independent of what the TNSP actually does. Therefore, it retains the full incentive for reducing its tax liabilities.

Asset beta/Equity beta

The beta used to establish the cost of capital is only indirectly related to the costs incurred in the provision of network services, however it shares a number of features in common with debt and taxation costs. First of all, it is a benchmarked assumption within the regulatory framework and that assumption influences the revenue caps determined. Second, the benchmark beta does not necessarily constrain the beta that would be assigned to the TNSP by financial markets. In the same way as with actual taxation and debt costs, the TNSP has a certain amount of discretion regarding the market based beta value it is able to achieve. Sound management strategies are likely to promote a lower beta assessment by financial markets. These would include:

- prudent investment decisions;
- the maintenance of its capital equipment in good order;
- minimising the incidence of system failures; and
- maintaining good rapport with regulatory authorities.

On the other hand a more cavalier approach to managing the business based on short term gains may achieve higher returns, but at a higher risk which will be recognised by the market. The corresponding strategies could include:

- short term based investment strategies involving long lived sunk assets;
- running down the assets with minimal maintenance;
- excessive borrowings;
- having insufficient redundancy to cope with unexpected stresses in the system; and
- gaming the regulator.

Clearly, there is a balance that most firms will seek, but the balance may vary with the ownership and circumstances of individual TNSP's. Therefore the importance to the firm of optimising its beta needs to be recognised.

Financial markets may suggest an evolution of the benchmark beta over time but just as there is no case for glide pathing the benchmark debt and tax assumptions, there is no case for glide pathing a change in the beta value.

Operations and maintenance expenditure

Operating and maintenance expenditure is fundamentally different from rate of return parameters and related costs in that the figures entering the regulatory accounts relates closely to the actual circumstances of the TNSP and the costs it is likely to incur. In this

case, not only does the TNSP have discretion to influence the regulatory accounts but there is a much greater asymmetry of information in favour of the TNSP and potential for gaming of the regulator.

The Commission depends on information provided by the TNSP to establish forecasts of operating and maintenance costs, which are passed on directly to the revenue cap for the regulatory period ahead. As a check on the information the Commission will have over time access to the audited historic accounts of the TNSP and benchmark estimates of productivity growth in operating and maintenance expenditures for similar operations. However, on the whole the Commission is not well placed to judge the true potential for productivity gains within a particular TNSP. The accomplishment of any savings in operating and maintenance expenditure greater than forecast goes straight to the bottom line of the TNSP's accounts, hence there is a strong incentive on the part of the TNSP to understate the potential for prospective operating and maintenance savings. Nevertheless, once those savings are realised the regulator is better placed to re-set operating and maintenance forecasts for the following regulatory period based on what it has observed.

Therefore, despite the potential for gaming there is also incentive for productivity gains, over the longer term, which can be passed on to benefit users. This is important, since in the absence of the CPI-X framework there would be no strong incentives for productivity gains. This is because operating and maintenance savings would be passed straight onto users, as would any inefficiencies, and the framework would more closely resemble a rate of return type regime.

It should be noted that under CPI-X the TNSP is provided with the incentive to pursue operating and maintenance efficiencies, since any under performance would result in correspondingly lower achieved returns overall. However, the regulator would not normally seek to be over-zealous in setting the operating and maintenance forecasts (in line with aggressive assumptions on potential productivity savings) as this may be viewed as introducing unnecessary regulatory risk which would need to be compensated for through a higher regulatory rate of return.

Therefore, the more significant issue is whether the single period incentive will achieve the desired improvements in efficiency or whether a glide path adjustment for operating and maintenance expenditures is necessary.[83] If the only benefits the TNSP is to receive from productivity gains are those available within a particular regulatory period, there may be an incentive to defer potential improvements (and not disclose them to the regulator) until the start of the next regulatory period. Of course, such gaming produces an economically inefficient outcome, although the benefit for the firm may be maximised. Glide pathing will significantly reduce the magnitude of this perverse incentive and whether the single period incentive is adequate or not may becomes a secondary consideration.

In refining the incentive further, it would be desirable to identify what cost reductions were due to the efforts of the TNSP and what were effectively windfall gains. The glide pathing of windfall gains/losses would not enhance the incentive and may compromise the expected return of the TNSP in the next regulatory period. Unfortunately, distinguishing the source of cost savings will not always be easy and where there is doubt there is a reasonable case for simply glide pathing the net out-performance in operating and maintenance cost reductions.

---

[83] Ideally the incentive should be as large as the potential savings. However, that would mean that users would never benefit from gains. In a contestable environment competition would ensure the full incentive for gains was preserved, while the benefits were passed onto customers.

Operating and maintenance costs may be reduced by reducing maintenance expenditure and allowing equipment to deteriorate more quickly or through extra expenditure on labour saving capital equipment. Similarly, when considering capital replacement or expansion options a TNSP may choose an alternative which involves lower operating and maintenance expenditure, but at a higher capital cost. Therefore there is a strong link between new capital expenditures and operating and maintenance savings and a potential trade-off between the two. Consequently, it is clear that care must be exercised to ensure that the incentive structure does not introduce unintended distortions in the optimal balance between capital expenditure and operating and maintenance expenditure. Glide pathing operating and maintenance expenditures will enhance the incentive for cost saving capital expenditures and this is perceived by the Commission to be desirable.[84]

Capital expenditure

Capital expenditure forecasts are required in setting target revenues. Forecast capital expenditure can vary from actual capital expenditure for a number of reasons – including deferral of expenditure, overestimation of required expenditures, or reductions in service standards. It can also be argued that capital can be used more innovatively or efficiently, resulting in reduced capital expenditure. The Commission notes that forward estimates of capital expenditure are often subject to greater uncertainty than estimates of operations and maintenance expenditures and is wary of encouraging overestimates of forward capital expenditures, which if not undertaken, the regulated business may try to claim as efficiency gains in the future.

For this reason the Commission considers it most appropriate to treat any cost reductions resulting from deferred capital expenditures as windfall gains, and as such, subject them to a P_0 adjustment mechanism at the beginning of the next regulatory period. However, the regulated TNSP is invited to demonstrate at each regulatory review that any capital expenditure below forecast levels has arisen because of management induced efficiency gains. Where it is clearly demonstrated by the TNSP that capital expenditure shortfalls have resulted because of management efficiencies or innovation, the capital expenditure efficiency gains may be subject to a glide path, similar to the operations and maintenance expenditure. If the regulated TNSP does not clearly demonstrate the case for retaining efficiency gains, then a full P_0 adjustment is more likely to be applied to the capital expenditure linked component of cost reductions.

Capital and depreciation

The Commission considers cost reductions with respect to both changes in the regulatory asset base and depreciation can be considered to be beyond the control of the regulated TNSP. Therefore the Commission intends to correct for any changes in costs at the end of the regulatory period using a full P_0 adjustment.

7.2.3 Menu of options

Due to the information asymmetry a regulator may experience, the *Regulation of Transmission Revenues Issues Paper* sought comment from interested parties on the desirability of offering a menu of options to the regulated TNSP. The menu of options as

---

[84] However, the regulatory framework provides for ongoing commercial returns on the increased capital expenditure which already creates a bias towards greater capital intensity.

portrayed in the *Regulation of Transmission Revenues Issues Paper* provided for a TNSP to choose from a range of combinations of X and glide paths.

The primary attraction of the menu of options is that it may assist in overcoming information asymmetry issues, especially where the regulator can not easily determine an appropriate level of future efficiency gains for the firm.[85] Thus the menu could provide a powerful tool in incentive regulation by revealing the TNSP preferences, while also providing the TNSP with continuing incentives to exceed its performance expectations. It is envisaged that the revealed preferences would then provide valuable information for the next regulatory review period.

The Commission recognises that such a tool must be carefully tailored to achieve the correct regulatory outcomes and incentive effects on the regulated TNSPs. Moreover, the Commission is aware of some doubt about the effectiveness of such a regime.[86]

At this stage the Commission does not have sufficient information to be confident about implementing such a regime. For this reason the Commission does not intend to implement it but will conduct further research regarding the approach.

7.3 Statement of Regulatory Principles

Proposed Statement – S7.1

The benefit sharing mechanism within the regulatory period

The form of benefit sharing will be CPI-X regulation.

The X factor will be set such that the net present value of the forecast target revenue stream (net of operating and maintenance expenditures) and the smooth average revenue streams (net of operating and maintenance expenditures) will be the same.

Productivity forecasts for components of the building block approach, the firm and the industry will be taken into account when forecasting cost estimates. Productivity forecasts will be used by the Commission to aid its judgement on cost estimates.

TNSP's are invited to submit, in their annual application, an assessment of achievable efficiencies and how these compare with benchmark data.

CPI-X will be applied to calculate the MAR in each year as:

MAR(t) = (1+percentage change in CPI) x (1-X) x MAR(t-1)

---

[85] A discussion of the menu of options can be found in the Commission's *Regulation of Transmission Revenues Issues Paper* and in:
Crew, M A., Kleindorfer, P. R.,1996, Incentive Regulation in the United Kingdom and the United States: Some Lessons, *Journal of Regulatory Economics*, Vol 9, pp. 211-225.
Berg S.V. and Foreman R.D. 1995, *Price Cap Policies in the Transition from Monopoly to Competitive Markets*, Public Utility Research Centre, University of Florida, February 16, prepared for University of Michigan Telecommunications Conference.

[86] Makholm, J.D., Quinn, M., Augustine, C. 1996, Profit Sharing and Sliding Scale Regimes, *NERA Working Paper*, 29 February.

Proposed Statement – S7.2

Benefit sharing between regulatory periods

Benefits will be glide pathed for a five year period commencing at the start of each regulatory review.

The Commission will make the following adjustments at the end of each regulatory period, to apply in the next regulatory period:

- Rate of return – full P_0 adjustment;
- Operations and maintenance expenditure – straight line glide path over the next regulatory period; and
- Capital expenditure – full P_0 adjustment. The TNSP is invited to demonstrate in its regulatory review application that any capital expenditure below forecast levels over the previous regulatory period has arisen because of management induced efficiency gains.

  Where it is clearly demonstrated by the TNSP that capital expenditure shortfalls are the result of management efficiencies or innovation, the capital expenditure efficiency gains may be subject to a glide path. If the regulated TNSP does not clearly demonstrate the case for retaining efficiency gains, then a full P_0 adjustment may be made on the capital expenditure component of cost savings.

  Forecast depreciation allowances linked to capital expenditures which do not eventuate are to be assigned to existing assets on a pro-rata basis: reducing the regulatory asset base at the beginning of the next regulatory period.

Sharing is not asymmetric, and the glide path and P_0 adjustments outlined above will apply equally in the situation where there are losses.

Proposed Statement – S7.3

Indexation factor

The Commission will use the most recently published eight capital cities weighted average all groups CPI, as published by the ABS (catalogue No. 6401.0) as the measure of inflation in the CPI-X component of the regulatory framework.

8. Service standards

8.1 Introduction

The economic rationale in the setting of service standards, and in the subsequent monitoring of TNSPs' quality of service, is to protect the users of services that have monopoly characteristics from the abuse of market power. Under a CPI-X revenue cap regulatory approach, a monopoly TNSP may attempt to supply a lower quality of service than that which has been included in the regulatory compact with the regulator, in order to boost earnings. Quality of service monitoring by a regulator, assisted by a suite of penalties for non-performance, can help ensure that TNSPs maintain their quality of service.

Effective incentive-based regulation will include an explicit level of service, for which the TNSP has been provided by the regulator with sufficient income to maintain the assets necessary to provide that level of service. Service standards should balance good industry practice against customer expectations. Further, the regulatory compact should specify service standards that are reasonable and appropriate to each regulated TNSP.

8.2 Commission considerations

The Commission considers that for the regulatory regime to be effective, service standards must be made explicit at the time of each revenue cap decision. Service standards should also be transparent and the TNSPs annual performance relative to those standards should be published annually in order to monitor performance. The submissions received[87] in response the to the *Regulation of Transmission Revenues Issues Paper* revealed support for explicit service standards to be developed, although there is less consensus on how to actually determine appropriate service standards and at what level or levels service standards should be set. The range of issues canvassed in submissions include a discussion of the form of service standards[88] and the ability of the TNSP to negotiate with users service standards above and below a 'normal' level.[89]

The Commission notes that service standards can be addressed in many different ways, and that currently State based licensing arrangements influence the service standards that apply to TNSPs. The NEC also has a number of definitions and standards for transmission network services, primarily in Chapter 5. As well, connection agreements between TNSPs and customers (especially generators) may specify service standards such as reliability criteria.[90]

The Commission does have concerns about undertaking what could be seen as 'technical regulation' rather than economic regulation. Further, given that certain service standards already exist, either explicitly or implicitly, the Commission does not consider it appropriate for it to solely determine the service standards that must apply to TNSPs, either individually

---

87 NSW Treasury submission 3 September 1998; EnergyAustralia submission 31 July 1998; South Australian Dept of Treasury and Finance submission 30 July 1998; Transend submission 3 August 1998.

88 Victorian Power Exchange submission 12 August 1998.

89 NSW Treasury submission 3 September 1998; EnergyAustralia submission 31 July 1998; GPU PowerNet submission 11 August 1998; South Australian Dept of Treasury and Finance submission 30 July 1998; Western Power submission 3 August 1998.

90 The SNNS working group identified the following NEC obligations on a TNSP in relation to service standards: system reliability; system stability; voltage quality requirements; and maintenance and operating practices.

or collectively. However, the Commission considers it imperative that all interested parties have the opportunity to provide input into the service standards that will apply to the regulated TNSP for the regulatory period. Therefore the Commission will implement a process whereby the TNSP includes explicit service standards in its regulatory application. These proposed service standards will be made available to interested parties and an opportunity to comment on them will be provided. The Commission may also employ a technical consultant to advise on the appropriateness of the proposed service standards.

The Commission notes that many submissions supported TNSPs offering a range of service levels. The Commission would like to accommodate these concerns but is unwilling to consider more than the basic level of service at this time. However, this does not limit the TNSP to providing only one level of service. Rather, the TNSP's proposed service standards submitted in the regulatory application must reflect a standard level of service, and where the TNSP wishes to offer alternative levels of service to users these must be negotiated outside of the regulatory framework.

The Commission is aware that the Specification and Negotiation of Network Services working group (SNNS working group) considered the issue of market-based service standards, that is service standards that indicate the value in the NEM of an interruption in service. The Commission believes that the development of market-based standards may provide a useful addition to the suite of service standards used to monitor the performance of a TNSP. The Commission would like to encourage the development of standards defined by market-based measures, for consideration into the future and endorses the recommendations made by the working group.

Monitoring and compliance

The measurement and monitoring of service standards is essential in order to ensure that cost reductions derived from falling service standards are not mistaken for increases in efficiency. For this reason the Commission requires the TNSPs to include in their regulatory application proposed benchmarks for each service standard against which performance can be measured. The TNSP will then have to supply annual information demonstrating compliance with the benchmark levels set out in the revenue cap decision.

The Commission notes that the Draft NECA Pricing Review also discusses the issue of service standards. The Draft NECA Pricing Review sets out a number of service standards as developed by the SNNS working group (these are reproduced in Annex 8.1). It is proposed by NECA that further development of these service standards be taken up by the Regulators Forum and benchmarks produced.

The Draft NECA Pricing Review goes on to suggest that TNSPs should be required to publish consistent annual statistics on their operational performance. The Commission endorses this recommendation, as published performance statistics could provide useful information to users. The Commission acknowledges that TNSPs may not be directly comparable as each TNSP may be operating under different circumstances. Nevertheless increased transparency of operational performance statistics should be helpful to the market in understanding the levels of access they are likely to expect, as an indicator of changes in service quality and in establishing whether good industry practice is being followed.

The Commission's intention is to request, and annually publish, the service standards set out in Annex 8.1. The Commission will compare these standards with those in the NECA Pricing Review when it is finalised. Further other service standards may be requested by the Commission subject to discussions with interested parties and the TNSP's if required.

The Commission also considers that some form of penalty may be appropriate where service standards are not achieved. The Draft NECA Pricing Review supports performance-based regulation (including bonuses for above standard performance as well as penalties for under performance). However, no such arrangement is contained in the current NEC because there are not explicit service standards against which to measure performance.

While the Commission supports the NECA view that penalties are an important aspect of revenue cap regulation, it has been unable to find many examples of such incentive schemes in Australia or elsewhere. The Commission understands, however, that parties are negotiating in South Australia the details of a new Transmission Code that would entail both penalties and bonuses. The penalties and bonuses are to be set against clear output focused criteria, with the design objective being to encourage the transmission business to strive for improved performance. It is proposed that the system of bonuses and penalties will vary the allowable revenue by a maximum of a few million dollars in any one year.[91] The Federal Energy Regulatory Commission (FERC) has also recently approved a proposed reliability system that imposes penalties for the violation of reliability criteria. This is the first measure of this type introduced by the FERC.[92]

The Commission notes that there are, in effect, two forms of penalty that could apply: commercially significant sanctions and penalties that compensate users for poor service quality. In relation to providing compensation the Commission is aware that there are difficulties in resolving issues such as who should benefit from the imposition of penalties on transmission networks, how to measure the level of compensation and so on. The Commission is currently not in a position to publish a penalty regime that incorporates a measure of compensation. However, development of this form of penalty is not ruled out.

Commercially significant sanctions have the purpose of providing a deterrent for certain behaviour. The development of a system of penalties is achievable but will require regulatory judgement and the actual nature of service standards and their measurement will impact on the type of sanctions imposed. Therefore, the monetary value of commercially significant sanctions and the type of breaches on which they will be imposed will be published by the Commission prior to 1 January 2002, and these penalties will form part of the revenue cap decision for each TNSP. This form of penalty may be refined as evidence and Commission experience grows.

8.3 Statement of Regulatory Principles

Proposed Statement – S8.1

TNSPs must propose a single set of service standards, and proposed benchmarks for each standard, as part of their regulatory review application.

[91] Source: correspondence between Commission and KPMG, 4 May 1999.

[92] Federal Energy Regulatory Commission 1999, 'Commission approves proposed reliability system: agrees to resolve disputes', *News Release*, April 14.

Proposed Statement – S8.2

The Commission will review the TNSP's application and establish a set of service standards with performance benchmarks, and a quality of service monitoring program for each TNSP under its jurisdiction.

Proposed Statement – S8.3

The Commission will include a set of service standards and benchmark levels of performance in its *Draft Decision* and *Final Decision* on the TNSP's application.

Proposed Statement – S8.4

Commercially significant sanctions for non-performance of service standards will be published prior to 1 January 2002.

Commercially significant sanctions will be imposed during a regulatory review for a TNSP that does not, in the Commission's sole opinion, maintain its service to customers at the benchmark level.

Proposed Statement – S8.5

Higher or 'premium' levels of service may be negotiated between the TNSP and customers – but any capital or operating costs attributable to the provision of that premium service shall be excluded from capital or operating costs in the Commission's setting of the TNSP's revenue cap. Any additional revenues obtained from providing a premium level of service shall be attributed to revenue from non-prescribed services.

Proposed Statement – S8.6

The Commission will publish consistent annual statistics comparing the operating performance of TNSPs it regulates, as set out in Annex 8.1.

Proposed Statement – S8.7

The Commission requires all TNSPs in the NEM to begin compiling the required data and calculating the indicators in Annex 8.1 for their transmission systems for the calendar year 1999. This is the first step in ensuring that a basic level of information exists when the Commission becomes the regulator of each TNSP.

Annex 8.1

Transmission service standards

Attached for information is a summary of SNNS working group's report, including the recommendations of the report, and the key performance statistics discussed and set out by the working group.[93]

Summary of the Specification and Negotiation Network Services Working Group report

The SNNS working group concluded that a clear specification of standard transmission services may:

- enable the available transmission services to be utilised more effectively;
- facilitate negotiation of cost effective variations in service levels; and
- establish a clearer basis for assessing the costs of provision of prescribed transmission services.

The SNNS working group states that items included in the specification of standard transmission services should be relevant to the purpose and be reproducible and auditable. The specification should be cost-effective to administer, be equitable to all parties and be consistent with other NEC and legislative requirements. Further the SNNS working group states that there needs to be adequate assurance that the specified standards will actually be adhered to and there needs to be transparency of process.

The SNNS working group determined that in terms of these criteria, the most important shortcoming of the current arrangements is the lack of direct relevance to market impacts. Market impacts can be measured as the cost to market participants or end users of network unavailability. The practical difficulties of assessing conformance to some NEC provisions, e.g. the requirement to adhere to 'good electricity industry practice' are similarly of some concern. The SNNS working group also states that there is a lack of clarity about the level of assurance to network users regarding the provision of prescribed levels of service.

As a consequence the SNNS working group considers an alternative market-based specification, which focuses on the benefits and costs to the market that arise from the services provided by TNSPs. It concludes that this market-based alternative might have limitations in terms of the volatility and auditability of the measures and the costs of conducting the required analysis. Therefore the SNNS working group does not recommend that market-based specifications be implemented at this time, but notes market-based specifications may provide a worthwhile goal for the future.

Instead, the SNNS working group presents an interim position that involves a mix of market-based measures (initially calculated on a for-information basis), selected process-related measures and the presently utilised physical statistics. It anticipates that the addition of the market-based and process-related indicators should provide a useful improvement in focus. The retention of the present measures should allow this to be tested without undue risk.

---

[93] Copies of the working group's report are available from NECA or the Commission.

Current measures

System minutes

(Unsupplied energy - calculated from MWhs unsupplied to transmission customers)

This is MWh unsupplied divided by MW peak demand (multiplied by 60 to convert to system minutes). It is a measure of the service level of the transmission network as perceived by customers of the network.

Energy not supplied to customers as a result of any of the following events should be included as unsupplied energy:

- Unplanned Outage – forced (required to be taken out of service because of emergency (e.g. safety))
- Unplanned Outage - fault (automatically removed from service because of electrical fault)

It is important to realise that the unsupplied energy should not include energy not supplied because of generation shortfalls. This is market failure not transmission service failure.

Availability

This is the actual circuit hours available for all transmission network elements (100kV and above), divided by the total possible circuit hours available. It provides a measure of overall system availability as well as the proportion of planned, forced and fault outages.

Circuit unavailability may be caused by any of the following:

- Planned Outage – maintenance
- Planned Outage – construction
- Unplanned Outage – forced
- Unplanned Outage – fault

This measure can be used in relation to:

- circuit availability (either overhead lines or underground cables)
- transformer availability
- circuit breaker availability

Voltage quality

To meet the NEC requirements on voltage quality the following indicators could also be reported annually:

- the number of measured excursions on the steady state voltage levels outside the limits in the NEC (this is largely a matter for NEMMCO);
- the estimated demand and energy lost as a result of voltage excursions outside the standard;
- the number of complaints regarding voltage quality received by the transmission TNSP;
- the number of complaints regarding voltage quality validated by measurement;
- the proportion of the valid complaints that were attributable to the transmission network;

- the number of unresolved transmission complaints regarding voltage quality;
- the number of transmission connection points monitored for voltage quality; and
- a report on any locations monitored where voltage quality did not comply with the standard in the NEC (with derogations where appropriate).

Proposed measures

The SNNS working group conclude by suggesting that the following set of performance statistics should be published by TNSPs:

Individual connection point interruptions to service:

- the total number of unplanned circuit outages which resulted in loss of supply (per year);
- the frequency of loss of supply per connection point (incidents per connection point per year);
- the minimum, maximum and average duration of loss of supply per connection point (minutes per connection point per year); and
- the amount of electricity not supplied per connection point per year (MW and MW hours per connection point per year).

Interruptions affecting multiple connection points:

- the total number of unplanned circuit outages (per year);
- the total number of unplanned circuit outages which resulted in loss of supply (per year);
- the energy not supplied during each incident (MW hour);
- the maximum load lost during each incident (MW); and
- the time taken to restore all load for each incident (hours).

Individual connection point reliability indicators:

- the frequency of planned interruptions (number per year);
- the frequency of unplanned interruptions (number per year);
- the duration of planned interruptions (hours);
- the duration of unplanned interruptions (minutes or hours);
- the quantity of electricity not supplied during interruptions (MW and MW hour); and
- the period of notice for planned interruptions (hours or days).

Shared network reliability indicators:

- the frequency of disturbances which result in interruptions (number per year);
- the severity of the disturbance measured by the load not supplied - maximum MW and total MW hours; and
- the time taken to restore all load.

Shared network circuit availability:

The aggregate proportion of time transmission circuits is available.

Sinclair Knight Merz proposals

In addition to the performance indicators shown above, the Commission engaged Sinclair Knight Merz (SKM) to analyse the performance indicators proposed by TransGrid. This consutancy has resulted in a set of proposed measures similar to those proposed by the SNNS working group. The Commission proposes that the following additional indicators, following from the SKM consultancy, be included in the list of indicators for the purposes of annual reporting by TNSPs:

System availability:

- number of sustained under/over voltage excursions;
- number of excessive transient voltage excursions.

Individual connection point interruptions to service:

All proposed indicators must be split into two components:

- Planned outages; and
- Unplanned outages.

Individual connection point interruptions to service:

Average (for all connection points):

- supply point interruption frequency;
- supply point interruption duration; and
- restoration time.

In addition, SKM recommended investigating further indicators for interconnector availability and market based indicators. The Commission is very interested in developing performance indicators for interconnector availability and market-based indicators and seeks views of interested parties on appropriate indicators.

A market-based alternative: an interim position

A number of market-based measures can be calculated on a 'for information only' basis at this stage. Methods for calculation are discussed in the SNNS working group's report. The actual measures to be reported include:

- the costs to the market of transmission outages;
- the benefits to the market that would have been available / were obtained from rescheduling planned outages or increasing the restoration effort during forced outages;
- a comparison with the costs that the TNSP would have incurred / did incur by rescheduling or increasing the restoration effort;
- the projected benefit to the market of proposed augmentations or refurbishment;
- retrospective assessments of the actual benefits and costs of augmentations; and
- outcomes from an availability incentive scheme if implemented.

Further SKM also recommend reporting such market based measures as:

- number of constraint events (classified by size of constraint);
- amount of extra generation required to overcome constraints;

- the cost of extra energy required to overcome constraints; and
- a measure of interconnector availability.

9. Financial indicators analysis

9.1 Introduction

The objectives set out in clause 6.2.2 of the NEC require that the regulator permit, on a prospective basis, a sustainable commercial revenue stream which provides a fair and reasonable rate of return on efficient investment to the TNSP, given efficient operations and maintenance practices.

It is important that the regulatory framework includes checks and balances that ensure that the regulator's decisions do not have an unwarranted adverse impact on the financial standing of the regulated TNSP. Financial indicator analysis provides a tool to observe the likely outcome of a regulatory decision on a regulated TNSPs credit worthiness.

The *Regulation of Transmission Revenues Issues Paper* raised the possibility of using multi-financial indicators as an alternative means of determining the maximum allowable revenues for a regulated TNSP. There is little support for such a proposal among the interested parties, although many submissions address the issue of using financial indicators to provide a form of sanity or reasonableness check against the results of the building block approach.[94] The transmission companies in particular were concerned that the Commission did not use financial indicator analysis to justify 'tweaking' the results, but rather to reassess results if financial indicator analysis highlighted any deficiencies.

9.2 Commission considerations

It is important that the decisions of the regulator take into account the possible impact that the prescribed revenue cap will have on the financial viability of the firm and its ability to access funds in the debt and equity markets. Financial indicator analysis can provide the Commission with a means of assessing the likely impact of its decisions on the financial standing of the regulated TNSP. Banks and credit rating agencies analyse financial and performance indicators of a business as part of their assessment of credit worthiness for the business. Businesses with lower ratings are less likely to gain access to funds in debt and equity markets, or must pay a premium to borrow funds.

In conducting financial indicator analysis both qualitative and quantitative indicators are used, the former being generally described as the business profile and the latter as the financial profile.[95]

---

[94] For example, Western Power submission 3 August 1998; TransGrid submission 6 August 1998; Transend submission 3 August 1998; NSW Treasury submission 3 September 1998; Powerlink submission 30 July 1998; GPU PowerNet submission 11 August 1998.

[95] These two aspects are intertwined. For example, a utility with a strong business profile could have less financial protection than one with a weaker business profile, yet they could still achieve the same credit rating.

Business profile[96]

Among the key characteristics of the business profile, the regulatory framework is the most important since it impacts directly or indirectly on the other elements. Given the importance of business profile analysis, the Commission believes that as far as electricity transmission in Australia is concerned, credit ratings are more sensitive to regulatory predicability, transparency and fairness than to the financial profile depicted by indicators. Being protected by a stable and transparent regulatory framework electricity transmission and distribution systems in Australia should have a relatively strong business profile.

It is to be appreciated that the regulatory framework in the Australian electricity market is still in an evolutionary stage which may lead to a degree of uncertainty. However, the public consultation process adopted by Commission in carrying out its regulatory role provide a high degree of transparency. Furthermore, as the regulatory review process becomes more widely understood and accepted, the Commission believes that any regulatory risk attributed to electricity transmission as part of the business profile will diminish.

Financial profile[97]

Notwithstanding the relative dominance of the business profile, the financial profile of a business can still be a useful tool to analyse the implications of regulatory decisions. The Commission will use the financial profile indicators to conduct sensitivity analysis to examine whether the revenue cap allowed by the Commission appears to compromise the credit worthiness of a regulated entity operating in a commercially responsible way.[98]

Financial indicators developed by credit rating agencies for analysing company financial risk include:

- total assets;
- net debt;
- funds from operations;
- funds flow net interest cover;
- net debt payback period;
- total debt/total capital; and
- internal financing.

Other financial indicators are also used to assist the analysis on company profitability, cash flow protection and capital structure.

The financial indicator analysis carried out by the Commission in respect of a regulated entity will be on a prospective basis, primarily for the regulatory period being considered.

For such analysis to be effective the Commission requires:

---

[96] Elements making up the business profile include the regulatory framework; the nature of the markets in which the firm operates; business operations, including cost reliability and quality of service; the competitiveness; and strength of key management personnel.

[97] Elements making up to financial profile include: profitability; capital structure; cash flow; and financial flexibility.

[98] It has been the Commission's observation that the financial indicators are relatively insensitive to the regulatory rate of return over what might be considered a feasible range.

- accurate demand and cost projections;
- assumptions of the firm's financial and dividend policies, including gearing ratio and dividend payments; and
- a set of comparable benchmarks.[99]

In analysing financial profiles, it should be noted that financial indicators are ratios and interpretation must consider the underlying components of the ratios. The use of financial indicators in credit ratings involves comparisons with financial indicators of other firms. However, the financial data of comparable companies are usually not readily available and may be subject to adjustments before meaningful indicators can be derived. Furthermore, if forecast financial indicators are used, the financial indicators derived will be subject to assumptions and estimates. Under such circumstances it is sometimes difficult to develop accurate indicators and interpret the ratios.[100]

Assessment of business and financial profile

Businesses having an 'A' overall rating are generally regarded by financial markets as having a strong capacity to meet financial commitments. A regulated TNSP with a weak financial profile should still achieve an indicative rating of 'A', because of a strong business profile flowing from stable income prospects and the lack of competition. A rate of return determined by the Commission that produces financial outcomes similar to the financial outcomes of a comparable company with an 'A' credit rating would generally be considered adequate for the purpose of regulatory settings.[101]

However, the Commission considers that even where a credit rating varies from a 'A' rating, this may not provide justification for 'tweaking' the regulatory framework or parameters in order to achieve an 'A' rating. As a general rule, the Commission will only review the regulatory outcome if new information is presented to it in the course of the *Draft Decision* and consultation process that indicates an error, misinformation or wrong assumption has been included in the information that led to the *Draft Decision*.

The Commission proposes to set out the comparisons and the assumptions that underlie the calculations and the estimation of the regulated TNSP's credit rating in its *Draft Decision*, enabling the regulated TNSP and interested parties to comment. Regulated TNSPs may provide the Commission with information regarding key financial policies at the time they submit their regulatory application.

However, it should be noted that the Commission may choose assumptions which do not necessarily correspond with the actual financial status of the firm. This is because in a large corporate entity a firm's financial situation may be heavily influenced by a broader agenda. In such cases the Commission may undertake the financial analysis as if the company was operating as a stand-alone entity conforming to the assumptions of the regulatory accounts.

---

[99] The Commission proposes to utilise benchmark data published by reputable credit rating agencies, such as Standard and Poor's.

[100] Other aspects that require careful interpretation in financial ratio analysis have been discussed in: Brealey, R.A. and Myers, S.C. 1996, *Principles of Corporate Finance*, McGraw-Hill, Chapter 27.

[101] Due to lack of relevant information in relation to transmission companies, distribution companies may be used as comparable companies for benchmark purposes. However, the financial ratios will have to be adjusted to reflect the relatively lower risk of transmission companies.

9.3 Statement of Regulatory Principles

Proposed Statement – S9.1

The Commission will use financial analysis to assess the potential credit rating of the regulated entity operating as a stand-alone entity.

Proposed Statement – S9.2

The Commission will use comparable benchmark data for its comparisons as published by the major credit rating agencies.

Proposed Statement – S9.3

The Commission proposes to set out such comparisons and the assumptions that underlie the calculations in its *Draft Decision*, enabling the regulated TNSP and interested parties to comment.

Regulated TNSPs may provide the Commission with information regarding key financial policies at the time they submit their regulatory application.

Proposed Statement – S9.4

The Commission will seek to confirm that the regulatory decision will not impact materially on the TNSPs ability to gain access to funds in the debt and equity markets.

Where such a rating is not achieved the Commission will seek to identify the underlying cause. In this assessment the Commission will be heavily reliant on submissions and public consultation. If considered appropriate the Commission may review the regulatory framework and/or seek a public rating.

10. Information requirements and information disclosure

10.1 Introduction

Clauses 6.2.5 (a) and (c) of the NEC require TNSPs and/or transmission network owners to submit to the Commission certified annual financial statements (in a form to be determined by the Commission), and any other information the Commission reasonably requires to perform its regulatory functions.

Information provided by the regulated TNSP will form the basis of the Commission's revenue cap decisions. The Commission will also use its information gathering powers to annually monitor the TNSP's compliance with its revenue cap. The information requirements to conduct each of these tasks are different in detail and form, and the Commission considers each separately below.

The Commission is conscious of the information asymmetry problem that it will face in both determining the revenue cap and monitoring the performance of the regulated TNSPs. This problem has the potential to bias regulatory outcomes due to incomplete, and/or misleading information used in the determination of a revenue cap. However, the information asymmetry issue can be partially addressed through independent verification of data and the ability to force disclosure of information.

The Commission is also aware of the costs of complying with information requests, and the temptation facing a regulator to seek too much information. Clearly, the overall regulatory costs will be increased where excessive information is requested, including the additional time required for the regulator to analyse and process the information.

There is a need to balance the requirement of ensuring that relevant and accurate information is supplied, and requesting information that is excessive or unnecessarily detailed. The Commission believes that by adopting the principles of best practice regulation, a regulator can foster a cooperative environment, with well informed participants, and in doing so reduce the overall regulatory costs, without increasing the risks of information asymmetry.

Clause 6.2.5(e) of the NEC states that information provided to the Commission by the regulated TNSP is to be treated as confidential by the Commission, unless the written consent of the TNSP to release the information has been obtained. Where such written consent is not obtained by the Commission clauses 6.2.6(b)-(e) of the NEC allow the Commission to notify the TNSP of its intention to publicly release information. Clause 6.2.6(d) also allows for an appeals process[102] to be initiated by the TNSP regarding such a decision. The issue of information disclosure is discussed more fully below.

[102] Clause 6.2.6(d) sets out that the Commission's decision to disclose information can be reviewed under the *Administrative Decisions (Judicial Review) Act 1977* (*ADJR Act*) upon application to the Federal Court.

10.2 Commission considerations

The requirement for the regulated TNSP to provide sufficient information for the Commission to undertake its regulatory role is set out in the NEC. Such a requirement is vital in ensuring that the Commission has sufficient information to:

- determine the maximum allowable revenue cap;
- calculate key ratios and utilise analytical tools;
- assess the likely impact of the Commission's regulatory decisions on the TNSP's financial performance and financial position;
- assess the impact of related party transactions on the TNSP's financial performance and position;
- assess the TNSP's compliance with revenue cap determinations; and
- conduct a public and transparent regulatory process in accordance with best practice regulatory principles.

However, the Commission recognises that the requirement to provide information will result in compliance costs on the regulated TNSP. Where the information requirements are too onerous, the compliance cost may outweigh any benefit the regulator derives from collecting and using the information. However, it is unlikely that the regulator will be able to effectively undertake the regulatory task if the information sought is at a very broad level, or if the regulator relies solely on existing accounts. The Commission will seek to balance the requirement for information to enable it to undertake all aspects of the regulatory task against the costs of compliance with information requests. The Commission will endeavour to achieve this balance by establishing consultation arrangements that ensure effective communication with the TNSP.

10.2.1 Information requirements for determining the revenue cap

Chapter 2 sets out a process by which the regulated TNSP submits a regulatory application to the Commission, which will include the information required to set a revenue cap. The process specifies that the regulatory application must be submitted to the Commission at least 8 months prior to the end of the regulatory period, and must include the information requirements as specified by the Commission. These include estimates of parameters that will be used to set the revenue cap, and the regulated TNSP's financial and other details that will enable the Commission to assess the application of the TNSP. Details of the type and form of financial and non-financial information to be supplied is discussed below, and set out in Appendix 1. Information requirements regarding the setting of, and reporting of compliance with, service standards are specified in Chapter 8.

General requirements

The Commission wishes to conduct a transparent public process, and will rely on public consultation and submissions, as well as the information provided by the regulated TNSP, to inform its judgements in setting a revenue cap. The consultation process the Commission envisions is that set out in Chapter 2.

It is therefore important that information is shared between interested parties, the applicant and the Commission as efficiently as possible. To facilitate the analysis and dissemination of the information supplied by the TNSP, the TNSP is required to provide all information in

both electronic and written format. The electronic format must be compatible with the Commission's computing system in use at the time the information is supplied.

The Commission also considers that the regulated TNSP must also take responsibility for the quality of the information it provides to the Commission. As such the Commission requires that all information must be verifiable. This is important as the regulated TNSP is the key source of information that will be used to make the regulatory decisions that comprise the revenue cap. Therefore, by requiring the information to be verifiable the Commission places the onus upon the regulated TNSP to only provide information that can be assessed for relevance and accuracy. This requirement is unlikely to place excessive compliance costs on the regulated TNSP as it reflects good accounting practice. The Commission considers that the ability to verify information provided by the TNSPs is essential.

Financial information

Given the concerns regarding compliance costs, the Commission has decided that the required information, including the schedules accompanying the regulatory accounts, must be able to be derived from the regulated TNSP's audited financial statements and accounts. The Commission believes that sourcing of the data from existing financial statements will reduce compliance costs and allow for better understanding of the impact of the regulatory decisions.

Appendix 2 sets out in greater detail the information requirements for the regulatory accounts. Further, in order to allow for comparisons between regulated entities and over time, the TNSP must submit the regulatory accounts to the Commission in the form set out in Appendix 5.

The regulated TNSP must provide the Commission with forecasts of key financial information. The Commission considers it is important that any forecast financial information be presented in the same format as historical financial information, to better allow for inter-temporal comparisons. Further, in order for any forecast financial information to be properly assessed and utilised it must include, as notes to the appropriate statements, the rationale and explanations of how the forecasts have been derived, and must state the accounting principles that have been employed.

In instances where the Corporations law does not apply the Commission will require the TNSP to prepare audited financial statements as if they did apply. The Australian Accounting Standards (AASs), which apply to entities which are not required to comply with the Corporations law, are very similar to the Accounting Standards (AASBs)[103] that apply under the Corporations law. Therefore, the Commission believes that the standardisation of the applicable accounting standards to be applied by the TNSPs will not be onerous.

Substance and materiality

The Commission considers that transactions which may have an impact on regulatory outcomes, either in part or as a whole, must be considered to be material. This is because in some instances transactions that may impact on regulatory decisions could be disguised by consideration of the component parts instead of the whole, particularly in situations where several transactions are required to achieve a common purpose. In such cases individual transactions may not reach the materiality thresholds, but taken as a whole the transaction

[103] The collective group of relevant Australian accounting standards including applicable Statements of accounting concepts and Urgent Issues Group (UIG) pronouncements will be hereafter referred to as the Australian accounting standards.

becomes material. The Commission requires that all material[104] items must be disclosed in the regulatory accounts and the regulatory accounts must reflect the commercial substance of transactions or events. That is, where the commercial substance of a transaction or event differs from legal form, it is the commercial substance that must be reported.

In reaching this decision the Commission has been guided by the accounting standards, and the Australian auditing standards. As such, this requirement is not considered by the Commission to add significantly to the compliance costs of the regulated TNSP.

Related party transactions

Related party[105] transactions could be used to manipulate regulatory outcomes and could be used to confer an unfair advantage on related parties competing in other markets. The Commission notes that the ring fencing guidelines (as set out in Chapter 13) may not identify related party transactions, as the ring fencing guidelines relate to structural, not commercial, arrangements. For this reason the Commission has decided to adopt similar procedures for disclosing related party transactions to those set out in the accounting standards.

The Commission wants to ensure all related party transactions are identified, and that the basis for pricing is clearly identified. An example of the necessity for this would be a situation where the TNSP over achieves in making efficiency gains and to hide this improved efficiency enters into transactions with a related party that artificially increase the operating costs of prescribed services. This would reduce the ability of the regulator to pursue higher levels of efficiency gains in the following regulatory period whilst the common shareholders would reap the benefits of the efficiency gains through increased dividends from the related party.

It is due to situations where manipulation is possible that the Commission will require full disclosure of all transactions with related parties, and also require full disclosure of all related parties. It should be noted that the definition of related parties for each business segment providing prescribed services also includes all other business segments of the TNSP.

The key features of these requirements are set out and discussed in more detail in Appendix 1.

Legal structure and status

There is a potential for the TNSP to attempt to manipulate regulatory outcomes by creating new legal entities to provide certain prescribed services, and thus allowing a greater chance for cross subsidisation of non-prescribed activities. The TNSPs may also see a benefit in attempting to evade the regulatory accounting requirements by selecting legal structures for the different entities that are not required to prepare financial reports under the Corporations Law. Therefore in instances where:

- the prescribed activities relating to a single TNSP are conducted by more than one legal entity; or

---

[104] The test for materially is generally that if omission, misstatement, or non-disclosure of a particular item will, or has the potential, to impact on the overall perception of the operations and performance of the TNSPs it is material. A guide to determining the minimum dollar value at which items could generally be seen as being material has been included in Appendix 1. It should be noted that the values indicated in Appendix 1 are, at all times, secondary to the objectives of the general test for materiality referred to above.

[105] A related party is a party that can exert a material influence over the decision making of the TNSP and vice-versa. Refer to Appendix 1 for detailed definition.

- any entity that is involved in prescribed activities is not required to prepare audited financial statements under the Corporations Law;

the following requirements must be complied with:

- consolidated, or aggregated, financial statements must be prepared encompassing the activities of all legal entities that are conducting the regulated activities;
- the consolidated statements must be prepared and audited as if they were required by the Corporations Law; and
- the audited statements are to be used as the audited financial statements, which are then to be used for the preparation of the disaggregated regulatory financial statements, subject to all of the regulatory requirements of this guideline.

Prescribed and non-prescribed services

The NEC requires the Commission to regulate the prescribed services of the TNSP. Prescribed services are defined in the NEC as services provided by the TNSP that the regulator determines are not contestable. In most instances the ring fencing arrangements imposed on the TNSPs (as set out in Chapter 13) will separate out prescribed and non-prescribed activities. However, it may be that TNSPs will earn revenue from activities that are deemed to be contestable by the regulator, although the corporate structure, or the waiving of ring fencing requirements, has meant the ring fencing guidelines are not applicable. In such cases the regulator requires a clear separation of the source of revenues, such that the revenue cap decision is not influenced by non-prescribed activities.

Such a distinction between the likely sources of revenue available to regulated TNSPs reflects the desire to restrict any possible cost shifting that may lead to the TNSP having an unfair competitive advantage in related markets. The Commission's aim is to ensure that the regulated revenue stream is sufficient to cover the costs associated with producing that revenue stream, and not additional costs arising from the provision of non-prescribed services. In order to accurately undertake this task the Commission therefore requires a separation of financial information into that which is relevant to prescribed services and that which is relevant to non-prescribed services. This separation is demonstrated in the detailed regulatory accounts set out in Appendix 5, and the basic requirements are set out below.

All items within the audited financial statements are to be disaggregated between prescribed services and non-prescribed services.

All items are to be allocated between prescribed and non-prescribed activities as follows:

- where causal allocation is used the TNSP must provide, as a minimum, information disclosing the following for each line item subject to allocation:
  - a description of the basis of allocation; and
  - for each allocation the value of each allocation applied to prescribed and non-prescribed business segments and the total.
- where a causal relationship is not apparent then a non-causal allocation may be utilised and the TNSP must provide information on:
  - the basis for selecting the method of allocation;
  - quantitative evidence of the appropriateness of the allocation rate applied; and

– for each allocation the value of each allocation applied to prescribed and non-prescribed business segments and the total.

No cost category may be attributed to more than one business segment.

Further, all transactions which are reported in the regulated financial statements as prescribed services must be adjusted to account for regulatory accounting rules that differ from those used in the preparation of the audited financial statements.

Non-financial information

In addition to the financial information required to make a decision regarding the revenue cap, the Commission also requires supporting non-financial information. Such non-financial information will be used to provide assurances as to the relevance and veracity of the financial information, and will also be used to determine appropriate levels of service standards. Chapter 8 sets out the service standard processes that are to apply. The regulatory application must include a proposed set of service standards that the Commission will assess as part of its revenue cap decision.

Information assurances

The Commission has decided that it requires assurances on the quality of the regulatory accounts in the form of both a Directors' Responsibility Statement (for an example see Appendix 4), to be signed by two or more directors, and assurances from the regulated TNSPs auditors regarding the veracity of the information.

The TNSPs are to be responsible for ensuring that the Commission receives sufficient assurances from the auditors that the regulatory accounts can be relied upon for regulatory purposes. If the audit fails to satisfy Commission requirements, the Commission may require a further audit to be conducted that addresses the Commission's requirements.

10.2.2 Ongoing information requirements for compliance monitoring

In order for the regulatory regime to be effective the Commission will undertake compliance monitoring on the regulated TNSPs. The Commission is aware that provision of information by regulated TNSPs to enable the Commission to monitor compliance with the regulatory regime will impose costs on the TNSPs. For this reason the Commission will undertake annual, rather than six monthly, assessments of the TNSPs' financial situation, and compliance with the revenue cap, including the service standards. The annual assessments will be timed to coincide with the financial reporting period of each TNSP, with compliance monitoring information to be provided to the Commission within four months of the end of the annual financial reporting period.

The details of the information to be provided are set out in Appendix 3.

The principles that apply to the provision of financial information for monitoring and compliance purposes are identical to those applying to the provision of financial information in the regulatory application. This includes the requirement that the information is based on the audited financial accounts of the TNSP, and the TNSP provides audit assurances when submitting the information.

10.2.3 Ad hoc information requirements

The Commission reserves the right to request further information from a regulated TNSP, as required. Should the Commission decide to make such a request, it will do so in writing specifying:

- the type of information;
- the format;
- where relevant, the applicable accounting principles and standards; and
- the time frame in which the information is to be delivered.

The TNSP will be required to also provide written consent to the public release of the information. Where the regulated TNSP wishes some information to remain confidential, it must include such claims and the rationale for such claims in its regulatory application or subsequent information provision. In such instances the Commission will follow the processes set out in clause 6.2.6(b) of the NEC.

10.2.4 Information disclosure

The Commission considers that the information disclosure regime is vital to ensuring that opportunities for exploiting information asymmetries are minimised, and to ensure a transparent regulatory process. Disclosure of information contained in the regulatory application will assist the Commission in its assessment of the information, via comments and analysis from interested parties, and lead to both better information supplied and better regulatory outcomes.

The Commission considers that the default information disclosure requirement must allow the full disclosure of all information submitted to the Commission in the regulatory application. Where the regulated TNSP wishes some information to remain confidential, it must include such claims and the rationale for such claims in its regulatory application or subsequent information provision. In such instances the Commission will follow the processes set out in clause 6.2.6(b) of the NEC.

This default position broadly reflects the requirements of the National Gas Access Code, and is specifically supported by the Energy Users Group in their submission to the Commission.

However, the Commission notes that many submissions[106] in response to the *Regulation of Transmission Revenues Issues Paper* agreed with the need to balance transparency against commercial in confidence concerns. When assessing whether or not to disclose information for which confidentiality has been sought, the Commission will balance the benefits that arise from public disclosure and consideration of such information against any possible impact on commercial operations of the regulated TNSP, or other issues that the TNSP may raise in its application.

Similarly, regulatory statements and assumptions submitted as part of the ongoing monitoring of the TNSPs will be made public.

---

[106] Powerlink submission 30 July 1998; Western Power submission 3 August 1998; DPIE submission 25 June 1998; et.al.

The purpose of releasing this information is to facilitate discussion on the assumptions and forecasts used by the TNSP in their revenue cap claims, and thereby facilitate transparent regulation of the TNSPs. Under the process set out in the NEC this requires the regulated TNSP to provide written consent for full disclosure to the Commission at the time of submitting information.

The Commission will also retain all public information submitted to it on a public register, and access to these documents will be available to any party requesting it. The information that will be available on the public register includes non-confidential information provided by the TNSP, submissions from interested parties, and the Commission's decision. It should be noted that a fee may apply to obtaining copies of documents.

Appeals

The Commission notes the appeals process set out in the NEC, which allows for a review of any decision to publish information, by application to the Federal Court under the ADJR Act. The Commission will follow the process set out in clause 6.2.6(d) of the NEC in respect of appeals.

10.3 Direction for the future

The Commission will continue to develop the information disclosure requirements over time. The development of the information disclosure requirements will reflect changes that occur in the transmission sector, in regulatory practice and the information needs of the Commission, and developments in accounting theory and standards.

As with all areas of commercial activity the transmission sector will evolve and change over time and therefore the information disclosure provisions will need to be assessed to determine if they need to be modified to accommodate the changed circumstances.

The information disclosure requirements will also change over time to reflect developments in regulatory best practice principles, the evolving information needs of the Commission, and developments in regulatory information disclosure practices and analytical tools.

One area of potential development for the information disclosure requirements that the Commission will be investigating is the utilisation of activity based reporting. The Commission recognised the benefits provided by the identification of, and reporting by, the various activity and cost centres of the TNSP's. The Commission will be seeking the cooperation of the TNSPs to assist in the identification and definition of the common activities and associated accounts.

The Commission has not attempted to develop an activity based framework for the information disclosure requirements at this stage for several reasons, including restructuring occurring due to the commencement of the NEM, and that the Commission's proposed regulatory regime may result in modifications to the existing management reporting frameworks adopted by each of the TNSPs. In order to facilitate an accurate identification of the common activities, cost centres and reporting definitions between the TNSPs the Commission has chosen to wait until these issues are closer to resolution.

Developments in accounting theory and reporting practices, and any associated changes in the Australian accounting standards, will need to be assessed for their relevance and impact on the information disclosure requirements. Where these developments are relevant, the

Commission will propose changes to its information disclosure requirements to provide the appropriate level of consistency with the developments.

10.4 Statement of Regulatory Principles

Proposed Statement – S10.1

Each TNSP must comply with the information requirements set out in Appendices 1-5.

Proposed Statement – S10.2

General

The TNSP must submit all information to the Commission in both electronic and written form.

Information submitted as part of the regulatory application must be submitted to the Commission in accordance with the processes and timetable specified in Chapter 2.

The TNSPs shall ensure that all information provided to the Commission is verifiable.

The regulatory statements must reflect the commercial substance of transactions or events. Where the commercial substance of a transaction or event differs from legal form, it is the commercial substance that must be reported.

Proposed Statement – S10.3

Financial information requirements

All items reported to the Commission in the regulatory financial statements are to be derived from the TNSP's audited financial statements.

All items reported to the Commission in the regulatory schedules are to be derived from the audited accounts.

All material items must be disclosed.

All transactions between TNSPs and related parties must be disclosed to the Commission.

All items within the audited regulatory statements are to be disaggregated between prescribed services and non-prescribed services.

No cost category may be attributed to more than one business segment.

All transactions which are reported in the regulated financial statements as prescribed services must be adjusted to account for regulatory accounting rules that differ from those used in the preparation of the audited financial statements.

The regulatory statements and schedules must be audited before being submitted to the Commission.

In instances where:

- the regulated activities relating to a single TNSP are conducted by more than one legal entity; or
- any entity that is involved in regulated activities is not required to prepare audited financial statements under the Corporations Law;

the following requirements must be complied with:

- consolidated, or aggregated, financial statements must be prepared encompassing the activities of all legal entities that are conducting the regulated activities;
- the consolidated statements must be prepared and audited as if they were required by the corporations law; and
- the audited statements are to then be used as the audited financial statements, which are then to be used for the preparation of the disaggregated regulatory financial statements, subject to all of the regulatory requirements of this guideline.

Forecast financial information must be in the same format as historical financial information. The forecast financial information must include, as notes to the appropriate statements, the rationale and explanations of how the forecasts have been derived, and must state the accounting principles that have been employed.

Proposed Statement – S10.4

Non financial information

The directors of the TNSP will be required to complete a Directors' Responsibility Statement to be signed by two or more directors.

The TNSPs are to be responsible for ensuring that the Commission receives sufficient assurances from the auditors that the information received from them can be relied upon for regulatory purposes.

If the audit fails to satisfy Commission requirements, the Commission will notify the TNSP that a further audit must be conducted that addresses the Commission's requirements. The Commission will include a rationale for requiring a further audit and timeframe for completion of the audit in the notification.

The TNSP must submit sufficient information to ensure that the Commission can assess compliance with service standard requirements.

Proposed Statement – S10.5

Information disclosure

The regulatory application must include written consent from the TNSP for the public release of all information within that application, or where confidentiality is sought,

details of each specific item for which the TNSP wishes to claim confidentiality and an explanation stating why confidentiality is required.

Information submitted annually as part of the ongoing monitoring of the TNSP must include written consent from the TNSP for the public release of the regulatory accounts and assumptions underlying those accounts. Where confidentiality is sought the TNSP must provide details of each specific item for which the TNSP wishes to claim confidentiality and an explanation stating why confidentiality is required.

Any additional information requested by the Commission or otherwise provided to the Commission by the TNSP must be accompanied by a written consent for public release, or a detailed statement outlining the claims for confidentiality.

Where the Commission decides to release information for which confidentiality is claimed, the Commission will follow the processes set out in clause 6.2.6(b)-(e) of the NEC.

Proposed Statement – S10.6

Direction for the future

The Commission will continue to develop the information disclosure requirements over time. The development of the information disclosure requirements will be driven by several factors including:

- the evolving information requirements of the Commission for the discharging of its duties under the NEC;
- developments that occur in the transmission sector;
- developments in accounting and reporting theory, including any associated changes in the accounting standards; and
- developments in regulatory information disclosure requirements and analytical tools to ensure the best regulatory practice is adopted.

11. The regulatory period

11.1 Introduction

The regulatory period refers to the length of time between regulatory reviews and is integral to the effectiveness of incentive based regulation. As discussed in Chapter 7, the length of the regulatory period will impact on the incentives facing the regulated TNSP, and the predicability and stability of the regulatory environment.

Clause 6.2.4(b) of the NEC specifies that the regulatory period must be at least five years.

A further issue is the risk of within period regulatory review (or regulatory recontracting) and the impact this will have on regulated TNSPs facing an incentive based regulatory regime. The risk of within period regulatory review is perceived to be heightened where regulatory periods are longer. Implementing within period reviews would lead to increased regulatory risk and could conflict with the principle of regulatory predicability.

Clause 6.2.4(d) of the NEC sets out the circumstances under which a regulator may undertake within period regulatory reviews. These are limited to circumstances where:

- the revenue cap was set on the basis of false or materially misleading information provided to the Commission;
- there was a material error in setting the revenue cap and written consent of the parties affected by any amendment to the revenue cap has been obtained; or
- a change in ownership may lead to a material change in the revenue requirement.

11.2 Commission considerations

11.2.1 Length of regulatory period

Generally regulated TNSPs will prefer a longer regulatory period, enabling them to reap the benefits of efficiency out performance for a longer period of time. Consumers will generally prefer the regulatory period to be shorter, enabling them to share the benefits of efficiency gains sooner.

The appropriateness of five yearly reviews depends upon a number of factors such as the rate of technological change, and likely changes in the industry structure and growth rates. In considering the appropriate length of regulatory period the Commission sought advice on the likely rate of technological change in the electricity transmission industry from Associate Professor T Blackburn of the University of New South Wales Department of Electric Power Engineering.[107] Professor Blackburn states that he considers the current rapid pace of research and development in particular areas of electricity transmission will continue for a decade or more with consequent impacts on the costs of transmission.

Given that the electricity transmission industry is not operating in a static environment, the Commission considers the five yearly review period set out in the NEC provides a compromise between providing regulatory certainty and stability to TNSPs, and also enabling

---

[107] Blackburn, T.R., 1999, *Rate of Change and Change in Costs of the Electricity Transmission Sector: A consultancy report for the Australian Competition and Consumer Commission*, May.

consumers to share the benefits of efficiency gains within a relatively short period of time. The Commission accepts that five years should be the minimum regulatory period in most circumstances (issues of within period regulatory reviews are considered below).

However, the Commission is of the view that in the future it may be appropriate to extend the length of time between regulatory reviews in some cases. Factors to be considered may include the expected growth of the transmission network under review and the likelihood and expected size of future efficiency gains. For its part the Commission will need to consider its commitment to the regulatory process, the implications of this longer horizon on incentive provisions, that is glide paths, and whether the applicant has incorporated review triggers in its application.

The Commission will consider extending the regulatory review period when requested to do so by the TNSP. Such a proposal must be included in TNSP's regulatory application to the Commission. In its proposal the TNSP must justify extending the regulatory review period beyond five years, and demonstrate that any such change will not disadvantage electricity consumers. The Commission will then consider the merits of the application and address the issue of the length of the regulatory period in its Draft and Final Decisions. In this manner all interested parties will be given an opportunity to comment upon the regulatory period for each TNSP.

11.2.2 Within-period adjustments

Regulated TNSPs have a strong preference for stable regulatory systems where, once determined, the regulatory regime is not subject to modification during the regulatory period.

Experience elsewhere, particularly in the England and Wales electricity pool has shown that regulators may undertake regulatory recontracting if cost savings relative to those forecast in the review are too great. In such cases the political sustainability of the existing regulatory contract is low, because of the perception that the earnings of the TNSP are too high. Conversely, the viability of the TNSP may be affected if costs are significantly greater than those forecast. In some cases the renegotiation of the regulatory contract may be in the long term best interests of consumers and the TNSP.

The Commission believes that within period regulatory intervention should only occur where the benefits from the intervention outweigh the costs of intervention. The Commission considers that accurately defining the criteria for initiating within period regulatory intervention is important in order to minimise regulatory risk.

The Commission will adopt the provisions of clause 6.2.4(d) of the NEC as the basis for within period regulatory recontracting. This view is supported by a number of interested parties who made submissions in response to the *Regulation of Transmission Revenues Issues Paper*.[108]

The Commission considers that in general the trigger for initiating a within period review should come from the regulated TNSP affected, but will reserve the right to initiate a review, where the information provided to the Commission is found to have been false or misleading,

---

[108] The TNSPs, Western Power (submission 3 August 1998);Transend (submission 3 August 1998); and Powerlink (submission 30 July 1998) and the distribution business, EnergyAustralia (submission 31 July 1998) supported the regulatory recontracting criteria outlined in the NEC. Western Power (submission 3 August 1998); Transend (submission 3 August 1998); and TransGrid (submission 6 August 1998) and EnergyAustralia (submission 31 July 1998) added that there should be within-period adjustments to address exogenous factors.

or a material error was made in the regulatory decision or there is a change of ownership that may materially change the revenue requirement.

Where a within period review is to be undertaken the Commission will notify the TNSP of its decision to undertake the review, set out the timetable for the review, and request a submission from the TNSP addressing the issues that have triggered the review. Upon receipt of the TNSP's submission the Commission will substantially follow the decision making processes set out in Chapter 2.

11.3 Statement of Regulatory Principles

Proposed Statement – S11.1

Regulatory period

The regulatory period will be a minimum of five years.

Regulated TNSPs may apply to have the regulatory period extended beyond five years at each regulatory review.

The Commission may extend a regulatory period beyond five years if it considers this appropriate, having regard to the network pricing objectives outlined in clause 6.2.2 of the NEC.

The Commission will include any decision to extend the regulatory period beyond five years in its *Draft Decision*, and thus provide all interested parties with an opportunity to comment before issuing a *Final Decision*.

Proposed Statement – S11.2

Within-period adjustments

The Commission will undertake a within period regulatory review where:

- the revenue cap was set on the basis of false or materially misleading information provided to the Commission;
- there was a material error in setting the revenue cap and written consent of the parties affected by any amendment to the revenue cap has been obtained;
- a change in asset ownership leads to a material change in the revenue requirement; or
- there has been a major change in government policy which leads to a material change in the revenue requirement.

Proposed Statement – S11.3

A within period regulatory review may be requested by the TNSP, or initiated by the Commission.

Where a within period review is to be undertaken, the Commission will:

- notify the TNSP of its decision to undertake the review;

- set out a timetable for the review with regard to the timeframes set out in Chapter 2;
- request a submission from the TNSP addressing the issues that have triggered the review; and
- upon receipt of the TNSP's submission, the Commission will follow the decision making processes set out in Chapter 2.

12. The treatment of new interconnectors

12.1 Introduction

As outlined in previous chapters, the NEC requires the Commission to set a revenue cap with an incentive mechanism (such as CPI-X or some variant) where pro-competitive and structural reforms of transmission networks are unable to provide an adequate means of addressing the problems of monopoly pricing.

However, clause 6.2.3(c) of the NEC provides the Commission with the flexibility to determine whether sufficient competition exists to warrant the application of a more 'light handed' regulatory approach, and if so, the form of that regulation. In the *Regulation of Transmission Revenues Issues Paper* the Commission sought to clarify whether contestable activities should be subject to a regulatory approach which is more 'light handed' than revenue capping or whether the market for those services is sufficiently competitive so as not to warrant regulatory oversight. It invited comment on the circumstances when particular activities should be excluded from a revenue cap and the form, if any, of regulatory arrangements for unregulated activities.

The Commission has formed the view that a light handed regulatory approach may be applied to the regulation of new interconnectors in the NEM. It will allow the MAR for new interconnectors to be determined through a competitive tender process. The Commission considers that an approach whereby the MAR for new interconnectors is determined through a competitive tender process has the potential to enforce some market discipline to the regulation of a new interconnector.

12.2 Commission considerations

The Commission is willing to adopt a 'light handed' approach to the regulation of new interconnectors. It is prepared to allow competitive tender arrangements similar to those for determining reference tariffs under the National Gas Access Code, to determine the MAR for new interconnectors.[109]

The acceptability of such an approach relies on the competitive pressures of the tender process to minimise potential monopoly profits and to generate revenues similar to those which might be considered appropriate under regulation taking account of the uncertainties involved. Therefore, there are a number of issues that need to be addressed before the Commission is willing for the MAR to be determined by a competitive tender process. In particular, it is imperative that the tender process delivers acceptable network pricing outcomes.

In addition, when considering a tender approval request the Commission is conscious that inputs such as environmental and engineering considerations may form part of the selection criteria. These criteria and the MAR itself may need to be refined though the tender evaluation process. Hence it is imperative that the tender evaluation methodology and criteria which are adopted retain a degree of flexibility, while establishing clearly the principles and methods which will be applied. In setting out a Statement of Regulatory Intent

---

[109] This course of action is endorsed by the Basslink Development Board in their submission (31 July 1998).

the Commission has therefore outlined key principles, while the exact evaluation methodology and criteria will be developed on a case by case basis.

12.3 Statement of Regulatory Principles

Proposed Statement – S12.1

In certain circumstances, the Commission is willing to adopt a light handed approach to the regulation of new interconnectors. The process and criteria that must be adopted by an applicant for the Commission to consider a light handed regulatory approach are set out in Box 12.1.

Proposed Statement – S12.2

If it is to deliver acceptable network pricing outcomes the following criteria of the tender process must be complied with:

- *The tender process must not be conducted by a party with a conflict of interest* – To ensure that tenders are selected on their merits, the party that submits the Tender Approval Request must not conduct the tender process if it has, or may appear to have, a conflict of interest.
- *The tender process must be competitive* – If the Commission is going to allow new network assets to sit outside the revenue regulation process, it must be satisfied that the number and character of tenders likely to be received would be such as to ensure a competitive outcome.
- *Selection criteria* – The Commission must be satisfied that the selection criteria applied in conducting the tender process will ensure that the successful tender will be selected primarily on the basis that the tender will deliver the lowest MAR (over the life of the asset) and will result in allocation of costs between users that is fair and reasonable. The Commission also believes that to ensure that tenders are selected on their merits, the bidding process should be independently audited.
- *NEMMCO processes must be followed* – The Commission will only consider a 'light handed' approach provided that NEMMCO has determined that the proposed interconnector is justified and deemed a regulated interconnector under clause 5.6.6 of the NEC. Such an approach could only be considered in conjunction with, rather than in lieu of, NEMMCO's inter-regional planning processes.
- *Final Approval process* – The Commission must have a role in approving the preferred proponent. Such a role would give the Commission the ability to check whether the preferred proponent has been selected in accordance with the selection criteria and also allow the Commission to determine whether the process has been conducted in such a way so as to deliver reasonable network pricing outcomes.
- *MAR determined by tender process is to apply for the duration of the tender period* – Once the MAR has been determined by the competitive tender process and approved by the Commission, the MARs as defined by the winning tender are to apply for the duration of the tender period, unless a review determines otherwise (see below). Therefore, if the competitive tender route is selected, the

Commission will not set a revenue cap for this interconnector until the completion of the initial tender period.

- *The value of the regulatory asset base and its residual value must form part of the tender* – The competitive tender provisions need to consider the asset base. The residual value of the asset base is important as it will determine the future transportation costs when/if the interconnector becomes regulated.
- *Triggers for review* – The tender applications may incorporate triggers for review of certain elements of the tender. These triggers will be considered by the Commission as part of the tender application. Review triggers may request a review of the tender period. There may however be a mechanism for varying tariffs in response to changing circumstances and these would be taken into account in assessing the lowest competitive bid.

Box 12.1: The competitive tender processes

12.1 Provided that the NEMMCO has determined that the proposed interconnector is justified and deemed a regulated interconnector under clause 5.6.6 of the NEC, any person who wishes to conduct a tender in relation to an interconnector that has not been built may make an application to the Commission (a Tender Approval Request) requesting the Commission to approve the use of a tender process to determine:

(a) asset values of the proposed interconnector or a MAR for certain network services to be provided by the proposed interconnector;

(b) other specified items which are required to be included in an Access Arrangement and which are essential to determine the MAR of the asset concerned (including, without limitation, the date when asset values will be revised).

12.2 A Tender Approval Request must:

(a) nominate the locations between which the proposed interconnector will transport electricity;

(b) detail the process (including procedures and rules) proposed to be followed in conducting the tender process, including the minimum requirements which a tender must meet before it will be accepted as a conforming tender (for example, the date by which tenders must be received);

(c) detail the selection criteria to be applied in selecting the successful tender; and

(d) specify the duration of the tender period applying to the proposed interconnector.

The specification of the tender period in a Tender Approval Request and a decision to approve such a Tender Approval Request do not limit in any way the Commission's discretion to approve or not approve a tender period pursuant to section 12.12(d).

12.3 Subject to section 12.6, within 14 days after receiving a Tender Approval Request which conforms with section 12.2 the Commission must:

(a) inform each person known to the Commission who the Commission believes has a sufficient interest in the matter that it has received a Tender Approval Request; and

(b) publish a notice in a national daily newspaper which at least:

(i) describes the proposed interconnector to which the Tender Approval Request relates;

(ii) states how copies of the Tender Approval Request can be obtained; and

(iii) requests submissions by a date specified in the notice.

12.4 Within 28 days of the date specified in the notice published under section 12.3(b), the Commission must make a decision in relation to a Tender Approval Request that:

(a) approves the Tender Approval Request; or

(b) does not approve the Tender Approval Request.

In making a decision under this section 12.4 the Commission must consider any submissions received within the time specified in the notice published under section 12.3(b) and may (but is not obliged to) consider any submissions received after the time.

12.5 The Commission may reject a Tender Approval Request without further consideration if it is of the opinion that the application has been made on trivial or vexatious grounds.

12.6 The Commission may at any time decide not to approve a Tender Approval Request if it is of the opinion that the person who submitted the Tender Approval Request may have, or may appear to have, a conflict of interest if it conducted the tender process. The Commission may decide not to approve a Tender Approval Request under this section 12.6 without conducting the public consultation required under section 12.3. If the Commission decides not to approve a Tender Approval Request under this section 12.6 on conflict of interest grounds, another person may submit a new Tender Approval Request under section 12.1 in relation to the same proposed interconnector.

12.7 The Commission must decide to approve a Tender Approval Request if satisfied of all of the following and must decide not to approve a Tender Approval Request if not satisfied of all of the following:

(a) (*new interconnector*): that the proposed interconnector will be a new interconnector;

(b) *(public interest objectives)*: that using the tender process as outlined in the Tender Approval Request to determine asset values or a MAR is in the public interest and is appropriate in the circumstances to prevent monopoly pricing, provide a fair return to the new interconnector developer, and create incentives to pursue ongoing efficiency gains through cost reductions;

(c) (*tender process will be competitive*): the number and character of tenders likely to be received would be such as to ensure a competitive outcome; and

(d) (*exclusion of certain tenders*): that the proposed procedures and rules to be followed in conducting the proposed tender will result in a tender being excluded from consideration if it:

(i) does not include a statement of the asset values or a MAR the tenderer proposes and the network services to which those asset values or a MAR would apply; and

(ii) does not include a policy on whether any additional revenue will either be retained by the Service Provider or returned in whole or in part to users in the form of lower network charges or some other form (an *Additional Revenue Policy*);

(iii) does not provide that the residual value of the proposed interconnector after the expiration of the initial reference tariffs will be based on depreciation over the proposed interconnector's economic life;

(iv) limits or purports to limit the services to which access might be sought under the NEC; or

(v) otherwise includes elements inconsistent with the NEC except as contemplated by section 12.13.

(e) (*consideration of all conforming tenders*): that the proposed procedures and rules to be followed in conducting the proposed tender will result in no tender being excluded from consideration except in the circumstances outlined in paragraph (d) or if the tender does not conform to other reasonable requirements in the request for tenders or does not meet reasonable prudential and technical requirements;

(f) (*selection criteria*): that the selection criteria to be applied in conducting the proposed tender:

(i) will result in the successful tender being selected principally on the basis that the tender will deliver the lowest sustainable network prices to users generally over the economic life of the proposed interconnector; and

(ii) are likely to result in asset values or a MAR that meet the criteria specified in section 12.12(c);

(g) (*configuration of proposed interconnector not limited*): that the tender documents published by the person conducting the tender will not specify the configuration of the proposed interconnector, including the areas the

proposed interconnector will service and asset technical specifications, unless the Commission is satisfied it would be appropriate to do so;

(h) (*determination of items with the MAR*): that the tender documents specify which items are required to be included in the tender approval request other than the MAR and which will be determined by the tender and that those items are directly relevant to the determination of the MAR;

(i) (*legislation*): any legislation or other document supporting or relating to the tender process is consistent with the Code and does not purport to limit:

(i) the services which the Service Provider may provide or to which access may be sought under the Code;

(ii) the configuration of the proposed interconnector including the areas the proposed interconnector will service and asset technical specifications unless the Commission is satisfied it would be appropriate to do so; or

(iii) the construction or operation of other transmission network assets which could transport electricity to the same market as the proposed interconnector.

12.8 If the Commission has made a decision under section 12.4 approving a Tender Approval Request and a tender process has been conducted, the person who conducted the tender process must apply in writing to the Commission for final approval under section 12.11 (a *Final Approval Request*). A Final Approval Request must include a statement of which tender was selected and the reasons for that selection based on the selection criteria.

12.9 After the successful tenderer has been selected, the Commission may permit the person who conducted the tender process and the successful tenderer to agree to changes to the terms of the tender which result in minor changes to the MAR proposed in the tender, provided the Commission is satisfied the changes are consistent with the requirements in section 12.7(a) to (i). The amended MAR shall be considered to be the MAR determined in accordance with the tender process for the purposes of the Commission making a decision to approve or not approve a Final Approval Request.

12.10 The Commission may before it makes a decision under section 12.11 require the person who submitted the Final Approval Request to provide the Commission with any information or assistance the Commission reasonably requires. The person who submitted the Final Approval Request may state that certain parts of the information are confidential or commercially sensitive. The Commission must not disclose any such information except where the Commission is of the opinion that the disclosure of the information would not be unduly harmful to the interests of any person.

12.11 If the Commission receives a Final Approval Request, the Commission must within 28 days of receiving all information it requires under section 12.10 make a decision that:

(a) approves the Final Approval Request; or

(b) does not approve the Final Approval Request.

12.12 The Commission must decide to approve the Final Approval Request if satisfied of all of the following and must decide not to approve the Final Approval Request if not satisfied of all of the following:

(a) that the successful tender was selected in accordance with the selection criteria specified in the Tender Approval Request approved by the Commission under section 12.4;

(b) that the tender process was conducted in accordance with the procedures and rules specified in the Tender Approval Request approved by the Commission under section 12.4;

(c) that the asset values or MAR determined in accordance with the tender process:

(i) must be consistent with the objectives outlined in clause 6.2.2 of the Code; and

(ii) contain or reflect an allocation of costs between services and an allocation of costs between users which is fair and reasonable;

(d) that the tender period for the proposed interconnector is not later than 10 years after the MAR for the proposed interconnector is approved or such later date as the Commission considers appropriate for the proposed interconnector on the basis of the proposed asset values and network charges; and

(e) that the successful tenderer outlines an additional revenue policy that is appropriate for the proposed interconnector on the basis of the proposed asset values and network charges.

12.13 If the Commission makes a decision under section 12.11 approving a Final Approval Request then in any Access Arrangement for that new transmission asset:

(a) the asset values or MAR shall be the asset values or MAR that was determined in accordance with the tender process and approved by the Commission; and

(b) each other item required to be included in an Access Arrangement, which is essential to determine a MAR and which was determined by the tender process, shall be as determined in accordance with the tender process and approved by the Commission.

12.14 Nothing in section 12.13 limits or affects the operation of any provision of the Code except the provisions relating to the content of an Access Arrangement to the extent that asset values or the MAR or other item included in the Access Arrangement may, under section 12.13, be determined in accordance with the tender process.

13. Transmission Ring Fencing Guidelines

13.1 Introduction

Part G of Chapter 6 of the NEC requires the Commission to develop ring fencing guidelines for the accounting and functional separation of the provision of prescribed services from the provision of other services by the TNSP.[110] All TNSPs are required, under clause 6.20.1 of the NEC, to comply with these guidelines.

13.2 Commission considerations

In developing these Transmission Ring Fencing Guidelines, the Commission's objective is to reinforce the effectiveness of the regulatory processes by limiting the ability of the transmission networks to extend their monopoly powers from the network business into the contestable parts of the industry. In particular, the Commission is seeking to ensure that regulated activities do not cross-subsidise contestable activities.

The Commission recognises that the electricity industry has undergone structural reform that has reduced the likelihood that regulated activities could be used to subsidise contestable activities. Nevertheless, future acquisitions are not ruled out, and in certain circumstances the NEC allows for some generation assets to be included in a network owner's regulatory asset base. Moreover, it is possible that the networks of the future will grow into businesses quite unlike the electricity networks of the past and will provide a range of contestable services. For example:

- connection assets may, in some circumstances, be contestable and not included in the regulatory asset base;
- additional revenue may be generated from engineering consultancy services; and
- other related services, such as telecommunications, may generate revenues that are not subject to the revenue cap.

The above points illustrate examples of incidental and/or related work where outlays could possibly be subsidised by expensing them against regulated components of the business, while recording income as unregulated revenues not subject to the revenue cap.

Ring fencing arrangements have been developed with varying degrees of success in the context of other monopoly industries. Most recently ring fencing arrangements were developed by the National Gas Reform Task Force and included in sections 4 and 7 of the National Gas Access Code.

In the *Regulation of Transmission Revenues Issues Paper* the Commission signalled its intention to adopt a set of ring fencing arrangements for electricity transmission networks which were very similar to the National Gas Access Code's ring fencing arrangements. This intention was based on the fact that the Commonwealth, State and Territory governments have agreed to the National Gas Access Code's ring fencing arrangements and that their application to electricity transmission networks would ensure consistency between gas and

[110] According to clause 6.20.2(a), prescribed services are defined by the NEC as transmission services provided by transmission network assets or associated connection assets which are determined by the Commission as not being contestable.

electricity transmission networks. Clause 6.20.2(d)(d) of the NEC requires the Commission to consider the need, so far as practicable, for consistency between the Transmission Ring Fencing Guidelines and Federal and State regulation in each participating jurisdiction of ring fencing requirements of other utility businesses.

For these reasons the Commission has decided to use the National Gas Access Code ring fencing provisions as a model for the NEM. In doing so the Commission has been guided by the views of interested parties, the majority of whom were supportive of the development of ring fencing guidelines along the lines of the National Gas Access Code.[111] In addition the Commission has selected a set of arrangements that provide the flexibility for the Commission to waive elements of the ring fencing arrangements where the costs of compliance outweigh any apparent benefit from imposing the ring fencing provisions.

It is to be stressed that in practice the Transmission Ring Fencing Guidelines must be read in conjunction with Chapter 10 which sets out the information that the Commission requires transmission network owners and TNSPs to submit and verify or audit under clause 6.2.5 of the NEC. The Commission does not at this stage propose to publish accounting or auditing guidelines under the Transmission Ring Fencing Guidelines but does not rule out the need for change and/or additional provisions at some future date.

13.3 Consultation process

The Commission is required under clause 6.20.2(a) of the NEC to develop the Transmission Ring Fencing Guidelines in consultation with the jurisdictional regulators and each participating jurisdiction. In developing these guidelines, the Commission has consulted the Energy Committee which includes representatives of the jurisdictional regulators.

In accordance with clause 2.20.2(e) of the NEC, the Commission is seeking comments on the Transmission Ring Fencing Guidelines set out in Box 13.1. The Commission will also consult with jurisdictional regulators and participating jurisdictions on the development of the Transmission Guidelines. In particular, further consideration is to be given to:

- the structural separation of TNSPs;
- regulator approval of contracts for the supply of transmission services by a TNSP to an associate;
- non-discrimination rules; and
- the use and disclosure of customer information. (Clause 8.6 of the NEC currently restricts a Code Participant's use and disclosure of confidential information. Information

---

[111] EUG (1 December 1998), BCA (26 August 1998), BHP (3 August 1998), South Australian Dept of Treasury and Finance (30 July 1998) and the Commonwealth DPIE (25 June 1998), generally support adoption of the ring fencing provisions in the National Gas Access Code. Powerlink (30 July 1998) and United Energy (6 August 1998) while supportive of ring fencing provisions noted the need to balance the cost of these additional provisions against their benefits. Ergon (29 June 1998) suggests that the National Gas Access Code provisions may not be sufficiently strong and should be supplemented with audit provisions. Energex (7 August 1998), Transend (3 August 1998), GPU PowerNet (11 August 1998) and Western Power (3 August 1998) do not consider that the ring fencing requirements in the National Gas Access Code are the most appropriate arrangements for the electricity industry. However they generally supported the provisions of clause 6.20.2(c) of the NEC as being a reasonable subset of the National Gas Access Code minimum obligations.

used by TNSPs for the purposes of transmission service pricing is deemed, under clauses 6.9.2 of the NEC, to be confidential information.)

13.4 Statement of Regulatory Principles

Proposed Statement – S13.1

In deciding whether to:

(i) amend the Transmission Ring Fencing Guidelines;

(ii) waive a TNSP's obligations under the Transmission Ring Fencing Guidelines; or

(iii) impose additional obligations on a TNSP under the Transmission Ring Fencing Guidelines;

the Commission will follow a consultation process that is at least as extensive as the consultation prescribed by the NEC consultation procedures.

Box 13.1: Transmission Ring Fencing Guidelines

Background

A. Clause 6.20.1 of the National Electricity Code (the *Code*) requires all *Transmission Network Service Providers* to comply with the *Transmission Ring Fencing Guidelines* prepared in accordance with clause 6.20.2 of the *Code*.

B. Clause 6.20.2(a) of the *Code* requires the *ACCC* to develop the *Transmission Ring Fencing Guidelines*.

C. This Guideline was *published* by the *ACCC* on [date].

Preliminary

D. In this Guideline, unless the contrary intention appears, italicised expressions have the meaning given to them in:

(i) this clause D; or

(ii) the National Electricity Code as in force from time to time.

'Auditor' means a person registered as an auditor, or taken to be registered as an auditor, under Part 9.2 of the Corporations Law.

'Associate', in relation to a *person*, has the meaning it would have under Division 2 of Part 1.2 of the Corporations Law if sections 13, 14, 16(2) and 17 of that Law were repealed.

Note: Schedule 1 section 13(7) of the Gas Pipelines Access (South Australia) Act 1997 (SA) contains an identical definition of 'associate'.

'Auditing standards' means the Auditing Standards and Auditing Guidance Statements as in force or existing from time to time issued by the Auditing Standards Board of the Australian Accounting Research Foundation (and any succeeding bodies).

'economic entity' has the meaning given in Accounting Standard AASB 1024: Consolidated Accounts as in force from time to time.

'marketing staff' means servants, consultants, independent contractors or agents directly involved in sales, sale provision or advertising (whether or not they are also involved in other functions) but does not include servants, consultants, independent contractors or agents involved only in:

(i) strategic decision making, including the executive officer or officers to whom *marketing staff* report either directly or indirectly; or

(ii) technical, administrative, accounting or service functions.

Note: Schedule 2 section 10.8 of the Gas Pipelines Access (South Australia) Act 1997 (SA) contains an identical definition of 'marketing staff'.

'parent entity' has the meaning given in Accounting Standard AASB 1024: Consolidated Accounts as in force from time to time.

'person' includes an individual or a body politic or corporate.

'ring fenced services' means *prescribed services*.

'related business' means, any activity other than the provision of *prescribed services*.

'relevant commencement date' means, the later of the following dates:

(i) 1 January 2000; or

(ii) the date on which the *ACCC*, pursuant to section 44ZZA of the Trade Practices Act 1974 (Cth), accepts an access undertaking provided by the *Transmission Network Service Provider* in accordance with clause 2.5(b) of the *Code*.

'reporting entity' has the meaning given in Accounting Standard AASB 1024: Consolidated Accounts as in force from time to time.

E. Where this Guideline authorises the making of an instrument or decision:

(i) the power includes the power to amend or repeal the instrument or decision; and

(ii) the power to amend or repeal the instrument or decision is exercisable in the same way, and subject to the same conditions, as the power to make the instrument or decision.

F. In this Guideline:

(i) words in the singular include the plural; and

(ii) words in the plural include the singular.

Ring fencing minimum obligations

1. A *Transmission Network Service Provider* must comply with the following provisions as from the *relevant commencement date*:

1.1 An entity that provides *ring fenced services*:

(i) must be a legal entity incorporated pursuant to the Corporations Law, a statutory corporation or an entity established by royal charter; and

(ii) must not carry on a *related business*. To avoid doubt, if the entity is a member of a partnership, joint venture or other unincorporated association, the entity is carrying on the activities of the partnership, joint venture or unincorporated association.

Note: The purpose of clause 1.1 is to legally separate the entity through which a *Transmission Network Service Provider* provides *prescribed services* from any other entity through which it conducts business.

1.2 (i) An entity that provides *ring fenced services* must establish and maintain:

(a) a separate set of accounts in respect of the provision of *ring fenced services*; and

(b) if applicable, a separate consolidated set of accounts in respect of the entire business of that entity.

(ii) The accounts must be prepared in accordance with any guidelines that apply to the entity under clause 3.

Note: Where the entity is a *Transmission Network Service Provider*, clause 1.2(i)(b) does not impose any additional obligations as clause 1.1(ii) prohibits the entity from carrying on any activity other than the provision of *prescribed services*. Clause 1.2(i)(b) will be relevant if the *ACCC*, under clause 6, waives the entity's clause 1.1(ii) obligations.

1.3 An entity that provides *ring fenced services* must allocate any costs that are shared between an activity that is covered by a set of accounts described in clause 1.2(i)(a) and any other activity according to a methodology for allocating costs that complies with any guidelines that apply to that entity under clause 3.

Note: Clause 1.3 regulates the allocation of costs between *ring fenced services* and any other activity including activities undertaken by other entities. The purpose of clause 1.3 is to prevent *Transmission Network Service Providers* subsidising contestable activities through regulated activities.

1.4 If an entity that provides *ring fenced services* is part of an *economic entity*, the entity that provides *ring fenced services* must ensure that:

(i) a separate consolidated set of accounts in respect of the provision of *ring fenced services* by that *economic entity* is established and maintained; and

(ii) the accounts are prepared in accordance with any guidelines that apply under clause 3.

Note: The Corporations Law and Accounting Standard AASB 1024: Consolidated Accounts require a *parent entity* in an *economic entity* which is a *reporting entity* to prepare consolidated accounts to reflect the *economic entity* as a single *reporting entity*. Principally, adjustments will be necessary whenever entities within an *economic entity* have had transactions with each other.

The purpose of clause 1.4 is to ensure that the cost of providing the *ring fenced services* is adjusted to reflect any transactions between the entities within the *economic entity* that relate to the provision of the *ring fenced services*.

1.5 An entity that provides *ring fenced services* must:

(i) (a) ensure that its *marketing staff* are not also servants, consultants, independent contractors or agents of an *Associate* that takes part in a *related business*; and

(b) in the event that its *marketing staff* become or are found to be servants, consultants, independent contractors or agents of such an *Associate* contrary to clause 1.5(i)(a), procure their immediate removal from its *marketing staff*; and

(ii) (a) ensure that none of its servants, consultants, independent contractors or agents are *marketing staff* of an *Associate* that takes part in a *related business*; and

(b) in the event that any of its servants, consultants, independent contractors or agents are found to be the *marketing staff* of such an *Associate* contrary to clause 1.5(ii)(a), procure their immediate removal from the entity that provides *ring fenced services*.

Note: In addition, clause 8.6.1(d) of the *Code* states that the officers of a *Transmission Network Service Provider* participating in *transmission service* pricing must not be involved in or associated with competitive electricity trading activities of any other *Code Participant*.

1.6 An entity that provides *ring fenced services* must notify the *ACCC* if:

(i) any of its servants, consultants, independent contractors or agents are, or will be, servants, consultants, independent contractors or agents of an *Associate* that takes part in a *related business*; or

(ii) any servants, consultants, independent contractors or agents of an *Associate* that takes part in a *related business* will be servants, consultants, independent contractors or agents of it.

2. A notification under clause 1.6 must be provided to the *ACCC* on or before the later of the following dates:

   (i) the *relevant commencement date*; or

   (ii) five *business days* prior to:

      (a) in relation to clause 1.6(i), the date on which the servant, consultant, independent contractor or agent of the entity that provides *ring fenced services* will be a servant, consultant, independent contractor or agent of the *Associate*;

      (b) in relation to clause 1.6(ii), the date on which the servant, consultant, independent contractor or agent of the *Associate* will be a servant, consultant, independent contractor or agent of the entity that provides *ring fenced services*.

3. In complying with clauses 1.2, 1.3 and 1.4, a *Transmission Network Service Provider* must:

   (i) if the *ACCC* decides to *publish* accounting guidelines for *Transmission Network Service Providers* which apply to the accounts being prepared, comply with those guidelines; or

   (ii) if the *ACCC* has not *published* such guidelines, comply with any guidelines that are prepared by the *Transmission Network Service Provider* and approved by the *ACCC*.

Additional ring fencing obligations

4. The *ACCC* may, by notice to the *Transmission Network Service Provider*, require the *Transmission Network Service Provider* to comply with obligations in addition to those contained in clause 1 provided that the *ACCC* is satisfied that the administrative cost to the *Transmission Network Service Provider* and its *Associates* of complying with the additional obligations is, or is likely to be, outweighed by the benefit to the public.

5. Without limiting the additional obligations that may be imposed under clause 4, the *ACCC* may require that:

   (i) the *Transmission Network Service Provider* ensure its servants, consultants, independent contractors or agents are not also servants, consultants, independent contractors or agents of an *Associate* that takes part in a *related business* and, in the event that they become or are found to be involved in such an *Associate*, ensure their immediate removal from their position with the *Transmission Network Service Provider*;

   (ii) at least one director of the *Transmission Network Service Provider* is not also a director of a company (whether or not an *Associate*) that takes part in a *related business* or is a *Code Participant* or *Intending Participant*; and

   (iii) the electronic, physical and procedural security measures employed in respect of the offices of the *Transmission Network Service Provider* and of all offices of its *Associates* are satisfactory to the *ACCC*.

The examples given in this clause 5 shall not be construed as limiting the types of action a *Transmission Network Service Provider* may have to take in order to comply with clause 1.

Waiver of ring fencing requirements

6. The *ACCC* may, by notice to the *Network Service Provider*, waive any of the *Transmission Network Service Provider's* obligations under clause 1 provided that the *ACCC* is satisfied that the benefit, or any likely benefit, to the public is outweighed by the administrative cost to the *Transmission Network Service Provider* and its *Associates* of complying with the obligation.

   Note: In deciding whether to waive any of the *Transmission Network Service Provider's* obligations under clause 1, the *ACCC* may take into consideration any additional obligations that can be imposed under clause 4.

Compliance procedures and compliance reporting

7. A *Transmission Network Service Provider* must establish and maintain appropriate internal procedures to ensure it complies with its obligations under clause 6.20.1 of the *Code*. The *ACCC* may require the *Transmission Network Service Provider* to demonstrate the adequacy of these procedures upon reasonable notice. However, any statement made or assurance given by the *ACCC* concerning the adequacy of the *Network Service Provider's* compliance procedures does not affect the *Transmission Network Service Provider's* obligations under clause 6.20.1 of the *Code*.

8. A *Transmission Network Service Provider* must provide a report to the *ACCC*, at reasonable intervals determined by the *ACCC*, describing the measures taken by the *Transmission Network Service Provider* to ensure compliance with its obligations under clause 6.20.1 of the *Code*, and providing an accurate assessment of the effect of those measures.

9. (i) The *ACCC* may, upon reasonable notice, require a *Transmission Network Service Provider* to:

   (a) appoint an independent *auditor* approved by the *ACCC* to report on such matters as are specified by the *ACCC*; and

   (b) provide a copy of the *auditor's* report to the *ACCC* by a date specified by the *ACCC*.

   (ii) If the *ACCC* nominates *auditing standards* to apply to an audit under clause 9(i), the *auditor* must report in accordance with those *auditing standards*. To avoid doubt, the *ACCC* may nominate one or more *auditing standards*.

   (iii) For the purpose of clause 9(i), the *ACCC* may *publish* auditing guidelines with which a *Transmission Network Service Provider* must comply.

   Note: The *ACCC* need not *publish* auditing guidelines in order to impose an obligation on a *Transmission Network Service Provider* under clause 9(i). It is intended that auditing guidelines will be *published* where obligations are to apply generally to *Transmission Network Service Providers* on an on-going basis.

10. A *Transmission Network Service Provider* must provide a report of any breach of any of its obligations under clause 6.20.1 of the *Code* to the *ACCC* immediately upon becoming aware that the breach has occurred.

Appendix 1: Framework of information disclosure

1. Forms of information to be disclosed

1.1 Financial information

1.1.1 Pro-forma statements

A series of pro-forma statements and schedules have been prepared for the purposes of reporting historical and forecast regulatory financial information to the Commission. The pro-forma statements have been designed to ensure that the Commission's minimum information requirements are met, and that the presentation of the regulatory financial information is consistent between TNSPs. This does not preclude the Commission from requesting, or the TNSPs providing, additional information when required to clarify or expand the information disclosed to assist in the arrival at the required regulatory decisions.

The Commission has provided three sets of pro-forma statements that are to be used by the TNSPs to report historic and forecast financial information. Appendix 3 details the pro-forma statements that will need to be completed by the TNSPs, and the times at which each will generally need to be completed.

1.1.2 'Free-form' statements

Most of the events and transactions that are reported in the financial statements will be of a recurring nature, and/or are most appropriately reported with pre-defined account classes. There will however, be events and transactions which are neither in the ordinary course of business, and/or do not fit any of the pre-defined account classes. To deal with these instances regulatory statements which are not pre-defined have been included to allow the TNSPs to fully disclose, and where appropriate analyse, potentially ambiguous events to the Commission.

This includes the use of notes to, and forming, part of these regulatory accounts which should include additional information such that the Commission will gain a full and fair understanding of the accounts in question.

Appendix 3 details the 'free-form' statements that will need to be completed by the TNSPs, and the times at which each will generally need to be completed. This list is not exhaustive and the TNSPs should not feel limited to these statements if there is information that they feel is pertinent to the Commission's decision making framework, and should be brought to the attention of the Commission.

1.2 Non-financial information

The following must accompany the regulatory statements and schedules that are submitted to the Commission.

1.2.1 Audit reports and engagements

The TNSPs are responsible for ensuring that the Commission receives sufficient assurances from the auditors that the regulatory financial information received from them can be relied upon for regulatory purposes. Some of the roles that will be required of the TNSPs in order to meet the Commission's requirement for audit assurance include:

- the appointing and remunerating of auditors;
- ensuring that the audit addresses Commission requirements;
- ensuring that the audit includes all documents to be submitted to the Commission, as per Appendix 3, including the associated working papers and adjustment journals;
- alerting the Commission to the appointment of the auditors, and details of the audit timetable;
- ensuring that the Commission has sufficient time to review the format of the audit report(s) it requires, however as a default the Commission requires a special purpose audit report;
- arranging for tripartite meetings before and after the audit is undertaken;
- ensuring the auditors are alerted to the Commission's information disclosure guidelines sufficiently in advance of the engagement to ensure that they are aware of the regulatory regime and accounting rules;
- ensuring that the audit report is prepared with a duty of care to the Commission; and
- ensuring that the audit report is prepared with a duty of care to all consumers of electricity who's charges may reasonably be expected to be influenced by the transmission network charges of the TNSP.

If the audit fails to satisfy Commission requirements, the Commission may require a further audit to be conducted that addresses the Commission's requirements. Where the assurance received from the auditors fails to meet the Commission's requirements the Commission will inform the TNSP why it has failed, and where applicable the rationale for an additional audit and the proposed timetable. The cost of any additional audit must be borne by the TNSP.

It should also be noted that in some circumstances more than one type of audit report may be required by the Commission in order to obtain the required level of assurance.

1.2.2 Directors' Responsibility Statement

The directors of the TNSP will be required to complete a Directors' Responsibility Statement, as provided in Appendix 4, to be signed by two or more directors.

The Directors' Responsibility Statement shall include as a minimum:

- the specific documents for which responsibility is accepted;
- assurances that the documents provided to the Commission comply with the requirements of these guidelines;
- assurances relating to the full disclosure of related party transactions to the Commission and adherence to the specific requirements of these guidelines in this respect;
- assurances relating to the full disclosure of financing transactions to the Commission and adherence to the specific requirements of these guidelines in this respect;
- assurances that the principles of ring fencing as outlined in Chapter 13, where appropriate, have been adhered to;
- assurances that the audit report address:
  - all of the Commission's requirements;

- the format requested by the Commission in Chapter 10, these appendices and from communications with the Commission relating to the specific audit engagement; and

- assurances relating to the full disclosure of financing transactions to the Commission.

1.2.3 Service standards

As detailed in Chapter 8, there are requirements upon the TNSPs to provide information regarding service standards. The service standards information required by the Commission as set out in Chapter 8 forms part of the TNSP's annual reporting to the Commission. As such the information disclosure relating to service standards are subject to the same requirements for the timing of submission, and inclusion in the public disclosure agreement.

1.2.4 Public disclosure agreement

Under clause 6.2.5(e) of the NEC, the Commission must obtain written consent to publicly disclose information provided to it by a TNSP, unless the procedures set out in clauses 6.2.6(b) to (e) are followed. Therefore, in order to efficiently manage the process, the Commission requires that a letter agreeing to the Commission publicly releasing the information disclosed must accompany all information provided. The TNSP may claim that certain information is of a commercially sensitive nature and where it does so, the TNSP must include the rationale for its claim.

1.2.5 NEC compliance checklist

The NEC has certain procedures that must be followed before a TNSP can undertake certain actions, such as new capital expenditure. Where the NEC has required such procedures, the Commission will require a compliance checklist to be completed to provide an assurance that the NEC has been adhered to.

An example of where this would be required is the NEC requirements regarding possible solutions to network limitations and augmentations as set out in clause 5.6.2.

1.3 Revenue cap application

As detailed in Chapter 2 the TNSPs will be required to submit a revenue cap application. The Commission will then examine the information submitted by the applicant and, with additional information, make a decision as to whether the requested revenue cap is appropriate. The type of information that the Commission expects the TNSP to provide in its application is included in Appendix 3.

The information that the Commission is requesting as part of an application is, for the most part, information that would be disclosed in a company's annual report. Therefore, the Commission does not perceive that the information disclosure requirements will raise concerns on the grounds of confidentiality nor does the Commission believe that they are onerous.

The information contained in the application is not intended to be exhaustive rather it is to begin the process whereby the TNSP will be preparing forecasts and examining historical performance with consideration of the regulatory framework. It is possible that the Commission will require additional detailed information in order to make a revenue cap decision. The application will aid in guiding any such requests, rather than requesting that all information at the TNSP's disposal be included in the application.

The information that is contained in the application will be available for public comment, although the TNSPs have the opportunity to argue for confidentiality of commercially sensitive information as set out in section 1.2.4 above. In addition, the Commission may request detailed information for its assessment that will follow the information disclosure provisions of the NEC.

2. Principles of preparation

2.1 Accounting principles and policies

Included as part of the financial information, each TNSP must provide to the Commission full and detailed documentation of the accounting principles and policies adopted. Furthermore any changes to accounting policies or principles must be brought to the attention of the Commission, as noted in Appendix 3, including the rationale for the changes. Where applicable, an analysis of the impact that the changes will have on the financial reporting to the Commission should be included.

Except where these guidelines, or other chapters of the *Draft Regulatory Principles* prescribe otherwise, the regulatory reporting requirements should be completed in accordance with the applicable Australian accounting standards.

2.1.1 General principles

The following should be read in conjunction with the ring fencing requirements detailed in Chapter 13.

All items reported to the Commission in the regulatory financial statements are to be derived from the TNSP's audited financial statements. All items reported to the Commission in the regulatory schedules are to be derived from the audited accounts. The regulatory statements and schedules are to be audited before being submitted to the Commission.

The information contained within the audited regulatory financial statements and schedules must also be disaggregated between prescribed and non-prescribed activities, and adjusted to reflect regulatory accounting adjustments. Although the order of applying disaggregation and regulatory adjustments should have no impact upon the information relating to regulated activities it may cause the unregulated financial information to vary.

Regulatory adjustments are only required for transactions relating to prescribed services. Therefore, if the adjustments are made prior to disaggregation the non-prescribed transactions will also be adjusted to reflect regulatory adjustments. The concern arises where the order of disaggregation and regulatory adjustments is not consistently applied by the TNSP, particularly between regulatory periods which may raise cost allocation issues unnecessarily.

In the interests of promoting consistent information disclosure the Commission will require that disaggregation occurs prior to making the appropriate regulatory adjustments.

In instances where:

- the prescribed activities relating to a single TNSP are conducted by more than one legal entity; or
- any entity that is involved in prescribed activities is not required to prepare audited financial statements under the Corporations Law;

the following requirements must be complied with:

- consolidated, or aggregated, financial statements must be prepared encompassing the activities of all legal entities that are conducting prescribed activities;
- consolidated statements must be prepared and audited as if they were required by the Corporations Law; and
- the audited consolidated statements are to be used in place of the audited financial statements for the purposes of reporting to the Commission and are subject to all of the regulatory requirements of this guideline, and other chapters of the *Draft Regulatory Principles*.

2.1.1.1 Disaggregation - reporting by business segment

All items within the audited financial statements are to be disaggregated between prescribed and non-prescribed activities. Disaggregation should be conducted before making any regulatory adjustments for the completion of regulatory financial statements and schedules.

In disaggregating the audited financial statements for the preparation of the regulatory financial statements the TNSP must cross-reference account headings used in the regulatory financial statements to those used in the audited financial statements. The cross-references, and associated rationale, must be included as an appendix to the TNSP's chart of accounts.

In order to promote consistency and clarity the Commission will require that the process of disaggregation be applied prior to making any regulatory adjustments to the figures reported in the audited financial statements of the TNSP.

2.1.1.2 Account item allocation principles

All account items are to be allocated in a fashion that demonstrates the manner in which the respective resources have been consumed, i.e. where a causal relationship exists. Where causal allocation is used the TNSP must provide, as a minimum, to the Commission information disclosing the following for each line item subject to allocation:

- a description, and justification of the basis of allocation used; and
- the numeric value of each allocation applied to each business segment (i.e. prescribed, non-prescribed) and the total.

Where a causal relationship is not apparent then a non-causal allocation may be utilised. Where non-causal allocation is used, the TNSP must provide, as a minimum, information disclosing the following:

- the basis for selecting the method of allocation;
- quantitative evidence of the appropriateness of the allocation rate applied; and
- for each allocation the numeric value of each allocation applied to each business segment (i.e. prescribed, non-prescribed) and the total must be disclosed.

At no stage shall an expense category be directly attributable to more than one business segment. If a TNSP believes that a cost category is directly attributable to more than one business segment they shall, in their regulatory statements, separate and prepare the cost category into sub-categories in such a manner that each sub-category is:

- traceable to the general ledger;
- uniquely associated with only one business segment; and

- accompanied by an explanation of its characteristics that associate it with the nominated business segment.

2.1.1.3 Regulatory adjustments

All transactions which are reported in the regulated financial statements as resulting from prescribed activities must be adjusted to account for any regulatory accounting rules that differ from those used in the preparation of the audited financial statements.

These regulatory adjustments are only required for those items attributable to regulated activities, and that have not been specifically excluded from being reported in the 'prescribed'[112] columns of the regulatory statements. Such adjustments are not required to be made for non-prescribed activities, however the TNSP should inform the Commission by way of a note to the statements as to whether the regulatory adjustments have also been applied to the non-prescribed items in the statements.

For regulatory accounting adjustments made to an audited account:

- a separate regulatory accounting journal must be prepared; and
- the regulatory accounting policy requiring the adjustment, and the policy adopted by the TNSP in the preparation of the audited account must be disclosed by way of a note to the regulatory financial statements.

2.1.1.4 Forecast financial information

Forecast financial information must use the same terms and definitions as apply to historical financial information. The forecast financial information must include, as notes to the appropriate statements, the rationale and explanations of how the forecasts have been derived[113] and must state the accounting principles that have been employed.

Where forecast financial information is prepared solely for prescribed activities, there is no need to undertake a disaggregation process, and the TNSP should inform the Commission of separate forecasting by way of a note to the regulatory statements.

Where forecast information relating to non-prescribed activities has not been included in the regulatory statements, due to separate forecasting, the Commission may request internal forecasts of these activities. This information may be requested where the Commission believes there may be cost allocation issues.

Forecast financial information provided on a yearly basis during a regulatory period will be used primarily to inform the Commission of changes in circumstances that were unforseen or erroneously forecast at the beginning of the regulatory period. This information will also aid the Commission in gaining an understanding of the nature of the regulated businesses that will assist in ensuring that revenue cap decisions are made with the best possible understanding of the TNSP's businesses, and the accuracy of their forecasts.

2.1.1.5 Record retention

The TNSP must retain the working papers supporting the regulatory adjustment journals, and working papers supporting the disaggregation of the audited financial statements for no less

---

[112] The forecast pro-forma regulatory statements are set out in Appendix 5.

[113] Where the derivation of forecasts has relied upon reports prepared by consultants and other external sources, the reports or source material shall be available for the Commission to examine and verify them.

than two regulatory periods. All working papers shall be made available to the Commission upon request.

2.1.2 Specific accounting requirements

2.1.2.1 Initial assets

The value of assets (for the first regulatory review) generally in service on 1 July 1999 will be determined in accordance with clause 6.2.3(d)(4)(iii) of the NEC. This issue is also discussed in Chapter 4.

The Commission may subsequently revalue the initial asset values where appropriate and consistent with the regulatory regime in place at that time. An example being an DORC framework, which may require the opening asset base to be revalued periodically to ensure that the asset values used in determining the revenue cap are still consistent with a DORC valuation at that time.

2.1.2.2 New assets

Assets coming into service after 1 July 1999 shall be valued according to the asset valuation methodology prescribed in Chapter 5. New assets shall be recognised in the regulatory asset base on a basis consistent with Chapter 5, and the calculation of depreciation shall commence at that date.

Where financing costs are to be included in the asset base in accordance with Chapter 5 the TNSP must maintain a subsidiary account to the asset account to record these costs. The financing costs contained in the account shall be amortised over the useful life of the asset, which must be consistent with that employed for the calculation of depreciation for the asset.

For reporting to the Commission, the financing costs included in the subsidiary account will be included in the regulatory asset value reported to the Commission. The TNSP should include a note to the regulatory statement or schedule detailing the financing component of the asset value. Similarly, the amortisation of these costs will be included in the depreciation recorded for the asset and a note detailing the amortisation component should accompany the regulatory statement or schedule.

If the asset is subject to optimisation an equivalent proportion of the subsidiary asset financing account is also to be optimised. The same reporting requirements for the subsidiary optimisation account are to apply as to the non-optimised portion of the asset. The accounting treatment applied to entries in the optimisation accounts is also to be applied to entries in the subsidiary optimisation account, in accordance with Chapters 4 and 5.

The subsidiary asset financing account is not to be adjusted for events other than amortisation and optimisation after the commissioning of the asset.

2.1.2.3 Subsequent regulatory revaluation of assets

When assets are subject to a regulatory revaluation the asset and accumulated depreciation accounts are to be re-stated at their new values as determined by application of the relevant asset valuation methodology. Any net increase or decrease in the carrying amounts of the assets as a result of applying the asset valuation methodology is to have a matching entry in the equity accounts of the TNSP.

For regulatory revaluations applied to assets that have been contributed to by customers this section should be read in conjunction with section 2.1.2.5 below.

2.1.2.4 Optimisation of assets

The general process and timing for optimisation is outlined in Chapters 4 and 5, for assets in the initial asset base and new capital expenditure respectively.

As assets may be optimised out of the asset base, at either construction or becoming stranded over time, they may re-enter the regulatory asset base at a later stage and a record of the optimised assets will need to be maintained.

The treatment of these assets while optimised out of the asset base shall be consistent with Chapters 4 and 5.

2.1.2.5 Customer contributions

For the purposes of regulatory reporting UIG abstract 17 'Developer and Customer Contributions in Price Regulated Industries' is not to be applied. As is recognised in the abstract the regulatory asset base is to be reported net of customer contributions. Therefore, in order to ensure that customer contributions are netted out of the asset values, the TNSPs are required to maintain contra accounts to the relevant asset accounts.

The following should be read in conjunction with section 2.1.2.3 above. Where an asset, which has been contributed to by the customer, is subject to a change in its economic value as a result of factors other than the consumption of future economic benefits it must be reflected in the customer contributions contra account.

The customer contributions contra account is to be adjusted on a basis consistent with the proportional contribution made by customers to ensure that the initial acquisition of the asset, and any subsequent contributions, are comparable to the investment made by the TNSP in the same assets. An example of how this would apply is where a customer contributed 30 per cent of the initial cost of the connection assets required for them to be connected to the TNSP's network. These assets have subsequently increased in value by $1000 for regulatory purposes due to an increase in the replacement cost of the asset. The customer contributions account would, in this instance, increase by $300.

When reporting to the Commission via the pro-forma statements, customer contributions should be recorded in the 'not allocated' column associated with the asset which has been contributed to.

Depreciation or return of capital charges are to be based upon asset values net of customer contributions, and net of the proportion of changes in asset values that is attributable to customer contributions. At no stage should the recovery of capital expenditure on a specific asset exceed the TNSP's share of investment in that asset.

2.1.2.6 Depreciation

As discussed in Chapter 5 the Commission intends to apply *competitive depreciation* for determining the return of capital component of each TNSP's revenue cap. The treatment of *competitive depreciation* in the regulatory financial statements requires that the change in the economic value of each asset, as determined by the asset valuation methodology, be recorded in the regulatory depreciation expense account for that asset.

The change in the economic value of an asset over the regulatory reporting period may be either positive or negative and is to be applied to all assets not just those that are depreciable for accounting purposes.

As would occur under the Australian accounting standards the balancing entry is made to the accumulated depreciation account associated with the asset in question. As noted previously this may result in either an increase or decrease in the balance of the accumulated depreciation account, which represents the change in the economic value of the asset over the regulatory reporting period.

If there is an increase in the economic value of the asset that will result in a negative value for the accumulated depreciation account, the excess over the current balance of the accumulated depreciation account should be recorded as an increase in the asset account. At no stage should there be a negative balance in the accumulated depreciation account for any asset.

2.1.2.7 Specific exclusions from asset base and cost recovery

The following items are not to be included in the regulated business segment of the TNSP's disaggregated regulatory statements.

Research and development - Asset base

Research and development expenses are not to be capitalised into the regulatory asset base in the regulatory statements. Due to the manner in which the revenue cap is determined any capitalisation and inclusion in the asset base would result in the expenses being recovered, via the return on and of capital components of the revenue cap. The Commission believes that research and development costs are best recovered through the commercial exploitation of the research and development undertaken.

Research and development - Cost recovery/amortisation

Research and development activities are not required for the provision of transmission services, and they can be subject to high levels of risk, and may provide substantial rewards. In order to reflect this, the Commission will not include those expenses associated with research and development as part of the regulated expenses in the regulatory statements. This enables the TNSPs to undertake any research and development they see as appropriate without fear that any results they may achieve will impact upon their regulated revenues. Customers of the TNSPs will also benefit, as the charges for the provision of regulated transmission services will not be subsidising unrelated activities.

Goodwill - Asset base

Goodwill will not be included as an asset in the regulatory asset base of the TNSPs as goodwill does not provide any additional services that warrant a regulated return.

Goodwill - Cost recovery/amortisation

Goodwill is not to be recovered by expensing it in the regulatory statements. In the current context goodwill is merely a premium paid to the vendor that has been made in anticipation of recouping amounts greater than the goodwill via means such as cost savings through the introduction of new practices, etc. It is a matter for prospective asset acquirers to consider when assessing bids or offers and cannot be justified for inclusion in the calculation of the revenue cap.

2.2 Regulatory accounting period

As a default the regulatory accounting period will match that of the TNSP's normal reporting period, i.e. the period for which their audited financial statements relate. The Commission

does however, reserve the right to require a TNSP to provide all of the following at times inconsistent with the normal reporting period:

- Corporations Law compliant audited financial statements;
- regulatory accounting statements; and
- other pertinent information, for periods other than that of the TNSP's normal reporting periods, as required by the Commission to discharge it duties under the NEC.

This will be particularly relevant for acquiring updated information when the Commission is required to make a revenue cap decision that does not coincide with the normal delivery of regulatory financial information.

2.3 Materiality

If omission, misstatement, or non-disclosure of a particular item will, or has the potential to, impact on the Commission's perception of the information disclosed by the TNSPs, it is material.[114] Materiality for accounting purposes is generally used to determine if an item, or items, is required to be included in the financial statements of the entity preparing them.[115] The Commission however, will use materiality as a mechanism for more detailed disclosure by the TNSPs.

All transactions shall be reflected in the regulatory statements prepared by the TNSPs, however where an item is deemed to be material to the regulatory regime that has been adopted it shall be disclosed in the regulatory statements separately. Alternatively, where it is included as part of a class of transactions it must be disclosed by way of a note to the regulatory statements.

Where a material difference arises between forecasts disclosed to the Commission and the eventual results, this difference and the reasons for this difference should be disclosed to the Commission by a note to the relevant historical regulatory statement. Where reasonable an assessment of the impact of the variance upon the performance of the TNSP for the remainder of the current revenue cap period should also be included in the note to the regulatory statement.

As noted below in section 2.4, it is the commercial substance of transactions that must be reported. Therefore, where several transactions for a common purpose occur, it is in aggregate that these transactions will be considered when assessing materiality and disclosure under this section.

The Commission in its meetings with the auditors prior to the commencement of their engagement will give an indication as to any specific criterion that should be applied in assessing an item's materiality, and therefore the requirement to disclose. These criterion form part of the regulatory framework that will be adopted for the regulatory review and will therefore form part of the Commission's decision. The Commission will necessarily apply rigorous criterion in the first regulatory periods to aid in familiarising itself with the TNSP's

---

[114] Adapted general test for materiality described in Statement of Accounting Concepts SAC 3 'Qualitative Characteristics of Financial Information', Australian Accounting Standard AAS 5 'Materiality', and Accounting Standard AASB 1031: Materiality.

[115] Paragraph 28 of Statement of Accounting Concepts SAC 3 'Qualitative Characteristics of Financial Information'.

businesses, however as the Commission's understanding increases the criterion may be relaxed.

When assessing the criterion to be applied in determining materiality the Commission will take note of the materiality levels adopted by audit firms and as a reference Table A1 has been included. The values that this table produces are meant to be a guide only and all assessments of materiality will reflect the general definition of materiality at the beginning of this section.

The Commission recognises the differences in the natures of forecast and historical information and will therefore include these differences in the assessment of the criterion to apply to each in determining materiality.

Table A1: Indicative materiality levels

Revenue / Asset Base			
Lower $	Upper $	Materiality level $	Of excess over $
30,000	100,000	1780 + 0.031	30,000
100,000	300,000	3970 + 0.0214	100,000
300,000	1,000,000	8,300 + 0.0145	300,000
1,000,000	3,000,000	18,400 + 0.01	1,000,000
3,000,000	10,000,000	38,300 + 0.0067	3,000,000
10,000,000	30,000,000	85,500 + 0.0046	10,000,000
30,000,000	100,000,000	178,000 + 0.00313	30,000,000
100,000,000	300,000,000	397,000 + 0.00214	100,000,000
300,000,000	1,000,000,000	856,000 + 0.00145	300,000,000

2.4 Commercial substance to prevail over legal form

The regulatory statements must reflect the commercial substance of transactions or events. Where commercial substance of a transaction or event differs from legal form, it is the commercial substance that must be reported.

2.5 Audit trail

The disaggregation of, and any regulatory adjustments to, account items must be conducted in such a manner as to produce an audit trail.

2.6 Verifying information disclosed

The TNSPs shall ensure that all information provided to the Commission is verifiable.

Where the Commission requires more detailed information than is provided by the TNSPs in the regulatory statements, the Commission reserves the rights to request access to the underlying schedules and accounting records that support the information in question.

2.7 Related party transactions

All transactions between TNSPs and related parties, as defined below, must be disclosed to the Commission.

Related party means, in relation to all business segments within TNSP:[116]

(a) any entity that, at any time during the regulatory accounting period, has control or material influence[117] over the TNSP; or

(b) any entity that, at any time during the regulatory accounting period, is subject to control or material influence by the TNSP; or

(c) any entity that, at any time during the regulatory accounting period, is controlled by the same entity that controls the TNSP; or

(d) any entity that, at any time during the regulatory accounting period, is controlled by an entity that materially influences the TNSP; or

(e) any entity that, at any time during the regulatory accounting period, is materially influenced by an entity with control over the TNSP; or

(f) any entity that, at any time during the regulatory accounting period, is materially influenced by an entity with material influence over the TNSP; or

(g) any entity that, at any time during the regulatory accounting period, controlled or materially influenced by an entity which is subject to control or material influence by the TNSP; or

(h) any director of the TNSP or any of their director-related entities; or

(i) any director of any entity identified as a related party in paragraphs (a) to (g) above, or any of their director-related entities; or

(j) any other business segment within the TNSP;

but excludes any other entity (except those identified as a related party under paragraph (h)) where the related party relationship results solely from normal dealings of:

(k) financial institutions; or

(l) authorised trustee corporations (as defined in the Corporations Law); or

(m) fund managers; or

(n) trade unions; or

(o) statutory authorities; or

(p) government departments; or

(q) local governments.

---

[116] Adapted from the definition of related party as contained in Accounting Standard AASB 1017: Related Party Disclosures.

[117] Material influence is the ability to materially influence the operation and management of, or by, the related party. The assessment of material influence will be based upon the relevant available facts relating to influence available to be exercised, and therefore quantitative guides to assessing material influence has not been prepared.

As part of meeting its requirement of disclosure for related parties, the TNSP must undertake to identify and bring to the attention of the Commission all related parties. The notification should include:

- the name of the related party;
- the nature of the relationship between the TNSP and the related party; and
- contact details for the related party.

2.7.1 Operating transactions

Transactions of an operational nature that occur between a TNSP and any related party shall be fully disclosed to the Commission. In order for the TNSP to meet its disclosure requirements, the TNSPs must ensure that:

- any transactions that occur in the reporting period are identified and the magnitude of these transactions is reported; and
- the basis of the pricing applied to the transaction is reported by way of a note to the relevant regulatory schedule.

2.7.2 Financing transactions and non-reciprocal transfers

Transactions of a financing or a non-reciprocal nature that occur between a TNSP and any related party shall be fully disclosed to the Commission. In order for the TNSP to meet its disclosure requirements, the TNSPs must ensure, as a minimum, that:

- any transactions that occur in the reporting period are identified and the magnitude of these transactions is reported;
- the terms and conditions of all related party financing transactions are disclosed by way of notes to the relevant regulatory schedule; and
- the purpose of all financing transactions and arrangements, and all non-reciprocal transfers to and from related parties are disclosed by way of notes to the relevant regulatory schedule.

2.8 Financing transactions and arrangements

All financing transactions and arrangements that are current, or were in place during the reporting period should be disclosed to the Commission. Such disclosure should, as a minimum, consist of:

- the identification of all transactions or arrangements which were active during the reporting period and the magnitude of these transactions or arrangements;
- the terms and conditions of all financing transactions or arrangements are to be disclosed by way of notes to the relevant regulatory schedule; and
- the purpose of all financing transactions and arrangements are to be disclosed by way of notes to the relevant regulatory schedule.

Appendix 2: Regulatory statements and schedules

1. Historic information

Historic financial information is of great significance to the regulatory process as it fulfils three major roles. It provides:

- a basis upon which forecasts of the future can be based;
- the ability to assess the accuracy of the forecasts once the events have occurred, and a measure of forecast error; and
- the regulator with an understanding of the business and its environment.

2. One-year forecasts

One-year forecasts will be used to revise the estimates made by the TNSPs at the previous regulatory review, and to give the Commission an understanding of the nature of any changes. This will be of most importance during the first few regulatory periods as the TNSPs become familiar with the regulatory regime, and to enable the Commission to gain a greater understanding of each of the TNSP's businesses, the forecasting processes utilised by the TNSPs, and their accuracy. This is particularly important when reviewing regulatory period forecasts.

3. Regulatory period forecasts

Regulatory period forecasts will be one of the major sources of information utilised by the Commission in its determination of the revenue cap to apply to the TNSP over the following regulatory period.

4. Completion instructions

4.1 Regulatory adjustments

There will be circumstances where an adjustment needs to be made to the account balances used in the audited general purpose financial reports in order to comply with regulatory accounting rules. When this occurs, the TNSP shall indicate the work-paper used to make the adjustments in the work-paper reference column in the appropriate regulatory statement or schedule, in addition to entering the total of the adjustments in the regulatory adjustments column.

4.2 Disaggregation

The amounts that appear in the TNSP's audited financial accounts should be disaggregated between:

- prescribed activities regulated by the Commission by the revenue cap determined in accordance with the NEC;
- activities which are not subject to the revenue cap regulation of the Commission; and

- transactions or accounts which are not required to be allocated between prescribed and non-prescribed activities, or where they have been directed to be disclosed in the 'not allocated' column of the pro-forma statements. Where such an entry is made, the event(s) giving rise to it should be disclosed by way of a note to the statement or schedule. Notes should include the financial magnitudes of the events and any subsequent adjustments, such as those that apply to revaluations of assets that have been contributed to by customers.

4.3 Shading of cells

Certain cells have been shaded in the pro-forma statements. This has been done to highlight those cells where data can or should be entered. The following information is most relevant to the electronic version of Appendix 5, as it may not be clearly reflected in the printed version.

Green: Cells shaded in green are those cells where data can be freely entered by the TNSP.

Red: Cells that have been shaded red require additional disclosures by way of a note to the statement or schedule when an entry is recorded in them. The note to the statement or schedule should include the rationale behind the entry and the section or chapter of the *Regulatory Principles* that allows or requires the entry.

Grey: Cells that are shaded in grey, are those cells where data may not be entered at any stage.

4.4 Account class and heading definitions

Appendix 5 contains the draft pro-forma statements that the Commission is proposing for the TNSPs to use for reporting their financial information. The classes and headings have not been explicitly defined and are designed to present an indication of the information that the Commission will be seeking from the TNSPs.

Prior to the implementation of the information disclosure requirements the Commission will discuss the option of further disaggregating the information into more appropriate cost centres and will seek advice on the most appropriate format for this from each TNSP. The Commission will take note of the disaggregation applied for management reporting for each of the TNSPs when assessing the most appropriate format for regulatory purposes. In addition to the management reporting frameworks the Commission will also be requesting information relating to account class titles and definitions used.

Disaggregation of the financial information into cost centres will be subsidiary to the pro-forma statements contained in Appendix 5 and will apply consistent definitions for account classes, however this information may be non-comparable between TNSPs reflecting specific issues of network management in each state.

By involving the TNSPs in this manner the Commission will be better informed about the TNSPs' businesses. The resultant regulatory statements will provide better information to the TNSPs about the impact of the regulatory regime by providing regulatory information disclosure requirements that will be more readily comparable to the internal management decision making processes.

4.5 Prescribed controllable costs

The 'Prescribed controllable costs' column should contain only those costs that have been entered into the 'Prescribed' column of the operating expenses schedules that the TNSP has the ability to control. Therefore, this column will generally not include fixed or imposed costs, such as sales tax.

4.6 Regulatory period headings

Column headings which include R1, R2, etc refer to future regulatory periods, with the number being equal to the number of regulatory periods it is from the current regulatory period. For example, R1 is the next regulatory period, and R3 is the third regulatory period from the current one.

4.7 Forecast values

The values entered into this schedule should be current market costs. The reliability test for recognition is not required to be applied to forecasts of capital expenditure more than 10 years into the future, however a note should be included as to the probability of the event or transaction. The inclusion of long-term forecasts is to provide the Commission with an indication as to the potential need, and magnitude of capital expenditure in those time periods, and any regulatory issues they pose.

4.8 Related party transactions

A new copy of this schedule is to be created for each related party that the TNSP had conducted transactions with, and where a different basis for dealing with the related party has arisen. This is important where the normal procedure is to conduct the transactions on an arms length basis, but an extraneous transaction which is material to the regulatory financial statements of the TNSP is not conducted in such a manner. Therefore, the name of the related party and the basis of dealings are to be unique to each schedule.

Details that should be included in the basis of dealings include:

- the relationship giving rise to the party being defined as a related party for regulatory purposes;
- the mark-up or loss on cost that the transaction(s) represent;

and where the transactions involving prescribed business segments are not on normal commercial terms:

- a general description of the manner in which the transactions are conducted; and
- the rationale for non-commercial transactions.

4.9 Optimisation accounts and schedules

In order to account for the optimisation of the regulatory asset base the TNSPs will need to create a series of new accounts. This would involve the TNSP establishing some form of control accounts for optimised assets and the associated accumulated depreciation. In addition the TNSPs would establish a series of subsidiary accounts to account for the specific

assets and their accumulated depreciation, where specific assets are identified in the optimisation process.

Optimisation of assets also requires that other asset related accounts also be created to ensure consistent and appropriate treatment of the assets remaining in the asset base. These accounts include a revaluation reserve, as discussed in section 2.1.2.3 of Appendix 1 and Chapter 4, and subsidiary asset financing accounts, as discussed in section 2.1.2.2 of Appendix 1 and Chapter 5.

Appendix 3: Regulatory reporting schedules

The following is intended to give an indication of the information disclosure requirements of the Commission. It should be noted that the following items are not exhaustive. The Commission reserves the right to vary the level of information provision required of each TNSP, on a case-by-case basis.

1. Annual reporting

Information that the Commission may, but is not limited to, require a TNSP to prepare and submit for a regulatory accounting period include:

- audited general purpose financial reports for the period including the notes to and forming the reports;
- audited regulatory statements and schedules including, but not limited to:
  - the disaggregated financial performance for the period, including supporting regulatory schedules;
  - the current financial position, including supporting regulatory schedules;
  - notes to and forming the regulatory statements;
  - the underlying accounts and regulatory adjustment journals;
  - an analysis of the forecast versus actual financial performance for the period, including clear explanations for material variances;
  - forecasts for the following period's financial performance; and
  - details of the basis of assumptions used to determine forecasts;
- a reconciliation of cash flows and regulatory accounting profit for the year;
- a reconciliation of regulatory accounting profit and profit for taxation purposes for the year;
- the auditor's report(s);
- the director's responsibility statement;
- the chart of accounts;
- demand figures for the previous year;
- forecast demand figures for the following year;
- service standards reporting requirements as per Chapter 8;
- a map of the current network which clearly identifies;
  - the different ratings of the transmission lines;
  - other network plant;
  - current capital works projects (noting anticipated completion date); and
  - the ages of the network assets;
- a NEC compliance checklist where appropriate; and

- a signed letter of agreement to publicly release the information provided to the Commission, and where exemptions to this agreement are being claimed by the TNSP there should be accompanying rationale.

2. Reporting for revenue cap review

Information that the Commission may, but is not limited to, require a TNSP to prepare and submit at a regulatory review period include:

- the annual reporting requirements;
- an analysis of budgeted versus actual capital expenditure for the previous regulatory review period;

the TNSP is also required to submit an application, as prescribed in Chapter 2, for a revenue cap which should include:

- the TNSP's estimation of their required revenue path for the next regulatory period including allowances for anticipated efficiency gains;
- justification for the TNSP's forecast revenue path for the next regulatory period including WACC, CAPM, efficiency assumptions, and the asset base to which the rate of return is to be applied;
- forecasts of the financial performance of the TNSP over the next regulatory period using the WACC, CAPM, and efficiency gains assumptions;
- details of how the forecast financial information has been derived, the accounting principles that have been employed in preparing the statements, and the assumptions which have been used;
- anticipated capital expenditure program for the next 20 years;
- details of the proposed financing arrangements for anticipated capital expenditure, the status of current debt, including those which are to be retired, and the forecast capital structure of the TNSP over the next regulatory period;[118]
- demand forecasts for the following regulatory period;
- forecast map of the network as at the end of the regulatory period which identifies:
  - proposed capital works projects (noting anticipated completion dates);
  - the different ratings of the transmission lines;
  - other network plant;
  - current capital works projects (noting anticipated completion dates); and
  - the ages of the network assets;
- a NEC compliance checklist where appropriate; and

[118] By requesting this information the Commission does not intend to micro-manage the financing arrangements of the TNSPs, rather it will be used in helping the Commission in assessing benchmark financing parameters for the WACC. It will also be used in the modelling of the taxation cash flows when assessing the rate of return to be applied to the regulatory asset base.

- a signed letter of agreement to publicly release the information provided to the Commission in the application, and where exemptions to this agreement are claimed by the TNSP there should be accompanying rationale.

The information requirements above include those items that the Commission will require of the TNSPs as a minimum. It should be noted however, that as the Commission will be required to make a revenue cap decision it is at this time that the Commission is most likely to require additional information from the TNSPs.

3. Interim reporting

Although information disclosure requirements will generally need to be met at the time frames set out above, situations may arise where interim, or shorter timeframe reporting will be required of the TNSPs.

This will most likely be the case where:

- there has been a material change in circumstances which threatens the validity of the revenue cap (either positively or negatively); or
- where certain information is required from the TNSP in order to undertake preparatory tasks, such as a reassessment of the optimal network, for the following revenue cap.

Without limiting the Commission's scope to require additional information disclosures, the types of information requirements outlined in the preceding sections of this appendix gives an indication of what information the Commission may request. The actual requirements will reflect the nature of the event that has given rise to the request for interim information.

Appendix 4: Directors' Responsibility Statement

In the opinion of the Directors of [name of TNSP]

- the Regulatory Accounting Statements set out on pages [ ] to [ ] are drawn up so as to present fairly in accordance with the requirements of the *Statement of Principles for the Regulation of Transmission Revenues* (*Regulatory Principles*) issued by the Australian Competition and Consumer Commission dated [version date];
  - the results of each Business Segment for the Regulatory Accounting Period ended [period end];
  - information concerning the state of affairs at [period end], of each Business Segment;
  - information concerning all Related Party Transactions required by section 2.7 of Appendix 1 of the *Regulatory Principles*; [delete if inapplicable] and
  - information concerning all Financing Transactions required by section 2.8 of Appendix 1 of the *Regulatory Principles*; [delete if inapplicable];
- no Related Party Transactions arose during the Regulatory Accounting Period that require disclosure under section 2.7 of Appendix 1 of the *Regulatory Principles* [to be deleted only if disclosure is confirmed above];
- no Financing Transactions arose during the Regulatory Accounting Period that require disclosure under section 2.8 of Appendix 1 of the *Regulatory Principles* [to be deleted only if disclosure is confirmed above];
- the ring fencing requirements as set out in Chapter 13 of the *Regulatory Principles* have been complied with; and
- the audit report set out on pages [ ] to [ ] addresses all of the Commission's requirements and is in the format requested.

The terms and definitions used in this statement accord with the definitions set out in the *Regulatory Principles* referred to above.

Signed in accordance with a resolution of Directors:

_____ _____

(name of director) Dated
Director

_____ _____

(name of director) Dated
Director

_____ _____

(name of director) Dated
Director

Appendix 5: Pro-forma statements and schedules