Third Party Access Code
for Natural Gas Distribution Networks in
New South Wales:
Access Undertaking Information for
Albury Gas Company Limited

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ACCESS UNDERTAKING INFORMATION FOR THE DISTRIBUTION SYSTEM BY THE ALBURY GAS COMPANY LIMITED

1. Introduction

1.1 Purpose of this document

This access undertaking information ("Access Undertaking Information") is submitted on 11 June 1998 by the Albury Gas Company Limited (ACN 000 001 249) ("AGC") to the Independent Pricing and Regulatory Tribunal ("Regulator") in accordance with section 20 of the Gas Supply Act 1996 (New South Wales), and section 2.1 of the Third Party Access Code for Natural Gas Distribution Networks in NSW ("NSW Access Code").

This Access Undertaking Information forms Part 2 of the proposed Access Undertaking by AGC ("the AGC Access Undertaking") for the distribution Pipelines described in appendix 3 of this Access Undertaking Information (the "Distribution System").

The following sections in the NSW Access Code set out the requirements for this Access Undertaking Information.

Section 2.4	*The proposed Access Undertaking submitted pursuant to sections 2.1 and 2.3 may include any relevant matter but must include at least the elements described in section 3. Applicable Access Undertaking Information must be submitted together with the proposed Access Undertaking.*
Section 2.6	*At any time after the receipt of the applicable Access Undertaking Information and before a Determination is made under section 2.11, the Regulator may direct the service Provider to make changes to the Access Undertaking Information. The Regulator must include the reasons for its decision and must specify a reasonable time by which the proposed Access Undertaking Information that rectifies the matters identified by the Regulator must be resubmitted.*
	This decision is not a Determination under this Code.
Section 2.7	*In making a decision under section 2.6, the Regulator may direct such information to be included in the Access Undertaking Information which, in the view of the Regulator, would enable Users and Prospective Users to understand the derivation of the elements in the proposed Access Undertaking. The Access Undertaking Information must include those categories of information described in Schedule B, but the Regulator may permit the re-categorisation and re-aggregation of data. The Regulator must not require the release of information that, in its view, could be harmful to the interests of a Service Provider, a User or a Prospective User.*

Appendix 1 to this document shows the information categories listed in schedule B of the NSW Access Code and indicates where this information is contained within this document.

Except where specifically defined in this Access Undertaking Information, words in this Access Undertaking Information have the same meaning as in the AGC Access Undertaking. Technical abbreviations and acronyms are defined in appendix 2.

1.2   Start date of the AGC Access Undertaking

If accepted by the Regulator, the AGC Access Undertaking will take effect on the date on which the Regulator approves the AGC Access Undertaking.

Two tariffs for Tariffed Distribution Services are available. Distribution Tariff D ("Tariff D") is charged on the basis of the Customer's highest consumption of Gas in any hour of a calendar year. Distribution Tariff V ("Tariff V") is charged on the basis of the volume of Gas transported on behalf of a Tariff V Customer. Whilst there is a small daily charge, there is no capacity component associated with Tariff V. The 8 largest Customers of the Distribution System initially meet the requirements for assignment to Tariff D. All other Customers are assigned to Tariff V.

AGC will manage and operate the Distribution System (including any associated augmentation) to ensure that all forecast deliveries are made pursuant to its agreed security standards of operation.

1.3   Tariff setting approach

Tariffs for Tariffed Distribution Services are set using a three stage approach which is summarised below.

Step 1: Set target revenue

Target revenue for AGC is set to allow AGC to earn a reasonable rate of return on the value of its existing assets together with new assets which it is expected will need to be introduced to meet forecast growth in service utilisation. The value of existing assets is based on the optimised depreciated replacement cost ("ODRC") which in some cases is reduced by public policy constraints which are referred to in section 3.4. Step 1 is described in more detail in section 2.

Step 2: Set year 1 tariffs to recover year 1 target revenue

A tariff methodology is used to set tariffs for each Tariffed Distribution Service and at each location on the Distribution System such that:

(a)   at forecast demand, AGC will recover target revenue for year 1; and

(b)   users contribute an appropriate share of the cost of the assets and services which are used in providing the relevant Tariffed Distribution Service (cost reflectivity).

The tariff methodology is described in detail in section 3.

Step 3: Set formula for tariff and revenue adjustment from year to year

A formula is set out in schedule 1 to the AGC Access Undertaking which governs the individual prices and hence the average revenue from tariffed services that can be recovered in the next year, given the prices and average revenues achieved in previous years. The objective of this formula is to:

(a)   achieve a clear overall price path, ensuring real gains to Customers;

(b)   create incentives to increase usage where an increase or decrease in total load leads to an increase or decrease in total revenue;

(c)   encourage efficiency gains, particularly capital efficiency; and

(d)   provide clarity of regulatory principles and controls so as to aid management decision making.

Step 3 is described in more detail in section 4.

1.4   Tables

(a)   There may appear to be slight inconsistencies in the tables due to rounding.

(b)   Dollar amounts in tables are in nominal terms unless otherwise stated.

1.5   Contact details

The contact officer for further details on this Access Undertaking Information is:

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2. Target Revenue

2.1 Introduction

(a) Target revenue calculation

Target revenue is set at a level which allows AGC to earn a reasonable rate of return on assets employed in providing Tariffed Distribution Services. This section sets out the process that has been undertaken to establish an appropriate level of target revenue for each of the five years covered by the AGC Access Undertaking.

The regulated asset base for AGC is calculated on the following basis:

(1) an ODRC valuation for the Distribution System has been performed by an independent engineering consultant Gutteridge, Haskins & Davey Pty Limited ("GHD");

(2) EPD then made various adjustments to the valuation to reflect the Victorian Government's policy objectives; and

(3) the adjusted ODRC forms the basis of the regulated asset base of AGC.

(b) Target revenue for each year

The target revenue for AGC for each year is the sum of:

(1) the annual current cost return on the regulated asset base employed by AGC, calculated by applying a real pre-tax Weighted Average Cost of Capital ("WACC") to the total assets employed in providing tariffed services. An appropriate WACC for AGC has been determined with consideration having been given to returns that would be expected by equity and debt contributors and appropriate capital structures;

(2) the annual current cost depreciation charge relating to the regulated asset base, based on the expected economic lives of those assets;

(3) forecast Operating and Maintenance ("O&M") costs and administration costs of the business; and

(4) a return on net working capital using a nominal pre-tax WACC.

In the remainder of this section further detail is provided in relation to important components of the target revenue calculation as follows:

(1) valuation of existing system assets;

(2) valuation of non-system assets;

(3) new assets;

(4) rate of return;

(5) return methodology;

(6) depreciation;

(7) operational costs; and

(8) net working capital.

2.2   Valuation of existing system assets

(a)   The ODRC based valuation methodology

The ODRC based methodology involves the following steps:

(1)   establish the replacement cost ("RC") of each Pipeline asset;

(2)   determine the optimal sizing and configuration for Pipeline assets ("Optimisation"); and

(3)   depreciate the asset.

These steps are described in more detail below.

Step 1: Establish replacement cost

This proceeds in two stages. First of all a modern engineering equivalent ("MEE") is identified for each asset type. This represents what the asset would be replaced with now, given modern technology and accepted industry practices. Secondly, a standard replacement cost ("SRC") is established for each MEE. This is expressed per unit of length or quantity.

The application of the SRC to the MEE of each existing Distribution System asset provides a RC for that asset.

Step 2: Asset Optimisation

Existing assets may be scaled down in size or removed altogether where the Capacity they provide is not required or is materially in excess of what is required based on existing and forecast Gas flows. The resulting replacement cost of the assets optimised this way is the optimised replacement cost ("ORC").

Step 3: Depreciate the asset

Depreciation is based on a straight-line depreciation profile using a standard economic life ("SEL") for each asset type, together with an estimate of the remaining life ("RL") of each asset. Thus if an asset had a SEL of 40 years and a RL of 10 years, it would be depreciated to 25% of its replacement cost.

Depreciation applied to the RC or ORC of each asset gives the depreciated replacement cost ("DRC") and ODRC for each asset. Target revenue is based on the total ODRC of all assets used to provide Tariffed Distribution Services

(b)   Justification for using the ODRC based methodology

The NSW Access Code provides that the initial capital base in existence at the commencement of the Code should be determined having regard to depreciated historical cost, ODRC, other well recognised asset valuation methodologies and the net working capital of the service provider, and that it should not fall outside the range of values for depreciated historical cost and ODRC. AGC has opted to utilise the ODRC method for the following reasons.

(1)   Using an ODRC based method gives tariffs that provide correct economic signals as to the value of the Tariffed Distribution Service. Using historical costs will significantly undervalue the asset and hence distort users' choices in using existing Pipelines rather than alternatives, such as other Pipelines, proposed new Pipelines, other forms of energy or energy efficiency.

(2)   Economic theory states that, in a competitive market, prices will reach equilibrium at a level consistent with using a real rate of return on optimal replacement costs for capital

(C) Allowance for up to three years of future growth is assumed before pipe sizes are considered to be over optimal capacity.

(D) Optimisation assumes "brownfield" conditions exist, that is all existing infrastructure (eg roads, footpaths, other services etc) are in place, and the replacement of the Distribution System assets would therefore need to allow for such features.

(E) Sizing of pipes and the length of pipes to be resized for the overall network is based on a sample of 5 representative networks. This sample has been extensively modelled to determine the optimised network based on:

- a maximum of 20,000 Customers;

- security of supply maintained by providing a linking Distribution Main;

- local outage limit of 100 domestic Customers affected for a maximum of 1 Day per event; and

- maximum and minimum levels of allowable pressure set at 450 kpa and 140 kpa.

(3) Replacement cost

The RC assumptions and calculations have been determined by GHD, by detailed cost analysis with indexation to 30 June 1997. The assumptions are listed below.

(A) MEE assets are based on proven technology, and accepted as common practice in the industry.

(B) The system operates at high pressure.

(C) Polyethylene and protected steel are used for the Distribution Mains and Connections.

(D) The lowest MEE pipe diameter and material used are 40 Polyethylene ("PE") for Distribution Mains and 10 PE for Connections.

(E) RCs are based on economies of scale (ie. not piecemeal extensions).

(F) The SRC per metre of Pipeline is built up from estimates of the material, trench, installation and overhead components which an efficient contractor could reasonably be expected to quote for contracts of a significant scale. A similar approach is applied in determining the unit costs of non-Pipeline assets.

(G) SRCs are calculated on the assumption that all existing infrastructure (eg roads, footpaths, other services etc) are in place, and the replacement of the Gas reticulation assets would therefore need to allow for such features.

(H) Cost of easements are excluded as the optimised network is designed to be built on public road reserves.

(I) Pricing for materials and labour rates is based on typical and sustainable market conditions.

(4) Depreciation

(A) Estimates of economic lives are based on industry experience, pipe life research, standard maintenance practice and specific research undertaken by National Institute of Economic and Industrial Research ("NIEIR").

(B) In 1996, GHD interpreted the NIEIR report to determine the extent to which the remaining economic lives of Distribution System assets would be impacted. It was assessed that natural Gas depletion would constrain lives to the year 2050.

(C) RLs for all assets are calculated as the economic life less the estimated age of the asset.

(D) Minimum RLs are assumed for each asset type, indicating that when the asset has reached the end of its "standard" life, if it is still providing Gas delivery service then some minimum value will be attributed to it.

(E) Certain assets have a residual value described as the "value of the hole in the ground" or "trench value", where pipe insertion techniques avoid the cost of digging a trench, therefore creating a benefit. This residual value benefit is recognised by limiting the depreciation of the pipe up to the residual value, if it is greater than the value of the pipe when it is at its minimum RL.

(F) The economic lives and minimum RLs assumed for the different types of assets are shown in table 1 below.

Table 1: Asset Life

Asset type	Economic Life(Years)	Minimum RL (Years)
Mains and Connections		
• Steel - HP (protected)	120	5
• PE	60	5
Transmission pressure pipeline	60	5
Domestic Meters	25	5
Meter/Regulators		
• Commercial	30	5
• System	30	5
• Transmission pressure	45	5
Field regulators	50	5
City gates	50	5
Other regulators	50	5
SCADA	5-7	5

The economic life of Connection assets for Tariff D Customers is:

(a) 60 years for services and connections; and

(b) 30 years for Meter/regulators.

The remaining life of Tariff D Connection assets for tariff setting purposes has been set to zero.

(e) Summary of valuation

The results of the adjusted ODRC based valuation of AGC's Distribution System assets as at 30 June 1997 by asset type are shown in table 2 below.

The effect of the optimisation is to reduce the RC of the Distribution System assets from $38.1m to $31.8m, a reduction of 16.6%. Depreciation reduces the value of the optimised assets from $31.8m to $24.2m.

Table 2: Asset Valuation

Asset Type as at 1 July 1997	RC $m	DRC $m	ORC $m	ODRC $m	ODRC Less Tariff D Assets $m
Mains	19.60	15.04	13.24	10.10	10.10
Connections	9.67	8.04	9.67	8.04	7.98
Transmission Pressure Mains	4.50	3.16	4.50	3.16	3.16
Domestic Meters	2.79	1.93	2.79	1.93	1.93
Meter/Regulators					
• Commercial	0.79	0.48	0.79	0.48	0.48
• Industrial	0.24	0.15	0.24	0.15	0.08
Field Regulators and City Gates	0.53	0.32	0.53	0.32	0.32
Total	**38.13**	**29.11**	**31.77**	**24.19**	**24.05**

The ODRC asset value for Connection assets for Tariff D Customers has been calculated by AGC to be $144,000. However, for tariff setting purposes, the remaining life of these assets has been set to zero given that those Customers have fully contributed to the capital cost of those assets.

2.3   Valuation of AGC non-system assets

The following approach has been taken to the valuation of AGC's relevant non-system assets:

(a)   Land and building

Independent property valuers John P. Lovell and Associates, First Pacific Davies, AW Male and Jens Gannt were appointed to undertake a valuation of the properties of AGC. The valuations are the lower of:

(1)   market value, representing the property as a clean site ready for sale in the open market; or

(2)   depreciated replacement value, representing "in use" value to the organisation based on the cost to reinstate existing structure after adjusting for physical depreciation and economic obsolescence.

(b)   Other assets

The other assets are relatively small in value compared to the Distribution System assets. Therefore specific individual asset valuation of these categories is generally replaced by book values (as contained in the financial records of AGC as at 30 June 1997) which should overall

provide a materially correct valuation. For the purposes of determining target revenues AGC has used the written down value as at 1 January 1998. This has been calculated from the written down value as at 1 July 1997 taking into account depreciation and capital expenditure for the period 1 July 1997 to 31 December 1997.

The results of the valuation of non-system assets are summarised in table 3 below.

Table 3: Non-System Assets

Non-system assets	As at 1 July 1997 $m	As at 1 January 1998 $m
Land and Buildings[1]	0.01	0.01
Other Assets	0.05	0.05
Total non-system assets	**0.06**	**0.06**

2.4 Regulated Asset Values

For the purposes of determining tariffs, revenues were initially determined based on the ODRC value of $24.12m as at 1 January 1998 resulting in an initial target revenue of $4.33m for 1998. EPD then reduced the ODRC value as at 1 January 1998 by $3.04m to $21.14m (including non-system assets of $0.06m) to reflect the public policy objectives to limit network price differentials at contestability. This resulted in a target revenue of $3.89m for 1998 which has been used to derive tariffs.

The adjusted ODRC value as at 1 January 1998 of $21.14m (including non-system assets of $0.06m) has been calculated from the ODRC value as at 1 July 1997 taking into account depreciation of $0.33m and capital expenditure of $0.40m for the period 1 July 1997 to 31 December 1997. The adjusted ODRC value as at 1 January 1998 reflects a write down of 12.6% of the ODRC value as at that date. To achieve the Victorian Government's public policy objectives only assets relating to Tariff V Customers were adjusted. A summary of the asset balances as at 1 January 1998 is set out in table 4 below.

Table 4: Asset Value at 1 January 1998

Asset Group As at 1 January 1998	ODRC $m	Adjusted ODRC
Mains and Connections	21.60	20.50
Meters - Domestic	1.94	-
Meters - Other	0.58	0.58
Non-system assets	0.06	0.06
Total	**24.18**	**21.14**

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[1] The value of land and buildings is less than $10,000.

2.5   Asset remaining lives

For the purposes of determining target revenues, individual asset categories were grouped together to calculate depreciation and return on assets. The weighted average RL for each of the asset groupings is set out in table 5 below.

Table 5: Asset Remaining Lives

As at 1 January 1998	Post Asset Write Down $m	RL (yrs)
Mains and Connections	20.50	43
Meters - Domestic	-	17
Meters - Other	0.58	18
Equipment and Vehicles	0.05	4
Total[2]	**21.13**	

2.6   New assets

(a)   Approach to valuation

Valuation of new assets is based on the forecast level of capital expenditure required to allow AGC to meet forecast growth in demand for Tariffed Distribution Services. Augmentation of Tariff V Services is essentially rolled-in to the tariff, so that existing and Prospective Users will pay a common tariff based on the overall cost of existing and new assets.

Inclusion of augmentation in the AGC Access Undertaking does not represent an obligation on AGC to incur the capital expenditure. It does however amount to an obligation on AGC to deliver the service associated with the augmentation. This provides an incentive on AGC to look for cheaper ways of providing the required service, perhaps involving a reduced level of capital expenditure.

The capital expenditure assumed in the calculation of the target revenues for AGC is set out in table 6. These amounts only include augmentations covered by the tariffs for Tariffed Distribution Services.

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[2] Excludes land and buildings.

Table 6: Capital expenditure

	Year ending 31 December				
	1998	**1999**	**2000**	**2001**	**2002**
	$m	**$m**	**$m**	**$m**	**$m**
Mains	0.23	0.24	0.24	0.25	0.26
Connections	0.38	0.38	0.40	0.40	0.41
Meters - Domestic	0.13	0.14	0.14	0.14	0.14
Meters - Other	0.07	0.07	0.07	0.07	0.07
Equipment and vehicles	0.01	0.01	0.01	0.01	0.01
Total	**0.82**	**0.84**	**0.86**	**0.87**	**0.89**

Given the relatively young age profile of the Distribution System, there is no allowance for capital expenditure on Distribution Mains and Connections renewals.

(b)   Major capital expenditure projects

The capital expenditure, shown in table 6 above, forming part of the target revenue determination includes extensions and augmentations within 1 kilometre of AGC's existing distribution network as at 6 April 1998 for Tariff V Customers only.

No other major reticulation projects have been identified by AGC within the 1 kilometre regulated boundary for Tariff V Customers. The forecast capital expenditure within the 1 kilometre boundary as included in the target revenue calculation is based on estimated Customer growth rates rather than the identification of individual projects. However, examples of individual projects which form part of the capital expenditure are provided below in table 7:

Table 7: Major Capital Expenditure Projects

Project	Metres
1998	
Frensham Hill Stage 2	300
Eastern View Stage 7	300
Norris Park Stage 6	400
Pemberton Park	250
Dalbirra Estate	250
1999	
Dunn Crs Thurgoona	500
Norris Park Stage 5	84
University Close Stage 3.1	400
Urana Rd, Lavington	120
Eastern View Stage 10.3	300

(c)   Justification for capital expenditure

AGC has reviewed the planned capital expenditure against best industry practice by reference to the Victorian Gas Industry Access Arrangements Information dated 3 November 1997.

AGC considers the planned capital expenditure to be in accordance with accepted best industry practice.

The average forecast capital expenditure per new residential Customer is $1,596. Planned capital expenditures do produce sufficient revenue at the Reference Tariff to cover the investment.

The Reference Tariff would support an allowable investment per new residential Customer of $1,658.

2.7   Capital related component of target revenue

Having established asset values and the appropriate rate of return there are a number of options for constructing the depreciation schedule. The three options considered by AGC were:

•   nominal accounting method;

•   current cost accounting ("CCA") method (real return); and

•   real annuity method.

Each of these approaches produces an income stream that, when discounted at the appropriate WACC, produces an identical Net Present Value ("NPV"). The difference lies in the timing of the cash flows. The general pattern of each option is illustrated in figure 1 below.

Figure 1: Target revenue pattern under different methodologies
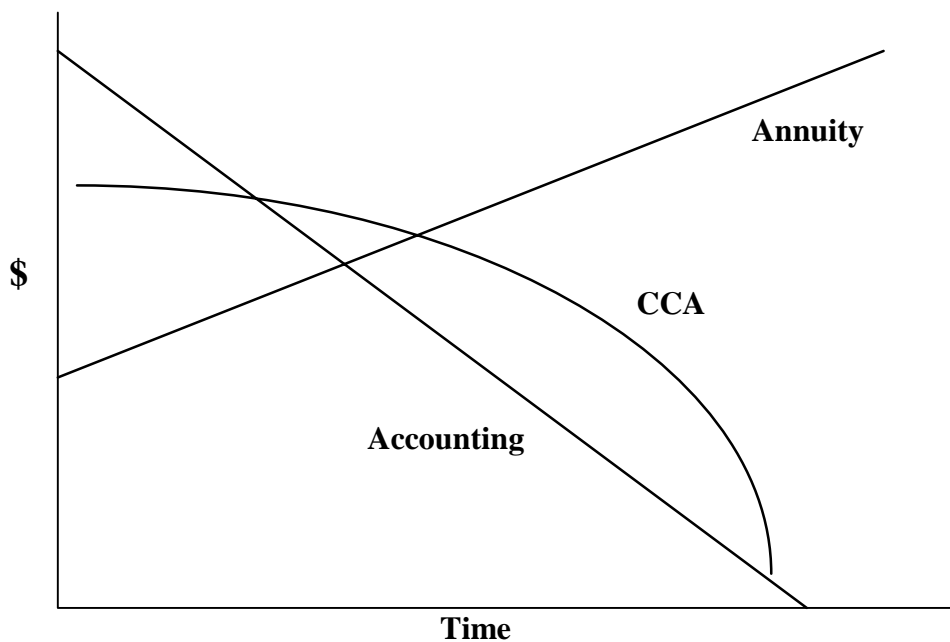
AGC considered that the CCA method represented a reasonable compromise between:

(1)   the economically "rational" annuity approach; and

(2)   the capital market preference for a front-ended income stream.

CCA is also a relatively straightforward method for the business and the Regulator and for monitoring by other interested parties. The CCA method adopted has two components:

(1)   depreciation = accounting charge $* (1 + CPI)^n$

(2)   return = written down value ("WDV") of assets $*$ real WACC

WDV of assets is determined as follows:

WDV of assets brought forward $* (1 + CPI)^n + 50\%$ of current year capex $* (1 + CPI)$

The 50% discount on current year capex is intended to provide for a pattern of expenditure throughout a year.

An explanation of how the depreciation and return on assets were calculated is summarised below:

(a)   Opening asset balances

Sections 2.2 and 2.3 provide details of the valuation of existing assets. In conducting their valuation of Distribution System assets, GHD also determined the remaining economic lives for each asset type. Economic life is the period over which it is reasonably expected that income may be earned from an asset. On occasion this may be less than technical life. Economic life rather than technical life is used in the calculation in order to allow for the full recovery of the asset value over its period of actual use.

(b)   Asset groupings

In calculating depreciation costs, assets were grouped by average RL and by asset class. The aggregation of assets and the weighted average remaining economic lives are shown in table 5.

(c)   Calculation

The depreciation costs were calculated using the asset groupings, valuation and RL shown in table 5.

A summary of the total depreciation costs included in the target revenue calculation is set out in table 8 below.

Table 8: Total Current Cost Depreciation

	Year ending 31 December				
	1998 **$m**	**1999** **$m**	**2000** **$m**	**2001** **$m**	**2002** **$m**
Mains and Connections	0.49	0.51	0.54	0.56	0.58
Meters - Domestic	0.00	0.01	0.02	0.02	0.03
Meters - Other	0.04	0.04	0.04	0.05	0.05
Equipment and vehicles	0.02	0.02	0.02	0.02	0.01
Total	**0.55**	**0.58**	**0.62**	**0.65**	**0.67**

2.8 Rate of return

(a) Approach taken

The rate of return to be applied to asset values set out above is calculated using a WACC approach. This calculates a weighted average of the cost of debt and the cost of equity, based on a commercially reasonable level of gearing for AGC. The WACC is based on the capital asset pricing model ("CAPM") adjusted for the effects of dividend imputation. Estimates for these variables are based on current levels set in capital markets. The appropriate capital structure and risk premia to be used in these calculations are derived by looking at comparable businesses in Australia and internationally.

The capital structure is derived in section 2.8(b) below. The return on equity is estimated in section 2.8(c). The cost of debt is estimated in section 2.8(d). Finally, the formula for calculating the WACC is described and applied in section 2.8(e).

(b) Capital structure

Gearing is defined as the ratio of debt to total capital, where debt and equity are defined as financial debt less cash, and the value of equity respectively.

Sixty percent (60%) has been chosen as the long term average gearing level. It should be noted that this is an estimated long term average. Initial gearing may be higher but trending down over time.

The long term average gearing level has been determined with reference to the gearing levels of a range of comparable entities throughout the world including Australia, Argentina, New Zealand, the United Kingdom and the United States. The key determinants of the chosen gearing were the levels observed in the privatised Victorian electricity distribution businesses, which exhibited significantly higher gearing levels than those traditionally observed elsewhere.

(c) Return on equity

The post-tax nominal return on equity (r_e) has been derived using the CAPM, which is defined as:

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

The inputs to the CAPM formula and the assumed values are given in the table 9 below.

Table 9: CAPM Inputs

Input	Definition	Value
r_f	Risk free rate of return	7.00%
$r_m - r_f$	Market risk premium	6.50%
β_e	Equity beta	0.89

(1)   Risk free rate

The ideal proxy for the risk free rate would be the yield on a default risk-free bond with the same maturity as the life of AGC's assets. In practice, however, the proxy for the risk free rate is usually defined as the annualised yield to maturity on the longest dated

Commonwealth Government bond (September 2009). At the close of trading on 1 January 1998, this yield was 6.11%. During the period from 27 October 1996 (when the bond was issued) to 1 January 1997, the bond's yield as at the close of trading, ranged from 5.91% to 8.31%.

However, the twelve year maturity of the September 2009 bond is likely to underestimate the true cost of longer term borrowings given that AGC's business comprises assets with lives substantially exceeding the longest dated Australian Commonwealth Bond (in most cases, relevant assets have an expected economic life of 30-60 years). Additionally, given the volatility of bond yields recently it is also considered appropriate to use a twelve month average bond yield as the basis for estimating the risk free rate. Given the positive slope in the yield curve, it is considered appropriate to build a small premium to the yield on the longest dated bond. US markets have consistently built a premium into longer dated bonds with 30 year Treasury notes trading, on average, 45 basis points over 10 year yields over the last five years.

Consequently a risk free rate of 7.0% has been chosen to best reflect these factors.

(2)   Market risk premium

The market risk premium ("MRP") is the rate of return above the risk free rate that an investor would expect to receive on a fully diversified equity portfolio. It is generally accepted within the corporate finance industry that the long run MRP is between 6% and 7%. Therefore, a MRP of 6.5% has been chosen.

(3)   Equity beta

Listed companies with comparable risk profiles provide a useful basis for estimating an equity beta for the entity under consideration. However, because the equity beta of a company will reflect both its business and financial risk an adjustment must be made to remove the effects of capital structure. This is known as "delevering" and is calculated as follows:

(A)   raw beta estimates are calculated for the range of comparable companies;

(B)   the beta of debt (β_d) is estimated by reverse-substitution of the cost of debt (derived below) and the risk free rate into the CAPM;

(C)   asset betas (β_a) are then calculated based on the following formula:

$$\beta_a = \beta_e \frac{E}{V} + \beta_d \frac{D}{V};$$

(D)   an industry average asset beta can then be estimated by averaging the point estimates for each company; and

(E)   again using the above formula the industry average asset beta can be "regeared" or "relevered" based on the financial structure of the company under consideration.

An asset beta of 0.45 has been chosen with reference to a number of local and international comparisons. Regearing the asset beta at a 60% debt level results in an equity beta of 0.89.

(d)   Cost of debt

The pre-tax nominal cost of debt has been derived by adding a risk premium to the assumed risk free rate of 7.0%. The risk premium has been determined by benchmarking the cost of debt for comparable companies, with an analysis of the appropriate credit rating.

The two major specialist credit ratings agencies are Standard and Poor's ("S&P") and Moody's. Given the similarity between the two systems this analysis has been restricted to S&P ratings.

The S&P system is divided into two broad ranges:

(1)   AAA to BBB which refers to investment grade debt; and

(2)   BB to D which indicates speculative grade debt.

Based on the similarities with the recently privatised Victorian electricity distribution businesses, existing infrastructure, expected stability of cashflows and the regulated nature of the Gas industry, it is assumed that AGC will be rated within the investment grade.

Both public and private debt comparisons suggest a debt margin of approximately 100 basis points for similarly rated debt in the current market. Adding this to the risk free rate derived above results in a total cost of debt of 8.00%.

(e)   WACC

Estimates derived in the preceding sections are summarised in table 10 below.

Table 10: WACC Inputs

Parameter	Definition	Value %
$\dfrac{E}{V}$	Long term proportion of equity funding	40.00
$\dfrac{D}{V}$	Long term proportion of debt funding	60.00
r_e	Post-tax nominal return on equity, pre-imputation	12.80
r_d	Nominal pre-tax cost of debt	8.00
T	Corporate tax rate	36.00
γ	Proportion of franking credits that are attributed value by shareholders	25.00

The benchmark WACC incorporates the effect of dividend imputation, rather than this being built into the cashflows. The imputation adjustment is designed to capture both the "pure" utilisation effect and the effect of the dividend payout ratio. Thus the imputation credit utilisation rate of 25% has been determined in anticipation of:

(1)   the expected ownership structure over the life of the AGC Access Undertaking taking into account current Government ownership and the Victorian Government's announced intention to privatise the Gas businesses it currently owns; and

(2)   a low dividend payout ratio relative to free cashflows.

The post-tax nominal WACC is defined as:

$$r_o^i = r_e \frac{(1-T)}{(1-T(1-\gamma))} \frac{E}{V} + r_d(1-T)\frac{D}{V}$$

Applying this formula with the above parameters gives a post-tax nominal WACC of 7.6%. This can be converted to other specifications as described below:

(1)   a pre-tax WACC is determined by "grossing up" the post tax WACC by a factor of (1- T); and

(2)   a real WACC is determined by applying the Fisher equation using the forecast inflation rate.

Assuming a constant inflation rate of 2% the WACC specifications set out in table 11 below can be derived.

Table 11: WACC Specifications

WACC Specification	Value
Post-Tax Nominal	7.6%
Post-Tax Real	5.5%
Pre-Tax Nominal	11.8%
Pre-Tax Real	9.6%

A pre-tax real rate of return of 9.6% is therefore applied to the assets valuation to calculate the return-on-capital element of the target revenue.

2.9   Operational costs

(a)   Approach taken

Initial forecasts of operational (ie non-capital) costs have been developed by AGC for the five years to 31 December 2002. AGC has realised operating efficiency savings which are reflected in the forecasts. These forecasts are described below.

(b)   O&M

Forecast O&M costs for the five years to 31 December 2002 are summarised in table 12 below. These amounts exclude costs relating to the provision of other distribution services described in clause 2.9(c) below. The O&M costs have been escalated at 2% and cost reduction factors have been applied to the various line items, resulting in a net escalation factor that is, on average, -2.2% per annum.

Table 12: Operating Expenses - (Direct/Indirect Breakdown)
Year ended 31 December

Total Costs	Allocation AGC %	Stratus %	1998 Amount $m	1999 Amount $m	2000 Amounts $m	2001 Amount $m	2002 Amount $m
Labour	100.00	0.00	0.36	0.34	0.34	0.35	0.36
Outside Services	100.00	0.00	0.06	0.06	0.06	0.06	0.06
Alliance Partners	100.00	0.00	0.12	0.12	0.12	0.12	0.13
Management Fee	3.70	96.30	0.20	0.20	0.20	0.20	0.20
Contracted Industry Services	4.11	95.89	0.33	0.34	0.32	0.31	0.29
Computer and Office Equipment	100.00	0.00	0.10	0.10	0.10	0.10	0.10
Materials	100.00	0.00	0.02	0.02	0.02	0.02	0.02
Other Distribution Services	100.00	0.00	0.12	0.12	0.12	0.12	0.12
Other Costs	100.00	0.00	0.17	0.14	0.14	0.13	0.10
Total Other Costs			0.94	0.93	0.90	0.87	0.83
Property Tax	100.00	0.00	0.06	0.06	0.06	0.06	0.06
Less Capitalised Labour and Overheads	100.00	0.00	(0.31)	(0.32)	(0.32)	(0.33)	(0.34)
Total Costs			**1.23**	**1.19**	**1.16**	**1.13**	**1.10**

With reference to table 12 above, further explanations of items are as follows:

(1)   The allocation of labour costs to Tariff V and Tariff D is as set out in table 13.

Table 13: Allocation of Labour Cost between Tariff V and Tariff D

	1998 Amount $m	1999 Amount $m	2000 Amount $m	2001 Amount $m	2002 Amount $m
Tariff V	0.35	0.33	0.33	0.34	0.35
Tariff D	0.01	0.01	0.01	0.01	0.01
Total	**0.36**	**0.34**	**0.34**	**0.35**	**0.36**

(2)   Outside services refers to the costs associated with the acquisition of services from Gas fitting contractors and general contractors.

(3)   Alliance partners refers to the cost of the outsourced maintenance function provided by AGC's alliance partner, Comdain.

(4)   Management fee refers to the charge for corporate support provided by Stratus to AGC.

(5) Contracted industry services include corrosion mitigation, meter testing and information technology services.

(6) Other distribution services means charges to AGC from Stratus for transportation of Gas from the Wodonga City Gate in Victoria across the Murray River to the AGC Distribution System.

(7) The overhead recovery amount capitalises certain expenses according to the level of capital expenditure incurred during the year.

(8) Property taxes include municipal rates, water rates and land tax.

(9) Total service provider costs at corporate level.

Details of the overhead and marketing costs included in O&M costs are as follows:

Table 14: Total Overhead and Marketing costs included in O&M Costs

Total Operating & Maintenance costs	Year ending 31 December ($m)				
	1998	1999	2000	2001	2002
Overhead costs	0.17	0.17	0.17	0.17	0.17
Marketing costs	0.03	0.03	0.03	0.03	0.03
Operational costs	0.96	0.93	0.89	0.86	0.83
Authorisation fee	0.07	0.06	0.07	0.07	0.07
Total Operating & Maintenance costs	**1.23**	**1.19**	**1.16**	**1.13**	**1.10**

The allocation of overhead costs between Tariff V and Tariff D is as set out in table 15.

Table 15: Allocation of Overhead Costs between Tariff V and Tariff D

	1998 Amount $m	1999 Amount $m	2000 Amount $m	2001 Amount $m	2002 Amount $m
Tariff V	0.17	0.17	0.17	0.17	0.17
Tariff D[3]	0.00	0.00	0.00	0.00	0.00
Total	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**

The allocation of marketing costs between Tariff V and Tariff D is as set out in table 16.

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[3] Total overhead costs allocated to Tariff D are less than $5000.

Table 16: Allocation of Marketing Costs between Tariff V and Tariff D

	1998 Amount $m	1999 Amount $m	2000 Amount $m	2001 Amount $m	2002 Amount $m
Tariff V	0.03	0.03	0.03	0.03	0.03
Tariff D[4]	0.00	0.00	0.00	0.00	0.00
Total	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**

The allocation of operational costs between Tariff V and Tariff D is as set out in table 17.

Table 17: Allocation of Operational Costs between Tariff V and Tariff D

	1998 Amount $m	1999 Amount $m	2000 Amount $m	2001 Amount $m	2002 Amount $m
Tariff V	0.93	0.90	0.86	0.84	0.81
Tariff D	0.03	0.03	0.03	0.02	0.02
Total	**0.96**	**0.93**	**0.89**	**0.86**	**0.83**

(c)   Costs relating to other services

AGC provides a number of services other than Tariffed Distribution Services including charges for disconnection, and relocation of Gas Distribution Mains and Connections, and has forecast revenue associated with these services. Table 18 summarises the forecast revenue. For the purposes of setting target revenue, AGC has excluded the operational costs associated with these services.

Table 18: Costs for Other Services

	Year ending 31 December				
	1998 $m	1999 $m	2000 $m	2001 $m	2002 $m
Revenue - Excluded Services (Tariff V)	0.06	0.07	0.07	0.07	0.07
Revenue - Excluded Services (Tariff D)[5]	0.01	0.01	0.01	0.01	0.01
Total	**0.07**	**0.08**	**0.08**	**0.08**	**0.08**

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[4] Total marketing costs allocated to Tariff D are less than $3000.

[5] Excluded services charges for O&M costs on Meter/Connection assets. For existing Tariff D customers, there are no capital costs since they have already been fully recovered by AGC.

(d)   Unaccounted for Gas

(1)   The estimated cost of unaccounted for Gas ("UAFG") has been allocated as follows:

   (A)   AGC has determined a benchmark (specified in table 19 below) for UAFG on the Distribution System and will be accountable for any deviations from this benchmark;

   (B)   as part of the Gas settlements process, persons using the Distribution System will automatically pay for UAFG (since all Gas taken at the Distribution Injection Point is paid for by those persons);

   (C)   therefore, at the end of each year, if overall UAFG is higher than the benchmark, AGC will be required to compensate Users for the UAFG that they paid for during the year over and above that benchmark; conversely, if the actual UAFG is below the benchmark, Users will pay the difference; and

   (D)   for the period of the AGC Access Undertaking, it will not be possible to meter exactly AGC's share of the overall UAFG on the entire system, and so an estimation algorithm will be used.

The estimated cost of UAFG has been allocated as follows:

Table 19: UAFG Benchmarks

Proposed benchmarks	Small Customers (<250,000 GJ p.a.)	Large Customers (>250,000 GJ p.a.)
	3.8%	0.1%

(2)   Methodology of UAFG benchmark

The installation of custody transfer metering, which will enable the measurement of the off-take of Gas from the TPA's transmission system and hence allow for a more precise measurement of UAFG, will not occur until May/June 1998 at the earliest. In light of this, the aggregate UAFG

has been determined according to the methodology described below.

   (A)   Leakage in GJ was calculated using parameters adopted by Gascor and endorsed by Gas Technology Ltd, ("GTL"). Rates adopted for estimating leakage from a High Pressure ("HP") system are $0.17m^3$/hr/km for steel pipe and $0.12m^3$/hr/km for PE pipe.

   (B)   According to GTL, leakage in a distribution system represents 44% of distribution UAFG, the balance being made up of metering error, pressure factor foregone, theft, temperature and pressure variations. The estimated leakage volume calculated according to (A) above was grossed up by the factor 2.247 (ie the inverse of 44.5%) to arrive at overall UAFG.

The results of these calculations are set out in table 20 below. Leakage from pipes is estimated at 8.9 TJ from PE and 13.6 TJ from steel. Total UAFG is obtained by grossing up the leakage component of UAFG (22.5 TJ) to derive a total of 50.6 TJ for AGC. The difference between this total and the leakage component, 28.1 TJ, is attributed to other UAFG sources such as pressure

factor foregone, as described in (B) above. Thus, the 50.6 TJ of UAFG, when related to issues of 2,834 TJ, results in an aggregate UAFG rate of 1.8% for AGC.

Table 20: Calculation of UAFG Volumes

Issues	Leakage	Leakage Steel	Other UAFG Sources	Total	UAFG
TJ	TJ	TJ	TJ	TJ	%
2,834	8.9	13.6	28.1	50.6	1.8

The allocations to the Customer groupings, based on the benchmark rates from table 19, are as follows:

Table 21: Allocation of UAFG to Customer Groupings

Customer Groupings	UAFG TJ
Small (< 250 TJ pa)	49.1
Large (> 250 TJ pa)	1.5
Total	50.6

It should be noted that UAFG has not been included in the volumes used to determine Distribution Tariffs, nor is the expected cost of UAFG included in the target revenue.

(e)   Regulated Costs

All costs directly incurred by AGC or allocated from Stratus Network are to be considered to be regulated. These costs relate to distribution activities only as opposed to retail authorities.

(f)   Fixed Versus Variable Costs

All costs are fixed in nature and do not vary with usage or throughput during the term of the AGC Access Undertaking.

2.10   Return on net working capital

As the net working capital throughout the year is forecast to be zero, no return on working capital has been included in the target revenue calculation.

2.11   Target revenue summary

Target revenues for the five year tariffing period are summarised in table 22 below.

Table 22: Target Revenue

Target Revenue	Year Ending 31 December				
	1998 $m	1999 $m	2000 $m	2001 $m	2002 $m
O&M Costs	1.23	1.19	1.16	1.13	1.10
Depreciation	0.55	0.58	0.62	0.65	0.67
Return on Assets	2.11	2.18	2.25	2.32	2.39
Total	**3.89**	**3.95**	**4.03**	**4.10**	**4.16**

2.12   Setting X

Target revenue figures are determined as above and supplied to the tariff setting process. Year 1 tariffs are determined by the process described in section 3.

X is initially a derived figure that represents the value that solves the following equation:

$$\text{NPV of } TR_{y1\text{-}5} = \text{NPV of } [RGJ_{y1} * V_{y1}$$
$$+ RGJ_{y1} * (1+CPI-X) * V_{y2}$$
$$+ RGJ_{y1} * (1+CPI-X)^2 * V_{y3}$$
$$+ RGJ_{y1} * (1+CPI-X)^3 * V_{y4}$$
$$+ RGJ_{y1} * (1+CPI-X)^4 * V_{y5}]$$

Where:

$TR_{y1\text{-}5}$ = Target Revenues for Years 1 to 5;

RGJ_{y1} = Average revenue per GJ of Gas consumed for Year 1;

V_{ya} = Forecast Gas consumption for Year a; and

CPI = the change in the Consumer Price Index which is assumed to be 2% per annum.

AGC has then considered the whole process of setting target revenue and the levels of productivity improvement built into the forecasts. In the context of this it has set X at a level that it judges represents best practice for a similar company including foreseeable improvements in best practice over the five year period.

X for AGC for the period ending 31 December 2002 has been set at 0.9%.

3. Cost allocation and tariff setting

3.1 Introduction

This section describes the basis upon which tariffs for Tariffed Distribution Services have been determined. A cost of service model has been adopted, that is, the tariffs have been designed to recover the target revenue as defined and calculated in the previous section, given the forecast utilisation of the various services. Utilisation forecasts are summarised in section 5 below.

The calculation of tariffs proceeds in four main stages which are summarised below.

(a)   The capital and operational costs related to system assets are divided into cost pools based on defined asset groups;

(b)   Customer groups are defined, based on consumption levels;

(c)   cost pools are allocated to Customer groups based on each Customer group's use of the corresponding asset groups; and

(d)   tariffs are structured and set to recover the target revenue allocated to that Customer group based on forecast utilisation.

These stages are described in more detail in the remaining parts of this section.

Tariffs are established for Year 1 (1998) only. In subsequent years, tariffs will be modified in accordance with the regulatory formula set out in schedule 1 of the AGC Access Undertaking.

3.2 Pricing principles and approach for Tariffed Distribution Services

(a) Consistency with NSW Access Code

It is a requirement that the developed tariffs are consistent with the requirements of the NSW Access Code. The objectives for a tariff, as stated in the NSW Access Code are in summary to:

(1)   provide AGC with a commercial sustainable revenue stream which is consistent with an appropriate return on capital base;

(2)   ensure safe and reliable Pipeline operation;

(3)   not distort investment decisions in Pipeline transportation systems, or in upstream or downstream industries; and

(4)   ensure that the level and structure of the Reference Tariff are efficient.

(b) Cost reflectivity

Costs of Distribution System assets and their operation are allocated to users wherever possible according to their use of those assets and the benefit received from their operation.

(c) Efficient pricing signals

The tariffs are structured to encourage desirable behaviour on the part of both AGC and users:

(1)   encouraging off-peak and discouraging peak Customer demand through the introduction of an off-peak discount to smooth load profile and optimise system utilisation;

(2)   encouraging efficient new investment decisions. The utilisation of the adjusted ODRC method for revenue determination, allows both a fair and reasonable profit to promote efficient growth of the system and encourages efficient location of Customer and Gas sources; and

(3)   encouraging continuous improvements in operational efficiencies by rewarding superior performance to pre-set benchmarks embedded in the tariff.

(d)   Recovery of allowed revenue

AGC will be subject to price cap regulation which will define the maximum prices it is allowed to apply to sales of Tariffed Distribution Services in a particular year. The price control regulation aims to allow AGC a reasonable return on assets, whilst providing tariff stability for users and incentives on its distribution business to improve operational efficiency.

The tariffs are designed to recover the allowed revenue or target revenue, based on forecasts of distribution service utilisation.

(e)   Price stability

As far as possible, the tariffed prices should be stable. That is, while they will change over time, they should not fluctuate capriciously. This is consistent with providing long-run pricing signals and does not prevent bilateral contracts in which charging parameters may fluctuate to a greater extent, reflecting short-run changes in circumstances.

(f)   Tariff equity

Public policy criteria were incorporated into the tariff design process to provide tariff equity and facilitate a smooth transition to a fully competitive market.

3.3   Cost allocation

(a)   Selection of Customer groups

The selection of Customer groups for distribution cost of supply ("DCOS") modelling purposes was based primarily on physical cost characteristics. Other important considerations included the likely final price structure, ease of Customer understanding and compatibility with contestability thresholds.

The Customer grouping adopted is shown in table 23 below. This grouping is an amalgamation of:

(1)   consumption bands (where no Maximum Hourly Quantity ("MHQ") metering is available); and

(2)   MHQ bands for Customers where MHQ metering is available.

Note that table 23 shows the Customer grouping (forecast Customer numbers are for the year ending at 30 June 1998) for calculation of the cost of supply only. The assignment of Customers to tariffs is discussed in section 3.4 below.

Table 23: DCOS Customer Groupings

Group	Group Description	Approximate Customer Numbers
V1	Less than 500 GJ per annum.	15 738
V2	500 to 2,000 GJ per annum	79
V3	2,000 to 5,000 GJ per annum	17
V4	5,000 to 7,000 GJ per annum	5
V5	7,000 to 10,000 GJ per annum	4
D1	Greater than 10,000 GJ per annum and less than 5 GJ MHQ	2
D2	Greater than 10,000 GJ per annum and 5 to 10 GJ MHQ	1
D3	10 to 50 GJ MHQ	4
D4	50 to 70 GJ MHQ	0
D5	70 to 200 GJ MHQ	0
D6	greater than 200 GJ MHQ	1

Grouping of Customers by MHQ characteristics is more cost reflective than consumption-based groupings. That is, MHQ is considered to be a better proxy for contribution to Distribution System cost. However, for most Customers, MHQ is not directly measured. An estimate of MHQ can be derived by applying an estimated load factor to each Customer's consumption. If one load factor assumption is made for all Customers using a particular Gas volume, then the MHQ grouping is identical to consumption based grouping.

The DCOS model allocates the full cost of supply for AGC to Customer groups. The full cost of supply is based on the unadjusted ODRC and comprises the following components:

(1)   return on Distribution System asset value;

(2)   depreciation of Distribution System asset value;

(3)   O&M expenses including charges for Pipeline services provided to AGC by other providers; and

(4)   administration costs.

These are discussed below.

(b)   Return on and depreciation of Distribution System assets

The return on assets and depreciation components of the target revenue are allocated to each asset category (Distribution Mains, Meters, and Connections).

For Distribution Mains, return on assets and depreciation is allocated to pipes (grouped by size) based on the ORC of those assets. Pipe costs are then allocated to Customer groups based on each group's MHQ and a model of pipe connectivity and peak Gas flow.

Costs associated with Connection assets are allocated to Customer groups based on the RC of a standard Connection configuration for that Customer group.

Costs associated with metering assets are allocated to Customer groups based on the RC of a standard metering configuration for that Customer group.

(c) Operating and maintenance costs

O&M costs are allocated to Distribution Mains, Meters and Connections cost pools based on AGC's estimated expenditure.

The Distribution Mains cost pool is allocated to pipes (grouped by size) based on the length of Distribution Mains in each asset group. Pipe costs are then allocated to Customer groups based on each group's MHQ and a model of pipe connectivity and peak Gas flow.

Costs associated with Connection assets are allocated to Customer groups based on the RC of a standard connection configuration for that Customer group.

Costs associated with metering assets are allocated to Customer groups based on the RC of a standard metering configuration for that Customer group.

(d) Administration costs

Administration costs are allocated to Distribution Mains, Meters and Connections cost pools on the basis of ORC. Administration cost pools are allocated to Customer groups on a weighted per-Customer basis.

3.4 Tariff design

(a) Tariff structure

The proposed Distribution Tariff regime consists of two tariffs:

(1)   Tariff V (volume tariff); and

(2)   Tariff D (MHQ demand tariff)

Tariff V consists of a fixed charge and 2 "rate blocks" for the Peak and Off-peak Periods. Tariff D consists of 3 MHQ rate blocks.

(b) Selection of a rate block structure

The DCOS model calculates a cost of supply for each Customer group.

For most Customers, only bi-monthly consumption is measured. The options for rate design for these Customers are limited to fixed charges and consumption based charges.

A multiple rate block structure, with the two tariff classes (see below) was chosen to:

(1)   minimise spurious behavioural signals that would arise with multiple tariff groups; and

(2)   minimise tariff assignment and transition rules.

(c) Tariff assignment

The "rate block" structure was chosen to minimise Customer group assignment issues. However, since two tariffs are proposed, an assignment between Tariff V and Tariff D is required. This section outlines the assignment rules in the AGC Access Undertaking.

All Customers will be assigned to Tariff V except where:

(1)   the Customer exceeds the Annual GJ Volume Limit;

(2)   the Customer exceeds the MHQ Demand Limit; or

(3)   the Customer elects to be assigned to Tariff D.

A Customer who exceeds either the Annual GJ Volume Limit or MHQ Demand Limit may, if AGC agrees, remain on Tariff V.

The Annual GJ Volume Limit is 10,000 GJ in any 12 month period. For a Customer with bi-monthly Meter readings, this means the last six bills, with the consumption pro-rated to a 365 Day period.

The MHQ Demand Limit is 10 GJ consumption in any hour. Where AGC assesses a Customer's MHQ to exceed 10 GJ, it can apply a datalogger to the Customer's Meter. Any single datalogger reading in excess of 10 GJ/h will be considered to exceed the demand limit.

Tariff D excludes a return on and of the capital cost of the Customer's Meter and Connection. The cost of Connections will be recovered via a Connection or local capacity charge. The basis of charging for metering and metering services will be regulated as part of the metering services specified in the AGC Access Undertaking.

Where an existing Tariff V Customer exceeds either the volume or demand limit, they will be subject to Tariff D for a minimum of one year.

Where a Tariff V Customer triggers the requirements for Tariff D, the Customer or the Customer's Retailer will be notified by AGC. Where the Customer prefers to remain on Tariff V, the Customer can remain on the GJ tariff only with the approval of AGC. (In most cases, the Customer would expect to pay less on Tariff D and would transfer to the less expensive tariff. For poor load factor Customers Tariff V may be less expensive than Tariff D. The requirement to gain AGC's approval to remain on Tariff V is included to protect AGC from very poor load factor Customers who would prefer to remain on the volume tariff).

Any Customer can elect to be subject to Tariff D, provided that they:

(1)   agree to pay for a Meter capable of recording their MHQ;

(2)   agree to pay a contribution to the capital cost of their Connection and Distribution Mains extension; and

(3)   agree to take or pay for a minimum MHQ of 1.15 GJ (equivalent to an annual consumption of 10,074 GJ at a 100% load factor).

(d)   Setting fixed charge level

The initial Tariff V fixed charge Tariff Component has been set at $0.07 per Day.

(e)   Setting the rate blocks

The DCOS model calculates an allocated target revenue for each Customer cost allocation group.

The following constraints were placed on the Tariff V and Tariff D rates:

(1)   each block rate must be less than or equal to the previous block rate (declining rate block structure); and

(2)   the number of rate blocks must be less than or equal to four (imposed to achieve the desired tariff simplicity).

Additionally, Tariff D rate blocks were set subject to the constraint that the minimum marginal MHQ rate per GJ is $50.

In addition, Tariff V rate blocks were set subject to the following constraints:

(1)   retail price outcomes on contestability meet the Victorian Government's guidelines of minimal price increases upon contestability;

(2)   to manage transition of Customers between Tariff V and Tariff D, a 10,000 GJ Customer at a 50% load factor would prefer Tariff D while a 5,000 GJ Customer at 50% load factor would prefer Tariff V;

(3)   a maximum differential between peak and off-peak rates of $0.50/GJ; and

(4)   a minimum marginal rate of $0.55/GJ.

(f)   Setting the peak and off-peak rates

The backbone of the Distribution System is designed to supply Gas at the time of the system peak. At other times the Distribution System is relatively under-utilised.

An off-peak distribution discount is introduced for Tariff V Customers with consumption in excess of 1.4 GJ per Day, in the Distribution Tariffs to improve system utilisation and to manage retail price stability on contestability.

Through consultation with representatives of AGC, the maximum long-run seasonal cost differential was estimated to be of the order of 15% of total distribution costs.

The off-peak discount for Distribution Tariffs was set by:

(1)   estimating the portion of distribution costs that are driven by seasonal load; and

(2)   examining retail price implications on contestability of the Distribution Tariff off-peak discount.

The resulting differential is used to set the distribution target seasonal differential that is included in the rate block constraints discussed above.

3.5   Cost allocation summary diagram

The cost allocation summary diagram in appendix 4 shows:

- full cost of supply allocation (in Access Undertaking Information cost pools) to areas and tariff groups; and

- revenue recovered by tariff.

3.6   Basis of charging

In general, Distribution Tariffs are charged by AGC to the Retailer associated with a Customer. Where there is no Retailer associated with an end-use Customer, AGC will bill the Customer directly for Tariffed Distribution Services.

(a)   Tariff V

Tariff V is charged on metered volumes at each Customer's Distribution Supply Point.

Almost all Tariff V Customers' Meters are currently read on a bi-monthly basis. The charges are expressed as daily rates and must be multiplied by the number of Days in the billing period to calculate the bi-monthly charge.

The Peak Period tariff applies to Gas consumed between 1 June and 30 September. Where a billing period includes both the Peak and Off-peak Periods, the consumption is pro-rated based on the number of Days in the billing period that fall in each of the Peak and Off-peak Periods.

Table 24 shows a billing example for a Tariff V Customer.

Table 24: Tariff V Billing Example

| | Quantities | | | Peak | Off-peak | Total |
	Peak	Off-peak	Total	$	$	$
Fixed Charge @ $0.07 per day (days)	30	17	47	2.10	1.19	3.29
First 1.4 GJ per day (GJ)	42.00	23.80	65.80	172.20	97.58	269.78
Balance (GJ)	21.84	12.36	34.20	44.55	19.03	63.59
Total	**63.84**	**36.16**	**100.00**	**218.85**	**117.80**	**336.66**

The average daily consumption over the 47 Day period is 2.128 GJ consumed over 30 peak Days and 17 off-peak Days.

In the Peak Period, there are 30 Days where 1.4 GJ per Day is charged at $4.10, totalling $172.20. The balance (2.128 GJ less 1.4 GJ equals 0.728 GJ per Day) is charged at $2.04 per GJ per Day, totalling $44.55.

Similar calculations are done for the 17 off-peak Days at off-peak rates.

It is a simplifying assumption that the same quantum of gigajoules are consumed each Day. This is necessary due to metering technology being confined to either monthly or two monthly reads.

(b)   Tariff D

Tariff D is charged on the single maximum hourly consumption metered in a calendar year. This metered quantity is applied to the rate set out in the AGC Access Undertaking to calculate the charge. Unlike current retail contracts, this distribution charge is based on actual metered demand rather than a negotiated contract quantity.

Users will be initially charged for each Customer on the basis of last years' peak MHQ or, in the case of new Customers, a negotiated rate. Where a Customer exceeds the previous maximum, future months' bills will be adjusted to recover the additional revenue.

Table 25 shows the monthly re-calculation working for a Customer who exceeds the previous year's demand. The example uses a simplified tariff of $1,200 per GJ MHQ. Last year's peak for this Customer was 10 GJ MHQ.

Where a Customer does not reach the estimated peak by September, bills will be reduced to reflect the actual metered MHQ. The re-calculation for this scenario is presented in table 26.

Note that Tariff D only applies to existing Distribution Mains. Any extension, augmentation or other specific facilities are subject to separate charges. As such, new investment need not be recovered based on the single MHQ. Typically such new investment would be subject to a contract between AGC and Retailer (or end use Customers).

Table 25: Tariff D Billing Example One

Months	Metered Quantity	MHQ Assumption (a)	Annual Bill Assumption (b)=(a)*1,200	Paid to Date $(c_n)=(c_{n-1})+(f_{n-1})$	To Pay (d)=(b)-(c)	Months to Bill (e)	Bill (f)=(d)/(e)
	GJ	GJ	$	$	$		$
Jan	4	10	12,000	0	12,000	12	1,000
Feb	8	10	12,000	1,000	11,000	11	1,000
Mar	10	10	12,000	2,000	10,000	10	1,000
Apr	12	12	14,400	3,000	11,400	9	1,267
May	10	12	14,400	4,267	10,133	8	1,267
Jun	8	12	14,400	5,533	8,867	7	1,267
Jul	14	14	16,800	6,800	10,000	6	1,667
Aug	10	14	16,800	8,467	8,333	5	1,667
Sept	8	14	16,800	10,133	6,667	4	1,667
Oct	15	15	18,000	11,800	6,200	3	2,067
Nov	6	15	18,000	13,867	4,133	2	2,067
Dec	7	15	18,000	15,933	2,067	1	2,067
Total							18,000

Table 26: Tariff D Billing Example Two

Months	Metered Quantity	MHQ Assumption (a)	Bill Assumption (b)=(a)*1,200	Paid $(c_n)=(c_{n-1})+(f_{n-1})$	To Pay (d)=(b)-(c)	Months to Bill (e)	Bill (f)=(d)/(e)
	GJ	GJ	$	$	$		$
Jan	4	10	12,000	0	12,000	12	1,000
Feb	8	10	12,000	1,000	11,000	11	1,000
Ma	7	10	12,000	2,000	10,000	10	1,000
Apr	8	10	12,000	3,000	9,000	9	1,000
May	8	10	12,000	4,000	8,000	8	1,000
Jun	7	10	12,000	5,000	7,000	7	1,000
Jul	9	10	12,000	6,000	6,000	6	1,000
Aug	4	10	12,000	7,000	5,000	5	1,000
Sep	6	9	10,800	8,000	2,800	4	700
Oct	9	9	10,800	8,700	2,100	3	700
Nov	6	9	10,800	9,400	1,400	2	700
Dec	7	9	10,800	10,100	700	1	700
Total							10,800

4. Tariff path and incentive structure

4.1 Introduction

This section explains the considerations that led to adoption of the regulatory price cap regime . It also describes the incentive structure built into the price cap regime and the effects it is intended to encourage. The price cap regime is set out in schedule 1 of the AGC Access Undertaking.

4.2 Regulatory objectives and assessment criteria

In selecting a price cap method AGC has given consideration to the following objectives:

(1) to encourage the use of Gas where it is economically efficient to do so;

(2) to develop a competitive market at all levels of the Gas industry, where this is possible;

(3) to design regulatory structures in monopoly areas that:

(A) protect Customers against monopolistic exploitation; and at the same time

(B) provide incentives to the owners of monopoly assets to use them efficiently for the benefit of the market as a whole;

(4) to prevent a party, at any level, from acting to prevent the emergence of competitive forces at its own, or any other, level;

(5) to protect the interests of consumers of Gas; and

(6) to provide ease of regulation and consistency with the NSW Access Code.

4.3 Incentive

With asset related costs (including return) representing around 68% of target revenue, asset efficiency is clearly the most important issue to address in the incentive structure.

The price cap regime provides an incentive mechanism designed to deliver the following objectives:

(a) Reduce O&M expenditure below that forecast.

(b) Reduce the level of capital expenditure below that forecast. These reductions can only occur to the extent that AGC can do so while maintaining forecast volume and relevant safety standards, and to the extent that they are commensurate with AGC's objective to undertake prudent investment.

(c) Increase total volumes of Gas transported without inefficient augmentation of the Distribution System.

(d) The volume incentives in turn provide AGC with an incentive to actively facilitate the marketing of Gas as a fuel source and it may choose to actively market its capacity itself. Alternatively, in the absence of a volume related incentive, AGC could fail to facilitate the marketing of Gas thereby undermining achievement of the objective of a competitive and dynamic Gas market.

(e) To ensure Users and Prospective Users gain from the increased efficiency, innovation and volume of sales.

5. System capacity and volume assumptions

5.1 System capabilities

(a) Description of system capabilities

The Distribution System comprises approximately 325 km of underground pipes in the New South Wales towns of Albury, Jindera and Moama.

The capacity of the Distribution System is designed to meet peak requirements on the heaviest hour of Gas demand in winter when Gas heating load is greatest.

The Distribution System comprises two connected systems as follows:

(1)   transmission trunk lines, up to 2800 kPa; and

(2)   a high pressure system operating between 140 - 515 kPa;

System pressure between the Victorian transmission system and the Distribution System is controlled via regulator stations. These stations contain multiple regulator/valve combinations which have the capacity to control flow and protect downstream equipment via shut off facilities. Control of the regulator/valves is available via remote terminal units ("RTUs") which are strategically located via the network as part of a SCADA system which also facilitates information from these sites to be recorded and sent to the control centre.

(b) Distribution system capacity data

The current capacity of AGC's Distribution Mains is described in table 27 below in terms of MHQ (746 GJ). A further dissection of the Distribution System in terms of diameter and associated lengths is to be found in appendix 3.

Table 27: System Capacity Data

	Current Average Daily Quantity (GJ)	Current Maximum Daily Quantity (GJ)	Current Maximum Hourly Quantity (GJ)
Tariff V Domestic	1,704	4,443	317
Tariff V Commercial and Industrial	764	1,550	97
Tariff D	5,178	6,367	332

5.2 Forecast distribution utilisation for AGC

(a) Forecast volumes delivered (GJ)

Forecast volumes delivered for Tariff V and Tariff D Customers are set out in table 28 below.

Table 28: Tariff V and Tariff D Forecast Volumes (GJ)

| | Year Ending 31 December | | | | |
	1998	1999	2000	2001	2002
Tariff V Domestic	646,760	664,072	680,904	697,208	702,709
Tariff V Commercial and Industrial	251,708	256,053	260,468	264,905	266,377
Tariff D	1,935,326	1,935,326	1,935,326	1,935,326	1,935,326
Total	**2,833,794**	**2,855,451**	**2,876,698**	**2,897,439**	**2,904,412**

The forecast of Gas volumes used to determine the tariffs is based upon a forecast developed by GASCOR (the "March '97 Forecast").

The March '97 Forecast provides forecast volumes of Gas for general tariff Customers and contract Customers. General tariff Customers are assumed to be non daily metered, Tariff V Customers. Contract Customers are assumed to be daily metered, Tariff D Customers.

All forecasts are allocated to postcodes, so volumes can be accurately allocated.

The March '97 Forecast has been produced for general tariff and contract Customers. General tariff Customers can be divided into three broad groups, ie residential, contract and commercial/industrial:

(1) Residential

Demand is driven by the number of Meters and the average consumption per Meter.

Meter forecasts are based on existing numbers of Meters, plus new Gas homes, conversions and reclassifications, less removals.

Forecast average consumption per Meter differs for new Meters and existing Gas homes:

(A) For new Meters in existing reticulated postcodes the new Meter was given the average consumption of the relevant postcode. For newly reticulated postcodes the average consumption was based upon studies produced for each new reticulation. Consideration on these studies resulted in average consumption of 35 GJ pa being assumed for year 1.

(B) Average consumption for existing Gas homes is based upon historical data. Data is weather adjusted and the average consumption and the growth in average consumption is derived.

(2) Contract markets

Annual forecasts for 5 years and monthly forecasts for one year were completed by Customer survey.

Preliminary forecasts based on historical data were completed by GASCOR and reviewed after consideration of survey results and feedback from sales consultants.

(3) Commercial and industrial general markets

As for the residential market, demand is driven by the number of Meters and the average consumption per Meter.

Meter growth is based upon recent historical trends

Average consumption per Meter is assumed to grow by 0.75% for the commercial general market, and negligible growth for the industrial market, based upon recent historical trends.

(b)   Forecast Customer numbers

Forecast Customer numbers for Tariff V and Tariff D Customers are set out in table 29 below.

Table 29: Forecast Customer Numbers

	Year Ending 31 December				
	1998	**1999**	**2000**	**2001**	**2002**
Tariff V Domestic	15,114	15,498	15,855	16,187	16,516
Tariff V Commercial and Industrial	729	751	773	795	814
Tariff D	8	8	8	8	8
Total	**15,851**	**16,257**	**16,636**	**16,990**	**17,338**

(c)   Tariff V consumption by rate block

The forecast consumption (TJ) by rate block used for setting the initial level of Tariff V components is set out in table 30 below.

Table 30: Tariff V Consumption by Rate Block

Tariff V Rate Block (GJ/day)	**Peak Volume (TJ)**	**Off Peak Volume (TJ)**
>0 - 1.4	378	378
>1.4	62	80
Total	**440**	**458**

(d)   Tariff D demand by rate block

The forecast MHQ (GJ) by rate block used for setting the initial level of Tariff D components is set out in table 31 below.

Table 31: Tariff D Forecast MHQ Demand by Rate Block

Tariff D Rate Block (GJ MHQ)	**MHQ (GJ)**
>0 - 10	14.6
>10 - 50	97.1
>50	220.0
Total	**331.7**

(e)   Distribution System Load Profile

As described in section 3.4, the monthly Gas volumes were not required for use in the tariff design as rates for Tariff V Customers are based on peak and off-peak volumes. Tariffs for Tariff D

6. Performance indicators

6.1 Introduction

(a) Objectives of providing KPIs

The objectives of providing the KPIs as set out in this section are as follows:

(1)   to allow interested parties to confirm that operational costs included in the target revenue are reasonable when compared to costs in other Australian Gas utilities;

(2)   to confirm the overall reasonableness of the revenue and tariff setting approach by comparison of the proposed tariffs with comparable rates proposed by AGL in its recent distribution network access undertaking; and

(3)   to compare input variables used in the derivation of the capital cost element of the target revenue with equivalent variables used by AGL in its access undertaking;

(b) Data sourcing issues

The level of detail of the comparative analysis of KPIs included in this section has been restricted by the availability of relevant and up-to-date information. Particular problems are that:

(1)   industry restructuring in the Australian Gas industry has led to a decrease in publicly available information in recent years;

(2)   different approaches to restructuring - and, particularly, the unique industry structure being adopted in Victoria - has made it difficult to compare like with like in respect of the scope of costs and tariffs;

(3)   creation of new distribution and retail companies out of GASCOR makes it difficult to compare historical costs of GASCOR with forecast costs of AGC .

As a result, the figures presented here are at a high level. It is anticipated that further benchmarking work will be undertaken during the consultation process.

(c) Context of KPIs in revenue and tariff setting

It should be stressed that AGC has not relied on KPIs in *setting* distribution revenues and tariffs. As explained in the preceding sections, AGC has used independent experts at each stage of the revenue calculation - setting asset value and cost of capital - who have used their experience and knowledge to ensure that each element of the target revenue is consistent with international good industry practice. This is considered to be the best approach to ensure that the target revenue as a whole - and hence tariffs - are competitive and realistic.

Therefore, the KPI comparisons presented here are not intended to justify or explain the proposed revenues and tariffs, but rather to allow meaningful comparisons of AGC's cost and revenue forecasts by the Regulator and Prospective Users.

6.2 Operational costs

Table 33 below compares O&M costs of AGC against those of other Australian Gas distribution companies. This data is drawn from the IPART determination on AGL's access undertaking and also the Australian Gas Association 1997 statistics. All cost information is in 1997/98 dollars, except Multinet and Westar information, which is in 1998 dollars.

Table 33: Comparable Operational KPIs

Company	AGC	Alinta	AGL	Envestra	Envestra	Westar	Multinet
State	N.S.W.	W.A.	N.S.W	S.A.	QLD	VIC	VIC
Year	97/98	95/96	95/96	96/97	96/97	1998	1998
$m	1.2	48.5	167.9	40.5	11.3	38.5	46.2
$m/1000 km	4.06	5.06	8.67	6.44	6.28	5.33	5.30
$/customer	78	133	250	126	158	93	79
$/GJ	0.44	1.03	1.78	1.00	3.14	0.54	0.79

Table 34 below shows the forecast O&M costs for the five years to 2002 that are factored into the target revenue.

Table 34: AGC Operational KPIs

	1998	1999	2000	2001	2002
$m	1.23	1.19	1.16	1.13	1.10
$m/1000 km	3.93	3.72	3.56	3.39	3.23
$/customer number	77.63	73.23	70.00	66.69	63.56
$m/GJ	0.43	0.42	0.40	0.39	0.38

6.3 Comparisons between AGC and AGL distribution tariffs

Table 35 below provides a comparison of the tariffs applicable under AGL's undertaking versus those applicable for the AGC distribution business. AGL information is drawn from their May 1997 draft access undertaking.

Table 35: Comparison of Distribution Tariffs

Including Trunk Costs ($/GJ actual)	10,000 GJ/year Customer	100,000 GJ/year Customer	1,000,000 GJ/year Customer
AGL Delivery Points			
Horsely Park	0.552	0.412	0.361
Auburn	0.798	0.621	0.555
Flemington	0.888	0.697	0.625
Mortlake	1.555	1.261	1.149
Haberfield	1.268	1.019	0.924
Tempe	1.161	0.928	0.840
Mascot	1.375	1.109	1.008
Willoughby	4.471	3.729	3.441
AGC Charges	0.669	0.369	0.047

Various assumptions have been made to try to present AGL and AGC tariffs on a comparable basis and these are listed below. A varied sample of offtake points in the Sydney region has been chosen to indicate the spread of prices. In general the lower prices represent those locations in western Sydney that are close to the trunk line.

Assumptions made are as follows:

(a)   the AGL transitional component is not relevant for comparison purposes;

(b)   typical customers of 10,000 GJ, 100,000 GJ and 1,000,000 GJ per annum have MHQs of 5, 50 and 200 GJ respectively;

(c)   the typical customers on the AGL and AGC systems require Meters for which they make annual O&M payments of $1,000, $3,000 and $6,000 respectively; and

(d)   AGL tariffs are calculated inclusive of trunk charges for the Sydney region only.

6.4   Input variables to target revenue calculation

Table 36 below shows the key input variables used in calculating target revenue for AGC, compared to the final range used in AGL's undertaking.

Table 36: Comparison of AGC WACC

Variable	AGC	IPART lower	IPART upper	Great Southern
Pre-tax WACC	11.8%	12.50%	13.50%	14.18%
Post-tax WACC	7.6%	8.00%	8.64%	-
Risk Free Rate	7.00%	7.68%	8.30%	8.83%
Market Risk Premium	6.50%	7.00%	7.00%	6.50% - 7.00%
Equity Beta	0.89	0.64	0.88	1.01 - 1.13
Gearing	60%	40%	60%	60%
Imputation Credit Utilisation	25%	50%	21%	15% - 21%

The IPART lower and upper WACC range is as per the AGL determination dated May 1997.

Appendix 1

Categories of information to be disclosed by AGC to interested parties as part of the Access Undertaking Information

Category in NSW Access Code	Clause Reference in AGC Access Undertaking Information
Category 1: Information regarding Access & Pricing Principles	
Tariff determination methodology	3
Cost allocation approach	3.3
Incentive structures	4.1/4.2/4.3
Category 2: Information regarding Capital Costs	
Asset values for each pricing zone, service or category of asset	2.2/2.3/2.4
Information as to asset valuation methodologies - historical cost or asset valuation	2.1/2.2
Assumptions on life of asset for depreciation	2.2(d)(4)
Depreciation	2.7
Accumulated depreciation	2.7
Committed capital works and capital investment	2.6
Description of nature and justification for planned capital investment	2.6
Rates of return - on equity and on debt	2.8
Capital structure - debt/equity split assumed	2.8(b)
Equity returns assumed - variables used in derivation	2.8(c)
Debt costs assumed - variables used in derivation	2.8(d)
Category 3: Information regarding Operations & Maintenance	
Fixed versus variable costs	2.9(f)
Cost allocation between zones, services or categories of asset & between regulated/ unregulated	2.9/3.3
Wages & Salaries - by pricing zone, service or category of asset	2.9/3.3
Cost of services by others including rental equipment	2.9
Gas used in operations - unaccounted for gas to be separated from compressor fuel	2.9(d)
Materials & supply	2.9
Property taxes	2.9

Category in NSW Access Code	Clause Reference in AGC Access Undertaking Information
Category 4: Information regarding Overheads & Marketing Costs	
Total service provider costs at corporate level	2.9
Allocation of costs between regulated/unregulated segments	2.9
Allocation of costs between particular zones, services or categories of asset	3.3
Category 5: Information regarding System Capacity & Volume Assumptions	
Description of system capabilities	5.1
Map of piping system - pipe sizes, distances and maximum delivery capability	appendix 3
Average daily and peak demand at "city gates" defined by volume and pressure	5.1
Total annual volume delivered - existing term and expected future volumes	5.2(a)
Annual volume across each pricing zone, service or category of asset	5.2(a)
System load profile by month in each pricing zone, service or category of asset	5.2(e)
Total number of customers in each pricing zone, service or category of asset	5.2(b)
Category 6: Information regarding Key Performance Indicators	
Industry KPIs used by regulator to assess "reasonably incurred" costs	6.3/6.4
Service provider's KPIs for each pricing zone, service or category of asset	6.2

Appendix 2

List of Acronyms and Abbreviations

CAPM	Capital Asset Pricing Model
CCA	Current Cost Accounting
DCOS	Distribution Cost of Supply
DRC	Depreciated Replacement Cost
EPD	Energy Projects Division of Department of Treasury and Finance, Government of Victoria
GFCV	Gas and Fuel Corporation of Victoria
GHD	Gutteridge, Haskins & Davey
GJ	Gigajoules
HP	High Pressure
KPIs	Key Performance Indicators
MEE	Modern Engineering Equivalent
MHQ	Maximum Hourly Quantity
MRP	Market Risk Premium
NIEIR	National Institute of Economic and Industrial Research
NPV	Net Present Value
O&M	Operating and Maintenance
ODRC	Optimised Depreciated Replacement Cost
ORC	Optimised Replacement Cost
PE	Polyethylene
RC	Replacement Cost
RL	Remaining Life
ROA	Return On Assets
RTU	Remote Terminal Unit
SCADA	System Control and Data Acquisition
SEL	Standard Economic Life
SRC	Standard Replacement Cost
TJ	Terajoules
UAFG	Unaccounted For Gas
WACC	Weighted Average Cost of Capital

Appendix 3

Description of Distribution System

The Distribution System is described by reference to:

(a)   the summary maps included in the Access Undertaking; and

(b)   the following Distribution System profile:

Distribution System Profile

System Profile as at 30 June 1997		
Pressure	**Diameter (mm)**	**Length (km)**
H	25	1.008
H	40	98.366
H	50	141.147
H	80	1.435
H	100	28.896
H	110	10.113
H	150	17.642
H	200	25.478
H	300	0.914
Total		**325.000**

Numbers in parntheses refer to allocation notes below

Mains [4]	
Tariff V	1.28
Tariff D	0.07
	1.35

Return on Assets [1]	
Mains	1.35
Meters	0.25
Connections	0.81
	2.41

Meters [5]	
Tariff V	0.25
	0.25

Services [5]	
Tariff V	0.81
	0.81

Albury	
Return on Investment	2.41
Depreciation	0.69
Operations	1.23
	4.33

Mains [4]	
Tariff V	0.22
Tariff D	0.01
	0.23

Depreciation [2]	
Mains	0.23
Meters	0.04
Connections	0.42
	0.69

Meters [5]	
Tariff V	0.04
	0.04

Services [5]	
Tariff V	0.42
	0.42

	Allocation to Tariff Groups	Revenue Recovered
Tariff V		
Group V1	3.77	3.34
Group V2	0.18	0.18
Group V3	0.12	0.12
Group V4	0.06	0.04
Group V5	0.07	0.07
	4.20	3.75

Mains [6]	
Tariff V	0.68
Tariff D	0.04
	0.72

O&M Costs [3]	
Mains	0.72
Meters	0.33
Connections	0.18
	1.23

Meters [7]	
Tariff V	0.33
Excluded	0.00
	0.33

Services [7]	
Tariff V	0.17
Excluded	0.01
	0.18

	Allocation to Tariff Groups	Revenue Recovered
Tariff D		
Group D1	0.04	0.01
Group D2	0.01	0.01
Group D3	0.05	0.08
Group D4	0.00	0.00
Group D5	0.00	0.00
Group D6	0.00	0.00
Group D7	0.02	0.04
	0.12	0.14

Excluded	0.01	0.00

Albury	
Return on Investment	2.41
Depreciation	0.69
Operations	1.23
	4.33

Albury	
Mains	2.30
Meters	0.62
Connections	1.41
	4.33

Albury	
Tariff V	4.20
Tariff D	0.12
Excluded	0.01
	4.33

Albury	Allocation to Tariff Groups	Revenue Recovered
Tariff V	4.20	3.75
Tariff D	0.12	0.14
Excluded	0.01	0.00
	4.33	3.89

Cost allocation summary diagram

General notes on the cost allocation summary diagram are:

(1)   Figures are in millions of dollars.

(2)   The allocated target revenue is based on the full cost of supply, before reductions for the public policy constraints. Assets were subsequently permanently written down and a lower target revenue calculated and consequently, Tariff V does not recover the allocated full cost of supply.

Allocation Notes

(1)   Return On Assets ("ROA") is allocated to Distribution Mains, Meters, and Connections based on ODRC value.

(2)   Depreciation is allocated to Distribution Mains, Meters and Connections based on ODRC depreciation.

(3)   O&M costs are allocated to Distribution Mains, Meters and Connections based on the business' estimated expenditure. Administration costs are allocated to Distribution Mains, Meters and Connections based on ORC value.

(4)   Mains ROA and depreciation costs are allocated to asset groups based on ORC. Asset group costs are allocated to Customer groups based on MHQ and a pipe connectivity model.

(5)   Meters and Connections ROA and depreciation area costs are allocated to asset groups based on ORC. Asset group costs are allocated to Customer groups based on the RC of a standardised connection. No costs are allocated to Tariff D Customer groups; assets serving Tariff D Customers are excluded from the ODRC valuation.

(6)   Mains O&M costs are allocated to asset groups based on ORC. Asset group costs are allocated to Customer groups based on MHQ and model pipe connectivity and peak Gas flow. Administration costs are allocated to Customer groups based on weighted Customer numbers. The cost of charges for Pipeline services provided to AGC are allocated to Customer groups based on MHQ.

(7)   Meters and Connections O&M costs are allocated to asset groups based on ORC. Asset group costs are allocated to Customer groups based on the RC of a standardised Connection. Costs are allocated to Tariff D Customer groups but are not recovered by Tariff D (but are recovered in the manner outlined in section 3.4).