Draft Decision

Access Arrangement
Great Southern Energy
Gas Networks Pty Limited
Submissions
Public involvement is an important element of the Tribunal’s processes. The Tribunal therefore invites submissions from interested parties to all of its investigations.

Submissions should have regard to the specific issues that have been raised. There is no standard format for preparation of submissions but reference should be made to relevant IPART reports. Submissions should be made in writing and, if they exceed 15 pages in length, should also be provided on computer disk in word processor, PDF or spreadsheet format.

Confidentiality
Special reference must be made to any issues in submissions for which confidential treatment is sought, and all confidential parts of submissions must be clearly marked. However, it is important to note that confidentiality cannot be guaranteed as the Freedom of Information Act and section 42 of the Gas Pipelines Access Law provide measures for possible public access to certain documents.

Public access to submissions
All submissions that are not subject to confidentiality will be made available for public inspection at the Tribunal’s offices immediately after registration by the Tribunal and also via the Tribunal’s website.

Public information about the Tribunal’s activities
A range of information about the role and current activities of the Tribunal, including copies of latest reports and submissions, can be found on the Tribunal’s website at www.ipart.nsw.gov.au.

The Tribunal members for this review are:

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Mr James Cox, Full time member
Ms Cristina Cifuentes, Part time member

Submissions on the issues raised in this paper should be received no later than 20 October 1998.

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There are many things that the Regulator is required to consider in assessing an access arrangement submitted by the owner of utility infrastructure. In the case of the Access Arrangement submitted by Great Southern Networks (GSN) with respect to the Wagga Wagga natural gas system, the Tribunal has made its assessment according to the National Access Code for Gas.

One of the most important matters for consideration is the annual revenue and associated prices to be allowed for the infrastructure. Inextricably linked to this revenue and price outcome is the initial regulatory asset base and the allowed rate of return. In addition to revenue and prices, there are a number of important terms and conditions for access which the Tribunal has considered, and, in a number of cases, is seeking amendment.

The Tribunal has been heavily involved for a number of years in the debate about asset valuation for regulatory purposes. We have consistently expressed concerns about both historical cost accounting measures (such as Depreciated Actual Cost - DAC) as well as economic cost and replacement cost measures (such as Depreciated Optimised Replacement Cost – DORC).

Perhaps not surprisingly, given the strongly competing interests of different stakeholders, the debate on asset valuation for regulatory pricing purposes has not been resolved. Indeed, the debate has been extended to the flip side of the revenue-price algorithm – the rate of return for regulatory purposes.

The Tribunal has observed the debates over the ACCC/ORG draft decisions on the Victorian Gas Access Arrangements with great interest (indeed, fascination). Asset valuation has again featured prominently, with the different stakeholders vigorously arguing the pros and cons of different valuation methodologies, especially the DORC and DAC approaches.

The debate over rate of return, and one approach to determining rate of return for regulatory purposes (the capital asset pricing model) has reached new heights. Indeed, one might observe that the CAPM-WACC debate has gone to extremes beyond that about “angels on pinheads”.

The Tribunal has drawn an important lesson from the “Victorian debate”: while it is important to form a view about the allowed or implied rate of return for regulatory revenue purposes, the CAPM-WACC approach can do no more than provide one element of guidance to the regulator.

The problems with using CAPM-WACC are well known. They include a number of theoretical and practical problems, including at what point in time the risk free rate should be set; how to determine the equity risk premium in the absence of useful comparable data for listed equities in the relevant industry; and, the treatment of tax and dividend imputation for a business which makes tax equivalent payments to its owner.
Another lesson is the market’s lack of familiarity with the rate of return on regulated assets expressed as the pre tax, real weighted average cost of capital, rather than a post tax, nominal return on equity.

The Tribunal has formed its views on GSN’s proposed Access Arrangement on the basis of careful analysis of the document and the various submissions made. The Tribunal has considered the extensive economic and financial analysis undertaken by the Secretariat, including work undertaken by consultants. This work has covered operating expenditure, capital expenditure, rate of return, the initial asset base, new investment and depreciation.

There also has been considerable work undertaken on cost allocation and alternative tariff scenarios. Transportation charges represent a significant cost for customers and the Tribunal is concerned to ensure, inter alia, that there are no inappropriate price shocks for customers.

As part of our judgement regarding the regulated revenue to be allowed to flow to the utility infrastructure assets, the Tribunal has set out, as required by the code, both an initial regulatory asset base and a rate of return for regulatory purposes. As is clear, there is a feasible range for both the asset base and the rate of return. Clearly, the revenue that the Tribunal intends to allow could be derived by different combinations of rate of return and asset valuations, within these ranges.

This draft decision reflects our assessment of and, most importantly, our judgement about the revenue and price outcomes that best balance the competing interests of the owner and the different groups of customers of the Wagga Wagga gas network. It reflects our understanding of and judgement on the evidence and the arguments that have been put to us to date. It reflects the exercise of our discretion with regard to the regulated revenue outcome, with associated price paths for different customer groups, that in our judgement best balances the interests of different stakeholders consistent with the requirements of the legislation and the Code. It also reflects our judgement about the initial capital base and rate of return, from within the feasible range for both these parameters, consistent with this revenue requirement.

The Tribunal invites further submissions on this draft decision and its proposed amendments to the GSN’s proposed Access Arrangement for Wagga Wagga gas networks.

Thomas G Parry
Chairman
September 1998
EXECUTIVE SUMMARY

1 Introduction

In March 1998, Great Southern Energy Gas Networks Pty Limited (GSN) submitted to the Tribunal its proposed Access Arrangement relating to the natural gas distribution system in Wagga Wagga. The Access Arrangement describes the terms and conditions under which GSN will provide third parties with access to its gas distribution system.

This report presents the Tribunal’s draft decision on GSN’s Access Arrangement proposal. The Tribunal has assessed the proposal in accordance with the National Access Code (the Code) which came into effect in August 1998 following the enactment of the Gas Pipelines Access (NSW) Act 1998. The Code establishes a framework for third party access to gas pipelines, which is one aspect of the competition reform now being implemented in NSW and the rest of Australia. The objective of the reform is to create competitive markets for natural gas in which customers may choose their gas supplier.

This executive summary provides an overview of the Tribunal’s assessment of the Access Arrangement and the amendments the Tribunal requires. The proposed amendments and discussion of the key issues are set out in the relevant sections of the draft decision. A summary of the required amendments is provided in Schedule 1 following this executive summary.

2 Assessment of the Access Arrangement proposal

The Code sets out provisions with which an Access Arrangement must comply, along with criteria and procedures that the Tribunal, as the regulator, must follow to assess GSN’s Access Arrangement:

- In assessing a proposed Access Arrangement, the Tribunal must take the following matters into account (under section 2.24 of the Code):
  - the service provider’s legitimate business interests and investment
  - firm and binding contractual obligations of the service provider or other persons (or both) already using the covered pipeline
  - the operational and technical requirements necessary for the safe and reliable operation of the covered pipeline
  - the economically efficient operation of the covered pipeline
  - the public interest, including the public interest in having competition in markets (whether or not in Australia)
  - the interests of users and prospective users
  - any other matters that the relevant regulator considers are relevant.

- The Tribunal must take into account the principles with which reference tariffs and a reference tariff policy included in an Access Arrangement must comply.

- The Tribunal must consider the principles when determining total revenue (ie the revenue to be generated from the sales (or forecast sales) of all services) during the Access Arrangement period.

- The Tribunal must issue a draft decision regarding the Access Arrangement. If the Tribunal does not approve the proposed Access Arrangement, it must list any amendments it requires and give the reasons for its decision. After a further period of
public consultation, the Tribunal must issue a final decision. If a revised Access Arrangement is requested, it must be submitted by GSN within a period of not less than 14 days. GSN has the right of appeal within 14 days of the final decision.

Based on the Tribunal’s assessment of the information provided by GSN and submissions received from interested parties, the Tribunal proposes (under section 2.35(b)) of the Code not to approve GSN’s Access Arrangement proposal in its present form. In order for the Tribunal to grant approval to the proposed Access Arrangement, the Tribunal must be satisfied that the amendments it has requested have been incorporated or the issues raised in the draft decision have been met by other means.

This draft decision will be subject to a 21 day period of public consultation. During that time, the Tribunal will consult with interested parties regarding the amendments. The Tribunal aims to have a final decision in November 1998. The commencement date for the Access Arrangement is anticipated to be 1 January 1999.

3 Key outcomes

This draft decision is made after considering: GSN’s proposal, the requirements of the Code, the interests of customers, returns to GSN, and the implications for efficiency and competitive outcomes. The main features of this draft decision are:

• The setting of a 4 ½ year price path for GSN’s reference tariffs from 1 January 1999 to 30 June 2003.

• Although the Tribunal has accepted GSN’s proposed cost of service method in determining revenue requirements, it questions the reasonableness of the cost components, namely, operating costs, depreciation and rate of return on the proposed capital base.

• Changes in average reference tariffs are limited by the CPI-X formula (in terms of price per GJ). Average transportation charges will fall by 8.5 percent (in real terms) on commencement of the Access Arrangement and by CPI-2 percent in each of the 4 years from 1999/2000 to 2002/03.

• The X factor is determined based on the allowed revenue incorporating:
   – a real operating cost reduction of 2 percent per year
   – a forecast capital expenditure of $6.1m from 1998/99 to 2002/03
   – an initial capital base for the existing network assets of $28m
   – depreciation determined using the lower regulatory capital base
   – a rate of return of 7.5 percent (real pre tax) on the regulatory capital base and an expected return on equity of around 12-13 percent (nominal post tax)
   – a growth forecast of 2 percent a year for volume customers.

• Costs and revenues are to be allocated to the two classes of customers, the contract and volume customers1, using GSN’s cost allocation method, but adjusted for an asset write-down of $6m.

• The Tribunal generally prefers that the asset write-down should be undertaken to achieve price stability, especially in the volume market. GSN is required to put forward proposals for the allocation of the asset write-down between customers.

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1 Contract customers are customers whose gas consumption is more than 10 TJ a year. Volume customers are customers who use less than 10 TJ a year.
If the full amount of the asset write-down is allocated to volume customers, the impacts on customers are expected to be:

**Contract customers (who use > 10 GJ a year)**
- Contract market revenue will fall by $1m over the next 4 ½ years. In nominal terms, average transportation charges for contract customers (as a whole) will fall from $1.98 per GJ in 1997/98 to $0.73 per GJ in 2002/03. This is a reduction of over 60 percent in real terms.
- GSN will have the flexibility to design the reference tariffs for each of its three zones: Bomen, Central and Fringe. The actual reduction will therefore vary for individual customers.
- The reduction in GSN’s gas transportation charges may equate to a reduction of 20-25 percent in delivered gas costs.

**Volume customers (who use < 10 GJ a year)**
- Average transportation charges for volume customers will increase by about 0.8 percent a year, in real terms.
- The delivered gas price to tariff customers will depend on future gas costs, haulage and retail costs. As a consequence of this draft decision, it is estimated that the delivered gas price will increase slightly above inflation on average.
- Impacts on tariff customers will vary. It is anticipated that there will be a small real increase of 0.3 percent (above inflation) for residential and small business. However, other customers (large industrial, industrial and commercial) are likely to enjoy price reductions, in real terms, depending on GSN’s tariff restructure.

A number of amendments have been proposed to the terms and conditions of the proposed Access Arrangement.

In determining an appropriate rate of return on the initial capital base for GSN, the Tribunal has considered alternative sustainable revenue paths, the practices of overseas regulators, recent draft decisions on the Victorian Access Arrangements, and submissions on the proposal.

The debate on asset valuation and cost of capital highlights the difficulties and problems inherent in applying theory in practice; for example in the computation of the weighted average cost of capital using the capital asset pricing model and the alternative valuation methodologies. A considerable degree of judgement is necessary to integrate all elements, components and issues which the Tribunal is required to address under the Code. It should be particularly noted that the Tribunal has had to exercise judgement on many difficult and important matters. Some of the conclusions in this draft decision are somewhat tentative, and the Tribunal may well revise them in light of any subsequent information.

### 4 Overview of matters considered in setting reference tariffs

Under the Code, a reference tariff and reference tariff policy should be designed to achieve the objectives of:
- efficient costs
- competitive market outcomes
- economic efficiency (in regard to investment decisions and pricing)
- safe and reliable operation of the pipeline
• providing incentives to the service provider to reduce costs and develop the market.

GSN has proposed that total revenue be set to cover costs using a cost of service methodology, that is:

Total revenue

= Total costs

= Rate of return on the capital base + depreciation on the capital base + non capital costs

The allowed total revenue is then allocated between the various services and users in order to derive the reference tariffs. The allocation of costs and design of reference tariffs are summarised in section 4.3 and 4.4 of this executive summary.

The table at the end of this executive summary compares the Tribunal’s draft decision and GSN’s proposal in respect of reference tariffs, total revenues and financial issues.

4.1 The Tribunal’s approach to price regulation

A primary objective of regulation is to establish an environment which encourages the efficient operation, use and development of the gas network. Many factors contribute to such a regime, including:

• the length and form of the regulatory cap
• commitment to the regime by both the regulator and the utility
• the future sharing of efficiency gains
• the predictability of future determinations.

Capital related costs (rate of return and depreciation) are a significant proportion of the cost of service. In GSN’s proposed Access Arrangement, these costs account for the majority (about 75 percent) of the costs. It is important that regulation provide the utility with the opportunity to earn a commercially reasonable, but not excessive return on efficient investment. If returns are set too high, they will adversely impact on the competitiveness of the end users and may encourage inefficient bypass\(^3\). If returns are set too low, investors/utilities may be reluctant to invest in the industry, resulting in a degradation of service standards.

The Tribunal has adopted a framework that incorporates:

• assessment of GSN’s operational and capital expenditure
• analysis of financial indicators, including the rate of return and an assessment of the past, current and future commercial performance of the service provider
• consideration of the impact on consumers and service standards
• provision of appropriate signals for efficient new investments

\(^2\) Non capital costs include operating, maintenance, marketing and overheads.

\(^3\) Bypass refers to the construction of a pipeline to avoid the use of the existing distribution system or part thereof.
• incentive based regulation to encourage ongoing efficiency gains to be made by the network service provider, thereby ultimately delivering lower prices to consumers
• enhancement of economic efficiency and competition (including upstream and downstream competition).

In deciding GSN’s total revenue, the Tribunal has considered the matters required by the Code. As shown below, the revenue requirement of GSN is intrinsic to issues associated with efficiency, competition, service quality and customer impacts.

**Determinants of total revenue**

GSN’s gas transportation charges are a significant element of the cost of gas to final customers, representing over 50 percent of average domestic customers’ bills and approximately 33 percent of the bills of contract customers. Many of the business customers face competition in their market. The gas costs may affect their competitiveness, particularly for energy consuming industries. Further, the level of transportation charges will influence demand and the likelihood of competitive entry in gas supply. This, in turn, has major implications for the efficient use of existing gas network and future investments.
The reference tariffs should set prices which provide the financial capacity for GSN to maintain an adequate service as well as yield a reasonable return for its owners. The return on capital is dependent on both the cost of capital, and the capital base. Guided by the Code, the Tribunal has considered a feasible range for the cost of capital and asset values under different valuation methodologies. **The decision on the cost of capital and the asset value is a regulatory judgement which seeks to balance the competing claims of stakeholders and promote efficient outcomes.**

In assessing various possible combinations of asset values and rates of return, the Tribunal considers it vital that the rate of return is in line with reasonable commercial expectations. The nominal rate of return can have a significant effect on future investment incentives which, given the capital intensity of networks, are critical for future costs and service capacity.

By contrast, variations to the initial valuation of sunk assets need not affect incentives for future investment. Furthermore, economic efficiency principles provide limited guidance on the valuation of sunk assets. Therefore, once the initial valuation is set, it is important that:

- the constraints on future revaluations, if any, of the initial asset value are clear, and
- the rules for roll-in of new investment are clear.

The Code provides clear protection for owners from future revaluations of the initial capital base. This decision outlines the approach to be used in rolling forward the asset base and incorporating new investment.

### 4.2 Key financial issues in determining total revenue

Key financial issues include the rate of return, the opening regulatory capital base, indexation of the regulatory asset value, depreciation, and the treatment of tax.

In addition to the submissions before it, the Tribunal has had regard to the draft decisions by the Australian Competition and Consumer Commission (ACCC) and the Office of Regulator General (ORG) on the proposed Access Arrangements for the gas transmission and distribution systems in Victoria. The Tribunal has also considered the various submissions to ACCC/ORG regarding these issues.

**(a) Rate of return**

The Code requires that the rate of return provide a return on investment commensurate with prevailing conditions in the market for funds and the risks involved in delivering the service.

There is no perfect or agreed basis for calculating an appropriate rate of return. The CAPM framework is widely used by the financial market to estimate a **nominal post tax return on equity**. A weighted average cost of capital (WACC) can be derived on the basis of the return on equity and cost of debt using an assumed capital structure.

GSN proposes a real pre tax cost of capital which will be applied to the regulatory capital base. GSN submits that its weighted average cost of capital (WACC) is 11.1 percent (real pre tax) calculated using the capital asset pricing model (CAPM).

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*Other than for exclusion of redundant capital or indexation of the capital base.*
There has been considerable debate on the appropriate cost of capital following the draft decisions by ACCC/ORG on a real pre tax WACC of 7 percent in May 1998. Clearly, there are conflicting views on the appropriate level of cost of capital. Many submissions discussed the theoretical application of the CAPM. Whilst utilities and investors argue that the draft decisions fall short of market/investors’ expectations, users and consumer groups support the draft decision. However, there appears to be some confusion in regard to the 7 percent cost of capital (pre tax real) and the nominal post tax return on equity which is commonly used to assess a return on investment in the finance market.

In forming judgements about the required rate of return, the Tribunal has considered both the CAPM and additional evidence about required rates of return which is outside that model.

**Cost of equity**

In accordance with the CAPM principles, the risk free rate of return should be assessed on a forward-looking basis and reflect returns which investors can currently obtain in the market. The Tribunal has decided to use the 20-day average of the 10 year Commonwealth bond rate calculated at the time of making this draft decision (3 September 1998). On this basis, the nominal risk free rate of return is 5.7 percent (or around 3-3.5 percent real). There is some market consensus that the risk premium on equity is generally in the range 5.5-7.0 percent. In regard to the equity beta (which reflects the sensitivity of returns from gas utilities to movements in the equity market as a whole), the Tribunal has allowed an asset beta of between 0.40-0.50. This implies an equity beta in the range of 0.96 to 1.10.

Adding the risk free rate of return to the risk premium applicable to the gas sector gives a post tax return on equity of around 11.0-13.4 percent in nominal terms (or 8.5-11 percent real).

**Cost of debt**

The Tribunal has concluded that the cost of debt for gas utilities is 1 percent above the risk free rate of return, ie a cost of debt of about 6.7 percent.

**A range for the rate of return**

In the Tribunal’s judgement, use of a CAPM/WACC model suggests a rate of return in the range of:

- 11.0-13.4 percent nominal post tax return on equity, or
- 5.8-8.6 percent pre tax real rate of return on capital.

Details of the analyses and assumptions underpinning this assessment are provided in Attachment 3. The Tribunal has also considered other factors such as market expectations and risk assessment in exercising its regulatory judgement on the rate of return for GSN.

**Rate of return for GSN**

The Tribunal wishes to stress that the CAPM/WACC approach is one model for assessing rate of return. While it is commonly used, other models, such as dividend growth models or arbitrage pricing models are also used in the financial sector.
Some factors, for example, specific risk factors such as regulatory risk, are not easily handled using the CAPM approach. In principle, specific risks should be incorporated in cash flows rather than the CAPM. In practice, this is often difficult.

The Tribunal concludes that GSN’s proposed real pre tax WACC of 11.1 percent is excessive. The 11.1 percent is due to the use of a figure for 10 year long term bond rate in CAPM calculation, which is much higher than the current value of this rate. Against this, the Tribunal acknowledges that it may be reasonable to allow some headroom in GSN’s rate of return. This is because GSN is a relatively small service provider and its finances would be greatly affected by the loss of any of its small number of major customers.

The Tribunal has used CAPM/WACC as a guide to the feasible range for the rate of return. However, the selection of the rate of return within this range is inevitably a matter for regulatory judgement. In addition, the Tribunal has considered other factors including an assessment of the risks faced by GSN, other evidence on rate of return and other economic considerations. The Tribunal concludes that a rate of return within the range of 7-8 percent is appropriate for GSN for purposes of this draft decision, which is towards the higher end of the range under CAPM framework.

Within this range for the real pre tax rate of return (ie 7-8 percent), the Tribunal must then decide on the most appropriate point as the rate of return for GSN. This has been made after examining the initial capital base, the implications for prices, new investments and competition, and GSN’s cashflow positions and financial projections for the next ten years. These issues are discussed in the following sections.

The Tribunal concludes that a real pre tax rate of return of 7.5 percent is appropriate for GSN for this Access Arrangement period, given the size of the network and its associated risk and other considerations listed in the previous paragraph. The underlying nominal post tax return on equity is approximately 12-13 percent, a cost of debt of around 6.7 percent and a debt to equity ratio of 60%:40%.

The Tribunal wishes to emphasise that the rate of return determined for GSN reflects the Tribunal’s assessment of its business risks, given its operating environment, the maturity of its market, and the characteristics of its pipeline systems. The outcome is not intended to set a precedent for other regulated utilities in NSW or in other states. The Tribunal will consider an appropriate return for other regulated utilities following a case-by-case assessment.

(b) Opening regulatory capital value

GSN has proposed that the capital base, that is, the value of the assets of the distribution business, be determined on the basis of its depreciated optimised replacement cost (DORC) of $34m. It argues that the DORC valuation is consistent with the asset valuation that would apply to an efficient new entrant.

Under the Code, the Tribunal should consider a range of matters in deciding an opening regulatory capital value. The Tribunal has examined various possible asset values using commonly adopted valuation methodologies:

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5 In coming to this tentative conclusion, the Tribunal has considered CAPM and converted the post tax return to the real pre tax rate of return assuming an effective tax rate of 30 percent.
Executive Summary

- depreciated actual costs (DAC): $14.9m (Tribunal’s estimate)
- depreciated optimised replacement costs (DORC): $32.7m - in accordance with the Tribunal’s consultant, Kinhill Pty Ltd, asset valuation study based on brownfields conditions
- optimised deprival value using a line-in-the-sand methodology: $28.3m (Tribunal’s analysis)
- indicative market value based on a number of bids reported at the time of the sale of the natural gas business in early 1997: around $27-$29m.

In addition, the Tribunal has considered the following matters:
- An analysis of historical depreciation and the rate of return earned by the previous owner, Wagga Wagga City Council (WWCC). It appears that there is no evidence of under-pricing for the gas business as a whole in past years. Indeed, the finding of this analysis suggests that the gas distribution business earned a very good return prior to the sale of the business in 1997.
- An analysis of the revenue profile and price effects of changing the basis of the asset valuation from historical cost to current cost valuation during the life of the assets.
- An analysis of financial indicators to assess GSN’s financial viability under a number of revenue profiles, including GSN’s proposed revenue.
- Purchase price by Great Southern Energy. The difference between the acquisition price and the DORC reflects many factors including the strategic value to Great Southern Energy. The Tribunal is of the view that the purchase price is not normally relevant to establishing the initial capital base.
- The implications of the initial capital base for economic efficiency, including the bypass issue.
- Impact on end users.

From its analysis, the Tribunal concludes that the asset valuation proposed by GSN does not provide a reasonable balance of interests between the shareholders and users. The use of DORC would result in inequitable outcomes to customers (who as a whole appear to have contributed substantially to the capital investments made by the previous pipeline owner). GSN’s proposed initial capital base of $34m is higher than the optimised replacement cost estimated by Kinhill, the optimised deprival value and the indicative market value.

As provided for in the Code, the Tribunal has decided that the initial capital base for GSN should be $28m. This compares with a DORC of $34m proposed by GSN and a DAC of $15m. The revenue path under the draft decision on an initial capital base of $28m allows GSN to finance its activities and pay a dividend as well as being fair to customers.

The Tribunal notes that in their draft decisions on the Victorian Access Arrangements, ACCC and ORG have accepted a DORC valuation which has been modified and written down to prevent price increases to certain groups of customers. However, the ACCC has stated clearly that future decisions will be made on a case-by-case basis recognising the

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6 This means that the replacement of assets would need to consider all existing infrastructure (roads, footpaths etc) which is in place.
7 The DORC asset values have been reduced by the proponents for assets serving markets where prices based on the DORC asset value would result in higher charges for certain groups of customers.
economic arguments for and against the various asset valuation methodologies. This aspect of ACCC/ORG’s draft decisions should not necessarily be seen as a precedent for future decisions.

The allocation of asset write-down is discussed in section 4.3 of this executive summary.

(c) Depreciation to be included in the allowed revenue

Depreciation can be regarded as asset consumption, as a return of capital, or as a means of financing the replacement of assets.

Depreciation will be allowed on the initial capital base ($28m) using the straight line depreciation method. Depreciation on new capital expenditure will be allowed, and considered in the cost of service model. The Tribunal notes that depreciation allowed over this Access Arrangement period is significantly higher than the replacement capital expenditure.

In order for GSN’s Access Arrangement to be approved, the depreciation component is to be calculated based only on the regulatory capital base, which reflects the initial capital base determined by the Tribunal. The proposed depreciation is to be revised accordingly.

(d) Capital expenditure

The Tribunal notes the lack of information in GSN’s business plan and asset management planning at this stage. While this is a matter of concern, the Tribunal recognises that GSN has owned the business for just over one year.

The Tribunal accepts GSN’s proposal to remove the $3.5m capital expenditure for augmentation of the system to allow for the southward drift of residential growth for the purposes of calculating reference tariffs. However, in order for GSN’s forecast capital expenditure to be included in calculating the total revenue, the following conditions must be met:

- GSN is required to provide further information on its major capital expenditure projects and actual capital expenditure in 1997/98 to assist the Tribunal in determining whether this new facilities investment can reasonably be expected to meet the requirements and conditions in sections 8.16 and 8.17 of the Code.
- GSN is required to revise its unaccounted for gas assumption and the growth forecast for the volume customers.

The Tribunal’s acceptance of GSN’s proposed new infrastructure investment budget would not imply that this investment would automatically be included in the capital base at the beginning of the next Access Arrangement period. At the next review, the Tribunal will assess all actual capital expenditure incurred during this Access Arrangement period against the requirements of the Code.

A more detailed review of forecast capital expenditure will be conducted at the next review. The Tribunal expects GSN to develop its business plan and asset management plan during 1999.

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8 Unaccounted for gas is the difference between the quantity of gas that is metered as having entered the system and the (metered) amount delivered to end-users. Unaccounted for gas can arise from losses from the system, metering error or theft.
(e) Rolling forward the regulatory capital base

The Tribunal proposes that the initial capital base for GSN’s gas distribution business of $28m be rolled forward by adding capital expenditure, deducting depreciation and redundant capital, and indexing by the Sydney CPI. The Tribunal believes that this will deliver a stable price and revenue profile while maintaining the financial capital of the business in real terms. As noted above, capital expenditures will be subject to external review and testing prior to roll-in at the next access review.

The Tribunal is also of the view that the roll forward of the capital base should allow for the write-down of assets which are either redundant or underutilised. However, the Tribunal recognises that this will increase the investment risk for GSN and there is a need to provide guidance on how these issues will be considered in future. The Tribunal has therefore outlined some assessment criteria for capital expenditure.

(f) Operating expenditure (non capital costs)

Whilst GSN compares favourably with other gas network companies in terms of key performance indicators, the Tribunal considers that in line with general improvements in productivity throughout the economy, there is scope for some cost reduction. A real operating cost reduction of 2 percent per annum is assumed in the allowed revenue. The Tribunal considers that GSN has the management ability to achieve this efficiency target.

(g) Allowed revenue

On the basis of the above, the Tribunal has calculated the appropriate allowed revenue for GSN’s gas transportation services over the five years to 2002/03. To provide GSN with stability in its revenue stream, the Tribunal has smoothed the reduction of revenue over this period which would otherwise occurred in the first year. The Tribunal recognises that this smoothing of prices provides a benefit to GSN of $0.59m (in net present value terms) over this Access Arrangement period.

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating costs</td>
<td>1.55</td>
<td>1.48</td>
<td>1.45</td>
<td>1.42</td>
<td>1.39</td>
<td>1.36</td>
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<td>Depreciation</td>
<td>1.12</td>
<td>0.97</td>
<td>0.93</td>
<td>0.97</td>
<td>1.00</td>
<td>1.02</td>
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<tr>
<td>Rate of return</td>
<td>2.58</td>
<td>2.18</td>
<td>2.21</td>
<td>2.23</td>
<td>2.24</td>
<td>2.25</td>
</tr>
<tr>
<td>Return on working capital</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Total revenue</td>
<td>5.25</td>
<td>4.63</td>
<td>4.60</td>
<td>4.63</td>
<td>4.64</td>
<td>4.65</td>
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<tr>
<td>Smoothed allowed revenue</td>
<td>5.25</td>
<td>4.86</td>
<td>4.81</td>
<td>4.75</td>
<td>4.70</td>
<td>4.65</td>
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<td>GSN proposal</td>
<td>5.29</td>
<td>5.58</td>
<td>5.89</td>
<td>6.22</td>
<td>6.56</td>
<td></td>
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</tbody>
</table>

Note:
1. It is estimated that GSN’s total costs in 1997/98 are $5.12m. Assuming an inflation rate of 2.5 percent in 1998/99, the costs are equivalent to $5.25m in 1998/99 dollars.
2. The figure of $4.86m revenue is based on the full year effect of a 8.5 percent reduction in average transportation charges ($/GJ). As the commencement date of the Access Arrangement is scheduled from 1 January 1999, GSN’s revenue in 1998/99 will be around $5m, reflecting only a half year effect of price reduction.
The Tribunal has undertaken financial analysis which indicates that the revenue outcomes under this draft decision are sustainable. The financial indicator analysis shows that the draft decision will not adversely impact on the financial viability of GSN. The draft decision will pass on to customers the benefits of increasing efficiency, while providing adequate funds for GSN to meet its obligations as well as a reasonable commercial return for its shareholders reflecting the risks of the business.

4.3 Cost allocation

GSN proposes introducing reference tariffs by customer class, namely contract and volume customers. Reference tariffs for contract customers vary by location (ie the three zones of Bomen, Central and Fringe) whereas those for volume customers vary by customer size (on the basis of meter flow rate).

The reference tariffs were developed using a fully distributed cost of supply model which allocates costs according to the use of pipeline assets by customer classes. The use of common assets has been allocated to customers based on customers’ demand measured by the maximum hourly quantity (MHQ) over a year. The optimised replacement cost of the assets and customers’ demand have been used to allocate return on assets, depreciation and operating and maintenance costs.

Fully distributed costing is a commonly used pricing method in regulated monopolies. On this basis, GSN argues that volume customers are currently subsidised by contract customers. The Tribunal notes, however, that fully distributed cost models are not appropriate for assessing whether cross subsidies exist.

Although the Tribunal considers that GSN’s cost of supply model is reasonable, the Tribunal considers that it is appropriate to allocate the write down in the asset value to certain customers to avoid price shocks, provided that the overall result is reasonable and sustainable (from the service provider’s perspective).

Under the Tribunal’s determined initial capital base of $28m, there is an issue of how the asset write-down of $6m should be allocated among customer classes. After assessing the customer impacts carefully, the Tribunal prefers that the asset write-down be allocated to volume customers to protect them from large price increases. However, the Tribunal wishes to consult further before making its final decision.

4.4 Tariff structure

GSN proposes separate reference tariffs for contract customers and volume customers. Contract customers are to be charged based on their maximum daily quantity (MDQ). However, charges for volume customers will be split into a fixed and a volume charge: 50 percent of revenue will vary in respect of volume with the other 50 percent fixed charges. The majority of the costs of transporting gas are fixed costs. The proposal is more cost reflective than the current charging arrangements and arguably provides greater certainty of revenue to GSN.

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9 Great Southern Energy’s submission on the Tariff Review in Wagga Wagga.
10 Maximum daily quantity is a measure of the network demand by a customer on a daily basis.
Subject to amendments to tariffs consistent with the allowed revenue, the Tribunal supports GSN’s proposal, including the 50/50 split for volume customers and the phasing in of the new tariffs over time.

4.5 Growth forecasts

GSN proposes a demand growth forecast of 1-1.5 percent per annum for the volume market and nil for the contract market.

On the basis of available information on past growth and current economic conditions, the Tribunal considers that a higher growth forecast of 2 percent per annum for the volume market should be adopted. The Tribunal accepts the zero growth forecast for contract customers.

4.6 Reference tariffs

The Tribunal is concerned that in calculating its reference tariffs, GSN has not incorporated revenue from growth. GSN is required to submit to the Tribunal for approval revised Reference Tariffs that take into account growth and other amendments set out in this draft decision.

4.7 Overrun policy

Under GSN’s proposal, a penalty will apply to overruns. The penalty depends on the number of occurrences. The Tribunal is concerned about aspects of the overrun charges, particularly the application of the 5 percent penalty to a user’s total capacity for the first two overruns in the month. The Tribunal is also concerned about the severity of the overrun payments. GSN is required to address these concerns and amend its overrun policy accordingly.

4.8 Movements of tariffs over time

The Tribunal’s draft decision implies a reduction in GSN’s network revenue over the proposed five years of the Access Arrangement. The reduction in overall revenue over this period is about 11 percent in real terms. Subject to further input from GSN, it is estimated that over the five year period, there will be a large real reduction in network revenue from the contract market as a whole (over 60 percent), and small increases in the volume market revenue.

If the full amount of the asset write-down is allocated to volume customers, movements of GSN’s transportation charges over the proposed Access Arrangement period (1998/99 to 2002/03) and the indicative flow on effects on the delivered price of natural gas are shown as follows:

Contract customers

The reduction on network charges for contract customers will vary depending on their current price level. The reduction in network charges for contract customers may result in an average real reduction of 20-25 percent in the annual gas bill.

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11 An overrun occurs when the withdrawals by a user at a delivery point on a day exceed the capacity entitlement of the user.
Volume customers

The Tribunal is undertaking a review of the delivered price of natural gas to tariff customers served from GSN’s gas network in Wagga Wagga in parallel with this Access Arrangement assessment. A draft report will be released after the final decision on GSN’s Access Arrangement. It is expected that the draft decision on the distribution network revenues will flow on to the delivered price of gas for volume customers. As shown in the following table, for the average domestic customers, it is estimated that the Tribunal’s draft decision amounts to a small real increase of about 0.3 percent in delivered tariff prices.

Volume customers - indicative average delivered tariff and gas prices

($/GJ, \$ of the day)

<table>
<thead>
<tr>
<th></th>
<th>1997/98</th>
<th>2002/03</th>
<th>Annual change, %</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$/GJ</td>
<td>$/GJ</td>
<td>Nominal</td>
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<tr>
<td>Large industrial customers</td>
<td>8.61</td>
<td>9.09</td>
<td>1.1</td>
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<tr>
<td>Industrial customers</td>
<td>8.85</td>
<td>9.28</td>
<td>1.0</td>
</tr>
<tr>
<td>Commercial customers</td>
<td>10.58</td>
<td>10.18</td>
<td>-0.8</td>
</tr>
<tr>
<td>Residential &amp; small business</td>
<td>10.23</td>
<td>11.75</td>
<td>2.8</td>
</tr>
<tr>
<td>Total volume customers</td>
<td>10.12</td>
<td>11.47</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Note:
1. It should be noted that the Tribunal will release a draft decision on the review of the delivered price of natural gas to tariff customers served from GSN’s gas networks in Wagga Wagga following the final decision on access prices. This impact analysis is indicative only, based on certain assumptions about retail, gas and transmission costs and growth assumptions.
2. Assumes an inflation rate of 2.5 percent per annum.
Executive Summary

5 Non tariff and other issues

• The Tribunal has accepted GSN’s proposal to operate the Wagga Wagga network as a contract carriage pipeline. Users will have a firm allocation of capacity and the ability to trade their right to transfer a service to another user.

• Metering services should be unbundled from transportation services in light of the potential contestability of these services. Metering charges should be set separately according to the costs associated with metering services.

• The Tribunal does not accept GSN’s proposed level of unaccounted for gas (UAG) of 3.5 percent. An allowance of 2.5 percent should be applied.

• The Tribunal does not accept GSN’s trigger mechanisms for possible early revisions for the Access Arrangement. However, the Tribunal requires trigger mechanisms to deal with retail contestability and the possibility of a new tax regime which may impact on reference tariffs. A new proposal for this aspect should be submitted by GSN.

6 The form of regulation and incentive mechanisms

6.1 Regulatory approach

GSN has not specified the form of price regulation, but proposes indexing prices by the Sydney CPI. The Tribunal favours incentive-based regulation, in the form of CPI-X, which is widely used by other utility regulators in Australia and the UK.

In assessing the Access Arrangement for GSN, the Tribunal has decided that:

• Reference tariffs will be predetermined for the Access Arrangement period to follow a path that is forecast to deliver the allowed revenue stream consistent with the principles in the Code. The Tribunal has smoothed the path of allowed revenue.

• Incentive based price cap regulation, in the form of CPI-X average price regulation ($/GJ) will be applied. This will provide incentives for GSN to be efficient and innovative, and to reduce its overall cost of service. If GSN reduces its operating costs below the level allowed for, or achieves capital efficiency while maintaining the service standards, it will be able to retain the additional profits that will accrue over this Access Arrangement period.

• Under CPI-X average price regulation, GSN will retain any additional revenue that results from growth in demand and/or volume sales higher than forecast. This provides an incentive for GSN to grow its market and to develop new services.

• Prudent new facilities will be rolled into the regulatory capital base at the next review. To minimise regulatory uncertainty, the Tribunal has outlined some assessment criteria.

• At the next review, the Tribunal will decide whether additional efficiency gains (if achieved) will be retained by GSN over the next regulatory period. At present, there are no formal arrangements for monitoring GSN’s capital and operating expenditure. GSN has owned and operated the system for just over one year. GSN is still developing its business plan, management reporting and asset management plan. The Tribunal expects that these plans will be developed and available from next year and submitted to the Tribunal on an annual basis. The Tribunal considers that there is merit in formalising reporting arrangements for both capital and operating expenditures.
In terms of risk sharing under the CPI-X price cap regulation:

- The risk of inflation will be borne by customers. The capital base and prices will be linked to inflation.

- The risk of any cost over-runs (both operating and capital) will be borne by GSN. However, any efficiency gains arising from performance that is better than expected will be retained by GSN, at least over this Access Arrangement period.

- The risks of increases/decreases in volume transported (relative to the assumed growth) will be borne by GSN.

6.2 Price caps

In line with the smoothed allowed revenue and forecast growth, a real reduction of CPI-2 percent will apply to GSN’s average revenue per GJ in each of the four years, 1999/2000 - 2002/03.

7 The duration of the Access Arrangement

GSN has proposed a five-year Access Arrangement to take effect from 1 July 1998. Recently, GSN has suggested a possible commencement date of 1 January 1999. The Tribunal has considered this suggestion and has decided that a 4 ½ year Access Arrangement from 1 January 1999 to 30 June 2003 would be appropriate. The revision submission date will be 1 October 2002, that is, nine months prior to the expiry date.
Overview of the draft decision

<table>
<thead>
<tr>
<th></th>
<th>GSN’s proposal</th>
<th>IPART’s proposed amendments</th>
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<tr>
<td><strong>Reference tariffs issues</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services policy</td>
<td>- Contract carriage</td>
<td>- Contract carriage</td>
</tr>
<tr>
<td></td>
<td>- Metering service included as part of the transportation</td>
<td>- Separate metering service.</td>
</tr>
<tr>
<td></td>
<td>service.</td>
<td></td>
</tr>
<tr>
<td>Cost recovery</td>
<td>Recovery of fully distributed cost using a cost of service model.</td>
<td>Cost recovery based on “efficient” costs using a cost of service model.</td>
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<td>Structure of reference tariffs</td>
<td>Contract customers: 3 zones Volume customers: Annual charge &amp; volume based charges.</td>
<td>Approval of tariff structure but tariffs to be revised in line with the draft decision.</td>
</tr>
<tr>
<td>Cost allocation methodology</td>
<td>On the basis of a measure of usage of the Network ie the peak coincident demand.</td>
<td>Largely the same except for an asset write-down to be applied to certain customer classes.</td>
</tr>
</tbody>
</table>

**Determining Total Revenue and Capital Base**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Nominal post tax return on equity</td>
<td>15.5 percent</td>
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<tr>
<td></td>
<td>Approximately 12-13 percent</td>
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<td>“Derived” cost of capital (real pre tax)</td>
<td>11.1 percent (using standard market practice)</td>
</tr>
<tr>
<td></td>
<td><em>(the Tribunal notes that this would be 9.2 percent using K Davis’ conversion formula)</em></td>
</tr>
<tr>
<td></td>
<td>7.5 percent</td>
</tr>
<tr>
<td>Initial capital base</td>
<td>$34m</td>
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<tr>
<td></td>
<td>$28m</td>
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<td>Depreciation</td>
<td>- Depreciation based on DORC</td>
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<td></td>
<td>- Straight line depreciation.</td>
</tr>
<tr>
<td></td>
<td>- Depreciation (lower) based on regulatory capital base</td>
</tr>
<tr>
<td></td>
<td>- Straight line depreciation.</td>
</tr>
<tr>
<td>Rolling forward of capital base</td>
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<tr>
<td></td>
<td>Initial capital base + New facilities investment - Depreciation – Redundant Capital + Inflation adjustment</td>
</tr>
<tr>
<td>Indexation of regulatory capital base</td>
<td>Not specified.</td>
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<tr>
<td></td>
<td>Sydney CPI</td>
</tr>
<tr>
<td>Total capital expenditure forecast 1998/99 – 2002/03</td>
<td>$6.2m plus $3.5m for system augmentation if residential areas continue their southward drift which will not be included in calculating the reference tariffs.</td>
</tr>
<tr>
<td></td>
<td>$6.2m subject to conditions.</td>
</tr>
<tr>
<td>Operating expenditure</td>
<td>Constant in real terms.</td>
</tr>
<tr>
<td></td>
<td>Efficiency target to achieve real cost reductions of 2 percent a year.</td>
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<td>Form of regulation</td>
<td>Prices to increase by CPI.</td>
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<td></td>
<td>Incentive based CPI-X.</td>
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<tr>
<td>X factor</td>
<td>NA</td>
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<tr>
<td></td>
<td>A revenue reduction to $4.86m (full year effect)</td>
</tr>
<tr>
<td></td>
<td>CPI-2 percent a year on average price</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Schedule 1: Summary List of Amendments

Amendment 1 - Rate of return
In order for the GSN’s Access Arrangement to be approved, the rate of return (in real, pre tax terms) used in the proposed cost of service methodology for calculating total revenue should not exceed 7.5 percent (this is consistent with a nominal post tax return on equity of approximately 12-13 percent).

Amendment 2 - Initial capital base
For the GSN’s Access Arrangement to be approved, the following amendments must be made:
(a) The initial capital base is $28m.
(b) The net working capital is to be excluded from the initial capital base. Return on net working capital is to be allowed for separately.

Amendment 3 - Rolling forward of capital base
In order for GSN’s Access Arrangement to be approved, a statement is required providing for the indexing of the regulatory capital base by the annual inflation (Sydney CPI) for each year.

Amendment 4 - Depreciation
In order for the GSN’s Access Arrangement to be approved, the depreciation component must be calculated based only on the regulatory capital base, thus reflecting the initial capital base determined by the Tribunal. The proposed depreciation is to be revised accordingly.

Amendment 5 - Forecast capital expenditure
In order for GSN’s forecast capital expenditure to be included in calculating the total revenue, the following conditions must be met:
(a) The amount of $3.5m being forecast capital expenditure attributable to the southward expansion of residential areas of Wagga Wagga is to be removed from the Access Arrangement Information Document Appendix 4
(b) GSN is required to provide further information on its major capital expenditure projects and actual capital expenditure in 1997/98 to assist the Tribunal in determining whether this new facilities investment can reasonably be expected to meet the requirements and conditions in sections 8.16 and 8.17 of the Code.
(c) GSN is required to revise its unaccounted for gas assumption and the growth forecast for the volume customers.

Amendment 6 – Non capital costs
In order for GSN’s Access Arrangement to be approved, the following amendments to GSN’s non capital cost (operating cost) forecast are required:
(a) incorporate a lower authorisation fee of $100
(b) allow for a real cost reduction of 2 percent per annum
(c) exclude the cost of metering in calculating the reference tariff for the transportation service.
Amendment 7 – Price cap  
(a) In order for the GSN’s Access Arrangement to be approved, GSN must submit a reference tariff which, if applied over the whole year, will be consistent with total revenue of $4.86m in 1998/1999.  
(b) A price cap of CPI-2% will apply to each of the year between 1999/2000 and 2002/03.  
   The Sydney CPI for the year to March quarter immediately preceding the start of the relevant financial year will be applied.

Amendment 8 – Pricing principles  
The Tribunal requires that clause 3.2.2 be reworded to more accurately describe the basis for the principles adopted.

Amendment 9 – Reference tariffs  
For the GSN’s Access Arrangement to be approved, the price proposal must be revised, based on the amendments to target revenue and pricing required in this draft decision.  
Where zonal pricing is adopted for contract customers, the proposal should include a uniform price to be applied to all customers within a zone.  The Tribunal will consider the proposal along with submissions from interested parties.

Amendment 10 – Demand forecasts  
In order for GSN’s Access Arrangement to be approved, the Tribunal requires that GSN amend the Access Arrangement to incorporate 2 percent growth per annum for the volume customers (clause 3.5.2) and that this proposed growth rate be reflected in the reference tariffs.  The volume customer identified to be using more than 10 TJ of gas per annum should also be regarded as a contract customer.

Amendment 11 – Overrun charges  
In order for GSN’s Access Arrangement to be approved, the Tribunal requires that an amendment be made to clause 6.3 so that the overrun penalty for the first two overruns in a month applies to the overrun quantity only.  The Tribunal is conscious that this amendment may result in GSN’s proposing a larger penalty on the overrun units, and the Tribunal will consider this proposal if it is raised.

The Tribunal has requested further information on the methodology used to estimate the MDQ for each customer for the determination of prices.  The approval of the overrun policy is subject to confirmation that the estimates of MDQ are reasonable.

Amendment 12 – Service policy  
In order for the GSN’s Access Arrangement to be approved, clauses 2.5(c) and (d) should be deleted.

Amendment 13 – Metering services  
In order for GSN’s Access Arrangement to be approved, the charges for metering services should be presented separately in the Access Arrangement.  The costs associated with metering services are to be excluded from the costs of the transportation service.
Amendment 14 – Queuing policy
In order for GSN’s Access Arrangement to be approved, clause 5.2.4(c) should be amended so that GSN may seek confirmation from a prospective user that it wishes to continue with its request for service no more than once every 3 months.

Clause 5.3.3 (a) should be amended to follow the word “those” in the second sentence with “prospective users which hold a higher priority in the queue, but which are …”.

In addition, the words in the brackets in clause 5.4.3(a) “which may be subject to GSN’s entering into a service agreement with other prospective users on the queue” should be deleted.

Amendment 15 – Gas balancing
In order for GSN’s Access Arrangement to be approved, the Tribunal requires that a clause be added outlining the methodology for allocating gas at the Bomen Receipt point to contract and volume customers.

The Tribunal also requires that the word "have" be inserted after “does not have appropriate rights to” in Clause 7.2 (c) (3).

Amendment 16 – Unaccounted for gas
The Tribunal requires that clause 7.3 (a) be amended to read: “The percentage for Unaccounted for Gas for the entire Network is estimated to be 2.5 percent.”

To adjust for the change in UAG and correct a cross referencing error, clause 7.3 (b) should be amended to read: “The allowance for Unaccounted for Gas detailed in section 7.2 will be 0.7 percent for delivery to Delivery Points of Contract Customers and 4.8 percent for delivery to Delivery Points of Volume Customers.”

Amendment 17 – Charge for trades
In order for GSN’s Access Arrangement to be approved it should be amended so that the proposed administration fee of $100 payable by both the buyer and the seller where a capacity trade takes place should be payable by the seller only.

Amendment 18 - Pre-conditions to the provision of services
In order for the GSN’s Access Arrangement to be approved, clause 2.6.1(a) and also the sentence immediately after clause 2.6.1 (b) requiring users and prospective users to provide details of their gas supply arrangements should be deleted.

Amendment 19 - Bonds
In order for the GSN’s Access Arrangement to be approved, clause 2.6.3 should be deleted

Amendment 20 - Agreements
In order for the GSN’s Access Arrangement to be approved, clause 2.6.4 should be deleted.

Amendment 21 – Automatic changes to reference tariffs
In order for the GSN’s Access Arrangement to be approved, clause 3.7 should be deleted.

Amendment 22 – Retail Contestability
In order for the GSN’s Access Arrangement to be approved, clause 3.9 should be deleted.
Amendment 23 – Form of agreement with user’s customers
In order for the GSN’s Access Arrangement to be approved, clause 4.4.1 should be deleted.

Amendment 24 – Supplier of last resort
In order for the GSN’s Access Arrangement to be approved, clauses 4.4.3, Election by user’s customers, and 4.4.4, Posted supply price, should be deleted.

Amendment 25 – Arrangements with approved supplier
In order for the GSN’s Access Arrangement to be approved, clause 4.4.5 should be deleted. All references to “Approved Supplier” within the Access Arrangement should also be removed.

Amendment 26 – Trigger mechanisms
In order for the GSN’s Access Arrangement to be approved, clauses 12(d) to 12(f) should be deleted. In addition, the Tribunal requires GSN to include new trigger mechanisms as follows:

• within a period of one month after the development of state or national policy for the introduction of retail contestability to the tariff market, GSN is required to submit revisions consistent with that policy
• if, in the opinion of the Tribunal, there has been a change in taxation policy that has a major impact on reference tariffs (as determined by the Tribunal), GSN is required to submit revisions addressing the change in taxation within a period of one month after advice by the Tribunal.

Amendment 27 – Period of Transportation Services Agreement
In order for the GSN’s Access Arrangement to be approved, clause 2.3.3 should be amended so that a more clearly defined contract period for reference services is provided. The Tribunal believes that in this case, a one or two year contract would be appropriate. The Tribunal also requires the Access Arrangement to be amended to indicate GSN’s proposal that options to extend a contract do not form part of a reference service.

Amendment 28 – Negotiated service
In order for the GSN’s Access Arrangement to be approved, clause 2.4(b) should be amended so that the first sentence includes words to the effect of: “may include but are not limited to:”

Amendment 29 – User default
In order for the GSN’s Access Arrangement to be approved, clause 4.4.2(a) should be amended to specify a time period for notification of default.

Amendment 30 – Compensation for holding capacity
In order for the GSN’s Access Arrangement to be approved, clause 5.5 should be amended to specify that the amount of compensation shall be no greater than the reference tariff. The clause should also stipulate that no compensation will accrue or be payable in the first 20 business days after an offer has been made.
Amendment 31 – Notification regime
In order for the GSN’s Access Arrangement to be approved, clause 11.1 should be amended to provide for the curtailment of end use customers served off an interconnecting network or pipeline. If there is an agreement on load shedding between GSN and the operator of the connected third party system, the user will be subject to that agreement, otherwise the user will be subject to Load Shedding Priority 2 as set out in Appendix 5 of the Access Arrangement.

Amendment 32 – Revisions Submission Date and Revisions Commencement Date
In order for the GSN’s Access Arrangement to be approved, a Revisions Submission Date of 1 October 2002 and a Revision Commencement Date of 1 July 2003 are required.

Amendment 33 – Information concerning the network and existing users
In order for the GSN’s Access Arrangement to be approved, clause 13.1.1 and 13.1.2 should be amended to either specify the fees applicable or refer to the relevant clause in the Access Arrangement where the fees are listed. Additionally, the definition of ‘prospective user’ in the glossary should be amended to mirror the Code and the term ‘consumer’ should be changed to ‘customer’, as identified in the glossary.

Amendment 34 – Appendix 2 Transportation Services Agreement
In order for the GSN’s Access Arrangement to be approved, Appendix 2, should be amended as follows:

- Sections 1 and 7 should be amended to specify the requirements and standards (respectively) that are necessary.
- Section 11(f) should remove any reference to the trading of gas.
- The last dot point in section 11 dealing with automatic novation should be deleted.
- Section 14 should be amended to make it clear that the procedures outlined are intended for non access related disputes. The typo in the last dot point should be removed so that it is clear that an expert determination is binding, which the Tribunal understands is GSN’s intent.

The Tribunal is seeking comments on section 13 which does not meet ACCC’s product liability policy. The Tribunal will decide whether an amendment is needed to this section in light of the comments received.
PART I  BACKGROUND
1. INTRODUCTION

In keeping with commitments made by the Council of Australian Governments (CoAG) in 1994 and more recently in the Natural Gas Pipelines Access Agreement dated November 1997, the NSW Government is introducing competition into the supply of natural gas. Reforms have paved the way for new suppliers of gas to enter the NSW gas market. This has occurred through the development of a third party access regime for natural gas pipelines. Once suppliers have third party access to pipeline networks, they will be able to access existing reticulation systems and thus, compete for customers.

A necessary prerequisite to allowing third party access to a network is the development and approval of an Access Arrangement. An Access Arrangement provides operating procedures and rights in respect of access to a network, including reference prices for the use of relevant services. Developed by the network operator, it must be approved by the relevant regulator before becoming effective.

This draft decision deals with the proposed Access Arrangement submitted to the Tribunal for its approval by Great Southern Energy Gas Networks Pty Limited (GSN).

1.1 Review process

GSN submitted its proposed Access Arrangement and Access Arrangement Information document to the Tribunal on 4 March 1998. These documents were submitted in accordance with section 20 of the Gas Supply Act 1996 (Gas Act) and section 2 of the Third Party Access Code for Natural Gas Networks in New South Wales (NSW Code).

Under the NSW Code, the owner or operator of a pipeline that is covered by the Code is required to lodge a proposed Access Arrangement with the Tribunal. The proposed Access Arrangement describes the terms and conditions under which GSN will provide third party access to its natural gas network in Wagga Wagga.

Upon receipt of these documents, the Tribunal assessed GSN’s Access Arrangement Information to determine whether this document meets the requirements of the NSW Code. As a result of this assessment, the Tribunal requested changes to the Information document to enable it to meet the minimum requirements set out in Schedule B of the NSW Code. GSN duly made the required changes and the proposed Access Arrangement and Access Information documents were advertised for public comment on 25 March 1998. In response six submissions were received from interested parties (see Attachment 2) and the Tribunal has given these careful considerations. A public hearing and a customer information session were held in Wagga Wagga on 21 May 1998 and 13 July 1998 respectively to enhance the consultation process.

On 14 August 1998 section 20 of the Gas Act was repealed and the NSW Code was replaced with the National Third Party Access Code for Natural Gas Pipelines Systems (the Code). Transitional arrangements in the Gas Pipelines Access (NSW) Act 1998 deem all action taken in respect of GSN’s proposed Access Arrangement to have been taken as if it had occurred under the national regime. GSN’s Access Arrangement will now be assessed in accordance with the requirements of the Code.

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1 Initially at a State level that has now been superseded by the National Regime.
2 The Wagga Wagga network is described in section 5 of the Access Arrangement Information document. A map of the network is provided in Appendix 6 of that document.
The Code requires the Tribunal to make a draft decision that proposes to either approve or not approve the Access Arrangement submitted by GSN.

1.2 Criteria for assessment (the balance of interests approach)

The Tribunal may approve a proposed Access Arrangement:

“only if it is satisfied that the proposed Access Arrangement contains the elements and satisfies the principles set out in sections 3.1 to 3.20 of the Code.”

In assessing a proposed Access Arrangement, the Tribunal must take the following matters into account:

(a) the Service Provider’s legitimate business interests and investment in the Covered Pipeline;
(b) firm and binding contractual obligations of the Service Provider or other persons (or both) already using the Covered Pipeline;
(c) the operational and technical requirements necessary for the safe and reliable operation of the Covered Pipeline;
(d) the economically efficient operation of the Covered Pipeline;
(e) the public interest, including the public interest in having competition in markets (whether or not in Australia);
(f) the interests of Users and Prospective Users;
(g) any other matters that the Relevant Regulator considers are relevant.

Specific requirements of the Code are listed in section 5 (Information and Timelines for Negotiation) and section 8 (Reference Tariff Principles).

Under section 8.1 of the Code the service provider’s reference tariff and reference tariff policy should be designed with a view to achieving the following objectives:

(a) providing the Service Provider with the opportunity to earn a stream of revenue that recovers the efficient costs of delivering the Reference Service over the expected life of the assets used in delivering that Service;
(b) replicating the outcome of a competitive market;
(c) ensuring the safe and reliable operation of the Pipeline;
(d) not distorting investment decisions in Pipeline transportation systems or in upstream and downstream industries;
(e) efficiency in the level and structure of the Reference Tariff; and
(f) providing an incentive to the Service Provider to reduce costs and to develop the market for Reference and other Services.

To the extent that any of these objectives conflict in their application with a particular Reference Tariff determination, the Relevant Regulator may determine the manner in which they can be reconciled or whether a particular objective should prevail.

Factors about which the relevant regulator must be satisfied in determining to approve a reference tariff and reference tariff policy are set out in section 8.2 of the Code:

(a) the revenue to be generated from the sales (or forecast sales) of all Services over the Access Arrangement Period (the Total Revenue) should be established consistently with the principles and according to one of the methodologies contained in section 8;
(b) to the extent that the Covered Pipeline is used to provide a number of Services, that portion of Total Revenue that a Reference Tariff is designed to recover (which may be based upon forecasts) is calculated consistently with the principles contained in this section 8;

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3 See section 2.24 of the Code
4 See section 2.24 of the Code.
Introduction

(c) a Reference Tariff (which may be based upon forecasts) is designed so that the portion of Total Revenue to be recovered from a Reference Service (referred to in paragraph b) is recovered from the Users of that Reference Service consistently with the principles contained in this section 8;

(d) Incentive Mechanisms are incorporated into the Reference Tariff Policy wherever the Relevant Regulator considers appropriate and such Incentive Mechanisms are consistent with the principles contained in this section 9; and

(e) any forecasts required in setting the Reference Tariff represent best estimates arrived at on a reasonable basis.

These matters are addressed throughout this draft decision.

The Tribunal recognises that a degree of tension may arise between these matters, including tension between groups with different interests. The Tribunal has used its judgement to reach an appropriate balance between the various matters, objectives and factors referred to in the Code.

The Tribunal commissioned an external engineering consultant, Kinhill Pty Ltd, to review the optimised replacement cost of the Wagga Wagga Natural Gas Distribution System. Copies of this report are available from the Tribunal upon request.

The Tribunal has also carefully reviewed recent draft decisions by the Australian Competition and Consumer Commission (ACCC) and the Office of the Regulator General (ORG) on the proposed Access Arrangements for the Victorian gas transmission and distribution systems. Subsequent public submissions to those bodies have also been examined carefully.

1.3 The draft decision

The Tribunal proposes not to approve the Access Arrangement as currently submitted by GSN in accordance with section 2.13(b) of the Code. In making this decision, the Tribunal is of the opinion that the Access Arrangement does not satisfy all of the elements and the principles as set out in the Code.

Subject to the final round of consultation, the Tribunal is required to state the amendments (or the nature of the amendments) which would have to be made to the Access Arrangement in order for the Tribunal to approve it. A list of all amendments can be found in the Executive Summary. Reasons for the Tribunal’s draft decision have been provided throughout the report, as required by section 7.7 of the Code.

Copies of this draft decision are now being sent to interested persons and comments are being sought as required by the Code. The expiry date for the lodgement of submissions is 20 October 1998. The Tribunal anticipates that its final decision will be released in November 1998 with third party access commencing in Wagga Wagga in January 1999.

1.4 Structure of the draft decision

Generally, where amendments are required, the draft decision has been structured to list the Code requirements (where applicable), GSN’s proposal(s), the Tribunal’s assessment of the GSN proposal and the amendments necessary for the Tribunal to approve the Access Arrangement.

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5 See section 2.13 of the Code.
This report is structured as follows:

- Part I, Background, provides an introduction to the report and describes the Wagga Wagga gas distribution system.
- Part II, Determination of total revenue, explains the Tribunal’s approach and provides draft decisions in relation to the factors and issues determining the appropriate allowed revenue for the GSN’s provision of distribution transportation services.
- Part III, Reference tariffs and other issues, discusses the Tribunal’s assessment of GSN’s proposed reference tariffs, cost allocation, associated pricing issues and mandatory non-tariff requirements, such as gas balancing, unaccounted for gas and trading policy. It also presents the Tribunal’s assessment of terms and conditions of the Access Arrangement and other issues relevant to this draft decision.
2. THE WAGGA WAGGA GAS DISTRIBUTION SYSTEM

Situated halfway between Sydney and Melbourne, Wagga Wagga is a significant regional centre with a population of approximately 57,000. The largest inland city in NSW, it is the commercial centre of the Riverina district. It is also strategically located on the route of the recently commissioned Wodonga to Wagga Wagga pipeline connection between the Victorian and New South Wales gas networks.

Gas has been available in Wagga Wagga since the late 1880s. Manufactured gas was used until natural gas from the Cooper Basin became available in 1981. The supply and reticulation of gas was a business of the Wagga Wagga City Council from the introduction of gas until 27 June 1997 when Great Southern Energy acquired the utility. To meet the ringfencing requirements under the Code, Great Southern Energy has established a wholly owned subsidiary to operate the gas network, Great Southern Energy Gas Networks Pty Limited. Operating and maintenance and support services are currently provided by Great Southern Energy which charges GSN for these services. A formal service agreement is being negotiated.

The Wagga Wagga system currently serves about 14,000 customers who purchase a total of approximately 1.5 petajoules of gas each year which is transported through 525 km of pipes/mains.

Most of the gas consumers in Wagga Wagga are tariff customers (described as volume customers in the Access Arrangement). They consume about 45 percent of total gas sold. The tariff market can be separated into residential, commercial and industrial sub-classes. Residential customers account for 96 percent of all natural gas customers in Wagga Wagga and consume about 34 percent of the total Wagga Wagga load. Of all the households in Wagga Wagga with access to gas mains, 85 percent are connected to gas. By comparison, about 50 percent of households with access to the gas mains are connected in Sydney, while 80 percent are connected in South Australia.

The other tariff customer sub-class is industrial and commercial customers. There are over 400 industrial and commercial customers in Wagga Wagga consuming 11 percent of total gas sold.

There are also 13 contract customers. These customers account for the remaining 55 percent of gas consumed. Commercial uses range from board processing, wool combing and hospital services, to plywood manufacture and asphalt production. Gas is also used by large army and airforce establishments and by Charles Sturt University.

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\[\text{6} \quad \text{Tariff customers are end use customers consuming less than 10 Tj per annum.}\]

\[\text{7} \quad \text{Contract customers are end use customers consuming more than 10 Tj per annum.}\]
Additional details regarding the network are provided in the following table:

**Table 1.1 Statistics for Great Southern Network 1998**

<table>
<thead>
<tr>
<th></th>
<th>Contract</th>
<th>Volume</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of customers</td>
<td>13</td>
<td>14,048</td>
<td>14,061</td>
</tr>
<tr>
<td>Annual sales TJ</td>
<td>826</td>
<td>649</td>
<td>1,475</td>
</tr>
<tr>
<td>MHQ</td>
<td>11,313</td>
<td>7,779</td>
<td>19,092</td>
</tr>
<tr>
<td>MDQ</td>
<td>4,450</td>
<td>4,550</td>
<td>9,000</td>
</tr>
<tr>
<td>ORC ($m)*</td>
<td>4.4</td>
<td>39.5</td>
<td>43.9</td>
</tr>
<tr>
<td>DORC ($m)*</td>
<td>3.3</td>
<td>29.4</td>
<td>32.7</td>
</tr>
</tbody>
</table>

*Sources: Great Southern Networks Access Arrangement Information dated 24 March 1998 and, for items marked with an asterisk, the Kinhill study “Review of the Optimised Replacement Cost of the Natural Gas Distribution Network in Wagga Wagga” dated 6 August 1998.

Note: The DORC values include other non-system assets.
PART II  DETERMINATION OF TOTAL REVENUE
3. GSN’S PROPOSAL AND THE TRIBUNAL’S APPROACH

3.1 General principles for determining total revenue

In accordance with the National Thirty Party Access Code (the Code), reference tariffs are to be set so as to deliver (or being forecast to deliver) a certain amount of revenue (total revenue) over the period for which the reference tariffs remain in effect. That is, the regulator is required to assess a total revenue requirement for the covered pipeline. The regulator is then required to determine reference prices consistent with the recovery of this total revenue.

Under section 8.4 of the Code,

The Total Revenue (a portion of which will be recovered from sales of Reference Services) should be calculated according to one of the following methodologies:

Cost of Service: The Total Revenue is equal to the cost of providing all Services (some of which may be the forecast of such costs), and with this cost to be calculated on the basis of:

(a) a return (Rate of Return) on the value of the capital assets that form the Covered Pipeline (Capital Base);
(b) depreciation of the Capital base (Depreciation); and
(c) the operating, maintenance and other non-capital costs incurred in providing all Services provided by the Covered Pipeline (Non-Capital Costs).

IRR: The Total Revenue will provide a forecast Internal Rate of Return (IRR) for the Covered Pipeline that is consistent with the principles in sections 8.30 and 8.31. The IRR should be calculated on the basis of a forecast of all costs to be incurred in providing such Services (including capital costs) during the Access Arrangement Period.

The initial value of the Covered Pipeline in the IRR calculation is to be given by the Capital Base at the commencement of the Assess Arrangement Period and the assumed residual value of the Covered Pipeline at the end of the Access Arrangement Period (Residual Value) should be calculated consistently with the principles in this section 8.

NPV: The Total Revenue will provide a forecast Net Present Value (NPV) for the Covered Pipeline equal to zero. The NPV should be calculated on the basis of a forecast of all costs to be incurred in providing such Services (including capital costs) during the Access Arrangement Period, and using a discount rate that would provide the Service Provider with a return consistent with the principles in sections 8.30 and 8.31.

The initial value of the Covered Pipeline in the NPV calculation is to be given by the Capital Base at the commencement of the Assess Arrangement Period and the assumed residual value at the end of the Access Arrangement Period (Residual Value) should be calculated consistently with the principles in this section 8.

The methodology used to calculate the Cost of Service, an IRR and NPV should be in accordance with generally accepted industry practice.

Section 8.5 of the Code states that:

Other methodologies may be used providing the resulting Total Revenue can be expressed in terms of one of the methodologies described above.

Section 8.6 of the Code states that:

In view of the manner in which the Rate of Return, Capital Base, Depreciation Schedule and Non Capital Costs may be determined (in each case involving various discretions), it is possible that a range of values may be attributed to the Total Revenue described in section 8.4. In order to
determine an appropriate value within this range the Relevant Regulator may have regard to any financial and operational performance indicators it considers relevant in order to determine the level of costs within the range of feasible outcomes under section 8.4 that is most consistent with the objectives contained in section 8.1.

### 3.2 Proposal by Great Southern Energy Gas Networks (GSN)

GSN has proposed using a cost of service method for calculating its revenue requirement. The cost of service includes forecasts of the cost of operations and maintenance, depreciation, and a return on assets.

GSN has stated that the annual cost of transporting gas in the Wagga Wagga network is $6.563m. This comprises:

- $1.516m operating and maintenance costs (23 percent of total costs)
- $1.174m depreciation (18 percent of total costs)
- $3.873m return on assets on the basis of 11.1 percent real pre-tax return on an initial capital base of $34.9m (59 percent of total costs).

GSN proposes that current network revenue will increase gradually over the next five years to achieve recovery of the proposed cost of $6.563m. GSN has provided a summary of the proposed cost of service over the five years 1998/99-2002/03 (real 1998/99 dollars) in the Access Arrangement Information. This 5-year summary and the Tribunal’s analysis of GSN’s costs in 1997/98 are shown in Table 3.1.

### Table 3.1 GSN’s proposed cost of service/total revenue ($m, 1998/99 prices)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tribunal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O&amp;M costs</td>
<td>1.12</td>
<td>1.12</td>
<td>1.12</td>
<td>1.12</td>
<td>1.12</td>
<td>1.12</td>
</tr>
<tr>
<td>Corporate overheads</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Marketing costs</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Depreciation</td>
<td>1.11</td>
<td>1.17</td>
<td>1.18</td>
<td>1.18</td>
<td>1.18</td>
<td>1.17</td>
</tr>
<tr>
<td>Return on assets</td>
<td>2.50</td>
<td>2.60</td>
<td>2.89</td>
<td>3.20</td>
<td>3.53</td>
<td>3.87</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td>5.12</td>
<td>5.29</td>
<td>5.58</td>
<td>5.89</td>
<td>6.22</td>
<td>6.56</td>
</tr>
<tr>
<td>Regulatory capital base</td>
<td>34.95</td>
<td>35.14</td>
<td>35.21</td>
<td>35.18</td>
<td>35.17</td>
<td></td>
</tr>
<tr>
<td>Annual return %</td>
<td>7.4</td>
<td>8.2</td>
<td>9.1</td>
<td>10.0</td>
<td>11.0</td>
<td></td>
</tr>
</tbody>
</table>

Source: Great Southern Energy Gas Network’s Access Arrangement Information, Appendix 5, IPART’s analysis of GSN’s unbundled network revenue in 1997/98.

**Note:**
1. A total cost of $5.12m is assumed after deducting gas purchase costs, haulage cost, retail cost and a retail margin of 2 percent from total gas sales. In June 1998, GSN was requested to provide its latest forecast outcome for 1997/98. GSN replied that it would be more appropriate to provide the full 1997/98 results as part of its year end financial reporting. For comparison purposes, the Tribunal has assumed that operating cost in 1997/98 is the same as the forecast for 1998/99 to 2002/03.
2. Annual return reflects GSN’s proposed return on assets (real pre tax).

### 3.3 Overview of the Tribunal’s approach

The return on capital is clearly a significant proportion of the 'cost of service'. Yet much controversy surrounds the determination of an appropriate asset base and rate of return. For this reason, the Tribunal has signalled in past determinations for other regulated utilities
that an approach which places undue emphasis on asset value and rate of return may lead to unreasonable expectations in the marketplace. In its July 1997 access determination relating to AGL Networks, the Tribunal emphasised that:

... it does not favour a strict application of a rate base/rate of return model. Accordingly, the target rate of return is not the determining factor of the revenue requirement, but it is one of a suite of financial indicators to which the Tribunal refers in assessing the reasonableness of the regulatory outcome.

In considering the various approaches to establishing the capital base for price regulation, it is important to bear in mind the signals which are provided for new investments, the impact on consumption and service standards, and implications for competition.

The Tribunal favours a framework that incorporates:

- assessment of operational and capital expenditure
- analysis of financial indicators, including the rate of return and an assessment of a service provider’s past, current and future commercial performance
- consideration of the impact on consumers and service standards
- provision of appropriate signals for efficient new investments
- incentive based regulation to encourage ongoing efficiency gains to be made by the network service provider, thereby ultimately delivering lower prices to customers
- enhancement of economic efficiency and competition (including upstream and downstream competition).

This approach has been used to determine an appropriate revenue requirement for GSN.

The Tribunal has considered different valuation methodologies which can be used to identify a range of feasible values for establishing the initial capital base. The determination of the capital base is discussed in more detail in chapter 5. The Tribunal has examined different views on the rate of return. It has also considered the views expressed in comments and submissions on the draft decisions for the Victorian Access Arrangements made by the Australian Competition and Consumer Commission (ACCC) and the Office of the Regulator General (ORG) in the past few months. The Tribunal has considered GSN’s capital expenditure requirements and noted that asset management plans and longer term capital expenditure forecasts (beyond five years) are not available at present.

The Tribunal has modelled a number of revenue scenarios to consider the financial and pricing implications. The draft decision on the allowed revenue path has been made in accordance with the requirements of the Code and after considering the conflicting demands and expectations of interested stakeholders.

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4. RATE OF RETURN

4.1 The Code’s general principles for determining the rate of return

The Code sets out broad principles for determining the rate of return (section 8.30). Essentially the Code requires that:

The Rate of Return used in determining a Reference Tariff should provide a return which is commensurate with the prevailing conditions in the market for funds and the risks involved in delivering the Reference Service.

The Code states that:

The Rate of Return may be set on the basis of a weighted average of the return applicable to each source of funds (equity, debt and any other relevant source of funds). Such returns may be determined on the basis of a well-accepted financial model, such as the Capital Asset Pricing Model (CAPM). In general, the weighted average of the return on funds should be calculated by reference to a financing structure that reflects standard industry structures for a going concern and best practice. However, other approaches may be adopted where the Relevant Regulator is satisfied that to do so would be consistent with the objectives contained in section 8.1.

The Code provides guidance on the use of CAPM and the weighted average cost of capital (WACC). However, issues arise in assessing and applying the model’s parameters which have revealed considerable differences in opinion. It is noted that CAPM is only one approach to setting a rate of return.

In determining the rate of return, the Tribunal must have regard to the general principles in section 8.1 of the Code (and in particular, the objectives stated in sections 8.1(a), (c) and (d)) and the factors set out in section 2.24 of the Code (and, in particular, the factors set out in sections 2.24(a) and (f)).

4.2 GSN’s proposed WACC

GSN has proposed that an 11.1 percent real pre-tax WACC is an appropriate rate of return for its gas network business. It claims that this rate of return is to compensate for the perceived higher risks of operating the Wagga Wagga gas network business as compared with similar business in metropolitan areas due to: the greater influence of a smaller number of customers, greater susceptibility to local economic fluctuations, reduced ability to diversify, greater competition from interstate gas, and significant risks of bypass.9

The 11.1 percent real pre-tax WACC is based on a 14.1 percent nominal pre-tax WACC and an inflation rate of 3 percent per annum. The 14.1 percent nominal pre-tax WACC lies in the middle of the WACC range determined by GSN. The range was derived by taking an average of the Tribunal’s high case for AGL (determined in July 1997), and the Victorian Energy Project Division’s base case assumptions and using a higher beta. The range is shown in Table 4.1.

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9 Bypass refers to construction of a pipeline to avoid the existing distribution system or part thereof.
### Table 4.1 GSN’s proposed WACC range

(Access Arrangement submitted in March 1998)

<table>
<thead>
<tr>
<th>Component of WACC</th>
<th>Low case</th>
<th>High case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal risk free rate</td>
<td>8.0%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Market risk premium</td>
<td>6.5%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Equity beta</td>
<td>1.13</td>
<td>1.01</td>
</tr>
<tr>
<td>Nominal cost of debt</td>
<td>8.8%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Gearing ratio</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>Tax rate</td>
<td>36%</td>
<td>36%</td>
</tr>
<tr>
<td>Imputation utilisation rate</td>
<td>21%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Nominal post tax return on equity</strong></td>
<td><strong>15.35%</strong></td>
<td><strong>15.38%</strong></td>
</tr>
<tr>
<td>Nominal pre-tax WACC</td>
<td>8.87%</td>
<td>9.13%</td>
</tr>
<tr>
<td>Nominal pre-tax WACC</td>
<td>13.9%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Average nominal pre-tax WACC</td>
<td>14.1% (mid point)</td>
<td>14.1% (mid point)</td>
</tr>
<tr>
<td><strong>Average real pre-tax WACC</strong></td>
<td><strong>11.1% (mid point)</strong></td>
<td><strong>11.1% (mid point)</strong></td>
</tr>
</tbody>
</table>

Source: GSN Access Arrangement Information p 12.

Note: The nominal post tax return on equity of around 15.4 percent is not shown explicitly in the Access Arrangement Information document.

### 4.3 Public submissions

Submissions from interested parties differ in their opinion of the WACC proposed by GSN. East Australian Pipeline Marketing Pty Ltd (EAPM) believes that the returns in the proposed Access Arrangement are lower than are required to sustain future development of gas infrastructure. On the other hand, BHP Petroleum (BHPP) suggests that a much lower, 9.9 percent return on depreciated actual cost (DAC) is appropriate; and claims that if the Tribunal accepts a depreciated optimised replacement cost (DORC) asset value, a 7.7 percent real pre-tax WACC should be applied.

In its submission, AGL notes that the 13.9-14.3 percent nominal pre-tax WACC range proposed by GSN is higher than the range used by IPART for AGL Networks.

In addition to the public submissions on GSN’s proposed Access Arrangement, the Tribunal has considered submissions on:

- its review of the delivered price of natural gas in Wagga Wagga (October 1997) which is being considered concurrently with this access review
- a consultation paper prepared by the Tribunal Secretariat for its review of the delivered price of natural gas in Albury and Moama (March 1998).

In its submission to the Tribunal’s review of the tariff market in Wagga Wagga, Boral submits that the equity beta should reflect *undiversifiable risk*. Boral states that the additional risks put forward by GSN, such as greater exposure to local economic fluctuations, are diversifiable risks. On this basis, these business risks should not be factored into a higher equity beta.

The Tribunal has received several submissions on the consultation paper covering financial issues including rate of return and asset value. Some of the organisations which have...

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10 Undiversifiable risk is the systematic risk which moves with the market and the economy as a whole.
presented submissions (eg Amcor) have attached copies of their previous submissions to ACCC/ORG regarding the Victorian Access Arrangement proposals.

4.4 Recent ACCC/ORG draft decisions

In May 1998, ACCC and ORG released their draft decisions on the Access Arrangements proposed by the Energy Projects Division (EPD) of the Victorian Treasury on behalf of the gas transmission and distribution companies. Both ACCC and ORG in their draft decisions have determined a 7 percent real pre-tax rate of return to be fair and reasonable for the legitimate business interests of the service provider and sufficient to raise capital in the financial market for investment in the gas business in Victoria. While the underlying assumptions used by ACCC and ORG vary, they agree on the overall rate of return.

The ACCC and ORG draft decisions attracted a large number of submissions from interested stakeholders, including the applicants, industry participants (eg pipelines owners), government treasuries, gas consumer groups, other energy utilities (both gas and electricity), academics, investors and specialist advisers in the banking sector. A full day conference was held on 3 July 1998 to address the issue of rate of return.

The debate surrounding the cost of capital in the ACCC/ORG draft decision has provided an important input to the Tribunal’s determination process.

The Tribunal notes the following points of interest in the submissions and in comments made at the public forum on rate of return:

- The Energy Projects Division (on behalf of the applicants) argues that the ORG/ACCC real pre-tax rate of return of 7 percent is too low. They contend that this would have the effect of discouraging future investment in the industry. EPD has argued for being generous in setting the cost of capital due to the early fragile phase of regulation in Victoria.

- The pipeline owners, investor-owned utilities and state treasuries argue that the risks of setting the rate of return too low are greater than those of setting the rate of return too high. Interest rates are currently very low. Consequently there is a need to avoid future price shocks resulting from setting prices too low at the outset. They argue that the calculation of the cost of capital does not provide sufficient headroom for competition and innovation to occur.

- Users and consumer groups argue that the 7 percent rate of return is not low, given that assets are valued using depreciated optimised replacement cost (DORC). They claim that lower prices resulting from the ACCC/ORG decisions will have flow-on benefits. Consumers prefer to enjoy lower prices now with the risk of higher prices later, rather than having to pay higher prices now with the possibility of even higher prices to come. They contend that the rate of return should be benchmarked against the regulatory return allowed by the UK regulators. They compare the 7 percent rate of return with the accounting return on assets achieved by the major locally listed companies and major energy consuming industries. The reasonableness of the rate of return should be considered in the context of the allowed capital base.

- The Australian Cogeneration Association submits that excessive charges will constrain development of cogeneration. It asserts that a 7 percent real rate of return is sufficient

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There has been major restructure and reform in the Victorian gas industry. The then vertically integrated government owned utility was split into separate businesses in 1996 and 1997. Transmission and the three pairs of distribution and retail companies are planned to be privatised.
for investment in existing system. There is a need to distinguish between extensions and augmentation to the existing network and greenfields pipelines project. The more speculative and risky pipeline investments are unlikely be rolled in and may warrant a higher return.

- A paper prepared for BHP Petroleum (BHPP) by the National Economic Research Associates (NERA)\textsuperscript{12} concludes that:
  
  - The equity return component of the WACC preferred by the ORG and ACCC is consistent with the opportunity cost of equity capital exhibited for gas distribution investments in the US. The WACC preferred by ORG and ACCC is based on a nominal cost of equity capital of 11.1 percent. The current nominal cost of equity capital for pure US gas distributors is around 11.19 percent.\textsuperscript{13}
  
  - Asymmetric risk is diversifiable and thus not a risk for which investors require compensation under the CAPM framework. This is an issue that the US Federal Energy Regulatory Commission (FERC) has addressed and dismissed.
  
  - The decision to value the gas assets and set a WACC for privatisation is not just an issue of a trade-off between the Treasury and gas consumers - there are also competition issues at stake. However, those competition issues argue for lower prices for gas transportation and distribution in order to stimulate demand and increase the likelihood of competitive entry in gas production. Thus, competition considerations support ORG and ACCC’s cost of capital.

- In a number of submissions, including a paper prepared by the Oxford Economic Research Associates Ltd (OXERA) for the Australian Pipelines Industry Association (APIA), the following comments are made:
  
  - The equity beta. There is strong evidence that the asset beta of a company which operates under rate-of-return regulation will underestimate the asset beta for a comparable gas monopoly which operates under a price cap mechanism. Using an appropriate set of comparators, ie a group of companies evolving in similar market structures and with similar regulatory frameworks, suggests more apt asset betas for the gas distribution businesses in Victoria would lie in the range of 0.45-0.60 on the basis of a 60 percent gearing ratio (compared with an implicit asset beta of 0.34 in the ACCC/ORG draft decisions).
  
  - Regulatory risk. It is argued that there may be risks which are not captured in the CAPM and which affect utilities’ cost of capital. Asymmetric risks may arise if: (a) investment of stranded assets is not allowed (b) regulators provide returns which are less than the cost of capital or asymmetric regulatory claw-back of higher than expected profits (c) the transition to competition limits returns to economic values in the long run and current cost values in the short run. There is evidence in the UK and USA that regulatory risk is associated with a higher rate of return required by investors even though this return has not been measured in the CAPM estimates. Regulatory risk should be associated with a premium over and above the CAPM estimates.\textsuperscript{14}

\textsuperscript{12} The Cost of Capital for Gas Transmission and Distribution Companies in Victoria, by Jeff Makholm, National Economic Research Associates prepared for BHP Petroleum in its submission to ACCC/ORG.

\textsuperscript{13} A consultant engaged by EPD has questioned this comment. However, NERA further comments that the transmission companies referred by the consultant are more diversified (including more risky business) and therefore are not directly comparable to the Victorian gas companies.

\textsuperscript{14} APIA submission to ACCC/ORG Draft Decisions. Supporting papers prepared by OXERA - A comment on the Equity Beta and Effective Tax Rate Assumptions and Regulatory Risk.
The use of an effective tax rate, rather than the statutory rate in grossing up the post tax return on equity to a pre tax return, has attracted much attention.

- Whether the effective rate is higher or lower than the marginal tax rate depends on the investment profile and pattern. Prices that reflect a lower tax liability now but a higher one in the future could be quite volatile and could lead to inter-generational equity problems.
- Several submissions argue that tax should be incorporated as a cash flow item rather than be included in the WACC calculation.
- Both Professor Davis and Macquarie Risk Advisory Services have expressed concern that the method used to derive the real pre-tax WACC from post-tax values could overstate the real pre tax WACC by 50-100 basis points (ie 0.5-1 percent).

Some financial advisers comment that the market is not accustomed to returns being quoted in real pre tax terms. They suggest that the rate of return should be expressed as a post tax nominal return.

EPD (on behalf of the applicants) included an element of unique risk in formulating its rate of return. One element of this unique risk is the future possibility of stranding assets. Dr Makholm of NERA states that based on his knowledge of the US gas industry there is little chance of this happening.

Although some elements of unique risk can be insured, a large measure of unique risks are still exposed. Some submissions argue that the beta needs to allow for this unique risk. EPD argues that non-insured costs for Transmission Pipelines Authority and the Victorian gas distribution businesses could be recognised by adjusting the real pre tax WACC by 0.4 percent and 0.1 percent respectively.

4.5 Tribunal’s analysis and assessment

Economic regulation is intended to mimic the outcomes of competition over the longer term so that charges for monopoly services reflect efficient costs. In practice, regulation provides a surer, more predictable income stream than markets which can be harsh in their sanctions and generous in their rewards. Under the cost of service model, the rate of return which is applied to determine regulated revenue streams for existing assets will also set a benchmark rate of return to be attributable to future investment in the regulated distribution business.

The Tribunal has considered the following questions, in particular:

- Do the risks faced by the gas pipelines companies warrant a higher rate of return?
- What level of return does the market consider necessary to attract new investment in the gas pipelines industry, including asset replacement?
- Should the cost of capital be considered on a pre tax basis?
- What are the potential impacts on economic efficiency, end-use customers and service standards?

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16 Macquarie Risk Advisory Services Ltd, The Appropriate Level of Taxation to Apply for Gas Distribution Businesses in Conjunction with the CAPM Model in the Determination of Regulated Use of System Charges, 19 May 1998.
17 This is a theoretical issue. The CAPM allows for systematic risk only. It assumes that unique risk is diversifiable and therefore should not be included.
18 ACCC/ORG’s public forum on weighted average cost of capital, 3 July 1998, Melbourne, transcript, p 63.
4.5.1 Approaches to rate of return

The Capital Asset Pricing Model (CAPM) approach is a generally accepted methodology for determining the cost of equity and the weighted average cost of capital. It is based on the portfolio theory of finance which classifies risks into two elements:

- Systematic risk (ie risk applicable to the market as a whole such as inflation, tax rises interest rates).
- Specific risk (ie the residual risk unique to the entity or to a small group of companies that forms a subset of the market).

Recent research and study has revealed problems inherent in applying CAPM, particularly in respect of the individual component parameters.

CAPM is just one approach. Other methods which can be used to estimate the cost of equity include:

- the price/earnings (P/E) ratio. The price/earnings ratio involves capitalising the estimated future maintainable earnings of the business at a price/earning multiple appropriate to the risks and prospects of the business.
- the dividend growth model (DGM). The dividend growth model (DGM) is based upon the premise that the value of a stock is commensurate with the present value of the dividend stream from that stock. The cost of equity is assumed to be the discount rate which equates the current market value of the share with the present value of that dividend stream.
- arbitrage pricing theory (APT). Use of APT would require that the macroeconomic factors affecting the stock be identified, that the risk premium for each of those factors be measured, and that the sensitivity of the stock to each of those factors be measured.

These alternative models are all based on the same underlying assumptions of discounted cashflow. The price earning ratio and dividend growth models are used in the financial markets but they generally suffer from problems in terms of their practical implementation. Given the lack of data and the circumstances of the gas transportation industry, alternative approaches are impracticable at this stage.

4.5.2 Practical issues associated with CAPM/WACC

CAPM is relatively simple to apply, at least in theory. It has widespread support. Whilst these may be good reasons for regulators to use it, CAPM has its critics too. The problems with CAPM are:

- It is doubtful whether CAPM provides a good description of actual equity returns over time. It is argued that if market risk is not identical to systematic risk, beta cannot adequately reflect market risk.
- Some of the economic assumptions underlying CAPM may be questionable, eg riskless returns, mean variance analysis, fully informed investors.
- Measuring the market portfolio is difficult.
- Estimating difficulties are varied and complex, particularly the estimation of expected return on equity. In applying CAPM in the Australian environment, relevant
comparators are generally not available in the stock market. Overseas estimates are not necessarily comparable.

The controversy surrounding nearly every parameter in the CAPM formula is reflected in recent debate about the ACCC/ORG draft decisions. Issues that attract much attention in the ORG/ACCC draft decisions include:

- Risk free rate, whether a historical average rate of return on bonds or the prevailing market rate should be used. The relationship between the maturity (term structure) of the bond, the regulatory period and the asset lives is also questioned.
- Market risk premium on equity including the estimation of the asset beta and equity beta.
- Treatment of specific\(^{19}\) and asymmetric risk\(^{20}\).
- The process and sequencing of the adjustment between nominal and real WACC and between post and pre tax WACC.
- Treatment of taxation
  - whether the effective or the statutory/marginal tax rate should be used in grossing up the post tax cost of equity to a pre tax figure
  - whether tax should be allowed in the cashflows and revenue requirement, rather than in WACC.
- The cost of debt and the appropriate premium on the risk free rate.
- Gearing level, ie financing mix.

Ideally, agreement should be reached on the methodological principles and procedures to be applied in the conversion. At this relatively early stage, a pragmatic approach is to consider a wider range incorporating varying treatment of the major parameters.

**Taxation issue**

Post tax nominal WACC is translated to pre tax real WACC by reference to a tax rate. GSN has assumed a statutory tax rate of 36 percent to arrive at a real pre tax WACC of 11.1 percent. Alternatively, a post tax rate of return can be applied to the capital base.

Adoption of a post tax approach requires assessment of the general tax position of the industry as a whole and/or the specific tax position of individual utilities. Over the life of the pipelines system, utilities are generally moving from a low to full tax paying position. This may increase price volatility. The Tribunal believes that it is for utilities to manage their own tax affairs. However, the Tribunal acknowledges the approach adopted by ACCC/ORG in using the effective tax rate\(^{21}\), which would pass some of the tax benefits onto end users.

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19. The portfolio theory of finance divides risks into two categories: systematic risk (which is undiversifiable and applicable to the market as a whole) and specific risk (ie residual risk unique to the entity which can be eliminated through diversification).

20. One of the underlying assumptions under CAPM is that returns are symmetrically and normally distributed. It is argued that under a regulatory regime, asymmetric distribution of returns may result (eg investment disallowance by a regulator). If this happens, certain risks faced by the company will not be captured by CAPM considerations.

21. The effective tax rate compares the tax expense to operating profit. The corporate tax rate for companies is 36 percent. Due to various timing and permanent differences of tax deductions, the actual expense for
There is no simple relationship between pre tax cash flows and the conventional post tax measure of the cost of capital. The Tribunal is at an early stage of investigating the treatment of taxation across all its regulated utilities, which at present time are mostly government trading enterprises (GTEs) (except AGL). The effective tax rate appears to vary among these utilities depending on the approach to tax planning.

The Tribunal has decided to:

• express the rate of return both in terms of a nominal post tax return on equity and a real pre tax return on the value of capital assets
• construct the proposed revenue/price path using the real pre tax rate of return on the capital base.

In establishing a feasible range of WACC, the Tribunal has used a tax rate of 25-36 percent for converting the post tax return to pre tax return. The treatment of taxation will be further examined at the next review.

Transformation of nominal post tax WACC to pre tax WACC

In their submissions to ACCC/ORG, the utilities/equity investors/owners of gas pipelines claim that the market expectation of the cost of capital is in the range of 7.5-9.5 percent (pre tax real) based on the so-called market practice of WACC transformation. This transformation methodology involves a change from nominal post tax to real pre tax WACC by converting the nominal post tax WACC to a nominal pre tax WACC, then de-escalating the nominal pre tax WACC to a real pre tax WACC.

If alternative conversion methods are applied, the market/investors/utilities 'expected' reasonable range falls to around 6.6-8.1 percent. As for GSN, the proposed real pre tax cost of capital would be 9.2 percent (rather than 11.1 percent) if the conversion sequence was reversed.

4.5.3 Establishing a feasible range for rate of return

In its 1997 Access Undertaking Determination for AGL, the Tribunal had regard to a range for the cost of capital under CAPM. In a consultation paper released in March 1998, the Tribunal has further examined and refined the values of the different components of the CAPM formula in the light of the latest debate on the issues at that time.

In the light of further debates of these issues, the inherent conversion problems and the arbitrariness of the combined effects of different inputs to CAPM, the Tribunal concludes that it is inappropriate to derive a single rate of return. Rather, the Tribunal has had regard to a feasible range for the cost of capital which is based on a combination of feasible parameters and the available information.

In summary, the Tribunal has considered the following:

tax charged against profit is rarely equal to 36 percent. Major differences can arise from the investment allowance, tax losses etc.
22 For example, the submission by NSW Treasury. AMP proposes 8 percent is the minimum of the acceptable range.
Cost of equity
In accordance with the CAPM principles, the risk free rate of return should be assessed on a forward-looking basis and reflect returns which investors currently can obtain in the market. The Tribunal has decided to use the 20-day average of the 10 year Commonwealth bond rate calculated at the time of making this draft decision (ie 3 September 1998). On this basis the nominal risk free rate of return is 5.7 percent (or 3.3-3.5 percent real). There is some market consensus that the risk premium on equity generally is in the range of 5.5-7.0 percent. In regard to the equity beta (which reflects the sensitivity of returns from gas utilities to movements in the equity market as a whole), the Tribunal has allowed an asset beta range of 0.40-0.50. The equity beta is in the range of 0.96-1.10.

Adding the risk free rate of return to the risk premium applicable to the gas sector gives a post tax return on equity of around 11.0-13.4 percent in nominal terms (or 8.5-11 percent real).

Cost of debt
The Tribunal has concluded that the cost of debt for gas utilities is 1 percent above the risk free rate of return, ie a cost of debt of about 6.7 percent.

While there is no general relationship between size and the cost of capital, borrowing margins are likely to be higher for smaller companies.

Cost of capital - a feasible range
In response to market suggestions, the Tribunal will highlight the nominal post tax return on equity underlying its assessment of the cost of capital for the real pre tax WACC.

In the Tribunal’s judgement the use of CAPM/WACC model would suggests rate of return in the range of:
- 11.0-13.4 percent nominal post tax return on equity, or
- 5.8-8.6 percent pre tax real rate of return on capital. 24

Details of the analyses and assumptions underpinning the assessment of these components are provided in Attachment 3.

The Tribunal wishes to stress that there is no single “precise” value for the component parameters of the WACC. However, the parameters provide a useful guide for establishing a reasonable range for the cost of capital within the CAPM approach.

The Tribunal considers that the cost of capital is not necessarily the same for all gas distribution companies or any other utilities currently regulated by the Tribunal. Factors to be considered for each company are: risks in the business, the size of the business and the maturity of the market in which the utility operates.

Even though a parent company can obtain better borrowing terms than its utility subsidiary could on its own, this is achieved only by providing guarantees and net asset backing with its own balance sheet. Under the ringfencing requirement, the utility should be charged the market debt rate as a stand-alone business. Government trading enterprises are required to

24 The lower and upper range is the real pre tax WACC using the two alternative conversion methods from nominal post tax WACC to real pre tax WACC.
pay a loan guarantee fee.\textsuperscript{25} The Tribunal is of the view that the ownership of the regulated business is therefore irrelevant to the cost of capital.

### 4.5.4 Risk assessment of GSN

In addition to CAPM, the Tribunal has considered a range of issues, including the business risks faced by GSN, market expectations, regulatory returns allowed by overseas regulators and other economic considerations (see section 4.5.5).

In assessing the business risk faced by GSN, the Tribunal has also examined the profile of GSN, including area of operation, customer profile, growth prospects, competition, operational issues, and the potential volatility of earnings.

**Risk assessment of gas utilities generally**

Debate about the risks faced by gas transportation companies has been considerable and ongoing. Some stakeholders have argued that the risks for gas transportation are higher than for the electricity business, due to greater volatility in revenues and a higher proportion of fixed costs relative to variable costs. The gas business may be more exposed to market risks due to the greater dependence on a small number of very large industrial users. In the residential and small business markets, it may face greater competitive risks than electricity, as it is a fuel of choice. This distinguishes it from electricity which is, for practical purposes, an essential requirement.

Some parties have argued that asymmetric regulatory risk exists under incentive-based CPI-X regulation. On this view, a regulator is unlikely to allow a utility to retain higher profits from favourable circumstances over an extended period. In contrast, reduced profits from unfavourable circumstances may be restored over a longer period. Utilities and their owners claim there should be a high degree of regulatory uncertainty in the early years of implementation of the Code. Others contend that the risk of asset stranding is high as is the potential risk of not getting a return on redundant capital.

Other stakeholders and commentators question the validity of this claim. In their view, the risk of asset stranding is caused mostly by excessively high charges. They contend that stranded assets are a normal business risk. Many of the extensions are based on dedicated investments or user contributions.\textsuperscript{26}

The Tribunal considers that although a competitive market is evolving, gas transportation and distribution is substantially a natural monopoly with low risks. The transparency of the regulatory process should help to reduce uncertainty. The Tribunal has yet to be convinced that the risks faced by gas distribution companies are sufficiently different from other utilities to justify a higher cost of capital. However, the Tribunal is mindful that this conclusion needs to be kept under review.

**Risks faced by GSN**

GSN argues that the Wagga Wagga gas network business has significant additional risks compared to other gas network owners. These risks are:

\textsuperscript{25} In 1990, the NSW Government introduced a credit rating based fee on the guaranteed debt of GTEs.

\textsuperscript{26} Submissions to ACCC/ORG by the Energy Action Group, 17 July 1998
• With the introduction of third party access, customers are able to bypass\textsuperscript{27} the reticulator’s network. The bypass risk is greater in the Bomen zone.

• The greater influence of a small number of major customers.

• Greater susceptibility to local rural economic fluctuations.

• Less ability to diversify.

GSN contends that there is an additional risk from the potential impact of the long term take or pay wholesale gas supply contracts.\textsuperscript{28} The Tribunal considers that this risk may affect a retailer, but not GSN, which is engaged only in gas distribution business. Further, the retailer should seek to reduce such risks through commercial negotiation with customers.

Gas utilities have traditionally been regarded as stable and low risk businesses. The introduction of access and competition has altered this perception to a degree. Nevertheless, the network aspects of the business remain a very low risk operation. Typical risks faced by GSN, a network service provider, are:

• Input costs (ie labour, authorisation fees\textsuperscript{29} and construction costs).

• Technology.

• Market.

• Regulatory.

• Other risks (political, environmental etc).

In regard to risks, the Tribunal has reached the following conclusions:

• Labour risk. Labour costs currently represent a small proportion of the controllable cost structure of GSN. Consequently, the risk faced by GSN would be small.

• Obsolescence. The technology used in network operation and construction has been largely consistent with industry practice. There appears to be little risk of obsolescence due to advances in technology.

• Stranded investment. In the absence of a material change in technology, the risk of stranded investment is low. The financial risk of stranded investment is considered to be largely a regulatory risk. This type of risk is considered to be low in the short and medium term. Over the longer term, it would be expected that a network service provider would be likely to take steps to protect its investment eg by obtaining commitments from ‘foundation’ customers to use their assets prior to making a large investment.

• Capital expenditure. Most utility businesses face large capital expenditure outlays to replace, upgrade or build new assets. Cost efficiency in capital expenditure outlays has a critical impact on the business. GSN has a relatively large refurbishment capital expenditure program. The risk issue is the return allowed by the regulator on the cost of capital expenditure.

\textsuperscript{27} Bypass is possible if prices are set above the stand-alone costs to a customer.

\textsuperscript{28} The take or pay contract is valid until 2006. Once larger contract customers are able to switch to an alternative supplier of gas, Great Southern Energy will face the risk of having to pay the original contracted amount of gas, despite the fact that it may have a smaller customer base.

\textsuperscript{29} Authorisation fees are determined by the Department of Energy.
• Market risk. GSN is a small but mature network business with a market comprising industrial, commercial and domestic customers. It has a high penetration rate of gas consumption compared with other parts of NSW. However, GSN’s contract market is dominated by only 13 customers. The loss of any major customer may have a large impact on revenue. Growth depends on GSN’s ability to attract new loads.

• Network competition. Competition arises from bypass and alternative energy sources (eg electricity). This reduces gas flows over the network and hence the network revenue of GSN. It is noted that the current prices of gas in Wagga Wagga compare favourably with electricity and gas prices in other parts of NSW. The threat of an alternative energy sources is likely to be limited, especially as Great Southern Energy also owns the local electricity distribution system and is the incumbent retailer. The risk of customer bypass is a function of the cost of new entry relative to expected future access charges. The bypass risk is greater if network charges are set too high.

• Regulatory environment. The regulatory risk associated with network prices depends on the frequency and consistency of determinations, and the nature of the regulatory formula. The Tribunal considers that there is a fair degree of certainty for GSN under the principles and requirements of the Code.

The Tribunal considers that the risks faced by GSN are generally low. However, it acknowledges that a small amount of ‘headroom’ could be allowed in determining the rate of return for GSN, given its vulnerability through having only a small number of major customers. One difficulty is that these risks are diversifiable, and under the CAPM model should be incorporated into cash flows rather than WACC.

4.5.5 Other evidence and considerations

Market expectations

The Tribunal notes the comments made to ACCC/ORG by investors, utilities and fund managers who contend that an internal rate of return of 13 percent is required to attract investment in infrastructure assets.

The issue of how shareholders’/investors’ expectations should be reflected in the cost of capital can be addressed in a variety of ways. It can be observed through historical returns in the share market (the ex-post approach). In their submissions to ACCC/ORG, users and consumer groups refer to the accounting return on assets of publicly listed companies as a benchmark for comparison. In such a comparison, the associated issue is the basis of asset valuation.

Another approach to market expectations is the forward looking cash flow method which is commonly applied in assessing new investments. This requires that future cash flows be discounted at the company’s cost of capital, consistent with market expectations.

The following table indicates some market evidence on the cost of equity.
Table 4.2 Australian and international equities

<table>
<thead>
<tr>
<th></th>
<th>Australian equities</th>
<th>MSCI (12)</th>
<th>MSCI (12 ex-Aus)</th>
<th>EWMSCI (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1979-96 (Average inflation rate = 6.58%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return %</td>
<td>17.58</td>
<td>19.00</td>
<td>19.04</td>
<td>19.38</td>
</tr>
<tr>
<td>Standard deviation %</td>
<td>21.10</td>
<td>15.95</td>
<td>16.10</td>
<td>15.46</td>
</tr>
<tr>
<td><strong>1987-96 (Average inflation rate = 4.94%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return %</td>
<td>12.75</td>
<td>12.14</td>
<td>12.09</td>
<td>13.08</td>
</tr>
<tr>
<td>Standard deviation %</td>
<td>20.46</td>
<td>15.90</td>
<td>16.04</td>
<td>15.50</td>
</tr>
<tr>
<td><strong>1992-96 (Average inflation rate = 2.42%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return %</td>
<td>11.10</td>
<td>12.00</td>
<td>12.00</td>
<td>14.26</td>
</tr>
<tr>
<td>Standard deviation %</td>
<td>13.42</td>
<td>10.75</td>
<td>10.84</td>
<td>11.27</td>
</tr>
</tbody>
</table>


Note:
1. The average inflation rate is calculated using CPI statistics provided by the Australian Bureau of Statistics.
2. MSCI (12) – Morgan Stanley Country Index for 12 markets including Australia, Canada, France, Germany, Hong Kong, Japan, Netherlands, Spain, Sweden, Switzerland, UK and USA.
3. MSCI (12 ex Aus) – As above, excluding Australia.
4. EWMSCI (12) – Equally weighted index.
5. The return is the annualised monthly figure.

In its submission to ACCC/ORG, AMP Asset Management Australia Ltd (AMP) states that:

In evaluating returns from alternative asset classes, we have regard to the long term (10 year) returns from tradeable securities such as listed equities, fixed interest and even short term government securities. At 30 June 1998, ten year returns for these asset classes were:  
- Australian equities - 10.2% (all ordinaries accumulation)  
- International equities - 14.1% (MSCI $A Accumulation)  
- Australian fixed interest - 12.9% (SBCWA Compound Bond Index)  
- Australian bank bills - 9.3% (SWCWA Bill Index).

It is important to note that all four asset classes above exclude credit risk (they are index investments) and embody virtually complete liquidity……. In summary, AMP cannot attract Australian investment in any infrastructure asset at an internal rate of return less than 12% pa nominal.\(^\text{30}\)

The available market information suggests that the cost of equity finance is around 11-14 percent based on current capital market conditions.\(^\text{31}\) The Tribunal concludes that a return of 12-13 percent on shareholders’ equity is a benchmark in evaluating new investments.

**Regulatory return allowed by overseas regulators**

In the UK, the cost of capital for utilities in general has achieved a consensus around a narrow band of between 6-8 percent before tax in real terms.

\(^{30}\) Supplementary submission to ORG/ACCC regarding the Draft Determination of May 1998 on the Victorian Gas Distribution Access Arrangement.

\(^{31}\) For example, Email’s comment that a rate of at least 12 percent return on shareholders’ equity was expected in evaluating new investments unless they had “major long term strategic value”, was reported in the Australian Financial Review, 8-9 August 1998.
Table 4.3 UK price regulation: rate of return and capital base

<table>
<thead>
<tr>
<th>Utilities</th>
<th>Cost of capital</th>
<th>Capital base</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFWAT (the water regulator)</td>
<td>Water and sewerage companies</td>
<td>Market value measured by companies’ average market capitalisation of first 200</td>
</tr>
<tr>
<td></td>
<td>5-6% real, post tax (for the 1995-2000 price review)</td>
<td>days' trading adjusted by net investment. Much lower than current cost asset</td>
</tr>
<tr>
<td></td>
<td></td>
<td>valuation</td>
</tr>
<tr>
<td>OFFER (the electricity regulator)</td>
<td>Regional electricity companies</td>
<td>Flotation value increased by 15%, currently subject to review</td>
</tr>
<tr>
<td></td>
<td>7% in real terms, pre tax</td>
<td></td>
</tr>
<tr>
<td>OFGAS (the gas regulator)</td>
<td>Transco (the gas transportation company)</td>
<td>Roll forward of the initial market value in end-1991, which was less than the</td>
</tr>
<tr>
<td></td>
<td>7% pre tax, real (for the 1997-2002 review)</td>
<td>balance sheet value of current cost assets.</td>
</tr>
<tr>
<td>MMC (Monopolies and Mergers</td>
<td>Report on OFGAS decision of gas transportation charges</td>
<td>Reaffirmed that the OFGAS approach is appropriate.</td>
</tr>
<tr>
<td>Commission)</td>
<td>6.5%-7.5% pre tax, real (in the 1993 MMC report and reconfirmed in June 1997)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Various reports by the UK regulators.

In the USA, it appears that a nominal cost of equity capital is around 11 percent\(^2\) for gas distribution companies similar to those in Australia. The figure is higher for companies with diversified businesses. Some commentators contend that the US rate of return system of regulation has the effect of creating a very low risk investment which requires only relatively low returns for shareholders to be recovered through prices. However, this approach, if adopted in Australia, would effectively mean that many of the economic risks which the capital markets are best placed to manage and deal with would be transferred to customers. Under such a system, there are questions about the possible volatility of prices. This is because prices would have to be reset more frequently to recover all costs actually incurred together with the specified rate of return.

**Other considerations**

It is important to ensure that the rate of return is set at a level which enables owners of regulated businesses to finance their regulated undertakings at reasonable costs. The Tribunal regards this issue as fundamental to the financial position and prospects of a gas network company. It is also important to the long term interests of customers and end users who pay for the services. The Tribunal’s underlying intention is that the service provider will have the opportunity to obtain reasonable returns on capital in accordance with the risks involved.

If the rate of return is set too low, prices will be distorted and the regulated businesses could become capital constrained or face financial distress, and would have to reduce maintenance and capital expenditure to below optimum levels. This would degrade the level of service, resulting in increased costs to consumers.

On the other hand, if the rate of return is set too high, this will be reflected in higher prices. This could result in distorted pricing signals to consumers, and is likely to lead to inefficient outcomes. High prices could distort the apparent economics of network bypass options,\(^3\)


\(^3\) Submissions on ACCC/ORG draft decisions by J Makholm, National Economic Research Associates, June 1998 and July 1998
demand side management, or use of alternative energy sources. For all these reasons, the rate of return should not be set at a level above the true cost of capital.

The rate of return adopted for the purpose of calculating regulated revenues should be consistent with achieving the objectives set out in section 8.1 of the Code. To achieve the best balance between stakeholders’ expectations and an efficient outcome, the regulator must exercise judgement. The outcome has to be considered reasonable in the context of present capital market conditions and expectations. The Tribunal considers that the cost of capital issue must be approached in a way that reflects the fundamental principles on which the regulatory system is based. The totality of the risks inherent in the gas transportation industry must be allocated appropriately to customers and the providers of equity and debt finance.

4.6 Draft decision on rate of return

The Tribunal believes that the Access Arrangement should set a rate of return which delivers a degree of certainty and predictability in the regulatory environment. There is no perfect theoretical answer. On the other hand, there are important considerations which are measurable, such as impact on end users and investors/utilities. If returns are set too high, they will impact adversely on the competitiveness of the end users and may encourage inefficient bypass. If returns are set too low, there will be an equally undesirable outcome. Investors/utilities may be reluctant to invest in the industry, resulting in a degradation of service standards.

At present, CAPM is the most widely accepted procedure for estimating the cost of capital. This view is supported by the industry and market participants. CAPM has been applied by regulatory agencies to estimate the cost of capital for regulated industries in the USA and UK.

As reflected in submissions on ACCC/ORG’s draft decisions and discussions in the forum that was held by these organisations, there are differences of opinion about how WACC should be calculated under a CAPM framework. Additional concerns are the treatment of asymmetric risks and sensitivity to current interest rates. Neither can be easily factored into CAPM but are relevant to a regulator’s judgement about the appropriate rate of return.

From the evidence currently available on the cost of equity, use of the CAPM suggests that the nominal post tax return on equity should be within the range of 11.0-13.4 percent. Using this approach, the weighted average cost of capital for the regulated gas distribution network should be within the range of 5.8-8.6 percent (real, pre tax).

In addition to CAPM, the Tribunal has considered other factors including an assessment of the risks faced by GSN, other evidence on market expectations of the rate of return and other economic considerations. The Tribunal concludes that a rate of return within the range of 7-8 percent which is towards the higher end of the range under CAPM framework is appropriate for GSN for purposes of this draft decision. It is considered appropriate for GSN given the size of its network and the associated risk. Although the GSN has a mature network, the potential volatility of earnings is considered to be above the average that may be faced by a service provider, given a small number of major customers provides most of the revenue. The Tribunal invites submissions on this conclusion.

Within this range for the real pre tax rate of return (ie 7-8 percent), the Tribunal must decide on the most appropriate point as the rate of return for GSN. This decision has been made
after examining the initial capital base, the implications for prices, new investments and competition, and GSN’s cash flow positions and financial projections for the next ten years. These issues are discussed in the following sections.

The Tribunal concludes that a real **pre tax rate of return of 7.5 percent**\(^{33}\) is appropriate for GSN for this Access Arrangement period. This conclusion is consistent with a **nominal post tax return on equity of approximately 12-13 percent**.\(^{34}\)

<table>
<thead>
<tr>
<th>Amendment 1 - Rate of return</th>
</tr>
</thead>
<tbody>
<tr>
<td>In order for the GSN’s Access Arrangement to be approved, the rate of return (in real, pre tax terms) used in the proposed cost of service methodology for calculating total revenue should not exceed 7.5 percent (this is consistent with a nominal post tax return on equity of approximately 12-13 percent).</td>
</tr>
</tbody>
</table>

\(^{33}\) In coming to this tentative conclusion, the Tribunal has, as noted above, considered among other things, GSN’s return on equity under CAPM. The return on equity can be transformed into a real pre tax rate of return.

\(^{34}\) This conversion occurs within the framework provided by CAPM/WACC. The conversion from a return on equity is based on a cost of debt of around 6.7 percent and a debt to equity ratio of 60%:40%. The assumed gearing ratio is considered appropriate and reflects standard industry capital structures for energy infrastructure providers. Details of the Tribunal’s consideration of rate of return and the underlying parameters are provided in Attachment 3.
5. CAPITAL BASE

5.1 Initial capital base

5.1.1 General principles in the Code

When a reference tariff is first proposed for a reference service provided by a covered pipeline that was in existence at the commencement of the Code, the following factors should be considered in establishing the initial capital base (section 8.10):

(a) The value that would result from taking the actual capital cost of the Covered Pipeline and subtracting the accumulated depreciation for those assets charged to Users (or thought to have been charged to Users) prior to the commencement of the Code;

(b) The value that would result from applying the “depreciated optimised replacement cost” methodology in valuing the Covered Pipeline;

(c) The value that would result from applying other well recognised asset valuation methodologies in valuing the Covered Pipeline;

(d) The advantages and disadvantages of each valuation methodology applied under paragraphs (a), (b) and (c);

(e) International best practice of Pipelines in comparable situations and the impact on the international competitiveness of energy consuming industries;

(f) The basis on which Tariffs have been (or appear to have been) set in the past, the economic depreciation of the Covered Pipeline, and the historical returns to the Service Provider from the Covered Pipeline;

(g) The reasonable expectations of persons under the regulatory regime that applied to the Pipeline prior to the commencement of the Code;

(h) The impact on the economically efficient utilisation of gas resources;

(i) The comparability with the cost structure of new Pipelines that may compete with the Pipeline in question (for example, a Pipeline that may by-pass some or all of the Pipeline in question);

(j) The price paid for any asset recently purchased by the Service Provider and the circumstances of that purchase; and

(k) Any other factors that the Relevant Regulator considers relevant.

The Code does not specify any particular asset valuation methodologies. Instead, it suggests that the initial capital base should normally be between depreciated actual cost (DAC) and the depreciated optimised replacement cost (DORC).

In establishing an appropriate initial capital base for GSN, the Tribunal considers that neither DAC nor DORC is appropriate. These valuation methods are geared to accounting and financial reporting purposes. They may not be fully applicable for pricing purposes. In addition to DAC and DORC, the Tribunal has examined other valuation methodologies and has considered:

- Optimised deprival value (ODV) incorporating an economic valuation based on the line-in-the-sand approach and the net present value (NPV) concept.
- Market value on the basis of the various tender prices as reported at the time of the sale of the natural gas business by Wagga Wagga City Council in 1997.
In particular, the Tribunal notes the following comments in a submission by NSW Treasury:

With respect to the issue of asset valuation, Treasury agrees that there are benefits of a consistent approach across the gas utilities IPART regulates. Accordingly, a similar approach to that applied to AGL in IPART’s recent determination would appear appropriate, (which yielded a figure between historical cost and Depreciated Optimised Replacement Cost (DORC)), unless IPART concludes there are compelling and transparent arguments that justify the adoption of an alternative approach.  

Although the Tribunal has, consistently with the Code, considered both DAC and DORC, it will exercise it regulatory judgement to determine the initial capital base for GSN.

5.1.2 GSN’s proposal

GSN has proposed an initial capital base of $34.9m including distribution system assets ($32.1m), non-system assets ($1.9m) and net working capital ($0.9m) estimated as at 30 June 1998.

The system asset valuation is based on DORC. GSN argues that a DORC asset value is an appropriate basis for establishing the initial capital base because DORC:  

- provides the correct economic signals as to the value of the service  
- represents a ‘fair value’ to both the buyer and the seller of assets  
- places existing networks on an equal footing with newly constructed networks which are unambiguously valued at construction cost.

The DORC value is based on the initial valuation by a consultant, Gutteridge, Haskins and Davey Limited (GHD), prior to the purchase of the natural gas business from the Wagga Wagga City Council (WWCC). Following the purchase, GHD further refined its valuation. GHD and GSN concluded that the distribution system had an optimised replacement cost of $48.6m and a depreciated optimised replacement cost of $32.1m. Depreciation was calculated using a straight line method based on industry standard useful lives for the various categories of asset.

The Tribunal notes that the gross replacement costs are calculated on the basis of brownfields conditions, ie the replacement of the assets would need to consider all existing infrastructure (roads, footpaths etc) which is in place. This valuation outcome will be higher than for greenfields conditions. Furthermore, these estimates may not be a reliable guide to future expenditures due to the availability of options such as the relining of pipes.

GSN has not specified how the initial capital base will roll forward in its Access Arrangement. In a letter to the Tribunal GSN states that:

In regard to the matter of future changes to the existing capital base, Great Southern Energy has complied with the requirement of the National Access Code as detailed in section 8 of that Code. That section allows “New Facilities Investment” to be added to the initial Capital Base and depreciation (to be) deducted on an annual basis. That is the basis for the table shown in Appendix Five of our proposed Access Information Arrangement report. The fact that the end
result in that table gives a Capital Base of $35.166m (in 1998/99 dollar terms) in June 2003, which will not be the actual capital base, is merely the result of expressing that table in real dollars.36

Discussions with GSN suggest that the book value of its asset base will not be indexed annually. There is no formal accounting policy requiring regular asset revaluations. Future asset valuations for accounting purposes will be the responsibility of the directors of GSN.

The Tribunal considers that the above comments may not sufficiently distinguish between asset indexation for accounting and pricing purpose. If the initial capital base is not indexed annually, there appears to be internal inconsistency within GSN’s proposal, which proposes indexing the reference tariffs based on the projected ‘real’ cost of service. The Tribunal’s consideration of rolling forward the capital base is discussed in section 5.3.

5.1.3 Public submissions

BHPP submits that the use of DAC is necessary if the benefits of gas reform are to flow through to customers, and not be absorbed by network owners. The Tribunal notes that BHPP made extensive submissions on the issue of using DAC versus DORC for setting an asset base.

AGL supports the use of DORC, stating that this would result in prices which provide efficient economic incentives to network users. AGL expresses some concerns about the assessment made by GHD that the replacement cost of the Wagga Wagga network is $48m.

5.2 Tribunal’s analysis and assessment of GSN’s initial capital base

5.2.1 Depreciated actual cost

The depreciated actual or historic cost of an asset reflects the original cost of constructing that asset, less accumulated depreciation. The DAC approach is simple in practice and is widely accepted by the commercial sector for financial accounting purposes. Supporters of DAC argue that if regulation is to act as a surrogate for competition, the asset valuation methodology must be the same as that used by the private sector. Therefore, as most listed companies in Australia use DAC as a basis for recording asset value, DAC should be used by regulators as the initial capital base.

Drawbacks of the use of DAC are that it does not allow for the impact of inflation or technological change. The repercussion of not taking into account the effect of inflation is that the rate of financial return to the business will tend to be overstated and more volatile. Returns which appear to be adequate, if fully distributed to owners may be unable to fully fund new investments. Part of the return component labelled ‘profit’ may in fact be required to maintain the financial or operating capability of the utility.

It is also argued that DAC generally bears little resemblance to the economic value of the assets or has no direct relationship with future cash flows generated by an asset in its normal use. In the Tribunal’s view, DAC is accordingly a measure of asset value which may generally be of little relevance for pricing purposes.

36 GSN correspondence of 14 June 1998.
Alternative values of DAC submitted to the Tribunal

GSN has not provided an estimate of DAC for the Wagga Wagga natural gas business in its Access Information document. At the public hearing, GSN made the following comments on DAC:

According to Wagga Wagga City Council, the June 1996 results show an original capital cost of around $21m, accumulated depreciation of $7m, and a depreciated actual cost of around $14m.

The issue with that is the Wagga City Council was also depreciating those costs at the rate of $1m per annum.... Those results show that that number is seriously flawed, either the system is undercapitalised quite substantially, if the depreciation is correct, or, if the capital value is correct, it has been over depreciated.

If you take capital expenditure over the last couple of years, you come to the conclusion that the equivalent today would be something in the order of $16.3m.

Those costs do not include appropriate capitalisation of overheads. There have been a variety of estimates from engineering consultants - as low as 12 or 15 percent and as high as 70 percent.

Taking a very low number of about 20 percent (for overheads), would add another $3.3m to the reported capital cost.

In its submission to the Tribunal for the review of the delivered price of gas to the tariff market in Wagga Wagga, Great Southern Energy argues that:

... the WWCC appears to have capitalised only the direct costs of in-house construction of the distribution system and thus to have understated the historic cost by not including overhead costs such as the planning, design, construction, supervision and administrative costs associated with construction. These costs would add 30-50 percent to historic cost values.39

However, the Tribunal notes that the DAC value of $14m presented in WWCC’s audited gas trading accounts:

• includes assets belonging to WWCC’s LPG business40
• does not include capital expenditure for 1996/97 and 1997/98
• does not incorporate accumulated depreciation for 1996/97 and 1997/98.

The Tribunal’s estimate of DAC

The Tribunal has estimated DAC on the basis of the June 1996 figures for the WWCC’s DAC. The Tribunal has used information from the WWCC’s Information Memorandum and its 1996/97 financial statements, as well as GSN’s capital expenditure estimates for 1997/98.

In addition, as part of its asset valuation review, the Tribunal sought an independent assessment of the rate of capitalisation of overheads. The consultant, Kinhill Pty Ltd, concluded that an appropriate overhead rate is 14-16 percent.41 The table below outlines the Tribunal’s analysis, which results in a DAC of about $14.9m.

---

40 WWCC Statement of Gas Trading Fund, June 1996 and BHPP submission.
41 Kinhill Pty Ltd, consultancy report on the review of the optimised replacement cost of the natural gas distribution network in Wagga Wagga, August 1998. This estimate is consistent with an estimate of 12 percent provided to the Tribunal by JP Kenny in December 1997.
Table 5.1 IPART’s estimate of DAC ($ of year)

<table>
<thead>
<tr>
<th></th>
<th>Gross Actual Cost</th>
<th>Accumulated Depreciation</th>
<th>Written Down Value (WDV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing balance as at 30.6.96</td>
<td>21,341,550</td>
<td>7,502,878</td>
<td>13,838,673</td>
</tr>
<tr>
<td>Less LPG assets</td>
<td>2,100,335</td>
<td>918,442</td>
<td>1,181,893</td>
</tr>
<tr>
<td><strong>Natural gas assets as at 30.6.96</strong></td>
<td><strong>19,241,216</strong></td>
<td><strong>6,584,436</strong></td>
<td><strong>12,656,780</strong></td>
</tr>
<tr>
<td>Add capex in 96/97 (WWCC)</td>
<td>1,260,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less depreciation in 1996/97</td>
<td></td>
<td>1,026,301</td>
<td></td>
</tr>
<tr>
<td><strong>Estimated historic cost as at 30.6.97</strong></td>
<td><strong>20,501,216</strong></td>
<td><strong>7,610,737</strong></td>
<td><strong>12,890,479</strong></td>
</tr>
<tr>
<td>Add capex in 97/98 (estimate)</td>
<td>1,200,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less depreciation in 1997/98</td>
<td></td>
<td>1,092,500</td>
<td></td>
</tr>
<tr>
<td><strong>Estimated historical cost as at 30.6.98</strong></td>
<td><strong>21,701,216</strong></td>
<td><strong>8,703,237</strong></td>
<td><strong>12,997,979</strong></td>
</tr>
<tr>
<td>Add capitalisation of overheads at 15%</td>
<td>3,255,182</td>
<td>1,305,486</td>
<td>1,949,697</td>
</tr>
<tr>
<td><strong>Estimate as at 30.6.98 based on WWCC’s depreciation</strong></td>
<td><strong>24,956,398</strong></td>
<td><strong>10,008,723</strong></td>
<td><strong>14,947,676</strong></td>
</tr>
</tbody>
</table>

Note:
2. It is assumed that all other assets are attributable to the natural gas business.

GSN has questioned the validity of the historical cost depreciation used by WWCC, implying the DAC might be higher. The Tribunal is of the view that:

- The historical cost depreciation of $1m appears to be on the high side.
- The DAC estimate is around 60 percent of the original historical cost. By comparison, GSN’s DORC is around 67 percent of the gross replacement cost. This highlights an inconsistency in the average remaining lives of the overall assets. If the same percentage of 67 percent is applied to the historical cost, the DAC would be estimated to be around $16.75m.
- Even if WWCC had over-provided for depreciation expenses, the implication is that users would have contributed to a higher proportion of return of capital in the initial years than would otherwise have been the case.

Based on the information available, the Tribunal estimates that the DAC is approximately $14.9m.

### 5.2.2 Depreciated optimised replacement cost

The depreciated replacement value (as specified in section 8.10(b)) is an estimate of the value of an asset in use which is equivalent to the net current cost of replacing the asset in its current state with an asset which has similar service potential (ie output or service capacity).

DORC is the replacement cost of an ‘optimised’ system, less accumulated depreciation. It allows for the depreciated state of the asset, and also incorporates engineering optimisation of the utility’s asset. An optimised system is a reconfigured system designed to serve exactly the current load. This method excludes any unused or under utilised assets and allows for potential cost savings that may have resulted from technological improvement. Calculating depreciation for this valuation approach is often a contentious issue.
Replacement cost reflects the cost of reconstructing the system today. Arguments made in support of DORC are:

- The revenue profile under DORC (and applying a real rate of return) is more stable than using DAC (and applying a nominal rate of return) (see section 5.2.6).
- DORC provides an efficient price signals because prices using depreciated replacement cost as the initial capital base reflect the cost of additional capacity.

Arguments against replacement cost are that:

- DORC leads to over recovery of costs for the utility as it allows the utility to earn a return on capital it never invested.
- Use of DORC values increase the complexity of regulation and increase the advantages of information asymmetry for the utility.
- Switching from DAC to DORC mid way through an asset’s life provides a windfall gain for the utility (see section 5.2.6)
- In some cases, assets will be maintained but not replaced. Nor is entry always a possibility. In these cases, DORC asset values are purely hypothetical.

**Alternative values of DORC submitted to the Tribunal**

GSN has submitted a consultancy report by GHD to support a DORC of $34.88m for the Wagga Wagga gas distribution system assets.

In light of the Tribunal’s public consultation and information collection, there appear to be a number of inconsistencies with GSN’s DORC value:

1. Wagga Wagga City Council’s estimate of the replacement cost (undepreciated) of assets at the time of sale was much lower.\(^{42}\) This estimate includes only system assets. However, it is significantly less than the GHD value, and has not been depreciated. In the public hearing for the tariff review, Great Southern Energy noted that:

   ... the unit rate of the Wagga City Council was only the direct cost of labour and materials in laying pipelines. It included no design, acquisition, construction, supervision type overheads.\(^{43}\)

2. The GHD valuation includes a loading to allow for the argued greater cost of construction in Wagga Wagga as compared to Melbourne and Sydney. Several submissions on the GHD asset valuation question this assumption.\(^{44}\)

3. Although GSN states that the GHD value is a DORC value, there appears to be no formal optimisation of the systems assets in the GHD report. In the public hearing for the tariff market review, Great Southern Energy’s response to this was that:

   The degree of optimisation is relatively small. It is not specifically identified. Most of the optimisation is really just pricing the network at modern equivalent construction materials standards... There isn't an optimisation in terms of that pipeline is 50 mms and it could be 40 mms or whatever. We don't believe that the error is significant.... It is a fairly low cost

\(^{42}\) The WWCC Information Memorandum is provided to the Tribunal by GSN on a commercial in confidence basis.


\(^{44}\) eg Boral, and AGL in their separate submissions to Tribunal’s review of the delivered price of gas to the Tariff market in Wagga Wagga, October 1997.
distribution system and we don’t believe that optimising it in terms of the total redesign would achieve any significant reduction in value.\textsuperscript{45}

\textit{Independent assessment of DORC}

In May 1998, the Tribunal commissioned Kinhill Pty Ltd to conduct an independent assessment of the GHD replacement cost valuation. Kinhill submitted its final report to the Tribunal in August 1998. The main findings of the report\textsuperscript{46} are that:

• Given the current system configuration, the GHD replacement cost valuation is reasonable. GHD has used reasonable methods and assumptions, and the unit rates are generally reasonable, though the costs for medium and high pressure regulators are higher than those used by Kinhill.

• The unit rates used by Wagga Wagga City Council in the Information Memorandum are low compared to industry norms.

• Kinhill estimates the optimised replacement cost to be $43.919m, based on a re-configured ‘optimised’ system. This value is $4.281m lower than GHD’s replacement cost. The main reason for the reduction in cost is the use of a smaller diameter high pressure ring main. This is due to the higher operating pressures proposed for an optimised system.

Using Kinhill’s optimised replacement cost, and accounting for accumulated depreciation, the DORC value is estimated at $30.8m, which is 4 percent below the GSN’s proposed DORC (Table 5.2).

\textsuperscript{45} Review of Price of Natural Gas – Wagga Wagga Hearing Volume Number 1 November 5, 1997, p 29.
Table 5.2 DORC valuation as at 1 July 1998 ($m)

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>GSN proposed DORC</th>
<th>DORC based on Kinhill Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution mains</td>
<td>23.6</td>
<td>22.0</td>
</tr>
<tr>
<td>Services (14,000 services)</td>
<td>5.6</td>
<td>6.0</td>
</tr>
<tr>
<td>Metering/ regulators</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>District regulators</td>
<td>1.2</td>
<td>1.4</td>
</tr>
<tr>
<td>City gate</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>SCADA system</td>
<td>0.07</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Total system assets</strong></td>
<td><strong>32.1</strong></td>
<td><strong>30.8</strong></td>
</tr>
</tbody>
</table>

**Other non-system assets:**

| Stock at 27 June 97              | 0.4               | 0.4                        |
| Land and building                | 0.7               | 0.7                        |
| Mobile equipment                 | 0.5               | 0.5                        |
| Sundry plant and equipment       | 0.3               | 0.3                        |
| **Total non system assets**      | **1.9**           | **1.9**                    |

**Initial capital base excluding working capital**

|                                         | 34.0 (1)          | 32.7                       |


Note:
1. GSN proposes an initial capital base of $34.9m, including net working capital of $0.9m.
2. The totals may not add up due to rounding.

Both valuations estimate optimised replacement cost on the basis of brownfields conditions. The estimates of the DORC prepared for AGL and the Victorian gas companies are also based on 'brownfields' estimates of unit costs. These estimates allow for the need to dig up and restore roads and footpaths when replacing existing pipes. This approach appears to be acceptable under the Code.

Use of a brownfields valuation raises a number of questions. Firstly, if the valuation is intended to reflect the future costs of maintaining system capacity, brownfields may well be a fictitious concept. The true cost may be the cost of relining. Secondly, where the development occurs subsequent to the construction of the original pipeline, the use of a brownfields estimate may be seen as providing the utility with a windfall gain from subsequent urban development. Conversely, the greenfields valuation is likely to reflect the development of new pipelines, particularly in rural areas.

Kinhill was asked to comment on the greenfields valuation. In its analysis, Kinhill assumes that the optimised network is built as designed, but roads, footpaths and driveways have not yet been built and therefore, construction rates are low. The undepreciated optimised replacement costs for a greenfields system is estimated at $28.4m, which is substantially lower than for the brownfields valuation. The Tribunal acknowledges that the actual capital outlay paid by the original investors/owners may be somewhere between brownfields and greenfields optimised replacement costs, particularly where the system was built and then gradually expanded in a 'developing' area. Furthermore, to the extent pipes are replaced rather than refurbished and/or relined, future replacement costs may more closely
approximate the brownfields estimate. However, it does highlight the sensitivity of valuation outcomes to the approach.

5.2.3 Deprival valuation/line-in-the-sand approach

The notion of deprival value stems from the work of Bonbright in the area of valuation for insurance purposes. A deprival valuation is expressed as:

Deprival Value = \( \text{minimum} \{ \text{DORC}, \text{maximum} [\text{NPV},\text{NRV}] \} \)

NPV = net present value of future earnings (ie economic value)
NRV = net realisable value (ie disposal value)

Deprival value was adopted by the Steering Committee on National Performance of Government Trading enterprises in 1994. In applying the deprival value concept, the entity must decide whether it would replace the service potential embodied in the asset if deprived of it. Under this approach, it is assumed that the owner will only replace an asset if the present value of future free cash flow generated from its use exceeds the existing replacement cost.

Deprival value was evolved as a means of valuing an entity’s assets, rather than as a means of valuing the entity.

The application of deprival value methodology which allows for optimisation is referred to as optimised deprival value (ODV). ODV methodology allows for both the application of deprival value rules and the concept of design optimisation.

The upper limit for the deprival value of an asset to its owner is set by the asset’s DORC. The minimum value is set by the economic value. An initial proxy for the economic value is established by discounting expected future cashflows which would be earned by the asset. The appropriate discount rate is determined by the company’s required rate of return. In circumstances where the maximum sustainable charges to customers would not generate sufficient revenue to cover associated operating costs, and where the service will continue to be supplied (eg under government directives), negative values should be assigned to the uneconomic parts of the entity.

In determining optimised deprival value, allowance must be made for:

- factors which may constrain cash flow
- the existence of potentially competitive energy sources or substitutes.

A strict application of the optimised deprival value approach requires a comparison of the DORC value and economic value for each asset of the entity. This would be a time consuming exercise and may not be practical. In particular, allocation of costs between the parts of the system may pose difficulties.

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The line-in-the-sand (LIS) methodology can be seen as a practical application of ODV. The basic principle of LIS is to decide on an appropriate starting point to value existing assets using the accepted existing prices 'as is'. Future investments are brought to account at full value. This asset valuation adjustment method was adopted for the Tribunal’s determination of price path for a metropolitan water agency in 1996. This method was also adopted to value the NSW electricity distribution businesses following their restructuring in 1996.

To implement the LIS approach, an opening or initial market value proxy for capital employed must be determined. The value is determined by discounting the utility’s expected future cashflows by the required rate of return. In the case of GSN, this produces an effective ‘market’ capitalisation of future cashflows assuming current regulated prices and economic asset lives. This approach requires general acceptance that the current income streams after adjustment for the differences in efficient costs (cash inflows) are reasonable for the existing asset stock.

The LIS process involves:
- determining the discount rate
- identifying agreed costs and revenues
- determining cashflow after adjusting costs to take account of efficiency targets
- valuing assets by discounting future cashflows by the discount rate.

The benefit of this approach is that it permits utilities to gradually adopt more economic price structure without price shocks to customers. Some have expressed a concern with the LIS approach in that current pricing may not offer appropriate price signals to the utility for future investments. However, signals to the utility for new investment are provided through the rate of return and the rules for incorporating new investment in the asset base.

One problem is that the LIS approach may encourage replacement expenditure before it is actually required, introducing the possibility of gaming (in relation to the definition of what is 'old' and what is 'new' investment). This is a variant on the well-recognised incentives to over-invest under regulatory models which emphasise the return on assets. Consideration of this factor must be included in the capital expenditure reviews commissioned to offset the adverse incentive effects of the emphasis on a 'return on rate base' at the time of periodic pricing reviews.

**Estimation of the ODV/LIS asset value**

By using GSN’s acquisition price for the natural gas business in Wagga Wagga, it may be argued that the net realisable value (NRV) is higher than net present value (NPV). However, the acquisition price also reflects other factors, such as the strategic value of the business. This should be separate from the regulatory value of the network.

LIS value can be established for assets as a whole, or for major asset categories servicing various customer groups. It is established using a NPV analysis. This requires projections of cashflows including earnings, revenue growth, operating expenditure, and capital refurbishment expenditure. The outcomes of the LIS asset valuation therefore depend on:

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50 Determination of Sydney Water’s medium term price path from 1 July 1996, June 1996.
51 Determination of revenue paths for electricity distributors in NSW, March 1996
• the discount rate (ie the rate of return)
• allocation of asset values into contract/volume customer groups
• growth assumptions
• forecast refurbishment expenditure
• forecast operating expenditure.

In establishing the LIS/ODV value for GSN, the following assumptions are made:
• The current revenue stream from volume customers is to be maintained in real terms. Revenue from contract customers is to be reduced to a level reflecting a return on DORC only. This revenue reduction will be phased in over the five years to 2002/03.
• Over the next five years, GSN's projection of refurbishment/replacement capital expenditure is to be applied. An annual refurbishment expenditure of $0.46m is assumed from 2002/03.
• An annual growth of 2 percent in gas demand from volume customers and no growth in the contract customers market are assumed.

The valuation results are summarised below. The discounted cash flow analysis is provided in Attachment 4.

Table 5.3 Asset value based on optimised deprival value and line-in-the-sand approaches ($m)

<table>
<thead>
<tr>
<th></th>
<th>Contract market</th>
<th>Volume market</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>96/97 Operating, corporate overheads and marketing costs</td>
<td>0.15</td>
<td>1.36</td>
<td>1.52</td>
</tr>
<tr>
<td>96/97 Network revenue</td>
<td>1.63</td>
<td>3.49</td>
<td>5.12</td>
</tr>
<tr>
<td>EBITD (gross operating surplus)</td>
<td>1.48</td>
<td>2.13</td>
<td>3.61</td>
</tr>
<tr>
<td>Discount rate = 7.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - NPV (net of capital refurbishment)</td>
<td>6.5</td>
<td>25.0</td>
<td>31.5</td>
</tr>
<tr>
<td>B - DORC (system + non system assets)</td>
<td>3.3</td>
<td>29.4</td>
<td>32.7</td>
</tr>
<tr>
<td>Optimised deprival value incorporating LIS valuation (lower of A&amp;B)</td>
<td>3.3</td>
<td>25.0</td>
<td>28.3</td>
</tr>
</tbody>
</table>

Under this approach and applying a discount rate of 7.5 percent, the initial capital base would be $28.3m.

It should be noted that the LIS and the amount of asset write-down depend on the assumption regarding the discount rate. At a higher discount rate, the LIS value will be lower. Conversely, the LIS will be higher if a lower discount rate is used.

5.2.4 Indicative market value

Under the Code, a regulator should consider the price paid for any asset recently purchased by the service provider and the circumstances of that purchase (section 8.10 (j)).
Some argue that assets may be valued at the estimated price that would be achieved by sale on the open market. It is argued that the amount that would be paid for a business is its current market value, and this could be used as the initial capital base. The Tribunal notes that the price paid for the asset is a factor which should be considered in establishing the initial capital base. However, it is of the view that the initial capital base should not normally equated to the purchase price of the business because, to do so may offer a guaranteed rate of return on the sum of money the investor is willing to invest. In turn, this may create a spiral effect and send the wrong signals to future investors.

However, tender bids may provide a check on the initial capital base as determined by the Tribunal. The Tribunal has therefore considered the value of the network assets by reference to the range of bids for the natural gas business made by Wagga Wagga City Council (WWCC) in early 1997. At the time of sale, the bidders were aware of the regulatory framework under the National Code.

A tender offer generally provides the opportunity for vendors to maximise the proceeds of sale by exploiting the special value of assets which may be attractive to certain investors. Potential investors will consider the record of profitability and cashflow generation, prospects for growth and dividend distribution of the subject business. The ultimate price (or value) achieved on the sale of the business represents the potential investor’s expectation and assessment of the viability of the business. This will include the value to the purchaser of any strategic benefits and their integration within an investor’s other activities. The Tribunal has considered the strategic benefits to the purchaser (Great Southern Energy). However, it believes that these benefits will be received by the purchaser through successful business operations and that, accordingly, there would be a degree of double counting in permitting such benefits to be achieved through regulated pipe revenues.

It developing their bids, potential purchasers would have considered:

- the value of the gas distribution business (essentially the earning capacity of the gas distribution networks system)
- the value of the retail business
- the strategic value (entering the gas market as ‘energy’ provider has business synergy benefits such as electricity generation opportunities and optimisation of margins across energy supply options)
- growth opportunities (market growth etc).

It is difficult to quantify the value of each component of the gas business. A conservative approach may be to assess zero strategic value for the bidders who are primarily gas utilities or are not participants in the regional electricity market. At the time of sale, it was reported\(^2\) that a number of the bids appeared to be between $30-$31m. From this value an estimate of the value of the retail margin needs to be deducted. In the AGL access review, a competitive retail margin of 2 percent was assumed, following consultation with various stakeholders. This is similar to the margin assumed by the Tribunal for electricity following a review of competitive retail margins by London Economics. This suggests a retail margin of $230,000 per annum. Depending on which price earnings multiple is adopted, this implies a value of $2-3m for the retail business.

On this basis, an indicative business value for the gas network of $27-$29m could be derived. This value would include:

- any strategic value for bidders who do not have a presence on the regional electricity market
- the value of future growth opportunities.

The strategic value of purchasing the Wagga Wagga gas business may be greatest for an electricity utility because of the synergies provided. These synergies may be even greater for an incumbent electricity supplier such as Great Southern Energy.

The price paid by Great Southern Energy may reflect a number of factors, such as the commercial advantages to it of a strong presence in both gas and electricity as retail markets become competitive. The reward for factors such as this will come through Great Southern Energy’s successful operation in the emerging competitive markets rather than through regulated pipe revenues.

### 5.2.5 Evaluation of asset valuation methodologies

Asset valuation is one of the most controversial issues (other than the rate of return) in determining the revenue requirement of a service provider. An evaluation of the methodologies for asset valuation for pricing purposes can be assessed in terms of:

- Degree of subjectivity. The key factor is availability of asset value, which can be verified.
- Implications for economic efficiency.
- Equity, in terms of impacts on customers and the service provider.
- Transparency, in terms of stakeholders’ expectations.
- Practicability in terms of future implementation as the capital base is rolled forward.

The advantages and disadvantages of the methodologies that have been considered by the Tribunal are summarised in Table 5.4. The issues of economic efficiency and equity are discussed in section 5.2.8.
### Table 5.4 Evaluation of asset valuation methodologies for existing assets

<table>
<thead>
<tr>
<th></th>
<th>DAC</th>
<th>DORC</th>
<th>ODV</th>
<th>Market value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basis</strong></td>
<td>Cost-based measure, sunk costs.</td>
<td>Cost-based measure, sunk costs.</td>
<td>Hybrid approach of cost based and value based using cashflow.</td>
<td>Based on earning capacity and cashflows of the asset/business, forward looking.</td>
</tr>
<tr>
<td><strong>Subjectivity</strong></td>
<td>A balance sheet item required in the audited financial statement, arguably least subjective.</td>
<td>Engineering assessment, subject to optimisation and estimate of remaining life. Arguably greater subjectivity.</td>
<td>Subject to “allowed regulated price” requiring a high degree of judgement.</td>
<td>Market evidence but may fluctuate depending on market sentiment and condition. Limited evidence available.</td>
</tr>
<tr>
<td>Pricing implication/revenue profile</td>
<td>Likely to lead to front-loaded cost recovery ie higher revenue in early years.</td>
<td>Likely to give a stable revenue requirement if implemented at the beginning of the asset life.</td>
<td>Prices are likely to be capped for some customers.</td>
<td>Subject to the relationship between market value and book value.</td>
</tr>
<tr>
<td>Movement over time</td>
<td>Depends on accounting depreciation and assumed asset life.</td>
<td>Depends on indexation and depreciation.</td>
<td>Depends on assumptions and economic valuation.</td>
<td>May be more volatile, depending on investors’ behaviour and expectations.</td>
</tr>
<tr>
<td>Implications for depreciation in the cost of service model assuming straight line depreciation</td>
<td>Historical cost depreciation. Higher depreciation in the early years.</td>
<td>Current cost depreciation. Higher depreciation over time.</td>
<td>Between DAC and DORC depreciation.</td>
<td>May require the application of a market to asset ratio to calculate “regulatory” depreciation.</td>
</tr>
<tr>
<td>Practicability and ease of implementation</td>
<td>Arguably relatively simple to implement.</td>
<td>More complex at initial setting. Future complexity depends on indexation.</td>
<td>Problem of circularity in the economic valuation.</td>
<td>Available only if there is tradeable equity or there is an established market for the asset.</td>
</tr>
</tbody>
</table>

Source: Various submissions, IPART analysis

As discussed above, there is a degree of subjectivity in each methodology. There is also a high degree of disagreement among stakeholders.

The controversy can be demonstrated by the following comments by King:

> Valuation of sunk assets may create considerable conflict between the regulators and the asset owners. Consider, for example, ACCC’s evaluating an access undertaking that covers sunk, fixed-flow assets. If ACCC wishes to maximise the economic benefits from access then it will want access prices to be as low as possible, subject to the relevant assets remaining in use. The optimal rate base is provided by scrap value.\(^5\)

In a submission to the National Electricity Code Administrator Network Pricing Review, the American infrastructure economic specialists, Putnam, Hayes and Bartlett (PHB) argue that:

> … (we) disagreed that the revenue requirement needs to provide a full return on the DORC of the existing networks….Lower initial valuations need not adversely affect efficient network utilisation, operations, long term sustainability of the business, or efficient competition, whereas higher than necessary values can lead to inefficiencies.

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On the other hand, network and pipeline owners argue that DORC is an appropriate proxy for establishing a competitive market value for assets. The implications for economic efficiency are discussed in section 5.2.8.

Consideration of customer impacts is also an important issue in deciding the Total Revenue and network prices. Assessing the impact on users and service providers is not a mechanistic process, particularly if there are existing cross subsidies between customer classes. Often, the issue is complicated by historical factors, eg past pricing decisions which may not have been made efficiently.

Network users favour recovery of asset costs using DAC. They contend that prices set on DORC are inflated. They argue that they have already contributed a fair proportion of the costs to the service provider in the past. The ability of these users to shift to an alternative energy source will depend on economics and relative prices. For smaller users (eg small domestic customers), the ability to use an alternative source may be limited, at least in the shorter term.

The Tribunal considers that equity or impact issues must be considered in the context of a wide range of factors, including historical tariffs, the current return to the service provider and importantly, protection of users from price shocks.

5.2.6 Capital recovery over the life of an asset

The depreciation profile and the rate of return component enable a service provider to recover its capital investment (past and new) over time. The Tribunal has assessed three alternative time paths for revenue requirements for capital recovery:

- Historical cost accounting method. Allowable income is the sum of historical cost depreciation plus a nominal return on historical asset value.

- Current cost accounting (CCA) method. Allowable income is the sum of current cost depreciation plus a real return on current cost asset (represented by DORC).

- Capital annuity method. This requires the use of an annuity formula which expresses how, over time, the present value of the annuities will equal the present value of capital investments.

A comparison of the allowable revenue (excluding the non-capital operating cost components) is shown in Figure 5.1.
Figure 5.1: Allowable revenue under alternative methodologies ($ of year)

Over the economic lives of assets, the present values of the allowable revenue are the same under the three approaches, provided that the chosen method is adopted consistently throughout the period. However, there is a significant difference in terms of timing, the pattern of allowable revenue, and hence, cash flows available to the utility to meet interest, debt repayment and capital expenditure.

In theory, the above analysis shows that over the life of an asset, the approach using nominal return on DAC equals real return on DORC if:

- the increase in the costs of the assets is in line with general inflation
- the 'true' replacement costs are disclosed and do not result in an over-statement of DORC.

One of the arguments put forward by end users is that, if a utility switches over from historical cost to revalued asset valuation, long term customers are required to pay for depreciation again. The Tribunal has examined the net present value under such circumstances. In so doing so, the Tribunal has assumed that the 'switch-over' occurs after one third of the asset’s economic life. The cashflow is then the allowable revenue under the historical cost method during the initial period (one third of asset life), followed by the allowable revenue under the current cost accounting method. In this case, the NPV is positive, ie the return to the utility is greater than the initial investment. The size of the additional return depends on the assumptions about inflation, timing of the switch-over and the cost of capital.

Whether in practice there will be a premium over the asset life depends on past pricing. If there was under-pricing in the past, the service provider may be unable to earn an adequate return, let alone additional returns, over the asset life. However, as noted above, available data do not suggest gas was previously under-priced in Wagga Wagga.

The above analysis suggests that where there is a change of valuation from DAC to DORC for pricing purposes, the use of full DORC may be inequitable from the customers’ perspective. Establishing the initial capital base below the DORC value when setting future prices can offset the benefit for the utility.
5.2.7 A feasible range for the initial capital base

As provided in the Code, the Tribunal considers that it is reasonable to consider a range of feasible asset values under various methods. The range of asset values using alternative valuation methodologies is summarised in Table 5.5.

**Table 5.5 Summary of alternative valuation methodology**

<table>
<thead>
<tr>
<th>Valuation methodology</th>
<th>Valuation date</th>
<th>Source</th>
<th>$m</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current cost valuation – system assets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replacement cost (some optimisation)</td>
<td>30.6.98</td>
<td>GSN proposal</td>
<td>48.6</td>
</tr>
<tr>
<td>Replacement cost (full optimisation)</td>
<td>30.6.98</td>
<td>Kinhill</td>
<td>43.9</td>
</tr>
<tr>
<td><strong>Depreciated optimised replacement Cost (DORC)</strong></td>
<td>30.6.98</td>
<td>GSN proposal</td>
<td>32.1</td>
</tr>
<tr>
<td></td>
<td>30.6.98</td>
<td>Kinhill</td>
<td>30.8</td>
</tr>
<tr>
<td>Other assets (book value)</td>
<td>30.6.98</td>
<td>GSN proposal</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Initial capital base based on DORC</strong></td>
<td>30.6.98</td>
<td>GSN proposal</td>
<td>34.0</td>
</tr>
<tr>
<td></td>
<td>30.6.98</td>
<td>Kinhill</td>
<td>32.7</td>
</tr>
<tr>
<td><strong>Historical cost valuation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimated historical cost</td>
<td>June 98</td>
<td>Tribunal</td>
<td>25.0</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>June 98</td>
<td>Tribunal</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Estimated depreciated historical cost (DAC)</strong></td>
<td>June 98</td>
<td>Tribunal</td>
<td>14.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Optimised deprival valuation (using the line-in-the sand approach)</td>
<td>30.6.98</td>
<td>Tribunal</td>
<td>28.3 (2)</td>
</tr>
<tr>
<td><strong>Indicative market value</strong></td>
<td>Early 1997</td>
<td>Newspaper reports (3)</td>
<td>27-29</td>
</tr>
</tbody>
</table>

Note:
1. Estimated on the basis of WWCC’s information memorandum and assumes capitalisation of overheads at 15 percent.
2. Includes both system and non-system assets.
3. On the basis of the range of tender bids reported for the sales of the Wagga Wagga Natural Gas business.

5.2.8 Other considerations required by the Code

GSN’s gas transportation charges are a significant element of the cost of gas to final customers, representing over 50 percent of average domestic customers’ bills and approximately 33 percent of the bills of contract customers. Many of the business customers face competition in their market. Further, the level of transportation charges will influence demand and the likelihood of competitive entry in gas supply. This, in turn, has major implications for the efficient use of existing gas network and future investments.

In determining the initial capital base, the Tribunal has considered the following factors:

*International best practice and the impact on energy consuming industries*

The regulator should consider best practice in pipeline transportation, including overseas companies, when determining a valuation.
In the consultancy brief for the asset valuation review study, the consultant was asked to consider the replacement cost of pipeline transportation, having regard to international best practice. Thus, the Tribunal believes that the system optimisation established by independent consulting engineers has essentially met this criterion. This will be a matter for further examination by the Tribunal at future reviews, particularly in respect of additions and extensions to the system.

The adoption of prices based on DORC asset value, as proposed by GSN, is unusual. North American regulatory practice is largely based on DAC. UK utility asset values are based on float values which are commonly well below depreciated replacement costs. It may therefore be argued that the proposal is not consistent with international best practice. However, the Tribunal notes that there is considerable debate on regulatory 'best practice' and that the Code would normally provide for DORC as a maximum for the range of asset values. This suggests that there is scope to establish an asset value below DORC where to do so is not inconsistent with economic efficiency and promotes a fairer balance between customers and owners.

The flow-on effect of pricing (from an asset valuation) has important implications for network users, particularly energy consuming industries. Higher charges to downstream users will jeopardise recovery of their costs, as they may not be able to pass the higher charges on to their customers. The impact will depend on the availability of substitutes for gas.

This draft decision is made following an analysis of customer impacts under scenarios using a feasible range of asset values between DAC and DORC.

**Historic tariffs, economic depreciation and returns**

BHPP and user groups argue that the tariffs they paid in the past covered a reasonable portion of the costs of the existing infrastructure. They claim that a lower valuation, such as DAC is justified for the remaining economic life. It is therefore necessary to ‘unravel’ the past before the Tribunal can form a view as to whether such claims are justified.

Historical returns to the previous owner (WWCC) have been considered to determine the extent to which economic depreciation and a rate of return were provided in the tariffs preceding the sale of the assets. The Tribunal notes that analysis of past returns is fraught with difficulties and is problematic due to changes in accounting policies over time. The degree of accuracy in such an analysis also relies very much on the allocation of costs between the gas business and other council activities. In addition to the natural gas business, WWCC had other gas businesses, including LPG and the sale of gas appliances.

In response to the Tribunal’s request, WWCC provided its gas trading accounts from 1980 when natural gas was first supplied to the Wagga Wagga area. The Tribunal is grateful for the assistance provided by WWCC.

The details of this analysis are shown in Attachment 5. The key findings of this analysis are:

- The rate of return compares favourably with the long term bond rates except for the early years (1980-1984) when the natural gas market was being developed.
- Depreciation of all operating assets was provided for every year since the commissioning of the network in early 1980. The average depreciation rate was
approximately 7.4 percent. Clearly, a good deal of depreciation has been allowed for in pricing.

- It would appear that in some years, the appliance business was not profitable.
- After allowing for a retail margin and the profit/loss of the appliance sales, the natural gas distribution network appears to earn a healthy profit.
- The natural gas distribution business appears to have been a profitable business, at least over the past 4.5 years. The adjusted earnings before interest and tax (EBIT, excluding retail) earned by WWCC in the past 3-5 years is consistent with the return GSN currently earns. Arguably, end users (in aggregate) have paid for a reasonable return of and on WWCC’s capital, at least over the past 5 years.

Based on the information available, it appears that tariffs set by WWCC generated good returns by commercial standards, including recovery of capital through the allowance for $7m accumulated depreciation in the cost base. There is no suggestion of under-recovery of costs (on a DAC basis), which would require remedy through increases in average prices.

GSN has advised the Tribunal Secretariat that income from capital contributions is insignificant. Based on the historical financial statements of WWCC, capital contributions do appear to be insignificant.

As noted above, attempts to ‘unravel the past’ are made difficult by changes in accounting policies over time and the fact that the natural gas business was only one of the functions carried out by WWCC. ORG’s draft decision on the Victorian distribution companies includes a historical analysis of the then Gas Fuel Corporation of Victoria (GFCV). Subsequently, BHPP has provided an alternative analysis yielding markedly different results. This highlights the sensitivity of the results to differences in assumptions adopted and the allocation of certain costs. 54

The reasonable expectations of persons under the regulatory regime that applied to the Pipeline prior to the commencement of the Code

Inevitably there are differences in the expectations of GSN and other interested parties (eg customers). The Tribunal has to balance the expectations and interests of various stakeholders including consumers and shareholders, while avoiding:

- price shocks (in the short and longer term)
- undue ‘regulatory risk’.

The Tribunal believes that factors to consider in meeting expectations are:

- Are prices reasonable, do they properly reflect costs, including the cost of the capital employed?
- Will the proposal result in significant ‘price shocks’ for users or ‘profit shocks’ for the utility?
- Are prices based on efficient costs?
- Do the current and prospective prices provide a reasonable, but not excessive return for the utility?

54 ORG’s financial analysis of the past and historical return and a commentary contained in a paper prepared by Peter Fitzgerald and attached to BHPP’s submission.
Each of these issues have been separately addressed in the relevant sections in this draft decision.

The impact on the economically efficient utilisation of gas resources

The Tribunal considers that the valuation methodology adopted should provide pricing signals which are incentives for the efficient development and use of gas resources for the Wagga Wagga system. Prices to end users should be cost reflective as far as practicable. The price set for existing assets may influence expectations of investors about the regulator’s treatment of future investment.

As far as economic efficiency is concerned, the debate has focused on:

- Static efficiency, ie the efficient use and operation of the existing network
- Dynamic efficiency, ie efficient decisions about new network investment.

In theory, efficient use of resources requires pricing which reflects marginal costs. Estimates of marginal costs can vary substantially, depending on the capacity constraints of the system. A common concern in network pricing is that there can be a large discrepancy between the revenue generated from marginal cost pricing and the revenue requirement of network owners to meet ongoing business obligations such as operating costs, debt repayment and dividend payments. This is a key practical problem for efficient network pricing and reflects the potential difference between marginal costs and average costs.

In practice, pricing is generally established using an average cost approach. An appropriate allocation of costs (including the overall valuation) to specific users or services is as important as the overall asset valuation.

Utilities and investors argue that the use of DORC asset values is consistent with the outcome that a competitive market would deliver. They contend that prices set on DORC are a better proxy for prices set by “new entrants” than is DAC. It is also argued that the use of DORC asset values provides greater price stability over time.

In a competitive market it would be expected that prices would be sufficient to provide the investor with a ‘normal’ return over the life of the asset, although returns from year-to-year are likely to reflect market conditions. As noted above, the use of either a nominal return on DAC or real return on DORC should, in principle, provide a similar income stream over the life of an asset. Thus, both can approximate market outcomes over the life of the asset although the profile over time will vary. The decision of a potential new entrant would be expected to reflect expected income streams over the life of an asset. In this context it is expected that the new entrant will respond to expected prices over time rather than the price in a particular year.

In principle, the prices may be more volatile over time under the approach of nominal return on DAC than real return on DORC if the system is comprised of a single asset or of assets of a single age and life expectancy. However, the differences may be reduced in practice as systems comprise assets with:

- different “vintages” or ages

Subject to the impact of technological change and construction costs.
• different standard asset lives
• different actual lives in situ even where the standard assumed lives are the same.

Utilities and investors also argue the use of DORC may better reflect the actual costs likely to be incurred in future in replacing or renewing existing capacity. However, it is not clear that existing assets will be replaced on a ‘like-for-like’ basis. While optimisation attempts to address this, the course of future technological change is difficult to predict. Even so, it appears that re-lining, which is already in use within the industry, may be an economic solution to the renewal and replacement of capacity. If so, it is the costs of relining that would be relevant rather than the replacement costs of existing pipes.

User groups claim that using DORC causes assets to be overvalued. It is argued that this, in turn, increases the likelihood of bypass and the stranding of assets and may reduce competition in upstream and downstream markets.

Ultimately, the risk of bypass may be borne by the utility. Bypass investment may be uneconomic and result in the inefficient allocation of scarce capital resources. In these circumstances the regulator may need to consider to what extent bypass should be permitted to adversely affect the reference prices to other users.

The potentially competitive elements of the gas supply chain are upstream and downstream of the distribution and transmission networks. To the extent that the network business extracts monopoly rent (for example through high asset values and/or high cost of capital), it reduces the scope for competition in the potentially competitive retail (downstream) and production sector (upstream). It is argued that if economic rent is extracted by the network service provider, there is less scope for competition from new fields. New gas producers will be discouraged if transportation tariffs are too high.

However, setting prices too low may discourage a service provider from investing in the gas industry. Insufficient investment in gas pipelines may adversely affect the serviceability of the service provider, leading to lower service standards.

The key issues for efficient pricing are:

• Economic efficiency principles do not provide strong guidance on the valuation of the initial capital base. However, an approach, or switch-over in approaches, which resulted in systematically higher average prices than necessary to meet the reasonable business interests of the service provider would run counter to the objectives of efficient pricing.
• Given that an initial asset value is chosen, the key issue for the incentives for investments is how new assets are brought in.
• A real return on indexed DORC and a nominal return on DAC can yield the same result over the life of the asset. However, a real return on DORC may:
  − more explicitly expose the utility to technological change risks
  − increase the problems of information asymmetry, which give the utilities greater opportunities to game the system.

Implementing pricing principles for gas transportation services has its difficulties, particularly in respect of the need to recover sunk costs for existing networks in a pragmatic
way. A range of asset values should be considered, rather than one single valuation methodology.

The comparability with the cost structure of new Pipelines that may compete with the Pipeline in question

The asset valuation methodologies chosen should not leave GSN open to uneconomic bypass. If DORC is properly estimated and allocated to customers, it should not be economic to duplicate the system as a whole, or large sections of the system. However, if prices are based on average costs, it may still be economic to ‘cherry pick’ and build bypass networks to serve a smaller group of particularly attractive loads. Hence, it is important that there be sufficient scope for negotiation to allow the utility to respond to circumstances.

Furthermore, in some cases, the alternative to the existing network may not be a bypass pipeline but use of another energy source or feedstock or importation of a processed product. In this case, the DORC asset value may be of little relevance.

The price paid for any asset recently purchased by the service provider and the circumstances of that purchase

GSN’s holding company, Great Southern Energy, purchased WWCC’s natural gas business for approximately $59m in June 1997. Since the purchase, Great Southern Energy has booked the difference ($25m) between the purchase price and the written down asset value ($34m) as ‘intangible assets’ 56 ie the right to distribute and supply gas in Wagga Wagga.

Following the sale of the business, the Tribunal notes that WWCC reported a capital gain of $41.3m on its disposal of the natural gas assets. 57

Great Southern Energy is currently working with its accounting advisers on the allocation of intangible assets. Its expectation is that the major portion of this amount will be allocated to retail activities rather than to GSN.

As noted in 5.2.4, the Tribunal is of the view that the initial capital base should not normally be equated to the purchase price of the business. It is of the view that any apportionment of intangible assets to the network business should normally be excluded from the initial capital base.

Any other factors the relevant regulator considers relevant

Ownership
GSN is owned by Great Southern Energy, which is a corporatised government trading enterprise. The Tribunal considers that there should be no difference in the regulation of government and privately owned systems such as AGL Gas Networks.

Net working capital
GSN has included a net working capital of $0.9m in the initial capital base. This amount is the difference between trade debtors and creditors. GSN proposes to earn a real rate of return on the net working capital.

57 Audited financial statement for the year ended 30 June 1997, Council of the City of Wagga Wagga, Schedule No. 15.
The level of net working capital is likely to change over time, depending on GSN’s financial management and working capital policy. Thus, net working capital will not simply rolled forward each year in accordance with CPI indexation.

The allowance of working capital in the cost of service model does not appear unreasonable. However, return on working capital should be calculated by multiplying net working capital as at year end by the rate of return (nominal pre tax).

The Tribunal has questions about GSN’s level of working capital of $0.9m, which is rather high. GSN will have to justify this level of its net working capital. The forecast return will need to be reduced in line with the reduction in the rate of return determined by the Tribunal.

5.2.9 Financial indicator analysis

The Code permits a regulator to assess financial performance in order to establish the initial capital base and determine an appropriate rate of return. The provision in the Code which relates to the assessment of other indicators of financial performance is as follows:

In view of the manner in which the Rate of Return, Capital Base, Depreciation Schedule and Non Capital Costs may be determined (in each case involving various discretions), it is possible that a range of values may be attributable to the Total Revenue. In order to determine an appropriate value within this range, the Relevant Regulator may have regard to any financial and operational performance indicators it considers relevant in order to determine the level of costs within the range of feasible outcomes (section 8.6).

The Tribunal’s consideration of GSN’s Total Revenue involves analysing GSN’s financial viability and considering the rate of return, and the composition, level and funding of expenditure.

Financial performance

Up until 30 June 1998, GSN operated as a business unit within Great Southern Energy. The gas business is small compared with Great Southern Energy’s electricity business. The gas network’s revenue is currently at around $5m compared with the electricity network use of system charge of $128m.

Historical financial performance of GSN is non-existent as the gas business was acquired by GSN in June 1997. A notional financial statement for the gas network’s business in 1997/98 has been established after unbundling the gas business into network and retail businesses. The Tribunal has assessed GSN’s financial performance in 1997/98 based on this set of notional accounts.

In terms of rate of return performance, GSN proposes an increasing return (on DORC) from 7.4 percent in 1998/99 to 11 percent in 2002/03 (from $2.4m to $3.9m). This translates to a return on assets valued at historic costs (around $15m) of 16 percent in 1998/99, which is considered to be a generous return compared with the average of around 8 percent in the private sector (all companies average).55

55 The 1996 Financial and Profitability Study by the Australian Stock Exchange, p1.5. In terms of the profitability indicator, EBIT/Total assets, the average return on assets is 7.75 percent for all company average and 8.56 percent for all industrial company average in 1995.
Financial projections and modelling

GSN provided the Tribunal with expenditure projections, but did not provide a financial model. The only financial projections available are for the Great Southern Energy Gas business including both the network and retail businesses. These notional accounts were provided to the Tribunal in October 1997 as part of the information required for the Tariff Review.

Given the proposed duration of the Access Arrangement (5 years), the Tribunal undertook financial modelling and a financial indicator analysis for the proposal. A financial model for the gas network was developed to assist in this task. A base case model (using the GSN proposal) was prepared and sent to GSN for comment.

To establish the base financial model, a number of assumptions were made by the Tribunal Secretariat, including:
- an opening debt level (ie gearing level) of $20m as submitted by GSN
- allocation of balance sheet items to the gas network business in accordance with the notional accounts provided to the Tribunal
- all ‘intangible assets’ were allocated to the retail business
- an inflation forecast of 2.5 percent per annum
- a tax rate of 36 percent
- dividend payout ratio of 70 percent.

Rating agencies commonly assess an organisation’s financial capacity and ability to service debt using ratios such as:
- funds flow interest cover - to assess an organisation’s ability to service debt
- net cash flow/capital expenditure - to assess internal financing capacity
- net debt/funds from operation - to assess ability to repay debt.

Whilst GSN does not have a credit rating of its own, notional credit rating ratios can be calculated to assist in evaluating its financial strength under various price path scenarios. The assessment is based on the guidelines provided by Standard & Poors (S&P) which sets out a range of profiles for utility businesses. The utility risk profile assessed for GSN is considered to be in the ‘excellent’ range due to its low business risk.

The ratios and related notional ratings provided by S&P Australian Ratings for utilities are as follows:

<table>
<thead>
<tr>
<th>Table 5.6 Credit rating ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating</td>
</tr>
<tr>
<td>Funds flow interest cover (times)</td>
</tr>
<tr>
<td>Internal financial ratio (percent)</td>
</tr>
<tr>
<td>Net debt/Fund flow from operation (times)</td>
</tr>
</tbody>
</table>

Revenue/price cap scenario analysis

The Tribunal has assessed the financial outcomes under GSN’s proposal and alternative revenue/price cap scenarios using a range of rates of return and initial capital bases. Of the various scenarios using different combination of rate of return and initial capital base, the three cases of most interest to the Tribunal are:

Case 1: GSN proposal, ie a real return of 11.1 percent on DORC ($34m)
Case 2: Historical cost approach, ie a nominal return of 10.2% on DAC ($15m)
Case 3: Sustainable revenue path using a real return of 7.5 percent on an initial capital base of $28m.  

The Tribunal concludes that:

- Under case 1 (GSN’s proposal), the financial position would improve significantly over the 5 years with a falling net debt (ie debt minus investment), increasing returns, and an impressive improvement in the credit rating ratios. It is considered that this would generate an excessive return and some revenue reduction below this level would be sustainable.

- Under case 2 (DAC approach), there would be deterioration in financial performance, resulting in a loss position. Borrowing would increase and GSN would suffer from increasing debt or loss of shareholder value.

- Under case 3, the performance would be fairly stable despite an initial fall in profits in the first year due to the revenue reduction. The credit rating ratios suggest an overall credit rating of between BBB and A.

The results of financial modelling, in terms of projected profitability and cashflow position, are summarised in Figure 5.2.

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55 Case 3 is preferred after an analysis of various revenue scenarios. See 5.2.10 for the Tribunal’s reasons.
The Tribunal has also compared the financial indicator results under each of the scenarios including the three cases presented above. The financial indicators under case 3 are considered to be satisfactory in terms of future viability. This revenue scenario allows GSN to meet its obligations, including the funding of operating and capital expenditure, and payment of a dividend to its owner.
The financial indicators are shown below:

### Table 5.7 Financial indicator analysis: sustainable revenue path under case 3

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lenders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funds flow adequacy</td>
<td>83.2%</td>
<td>81.3%</td>
<td>90.1%</td>
<td>100.2%</td>
<td>102.7%</td>
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<tr>
<td>Funds flow interest cover (times)</td>
<td>1.83</td>
<td>1.85</td>
<td>1.90</td>
<td>1.96</td>
<td>2.02</td>
</tr>
<tr>
<td>Funds flow net debt payback (years)</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
</tr>
<tr>
<td>Funds flow interest cover (times)</td>
<td>1.83</td>
<td>1.85</td>
<td>1.90</td>
<td>1.96</td>
<td>2.02</td>
</tr>
<tr>
<td>Funds flow net debt payback (years)</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
</tr>
<tr>
<td>Internal financing ratio</td>
<td>79.0%</td>
<td>78.5%</td>
<td>88.3%</td>
<td>100.2%</td>
<td>103.3%</td>
</tr>
<tr>
<td>Pre tax interest cover (times)</td>
<td>1.3</td>
<td>1.3</td>
<td>1.3</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Total debt/total capital</td>
<td>71%</td>
<td>69%</td>
<td>68%</td>
<td>66%</td>
<td>64%</td>
</tr>
<tr>
<td><strong>Regulator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PATBI/Funds employed</td>
<td>7.0%</td>
<td>7.0%</td>
<td>6.9%</td>
<td>6.9%</td>
<td>6.9%</td>
</tr>
<tr>
<td>PBIT/Sales volume ($/GJ)</td>
<td>1.5</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.7</td>
</tr>
<tr>
<td>PBIT/Total revenue</td>
<td>47%</td>
<td>48%</td>
<td>48%</td>
<td>48%</td>
<td>48%</td>
</tr>
<tr>
<td>PBITD/Sales volume ($/GJ)</td>
<td>3.2</td>
<td>3.2</td>
<td>3.3</td>
<td>3.4</td>
<td>3.4</td>
</tr>
<tr>
<td>PBITD/Total revenue</td>
<td>68%</td>
<td>68%</td>
<td>69%</td>
<td>70%</td>
<td>70%</td>
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<tr>
<td><strong>Key performance indicators</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real total operating costs $ per customer</td>
<td>106.5</td>
<td>103.1</td>
<td>99.8</td>
<td>96.7</td>
<td>93.7</td>
</tr>
<tr>
<td>Real total operating costs $ per GJ of sales volume</td>
<td>1.03</td>
<td>1.01</td>
<td>0.99</td>
<td>0.96</td>
<td>0.94</td>
</tr>
<tr>
<td>Real total operating costs % per GJ of MDQ</td>
<td>170.5</td>
<td>167.2</td>
<td>163.9</td>
<td>160.7</td>
<td>157.5</td>
</tr>
<tr>
<td>** Investors**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profit before interest &amp; tax (EBIT)</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>2.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Profit after tax</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>PBIT/Funds employed</td>
<td>7.6%</td>
<td>7.6%</td>
<td>7.6%</td>
<td>7.6%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Operating cash flow</td>
<td>1.4</td>
<td>1.5</td>
<td>1.6</td>
<td>1.7</td>
<td>1.8</td>
</tr>
<tr>
<td>PAT/Assets (Depreciated actual cost)</td>
<td>1.9%</td>
<td>2.0%</td>
<td>2.1%</td>
<td>2.2%</td>
<td>2.4%</td>
</tr>
<tr>
<td>PAT/DORC</td>
<td>1.0%</td>
<td>1.1%</td>
<td>1.2%</td>
<td>1.3%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

Source: IPART’s financial model.

The Tribunal has also considered longer, 10 year forecasts including financial indicators under case 3. They show an overall improvement in financial position beyond this regulatory period.

### 5.2.10 Conclusion and draft decision

On the basis of its consideration as described above, the Tribunal determines that $28m is an appropriate initial capital base. The main reasons for this decision are:

- DAC is considered not appropriate. Adopting DAC as the initial capital base would result in deterioration in GSN’s financial performance.
- Kinhill’s estimate of the full optimised replacement cost is lower than that of GSN.
A change of valuation from DAC to the use of full DORC for pricing purposes will generate a return over the whole of the economic life of the assets greater than the initial investment. Establishing the initial capital base below the DORC value provides a more balanced outcome for customers.

The optimised deprival valuation is around $28.3m.

Based on reports of bids at the time of the sale of the gas business, it would appear that an indicative market value of the gas network is within a range of $27-29m.

Under GSN’s proposal, there will be large increases in prices, particularly for volume customers. Some asset write-down is appropriate to achieve price stability, particularly for volume customers.

There is no evidence of under-cost recovery from customers as a whole in the past.

Prices incorporating a real return on DORC are likely to be more stable than prices set on a nominal return on DAC.

Economic efficiency principles do not provide strong guidance on the valuation of the initial capital base.

For new investments, the key issue for efficient pricing is how new assets are brought in under the provisions of the Code. The Tribunal considers that the decision on GSN’s initial capital base should not affect its incentives for future investment.

The adoption of $28m as the initial capital base is expected to deliver a revenue stream (over this and future Access Arrangement periods) sufficient for GSN to finance its network functions, maintain an adequate service and earn reasonable return.

The risk of uneconomic by-pass is likely to be higher if prices are set too high.

The Tribunal notes that in their draft decisions on the Victorian Access Arrangements, ACCC and ORG have accepted a DORC valuation which has been modified and written down to prevent price increases to certain groups of customers. However, the ACCC has stated clearly that future decisions will be made on a case-by-case basis recognising the economic arguments for and against the various asset valuation methodologies. This aspect of ACCC/ORG’s draft decisions should not necessarily be seen as a precedent for future decisions.

The choice of the initial capital base requires considerable judgement about a range of matters, including the balance of interests between stakeholders. The Tribunal considers that its decision on the initial capital base for GSN, along with its other decisions (including the rate of return), will provide for the ongoing provision of services and a commercial return to GSN.

As a result of the Tribunal’s decision on the initial capital base, there will be an asset write-down of $6m. The allocation of the asset write-down, as a consequence of this draft decision, is discussed in chapter 10.

60 The DORC asset values have been reduced by the proponents for assets serving markets where prices based on the DORC asset value would result in higher charges for certain groups of customers.
Amendment 2 - Initial capital base
For the GSN’s Access Arrangement to be approved, the following amendments must be made:
(a) The initial capital base is $28m.
(b) The net working capital is to be excluded from the initial capital base. Return on net working capital is to be allowed for separately.

5.3 Rolling forward of the capital base

5.3.1 Code requirements

Section 8.9 of the Code states in part:

… the Capital Base at the commencement of each Access Arrangement Period after the first, for the Cost of Service methodology, is determined as:

(a) the Capital Base at the start of the immediately preceding Access Arrangement Period; plus

(b) the New Facilities Investment or Recoverable Portion (whichever is relevant) in the immediately preceding Access Arrangement Period (adjusted as relevant as a consequence of section 8.22 to allow for the differences between actual and forecast New Facilities Investment); less

(c) Depreciation for the immediately preceding Access Arrangement Period; less

(d) Redundant Capital identified prior to the commencement of that Access Arrangement Period,

and for the IRR or NPV methodology, is determined as:

(e) the Residual Value assumed in the previous Access Arrangement Period (adjusted as relevant as a consequence of section 8.22 to allow for the differences between actual and forecast New Facilities Investment); less

(f) Redundant Capital identified prior to the commencement of that Access Arrangement Period.

Under the cost of service model, the rolling forward of the capital base can be expressed as follows:

Regulatory capital base = Initial capital base + New facilities investments (excluding speculative investment) - Depreciation - Redundant capital

The Code has specific provisions covering the treatment of:
• New facilities investment (section 8.15-8.17).
• Speculative investment (section 8.19).
• Capital contributions (section 8.23 and 8.24).
• Redundant capital (section 8.27).

The Code also provides guidance on dealing with forecast capital expenditure in the development of reference tariffs and the timing of recognising capital expenditure in the capital base.
5.3.2 GSN’s proposal

GSN does not address the rolling forward of the capital base in its proposal. GSN has provided projections for depreciation and the capital base in real 1998/99 dollars. This implies that depreciation (underpinning the total revenue) and the regulatory asset base will be indexed.

5.3.3 Submissions

No submissions have been received regarding the issue of rolling forward of the capital base.

5.3.4 Tribunal’s assessment

As discussed in previous sections, the Tribunal interprets GSN’s proposal as implying a current cost accounting (CCA) approach under which both depreciation and the capital base will be indexed by the CPI. Accordingly, a real rate of return will be applied to the indexed capital base. Provided asset values are not revalued (other than for CPI indexation), the service provider will be able to recover its capital investment, including the cost of capital.

Although there is no specific provision in the Code to allow for adjustments to the asset base for inflation, some flexibility is allowed in the method used to calculate revenue (section 8.5). Both ACCC and ORG have accepted Energy Projects Division’s current cost accounting approach in their draft decisions.

Financial versus operating capital, and indexation

There are two concepts of capital maintenance in CCA – financial equity and operating capability. In simple terms, financial equity means the maintenance of the financial equity of a business in real terms. Operating capability means the ability of an enterprise to maintain the same level of goods and services over time.

There is a question of whether the regulatory capital base represents shareholder financial investments in the firm or the physical assets of the firm. This choice has implications for depreciation and for the indexation of the regulatory capital base.

UK utility regulators have typically followed a financial equity approach to setting price caps. The regulatory asset base therefore represents shareholder financial investments in the firm, rather than the physical assets or operating capability of the firm. This view is reflected in:

- The deeming of initial regulatory asset bases in relation to enterprise values following privatisation.
- The indexation of regulatory values by the Retail Prices Index (RPI), rather than by asset-specific indices.

The Tribunal believes the UK approach can be adapted to the regulation of GSN’s gas distribution business. This approach allows initial investors a reasonable forward looking return on their (financial) investment.

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61 The discussion is based on a draft paper prepared by a consultant, PriceWaterhouseCoopers for IPART.
Although the Code does not specify indexation of depreciation and the capital base (ie existing assets and new facilities investment), the underlying principles allow for a return of and on capital over the life of a covered pipeline. As illustrated in section 5.2.6, the recovery of capital costs (including a return) can be achieved using different methodologies, namely the historical cost accounting method, current cost accounting method, and capital annuity method. It is noted that over the life of an asset, allowing a nominal return on depreciated historical cost (unindexed) plus historical cost depreciation is equivalent to allowing a real return on current cost asset base (ie indexed) and current cost depreciation.

The Tribunal notes that section 8.5 of the Code provides for flexibility in the method used to calculate revenue and that other methodologies may be used provided the resulting total revenue can be expressed in terms of one of the methodologies described above (ie cost of service, IRR and NPV). For logical consistency, if a real rate of return is allowed on the value of the capital assets, the capital base and depreciation should be indexed. The use of real rate of return is consistent with the flexibility incorporated by section 8.31 of the Code. The Tribunal notes that ACCC and ORG have adopted indexation of capital base and depreciation in their draft decisions on the Victorian Access Arrangements.

The Tribunal concludes that the regulatory capital base should be indexed by CPI, which is consistent with the concept of financial capital maintenance, that is, maintaining the value of the shareholder’s investment.

The Tribunal has considered the relative merits of the underlying rate and the headline rate for inflation and the trend of the Sydney and All Capitals inflation rates over time. The average rates over time suggest that the rates are closely aligned. However, the Sydney and the All Capitals CPI have the benefit of being easily accessible by the public. It is important that the same rate be adopted consistently over time.

The Tribunal has decided that indexation of the regulatory capital base will be based on the actual Sydney CPI for each financial year over the access arrangement period. A real rate of return will then be applied to the indexed capital base.

**Prudency test of investments**

Under the Code, actual new facilities investment must pass a “prudent investment” test to be included in the capital base within the Access Arrangement period.

8.15 The Capital Base for a Covered Pipeline may be increased from the commencement of a new Access Arrangement Period to recognise additional capital costs incurred in constructing New Facilities for the purpose of providing Services.

8.16 The amount by which the Capital Base may be increased is the amount of the actual capital cost incurred (New Facilities Investment) provided that:

(a) that amount does not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice, and to achieve the lowest sustainable cost of delivering Services; and

(b) one of the following conditions is satisfied:

(i) the Anticipated Incremental Revenue generated by the New Facility exceeds the New Facilities Investment; or

The general principles are provided at the beginning of section 8. It states that “In addition, other methodologies that can be translated into one of these forms are acceptable (such as a method that provides a real rate of return on an inflation-indexed capital base)".
(ii) the Service Provider and/or Users satisfy the Relevant Regulator that the New Facility has system-wide benefits that, in the Relevant Regulator’s opinion, justify the approval of a higher Reference Tariff for all Users; or

(iii) the New Facility is necessary to maintain the safety, integrity or Contracted Capacity of Services.

8.17 For the purposes of administering 8.16(a), the Relevant Regulator must consider:

(a) whether the New Facility exhibits economies of scale or scope and the increments in which Capacity can be added; and

(b) whether the lowest sustainable cost of delivering Services over a reasonable time frame may require the installation of a New Facility with Capacity sufficient to meet forecast sales of Services over that time frame.

8.18 A Reference Tariff Policy may, at the discretion of the Service Provider, state that the Service Provider will undertake New Facilities Investment that does not satisfy the requirements of section 8.16. If the Service Provider incurs such New Facilities Investment, the Capital Base may be increased by that part of the New Facilities Investment which does satisfy section 8.16 (the Recoverable Portion).

Under the Code, forecast capital expenditure may be included in the determination of total revenue and reference tariffs (see chapter 7 for the Tribunal’s assessment):

8.20 Reference tariffs may be determined on the basis of new facilities investments that is forecast to occur within the Access Arrangement period provided that the new facilities investment is reasonably expected to pass the requirements in section 8.16 when the new facilities investment is forecast to occur.

Formal roll-in of new facilities investment in the asset base will be considered at the next review. The Tribunal expects that GSN will then be able to provide much better information in support of its past and projected capital expenditure.

At the next access review, the Tribunal will assess actual capital expenditure that the conditions under the Code are satisfied. To provide regulatory certainty to GSN, the Tribunal wishes to outline some of the assessment criteria for capital expenditure. These include asset replacement and new investment to meet growth and business requirement. The criteria will include but will not be limited to the following:

- Performance measured against target output and service standards and linkage of planning and design criteria to these standards.
- The scope and effectiveness of capital expenditure evaluation and approval processes (covering ex-ante and ex-post evaluation).
- Adequacy of asset management systems for planning, construction, operation and maintenance works.
- Efficiency of procurement methods in minimising costs of the capital expenditure program eg whether the work is undertaken in-house or contracted out.
- Benchmark comparisons of planning criteria, capital expenditure and unit costs against other gas utilities.
- Development of asset management plans.

The Tribunal intends to audit capital expenditure (both actual and forecast) at the next review. The review of capital expenditure commissioned as part of the current electricity review provides an example of this process.
The Tribunal will also request an annual information return from GSN, including information about actual capital expenditure. The format of this 'information pack' will be developed in consultation with GSN.

**Speculative investment, redundant capital, uneconomic proportion of new investment**

The Code allows a mechanism that will, with effect from the commencement of the next Access Arrangement period, remove an amount from the capital base (redundant capital) for a covered pipeline 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 the volume of sales of services provided by means of the covered pipeline between the service provider and users.

Speculative investment cannot be included in the capital base. However, if over time, this investment (or part thereof) meets the prudency test, this expenditure (or part thereof) can be included in the capital base:

8.19 The Reference Tariff Policy may also provide that an amount in respect of the balance of the New Facilities Investment may subsequently be added to the Capital Base if at any time the type and volume of services provided using the increase in Capacity attributable to the New Facility change such that any part of the Speculative Investment Fund (as defined below) would then satisfy the requirements of section 8.16. The amount of the Speculative Investment Fund at any time is equal to:

(a) the difference between the New Facilities Investment and the Recoverable Portion, less any amount the Service Provider notifies the Relevant Regulator (at time the expenditure is incurred) that it has elected to recover through a Surcharge under section 8.25 (Speculative Investment); plus

(b) an annual increase in that amount calculated on a compounded basis at a rate of return approved by the Relevant Regulator which rate of return may, but need not, be different from the rate of return implied in the Reference Tariff; less

(c) any part of the Speculative Investment Fund previously added to the Capital Base under this section 8.19.

The Tribunal notes the comment made in the submissions to ACCC/ORG draft decisions that stranded cost (or redundant capital) exposure may lead to an increase in the investors’ required rate of return.\(^{63}\) This is because such risks are not captured in the CAPM.

Enterprises in a competitive market have to face and manage the risk of stranded asset cost as a result of competition and technological advancement. Where assets are stranded as a result of poor investment decisions or adverse circumstances, a full commercial return on the investments will not be achieved. Whilst the Tribunal does not wish to create uncertainty, it believes it is not appropriate to shield natural monopolies from business risks. As required by the Code, the Tribunal will assess GSN’s capital expenditure (both actual and forecast) to determine whether there is any need for adjustment at the next access review.

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\(^{63}\) A commentary paper on regulatory risk prepared by Oxford Economic Research Associates on behalf of APIA, p 7.
Use of actual vs expected capital expenditure and the timing of recognition

Where actual capital expenditure is less than the projected capital expenditure used by the regulator in establishing total revenue and reference tariffs, there are three main options:

1. To reduce immediately the service provider’s allowable revenue by the difference between the actual and projected capital expenditure.

2. To adjust the regulatory capital base to take account of the actual capital expenditure at the next review, thereby allowing the service provider to keep in the meantime the returns it has made as a result of the discrepancy between projected and actual levels. A further option is to keep the projected capital expenditure in the regulatory capital base for a fixed period, say five years.

3. To roll forward the capital base at all price reviews on the basis of projected capital expenditure.

If actual capital expenditure is greater than the forecast level, the regulator will need to decide whether the cost overrun is due to inefficient capital investment decisions. The regulated utilities are required to justify the higher capital expenditure outcomes.

The Tribunal considers that the second approach provides the right balance between protecting the interests of users and providing the service provider with good incentives for efficiency in capital expenditure. This approach should be accompanied by an independent assessment of capital expenditure at each major review, in order to reduce over-estimation by the regulated utilities.

The Tribunal notes that OFWAT is currently proposing that:

• For a five year period after particular capital expenditures are expected to be incurred, the regulatory asset base will be rolled forward on the basis of the expected level of capital expenditure as long as companies have achieved the “output” expected to be achieved from that expenditure.

• There will then (on a rolling basis) be a reconciliation with actual expenditure. If actual expenditure is lower, it will be substituted for projected expenditure.

Through the use of predicted capital expenditure for longer period than previously, this approach places considerable emphasis on providing an incentive to achieve capital efficiency.

OFWAT benchmarks capital efficiency at the beginning of each major review. If companies rank unfavourably in the benchmarking study, their capital expenditure forecast will be scaled down for the purpose of price regulation. This front-end scrutiny is possible due to the greater number of water and sewerage companies in the UK available for benchmarking against each other. This approach also requires clear performance standards and a clear understanding of the relationship between capital expenditure and performance standards. The water industry may have made more progress in relating expenditure to outputs than the gas industry.

As discussed in chapter 7, the Tribunal has undertaken a preliminary assessment of GSN’s capital expenditure projections. Except for the obscure $3.5m capital expenditure projected in 2002/03 and subject to some specified conditions to be met, the Tribunal has at this stage allowed the forecast capital expenditure in assessing GSN’s total revenue requirement under
the cost of service model. At the next regulatory period, actual capital expenditure will be added to the regulatory capital base following an external review.

5.3.5 Conclusion and draft decision

The Tribunal acknowledges that assessing capital efficiency is one of the most difficult regulatory issues. The Tribunal will continue to consult with other regulators regarding benchmarking capital efficiency and monitoring capital spending of natural monopolies.

The Tribunal concludes that:

• Under the cost of service model, the capital base (including future new facilities investment) and depreciation should be indexed by the Sydney CPI. A real rate of return is allowed on the regulatory capital base.

• Actual capital expenditure will be included in the regulatory capital base in the year in which that expenditure is incurred, provided service standards have been met.

Amendment 3 - Rolling forward of capital base

In order for GSN’s Access Arrangement to be approved, a statement is required providing for the indexing of the regulatory capital base by the annual inflation (Sydney CPI) for each year.
6. DEPRECIATION

6.1 Code requirements

Sections 8.32 and 8.33 of the Code provide for the allowance of the Depreciation Schedule under the Cost of Service method:

The Depreciation Schedule is the set of depreciation schedules (one of which may correspond to each asset or group of assets that form part of the Covered Pipeline) that is the basis upon which the assets that form part of the Capital Base are to be depreciated for the purposes of determining a Reference Tariff (the Depreciation Schedule). (section 8.32)

The Depreciation Schedule should be designed:

(a) so as to result in the Reference Tariff changing over time in a manner that is consistent with the efficient growth of the market for the Services provided by the Pipeline (and which may involve a substantial portion of the depreciation taking place in future periods, particularly where the calculation of the Reference Tariffs has assumed significant market growth and the Pipeline has been sized accordingly);
(b) so that each asset or group of assets that form part of the Covered Pipeline is depreciated over the economic life of that asset or group of assets;
(c) so that, to the maximum extent that is reasonable, the depreciation schedule for each asset or group of assets that form part of the Covered Pipeline is adjusted over the life of that asset or group of assets to reflect changes in the expected economic life of that asset or group of assets; and
(d) subject to section 8.27, so that an asset is depreciated only once (that is, so that the sum of the Depreciation that is attributable to any asset or group of assets over the life of those assets is equivalent to the value of that asset or group of assets at the time at which the value of that asset of group of assets was first included in the Capital Base) (section 8.33).

6.2 GSN’s proposal

Under the cost of service model, GSN has proposed that annual depreciation be set at $1.2m on the basis of its proposed capital value. Forecast depreciation expenses are expressed in real terms. The Tribunal has interpreted this to be a form of current cost accounting, under which depreciation will be indexed to increase with the asset value.

6.3 Tribunal’s analysis and assessment

Depreciation is an asset-related cost. It is a measure of the decline in economic value of an entity’s asset base over time as its useful life becomes shorter. From an accounting point of view, a depreciation charge is important because it matches the decline in the asset value with the revenue generated by the asset base. It is noted that accounting depreciation may not reflect economic depreciation. It is very difficult to apply the economic concept of depreciation within the limitations imposed by accounting data produced to satisfy accounting standards.

Under the cost of service model, the annual depreciation expense component provides for the recovery of the utility’s capital investment over the anticipated economic life of the depreciable assets. The other asset related cost is return on capital. The timing profile of the return on assets is closely related to the depreciation profiles assumed. For example, the adoption of longer asset lives will produce lower annual depreciation charges but a higher depreciated asset value in the initial years. Consequently, the return on assets will be higher in those years.
The time profile of the allowed revenue earned from the regulated assets therefore depends on assumptions about depreciation and the asset base. To assess overall capital costs over the life of an asset, return of capital (depreciation) should be considered together with return on capital.

6.3.1 Methods of depreciation

The commonly adopted methodology is to allow for depreciation to be calculated on either historical or replacement costs (ie the conventional accounting method). In the UK the regulatory asset bases are generally between historic and replacement costs and the allowed depreciation is based on the regulatory asset base. Other methods include condition based depreciation, and renewals annuity under a renewal accounting concept. Infrastructure renewal accounting was first adopted in the UK water industry. The premise underlying renewal accounting is that infrastructure assets have infinite lives and that operating capacity can be maintained in perpetuity.

Under the conventional accounting approach, the depreciation profile will also depend on the method of depreciation. The most commonly adopted methods are:

- **Straight line depreciation** - ie a uniform annual depreciation charge provided over the life of the asset.
- **Accelerated depreciation** - ie depreciation is front loaded or is higher in early years as with a double declining balance, sum of digits or depreciation on diminishing value used for taxation purposes.

Straight line depreciation is the method most commonly used by economic regulators in the UK except for OFFER. The Regional Electricity Companies (REC) have adopted a depreciation rate for the network systems of 3 percent for the first 20 years and 2 percent for the remaining 20 years.

Given the accounting practices adopted by the gas industry, the Tribunal considers that the standard method of determining annual depreciation charges based on an estimate of economic life provides an approximation of asset consumption.

6.3.2 Asset lives

The following table provides the asset lives assumed by GSN and compares them to those used by Greenwood Challoner in its review for the Tribunal of AGL’s costs,\(^{64}\) and Sinclair Knight Merz in its review for ORG/ACCC of the Victorian gas asset ODRC valuations.\(^{65}\)

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### Table 6.1 Comparison of asset lives (years)

<table>
<thead>
<tr>
<th>Asset</th>
<th>Great Southern Energy Networks</th>
<th>Greenwood Challoner/AGL</th>
<th>Sinclair Knight Merz/Victorian gas assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cast iron</td>
<td>100</td>
<td>50 (AGL argue 13 yrs)</td>
<td>50 – 120</td>
</tr>
<tr>
<td>Steel</td>
<td>80</td>
<td>30 – 120</td>
<td></td>
</tr>
<tr>
<td>Polyethylene/nylon</td>
<td>50</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Customer services</td>
<td>50 (AGL argue 13 yrs)</td>
<td>as for mains</td>
<td></td>
</tr>
<tr>
<td>Meters</td>
<td>15</td>
<td>15 (1)</td>
<td>25</td>
</tr>
<tr>
<td>District Regulators</td>
<td>40</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>City Gate</td>
<td>50</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td>SCADA system</td>
<td>20</td>
<td>-</td>
<td>5-7</td>
</tr>
<tr>
<td>Plant and equipment</td>
<td>5</td>
<td>10-20</td>
<td>-</td>
</tr>
</tbody>
</table>

Note:
1. There is a statutory requirement for meters to be replaced after 15 years of service.

The results show that GSN’s asset lives generally accord with those employed by the engineering consulting firms and other gas distribution utilities.

The issues that need to be examined are:
- Which asset value should be the basis for determining depreciation?
- What is the difference between depreciation and renewal expenditure?

### 6.4 Depreciation and regulatory capital value

The Tribunal has examined overseas methods of dealing with regulatory depreciation. The US allows historical cost depreciation on the rate base using historical cost net book value (ie DAC). In UK, the approaches adopted are:

- **Electricity industry.** In setting price controls, the regulator, OFFER, allows depreciation only on the regulatory asset value of assets. It allows all new capital expenditure to be added to the regulatory asset base.

- **Water industry.** The regulator, OFWAT, allows full current cost depreciation/renewals. It allows the regulatory asset base to be enhanced in real terms only to the extent that investment exceeds the renewal charge, in respect of underground assets, or the depreciation charge in respect of above ground assets.

- **Gas industry.** The 1997 Monopolies and Mergers Commission (MMC) report on the TransCo price control stated that depreciation would be allowed only on the regulatory value of assets. It allows actual capital expenditure which has been incurred over the previous price control period. Depreciation is profiled in TransCo’s book depreciation

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66 See a draft paper prepared by Tim Tutton (PricewaterhouseCoopers) for the Tribunal, August 1998. This paper is available on request.

which is adjusted downwards to reflect the difference between regulatory value and book value.

The Tribunal notes that for the electricity and gas industries, the regulatory asset base will be indexed by inflation. The Tribunal notes that the 1993 MMC report allowed both full current cost depreciation and a full cost of capital rate of return on all capital expenditure. As a result, BT TransCo was able to earn an ex-ante rate of return on its regulatory value in excess of its deemed cost of capital. The 1997 MMC report reversed that approach in explicit recognition of its inappropriateness.

The Tribunal considers that allowing depreciation on the regulatory capital base only is internally consistent with allowing the full amount of new capital investment (subject to the prudent investment test). This will reduce, but not eliminate the gap between depreciation and renewal expenditure.

### 6.5 Depreciation and replacement expenditure

The annual depreciation expense component of revenue requirements provides for the recovery of a utility’s capital investment over the anticipated useful life of the depreciable assets. Since depreciation is a provision from profits, not an actual expenditure, the funds resulting from depreciation are retained in the business and are available as a source of capital for replacing, improving, expanding the system, or repaying debt and redeeming equity. Often, depreciation is seen as a return of capital, that is, capital repayment.

In considering the appropriateness of depreciation, there is a question of whether depreciation represents a surrogate for replacement capital expenditure. The UK Office of the Rail Regulator raised this issue in a consultation paper regarding the approval of access charges. It suggested that access charges should cover depreciation on a current cost basis, and thus should finance, over time, expected expenditure on the renewal of assets.

OFGAS, the UK regulator for the gas transportation company TransCo, undertook a comparison of current cost depreciation and replacement expenditure in the past and in the future over the period, 1988-2007. It found that total replacement expenditure was approximately 60 percent of current cost depreciation. This implies that if CCA depreciation is seen as a proxy for future capital requirements to fund the replacement of TransCo’s assets, it appears to favour shareholders over customers because it over-provides for those needs.

If depreciation is allowed as a return of capital, that is, capital repayment, it is argued that there should be a close approximation between asset replacement and depreciation over the life of the assets. Otherwise, there will be a clear question of whether some of the assets will ever be replaced and/or the assets have service potential greater than the original expectation.

The Tribunal notes that over the next five years, total depreciation of $5.88m (in real 1998/99$) is significantly higher than the total capital expenditure on asset refurbishment and replacement of $2.35m (in real 1998/99$).

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69 OFGAS submission to MMC, November 1996, p64.
Figure 6.1 Replacement expenditure vs depreciation (capital repayment) on existing and replacement assets (real $1998/99m)

Note: Depreciation is calculated on existing assets and replacement assets only.

As shown in Figure 6.1, GSN’s proposed depreciation and the Tribunal’s allowed depreciation on the regulatory capital base significantly exceed the replacement/refurbishment expenditure in the five years under the proposed Access Arrangement Period. The gap between accumulated depreciation and the projected replacement expenditure over the five years is reduced under the Tribunal’s draft decision. The compounded value of the cash reserves of excess depreciation over replacement expenditure over this period is a valuable funding source for GSN.

If GSN replaces all its assets and the depreciation provision is accepted as a reasonable estimate of the average replacement needs over time, then replacement expenditure will have to be higher than the depreciation provisions at some time in the future. For long lived infrastructure assets, the time profile of replacement needs is likely to be cyclical and towards the end of the asset life. For GSN, the needs for asset replacement may be low at this point of time where the assets are about 15 years old. As estimates of capital expenditure beyond 2002/03 are not available, it is not possible to assess how the gap between replacement expenditure and depreciation changes over time.

In the absence of sufficient data on longer term capital expenditure (particularly in light of the recent change of ownership), the Tribunal wishes to examine this issue further at the next access review.

6.6 Conclusion and draft decision

Depreciation will be allowed on the initial capital base established for regulatory purposes. The depreciation schedule will be calculated using straight line depreciation over the economic life of the assets. Depreciation on new capital expenditure will be allowed and added to the cost of service model. For the purposes of determining a reference tariff over this Access Arrangement period, depreciation based on GSN’s adjusted forecast capital expenditure (see chapter 7) will be assumed.
Amendment 4 - Depreciation
In order for the GSN’s Access Arrangement to be approved, the depreciation component must be calculated based only on the regulatory capital base, thus reflecting the initial capital base determined by the Tribunal. The proposed depreciation is to be revised accordingly.
7. CAPITAL EXPENDITURE (NEW FACILITIES INVESTMENT)

7.1 Code requirements

Under the Code:

Consistent with the methodologies described in section 8.4, Reference Tariffs may be determined on the basis of New Facilities Investment that is forecast to occur within the Access Arrangement Period provided that the New Facilities Investment is reasonably expected to pass the requirements in section 8.16 when the New Facilities Investment is forecast to occur. (section 20)

If the Relevant Regulator agrees to Reference Tariffs being determined on the basis of forecast New Facilities Investment, this need not (at the discretion of the Relevant Regulator) imply that such New Facilities Investment will meet the requirements of Section 8.16 when the Relevant Regulator considers revisions to an Access Arrangement submitted by a Service Provider. (part of section 21).

Sections 8.16 and 8.17 set out the matters to be considered by the regulator in assessing a service provider’s forecast capital expenditure.

7.2 GSN’s forecast capital expenditure

GSN’s forecast capital expenditure is shown in the following table:

<table>
<thead>
<tr>
<th></th>
<th>1998/99</th>
<th>1999/00</th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Capital Works</td>
<td>0.455</td>
<td>0.505</td>
<td>0.505</td>
<td>0.505</td>
<td>4.005</td>
</tr>
<tr>
<td>Refurbishment</td>
<td>0.310</td>
<td>0.560</td>
<td>0.560</td>
<td>0.460</td>
<td>0.460</td>
</tr>
<tr>
<td>Metering/Telemetry</td>
<td>0.442</td>
<td>0.290</td>
<td>0.170</td>
<td>0.170</td>
<td>0.170</td>
</tr>
<tr>
<td>Other</td>
<td>0.023</td>
<td>0.011</td>
<td>0.021</td>
<td>0.011</td>
<td>0.021</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.230</strong></td>
<td><strong>1.366</strong></td>
<td><strong>1.256</strong></td>
<td><strong>1.146</strong></td>
<td><strong>4.456</strong></td>
</tr>
</tbody>
</table>


In the Access Arrangement Information document, GSN reveals that the forecast $4.456m capital expenditure in 2002/03 includes $3.5m for system augmentation if residential areas of Wagga Wagga continue their southward drift. However, GSN has noted that the project is still uncertain and it has therefore not been included for the purposes of pricing.

7.3 Public submissions

In submissions to the Tribunal, no comment was made on the magnitude of GSN’s planned capital expenditure. However, BHPP and AGL have noted several inconsistencies:

- The fact that a considerable proportion of capital works has been assumed for system rehabilitation is inconsistent with no planned reductions in the unaccounted for gas (UAG).
- The growth forecasts used by GSN appear to be too low.

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70 See section 5.3.4 of this report.
71 Great Southern Energy’s proposed Access Arrangement Information, p 13.
72 BHPP and AGL submissions.
73 BHPP submission.
7.4 Tribunal’s assessment

Key issues for consideration are:

- Is it reasonable to expect that the forecast capital expenditure will occur?
- Should actual capital expenditure (rather than forecast) be included in the capital base? (See chapter 5.)
- Should the uneconomic proportion of the new investment (to connect new customers) be excluded from GSN’s capital base?

The Tribunal notes the lack of information in GSN’s business plan and asset management planning at this stage. GSN has owned the business for just over one year. Questions have been raised in the submissions regarding the internal consistency between the capital expenditure forecast and assumptions on growth and UAG.

The Tribunal understands that GSN is in the process of developing its asset management plans. Given the limited prospects of obtaining better data at this stage, the Tribunal has not sought a further detailed consultancy review of GSN’s capital expenditure forecast. However, the Tribunal has compared GSN’s proposal with capital expenditure forecasts by the previous networks owner (WWCC) and the capital expenditure proposed by similar gas networks such as the Albury Gas Company.

The Tribunal has considered the capital expenditure forecast by WWCC in its Information Memorandum, which was prepared for prospective tenderers at the time of sale.

GSN’s proposed expenditure in 1998/99 is consistent with this information. However, proposed capital expenditure post 1998/99 is higher compared to that envisaged by WWCC.

The Albury Gas Company (AGC) operates a similar gas network to GSN. Its network is smaller in terms of length of pipes, but is of similar age and serves similar loads. A comparison of the capital expenditure forecast for the two networks can help the Tribunal to judge GSN’s proposed new facilities investment.

Table 7.2 Projected capital expenditure

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GSN ($1998/99m)</td>
<td>1.230</td>
<td>1.366</td>
<td>1.256</td>
<td>1.146</td>
<td>4.656</td>
</tr>
<tr>
<td></td>
<td>1998</td>
<td>1999</td>
<td>2000</td>
<td>2001</td>
<td>2002</td>
</tr>
<tr>
<td>Albury Gas Company ($m of year)</td>
<td>0.82</td>
<td>0.84</td>
<td>0.86</td>
<td>0.87</td>
<td>0.89</td>
</tr>
<tr>
<td>Albury Gas Company ($1998m) (1)</td>
<td>0.82</td>
<td>0.82</td>
<td>0.82</td>
<td>0.82</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Source: Albury Gas Company Access Arrangement Proposal p 12. Expenditures are for calendar year.

Note:
1. The forecast capital expenditure by Albury Gas Company is in nominal dollars assuming an inflation rate of 2 percent a year. The forecast figures are converted in 1998$m for comparison purposes.

74 The Tribunal has had access to the WWCC Information Memorandum on a commercial-in-confidence basis.
75 GSN has slightly more lengths of mains than the AGC network.
Capital expenditure

The Tribunal considers that the capital expenditure forecast should depend on the characteristics of the networks, the growth forecast and the refurbishment requirement to reduce gas leakage in the system.

The main difference between the capital expenditure forecasts of GSN (for Wagga Wagga) and AGC (for Albury) is for refurbishment expenditure. AGC argues in its Access Arrangement recently submitted to the Tribunal that, given the relatively young age profile of its distribution system, there is no need to allow for capital expenditure on renewals. AGC’s UAG assumption (1.8 percent) is also lower than that of GSN (3.5 percent). The Tribunal’s preliminary assessment is that GSN’s forecast refurbishment capital expenditure can only be justified if, as a result of the expenditure, there will be a reduction in UAG.

AGC’s growth forecasts for the tariff market (2-2.5 percent per annum) are higher than GSN’s (1–1.5 percent). Both AGC and GSN forecast that no growth will occur in the contract market. GSN’s forecast capital expenditure on new mains is above AGC’s but capital expenditure on new connections is forecast to be below that of AGC. The Tribunal has also considered the comments made by Kinhill that the existing system is reaching its capacity.

As noted above, the Tribunal is required to satisfy itself that forecast new investment would be reasonably expected to pass a “prudency test” before making allowance for it in the price path. The Tribunal has come to the conclusion that this test will be satisfied only if the new investment improves the efficiency of the system or is based on a reasonable assumption about growth. The Tribunal has examined GSN’s assumptions about the growth forecast and unaccounted for gas, but requires GSN to provide further information about the capital expenditure program to assist the Tribunal in determining whether it can be reasonably expected to pass the prudency test.

7.5 Impact of proposed capital expenditure on price path

Capital expenditure is required to maintain the serviceability of the existing system (replacement expenditure) and to meet growth and/or to improve serviceability (eg higher service standards).

Under the cost of service model, the revenue allowed to cover capital costs (ie depreciation and rate of return) relating to the existing asset stock declines over time as the assets are depreciated. However, as new investments are made, capital–related costs are added to the allowed revenue. If assets are gradually replaced and new investments are made, the total revenue allowed under the cost of service model will remain stable or gradually change as a result of the level of capital expenditure. The capital base will also change over time. The issue of rolling forward is discussed in section 5.3.

7.6 Conclusion and draft decision

The Tribunal accepts GSN’s proposal to remove the $3.5m capital expenditure for augmentation of the system to allow for the southward drift of residential growth for the purposes of calculating reference tariffs.
The Tribunal concludes that GSN’s capital expenditure forecasts are inconsistent with its proposed growth and UAG assumptions (see section 10.4 for demand forecasts and section 11.4 for UAG).

In this draft decision, the Tribunal proposes amendments to GSN’s assumptions for growth and UAG (see section 10.4). In addition, GSN is required to submit further information including its major capital expenditure projects over the Access Arrangement period and actual capital expenditure in 1998/99. The Tribunal will assess this information prior to making a final decision. Subject to these amendments and a satisfactory assessment of GSN’s further information, the Tribunal would accept GSN’s forecast capital expenditure (net of $3.5m in 2002/03) for calculating target revenue.

A more detailed review of forecast capital expenditure will be conducted at the next review. A longer term capital expenditure forecast will be required. The Tribunal expects GSN to develop its business plan and asset management plan in 1999.

**Amendment 5 - Forecast capital expenditure**

In order for GSN’s forecast capital expenditure to be included in calculating the total revenue, the following conditions must be met:

(a) The amount of $3.5m being forecast capital expenditure attributable to the southward expansion of residential areas of Wagga Wagga is to be removed from the Access Arrangement Information Document Appendix 4

(b) GSN is required to provide further information on its major capital expenditure projects and actual capital expenditure in 1997/98 to assist the Tribunal in determining whether this new facilities investment can reasonably be expected to meet the requirements and conditions in sections 8.16 and 8.17 of the Code.

(c) GSN is required to revise its unaccounted for gas assumption and the growth forecast for the volume customers.

The Tribunal’s acceptance of the proposed new infrastructure investment would not imply that this investment would automatically be included in the capital base at the beginning of the next Access Arrangement period. During the next review, the Tribunal will assess all actual capital expenditure incurred during this Access Arrangement period against the requirements of the Code at the next review.
8. OPERATING COSTS (NON CAPITAL COSTS)

8.1 Code requirements

The Code’s provisions for Non Capital costs are as follows:

Non Capital Costs are the operating, maintenance and other costs incurred in the delivery of the Reference Service (section 8.36)

A Reference Tariff may provide for the recovery of all Non Capital Costs for forecast Non Capital Costs, as relevant), except for any such costs that would not incurred by a prudent Service Provider, acting efficiently, in accordance with accepted and good industry practice, and to achieve the lowest sustainable cost of delivering the Reference Service (section 8.37).

8.2 GSN’s proposal

GSN’s operating costs total about $1.5m, comprising:
- $1.1m operating and maintenance costs
- $0.25m corporate overheads
- $0.14m marketing costs.

These costs are forecast to remain constant in real terms over the Access Arrangement period. A detailed cost split is provided in the Access Arrangement Information document.

GSN’s non capital costs are an allocation of the corporate costs and other costs (such as the costs of field services) incurred by Great Southern Energy. Great Southern Energy is able to harness considerable economies of scope by operating both a gas and an electricity business.

8.3 Submissions

The submissions have generally been positive toward the magnitude of GSN’s current operating costs. However, submissions do note that cost efficiencies have not been incorporated over time.

8.4 Tribunal’s assessment

The Tribunal has assessed the reasonableness of GSN’s operating cost assumptions by considering the following:
- Are the individual cost components reasonable/verifiable?
- Do the costs represent a reasonable allocation of costs from Great Southern Energy?
- Are the costs comparable to those for other gas utilities?
- Are the costs reasonable over time?
- Do the costs meet the test of prudence, efficiency, good industry practice and the lowest sustainable cost?

77 eg BHPP.
The Tribunal notes that the allocation of costs to the gas business has been made on an incremental cost basis. This raises the issue of whether this is fair for electricity customers. Should they benefit from Great Southern Energy’s diversification. However, the electricity network’s cap and margin are set until 30 June 1999, and this covers the stand-alone costs of the electricity business. To allow Great Southern Energy to recover any more than the incremental cost of running the gas business would be allowing Great Southern Energy to over recover costs.

GSN submits that a formal service agreement is being negotiated between the network company and its holding company, Great Southern Energy. Under the ring-fencing requirement of the Code, GSN will be required to submit a copy of the service agreement to the Tribunal. The Tribunal will assess whether the corporate service charges to GSN are reasonable.

### 8.4.1 Comparison of key performance indicators

GSN’s operating cost appears to be reasonable when compared with other gas distributors.

<table>
<thead>
<tr>
<th>Table 8.1 A comparison of current operating costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>$ per customer</td>
</tr>
<tr>
<td>$ m per 1000 km of main</td>
</tr>
<tr>
<td>$ per GJ</td>
</tr>
</tbody>
</table>

Sources:
(1) GSE proposed Access Arrangement Information, p 21.
(3) AGC proposed Access Arrangement, p 41.
(4) ORG Draft Determination - Attachment D.

GSN argues that significant reductions in operating costs have been made compared with WWCC’s performance. According to GSN, maintaining this level of cost in real terms provides a sufficient efficiency gain. However, the Tribunal notes that AGC has incorporated greater efficiency gains over the term of the price path in its Access Arrangement submitted to the Tribunal in June 1998.

### 8.4.2 Scope for cost reduction

The Tribunal notes that the assumed authorisation fee\(^{28}\) is $40,500 compared with $100 currently paid by GSN. Discussions with the Department of Energy (DOE) reveal that a review of the fee will be undertaken. If there is any change, it will be implemented after the commencement of this Access Arrangement. DOE did not indicate the likely outcome of

\(^{28}\) Authorisation fee is associated with the issue of a licence to distribute gas.
this review. The Tribunal considers that the non-capital costs should be reduced to reflect the current fee.

It is broadly accepted that the length of pipe is a key cost driver. On this measure, GSN’s performance is good. Whilst GSN compares favourably with other gas network companies in terms of key performance indicators, the Tribunal considers that an efficiency target should be set to encourage further productivity gains. Given the size of the corporate overhead (17 percent of the non-capital cost) and the general improvements in productivity throughout the economy, the Tribunal considers that there is scope for some cost reduction. The Tribunal considers that GSN has the management ability to reduce its non-capital costs by 2 percent a year.

8.4.3 Metering cost

In the operating costs, GSN includes costs associated with metering service, including meter reading. The Tribunal has determined that metering service should be separated out because it is a service which is potentially open to competition. Consequently, the Tribunal requires that GSN’s metering costs should be excluded from the non-capital cost component for the purpose of determining total revenue and reference tariffs. This can be achieved through the cost allocation process.

8.5 Conclusion and draft decision

Whilst GSN compares favourably with other gas network companies in terms of key performance indicators, the Tribunal considers that given the size of corporate overhead (17 percent of the non-capital cost), there is scope for some cost reduction. A real operating cost reduction of 2 percent a year is assumed in the allowed revenue. The Tribunal considers that GSN has the management ability to achieve this efficiency target.

The Tribunal proposes to amend the non-capital cost forecast as follows:

- a lower authorisation fee will be allowed
- cost efficiencies of 2 percent per annum for the period of the access arrangement.

Amendment 6 – Non capital costs

In order for GSN’s Access Arrangement to be approved, the following amendments to GSN’s non capital cost (operating cost) forecast are required:

(a) incorporate a lower authorisation fee of $100
(b) allow for a real cost reduction of 2 percent per annum
(c) exclude the metering costs in calculating the reference tariff for the transportation service.
9. TOTAL REVENUE AND FORM OF REGULATION

9.1 Code requirements

Chapter 8 of the Code generally provides three alternative methods for determining total revenue or, in effect, forecast average price (see section 1.1). The Code then requires that individual prices be calculated from costs attributed to different customers or classes of customers under a cost of supply model. A regulator is required to set reference tariffs based on the following form of regulation (section 8.3):

- a ‘price path’ approach
- a ‘cost of service’ approach
- variations or combinations of these approaches.

Sections 8.44 to 8.46 of the Code provide guidance on the use of incentive mechanisms. Section 8.46 states that:

An incentive mechanism should be designed with a view to achieving the following objectives:

(a) to provide the Service Provider with an incentive to increase the volume of sales of all Services, but to avoid providing an artificial incentive to favour the sale of one Service over another;
(b) to provide the Service Provider with an incentive to minimise the overall costs attributable to providing those Services, consistent with the safe and reliable provision of such Services;
(c) to provide the Service Provider with an incentive to develop new Services in response to the needs of the market for Services;
(d) to provide the Service Provider with an incentive to undertake only prudent New Facilities Investment and to incur only prudent Non Capital Costs, and for this incentive to be taken into account when determining the prudence of New Facilities Investment and Non Capital Costs for the purposes of section 8.16 and 8.37; and
(e) to ensure that Users and Prospective Users gain from increased efficiency, innovation and volume of sales (but not necessarily in the Access Arrangement Period) during which such increased efficiency, innovation and volume of sales occur).

9.2 GSN’s proposal

GSN proposes a price path in real terms. Reference tariffs for the contract and volume contract have been submitted. This approach is a pure price cap regulation.

9.3 Tribunal’s assessment – form of regulation

9.3.1 Price vs revenue regulation

Price regulation can take a number of forms. The regulator can set the average price (total revenue/volume), individual prices or a composite index of prices. In each case, if volumes increase above forecast, revenues increase in the same proportion, and conversely for volume reductions.

However, revenue regulation generally sets the total revenue to be recovered and prices are set to recover this amount of revenue for the given volume of throughput and/or cost drivers. The key difference between price and revenue regulation is whether the utility bears the quantity risk, that is, whether profits vary with quantity sold or not.
Hybrid approaches can be used to give the effect of a weighted average of price and revenue regulation. In this case, the utility bears a reduced quantity risk.

The arguments for price and revenue regulation are:

**Price regulation**
- provides stronger incentives to grow the market
- ensures prices are more stable.

**Revenue regulation**
- reduces risks because it better reflects network cost drivers
- reduces the bias against demand management under price caps
- more effectively quarantines the incentives for the incumbent retailer from that of the network.

In North America, the most common form of regulation has been price regulation. In the UK, the electricity regulator (OFFER) has used a hybrid approach to regulate both networks and monopoly elements in retail supply. OFFER decided that this hybrid approach better reflected cost drivers and reduced the disincentives to demand management. By tracking costs better, the hybrid approach reduces the likelihood of large swings in profits with volume changes because the majority of the costs of the network businesses are fixed. This reduces risks for the utility and regulator alike.

OFGAS has previously regulated prices for gas haulage (TransCo). However, following the last MMC determination, OFGAS set a revenue cap because it was concerned that the upside on the volume forecasts could provide TransCo with an excessive windfall gain.

Since 1996 the Tribunal has adopted a hybrid approach, commonly called revenue regulation, to regulate electricity prices. The introduction of this approach followed an extensive period of consultation. As in the UK, it was adopted because it reflects cost drivers better and reduces the bias against demand management.

In the AGL access undertaking determination the Tribunal set price caps. This provides AGL strong incentives to increase utilisation of the network, which was considered desirable given the current low market penetration of gas in NSW. Improved utilisation of the network will be translated into reduced prices in following regulatory periods.

The ACCC and ORG approved the use of a cost of service approach which effectively sets a price cap. Although these prices are calculated on the basis of an agreed set of revenue and growth projections, if growth turns out to be stronger than forecast, the benefit is retained by the utility and the prices will not change. Whilst accepting the proposed price control formula (CPI-X mechanism), ORG has expressed concerns about the proposed strong link between revenue and forecast gas demand growth. ORG has stated it intention to reconsider this mechanism at the next review.

GSN has proposed price controls but has also proposed a number of conditions for review of the Access Arrangement. This is an attempt to protect GSN from the effects of loss of
volumes, while providing for GSN to retain the benefits of load growth. The Tribunal has proposed that the conditions for review during the course of the Access Arrangement be withdrawn. While it would be feasible to include load growth as a condition for review, it may be of doubtful value in practice. Load growth strongly benefits the utility under a price cap and any change to the access arrangements prior to the end date would require the agreement of the utility.

The Tribunal has decided to apply a price cap for this decision.

In adopting price regulation, two matters to be considered are:
- The reasonableness of the demand forecasts. This issue is considered in chapter 10.
- The form of regulation: whether the Tribunal should regulate the average unit price or an index of prices, or should fix specific prices.

9.3.2 Incentive based price regulation in the form of CPI-X

Other determinations by the Tribunal advocate the use of incentive based regulation. Prices are determined in relation to inflation for a set period. The strength of this approach is the incentive for promoting efficiencies that eventually result in long term price reductions.

Regulating average prices is the simplest approach, but can introduce some instability in prices over the subsequent regulatory period if major customers leave the system or join. However, setting individual charges is complex and may inhibit the development of pricing systems.

The Tribunal favours an approach which provides flexibility for the regulated utility to work out its pricing structure within the average price caps. The Tribunal believes that the utility itself is best placed to set its prices. The Tribunal therefore proposes the use of price cap regulation in the form of CPI-X. The price cap will be expressed as average price per GJ. GSN will be required to calculate and project prices for each zone and customer or customer classes consistent with this cap. These prices will be locked in throughout the Access Arrangement Period.

The Tribunal acknowledges the glide path approach currently proposed by ORG in which a service provider is allowed to retain efficiency gains over the future regulatory period. The Tribunal’s preliminary view is that whilst the glide path approach will increase incentives to improve efficiency, there are practical difficulties in measuring efficiency gains due to management success and external factors that are not attributable to management control.

9.3.3 Smoothing the price path

In the absence of smoothing, the Tribunal’s draft decision could result in significant reduction in average prices in the first year followed by increases in subsequent years. This would result in greater volatility in earnings for the utility.

Under the Tribunal’s draft decision on rate of return, initial capital base and operating costs, there will be a 9.6 percent nominal reduction of network revenue in 1998/99, compared with the Tribunal’s estimated revenue in 1997/98 under a bundled gas supply service. Revenue will then increase over time. In terms of average price per GJ, the allowed revenue

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79 This revenue reduction includes a full year effect of the draft decision on GSN’s Access Arrangement.
translates into a 10 percent reduction in 1998/99, increasing by an average of 1.7 percent. The Tribunal notes that the flow on effects on contract and volume customers will be dramatic in the first year under the cost of supply model. Further details are discussed in chapter 10.

The Tribunal considers it appropriate to smooth the revenue path over the entire Access Arrangement period so that price reforms can be phased in.

A comparison of GSN’s proposal with other price path scenarios that have been considered by the Tribunal are shown below.

Table 9.1 A comparison of price path scenarios ($ of the year)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI</td>
<td>0.1%</td>
<td>2.5%</td>
<td>2.5%</td>
<td>2.5%</td>
<td>2.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Revenue path $m</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1 (unsmoothed path)</td>
<td>5.12</td>
<td>4.63</td>
<td>4.71</td>
<td>4.86</td>
<td>4.99</td>
<td>5.13</td>
</tr>
<tr>
<td>R2 (smoothed path)</td>
<td>5.12</td>
<td>4.86</td>
<td>4.93</td>
<td>4.99</td>
<td>5.06</td>
<td>5.13</td>
</tr>
<tr>
<td>R3 (GSN proposal)</td>
<td>5.01</td>
<td>5.29</td>
<td>5.72</td>
<td>6.19</td>
<td>6.70</td>
<td>7.24</td>
</tr>
<tr>
<td>Average price $/GJ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1 (unsmoothed path)</td>
<td>3.47</td>
<td>3.11</td>
<td>3.14</td>
<td>3.21</td>
<td>3.26</td>
<td>3.33</td>
</tr>
<tr>
<td>R2 (smoothed path)</td>
<td>3.47</td>
<td>3.27</td>
<td>3.28</td>
<td>3.30</td>
<td>3.31</td>
<td>3.33</td>
</tr>
<tr>
<td>R3 (GSN proposal)</td>
<td>3.40</td>
<td>3.55</td>
<td>3.81</td>
<td>4.09</td>
<td>4.38</td>
<td>4.70</td>
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<tr>
<td>Nominal price change</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1 (unsmoothed path)</td>
<td>-10.4%</td>
<td>0.8%</td>
<td>2.3%</td>
<td>1.7%</td>
<td>1.9%</td>
<td></td>
</tr>
<tr>
<td>R2 (smoothed path)</td>
<td>-6.0%</td>
<td>0.5%</td>
<td>0.5%</td>
<td>0.4%</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>R3 (GSN proposal)</td>
<td>4.6%</td>
<td>7.2%</td>
<td>7.2%</td>
<td>7.2%</td>
<td>7.2%</td>
<td></td>
</tr>
<tr>
<td>X factor under CPI-X regulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R1 (unsmoothed path)</td>
<td>CPI-12.9%</td>
<td>CPI-1.7%</td>
<td>CPI-0.2%</td>
<td>CPI-0.8%</td>
<td>CPI-0.6%</td>
<td></td>
</tr>
<tr>
<td>R2 (smoothed path)</td>
<td>CPI-8.5%</td>
<td>CPI-2.0%</td>
<td>CPI-2.0%</td>
<td>CPI-2.0%</td>
<td>CPI-2.0%</td>
<td></td>
</tr>
<tr>
<td>R3 (GSN proposal)</td>
<td>CPI+2.1%</td>
<td>CPI+4.7%</td>
<td>CPI+4.7%</td>
<td>CPI+4.7%</td>
<td>CPI+4.7%</td>
<td></td>
</tr>
</tbody>
</table>

Note: 1. An annual inflation rate of 2.5 percent is assumed in transforming GSN’s proposal from real to nominal terms.

The Tribunal has compared the net present value of the revenue stream under these two scenarios. The effect of a commencement date of January 1999 for this Access Arrangement has also been considered by the Tribunal.

The Tribunal favours a smoothed approach with a significant reduction in the first year then small reduction in the average price (in real terms) over the remaining years to 2002/03. The Tribunal notes that, under this scenario, GSN will benefit from a slight improvement in cashflow and financial performance, as compared with the “unsmoothed” scenario.

The Tribunal considers that the smoothed approach is a modification of the cost of service methodology which is permitted under section 8.5 of the Code.
9.4 Conclusion and draft decision on form of regulation

The Tribunal has decided on the following:

- A price path approach whereby the reference tariffs are pre-determined over the Access Arrangement period to follow a path that is forecast to deliver a revenue stream consistent with the principles in the Code. As explained in section 9.3, the Tribunal has smoothed the allowed revenue. The allowed revenue will be allocated between contract and volume market. GSN will have flexibility in structuring the reference tariffs between these two market segments.

- Incentive based regulation, in the form of CPI-X average price regulation ($/GJ), will be applied. This provides incentives to GSN to be efficient, innovative and to reduce the overall cost of service. If GSN reduces their operating costs below the level allowed for or achieves capital efficiency while maintaining the service standards, it will be able to retain the additional profits that will accrue over this Access Arrangement period.

- Under the CPI-X average price regulation, GSN will retain any additional revenue that results from demand or the volume of sales being higher than the forecast. This provides an incentive for GSN to grow the market and to develop new services.

- Only prudent new investments will be rolled in the regulatory capital base. The Tribunal has provided some assessment criteria to minimise regulatory uncertainty.

- The Tribunal will decide at the next review whether additional efficiency gains (if achieved) will be retained by GSN over the next regulatory period. At present, there are no formal arrangements for monitoring GSN’s capital and operating expenditure. GSN has owned and operated the system for only one year only. GSN is still developing its business plan, management reporting and asset management plan. The Tribunal expects that these plans will be developed and available from next year and submitted to the Tribunal on an annual basis. The Tribunal sees that there would be merit in putting in place reporting arrangements for both capital and operating expenditures.

Under the CPI-X price cap regulation:

- The risk of inflation will be borne by customers. The capital base and prices will be linked to inflation.

- The risk of cost over-runs (both operating and capital) will be borne by GSN. However, any out-performance efficiency gains will be retained by GSN, at least over this Access Arrangement period.

- The risks of increases/decreases in volume transported (relative to the assumed growth) will be borne by GSN.

<table>
<thead>
<tr>
<th>Amendment 7 – Price cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) In order for the GSN’s Access Arrangement to be approved, GSN must submit a reference tariff which, if applied over the whole year, will be consistent with a total revenue of $4.86m in 1998/1999.</td>
</tr>
<tr>
<td>(b) A price cap of CPI-2% will apply to each of the year between 1999/2000 and 2002/03. The Sydney CPI for the year to March quarter immediately preceding the start of the relevant financial year will be applied.</td>
</tr>
</tbody>
</table>
9.5 Tribunal’s assessment of the total revenue requirement

GSN’s proposed total revenue would yield excessively high prices. The cash generated by GSN’s proposed return is judged to be in excess of GSN’s revenue requirements.

Determination of the initial capital base cannot be considered in isolation. From a regulatory perspective, asset valuation and rate of return need to be considered together. Determining the asset value and the cost of capital is not an exact science. No matter which method is employed, the desired result - the reasonableness of the pricing outcome - should be given high priority.

The Tribunal will allow a rate of return of 7.5 percent (pre tax real) on an initial capital base of $28m. The underlying return on equity is 12-13 percent (nominal post tax). The initial capital base for existing pipelines is within the lower range of DAC ($15m) and the upper range of the depreciated optimised replacement cost of assets proposed by GSN ($34m). In establishing $28m, the Tribunal has regard to the distinction between assets existing prior to this access arrangement and new investments. Excessive profits currently earned from the contract market customers will gradually be removed.

Under the cost of service model, the Tribunal has determined that GSN’s total revenue be set to cover:

- Operating costs, which will be reduced by 2 percent in real terms a year from the projected 1998/99 level to enable pass through of further efficiency gains to customers.

- A rate of return of 7.5 percent on the capital base. The initial capital base of $28m has been established after considering a number of asset valuation methodologies. This initial capital base falls between DAC ($15m) and DORC estimated by Kinhill ($33m).

- Depreciation on the regulatory capital base.

A comparison of allowed revenue under this draft decision and GSN’s proposed revenue is shown in Table 9.2.
Table 9.2 Breakdown of unsmoothed and smoothed allowed revenue for GSN’s gas transportation services (1998/99 $m)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Estimate(1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating costs</td>
<td>1.55</td>
<td>1.48</td>
<td>1.45</td>
<td>1.42</td>
<td>1.39</td>
<td>1.36</td>
</tr>
<tr>
<td>Depreciation</td>
<td>1.12</td>
<td>0.97</td>
<td>0.93</td>
<td>0.97</td>
<td>1.00</td>
<td>1.02</td>
</tr>
<tr>
<td>Rate of return</td>
<td>2.58</td>
<td>2.18</td>
<td>2.21</td>
<td>2.23</td>
<td>2.24</td>
<td>2.25</td>
</tr>
<tr>
<td>Return on working capital</td>
<td>0.00</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Total revenue (unsmoothed)</strong></td>
<td>5.25</td>
<td>4.63</td>
<td>4.60</td>
<td>4.63</td>
<td>4.64</td>
<td>4.65</td>
</tr>
<tr>
<td><strong>Smoothed allowed revenue</strong></td>
<td>5.25</td>
<td>4.86(2)</td>
<td>4.81</td>
<td>4.75</td>
<td>4.70</td>
<td>4.65</td>
</tr>
<tr>
<td><strong>GSN proposal</strong></td>
<td>5.29</td>
<td>5.58</td>
<td>5.89</td>
<td>6.22</td>
<td>6.56</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. It is estimated that GSN’s total costs in 1997/98 are $5.12m. Assuming an inflation rate of 2.5 percent in 1998/99, the costs are equivalent to $5.25m in 1998/99 dollars.
2. The figure of $4.86m revenue is based on the full year effect of a 8.5 percent reduction in average transportation charges ($/GJ). As the commencement date of the Access Arrangement is scheduled from 1 January 1999, GSN’s revenue in 1998/99 will be around $5m, reflecting only a half year effect of price reduction.

The Tribunal has assessed the adequacy of the allowed revenue in terms of GSN’s cash flow requirements under the draft decision. The financial indicators under this draft decision are shown in Table 9.3.
### Table 9.3 Draft decision on GSN’s total revenue: financial indicators analysis

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Lenders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funds flow adequacy</td>
<td>91.0%</td>
<td>84.1%</td>
<td>89.6%</td>
<td>98.9%</td>
<td>100.2%</td>
</tr>
<tr>
<td>Funds flow interest cover (times)</td>
<td>1.94</td>
<td>1.97</td>
<td>1.99</td>
<td>2.02</td>
<td>2.06</td>
</tr>
<tr>
<td>Flows fund net debt payback (years)</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
<td>BBB</td>
</tr>
<tr>
<td>Internal financing ratio</td>
<td>88.7%</td>
<td>80.6%</td>
<td>86.9%</td>
<td>98.6%</td>
<td>100.3%</td>
</tr>
<tr>
<td>Pre tax interest cover (times)</td>
<td>AA</td>
<td>AA</td>
<td>AA</td>
<td>AA</td>
<td>AAA</td>
</tr>
<tr>
<td>Total debt/total capital</td>
<td>71%</td>
<td>69%</td>
<td>67%</td>
<td>65%</td>
<td>63%</td>
</tr>
<tr>
<td><strong>Regulator</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PATBI/Funds employed</td>
<td>7.6%</td>
<td>7.4%</td>
<td>7.2%</td>
<td>7.0%</td>
<td>6.9%</td>
</tr>
<tr>
<td>PBIT/Sales volume ($/GJ)</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>PBIT/Total revenue</td>
<td>50%</td>
<td>51%</td>
<td>50%</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>PBITD/Sales volume ($/GJ)</td>
<td>3.3</td>
<td>3.3</td>
<td>3.4</td>
<td>3.4</td>
<td>3.5</td>
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<tr>
<td>PBITD/Total revenue</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>70%</td>
<td>71%</td>
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<tr>
<td><strong>Key performance indicators</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Real total operating costs $ per customer</td>
<td>103.7</td>
<td>100.3</td>
<td>97.0</td>
<td>93.8</td>
<td>90.8</td>
</tr>
<tr>
<td>Real total operating cost $ per GJ of sales volume</td>
<td>1.00</td>
<td>0.98</td>
<td>0.96</td>
<td>0.94</td>
<td>0.91</td>
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<td>Real total operating cost $ per GJ of MDQ</td>
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<td>159.2</td>
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<td>152.7</td>
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<tr>
<td>Profit before interest &amp; tax (EBIT)</td>
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<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Profit after tax</td>
<td>0.4</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>PBIT/Funds employed</td>
<td>8.4%</td>
<td>8.3%</td>
<td>8.1%</td>
<td>7.9%</td>
<td>7.7%</td>
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<td>Operating cash flow</td>
<td>1.6</td>
<td>1.7</td>
<td>1.7</td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>PAT/Assets (Depreciated actual cost)</td>
<td>2.8%</td>
<td>2.9%</td>
<td>2.7%</td>
<td>2.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>PAT/DORC</td>
<td>1.5%</td>
<td>1.6%</td>
<td>1.5%</td>
<td>1.4%</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

Source: IPART’s financial model.

Note: The results shown in this table are different from Table 5.7. This table reflects the smoothed revenue path under this draft decision.

Under the Tribunal’s draft decision, the impact of lower revenue allowed in 1998/99 is also offset by a lower depreciation expense. As a consequence, there will be a small reduction in operating profit in 1998/99 of $0.1m. The operating profit is expected to be maintained at $2.5m over this regulatory period. The Tribunal considers this represents a fair return to the GSN after considering other factors and principles provided in the Code.

The Tribunal has considered longer term financial forecasts beyond 2002/03. All the credit rating ratios show an improvement over the next regulatory periods. The indicative credit rating is expected to be A rating by year 2010.

The Tribunal has considered GSN’s future cashflows. It is expected that under the draft decision, GSN would have adequate cashflow to fund all capital expenditure including new investments and pay a dividend to its shareholders.
PART III  REFERENCE TARIFFS AND OTHER ISSUES
10. REFERENCE TARIFFS AND CHARGES

10.1 Overview of Code requirements

Section 8 of the Code sets out the principles by which reference tariffs and a reference tariff Policy (the principles underlying the calculation of reference tariffs) included in an Access Arrangement must comply with the Code.

The reference tariff principles are designed to ensure that certain key principles are reflected in the reference tariff policy and in the calculation of all reference tariffs. Within these parameters, principles are designed to provide a high degree of flexibility so that the reference tariff policy can be designed to meet the specific needs of each pipeline system. Reference tariffs should be based on the efficient cost (or anticipated efficient cost) of providing the reference services.

Section 8.1 of the Code outlines the objectives that should be achieved through reference tariffs and reference tariff Policy. These objectives are covered in section 1.2 of this draft decision.

To the extent that any of these objectives conflicts in its application with a particular reference tariff determination, the regulator may determine the manner in which they can best be reconciled or which of them should prevail.

Section 8.2 of the Code lists the factors about which the regulator must be satisfied in determining to approve a reference tariff and reference tariff policy. These have also been covered in section 1.2 of this draft decision.

The principles also require that, where appropriate, reference tariffs be designed to provide the service provider with the ability to earn greater profits (or smaller profits) between reviews than anticipated, if it outperforms (or underperforms) against the benchmarks adopted in setting the reference tariffs. The intention is that, to the extent possible, service providers be given a market-based incentive to improve efficiency and to promote efficient growth of the gas market (an incentive mechanism).

10.2 Pricing principles

10.2.1 GSN’s proposal

The reference tariffs proposed by GSN are designed to meet the Code objectives. GSN has outlined its approach to the pricing and tariff design and the principles taken into account in clause 3.2.2 of the Access Arrangement. These are reproduced below:

(a) **Cost reflectivity.** The costs of the Network assets and their operations and maintenance have as far as possible been allocated to the various Customer groups on the basis of their utilisation of those assets and the benefit received from their operation.

(b) **Efficient pricing signals.** The design of the Reference Tariffs rewards Customers who can minimise their peak demand and maximise their utilisation of the Network. Pricing is based on the long run marginal cost of providing the Transportation Service and thus Customers can make efficient decisions to continue to utilise the service and evaluate alternatives.

(c) **Fully allocated costs.** The Reference Tariffs are designed to recover an allocated share of average costs. At the upper limit, those costs are approximately equal to the “stand alone” costs of supplying the various Customer classes and thus encourage efficient investment.
decisions. Marginal costs or avoidable cost approaches have not been used because the marginal costs of any Customer or small group of Customers connected to the Network are close to zero.

(d) **Price stability.** The Reference Tariffs have been designed to allow for a smooth transition from their existing levels to tariffs which are cost reflective and efficient over the five year period of this Access Arrangement.

**10.2.2 Tribunal’s assessment**

The Tribunal has some concerns about the description of GSN’s pricing principles. The statement that the reference tariffs reward customers who can minimise their peak demand (paragraph (b) above) applies only to the contract market. Reference tariffs for volume customers do not provide these rewards because the demand component of these is fixed by the rate at which gas flows through the meters and not by the maximum demand. Also, it is not clear that volume customer pricing is based on the long run marginal cost of providing the transportation service. (See chapters 3 and 4 on revenue determination and pricing.) Paragraph (c) refers to allocating costs based on stand alone and marginal costs. There is no evidence that costs have been allocated in this manner in the Access Arrangement or the Access Arrangement Information.

**Amendment 8 – Pricing principles**

The Tribunal requires that clause 3.2.2 be reworded to more accurately describe the basis for the principles adopted.

**10.3 Cost allocation and tariffs**

**10.3.1 Code requirements**

The allocation of revenue (costs) between services is provided for in section 8.38 – 8.41 of the Code. Section 8.38 of the Code discusses the portion of the total revenue that a reference tariff should be designed to recover (which may be based on forecasts). This should include:

(a) all of the Total Revenue that reflects costs incurred (including capital costs) that are directly attributable to the Reference Service; and

(b) a share of the Total Revenue that reflects costs incurred (including capital costs) that are attributable to providing the Reference Service jointly with other Services, with this share to be determined in accordance with a methodology that meets the objectives in section 8.1 and is otherwise fair and reasonable.

Further, section 8.39 states that if the regulator requires a different methodology from that proposed by the service provider be adopted, the regulator shall provide a detailed explanation of the methodology that it requires be used to allocate costs pursuant to section 8.38.

Section 8.42 of the Code requires that a reference tariff be designed so that a particular user’s share of the portion of total revenue recovered from sales of a reference service is consistent with the principles described in section 8.38.

**10.3.2 GSN’s proposal**

**Background**

At present, the GSN network in Wagga Wagga serves just over 14,000 customers. These customers have been split into two segments (contract and volume customers). Contract
customers are those customers that use more than 10 TJ of gas per year and volume customers are those customers that use less than 10 TJ of gas per year. Of the 14,000 plus customers, only 13 are contract customers. The annual usage of all customers is 1.475 PJ. Of the total gas used, the contract market consumes 56 percent.

**Target revenue**

The reference tariffs for customers in Wagga Wagga have been derived by allocating the target revenue to customers on the basis of the assets serving each customer group. The target revenue comprises costs associated with providing transportation services to these customers. As shown in Table 3.1, GSN proposes a Total Revenue of $6.56 million to cover operating and maintenance costs, corporate overheads, marketing costs, depreciation and a return on its assets.

GSN has provided a cost of supply model to the Tribunal in support of its proposed target revenue and reference tariffs.

**Allocation of costs to market segments**

GSN has allocated its costs firstly between the contract and volume markets, and then within these markets to customers. The allocation has been made on the basis of the optimised replacement cost of the assets serving these market segments. The optimised replacement cost allocation is based on the valuation by GHD (see section 5.1.2 of this draft decision).

The network is composed of high, medium and low pressure assets. Gas is transported firstly through the high pressure mains, then the medium pressure mains and then through the low pressure pipes. While the contract customers are deemed to be connected to the high and medium pressure mains, all the volume customers are deemed to be connected to the low pressure pipes. Therefore, the contract and volume customers share the use of the high and medium pressure mains, but the low pressure pipes are used only by the volume customers.

To determine the share of the high and medium pressure assets used by each market, the use of assets has been allocated by the demand of each segment. The demand has been measured by the maximum hourly quantity (MHQ) of each market in 1997/98. Using the optimised replacement cost and demand to allocate the asset usage, the costs of transportation to each market results in 90 percent of costs being allocated to the volume customers and 10 percent to the contract customers. This allocation is then applied to the allocation of operating and maintenance costs, depreciation and a return on assets to the volume and contract markets.
Allocation of costs within market segments

Contract customers
Within the contract market, costs have been allocated to three zones based on the assets used in each zone. The three zones are:

- the Bomen zone covering all the area serviced by the network that is north of the Murrumbidgee River
- the Central zone covering the main area of the City of Wagga Wagga
- the Fringe zone covering customers located on the extensions of the network to the Kapooka and Forest Hills areas.

Where customers in one zone also use the assets of another zone, the proportion of assets used in each zone has been allocated based on the demand of customers in each zone. This allocation method has resulted in 3.6 percent of the total costs being allocated to the Bomen zone, 1.3 percent to the Central zone, and 5.1 percent to the Fringe zone.

The costs allocated to each zone have then been allocated to customers based on the demand of each customer. This means that regardless of where a customer is located within a zone, that customer pays a proportion of the total costs of the zone, based on its proportion of total demand within the zone.

The contract tariff will be based on the maximum daily quantity (MDQ) reserved by customers for the contract year. The tariff will vary according to the zone the customer is located. The tariffs have been designed to move from the current level of tariff to the proposed level of tariff over a five year period.

The average contract tariff has been designed by GSN to decrease over the five years to 2002/3. The tariff that will apply to new customers at the commencement of the Access Arrangement will be the average price. These prices are presented in the Access Arrangement and summarised in Table 10.1. For existing customers, GSN has proposed that customers be subject to a five year phasing in process. Each customer’s price will vary each year by the same proportion from the current delivered price less commodity, transmission and retail costs, to the contract tariff in year five. GSN will notify customers of their price path.

The following table shows the reduction in average price proposed by GSN in each zone from 1998/99 to the end of the 5 year adjustment period.
Table 10.1  GSN proposed contract tariffs (real 1998/99 dollars)

<table>
<thead>
<tr>
<th>Contract Customers</th>
<th>Bomen</th>
<th>Central</th>
<th>Fringe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport charge</td>
<td>$/MDQ</td>
<td>$/MDQ</td>
<td>$/MDQ</td>
</tr>
<tr>
<td>1998/99</td>
<td>203.80</td>
<td>693.60</td>
<td>639.20</td>
</tr>
<tr>
<td>2002/03</td>
<td>66.80</td>
<td>260.00</td>
<td>586.30</td>
</tr>
<tr>
<td>Change</td>
<td>-67%</td>
<td>-63%</td>
<td>-9%</td>
</tr>
</tbody>
</table>

Source: GSN Access Arrangement, p. 73

Revenue from new customers will be additional to that assumed in the revenue analysis.

Volume customers

Within the volume market, there are four tariff classes. Customers have been allocated to classes based on the maximum flow rate of their meters. The classes of customer and the corresponding meter flow rate are shown below.

Table 10.2  Volume tariff classes

<table>
<thead>
<tr>
<th>Volume customer class</th>
<th>Maximum meter flow rate (m³/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large industrial</td>
<td>150</td>
</tr>
<tr>
<td>Industrial</td>
<td>85</td>
</tr>
<tr>
<td>Commercial</td>
<td>30</td>
</tr>
<tr>
<td>Residential and small business</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: GSN Access Arrangement, p.73.

The volume tariff will comprise a fixed component and a volume component. The proportion of target revenue allocated to the volume customers has been split into a 50 percent fixed component and a 50 percent variable component. The fixed component has been allocated to each customer based on a customers maximum meter flow rate. This results in a customer with a meter flow rate of 30 cubic metres paying a fixed charge three times greater than a customer with a meter flow rate of 10 cubic meters. The variable component has been spread across the total annual consumption of the volume customers.

This tariff has been designed by GSN to move from the current (1997/98) level of tariffs to the proposed level of tariffs over a five year period. The percentage change for the total revenue gained in respect of the volume tariff and each of the zone contract tariffs is equal for each of the five years.

The following table provides an indication of current estimates of network tariffs and the tariffs proposed by GSN in 2002/03.
### Table 10.3  GSN proposal - volume tariffs (real 1998/99 dollars)

<table>
<thead>
<tr>
<th>Years</th>
<th>Large industrial</th>
<th>Industrial</th>
<th>Commercial</th>
<th>Residential and small business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge ($)</td>
<td>Annual Variable</td>
<td>Annual Variable</td>
<td>Annual Variable</td>
<td>Annual Variable</td>
</tr>
<tr>
<td>1998/99</td>
<td>$603 $4.38</td>
<td>$342 $4.51</td>
<td>$121 $5.93</td>
<td>$40 $4.96</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>100% 0%</td>
<td>100% 0%</td>
<td>99% -6%</td>
<td>100% -5%</td>
</tr>
<tr>
<td>1999/00</td>
<td>$1,207 $4.39</td>
<td>$684 $4.49</td>
<td>$241 $5.57</td>
<td>$80 $4.71</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>50% 1%</td>
<td>50% 0%</td>
<td>50% -6%</td>
<td>51% -3%</td>
</tr>
<tr>
<td>2000/01</td>
<td>$1,810 $4.42</td>
<td>$1,026 $4.49</td>
<td>$362 $5.23</td>
<td>$121 $4.56</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>33% 1%</td>
<td>33% 0%</td>
<td>33% -7%</td>
<td>33% -1%</td>
</tr>
<tr>
<td>2001/02</td>
<td>$2,414 $4.48</td>
<td>$1,368 $4.51</td>
<td>$483 $4.89</td>
<td>$161 $4.50</td>
</tr>
<tr>
<td><strong>Change</strong></td>
<td>25% 2%</td>
<td>25% 1%</td>
<td>25% -7%</td>
<td>25% 2%</td>
</tr>
<tr>
<td>2002/03</td>
<td>$3,017 $4.57</td>
<td>$1,710 $4.57</td>
<td>$603 $4.57</td>
<td>$201 $4.57</td>
</tr>
<tr>
<td><strong>Total Change</strong></td>
<td>400% 4%</td>
<td>400% 1%</td>
<td>398% -23%</td>
<td>403% -8%</td>
</tr>
</tbody>
</table>

Source: GSN Access Arrangement, p.73.

The following table shows the average transport price per gigajoule for volume customers in the first and last year of the proposed Access Arrangement.

### Table 10.4  GSN’s proposal - average transport prices ($/GJ (real 1998/99 dollars))

<table>
<thead>
<tr>
<th>Volume customers</th>
<th>1998/99</th>
<th>2002/03</th>
<th>Percent change per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large industrial customers</td>
<td>4.59</td>
<td>5.54</td>
<td>4.8</td>
</tr>
<tr>
<td>Industrial customers</td>
<td>4.78</td>
<td>5.79</td>
<td>4.9</td>
</tr>
<tr>
<td>Commercial customers</td>
<td>6.41</td>
<td>6.89</td>
<td>1.8</td>
</tr>
<tr>
<td>Residential &amp; small business</td>
<td>5.82</td>
<td>8.59</td>
<td>10.2</td>
</tr>
<tr>
<td>Total volume customers</td>
<td>5.75</td>
<td>8.27</td>
<td>9.6</td>
</tr>
</tbody>
</table>

Source: Information provided by GSN to IPART.
Incentive mechanisms

GSN has stated that their reference tariffs provide incentives for it to reduce its operating and maintenance costs and increase utilisation of the network. The Access Arrangement also states that the reference tariff design provides incentives for individual customers to reduce or control their peak demand.

10.3.3 Tribunal’s assessment

Target revenue

The Tribunal has required amendments to the derivation of the target revenue proposed by GSN in Part 2 of this draft decision.

A number of issues arise:
• whether GSN’s cost allocation methodology (based on fully distributed costs) is reasonable
• how the reduction in asset value should be allocated to customers
• what are the impacts on customers.
These are covered below.

Allocation of costs between market segments

The Tribunal considers that in allocating costs among customer classes the following points should be considered:
• the imprecision of cost allocations
• economic principles of efficient pricing
• non-cost policy considerations such as protection of customers from price shocks.

Ideally, the cost of service should be determined by recording, and calculating the costs incurred. However, in cases such as gas transportation, costs are often shared and cannot be directly recorded by service or customer. Where this is the case, costs must be allocated on an acceptable basis. Choosing an allocator can be arbitrary, especially where costs are aggregated. This is because the particular cost driver can be hard to identify. Where costs are disaggregated and cost drivers relatively simple to identify, an allocation methodology can deliver reasonable results.

Because a network system is built to provide capacity for the estimated maximum demand, it is common to allocate the use of assets by demand. As only one contract customer is served from the low pressure system and no volume customers are served from the high or medium pressure systems, GSN’s assumption that all contract customers are served from the high and medium pressure system, while all volume customers are served from the medium and low pressure system is reasonable.

Further, GSN has allocated costs between the contract and volume markets based on the optimised replacement cost of the assets used in these markets. This generally acceptable allocation methodology has been used by both the gas and electricity sectors in Australia. The Tribunal considers that this is a reasonable method of allocating asset related costs and those operating and maintenance costs that cannot be directly allocated between markets.
However, where this methodology is adopted, the Tribunal prefers that Kinhill optimised replacement asset values be adopted.

Allocation of costs within market segments

As far as possible, the prices of a service should be based on the cost of providing that service. The first step in translating the revenue requirement into reference tariffs is to identify the cost drivers for each service.

Once the total cost of the services provided by the service provider have been determined, the price for each service can be derived by identifying the services provided and allocating the total cost to each service. The price per unit of service is then determined by dividing the costs allocated to each service by the number of units of service provided.

Practical pricing strategies need to marry the benefits of marginal prices, which signal the costs of using more or less of the product, with average pricing, which provides adequate financial resources for the service provider so that the overall provision of the service is of net economic benefit. The most common means of combining the merits of these approaches is non-linear pricing.

Non-linear tariffs

A linear tariff is a pricing structure based on a unit rate, so that the total cost to the consumer depends entirely on the quantity of the product consumed. Conversely, a non-linear tariff is one that contains a component that is not dependent on the level of consumption. Examples of non-linear tariffs include: fixed tariffs that do not vary with consumption, two part fixed/variable tariffs, and minimum bill requirements. Non-linear pricing is widely used in utility services, where the costs of providing the service are largely fixed in nature.

The two part tariff consists of a fixed component which recovers the fixed costs of the network, and a variable component designed to recover the variable costs that may be associated with transport services. The variable component should be closely linked to the marginal cost of providing the service.

The majority of costs incurred in providing a transportation service through a gas pipeline are fixed. These costs usually do not vary with the volume of gas that passes through the system. The capital costs and operating and maintenance costs of a particular pipeline designed to transport 100 units of gas per day are the same whether the pipe carries 100 units or 20 units.

The fixed component of a two part transportation tariff is usually referred to as a demand or capacity charge. This should be designed to recover fixed costs, that is, those costs that do not vary with the volume of gas transported. These tariffs compensate the infrastructure owner for the capital invested to provide the amount of capacity the customer has contracted. Thus, they should be payable irrespective of actual throughput. The capacity contracted should be based on peak daily demand as the most relevant measure of the capacity requirement.

For most gas pipelines, the variable costs are very low unless compression is required.

The adoption of the two part approach can lead to very large fixed charges. There can be practical problems with this pricing mechanism particularly where charges in the past were
largely volume based. Restructuring tariffs so they reflect fixed costs can lead to increased prices for many customers. Practical issues and customer impacts both suggest a more balanced mix of fixed and variable charges is preferable.

Pricing structures should reflect the extent to which customers use the distribution network. Generally speaking, customers should:

- pay for assets used to provide the service to them
- not pay for assets not used to provide the service to them
- make a fair contribution to the joint and common costs of the system.

Although customers should be expected to make a fair contribution to the cost of the system, there is some debate over what constitutes a fair contribution. Efficient prices can be said to exist anywhere between the incremental cost\(^{80}\) of providing a service and the stand alone cost\(^{81}\) of providing that service. That is, any price that does not result in losses to the service provider and does not exceed the cost at which the user can provide the service itself is efficient. Any price between this floor and ceiling could also be considered to be fair.

As long as users are covering the incremental cost of service, they are not being cross subsidised. Incremental costs set a minimum charge, but customers will usually pay in excess of incremental costs. The extent to which charges vary from incremental costs for each customer group is a matter of judgement.

**Contract tariffs**

The allocation of costs amongst zones reflects the assets used in each zone. The Tribunal considers this to be a reasonable approach. However, costs within zones are averaged across individual customers. There are only four or five customers in each zone, and in some cases the customers within zones are quite a distance apart. The zonal price results in all customers within each zone paying a proportion of all the assets in each zone, even if a particular customer does not use all the assets. This could expose GSN to bypass risk. A customer on the border of a zone could build its own pipe to the neighbouring zone, or bypass the GSN network to avoid paying the average cost of the assets used in its zone. Although the Tribunal is mindful of this risk, GSN has not indicated that it sees this circumstance eventuating.

As discussed in previously in this section, the cost of providing transport services through a gas network is dependent on the maximum amount of capacity a customer requires to transport gas. Even if a customer’s demand varies over time, the pipe which transports the gas must be sized to carry the maximum amount of gas required at any time. The network operator is unable to vary the capacity of a pipeline in the short term, so it appears widely accepted that charges should reflect the cost of the capacity required over a reasonable period of time. Therefore, a capacity based charge reflects the cost of capacity made available to the customer at his peak demand regardless of when the peak is reached may be appropriate.

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\(^{80}\) Incremental costs are the costs incurred in supplying only one particular customer, or group of customers. They are the costs that would not be incurred if a customer, or group of customers was not supplied.

\(^{81}\) Stand alone costs are those costs incurred by an efficient supplier to supply a customer or group of customers only. Normally, these are the costs a customer or group of customers would incur if they were to supply themselves.
Costs have been allocated based on MHQ. However, MDQ has been adopted as a charging parameter by GSN. MDQ estimates are more readily assessed by customers and the service provider, and are less prone to wide fluctuations.

The economic case in support of the proposed structure of charges may be stronger for small local systems such as Wagga Wagga. In these cases a more significant proportion of the assets serving a large customer may be largely dedicated to that customer or a small number of large customers. However, much of the merit of this approach lies in its acceptability, or apparent equity for customers. It is not clear that it provides efficient economic signals for shared assets.

This method of charging encourages users to manage their demand. If a customer can manage its load so that its peak is reduced, it will benefit from lower annual transportation charges. If a user continues to use the same volume of gas throughout the year, but is able to maintain a lower MDQ for the year, the cost per unit of gas transported is reduced. By encouraging this behaviour, the service provider can improve the utilisation of the network. This is consistent with the incentive mechanisms discussed in the Code.

The Tribunal proposes accepting this approach.

Although the Access Arrangement Information discusses the tariffs which will apply to existing contract customers, the Access Arrangement implies that all contract customers will have access to the tariffs presented in Appendix 3. Eastern Energy\(^2\) indicates in its submission that specific information on reference tariffs is required in order to set prices for customers. However, the provision of average tariffs does not allow this. It submits that:

> It is not clear how Reference Tariffs will vary with, for example, Customer’s specific location within the zone and with usage.

Eastern Energy would like to see a table or a formula that clarifies the tariff for each customer.

The Eastern Energy submission highlights the fact that the application of the reference tariffs has not been adequately defined in the Access Arrangement. The Tribunal prefers to see transparency in pricing mechanisms. The Tribunal understands that where a price is unique to an end user, the end user may not wish the price to be publicly disclosed. However, if tariffs for individual users are not publicly available, a customer or potential supplier should be able to have access to an indication of the applicable price. Presenting an average price path does not necessarily provide an indication of a particular customer’s tariff. The actual tariff applicable to individual customers may vary widely from the average. In fact, although the average price in each zone reduce over time, the price to one customer actually increases under the GSN proposal.

Indeed, the GSN proposal may disadvantage existing customers. If an existing customer has a tariff considerably above the average tariff, it will not have access to the average tariff until year five. The difference between the actual tariff and the average tariff could be considered to be an additional component paid by existing customers which does not reflect the cost of service. A new customer would not have to pay this additional cost.

The Tribunal prefers a price proposal that provides pricing transparency to all users of the system. Although the Tribunal does not object to zone tariffs for contract customers, the

Tribunal requires that the price in each zone be uniform for all customers in that zone from the first year.

The Tribunal is comfortable with a pricing approach that phases in the decreases to contract customers, particularly because it means any required increases to volume customers are also phased in.

**Volume tariffs**

The revenue to be collected from each tariff class of volume customers has been allocated on the basis of use of gas and capacity of meter. GSN has specified four classes of meter. One of the meter classes covers residential and small business customers. These customers comprise 90 percent of the 14,000 volume customers. The remaining three classes of meter capacity are likely to provide a reasonable allocation amongst the remaining volume customers. The Tribunal considers that the capacity of the meter is a good proxy for the relative average demand of volume customers.

The Tribunal notes that the pricing proposal for volume customers provides no incentives for volume customers to manage their loads to improve the utilisation of the network. These customers are allocated a meter capacity and they pay the same whether they require the full capacity of the meter or not. Although the majority of costs incurred by these customers are capacity based, GSN proposes collecting 50 percent of the revenue from these customers through volume based charges.

An issue for the Tribunal to settle is the appropriate split between fixed and volume charges for volume customers. An extension of this issue is how the structure of network transportation charges is reflected in the delivered price to volume customers. Increasing the proportion of revenue to be collected from capacity based charges may result in price changes for some customers, as currently the total delivered price is based on volume. The Tribunal is wary of the implications for the delivered price to these customers that a 100 percent fixed transportation charge imposes. Hence, the Tribunal supports the need for a balance between fixed and variable charges. It is prepared to accept the 50/50 split proposed by GSN. However, prior to making its final decision, the Tribunal would appreciate comments on this issue from interested parties.

This pricing method may discourage new suppliers of the tariff market as they will be unable to benefit from any diversity of load if each customer is charged based on meter capacity at delivery point. Suppliers to contract customers may benefit from diversity through utilising GSN’s trading policy.

The submission from BHPP indicates that it agrees with the method of pricing the low pressure and medium pressure segment of the network. BHPP believes that the concept of a combined low and medium pressure zone is appropriate for a network of limited geographic spread.

The Tribunal accepts the proposal to phase in any price variations over time.

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Price implications

When assessing a price proposal, the Tribunal considers the implications for end use customers. This consideration includes the analysis of prices incorporating the amendments required by the Tribunal, particularly in regard to target revenue.

The Tribunal has found the price increases required under the GSN proposal to be unacceptable. Although a reduction in target revenue results from the Tribunal’s required amendments, addressing this issue to some extent, the reduction is not sufficient to avoid price increases.

Although allocating costs based on the optimised replacement cost (ORC) of assets is an acceptable methodology, the Tribunal has considered allocating costs so that the benefits of the reduced asset value are allocated to those customers that would face large price increases under the ORC methodology. This can be achieved by writing down any assets used by the customers that are likely to face price increases. They should be written down by the difference between the GSN proposed asset value and the asset value considered appropriate by the Tribunal.

As a result of allocating costs using this methodology, prices to contract customers would be based on a 7.5 percent return on the DORC asset value. Prices to volume customers would be based on a return on an asset value supported by current revenue. This allocation is consistent with the ‘line in the sand’ asset valuation methodology discussed in chapter 5.

There may be economic benefits from focusing the benefits of the reduced sunk cost recovery for the network business on those customers who would otherwise face price increases. As discussed earlier, economics provides limited guidance on the initial valuation of network assets and the level of sunk cost recovery. However, substantial re-structures of tariffs can impose real economic adjustment costs as users respond to the new signals. Customers invested in assets on the basis of past prices and these assets may be uneconomic at the new prices. Focusing the write-down of existing assets on assets used by customers who would face increases may reduce these adjustment costs.

The Tribunal’s preferred approach is for the benefit of the reduction in asset value to be allocated to those customers that would otherwise face substantial increases in price. The remaining customers still receive substantial decreases. The Tribunal would like to receive further submissions on this issue, and suggests that GSN submit a proposal to the Tribunal indicating its preferred approach which should take account of the discussion on customer impacts. The Tribunal will then either accept or modify GSN’s proposal in its final decision.

Table 10.5 indicates movement in revenue from 1997/98 to 2002/2003 where the target revenue incorporates the Tribunal’s amendments, and the benefit of the reduction in asset value is allocated to the volume customers.
Reference tariffs and charges

Table 10.5  Network transportation revenue – with amendments

<table>
<thead>
<tr>
<th>Customer segment</th>
<th>1997/98 (nominal)</th>
<th>2002/03 (nominal)</th>
<th>Percent change per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Revenue ($)</td>
<td>1,632,000</td>
<td>606,437</td>
<td>-18.0</td>
</tr>
<tr>
<td>Volume Revenue ($)</td>
<td>3,491,000</td>
<td>4,538,000</td>
<td>5.4</td>
</tr>
</tbody>
</table>

Notes: Assumes an inflation rate of 2.5% per year. Includes revenue to be collected through metering service charges.

It is important to note that under this scenario, volume customers still face an average annual real increase in transportation prices of 0.8 percent per year, whilst contract customers face an average annual real decrease of 20 percent. Table 10.6 represents the average transport tariffs for contract and volume customers. The price for contract customers has been presented in terms of capacity and volume (assuming throughput constant at the 1997/98 level).

Table 10.6  Average transport tariffs – with amendments

<table>
<thead>
<tr>
<th>Customer segment</th>
<th>1997/98 (nominal)</th>
<th>2002/03 (nominal)</th>
<th>Percent change per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract customers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$/GJ MDQ</td>
<td>375.34</td>
<td>139.47</td>
<td>-18.0</td>
</tr>
<tr>
<td>$/GJ</td>
<td>1.98</td>
<td>0.73</td>
<td>-18.0</td>
</tr>
<tr>
<td>Volume customers ($/GJ)</td>
<td>5.38</td>
<td>6.34</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Note: Tariffs include revenue to be allocated to metering charges.

Figure 4.1 provides a graphic indication of the variation to revenue and transportation prices in the contract market over the period to 2002/03 where the benefit of the reduction in asset value is allocated to the volume market.
The Tribunal is currently undertaking a review of the delivered price of gas to volume customers in Wagga Wagga. A decision was made that the review should be run concurrently with the access review as transportation prices are an important component of the delivered price. The Tribunal’s draft decision on the review of delivered prices will not be finalised until the final decision on access prices has been issued. However, the Tribunal has considered the implications of this draft decision on transportation prices for the delivered price to volume customers. Table 10.7 provides an indication of the average delivered price to volume customers in Wagga Wagga. The price incorporates the average transportation prices presented in the above tables. As the delivered price review has yet to be completed, and a decision on the transportation prices is not final, the following table is only indicative.

**Table 10.7 Indicative average delivered price to volume customers (nominal)**

<table>
<thead>
<tr>
<th>Delivered price (volume)</th>
<th>1997/98</th>
<th>2002/03</th>
<th>Percent change per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$/GJ</td>
<td>$/GJ</td>
<td>Nominal</td>
</tr>
<tr>
<td>Large industrial customers</td>
<td>8.61</td>
<td>9.09</td>
<td>1.1</td>
</tr>
<tr>
<td>Industrial customers</td>
<td>8.85</td>
<td>9.28</td>
<td>1.0</td>
</tr>
<tr>
<td>Commercial customers</td>
<td>10.58</td>
<td>10.18</td>
<td>-0.8</td>
</tr>
<tr>
<td>Residential &amp; small business</td>
<td>10.23</td>
<td>11.75</td>
<td>2.8</td>
</tr>
<tr>
<td>Total volume customers</td>
<td>10.12</td>
<td>11.47</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Note: Assumes inflation rate is 2.5% per year.

**Amendment 9 – Reference tariffs**

For the GSN’s Access Arrangement to be approved, the price proposal must be revised, based on the amendments to target revenue and pricing required in this draft decision. Where zonal pricing is adopted for contract customers, the proposal should include a uniform price to be applied to all customers within a zone. The Tribunal will consider the proposal along with submissions from interested parties.
DISCUSSION BOX
‘Negotiate and Arbitrate’

Under the requirements of the National Competition Principles, the main objectives of an access regime are that users and end use customers have non-discriminatory access to transportation services at the reference tariff. In addition, the regime is intended to be a “negotiate and arbitrate” regime. Where negotiation fails, access will be determined by the arbitration model encompassed in the Code.

As long as reference tariffs are available to all users, the right to negotiate prices is an important component of an access regime. Like the right to bypass the network, the right to negotiate places an important constraint on the network service provider. Negotiation provides greater flexibility in setting prices to meet specific circumstances than is feasible under fully regulated prices.

Negotiation may be particularly appropriate where the user or end use customer has specific requirements, an ability to switch fuels, a financial constraint which without price decreases would otherwise result in reduced or ceased production, or a viable bypass opportunity. A user’s success in negotiating is likely to depend on the credibility of these circumstances.

Where a customer negotiates a price below the reference tariff, the service provider foregoes the difference in revenue between the reference tariff and the negotiated price for the remaining period of the Access Arrangement. The service provider’s revenue is also forgone where a user leaves the system or reduces demand. When assessing the Access Arrangement for the following period, the regulator will have to consider whether any discount to the reference tariff is reasonable. If negotiation does not take place, load or revenue could be lost if customers leave the network. The Tribunal will then consider whether this lost revenue should be recovered from other customers on the network. The possibility of lost revenue should encourage service providers to negotiate.

Bypass

The purpose of an access regime is to provide access to facilities that are not economical to duplicate. It is expected that the service provider may negotiate with the user or end user below the reference tariff to ensure that the user or end user continues to use the network rather than bypass the network.

If physical bypass occurs, at the next review, the Tribunal may consider the treatment of associated costs and/or lost revenue. Depending on its assessment of the circumstances, the Tribunal may wish to ensure that any reduction in revenue due to lost load, or costs of the bypassed pipeline, are not recovered from other users of the network. One option would be to deem that the lost load continues to flow and that the revenue continues be earned when setting prices for the following review period.

Bypass is allowed from any point on the network, or of the whole network.
10.4 Demand forecasts

10.4.1 Code requirements

The Code indicates that the intention of reference tariffs is that, to the extent possible, service providers are given a market based incentive to improve their efficiency and to promote efficient growth of the gas market.

Section 8.2 requires that the regulator be satisfied that any forecasts required in setting the reference tariffs represent best estimates arrived at on a reasonable basis.

10.4.2 GSN’s proposal

GSN has proposed that the tariff market grow by approximately 1 - 1.5 percent per year, and that there be no growth in the contract market.

10.4.3 Tribunal’s assessment

Growth assumptions are an important part of an access arrangement because the forecast demand is used to derive the reference tariffs taking into account the allowed target revenue. Because the costs of providing transportation services are largely fixed, the number of units over which those costs are recovered will affect the price for each service. A higher assumed growth results in lower prices. Conversely, a lower assumed growth results in higher prices.

During the period of an access arrangement, when the price has been determined based on a required revenue and then capped, the service provider bears the volume risk. Thus, if growth exceeds the forecast in the Access Arrangement, revenues will increase proportionately. As costs are largely fixed, profits will increase more than proportionately. The converse occurs if growth in demand falls short of forecasts.

Consequently, the service provider has strong incentives to:

- propose conservative growth assumptions for the period of the Access Arrangement
- grow the market during the period of the Access Arrangement.

Arriving at a forecast that provides an appropriate balance of risks and incentives for the service provider requires careful consideration of the history of growth patterns, current demand, and economic conditions.

Volume customers

Load and customer growth in the tariff market have averaged about 6 percent per annum over the past five years. However, in the past two years, growth has been closer to 3 percent. Information from the Wagga Wagga City Council has indicated that expected growth in residential gas use for the next few years is around 2 percent.

Very little information is available on the potential for growth in the industrial and commercial market.

Growth in the residential market can occur by increasing the volume of gas used by existing customers, enticing additional households to connect, or connecting new households.
Average gas usage by residential customers in Wagga Wagga is around 40 GJ per year. This is similar to the average usage in Canberra and Melbourne, and just over double the average usage in the rest of NSW.

Around 80 percent of the households in Wagga Wagga are currently connected to gas. This penetration rate is comparable with Victoria’s and exceeds the NSW average penetration rate by around 30 percentage points.

The Tribunal is of the view that the proposed growth by GSN is very conservative considering historic growth and the growth previously projected by Wagga Wagga City Council.

Figures from the ABS\textsuperscript{85} indicate that over the last 5 years, population has been growing at just under one percent per annum. This level of population growth appears to have supported a 3 percent annual growth in gas consumption. Projections of population over the next 5 years from the Department of Urban Affairs and Planning\textsuperscript{86} indicate that this growth rate is expected to continue. Therefore, assuming 2 percent growth in gas consumption over the period of the Access Arrangement appears to be reasonable.

An additional concern held by the Tribunal is that GSN’s estimates of growth for volume customers are not reflected in the price path. Prices have been determined by taking the revenue requirement and dividing it by the quantity. The quantities used to determine prices to volume customers have been held constant; these should be increased over time to reflect growth.

\textit{Contract customers}

GSN has assumed that there will be no growth in the contract market. Confidential information provided to the Tribunal by GSN provides support for this forecast. However, it appears that one of the customers assumed to be an industrial volume customer in the pricing model, should be treated as a contract customer for pricing and cost allocation purposes. This may affect the allocation of costs to the contract and volume customer segments and between customers within the contract customer zones.

If the volume of gas used by the contract market were increased, this would not necessarily be accompanied by an increase in capacity reservation. Under a capacity based charging structure, customers may act to improve their load profiles so that the actual MDQ reserved could fall, or where growth in volumes occurs, stay constant.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
\textbf{Amendment 10 – Demand forecasts} & \\
\hline
In order for GSN’s Access Arrangement to be approved, the Tribunal requires that GSN amend the Access Arrangement to incorporate 2 percent growth per annum for the volume customers (clause 3.5.2) and that this proposed growth rate be reflected in the reference tariffs. The volume customer identified to be using more than 10 TJ of gas per annum should also be regarded as a contract customer. & \\
\hline
\end{tabular}
\end{table}

\textsuperscript{85} ABS, \textit{Estimated Resident Population by Sex and Age in Statistical Local Areas}, NSW (Cat no 3209.1).

10.5 Overruns

10.5.1 GSN’s proposal

The Access Arrangement proposed by GSN includes a policy on overruns. An overrun occurs when the withdrawals by a user at a delivery point on any one day exceed the capacity entitlement of the user for that delivery point on that day. If it is not possible to determine whether a user has had an overrun due to a failure or unavailability of metering facilities, no overrun will be recorded.

GSN has amended the overrun policy contained in the Access Arrangement. The new policy is presented in Attachment 6.

Under the proposal, all overruns will incur a penalty:

- The first two overruns in a month will incur a penalty equal to five percent of the daily capacity charge for the reserved MDQ plus the overrun quantity.
- If a user overruns three or more times in a month, the user will pay the capacity charge for the reserved MDQ plus the overrun quantity for the days in the month when no overrun occurs, plus the overrun payments applicable on each day an overrun occurred.
- If a user overruns 10 times or more in any year, the capacity charge for the year will be based on the reserved MDQ plus overrun quantity rather than the reserved MDQ.

10.5.2 Tribunal’s assessment

The Tribunal is concerned about the application of the 5 percent penalty to a user’s total capacity used on a particular day for the first two overruns in the month. A user should not have to pay an additional 5 percent of the capacity charge on the total quantity. Under this policy the penalty paid by a large user that overruns by one unit will be much greater than the penalty paid by a small user that overruns by one unit.

The Tribunal is also concerned about the severity of overrun payments which depend on the estimated MDQ compared with the likely actual MDQ reserved by users. The Tribunal requires information confirming that the MDQ estimation of each customer used in the determination of prices is the historical maximum for each customer. If the MDQ assumed for each customer is (or is a reasonable estimate of), the historical maximum, the Tribunal is comfortable with the level of overrun charges. If the MDQ assumed for each customer in the price determination is something other than the historical maximum (or a good estimate of the historical maximum), the Tribunal may wish to raise further issues with regard to the level of charges.

Amendment 11 – Overrun charges

In order for GSN’s Access Arrangement to be approved, the Tribunal requires that an amendment be made to clause 6.3 so that the overrun penalty for the first two overruns in a month applies to the overrun quantity only. The Tribunal is conscious that this amendment may result in GSN’s proposing a larger penalty on the overrun units, and the Tribunal will consider this proposal if it is raised.

The Tribunal has requested further information on the methodology used to estimate the MDQ for each customer for the determination of prices. The approval of the overrun policy is subject to confirmation that the estimates of MDQ are reasonable.
11. NON-PRICING ISSUES

11.1 Service Policy

11.1.1 Code requirements

Section 3 of the Code states that an access arrangement must include a policy on the service or services to be offered and include a description of one or more services that the service provider will make available to users or prospective users. It should include one or more service that is likely to be sought by a significant part of the market; and any service or service which, in the regulator’s opinion, should be included.

To the extent practicable and reasonable, a user or prospective user must be able to obtain a service which includes only those elements that the user or prospective user wishes to be included in the Service. A separate tariff should be available for an element of the Service if this is requested by a user or prospective user.

11.1.2 GSN’s proposal

GSN’s proposal describes its network as a ‘contract carriage pipeline’. A contract carriage pipeline is defined in the Code as a system of managing third party access whereby normally:

- Users are required to enter into a contract that specifies a quantity of service.
- The service provider manages its ability to provide a service primarily by requiring users to use no more than the quantity of service specified in the contract.
- Charges for the use of a service are based, at least in part, upon the quantity of service specific in a contract.
- A user has the right to trade its right to obtain a service to another user.

GSN’s proposal sets out a description of the services offered and matters which impact on those services, including how a user or prospective user may obtain a service or an element of a service.

GSN’s proposal offers a transportation service and negotiated services. The transportation service includes:

- receiving natural gas at the receipt point
- transporting the natural gas from the receipt point through the network
- delivering the natural gas to the delivery point of the user
- installing, maintaining and repairing metering facilities
- reading the metering facilities and forwarding metering data to the user.
Clause 2.5 of the proposed Access Arrangement outlines the types of services a user or prospective user may obtain from GSN. These include:

a) a Transportation Service (a Reference Service)
b) a Negotiated Service
c) a combined Service
d) to the extent that it is practicable and reasonable for GSN, elements of a Negotiated Service or a combination of such elements.

Negotiated services are services other than, or in addition to, transportation services, or services under terms and conditions which differ from those under a transportation services agreement.

GSN has proposed that meter reading, and installing, maintaining and repairing metering facilities remain the responsibility of the service provider and be included in the transportation service. GSN has proposed that the cost of these services be rolled into the volume customers’ charges, but that a separate and specific charge apply to each contract customer delivery point. Although Appendix 6 of the Access Arrangement discusses these charges, GSN has not provided a schedule of these charges.

11.1.3 Public submissions

The submission received from BHPP\(^7\), indicates that services such as meter reading are not natural monopolies and should not be rolled into network pricing. Such a roll in would make the activity non-contestable, and a truly competitive meter reading market could never develop. Further, BHPP believes that the meter reading costs could be transferred to the retail arm of GSE. This would allow GSE Retail and new market entrants to be in a position to pursue the most efficient and cost effective means of reading meters. Meter reading can then be used to create a competitive retail advantage.

11.1.4 Tribunal’s assessment

The Tribunal accepts GSN’s proposal to operate the network as a ‘contract carriage pipeline’.

The Tribunal is of the view that there should be two classes of services within an access arrangement:

- reference services
- negotiated services.

GSN has not defined ‘combined service’ in the proposed Access Arrangement. In practice, negotiated Services may have some elements of a reference service and this is what GSN is attempting to define. If this is the case, the Tribunal sees no benefit in attempting to distinguish between a negotiated service and a combined service. Sub-clause (d) also appears to be a negotiated service and Tribunal is uncertain what distinguishes this service from sub-clause (c).

**Amendment 12 – Service policy**

In order for the GSN’s Access Arrangement to be approved, clauses 2.5(c) and (d) should be deleted.

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\(^7\) Submission from BHPP, May 12, 1998, p 6.
The Tribunal considers that metering may become contestable in the future. However, CoAG’s Gas Reform Implementation Group has not reached a definite position on this issue. It is appropriate at this time for metering services to continue to be considered part of the network’s responsibilities. However, metering charges should be clearly identified and unbundled from GSN’s transportation service.

Further, it appears that the costs associated with metering facilities for contract and volume customers have been bundled in with the costs of the transportation service to those customers. Therefore, in addition to requiring metering charges to be provided in a separate schedule, the Tribunal will require that the costs associated with metering services be removed from the costs of the transportation service.

 Amend 13 – Metering services
In order for GSN’s Access Arrangement to be approved, the charges for metering services should be presented separately in the Access Arrangement. The costs associated with metering services are to be excluded from the costs of the transportation service.

11.2 Conditions applicable to a queue

11.2.1 Code requirements

Section 3.12 of the Code requires a service provider to include in its access arrangement, a policy for determining the priority that a prospective user has to obtain access to spare capacity and developable capacity (and to seek dispute resolution under section 6).

Section 3.13 of the Code notes that a queuing policy must set out sufficient detail to enable users and prospective users to understand in advance how the queuing policy will operate.

Section 3.14 of the Code allows the Tribunal to require the queuing policy to deal with any other matter the Tribunal deems worthy of consideration, taking into account the matters listed in section 2.24 of the Code. Section 2.24 of the Code requires that the regulator must take into account the following matters when assessing a proposed access arrangement:

- a) the Service Provider’s legitimate business interests and investment in the Covered Pipeline;
- b) firm and binding contractual obligations of the Service Provider or other persons (or both) already using the Covered Pipeline;
- c) the operational and technical requirements necessary for the safe and reliable operation of the Covered Pipeline;
- d) the economically efficient operation of the Covered Pipeline;
- e) the public interest, including the public interest in having competition in markets (whether or not in Australia);
- f) the interests of Users and Prospective Users;
- g) any other matters that the Relevant Regulator considers are relevant.

Section 3.15 of the Code requires the service provider to comply with the Queuing Policy specified in the service provider’s Access Arrangement.
11.2.2 GSN’s proposal

GSN has proposed a queuing policy in clause 5. The policy allows capacity to be made available to prospective users in a predetermined manner where a queue exists for capacity. Prospective users will become part of a queue when the capacity they have sought in a request for service is not available. Once in the queue, a user will be advised of:

- the existence of the queue and the user’s position in the queue
- the consequences of not confirming the wish to proceed with the request for service
- the average capacity sought by other prospective users ahead of a particular prospective user in the queue
- the estimated cost of capacity
- an estimate of when capacity may become available
- the requirement that an investigation establish how the requested services can be provided, with the cost and timing of any such investigation.

The policy also includes the conditions applicable to a queue (clause 5.2.4), the priority of prospective users in obtaining services (clause 5.3), the procedure whereby capacity can be made available (clause 5.4), and discussion of compensation for holding capacity (clause 5.5).

Clause 5.3.4 allows GSN to seek confirmation of the request for service from a prospective user on a queue at any time. Clause 5.3.3 outlines the priority of users within queues.

Clause 5.4.3 of GSN’s proposed Access Arrangement allows a prospective user 20 business days from the date of an open offer to enter into a service agreement (which may be subject to GSN’s entering into a service agreement with other prospective users on a queue) or to notify an access dispute. Failure to act on either of these options will result in the loss of its position in a queue.

GSN’s Access Arrangement defines an open offer as an offer of access to the network made by GSN, which is not a conditional offer. A conditional offer is defined as an offer made by GSN for access to the network where a term of the offer is that the prospective user contribute to the upgrading or expansion of the network.

11.2.3 Tribunal’s assessment

The Tribunal considers the proposed queuing policy to be acceptable except for two clauses. The Tribunal believes that clause 5.3.4, which allows GSN to seek confirmation at any time, that a user wishes to continue with a request for service may be an unnecessary administrative burden on users. It would seem appropriate that some limit be placed on the frequency with which the service provider may request confirmation of this. When assessing the AGL Access Undertaking in 1997, the Tribunal considered a frequency of no more than once every three months to be appropriate.

The Tribunal believes that clause 5.3.3(a)(1) is ambiguous. With its current wording, the clause would allow a prospective user seeking a negotiated service to jump the queue by accepting an offer from GSN for a transportation service. The Tribunal does not believe that this is the intent of this clause.
As clause 5.4.3 is currently worded, a request for service may lapse if other prospective users do not agree to enter into service agreements at the same time. A user which accepts an open offer should not lose its place on the queue if other prospective users decline the offer and the capacity enhancement does not proceed.

**Amendment 14 – Queuing policy**

In order for GSN’s Access Arrangement to be approved, clause 5.2.4(c) should be amended so that GSN may seek confirmation from a prospective user that it wishes to continue with its request for service no more than once every 3 months.

Clause 5.3.3 (a) should be amended to follow the word “those” in the second sentence with “prospective users which hold a higher priority in the queue, but which are …”.

In addition, the words in the brackets in clause 5.4.3(a) “which may be subject to GSN’s entering into a service agreement with other prospective users on the queue” should be deleted.

### 11.3 Gas balancing

#### 11.3.1 Code requirements

The only reference to balancing in the Code is in Section 10.8 (Definitions) where a service provider may purchase or sell natural gas to enable it to provide balancing services in connection with a covered pipeline.

#### 11.3.2 GSN’s proposal

GSN proposes not to impose gas balancing obligations on users of the system. The Access Arrangement indicates that at any time the quantity of gas capable of storage in the network is negligible. Therefore, the network will be in balance on a daily basis.

GSN has reserved the right to revisit its approach to balancing if a new receipt point is proposed, or the operator of any pipeline to which the network is connected requires GSN to impose natural gas balancing procedures on users of the network.

#### 11.3.3 Tribunal’s assessment

EAPL, the transmission service provider, transports gas to the Wagga Wagga system receipt point. EAPL has indicated its desire to appoint GSN as the ‘shared facility operator’. As a shared facility operator, GSN requires users of the system to provide daily nominations to the network operator.

Although EAPL believes that the implied method for allocating gas quantities between contract customers and volume customers is an acceptable method, it indicates that it wishes to have the method clarified. The method of allocating the gas entering the GSN system at the Bomen receipt point to users is relevant to GSN for allocating unaccounted for gas to the contract and volume markets. Therefore, it may be appropriate to include this aspect in the Access Arrangement.

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In addition, in order to clarify the intention of Clause 7.2 (c) (3), EAPL\textsuperscript{89} believes the word "have" should be inserted after “does not have appropriate rights to ...”. The Tribunal agrees that this clarifies the intention of the clause.

The Tribunal considers that if EAPL and GSN co-operate to address balancing requirements, this should be adequate for the safe operation of the network.

**Amendment 15 – Gas balancing**

In order for GSN’s Access Arrangement to be approved, the Tribunal requires that a clause be added outlining the methodology for allocating gas at the Bomen Receipt point to contract and volume customers.

The Tribunal also requires that the word "have" be inserted after “does not have appropriate rights to” in Clause 7.2 (c) (3).

### 11.4 Unaccounted for gas

#### 11.4.1 GSN’s proposal

Unaccounted for gas (UAG) has not been included as a cost of the network business in GSN’s proposal. GSN proposes that users of the network will inject an additional 3.5 percent of their required quantity of gas to allow for UAG.

GSN has indicated that the majority of UAG is through leakage in the medium and low pressure pipes, and only a small amount from measurement error which could be allocated to the contract market. Therefore, they will require that users serving the contract market inject an additional 1 percent, and users serving the tariff market inject an additional 6.7 percent. If UAG is greater than the allowed UAG, then GSN will undertake to purchase any additional gas, and if the actual UAG is less than the allowed UAG, GSN will sell the gas to the retailers.

#### 11.4.2 Tribunal’s assessment

The submission from AGL\textsuperscript{90} indicates that if UAG was included as an operating cost, the service provider would have greater incentives to minimise the cost of UAG. In the final determination on the AGL Access Undertaking released in July 1997, the Tribunal agreed that including UAG costs in the service provider’s operating costs would provide adequate incentives for the service provider to reduce these costs.

However, the Tribunal is of the view that the incentives for the service provider to reduce losses would be similar to that under the AGL proposal if UAG is set at a benchmark level and the service provider is able to sell any surplus gas where actual losses are less than the benchmark, or required to purchase gas where actual losses are greater than the benchmark. In addition to providing sufficient incentives to the service provider to reduce losses, this method of addressing UAG allows users to benefit where their supply contracts are more favourable than the service provider’s supply provisions. This is likely to be the case if a user is negotiating with a supplier for a quantity of gas greater than the quantity required by the service provider. The Tribunal has accepted the methodology proposed by GSN.

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\textsuperscript{89} See submission from EAPL, May 13, 1998, p 2.

\textsuperscript{90} Submission from AGL, May 8 1998, p 4.
The submission from BHPP\(^{91}\) points out that the WWCC Annual Report states that UAG for 1995/96 was less than 3.5 percent. Further, BHPP asks why UAG does not decrease over time, considering the proposed level of capital expenditure on system rehabilitation. If the capital expenditure results in less UAG, it would seem inappropriate to allow the service provider to recover the capital expenditure that reduces UAG through network tariffs, and then benefit further from any reduction in UAG.

In light of the information available, the Tribunal proposes to use the Australian average for UAG for 1996\(^{92}\) of 2.5 percent. The Tribunal notes that the UAG estimate in the Albury Gas Company (AGC) proposed Access Arrangement is 1.8 percent.

The Tribunal is inclined to accept the allocation of UAG to contract and volume customers. Allocating the UAG allowed by the Tribunal amongst customers in the way GSN has proposed, results in users serving contract customers being required to inject an additional 0.7 percent of gas, and users serving the tariff market being required to inject an additional 4.8 percent.

**Amendment 16 – Unaccounted for gas**

The Tribunal requires that clause 7.3 (a) be amended to read: “The percentage for Unaccounted for Gas for the entire Network is estimated to be 2.5 percent.”

To adjust for the change in UAG and correct a cross referencing error, clause 7.3 (b) should be amended to read: “The allowance for Unaccounted for Gas detailed in section 7.2 will be 0.7 percent for delivery to Delivery Points of Contract Customers and 4.8 percent for delivery to Delivery Points of Volume Customers.”

### 11.5 Trading policy

#### 11.5.1 Code requirements

Section 3.9 of the Code indicates that the Access Arrangement for a Covered Pipeline must include a policy that explains the rights of a user to trade its right to obtain a service with another person (a Trading Policy). Generally, the Code requires the policy to include provisions for:

- capacity trades on exactly the same terms and conditions to which the gas was originally purchased (bare transfer)

- capacity trades on terms and conditions which differ from those on which the gas was originally purchased (other transfer).

#### 11.5.2 GSN’s proposal

Section 8 of GSN’s proposed Access Arrangement discusses trading policy. The proposal allows users to make a Bare Transfer of all or part of their MDQ without GSN’s consent, provided that, prior to utilising any MDQ so transferred or assigned, the transferee notifies GSN of:

- the users which made the transfer

- the amount of the MDQ which was transferred

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91 Submission from BHP Petroleum, May 12, p 6.
• the location of the Delivery Point which is the subject of the transfer.

A user is able to make a single zone transfer without GSN’s consent provided the transferor and the transferee notify GSN, as soon as it is practicable before the transfer or assignment takes place (and in any event not later than one business day prior to the date of the proposed trade), of:
• the user which proposes to make the transfer or assignment
• the amount of the Capacity Entitlement which is to be transferred or assigned
• the location of the Delivery Points from which the relevant amount of the Capacity entitlement is to be transferred or assigned
• the location of the Delivery Point to which the relevant amount of the Capacity Entitlement is to be transferred or assigned
• the dates and number of days to which the transfer or assignment is to relate.

A user may transfer or assign some or all of its capacity entitlement other than by a bare or single zone transfer. However, these transfers require GSN's consent. GSN may withhold its consent or make its consent subject to conditions only on reasonable commercial or technical grounds.

GSN has proposed that each trade be subject to an administration fee of $100, payable by both the seller and the buyer.

11.5.3 Tribunal’s assessment

The Tribunal considers the trading policy proposed by GSN to be reasonable. The proposal allows users to trade capacity with other users to the same delivery point or to another delivery point within the same pricing zone as long as GSN is notified. Other trades, for example, between pricing zones, will be allowed with the permission of GSN, subject to the availability of capacity and revenue neutrality.

The Tribunal considers that an administration payment for each trade from both the buyer and the seller would exceed the costs of administering capacity trades. When assessing the Access Undertaking of AGL Gas Networks Ltd in 1997, the Tribunal considered $100 to be an adequate charge to cover the administration cost of a trade.

Amendment 17 – Charge for trades
In order for GSN’s Access Arrangement to be approved it should be amended so that the proposed administration fee of $100 payable by both the buyer and the seller where a capacity trade takes place should be payable by the seller only.

11.6 Extensions and expansions policy

11.6.1 Code requirements

Section 1.40 of the Code states that an extension to, or expansion of the capacity of, a covered pipeline shall be treated as part of the covered pipeline for all purposes under the Code if it is consistent with the Extensions/Expansions Policy contained in the Access Arrangement.
11.6.2 GSN’s proposal

GSN’s proposed extension and expansion policy is presented in section 10 of the Access Arrangement. Any extension within 1 km of the existing network will automatically be covered under the Access Arrangement and, where any extension greater than 1 km occurs and GSN notifies the regulator, this extension will also be covered under the Access Arrangement.

GSN proposes that any expansion of capacity will be treated as part of the Network and be subject to the Access Arrangement.

In addition, GSN proposes that where a user is not connected to the Network and its property is within 50 metres of a part of the network which is an appropriate size to supply the customer, then GSN will, free of charge, construct a pipeline to the customer’s property and construct a service with a maximum length of 10 metres within the customer’s property.

Where such a customer is more than 50 metres from an appropriately sized pipe, GSN may agree to connect the customer if the customer agrees to pay a surcharge that does not exceed the capital cost of constructing the pipeline to supply the customer.

11.6.3 Tribunal’s assessment

The Tribunal is satisfied with the proposal for extensions or expansions under the Access Arrangement. However, the Tribunal notes that although these extensions/expansions will be covered, capital expenditure on the extension/expansion will not automatically be rolled in to the asset base at the next review.
12. OTHER ISSUES

12.1 Introduction

This section of the draft decision outlines a range of other issues which the Tribunal believes necessitate amendments to the Access Arrangement in order to:

- meet the Code requirements and/or
- remove ambiguity from the Access Arrangement and/or
- remove clauses that are not required by the Code and are considered by the Tribunal to be inappropriate.

The more significant amendments are listed first. Minor amendments are grouped together in the Miscellaneous Amendments section.

Generally the amendments proposed in this section are not issues raised in public submissions.

12.2 Pre-conditions to the provision of services

12.2.1 GSN’s proposal

Clause 2.6.1 requires in part that users and prospective users demonstrate that they are entitled to gas supply. GSN believes that it has a legal liability to check whether a user has a right to natural gas before transporting it. GSN claims that this clause is necessary as a precaution against any legal liability it might have to the gas producers or other suppliers (especially if the user becomes insolvent).

12.2.2 Tribunal’s assessment

The Tribunal is concerned that GSN is imposing obligations on users to demonstrate that they have the right to take delivery of the gas that are unnecessary. Generally, a user’s relationship with its gas supplier should not be GSN’s concern. There is no precedent in other Access Arrangements submitted in this or other jurisdictions for this type of requirement.

The Tribunal knows of no general legal principles which could hold GSN liable to a gas supplier, as there is no direct contractual relationships between GSN and the supplier. The Tribunal has asked GSN to provide a legal opinion supporting its position, but this has not been forthcoming.

In the absence of any convincing legal explanation from GSN, the Tribunal believes that GSN is not required to ascertain whether a prospective user has a right to receive natural gas.

**Amendment 18 - Pre-conditions to the provision of services**

In order for the GSN’s Access Arrangement to be approved, clause 2.6.1(a) and also the sentence immediately after clause 2.6.1 (b) requiring users and prospective users to provide details of their gas supply arrangements should be deleted.
12.3 Bonds

12.3.1 Code requirements

There are no Code requirements for the provision of bonds. However, to become an Authorised Supplier in NSW, an applicant must satisfy, among other things, prudential requirements.

Section 9(2) of the Gas Supply Act 1996 states:

An application may be refused on any of the following grounds:

(a) that the proposed holder of the authorisation fails to satisfy such technical or prudential criteria as have been adopted by the Minister to determine whether a person is able to operate a viable business as an authorised reticulator or authorised supplier, as the case may be.

12.3.2 GSN’s proposal

Clause 2.6.3 of the proposed Access Arrangement specifies that before a prospective user receives a Transportation Service, the prospective user may need to provide a bond to GSN as security.

12.3.3 Tribunal’s assessment

Although no objections to the application of bonds have been raised by prospective users, the Tribunal is of the view that bonds should not be necessary due to the prudential requirements in the supplier authorisation process. In response, GSN has argued that the Minister’s prudential criteria have not been developed and, without this security, GSN requires indemnity against financial loss.

The Tribunal believes that, in respect of authorised suppliers, prudential criteria within the authorisation process should be developed rather than bonds being imposed in the Access Arrangement. The Tribunal will encourage the Department of Energy to prepare prudential criteria as soon as possible for the Minister’s consideration.

In AGL’s Access Undertaking, no bonds are required. AGL has signalled that it may wish to satisfy itself of a prospective user’s creditworthiness. To that end, AGL may seek information from the Credit Reference Association of Australia, and/or obtain trade references, and/or bank opinions. The prospective user is required to provide AGL with such authorisations to obtain such information, references or opinions, as AGL reasonably requires. It should be noted that the Tribunal has no objection to the procedures adopted by AGL also being used by GSN.

Amendment 19 - Bonds
In order for the GSN’s Access Arrangement to be approved, clause 2.6.3 should be deleted

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83 Eastern Energy (submission 8 May, 1998 p 2) accepts the application of a bond as long as it is subject to a reasonableness test.
12.4 Agreements

12.4.1 GSN’s proposal

Clause 2.6.4 of the proposed Access Arrangement requires connection agreements to be made between users and end use customers before GSN will provide Transportation Services. It also requires that the parties agree to comply with clause 4.1 of the Access Arrangement.

12.4.2 Tribunal’s assessment

There are no precedents for this type of clause in any access arrangement submitted in this or other jurisdictions. The Tribunal believes that GSN does not require this information in order to operate the network effectively. The Tribunal is of the view that this requirement is unnecessary to the contractual arrangements between users and the end use customers. The requirement to comply with clause 4.4.1 of the Access Arrangement is also not supported.

Amendment 20 - Agreements
In order for the GSN’s Access Arrangement to be approved, clause 2.6.4 should be deleted.

12.5 Automatic changes to reference tariffs

12.5.1 Code requirements

In circumstances where reference tariffs or reference services are changed, the Code requires public consultation (including the preparation of an Access Arrangement Information document). It is the Tribunal’s view that, the Code does not prevent it from approving automatic changes to reference tariffs (if considered appropriate) as part of the public process now being conducted to review GSN’s proposed Access Arrangement.

12.5.2 GSN’s proposal

GSN is seeking the Tribunal’s prior approval for automatic changes to reference tariffs in the following circumstances: (see clause 3.7 of the Access Arrangement)

- allowing Reference Tariffs to be indexed to CPI
- following any increase in the reticulator’s authorisation fee paid by the network
- following any increase in the level of any or any new government or statutory fee or tax
- to take account of any costs, charges or imposts approved by the Relevant Regulator as amounts that may be recovered as part of the reference tariffs
- as a result of any additional costs for metering, meter reading, billing and settlement which may arise from the establishment of third party access for tariff customers.

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94 However, information may be required by GSN if a queue exists for capacity required to supply an end use customer and more than one user is competing to supply the same end use customer.
95 See section 12.7 of this report.
96 For example, see section 2.33 of the Code.
12.5.3 Tribunal’s assessment

Having carefully considered the matters listed in the proposed clause, the Tribunal is of the view that they are not appropriate and should be deleted from the Access Arrangement for the following reasons:

**Reference Prices to be indexed to CPI**

Following the draft decision on reference tariffs (see section 5.3 Rolling forward of the capital base) this clause is no longer relevant.

**Any increase in the reticulator’s authorisation fee paid by the network**

GSN is currently paying a $100 authorisation fee. The Tribunal notes that there is a possibility that during the course of GSN’s Access Arrangement, the Department of Energy may increase this fee to more accurately reflect the cost of regulation. The precise amount and timing of any increase has not been determined by the Department of Energy.

The Tribunal is of the opinion that a change to an authorisation fee should not have a major impact on the revenue stream of GSN. The Tribunal therefore does not support the inclusion of an automatic revision clause for this purpose.

**Any increase in the level of any or any new government or statutory fee or tax**

The Tribunal believes that the only possible new government or statutory fee or tax (currently identified) that may have a potential impact on reference tariffs is a goods and services tax (GST). It may well be that a GST would simply be added on top of the reference prices. Other taxes which impact on GSN may change as part of the overall package. An example is sales tax. GSN currently pays sales tax equivalents to the NSW Treasury. If sales taxes are eliminated, Reference Tariffs may need to be adjusted accordingly.

The Tribunal would prefer that if new government charges, fees or taxes are to be introduced, the matter be reviewed closer to the time of introduction of these charges pursuant to section 2.28 of the Code. In this regard, the Tribunal proposes that a trigger mechanism be introduced that would enable reference tariffs to be reviewed if, in the opinion of the Tribunal, there has been a change in taxation policy with impacts on Reference Tariffs.\(^{97}\)

**Any costs, charges or imposts approved by the relevant regulator as amounts that may be recovered as part of the reference tariffs**

The Tribunal may only assess reference tariffs at the time of a review of an Access Arrangement. Accordingly, this clause is not necessary and its inclusion is not supported by the Tribunal.

**As a result of any additional costs for metering, meter reading, billing and settlement which may arise from the establishment of third party access for tariff customers**

No major impacts to costs have been currently identified. This clause appears to be one sided, in favour of the service provider. The Tribunal is of the view that the extension of competition to tariff customers may require a number of changes to the Access

\(^{97}\) See section 12.10 of this report.
Arrangement. For example, new procedures and policies will need to be placed in the Access Arrangement to ensure effective access to these customers. The Tribunal also notes that GSN has the ability to seek a variation in reference tariffs/Access Arrangement as outlined in section 2.28 of the Code. The Tribunal believes that a trigger mechanism should be incorporated in the Access Arrangement to deal with this issue.

**Amendment 21 – Automatic changes to reference tariffs**
In order for the GSN’s Access Arrangement to be approved, clause 3.7 should be deleted.

### 12.6 Retail contestability

#### 12.6.1 Code requirements

GSN’s proposed clauses have the potential to change Reference Prices between reviews. In normal circumstances, the Code would require an Access Arrangement Information to be prepared and full public consultation to take place.

#### 12.6.2 GSN’s proposal

In clause 3.9, GSN seeks to reserve the right to vary reference tariffs if additional costs are incurred as the result of retail contestability for tariff customers.

#### 12.6.3 Tribunal’s assessment

The Tribunal is of the opinion that there may be a need to review the Access Arrangement once retail contestability is introduced for tariff market customers. This may not necessarily revolve around changes to costs, but could result from the need to include new procedures and policies in the Access Arrangement and licensing arrangements to ensure effective competition in this part of the market. For example, the development of allocation algorithms where time of use meters are not economical, and the development of gas apportionment and settlement procedures, are matters that may need to be included in a revised Access Arrangement.

The Tribunal does not support the right for GSN to simply increase its reference tariffs if additional costs are incurred as a result of retail contestability. Instead, the Tribunal requires the inclusion of a new trigger mechanism to be included in the Access Arrangement.

**Amendment 22 – Retail Contestability**
In order for the GSN’s Access Arrangement to be approved, clause 3.9 should be deleted.

### 12.7 Form of agreement with user’s customers

#### 12.7.1 GSN’s proposal

Clause 4.4.1 of the proposed Access Arrangement requires all users to have customer connection agreements that:

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98 See section 12.6 of the report.
99 See section 12.10 of the report.
100 See section 2.28 of the Code.
101 See section 12.10 of the report.
• terminate when the user’s Service Agreement with GSN terminates
• novate, in favour of GSN, the customer’s obligation to pay for the delivered gas.

GSN wants to reduce the financial risks involved in transporting gas to a customer via an insolvent user.

12.7.2 Tribunal’s assessment

There are no precedents for this type of provision in this or other jurisdictions. GSN has no direct contractual obligation to transport gas to an end use customer if its retailer defaults. In the normal course of GSN’s business, its only obligation is to the users. The Tribunal believes that this matter should be dealt with by developing ‘supplier of last resort’ provisions either at a state or national level (see next section of this report).

Amendment 23 – Form of agreement with user’s customers

In order for the GSN’s Access Arrangement to be approved, clause 4.4.1 should be deleted.

12.8 Supplier of last resort

12.8.1 GSN’s proposal

Within the proposed Access Arrangement, GSN has included a number of clauses dealing with the supplier of last resort. These include clause 4.4.3, Election by user’s customers, and Clause 4.4.4, Posted supply price. GSN indicates that this provision is necessary to ensure continuity of supply to end use customers. GSN has also an overall objective to continue to receive payment for any transportation service provided.

GSN believes that the affiliated retailer is in the best position to be the supplier of last resort and that other suppliers would place little value on this right.

12.8.2 Tribunal’s assessment

The Tribunal notes that other Access Arrangements previously submitted to it or other jurisdictional regulators have not included supplier of last resort provisions. Further, no national or state policy in this area has been developed. However, the Tribunal understands that the Gas Reform Implementation Group (GRIG) of CoAG is currently examining retail contestability issues including the need for supplier of last resort provisions.

The Tribunal acknowledges that any interruption of gas supply may be costly and may have serious consequences for end use customers. The Tribunal believes that there is merit in developing either a state or national policy for supplier of last resort. In this regard, the Tribunal will encourage the Department of Energy and GRIG to establish suitable procedures as soon as possible.

The Tribunal is of the opinion that the inclusion of supplier of last resort provisions within GSN’s Access Arrangement which favour the associated supplier may be premature and may hinder the development of a suitable state or national policy on this issue. For this reason, the Tribunal does not support the inclusion of these clauses within the Access Arrangement. But this issue would need to be considered further by the Tribunal in the lead up to retail contestability (see section 12.10 below).
12.9 Arrangement with approved supplier

12.9.1 GSN’s proposal

Clause 4.4.5 states that any supply and transportation arrangement between a customer and an approved supplier will be subject to the approved supplier having the right under its Transportation Services Agreement to have gas delivered to the Delivery Point(s) which services the customer. An approved supplier is defined in the glossary of the Access Arrangement as “a user holding an appropriate consent under clause 2.6.2 which is a party to a Transportation Services Agreement”.

12.9.2 Tribunal’s assessment

The Tribunal notes that there is no contractual arrangement between the network and a user’s end use customers, especially in relation to supply arrangements. The Tribunal questions the need and/or desirability for the Access Arrangement to enforce matters that should be dealt contractually between users and their end use customers. The Tribunal also believes that the term, “Approved Supplier”, should be deleted from the Access Arrangement. Suppliers are authorised by the Department of Energy. They do not need to be ‘approved’ by GSN.

Amendment 25 – Arrangements with approved supplier

In order for the GSN’s Access Arrangement to be approved, clause 4.4.5 should be deleted. All references to “Approved Supplier” within the Access Arrangement should also be removed.

12.10 Review of Access Arrangement (trigger mechanisms)

12.10.1 Code requirements

Once an Access Arrangement has been approved, and before the scheduled revision submission date, a service provider may, at any time, seek revisions to the Access Arrangement. The Regulator does not have a corresponding power, but may nominate trigger mechanisms within the Access Arrangement that can be used to start a review. These triggers may be specific major events or involve mechanisms such as revenue caps.

Where an Access Arrangement is for a period of more than five years, the Relevant Regulator must not approve the access arrangement without considering whether mechanisms should be included to address the risk of forecasting error.

The Code does not prevent a service provider nominating trigger mechanisms within its Access Arrangement.

In summary, the Code envisages trigger mechanisms which fulfil the following roles:

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See section 2.28 of the Code.

See section 3.17(b) (ii) and section 3.18 of the Code.

See section 3.18 of the Code.
• counter balance (to some degree) the service provider’s ability to seek revisions at any time
• nominate specific major events that may impact on the Access Arrangement and hence the need for a revision
• provide mechanisms that would enable consideration of revisions to the Access Arrangement due to forecasting errors.

12.10.2 GSN’s proposal

GSN proposes a revision submission date of 31 January 2002. It also proposes various trigger mechanisms that may result in an early revision of the Access Arrangement (see section 12 of the proposed Access Arrangement). The events which would act as triggers are as follows:

• prior to the connection of any facilities to the network, other than at the Receipt Point, for the injection of gas into the network
• if the operator of any pipeline which is connected to the network requires the network to impose natural gas balancing procedures on users of the network
• if GSN’s associated retailer is required to make take or pay (TOP) payments
• if ownership of the Network (or part thereof) changes
• if the Code ceases to apply.

12.10.3 Tribunal’s assessment

The Tribunal’s assessment of each of the trigger mechanisms proposed by GSN is as follows:

Prior to the connection to the network of any facilities, other than at the Receipt Point, for the injection of gas into the network

The Tribunal notes that in these circumstances new balancing arrangements would be necessary which would require a number of amendments to the Access Arrangement. The Tribunal does not object to the retention of this clause.

If the operator of any pipeline which is connected to the network requires the network to impose natural gas balancing procedures on users of the network

The Tribunal has no objection to this provision. It is similar to the previous clause.

If GSN’s associated retailer is required to make TOP payments

The Tribunal has taken into account Great Southern Energy’s contractual obligations in respect to TOP. The Tribunal notes that Great Southern Energy acquired the gas utility with full knowledge of the TOP contract. The Tribunal believes that Great Southern Energy’s gas retailer should develop commercial/contractual solutions to resolve any potential problems with TOP. Any transfer of risk to users of GSN’s network in these circumstances is considered inappropriate. As a consequence, the Tribunal cannot support the inclusion of this clause.
If ownership of the network changes (or part thereof)

The Tribunal concludes that a change of ownership should generally have no bearing on the operation of the Access Arrangement. Notwithstanding, the Tribunal notes that at any time, the service provider may seek revisions to the Access Arrangement. For these reasons, the Tribunal does not support the inclusion of this clause.

If the Code ceases to apply

In all likelihood, if the Code ceases to apply, the requirement for an Access Arrangement approved by the regulator may also disappear. On this basis, the Tribunal is of the view that this clause is not necessary.

In addition to the clauses proposed by GSN, the Tribunal believes that trigger mechanisms should be added in case of either of the following events:

- state or national policies in relation to retail contestability are developed which in the Tribunal’s opinion require changes to the Access Arrangement.
- a change in the taxation regime which affects Reference Tariffs

Retail contestability

From 1 July 1999, all gas users in NSW will be eligible for third party access. Before this can happen, there are a number of issues to be resolved including:

- the development of meter reading solutions including the possible use of allocation algorithms where it is not economical to install time of use meters
- the examination of ownership of meters and responsibility for meter reading services
- the development of supplier of last resort provisions
- the development of apportionment and settlement procedures
- the development of contractual arrangements with residential customers and procedures for switching suppliers.

The Gas Implementation Group of the Council of Australian Governments is currently examining these issues. Its aim is to develop, where appropriate, a consistent, national approach to retail contestability. The Department of Energy has indicated to the Tribunal that it is hopeful that the required procedures (at least at a State level) will be in place by 1 July 1999. Once these procedures have been adopted, the Tribunal believes that it will be necessary to amend the Access Arrangements to take these issues into account and ensure effective contestability for gas users.

Taxation regime impacting Reference Prices

In section 12.5 of this report the Tribunal outlines the possible impact that a GST may have on References Prices. The Tribunal indicates that a GST might also impact on other taxes including state sales tax. The Tribunal proposes that a trigger mechanism be introduced to cover an event of a change in taxation policy impacting References Tariffs.
Amendment 26 – Trigger mechanisms
In order for the GSN’s Access Arrangement to be approved, clauses 12(d) to 12(f) should be deleted. In addition, the Tribunal requires GSN to include new trigger mechanisms as follows:

- within a period of one month after the development of state or national policy for the introduction of retail contestability to the tariff market, GSN is required to submit revisions consistent with that policy
- if, in the opinion of the Tribunal, there has been a change in taxation policy that has a major impact on reference tariffs (as determined by the Tribunal), GSN is required to submit revisions addressing the change in taxation within a period of one month after advice by the Tribunal.

12.11 Miscellaneous amendments

12.11.1 Period of transportation services agreement

Code requirements

There is no specific Code requirement referring to the period of Transport Service Agreements. However, the Tribunal believes that the Code implies that reference services should be clearly specified. For example, a service is referred to in the Glossary of the Code as:

\[
\text{... a Service which is specified in an Access Arrangement and in respect of which a Reference Tariff has been specified in that Access Arrangement.}
\]

GSN’s proposal

Clause 2.3.3 of the Access Arrangement indicates that a contract for a reference service must be for a minimum period of one year. The clause does not state a maximum period for a reference service contract. GSN is of the opinion that no maximum limit is required since this allows greater flexibility for customers. GSN believes that, in practice, a natural maximum contract period will be set in accordance with the length of the Access Arrangement (ie approximately five years because reference tariffs beyond this time would not be known).

Another matter that applies to the definition of reference services is the provision of extension options to contracts. In discussions with the Tribunal, GSN has indicated that an option to extend the contract will not form part of a reference service. GSN believe that a contract that has an option to extend has a greater value as compared to contract that has no option. Any decision on this matter will need to take into account the length of the relevant reference service contract (as discussed in clause 2.3.3 of the Access Arrangement).

Tribunal’s assessment

The Tribunal is of the view that a reference service should be clearly defined in the Access Arrangement. A defined contract period should be set. This issue would assume greater importance if an access dispute arose. The arbitrator must apply the reference tariff for a reference service\textsuperscript{105}. If a reference service is not clearly defined, this would present difficulties and possibly limit the use of arbitration.

\textsuperscript{105} See section 6.13 of the Code.
The Tribunal is of the view that setting a defined contract period would not restrict the flexibility of users or prospective users. If required, negotiated contracts for longer periods should be available.

The Tribunal notes that the existing Access Undertaking of AGL Gas Networks Limited provides for a one or two year reference service at the election of the user.

In discussions with GSN, the Tribunal has discovered that option to extend a contract will not form part of a reference service. The Tribunal believes that the Access Arrangement should clearly indicate this situation if this is indeed GSN’s intention.

**Amendment 27 – Period of Transportation Services Agreement**

In order for the GSN’s Access Arrangement to be approved, clause 2.3.3 should be amended so that a more clearly defined contract period for reference services is provided. The Tribunal believes that in this case, a one or two year contract would be appropriate. The Tribunal also requires the Access Arrangement to be amended to indicate GSN’s proposal that options to extend a contract do not form part of a reference service.

**12.11.2 Negotiated service**

*GSN's proposal*

Clause 2.4(b) of the proposed Access Arrangement sets out some examples of negotiated services that may be contracted. GSN believes that stating examples of negotiated services helps users to define the differences between those services and reference services.

*Tribunal’s assessment*

The Tribunal has no objection to the inclusion of examples of negotiated services, provided a statement is included, clarifying the fact that these examples do not limit the range of negotiated services that may be sought.

**Amendment 28 – Negotiated service**

In order for the GSN’s Access Arrangement to be approved, clause 2.4(b) should be amended so that the first sentence includes words to the effect of: “may include but are not limited to:”

**12.11.3 User default**

*GSN's proposal*

Clause 4.4.2 deals with notifications to users and their end use customers if a user is in default to the GSN.

*Tribunal’s assessment*

The Tribunal generally has no objection to this clause, but believes that it should also specify the time when notice of default is given.

**Amendment 29 – User default**

In order for the GSN’s Access Arrangement to be approved, clause 4.4.2(a) should be amended to specify a time period for notification of default.
12.11.4 Compensation for holding capacity

GSN’s proposal

In the Access Arrangement it is normally assumed that where capacity is available, a service agreement will be executed within 20 business days from the date of a request for service. Clause 5.5 of the proposed Access Arrangement entitles GSN to charge compensation if the prospective user requests that the service commence after 20 business days.

Tribunal’s assessment

To remove any ambiguity, this clause should specify the actual amount of compensation to be paid. The Tribunal believes that the compensation should not exceed the Reference Price that would normally apply if the service was being used. The clause should also stipulate that no compensation will accrue or be payable in the first 20 business days after an offer has been made.

Amendment 30 – Compensation for holding capacity

In order for the GSN’s Access Arrangement to be approved, clause 5.5 should be amended to specify that the amount of compensation shall be no greater than the reference tariff. The clause should also stipulate that no compensation will accrue or be payable in the first 20 business days after an offer has been made.

12.11.5 Notification regime

GSN’s proposal

Clause 11.1 sets out GSN’s load shedding policy in the event of a gas supply failure within the network (or part thereof). It lists procedures to be adopted for ranking and priority of disconnection and reconnection, and the notification of customers.

Tribunal’s assessment

The Tribunal is of the view that this clause should also state the arrangement for load shedding that would exist in circumstances where a third party distribution system/pipe is connected to GSN’s network. If there is an agreement on load shedding between GSN and the operator of the third party system, the user will be subject to that agreement, otherwise the user will be subject to Load Shedding Priority 2 as set out in Appendix 5 of the Access Arrangement. A similar provision has been included in AGL’s Access Undertaking.

Amendment 31 – Notification regime

In order for the GSN’s Access Arrangement to be approved, clause 11.1 should be amended to provide for the curtailment of end use customers served off an interconnecting network or pipeline. If there is an agreement on load shedding between GSN and the operator of the connected third party system, the user will be subject to that agreement, otherwise the user will be subject to Load Shedding Priority 2 as set out in Appendix 5 of the Access Arrangement.
12.11.6 Revisions Submission Date and Revisions Commencement Date

**Code requirements**

Section 3.17 of the Code requires that:

An Access Arrangement must include:

(a) a date upon which the Service Provider must submit revisions to the Access Arrangement (a Revisions Submission Date).

(b) a date upon which the next revisions to the Access Arrangement are intended to commence (a Revisions Commencement Date).

**GSN’s proposal**

GSN has nominated a number of possible Revisions Submission Dates based on various possible events (see clause 12 of the proposed Access Arrangement). GSN indicates that it will nominate a date upon which each revision would commence\(^\text{106}\) (being not more than 120 days after the Revisions Submission Date). Most of these proposals are discussed in section 12.10 on trigger mechanisms.

It appears that if no trigger mechanisms are activated, GSN is seeking an Access Arrangement Period which concludes no later than 31 May 2003 (a Revisions Submission Date of 31 January 2003 plus 120 days).

**Tribunal’s assessment**

The Tribunal is of the opinion that GSN needs to be more definitive in nominating the Revisions Commencement Date for this Access Arrangement. The Tribunal is of the view that 1 July 2003 would be appropriate.

The Tribunal believes that 120 days is insufficient for consideration of any major revisions due to the detailed analysis required and the public processes outlined in the Code. The period inferred by the Code for consideration of major revisions to an Access Arrangement is up to six months\(^\text{107}\). The Tribunal believes that even six months may be insufficient, based on the experience of the Tribunal and other regulators\(^\text{108}\). The Tribunal therefore proposes that the Revisions Submission Date should be nine months before the Revisions Commencement Date (ie 1 October 2002).

**Amendment 32 – Revisions Submission Date and Revisions Commencement Date**

In order for the GSN’s Access Arrangement to be approved, a Revisions Submission Date of 1 October 2002 and a Revision Commencement Date of 1 July 2003 are required.

12.11.7 Information concerning existing users & information about the network

**GSN’s proposal**

Clauses 13.1.1 and 13.1.2 relate to procedures for the release of information by GSN. Clause 13.1.1 requires the consumer’s written consent before the release of certain information by GSN. There is no definition of consumer in the Access Arrangement. It is necessary to clarify...
that any reference to a consumer is a reference to a customer\textsuperscript{109}. Eastern Energy\textsuperscript{110} has suggested that the information on load and usage pattern should be available to any third party provided that the necessary consent has been obtained form the customer as per section 13.1.1 (b) of the Access Arrangement.

Eastern Energy\textsuperscript{111} considers that a response to the request for information in section 13.1.1 (c) should be made within five working days, as 25 days would be an impediment to third parties in carrying out tariff analysis.

\textit{Tribunal's assessment}

These clauses are generally in accordance with the Code. However, the Tribunal has two concerns:

- fees payable have not been clearly specified
- prospective users have been too narrowly defined in the glossary of the Access Arrangement, resulting in unnecessary restrictions on the release of information.

In relation to this last point, 'prospective user' is defined in the Access Arrangement as any person who has submitted a request for service (and in respect of that request for service includes any user who submits a request for service). \textit{Potential} users who are examining the market, but have not submitted a request for service, will not fit in this category. This is a serious restriction which should be remedied.

The Tribunal notes that 'prospective users' are more broadly defined in the Code.

'Prospective User' means a person who seeks or who is reasonably likely to seek to enter into a contract for a Service and includes a User who seeks or may seek to enter into a contract for an additional service. (emphasis added).

The simplest way of resolving this issue is for the definition of 'prospective user' in the Access Arrangement to be amended to mirror what is in the Code.

\textbf{Amendment 33 – Information concerning the network and existing users}

In order for the GSN’s Access Arrangement to be approved, clause 13.1.1 and 13.1.2 should be amended to either specify the fees applicable or refer to the relevant clause in the Access Arrangement where the fees are listed. Additionally, the definition of ‘prospective user’ in the glossary should be amended to mirror the Code and the term ‘consumer’ should be changed to ‘customer’, as identified in the glossary.

\textbf{12.11.8 Appendix 2 Transportation Services Agreement}

\textit{GSN's proposal}

The second dot point of section 1 (Services) indicates that delivery points must satisfy certain requirements (to be notified to the user by Great Southern Networks).

Section 7 (Measurement of Gas) indicates that equipment must meet certain standards.

\textsuperscript{111} Submission May 8, 1998, p 3.
Section 11(f)(Termination) refers to the trading of gas. The last dot point in section 11 proposes that if a user is in default to the network, there is an automatic novation to GSN of a user’s rights in respect of its end use customers.

Section 13 deals with liabilities and indemnities. GSN has advised that this section is not consistent with ACCC’s legal opinion on product liability. GSN has indicated that ACCC’s legal advice has not been accepted by others and still has not been tested. The Tribunal believes that this clause would not negate any person’s rights under the Trades Practices Act. At this time, the Tribunal has not sought amendment of this clause but any comments on this matter would be appreciated.

Section 14 deals with dispute resolution.

Tribunal’s assessment

The Access Arrangement should specify all terms and conditions of access. Accordingly, sections 1 and 7 of Appendix 2 will need to be amended.

A service provider is not allowed to carry on a Related Business\textsuperscript{112} (which includes the trading of gas) unless this is for the safe and reliable operation of a pipeline or for balancing services. Accordingly, section 11 will need to be amended to remove reference to GSN’s trading gas.

The last dot point in section 11, dealing with automatic novation, should be deleted in light of the Tribunal’s views on supplier of last resort\textsuperscript{113}.

Following discussions with GSN, it has been ascertained that the dispute resolution process outlined in section 14 is meant to deal with non access related disputes (ie contractual disputes). GSN has also advised that the determination of the expert would be binding (there is a typo in the last dot point of section 14). The Tribunal has no objection to the inclusion of this section, subject to its being made clear that this section is for non access related disputes.

Amendment 34 – Appendix 2 Transportation Services Agreement

In order for the GSN’s Access Arrangement to be approved, Appendix 2, should be amended as follows:

- Sections 1 and 7 should be amended to specify the requirements and standards (respectively) that are necessary.
- Section 11(f) should remove any reference to the trading of gas.
- The last dot point in section 11 dealing with automatic novation should be deleted.
- Section 14 should be amended to make it clear that the procedures outlined are intended for non access related disputes. The typo in the last dot point should be removed so that it is clear that an expert determination is binding, which the Tribunal understands is GSN’s intent.

The Tribunal is seeking comments on section 13 which does not meet ACCC’s product liability policy. The Tribunal will decide whether an amendment is needed to this section in light of the comments received.

\textsuperscript{112} See section 4.1(b) of the Code.
\textsuperscript{113} See section 12.8 of this report.
12.11.9 Gas specifications

GSN lists its natural gas specifications in Appendix 7 of the proposed Access Arrangement. In respect of gas specifications, the Tribunal has only two concerns. These are to ensure that:

- the specifications are not too narrowly defined, resulting in an artificial barrier to future competition
- the specifications will ensure the safe and reliable operation of the pipeline.

The Tribunal is not a technical regulator and will primarily rely on assurances from the service provider and any responses from the gas industry regarding the specification.

Safety issues in relation to the gas specification (particularly the Wobbe Index and the CO₂ content) have been raised by AGL. In light of this submission, the Tribunal has sought an assurance from GSN that the gas specifications are appropriate for safe and reliable operation of the pipeline. GSN has advised the Tribunal that the gas specifications are in accordance with its gas supply contract with AGL. GSN has initiated discussions with AGL to resolve the issue of specifications.

In a letter dated 30 June 1998 AGL has indicated that, following discussions with GSN, it has proposed that GSN’s gas specifications change to satisfy AGL’s and the South Australian producers’ Letter of Agreement and the Gas Transmission Agreement (with EAPL).

No submission or comments have been received which suggest that current specifications would represent an artificial barrier to competition. However, this issue may need to be re-examined if the specifications are changed. This is of particular interest, due to the recent commissioning of the Wodonga to Wagga Wagga pipeline, which raises the possibility of Gippsland Basin gas being supplied to GSN’s network in the future.

Accordingly, the Tribunal needs to be satisfied regarding the appropriateness of GSN’s gas specification before it can make a final decision on the Access Arrangement. A written assurance from GSN will be required stating that the gas specification is appropriate to ensure safe and reliable operation and will not act as an artificial barrier to future competition.

### GLOSSARY AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACCC</td>
<td>Australian Competition and Consumer Commission.</td>
</tr>
<tr>
<td>Access Arrangement</td>
<td>The document by which a distributor undertakes to provide access to its system by system users, per the Gas Pipeline Access Law and the <em>Gas Pipelines Access (New South Wales) Act 1998</em></td>
</tr>
<tr>
<td>AGL</td>
<td>Unless otherwise stated, refers to AGL Gas Networks Limited.</td>
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<tr>
<td>Bare transfer</td>
<td>A transfer or assignment of any interest in any person’s right to obtain a service in which the contract between the service provider and the transferor or assignor remains in effect.</td>
</tr>
<tr>
<td>BHPP</td>
<td>BHP Petroleum Pty Ltd.</td>
</tr>
<tr>
<td>Bypass</td>
<td>Construction of a pipeline to avoid the distribution system or part thereof.</td>
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<tr>
<td>CAPM</td>
<td>Capital asset pricing model, a financial model that relates the required return of an asset to the risks associated with that asset.</td>
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<tr>
<td>City Gate</td>
<td>Transition point from high pressure transmission pipelines to distribution network.</td>
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<tr>
<td>CoAG</td>
<td>Council of Australian Governments.</td>
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<tr>
<td>Contract customers</td>
<td>End use gas customer consuming more than 10 TJ per annum.</td>
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<td>CPA</td>
<td>Competition Principles Agreement.</td>
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<td>CPI</td>
<td>Consumer Price Index.</td>
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<tr>
<td>DAC</td>
<td>Depreciated actual cost.</td>
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<tr>
<td>Distribution</td>
<td>Transport of gas over a combination of high pressure and low pressure pipelines from a city gate to various customers’ usage points. Also known as reticulation.</td>
</tr>
<tr>
<td>DORC</td>
<td>Depreciated optimised replacement cost, an asset valuation approach that reflects both the age of the assets and the required size of the assets.</td>
</tr>
<tr>
<td>EAPL</td>
<td>East Australian Pipelines Limited.</td>
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<tr>
<td>EBIT</td>
<td>Earnings before interest and tax.</td>
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<td>EPD</td>
<td>Energy Projects Division, the Victorian Treasury.</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>FDC</td>
<td>Fully distributed costs.</td>
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<tr>
<td>GHD</td>
<td>Gutteridge, Haskins and Davey Limited.</td>
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<tr>
<td>GJ</td>
<td>Gigajoule, a measure of the heat content of gas (an average residential customer in NSW consumes approximately 20 GJ of gas per year).</td>
</tr>
<tr>
<td>GSN</td>
<td>Great Southern Energy Gas Networks Pty Limited.</td>
</tr>
<tr>
<td>GTC</td>
<td>Gas Transmission Corporation of Victoria.</td>
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<tr>
<td>GTE</td>
<td>Government trading enterprise.</td>
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<tr>
<td>IPART</td>
<td>Independent Pricing and Regulatory Tribunal of NSW, otherwise referred to as the Tribunal.</td>
</tr>
<tr>
<td>Load factor</td>
<td>A measure of the degree to which a customer’s load can cause peak demands on the system, measured as the relationship between the customer’s average daily demand and its peak day demand.</td>
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<tr>
<td>LPG</td>
<td>Liquefied petroleum gas.</td>
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<tr>
<td>MDQ</td>
<td>Maximum daily quantity.</td>
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<tr>
<td>MHQ</td>
<td>Maximum hourly quantity.</td>
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<tr>
<td>NCC</td>
<td>National Competition Council.</td>
</tr>
<tr>
<td>NRV</td>
<td>Net realisable value.</td>
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<tr>
<td>ODV</td>
<td>Optimised deprival value.</td>
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<tr>
<td>OFFER</td>
<td>Office of Electricity Regulation - the UK electricity industry regulator.</td>
</tr>
<tr>
<td>OFGAS</td>
<td>Office of Gas Supply - the UK gas industry regulator.</td>
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<tr>
<td>OFWAT</td>
<td>Office of Water Services - the UK water industry regulator.</td>
</tr>
<tr>
<td>ORG</td>
<td>Office of Regulator General, Victoria.</td>
</tr>
<tr>
<td>PJ</td>
<td>Petajoule, equal to 1,000,000 GJ.</td>
</tr>
<tr>
<td>Prospective user</td>
<td>Prospective user means a person who seeks or who is reasonably likely to seek to enter into a contract for a service and includes a user who seeks or may seek to enter into a contract for an additional service.</td>
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<tr>
<td>Glossary and abbreviations</td>
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<tr>
<td><strong>Retail</strong></td>
<td>Selling gas as a commodity, independent of transportation service.</td>
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<tr>
<td><strong>Reticulation</strong></td>
<td>See distribution.</td>
</tr>
<tr>
<td><strong>Ringfence</strong></td>
<td>Clear separation of subsidiaries or divisions of a company that may be viewed as having competitive advantages in their dealings with each other.</td>
</tr>
<tr>
<td><strong>Service provider</strong></td>
<td>Service provider has the meaning given in the Gas Pipeline Access Law. This means, in relation to a pipeline or proposed pipeline, the person who is, or is to be, the owner or operator of the whole or any part of the pipeline or proposed pipeline.</td>
</tr>
<tr>
<td><strong>Substituted transfer</strong></td>
<td>A transfer or assignment of any interest in any person’s right to obtain a service in which the contract between the service provider and the transferor or assignor either does not remain in effect or remains in effect with changed terms.</td>
</tr>
<tr>
<td><strong>Tariff gas user</strong></td>
<td>An end use gas customer consuming less than 10 TJ per annum.</td>
</tr>
<tr>
<td><strong>TJ</strong></td>
<td>Terajoule, equal to 1,000 GJ.</td>
</tr>
<tr>
<td><strong>TOP</strong></td>
<td>Take-or-pay.</td>
</tr>
<tr>
<td><strong>Transmission</strong></td>
<td>Long haul transportation of gas via high pressure pipelines.</td>
</tr>
<tr>
<td><strong>Trunk mains</strong></td>
<td>High pressure pipelines within the distribution network used to transport large quantities of gas to sections of the network downstream from the city gate.</td>
</tr>
<tr>
<td><strong>User</strong></td>
<td>User means a person who has a current contract for a service or an entitlement to a service as a result of an arbitration.</td>
</tr>
<tr>
<td><strong>Volume tariffs</strong></td>
<td>Transportation charges to a user supplying tariff gas users.</td>
</tr>
<tr>
<td><strong>WACC</strong></td>
<td>Weighted average cost of capital.</td>
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<tr>
<td><strong>WDV</strong></td>
<td>Written down value.</td>
</tr>
<tr>
<td><strong>WWCC</strong></td>
<td>Wagga Wagga City Council.</td>
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</table>
ATTACHMENT 1    PUBLIC HEARING AND CONSULTATION

Presenters at public hearing, Thursday 21 May 1998, Wagga Wagga Leagues Club

Great Southern Energy Networks  Mr Peter Hoogland, Manager - Regulatory Affairs
Eastern Energy Ltd          Mr Brendan O’Meally, Gas Purchasing Manager
BHP Petroleum Pty Ltd       Mr Colin Martin, Marketing Manager

A copy of the transcript is available from the Tribunal’s office at Level 2, 44 Market Street, Sydney.

Organisations which participated in the Information Session held on 13 July 1998

The Tribunal held an information session in Wagga Wagga on 13 July 1998. The session began with a brief introduction by the Tribunal Secretariat, followed by a presentation by Great Southern Energy Networks on its proposed Access Arrangement. A question and discussion session followed.

Organisation                  Represented by
Riverina Woolcombing          Bruce Hamilton
Southern Country Foods         Ray Peltier
Charles Sturt University      Kevyn Smith
Wagga Base Hospital           Steve Butt
RAAF, Kapooka                 Craig Saunders, Harold Milham
Ausply                       David Linley
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<tr>
<th>Organisation</th>
<th>Name</th>
<th>Date of submission</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGL</td>
<td>Mr Bruce Connery</td>
<td>8 May 1998</td>
</tr>
<tr>
<td>AGL</td>
<td>Mr Bruce Connery</td>
<td>15 May 1998</td>
</tr>
<tr>
<td>BHP Petroleum Pty Ltd</td>
<td>Mr Bill Henson</td>
<td>13 May 1998</td>
</tr>
<tr>
<td>BTR Asia Pacific</td>
<td>Mr Peter W Dobney</td>
<td>20 April 1998</td>
</tr>
<tr>
<td>East Australian Pipeline Marketing Pty Ltd</td>
<td>Mr B D Rochford</td>
<td>13 May 1998</td>
</tr>
<tr>
<td>Eastern Energy Ltd</td>
<td>Mr Craig Culley</td>
<td>8 May 1998</td>
</tr>
</tbody>
</table>
ATTACHMENT 3 RATE OF RETURN

The following provides a summary of the Tribunal’s analysis and consideration of the rate of return, particularly the application of the capital asset pricing model (CAPM) and the calculation of the weighted average cost of capital (WACC). A discussion of a range of estimation for the weighted average cost of capital follows.

A3.1 Relationship between rate of return, asset values and regulated revenue

The minimum efficient cost of service is the sum of:

- the capital cost of the efficient set of assets required to provide the service and
- the efficient cost of operating and maintaining those assets.

As gas networks are capital intensive business, the majority of costs are capital costs: the return of and return on capital. Hence, considerable attention is given to capital costs.

Given that the assets provide service over a number of years, the total capital cost must be apportioned over the asset’s life and included in the annual cost of service (or ‘target revenue’). This can be expressed as follows:

Annual cost of service
= annual capital cost + annual O&M cost
= [(Rate of return x regulatory capital base) + annual depreciation] + annual O&M cost

GSN proposes using a rate of return based on its WACC under the CAPM.

A3.2 Application of CAPM and WACC

The CAPM approach is a commonly accepted methodology for determining the cost of equity. CAPM derives the cost of equity as the sum of the risk free return plus a risk premium. It is based on the portfolio theory of finance which divides risks into two categories:

- systematic risk - risk applicable to the market as a whole, such as inflation, tax rises, interest rates
- specific risk - residual risk unique to the entity or to a small group of companies that forms a subset of the market.

The basis of CAPM is the relationship between risk and return. Although there has been considerable debate on the strength of the risk/return relationship, evidence indicates there is a strong linear and positive relationship over the very long term. Under CAPM, there is no compensation for specific risks which can be eliminated through diversification. The relationship is expressed as follows:
\[ R_e = R_f + \beta (R_m - R_f) \]

where
- \( R_e \) = return on equity, being the return after corporate tax, but before personal tax
- \( R_f \) = risk free rate of return
- \( R_m - R_f \) = market premium
- \( \beta \) = beta, i.e. the relative volatility of the specific stock to the market, a measure of systematic risk

The required return for equity and debt are weighted in proportion to the relative amount of equity and debt used in the financing mix.

The formula used to calculate the pre tax weighted average cost of capital (WACC) is as follows:

**Pre tax WACC**

\[ \text{Pre tax WACC} = \{R_e/[1 - t(1 - \gamma)]\} \times S/V + R_d \times D/V \]

where
- \( R_e \) = required rate of return on equity after company tax
- \( R_d \) = pre tax weighted average cost of debt
- \( t \) = effective corporate tax rate
- \( \gamma \) = value of franking credits or imputation factor
- \( S \) = market value of equity
- \( D \) = market value of debt
- \( V \) = market value of debt plus equity

Described by Officer (1994), this formula is widely accepted and applied throughout the financial markets as a means of estimating the weighted average cost of debt and equity capital for a firm or project.

The cost of capital can be expressed in nominal terms, or in real terms (i.e. the return over and above inflation). The difference between nominal and real rate of return should reflect expectations about future inflation. A measure of inflation expectations can be derived from the difference between the interest rates on indexed and non-indexed bonds.

Although the basic concept is simple, estimating difficulties are varied and complex, particularly the estimation of expected return on equity. There continues to be some debate amongst academics and practitioners in relation to the following issues:

- whether the risk free rate should be based on some form of ‘average rate’ or an ‘on-the-day’ rate
- the ‘re-levering’ of asset betas to derive equity betas used in the CAPM and the applicability of overseas benchmarks in the estimation of asset and equity betas for Australian firms
- the treatment of the effects of the dividend imputation taxation system in the WACC and CAPM formulae
- the treatment of taxation
- the transformation from a nominal post tax return to a real pre tax WACC.
A3.3 Risk free rate

Within the CAPM framework, the risk free rate of return should be assessed on a forward looking basis and should reflect returns which investors currently can obtain in the market. Current rates are normally used for assessing investments. This means that historical information on returns obtainable in the past is irrelevant. The term structure of interest rates should accord with the economic assumptions and principles on which beta are based.

In theory, the ‘on-the-day’ rate should be used in the CAPM model. The most commonly used proxy is the 10 year Australian Commonwealth bonds yield because of its market depth. These give a better picture of the true market rate than the less liquid bonds such as 15 or 20 year bonds.

Conceptually, since the market risk premium applied in the CAPM reflects a margin over the contemporaneous 10 year bond rate, it would seem most reasonable to take the current 10 year government bond rate as the risk free rate. This ensures consistency between the estimation of the market risk premium and its application.

Another reason to use the contemporaneous 10 year bond rate is that it incorporate views current within the market on future economic trends. In using a rate of return as input under incentive regulation, the regulator is seeking to benchmark reasonable expectations for future profit levels. It is a forward looking concept which should reflect current expectations for future trends for inflation and other variables. Hence it is inappropriate to base the return on interest rates estimated over an extended period in the past. Past interest rates reflect expectations in prior periods. Some of the expected events may or may not have already occurred and expectations about other factors may have changed.

The movement in the bond rates is shown below:
In the past year, the average 10 year commonwealth bond rate has fallen from 6.56 percent in August 1997 to 5.53 percent in July 1998. The average for this period is around 5.91 percent. The rate then moved up at the end of August but fell in September.

The Tribunal notes some market comment in response to the ACCC/ORG draft decisions that the bond rate appears to have reached the bottom and may be on the way up. Volatility is expected in the short term, due to the influence of the world equity market, the Australian dollar, and the Asian financial crisis. The Tribunal considers it is inappropriate for it, as the utility regulator, to attempt to forecast future long term interest rates.

The controversy surrounding the use of some form of ‘average bond rate’ rather than a single current rate is well reflected in the comments made by Dr Makholm at the public forum on the WACC for the Victorian Gas Access Arrangements:

If interest rates are rising then you can ensure that the petitioner utility (in the US) will want to use the last day, and if interest rates are falling you can count on those same people as advocating the use of an average…. The only jurisdictions that make a business of not listening to that nonsense are those who take it as a position to use either a single day or, for instance, the New York State Public Service Commission will use the last 20 days. They have used a 20 day average for years.¹

Whilst it is theoretically correct to use the ‘on-the-day’ rate under CAPM, the Tribunal acknowledges a practical difficulty in that the use of on-the-day rates introduces a degree of

short term variability. Therefore, the Tribunal considers it appropriate to adopt an average over a relatively short period to smooth daily variations. It also understands that the benchmark of a 20 day average has a degree of acceptance in financial markets.

This draft decision was made at a Tribunal meeting on 3 September 1998. The 20 day average for the 10 year Commonwealth bond rate at that time, that is, between 7 August to 3 September 1998 is 5.67 percent.\(^2\)

On the basis of the differential between the 10 year bond rate and the corresponding index bond, inflation is expected to be around 2.1-2.5 percent. This compares with the underlying inflation forecast of 2.5 percent by the Government and economic commentators. Assuming inflation of 2.1-2.5 percent, the real risk free rate is around 3-3.5 percent.

### A3.4 Treatment of taxation

Another key issue is the treatment of tax, that is, whether tax should be treated as a separate cashflow item, or incorporated in the CAPM/WACC formula. In arriving at 11.1 percent real pre tax WACC, GSN has assumed a statutory tax rate of 36 percent.

In a report on this issue, Macquarie Risk Advisory Services concludes that the effective tax rate (rather than the statutory rate of 36 percent) should be used in the ‘grossing up process’. Its tax analysis suggests that an effective rate of 15-25 percent should be used.\(^3\)

The argument for using an effective tax rate arises due to the gap between tax expense and tax payable. This gap is due to timing differences in tax treatment as compared to accounting treatment of such items such as depreciation and research and development eg accelerated depreciation for tax deductions. In theory, timing differences will be ironed out over time. This can be observed with long range forecasting. However, in the case of industries with long life assets, timing differences may extend over many years.

Rather than deciding on a pre tax WACC, one alternative is to include tax as an expense (ie cost to the utility) in the cost of service model. The question is then whether tax should be treated in the cashflow or incorporated in the CAPM/WACC formula.

If tax is allowed as a separate cost, the regulator will have to decide on a post tax return and the level of tax in the cost of service model. The statutory rate or the effective rate can be applied across the board, or the allowed tax can be assessed using a case-by-case approach.

A single uniform tax rate may not adequately reflect the circumstances that exist across the regulated companies, which may be seen as ‘unreal’. Alternatively, the regulator may undertake a case-by-case assessment of a utility’s tax forecast. However, this approach involves investigating the tax position of a regulated utility. This is likely to vary, depending on the company structure etc. The resulting variation in the allowed tax may be viewed as unequal treatment by the regulated utilities. It may result in unwarranted price changes caused by variations in cashflow to meet tax payments.

Currently, all but one of the utilities regulated by the Tribunal are government owned trading enterprises (GTEs). The exception is AGL Networks. Income tax is not payable to

\(^2\) Source: Reserve Bank of Australia.

\(^3\) Macquarie Risk Advisory Services Ltd, *The Appropriate Level of Taxation to Apply for Gas Distribution Businesses in Conjunction with the CAPM Model in the Determination of Regulated Use of System Charges*, 19 May 1998.
the Australian Taxation Office but is calculated under the NSW tax equivalent regime. Up until recently, the NSW Treasury adopted a financial distribution policy based on pre tax profits. However, its current policy is now negotiated and set on a post tax basis. The NSW GTEs are required to adopt tax effect accounting and tax planning. It appears that GTEs are in the early years of the tax equivalent regime. If fully applied, the depreciation deduction for tax purposes is likely to be greater than accounting depreciation. As a result, the effective tax rate is likely to be less than 36 percent.

There is no simple relationship between pre tax cash flows and the conventional post tax measure of the cost of capital. Adoption of a post tax approach requires the general tax position of the industry as a whole to be assessed and/or the specific tax position of individual utilities. Over the life of the pipelines system, utilities generally move from a low to a full tax paying position. This may increase price volatility. The Tribunal believes that it is for utilities to manage their own tax affairs. However, The Tribunal acknowledges the approach adopted by ACCC/ORG in using the effective tax rate, which passes some of the tax benefits on to end-users.

The Tribunal is at an early stage of investigating the treatment of taxation across all its regulated utilities. It is understood that tax effect accounting is widely adopted by these GTEs. However, the effective tax rate appears to vary among these utilities, depending on their approach to tax planning. The Tribunal notes comments by industry that tax benefits are an incentive for investing in infrastructure industries.

In view of these and other problems, the Tribunal has decided to use a real pre tax WACC for calculating return on capital for this Access Arrangement. In establishing a feasible range of WACC, the Tribunal has used a tax rate of 25-36 percent for converting the post tax return to a pre tax return. The Tribunal will review the taxation issue at the next review, by which time, more evidence will have become available.

A3.5 Transformation to a real pre tax WACC

One of the issues to be considered in determining a real pre tax WACC is the conversion method from a nominal post tax return on equity (under the CAPM model) to a real pre tax WACC. It appears ‘market practice’ (as used by GSN and in most submissions to ACCC/ORG) is to calculate the conversion by:

(a) ‘grossing up’ a nominal post tax WACC to a nominal pre tax WACC by applying an estimated tax rate, and
(b) de-escalating to a real pre tax WACC using an estimated inflation range.

However, there are suggestions that this conversion sequence would result in an actual return that is higher than expected.6

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4 NSW Treasury’s dividend policy is now set on post tax profit. In the past, dividends payable were calculated as 70 percent of the operating profit before income tax and capital contributions.
5 The effective tax rate compares the tax expense to accounting profit. The prima facie tax rate for companies is 36 percent. Due to various timing and permanent differences of tax deductions, the actual expense for tax charged against profit is rarely equal to 36 percent. Major differences can arise from the investment allowance, tax losses etc.
6 Analyses by Macquarie Risk Advisory Services and Professor K Davis.
A report prepared for ORG by Macquarie Risk Advisory Services suggests that the nominal post tax WACC be converted to a real post tax WACC and then ‘grossed up’ to a real pre tax WACC. This reverses the conversion sequence commonly adopted.

Professor K Davis suggests that:

- The practice so far adopted (ie ‘market practice’) is valid where tax depreciation is based on historical cost and for a ‘one period’ asset life. Otherwise, the real pre tax WACC will be over-estimated.
- The reversed order suggested by Macquarie Risk Advisory Services is valid only for a multi-period model where tax is a simple fixed proportion of cashflows.

Davis also suggests a formula for conversion depending on asset life. An alternative would be to apply pre tax real interest rates in the CAPM model. The risk free rate would be ascertained by reference to the long term bond rate and an inflation indexed bond.

In their submissions to ACCC/ORG, the utilities/equity investors/owners of gas pipelines claim that the market expectation of the cost of capital is in the range of 7.5-9.5 percent (pre tax real) based on so-called ‘market practice’. If alternative conversion methods are applied, the market/investors/utilities ‘expected’ reasonable range falls to around 6.6-8.1 percent. As for GSN, the proposed real pre tax cost of capital would be 9.2 percent (rather than 11.1 percent) if the conversion sequence is reversed.

Ideally, agreement should be reached on the methodological principles and procedures to be applied in the conversion. At this relatively early stage, a pragmatic approach is to consider a wider range of WACC estimates incorporating both approaches.

**A3.6 Cost of capital - a feasible range**

The Tribunal has considered the application of CAPM in the light of the latest information and comments by stakeholders. In addition to issues of the risk free rate (A3.3), the use of effective vs statutory tax rate (A3.4), and the conversion difficulty (A3.5), the Tribunal has considered the following parameters within CAPM:

**Market risk premium**

The market risk premium is the difference between the expected return on the equity market portfolio and the risk free return. It can be calculated either on the basis of an arithmetic or a geometric average of premiums in previous years. The two approaches yield different values, with the arithmetic mean exceeding the geometric mean.

The estimate of risk premium will vary according to the period over which it is calculated. The following table shows a range of estimates of the risk premium:

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8 For example, submission by NSW Treasury. AMP proposes that 8 percent be the minimum of the acceptable range.
Table A3.1 Estimates of market risk premium

<table>
<thead>
<tr>
<th>Method</th>
<th>Period</th>
<th>Risk Premium %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Including October 1986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arithmetic average</td>
<td>1964-1995</td>
<td>6.2</td>
</tr>
<tr>
<td>Geometric average</td>
<td>1964-1995</td>
<td>4.1</td>
</tr>
<tr>
<td>Excluding October 1986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arithmetic average</td>
<td>1964-1995</td>
<td>8.1</td>
</tr>
<tr>
<td>Geometric average</td>
<td>1964-1995</td>
<td>6.6</td>
</tr>
</tbody>
</table>

Source: Study by the Centre for Research in Finance at the Graduate School of Management.

The above research data suggests that the market risk premium for gas utilities is within the range of 6-8 percent (using arithmetic average). Utility companies have argued that the upper range of the market risk premium should be applied.

Some finance practitioners have suggested that the equity risk premium has reduced in recent years due to the effects of dividend imputation. A further issue is whether the market risk premium should be expressed as an absolute number, margin or relative to interest rate which has declined with lower inflation.

The UK regulator OFFER applied a range for the equity risk premium (3.5-4.5 percent) in 1996 when it reviewed the price control for the electricity transmission company – the National Grid Company in 1996. This was estimated by deducting the real index-link gilts (3.5-3.8 percent) at the time of the price determination from the real average dividend yield (7-8 percent). The risk premium therefore represents a snapshot of the condition of the market at that time.

In a recent article, Dr Tim Jenkinson of Oxford University argues that on the basis of historical evidence of equity and bond returns, an equity risk premium of 3.5 percent can be derived. This is towards the lower end of the range employed by the Monopolies and Mergers Commission (MMC) and the UK utility regulators. Although there are differences in the capital markets in the UK and Australia, there are similarities in the regulatory framework using incentive based regulation.

In establishing a plausible range for return on equity, the Tribunal has adopted a equity market premium in the range of 5.5-7.0 percent.

**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 the stock, ie the risk that cannot be eliminated in a well balanced and diversified portfolio. Past pricing data is used to calculate a historical beta.

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In addition to systematic risk, a beta calculated from historical data reflects the financial risk attaching to a company. Changes in the economic and regulatory environment and changes in the financial and operating structure of the entity may mean that historical beta needs to be adjusted.

Where a company is listed, conventional practice is to use other companies or sector averages as proxies. However, there are very few direct Australian reference stocks (except for AGL and Boral). It is noted that AGL has businesses other than gas distribution. Beta estimates based on AGL incorporates risks which are different from those faced by GSN. Estimation of beta therefore requires a subjective adjustment to account for differences between the reference stocks and the stock in question. Overseas proxies (eg in the UK and US) can be used, but it is argued that adjustments are necessary because of differences in the market and country risks.

To ensure consistency between the capital structure and equity beta, the beta of the reference stock needs to be adjusted from a geared beta to an asset beta, using the formula:

$$\beta_a = \beta_e / \{ 1 + \left[ (1 - t) \times D/E \right] \}$$

where

- $\beta_a$ = asset beta
- $\beta_e$ = equity beta
- $D/E$ = gearing

Under an imputation system, the asset beta is relevered to produce an estimated equity beta for a given level of financial leverage by using the following formula:

$$\beta_e = \beta_a \times \left[ 1 + (1 - T_e(1-\gamma)) \times D/E \right] + \beta_d \times D/V$$

Where $\gamma$ is the value of imputation credits, $T_e$ is the tax rate and $\beta_d$ is the debt beta.

In its March consultation paper, the Tribunal Secretariat proposed an equity beta in the range of 0.66-0.88. This beta is adjusted from a geared equity beta to an asset beta without taking imputation credits into account. As a consequence, the equity beta is less than one.

Estimating beta is difficult due to the lack of comparable companies, and measurement problems. Observations from Australian data are limited as there are few listed companies with energy infrastructure assets energy. The estimation of beta is also affected by other assumptions.

Based on the information available and its assessment, the Tribunal has allowed a range of 0.40 and 0.50 (applying a 60 percent gearing). The corresponding range for the equity beta is 0.96-1.10. The Tribunal considers that this is a conservative estimate and will keep this assumption under review.

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11 This range is based upon the range adopted for the determination of AGL’s Access Undertaking in July 1997.
**Imputation credits**

Following the introduction of dividend imputation in Australia, calculations of the cost of capital need to take account of the value of imputation/franking credits, ie the proportion of tax paid out as franking credits and used as a tax credit by investors.

In its 1997 determination of the AGL Access Undertaking, the value of imputation credits was a significant and contentious issue. The Tribunal notes that debate on this issue continues. However, in the light of market comments and the level of utilisation, assuming different scenarios of ownership (ie foreign vs domestic), an imputation utilisation rate between 0.30-0.50 appears to emerge as an acceptable range.

The Tribunal has therefore adopted a value for franking credits within a range of 0.30-0.50 for the imputation credits.

**Tax rate used in the WACC conversion**

As discussed above, the Tribunal has decided that on balance, a range of 25-36 percent should be used to establish the WACC during the period of GSN’s Access Arrangement. The Tribunal will continue to consult with specialist advisers on the latest research or empirical evidence. The results of these consultations will contribute to future reviews.

**Gearing**

In the March consultation paper, the Tribunal Secretariat proposed to adopt a gearing of 60 percent in calculating the WACC. This assumption appears to be acceptable to the stakeholders. The Tribunal notes that GSN has adopted this gearing level for the gas business.

Actual gearing ratio for a utility is likely to fluctuate over time, subject to a number of factors, including the state of the capital market and individual circumstances. It would be contrary to the objectives of stability and predictability for a regulator to adopt different gearing ratios for different utilities within the same industry.

The average gearing level of a sample of large Australian companies is approximately 34 percent. However, it is generally recognised that debt levels for the low risk energy utilities (such as electricity and gas) are significantly higher than for the major listed industrial companies. This is demonstrated by the range of gearing level (55-78 percent) of the privatised electricity utilities in Victoria.

The Tribunal proposes that a standard gearing ratio of 60 percent to be applied, regardless of the individual utility’s balance sheet structure.

**Cost of equity**

In accordance with CAPM principles, the risk free rate of return should be assessed on a forward-looking basis, reflecting returns which investors can currently obtain in the market. On this basis the nominal risk free rate of return is 5.7 percent (or around 3-3.5 percent in real terms). The Tribunal is of the view that the risk premium on equity is generally in the range of 5.5-7.0 percent. Adding the risk free rate of return to the risk premium applicable to the gas sector yields a **post tax return on equity of around 11.0-13.4 percent in nominal terms** (or 8.5-11 percent in real terms).
Cost of debt

The cost of debt will vary depending on the gearing of the business and the term of the debt. The cost of long term debt is established by reference to the Commonwealth 10 year bond rate. The cost of short term debt is established by reference to the 180 day bank bill rate. Assuming a mix of long term and short term debt, a margin can be derived.

A number of submissions to the ACCC/ORG draft decisions argue for a higher margin in the range of 100 to 155 basis points, reflecting corporate credit risk, prevailing market conditions and swap margins. This is higher than the 70-80 basis points proposed by GSN.

The Tribunal has concluded that the cost of debt for gas utilities is 1 percent above the risk free rate of return, that is, a cost of debt of approximately 6.7 percent.

Cost of capital

The Tribunal considers that for gas utilities, a feasible range of nominal post tax return on equity is 11.0-13.4 percent. By comparison, the range (among other matters) considered by the Tribunal’s 1997 determination of the AGL Access Undertaking was 9.5-13 percent.

Taking the feasible outcomes under alternative transformation methods, it yields a real pre tax WACC of 5.8-8.6 percent.

Table A3.2 shows the plausible range of values for each variable in the WACC calculation:
### Table A3.2 IPART assessment - a feasible range of WACC

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk free rate</td>
<td>5.67%</td>
<td>5.67%</td>
<td>5.67%</td>
</tr>
<tr>
<td>CPI</td>
<td>2.30%</td>
<td>2.30%</td>
<td>2.30%</td>
</tr>
<tr>
<td>Real risk free rate</td>
<td>3.30%</td>
<td>3.30%</td>
<td>3.30%</td>
</tr>
<tr>
<td>Market risk premium</td>
<td>5.5%</td>
<td>6.3%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Debt margin</td>
<td>1.00%</td>
<td>1.00%</td>
<td>1.00%</td>
</tr>
<tr>
<td>Debt funding</td>
<td>60%</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>Equity funding</td>
<td>40%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>Gamma</td>
<td>0.50</td>
<td>0.40</td>
<td>0.30</td>
</tr>
<tr>
<td>Asset beta</td>
<td>0.40</td>
<td>0.45</td>
<td>0.50</td>
</tr>
<tr>
<td>Debt beta</td>
<td>0.06</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Effective tax rate for CAPM</td>
<td>25%</td>
<td>30%</td>
<td>36%</td>
</tr>
<tr>
<td>Equity beta (calculated)</td>
<td>0.96</td>
<td>1.04</td>
<td>1.10</td>
</tr>
</tbody>
</table>

#### Cost of equity (nominal post tax)

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of equity (nominal post tax)</td>
<td>10.96%</td>
<td>12.17%</td>
<td>13.35%</td>
</tr>
<tr>
<td>Cost of debt (nominal pre tax)</td>
<td>6.67%</td>
<td>6.67%</td>
<td>6.67%</td>
</tr>
<tr>
<td>WACC (nominal post tax)</td>
<td>6.76%</td>
<td>6.96%</td>
<td>7.13%</td>
</tr>
</tbody>
</table>

#### Conversion 1 (Macquarie): nominal post tax WACC => real post tax => gross up to real pre tax

WACC (real post tax) 4.36% 4.55% 4.72%

WACC (real pre tax) 5.81% 6.50% 7.38%

#### Conversion 2: (K Davis formula): nominal post tax => real pre tax

WACC (real pre tax) 5.83% 6.52% 7.40%

#### Conversion 3: nominal post tax WACC => nominal pre tax => real pre tax

WACC (nominal pre tax) 9.01% 9.94% 11.14%

WACC (real pre tax) 6.17% 7.47% 8.64%

#### Alternative: apply pre tax real interest rate in the CAPM model

WACC (real pre tax) 6.49% 7.34% 8.43%

### Sensitivity of return on equity range to changes of parameters

The Tribunal has examined the sensitivity of return on equity to change of parameters under CAPM. It notes that return on equity is most sensitive to the risk free rate, the market risk premium, and the asset beta.
Table A3.3 Sensitivity analysis

<table>
<thead>
<tr>
<th>Change of the parameter by:</th>
<th>% change on return on equity</th>
<th>% change on weighted average cost of capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk free rate – 1%</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Market risk premium – 1%</td>
<td>1.0</td>
<td>0.5</td>
</tr>
<tr>
<td>Asset beta change - 0.05</td>
<td>0.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Gamma (imputation credit) - 0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Debt margin – 0.5%</td>
<td>0</td>
<td>0.3</td>
</tr>
<tr>
<td>Gearing ratio – 50% (rather than 60%) (1)</td>
<td>1.0 (lower)</td>
<td>0.3 (higher)</td>
</tr>
<tr>
<td>Effective tax rate – 5%</td>
<td>0.1</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Note:
1. A lower gearing ratio would result in a lower equity beta and therefore a lower return on equity. However, the weighted average cost of capital is higher because of the higher proportion of equity at a higher cost.

**A3.7 Assessment of GSN against the feasible range**

Overall, the Tribunal considers that some of the assumptions adopted by GSN have resulted in an over-estimation of the rate of return from the CAPM framework.

*Nominal risk free rate*

The Tribunal considers that a 20-day moving average yield to maturity on 10 year Commonwealth bonds provides a more appropriate indicator of the risk free rate than the 8-8.3 percent proposed by GSN.

*Franking credits*

GSN’s proposed range of 15-21 percent is at the lower end of the figure estimated by the academics and specialists.

*Tax rate*

GSN has not provided the Tribunal with any forecast of income tax ie prima facie tax on operating profit and the tax payment. As discussed earlier, a tax rate in the range of 25-36 percent is used to transform the post tax WACC to pre tax WACC.

**A3.8 Alternative approaches to rate of return**

Other methods which can be used to estimate the cost of equity include:
- the price/earnings (P/E) ratio
- the dividend growth model (DGM)
- more sophisticated models, such as arbitrage pricing theory (APT).

These alternative models are all based on the same underlying assumptions of discounted cashflow. The price/earnings ratio involves capitalising the estimated future maintainable earnings of the business at a price/earning multiple appropriate to the risks and prospects of the business. This method is commonly used in practice. It is generally more applicable to established businesses with a financial track record and regular cashflows and earnings.
The dividend growth model (DGM) is based upon the premise that the value of a stock is commensurate with the present value of the dividend stream from that stock. The cost of equity is assumed to be the discount rate which equates the current market value of the share with the present value of that dividend stream. The general formula for the DGM is:

\[ r = \left( \frac{D_1}{P_0} \right) + \gamma \]

where,
- \( r \) = cost of equity
- \( D_1 \) = expected dividend
- \( P_0 \) = current share price
- \( \gamma \) = rate of growth in dividends

Assumptions inherent in the DGM include dividends grow at a constant rate forever and expected dividend growth can be estimated accurately. The DGM has one major disadvantage: it relies too much on subjective judgements about expected dividend growth in perpetuity.

It is difficult to apply DGM to the gas transportation industry. Historically, most gas utilities in Australia have been government owned enterprises except for AGL and Boral. There is a lack of market evidence on historical dividend yield. Until 1997, AGL Gas Networks Pty Ltd was one business segment within the AGL Group covering the gas retail business, investment in transmission pipelines, and other energy businesses. Estimation of the cost of equity based on DGM for the whole business of AGL is not directly relevant to the distribution network business. Separation of Boral’s interest in gas transportation prior to the establishment of Envestra is similarly complicated.

It can be argued that future dividends may be difficult to forecast, because the industry is undergoing reforms. Further, any forecast will depend on regulatory decisions on a revenue path for the gas transportation business, resulting in a circularity problem.

As GSN has yet to formalise its dividend policy, estimation of dividend growth is not possible at present. The Tribunal will explore this issue in the light of dividend outcomes over this regulatory period.

Use of APT would require that macroeconomic factors affecting the stock be identified, that the risk premium for each of those factors be measured, and that the sensitivity of the stock to each of those factors be measured. APT has rarely been used in mainstream valuation exercises because the number and specification of the factors to be priced vary from model to model, and individual factor loadings must be estimated.

The price earning ratio and dividend growth model are used in the market, but they generally suffer from problems in their practical implementation. Given the lack of data and the circumstances of the gas transportation industry, alternative approaches are impracticable at this stage.
A3.9 Conclusion

As reflected in submissions to ACCC/ORG’s draft decisions and the forum on WACC, there are differences of opinions and concerns about calculating WACC under a CAPM framework. This relates particularly to the treatment of asymmetric risks and sensitivity to current interest rates which are not easily factored into CAPM, but are relevant to a regulator’s judgement on the appropriate level of rate of return.

From the evidence currently available on the cost of equity, the Tribunal concludes that the range of the nominal post tax return on equity is 11.0-13.4 percent. The overall cost of capital for the regulated gas distribution network should be within the range of 5.8-8.6 percent (pre tax, real).

The Tribunal has used the CAPM/WACC only as a guide to the feasible range for the rate of return. The selection of the rate of return within this range is a matter of regulatory judgement.
ATTACHMENT 4  OPTIMISED DEPRIVAL VALUATION - EXISTING PIPELINE SYSTEM

Assumptions

Analysis period - remaining asset life Say 30 years to 2029
Discount rate (real, pre tax) 7.5%
Real cost reduction between 1997/98-2002/03 2% per annum
Refurbishment capital expenditure forecast
- between 1998/99 to 2002/03 Per GSN forecast
- beyond 2002/03 $460,000 per annum
Allocation of refurbishment capital expenditure
- contract market 10%
- volume market 90%
Revenue growth
- contract market Nil
- volume market 2% per annum in 1997/98 - 2002/03

Summary results

<table>
<thead>
<tr>
<th></th>
<th>Contract market</th>
<th>Volume market</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net present value (NPV)</td>
<td>6.5</td>
<td>25.0</td>
<td>31.5</td>
</tr>
<tr>
<td>Depreciated optimised</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>replacement cost (DORC)</td>
<td>3.3</td>
<td>29.4</td>
<td>32.7</td>
</tr>
<tr>
<td>Optimised deprival value (lower of NPV and DORC)</td>
<td><strong>3.3</strong></td>
<td><strong>25.0</strong></td>
<td><strong>28.3</strong></td>
</tr>
</tbody>
</table>

Comments

The Tribunal notes that the optimised deprival value is sensitive to the assumptions and parameters used, particularly the discount rate, refurbishment capital expenditure, revenue growth and period of analysis.
<table>
<thead>
<tr>
<th>Year</th>
<th>Discount factor</th>
<th>Real Cash Flow Projection - Contract Market</th>
<th>Real Cash flow Projection - Volume Market</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Revenue existing customers</td>
<td>Revenue growth</td>
</tr>
<tr>
<td>1999</td>
<td>0.930</td>
<td>1.63 0.00 0.15 0.03 1.45</td>
<td>3.49 0.07 1.36 0.28 1.92</td>
</tr>
<tr>
<td>2000</td>
<td>0.865</td>
<td>1.36 0.00 0.15 0.06 1.15</td>
<td>3.49 0.14 1.34 0.50 1.79</td>
</tr>
<tr>
<td>2001</td>
<td>0.805</td>
<td>1.08 0.00 0.15 0.06 0.88</td>
<td>3.49 0.21 1.31 0.50 1.89</td>
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<tr>
<td>2002</td>
<td>0.749</td>
<td>0.81 0.00 0.14 0.05 0.62</td>
<td>3.49 0.28 1.28 0.41 2.07</td>
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<tr>
<td>2003</td>
<td>0.697</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
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<td>2004</td>
<td>0.648</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
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<tr>
<td>2005</td>
<td>0.603</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
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<td>2006</td>
<td>0.561</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
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<td>2007</td>
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<td>3.49 0.35 1.26 0.41 2.17</td>
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<td>2008</td>
<td>0.485</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2009</td>
<td>0.451</td>
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<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2010</td>
<td>0.420</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2011</td>
<td>0.391</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2012</td>
<td>0.363</td>
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<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2013</td>
<td>0.338</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2014</td>
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<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2015</td>
<td>0.292</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2016</td>
<td>0.272</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2017</td>
<td>0.253</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2018</td>
<td>0.235</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2019</td>
<td>0.219</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2020</td>
<td>0.204</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2021</td>
<td>0.189</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2022</td>
<td>0.176</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2023</td>
<td>0.164</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2024</td>
<td>0.153</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2025</td>
<td>0.142</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2026</td>
<td>0.132</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2027</td>
<td>0.123</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2028</td>
<td>0.114</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>2029</td>
<td>0.106</td>
<td>0.53 0.00 0.14 0.05 0.35</td>
<td>3.49 0.35 1.26 0.41 2.17</td>
</tr>
<tr>
<td>Present value</td>
<td>8.75 0.00 1.69 0.55 6.51</td>
<td>41.60 3.55 15.23 4.96 24.97</td>
<td></td>
</tr>
</tbody>
</table>
ATTACHMENT 5 FINANCIAL ANALYSIS OF THE GAS BUSINESS OF WAGGA WAGGA CITY COUNCIL 1980-1996/97

The financial analysis of Wagga Wagga City Council’s gas business, prior to the sale in 1997, is undertaken based on the gas trading accounts from 1980-1996/97.

The financial analysis is shown in the following two tables:

Table A5.1: Financial analysis of the natural gas business 1.1.93 to 30.6.97
Table A5.2: Financial analysis of the overall gas business 1980-1996/97

Table A5.1 Historical financial results for Wagga Wagga City Council’s natural gas business, 1.1.93 to 30.6.97

<table>
<thead>
<tr>
<th>Operating income</th>
<th>12 months to 31.12.93</th>
<th>6 months to 30.6.94</th>
<th>12 months ended 30.6.95</th>
<th>12 months ended 30.6.96</th>
<th>12 months ended 30.6.97</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales of gas</td>
<td>10.27</td>
<td>4.62</td>
<td>11.43</td>
<td>11.59</td>
<td>11.01</td>
</tr>
<tr>
<td>Other income</td>
<td>0.12</td>
<td>0.10</td>
<td>0.08</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Operating income</td>
<td><strong>0.39</strong></td>
<td><strong>4.72</strong></td>
<td><strong>11.51</strong></td>
<td><strong>11.64</strong></td>
<td><strong>11.03</strong></td>
</tr>
</tbody>
</table>

Operating expenses

| Purchase of gas  | 5.04                  | 2.52                | 5.83                   | 6.01                   | 5.90                   |
| Distribution     | 0.42                  | 0.19                | 0.43                   | 0.44                   | 0.36                   |
| Administration   | 0.69                  | 0.47                | 0.97                   | 0.94                   | 0.89                   |
| General          | 0.99                  | 0.42                | 0.82                   | 0.89                   | 0.89                   |
| Other            | -0.06                 | -0.04               | 0.09                   | 0.15                   | 0.00                   |
| Total operating expenses | **7.08** | **3.55** | **8.14** | **8.43** | **8.03** |

EBITD

| 3.30 | 1.16 | 3.37 | 3.22 | 2.99 |

Depreciation

| 0.72 | 0.52 | 0.92 | 1.03 | 1.03 |

EBIT

| 2.58 | 0.64 | 2.45 | 2.19 | 1.97 |

Investment income

| 0.15 | 0.09 | 0.35 | 0.50 | 0.54 |

Interest expense

| 0.16 | 0.06 | 0.08 | 0.05 | 0.02 |

Net interest

| 0.01 | -0.04 | -0.27 | -0.45 | -0.52 |

Profit before tax

| 2.57 | 0.68 | 2.73 | 2.64 | 2.49 |

Depreciated historical cost

| 11.60 | 12.00 | 12.66 | 12.89 |

EBIT – network and retail

| 2.58 | 0.64 | 2.45 | 2.19 | 1.97 |

Less retail margin @ 2%

| 0.21 | 0.09 | 0.23 | 0.23 | 0.22 |

EBIT attributable to network

| 2.37 | 0.55 | 2.22 | 1.96 | 1.75 |

EBIT/operating assets

| 9.5% | 18.5% | 15.5% | 13.6% |

Source: Tribunal’s analysis based on WWCC’s Gas Trading Accounts.
### Table A5.2 Financial analysis of the gas business including natural gas, retail, appliance sales and LPG (1980-1996/97)

<table>
<thead>
<tr>
<th></th>
<th>Revenue excl investment income</th>
<th>Operating expenses</th>
<th>Depreciation</th>
<th>EBIT</th>
<th>Total assets</th>
<th>Return on assets</th>
<th>Long term bond rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996/97 (1)</td>
<td>17.88</td>
<td>17.38</td>
<td>1.41</td>
<td>-0.91</td>
<td>1.29</td>
<td>nc</td>
<td>7.6%</td>
</tr>
<tr>
<td>1995/96</td>
<td>20.20</td>
<td>18.97</td>
<td>1.23</td>
<td>0.00</td>
<td>13.84</td>
<td>0.0%</td>
<td>8.7%</td>
</tr>
<tr>
<td>1994/95</td>
<td>20.21</td>
<td>16.44</td>
<td>1.11</td>
<td>2.66</td>
<td>12.59</td>
<td>21.2%</td>
<td>10.1%</td>
</tr>
<tr>
<td>1994 (6 months)</td>
<td>8.62</td>
<td>7.34</td>
<td>0.60</td>
<td>0.68</td>
<td>10.72</td>
<td>12.8%</td>
<td>9.6%</td>
</tr>
<tr>
<td>1993</td>
<td>18.59</td>
<td>14.78</td>
<td>0.87</td>
<td>2.93</td>
<td>11.80</td>
<td>24.9%</td>
<td>7.3%</td>
</tr>
<tr>
<td>1992</td>
<td>15.84</td>
<td>12.13</td>
<td>0.84</td>
<td>2.87</td>
<td>10.86</td>
<td>26.5%</td>
<td>8.9%</td>
</tr>
<tr>
<td>1991</td>
<td>14.97</td>
<td>11.51</td>
<td>0.70</td>
<td>2.76</td>
<td>9.69</td>
<td>28.5%</td>
<td>11.1%</td>
</tr>
<tr>
<td>1990</td>
<td>13.83</td>
<td>11.21</td>
<td>0.70</td>
<td>1.92</td>
<td>8.63</td>
<td>22.2%</td>
<td>13.4%</td>
</tr>
<tr>
<td>1989</td>
<td>12.00</td>
<td>9.60</td>
<td>0.64</td>
<td>1.77</td>
<td>7.71</td>
<td>22.9%</td>
<td>13.5%</td>
</tr>
<tr>
<td>1988</td>
<td>10.54</td>
<td>8.25</td>
<td>0.57</td>
<td>1.72</td>
<td>7.08</td>
<td>24.3%</td>
<td>11.9%</td>
</tr>
<tr>
<td>1987</td>
<td>10.56</td>
<td>9.15</td>
<td>0.45</td>
<td>0.96</td>
<td>6.37</td>
<td>15.1%</td>
<td>12.8%</td>
</tr>
<tr>
<td>1986</td>
<td>9.97</td>
<td>8.62</td>
<td>0.41</td>
<td>0.94</td>
<td>5.69</td>
<td>16.4%</td>
<td>12.9%</td>
</tr>
<tr>
<td>1985</td>
<td>8.17</td>
<td>6.95</td>
<td>0.40</td>
<td>0.82</td>
<td>5.19</td>
<td>15.8%</td>
<td>13.5%</td>
</tr>
<tr>
<td>1984</td>
<td>7.52</td>
<td>6.72</td>
<td>0.34</td>
<td>0.46</td>
<td>4.99</td>
<td>9.2%</td>
<td>13.7%</td>
</tr>
<tr>
<td>1983</td>
<td>6.74</td>
<td>6.35</td>
<td>0.32</td>
<td>0.06</td>
<td>4.81</td>
<td>1.3%</td>
<td>14.8%</td>
</tr>
<tr>
<td>1982 (2)</td>
<td>6.23</td>
<td>5.86</td>
<td>0.30</td>
<td>0.06</td>
<td>4.50</td>
<td>1.3%</td>
<td>16.4%</td>
</tr>
<tr>
<td>1981</td>
<td>5.01</td>
<td>4.91</td>
<td>0.28</td>
<td>-0.18</td>
<td>4.20</td>
<td>-4.2%</td>
<td>13.1%</td>
</tr>
<tr>
<td>1980</td>
<td>3.78</td>
<td>3.58</td>
<td>0.24</td>
<td>-0.04</td>
<td>3.15</td>
<td>-1.4%</td>
<td>11.8%</td>
</tr>
</tbody>
</table>


Note:
1. The natural gas business was sold to Great Southern Energy in June 1997. Council reported a gain of $41.3m on disposal of assets.
2. The 1982 calendar year represented the first full year of operation on natural gas.
ATTACHMENT 6  OVERRUN PROVISIONS AS AMENDED BY GREAT SOUTHERN ENERGY NETWORKS

A6. Overruns

A6.1 General

A User Overrun occurs when the withdrawals by a particular User at a Delivery Point on a Day exceed the Capacity Entitlement of that User for that Delivery Point on that Day. For the purpose of applying this section 6, and determining whether a User must pay an additional charge in respect of a User Overrun and the amount of that charge, a Day will be deemed to fall entirely within the month or Year on which that Day commences.

A6.2 Deeming Provision

The quantity of a User Overrun for a Day will be deemed to be zero if it is not possible to determine the quantity of natural gas withdrawn at the Delivery Point because of a failure or unavailability of Metering Facilities even if it is subsequently established that a User Overrun would have occurred on the basis of the quantities subsequently estimated to have been withdrawn on that Day.

A6.3 Overrun Charges

A6.3.1 Payment for Capacity

For any month, a User will pay Great Southern Networks for Capacity the amount, for each Delivery Point which is equal to the Capacity Payment calculated in accordance with the following formula:

\[ CP = DCC \times (MDQ + OQ) \times NOD + 3OP \]

where

- \( CP \) is the Capacity Payment
- \( DCC \) is the Daily Capacity Charge for that Delivery Point in that month
- \( MDQ \) is Maximum Daily Quantity for that Delivery Point in that month
- \( OQ \) is Overrun Quantity for that Delivery Point in that month
- \( NOD \) is the number of Days in that month in respect of which no Daily Overrun Payment was calculated
- \( 3OP \) is the sum of all amounts calculated as a Daily Overrun Payment in that month
A6.3.2 Overrun Payments

If a User Overrun occurs, then:

(a) on each of the first two times a User Overrun occurs in a month, for the purpose of determining the amount payable by the User for Capacity in accordance with clause 6.3.1 for that Delivery Point in respect of the Day on which the User Overrun occurs, the Daily Overrun Payment shall be the amount calculated as DOP for that Delivery Point in respect of that Day on the basis of the following formula:

\[ \text{DOP} = 1.05 \times \text{DCC} \times \text{WQ} \]

where:

- DOP is the Daily Overrun Payment for that Delivery Point in respect of that Day,
- DCC is the Daily Capacity Charge for that Delivery Point in that month,
- WQ is the total quantity of gas withdrawn by the User from the relevant Delivery Point on the Day on which the User Overrun occurs;

(b) if a User Overrun occurs 3 or more times in a month, or 10 or more times in a Year, then for the purpose of determining the amount payable by the User for Capacity in accordance with clause 6.3.1 in respect of that User, the Overrun Quantity, in respect of that month or each month in that Year (as the case may be), will be the largest quantity which results from subtracting the User's Capacity Entitlement for that Delivery Point on any Day on which a User Overrun occurred in that month or that Year (as the case may be) from the quantity of gas actually withdrawn by the User from that Delivery Point on that Day; and

(c) the calculation of an Overrun Quantity in relation to a User in respect of a month will not prevent the calculation of a higher Overrun Quantity in respect of that month through the application of clause 6.3.2(b) at any later time.
"Capacity" means at a point in time the capability of the Network or a particular section of the Network to transport natural gas between defined points, taking into account the configuration of the Network and its operational requirements, as determined by Great Southern Networks using its then current load flow model of the Network.

"Capacity Charge" means the charge calculated in accordance with Appendix 3.

"Capacity Entitlement" means in relation to a User and a Delivery Point of that User, the MDQ of that person in relation to that Delivery Point plus the amount, if any, of any Contracted Capacity of any other Users that has been transferred or assigned to the first mentioned User less the amount, if any, of any Contracted Capacity of the first mentioned User in relation to that Delivery Point that is transferred or assigned to another User.

"Contracted Capacity" means in respect of an User that part of the Capacity which has been reserved by the User or Users pursuant to a contract entered into with Great Southern Networks.

"Day" means (unless otherwise advised by Great Southern Networks) a period of twenty-four hours beginning at 6.30 am Eastern Standard Time.

"Daily Capacity Charge" means in respect of a User for a month and a Delivery Point, the Capacity Charge for that User in respect of that Delivery Point in that month divided by the number of Days in the month.

"Delivery Point" means the point on the Network nominated or defined in a Service Agreement at which natural gas is withdrawn from the Network by a User for use by a Customer. A Delivery Point may in certain circumstances consist of one, two or more sets of Metering Facilities servicing a particular Customer’s site or premises, or servicing a third party network.

"Great Southern Networks" means Great Southern Energy Networks Pty Limited.

"MDQ" or "Maximum Daily Quantity" means the maximum daily quantity of natural gas (which Great Southern Networks is required to transport and which the User may withdraw under a Service Agreement).

"Overrun Quantity" means the quantity of gas withdrawn in respect of a User calculated under clause 6.3.2(b).

"User" means a person to whom Great Southern Networks provides a service under a Service Agreement.

"User Overrun" occurs when withdrawals of gas by a User at a Delivery Point exceed the User’s Capacity Entitlement for the Delivery Point on that Day.

"Year" means a calendar year.