DRAFT DECISION

Access Arrangement

for

AGL Gas Company (ACT) Limited

and

AGL Gas Networks Limited

Natural Gas System

in ACT, Queanbeyan and Yarrowlumla

March 2000

INDEPENDENT PRICING AND REGULATORY COMMISSION

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Submissions
Public involvement is an important element of the Commission's processes. The Commission 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 IPARC 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 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 Commission's offices immediately after registration by the Commission.

The Commission is headed by:

Mr Paul Baxter

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Submissions on this Draft Decision should be received no later than 7 April 2000.

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Foreword

This is the Commission's draft decision on the proposed Access Arrangement submitted by AGL Gas Company (ACT) Limited and AGL Gas Networks Limited (collectively AGL(ACT)) for the natural gas distribution system in the ACT, Queanbeyan and Yarrowlumla. The Commission has made its decision under the National Third Party Access Code for Natural Gas Pipeline Systems (the Code). As well as considering submissions from AGL(ACT) and other interested parties, the Commission has held a public hearing on the proposed Access Arrangement.

In assessing the proposed Access Arrangement submitted by AGL(ACT), the Commission has applied the Code. The Commission has decided to not accept the proposed Access Arrangement as submitted. The Commission requires AGL(ACT) to revise its Access Arrangement in respect of matters relating to revenue and price outcomes, non-price terms, and conditions for access.

The Commission does not accept the initial capital base proposed by AGL(ACT) nor the rate of return underpinning the annual revenue requirement and resultant prices proposed in AGL(ACT)'s Access Arrangement. Furthermore, the Commission believes AGL(ACT)'s non capital cost projections are too high and should be revised downward.

The Commission has formed its views on AGL(ACT)'s proposed Access Arrangement on the basis of careful analysis of those arrangements, the Code and the various submissions made. The Commission has also considered the extensive economic and financial analysis undertaken by the Independent Pricing and Regulatory Tribunal of NSW (IPART) in reaching its draft decision on AGL Gas Networks Limited, including work undertaken by consultants engaged by IPART. This work has covered operating expenditure, capital expenditure, rate of return, the initial asset base, and depreciation.

The revenue caps proposed by the Commission in this draft decision will bring a real reduction in network revenues of over 10 per cent over the period 2000-2004. This compares with the real increase of 6.2 per cent sought by AGL(ACT) in its proposed Access Arrangement. Network charges will fall by over 18.4 per cent (constant prices) for both contract and tariff customers under the draft decision, compared with a fall of 3.9 per cent under the AGL(ACT) proposal over the period 2000-2004.

The Commission welcomes submissions in response to this draft decision.

Paul Baxter
Commissioner
March 2000

PART I

DRAFT DECISION

EXECUTIVE SUMMARY

DRAFT DECISION

The Independent Pricing and Regulatory Commission (the Commission) considers that AGL(ACT)'s proposed Access Arrangement does not satisfy all the elements and principles set out in sections 3.1 to 3.20 of the National Third Party Access Code for Natural Gas Pipeline Systems (the Code). The Commission's assessment is based on information provided by AGL(ACT) and submissions received from interested parties.

Under section 2.16(b) of the Code, the Commission decides not to approve AGL(ACT)'s proposed Access Arrangement. The amendments (or the nature of the amendments) which would have to be made to the Access Arrangement in order for the Commission to approve it are listed below, 'Summary list of required amendments'.

In addition, the Commission requires AGL(ACT) to provide the information listed below, 'Summary list of information requirements' to assist the Commission in assessing AGL(ACT)'s Access Arrangement.

Summary list of information requirements

1 – Capital expenditure (chapter 9)

AGL(ACT) is required to provide further information and explanation concerning:

a) the downward revision in the capital expenditure forecasts submitted in August, prior to the new proposal on the Eastern Gas Pipeline connection, compared to the April submission

b) whether the capital expenditure per connection includes or excludes mains costs.

2 – Services policy (chapter 12)

AGL(ACT) is required to present information on the appropriateness of:

a) a partial use of assets reference service

b) a summer tranche reference service

c) a short term requirements reference service for small and medium users.

3 – Demand forecasts (chapter 16)

AGL(ACT) is required to:

a) provide an adequate explanation of factors driving the contract market forecasts, and revise its methodology for the contract market to reflect factors in the ACT

b) provide a satisfactory outline of its forecasting methodology in the Access Arrangement Information.

Summary list of required amendments

Amendment 1 – Access Arrangement Information (chapter 3)

AGL(ACT) is required to amend the Access Arrangement so that it includes the following:

a) consolidation of the information in its original AAI submitted to the Commission on 5 January 1999, its RAAI of 15 February 1999 and its SAAI of 22 April 1999, consistent with this draft decision

b) amendments required by this draft decision

c) actual results in 1998/99 including capital costs, non-capital costs, system capacity, sales volume, MDQ, and key performance indicators

d) cost allocation information consistent with the revisions required by the draft decision.

Amendment 2 - Funds employed and net working capital (chapter 4)

AGL(ACT) is required to amend:

a) its funds employed approach by separating regulatory capital assets (system and non-system assets) from net working capital when the rate of return component is calculated. A real rate of return is to be applied to the regulatory capital assets (ie system assets and non system assets). A nominal return is to be applied to net working capital

b) its level of net working capital to exclude taxation assets and liabilities (ie taxation provisions, deferred income tax liabilities and future income tax benefits)

c) its net working capital forecast with disclosure of the assumptions and parameters underlying such forecasts.

Amendment 3 - Rate of return (chapter 5)

The rate of return used in the proposed cost of service methodology for calculating total revenue must not exceed 7.75 per cent in real, pre tax terms. This is consistent with a nominal post tax return on equity of approximately 12-13 per cent.

Amendment 4 - Initial capital base as at 1 July 1999 (chapter 6)

AGL(ACT) is required to set the initial capital base for its covered pipelines at 1 July 1999 (including ACT, Queanbeyan and Yarrowlumla) at a value no higher than $170m.

Amendment 5 - Rolling forward the regulatory capital base (chapter 7)

For the purpose of calculating reference tariffs during the Access Arrangement period, AGL(ACT) is required to roll forward the regulatory capital base by:

a) including forecast capital expenditure which meets the prudency test for the period 1999/2000 to 2003/04

b) deducting forecast regulatory depreciation

c) indexing the regulatory capital base annually from 1 July 1999 using the CPI defined as the All Groups Consumer Price Index (weighted average of eight Australian capital cities) as published by the Australian Bureau of Statistics.

Amendment 6 – Depreciation (chapter 8)

AGL(ACT) is required to amend depreciation so that:

a) the depreciation component is calculated on the regulatory capital base only, thus reflecting the initial capital base at 1 July 1999 as determined by the Commission

b) depreciation must be calculated using a straight line method based on economic lives by asset category:

Asset category	Economic life
Mains:	
- cast iron	50
- steel	80
- polyethylene/nylon	50
Inset services	50
Meters	15
District regulators	50
City gate	50
SCADA systems	5-10
Plant and equipment	5-20

Amendment 7 – Non capital costs (chapter 10)

AGL(ACT) is required to amend its non capital cost (operating cost) forecast to:

a) allow for a cost reduction of 30 per cent in controllable costs, phased in over the five year course of the Access Arrangement (ie 1999/2000 to 2003/2004). Controllable non capital costs are: operation and maintenance, marketing and overheads, and exclude government levies, unaccounted for gas, and costs associated with retail contestability

b) allow for growth with an equal 50 per cent weighting applied to both volume load growth and customer growth

c) the allowed controllable costs and the Commission's provisional allowance for non controllable costs (ie government levies and new costs associated with retail contestability) plus UAG are:

Forecast non capital costs – real 1999/2000 $m

Year ending June	2000	2001	2002	2003	2004
Controllable costs	9.1	8.7	8.4	8.0	7.6
Other	1.9	2.0	2.0	2.0	2.0
Total	11.0	10.7	10.4	10.0	9.6

Subject to Commission's final decision on growth forecasts.

Amendment 8 – Price and revenue caps (chapter 11)

a) AGL(ACT) is required to submit reference tariffs which, if applied over the whole year 1999/2000 and subsequent years to 2003/04, must be consistent with total revenue as follows:

Revenue path in real 1999/2000 $m [(1)]

	1999/2000	2000/01	2001/02	2002/03	2003/04
Contract revenue	2.2	2.1	2.0	1.8	1.7
Tariff revenue	30.3	29.4	28.4	27.4	26.3
Total	32.5	31.4	30.3	29.2	28.1

Note:
1. Subject to the Commission's final decision on new facilities investment on connecting to the Eastern Gas Pipeline (EGP). The revenue paths shown in this table exclude capex on connection to the EGP.

b) within this revenue cap, AGL(ACT) is required to establish reference tariffs in each of the years, 1999/2000 to 2003/04, expressed in real 1999/2000 dollars. The reference tariffs will be adjusted by the change in CPI (EX-GST) over the year to March quarter immediately preceding the start of the relevant financial year. CPI (EX-GST) is defined as follows:

> "**CPI (Ex -GST)**" means the consumer price index, All Groups index number weighted average of eight capital cities (a classification employed and published by the Australian Bureau of Statistics), exclusive of the net effect across those eight capital cities of:
>
> (a) the 'GST' (as that expression is defined in *A New Tax System (Goods and Services Tax) Act 1999*) ; and
>
> (b) changes to any other Commonwealth, State or Territory taxes or charges, consequent upon the introduction of the GST,
>
> (the "Index"),
>
> as calculated and published by the Australian Bureau of Statistics from time to time, or if the Australian Bureau of Statistics does not, or ceases to calculate and publish the Index then CPI (Ex-GST) will mean:
>
> (c) an index published by Commonwealth Treasury which is its best estimate of the Index; or
>
> (d) if Commonwealth Treasury does not, or ceases to publish an index then an index published by the Reserve Bank of Australia which is its best estimate of the Index; or
>
> (e) if the Reserve Bank of Australia does not, or ceases to publish an index, then at the Relevant Regulator's discretion, either:
>
> (i) an index published by a person appointed by the Relevant Regulator which is that persons best estimate of the Index; or
>
> (ii) an index published by the Relevant Regulator that is its best estimate of the Index.

c) reference prices must apply from 1 July 2004 or two weeks after the final approval of AGL(ACT)'s revised Access Arrangement, whichever is the latter.

Amendment 9 – Reference tariff policy (chapter 13)

AGL(ACT) is required to amend its reference tariff policy (section 4 of the Access Arrangement) by:

a) modifying the policy to reflect the draft decision on revenues (Amendment 8) and cost allocation (Amendment 10)

b) removing policy statements regarding treatment of new facilities investments.

Amendment 10 – Cost allocation between contract and tariff markets (chapter 14)

AGL(ACT) is required to apply a non discriminatory cost allocation methodology to the contract and tariff markets.

Amendment 11 – Contract market reference tariffs (chapter 15)

AGL(ACT) is required to recalculate its contract reference tariffs on the basis of non discriminatory cost allocation between contract and tariff markets, and revised contract demand forecasts.

Amendment 12 – Contract charges: price constraints (chapter 15)

AGL(ACT) is required to ensure that no existing customer will face a real increase in transportation charges over the Access Arrangement period from the current prices as at 30 June 1999.

Amendment 13 – Overrun charges (Chapter 15)

AGL(ACT) is required to state that overruns of MHQ are not counted for the purposes of overrun payments. A statement to this effect should be placed in schedule 2B of the Access Arrangement, in the overrun section on pages 45 and 46.

Amendment 14 – Pricing in the tariff market (chapter 15)

AGL(ACT) is required to recalculate its reference tariffs for the tariff service on the basis of non discriminatory cost allocation between contract and tariff markets and revised demand forecasts as stipulated by the Commission in amendment 16.

Amendment 15 - Variations in reference tariffs (chapter 15)

AGL(ACT) is required to amend Section 3 of the proposed Access Arrangement, 'Impost and other statutory charges', to include statements to the following effect:

AGL(ACT) may vary the reference tariffs from time to time, arising from any change in the level of any government charges or statutory fee or tax, and/or the introduction of new charges (eg the Goods and Services Tax). The statement must indicate that:

i) AGL(ACT) is required to make application to the Commission proposing a revision to the Access Arrangement to reflect the change

ii) the Commission has the discretion to appoint an independent auditor to ascertain the impact on reference tariffs. The approval of a change in reference tariffs will be based on the Commission's review of the independent auditor's advice

iii) any burden or benefit of any adjustment to the reference tariffs to which AGL(ACT) is entitled will be allocated on the same basis as AGL(ACT) allocated the relevant

costs or similar costs to develop the reference tariff or in the manner prescribed by law.

Amendment 16 – Demand forecasts (chapter 16)

AGL(ACT) is required to amend its Access Arrangement and AAI to:

a) revise its contract market forecasts based on the actual 1998/99 figure and load associated with the ACT urban bus fleet

b) revise upwards its business tariff market forecasts consistent with the following figures:

Business tariff market forecasts (TJ)

1999	2000	2001	2002	2003	2004
1,430	1,459	1,488	1,518	1,548	1,579

Note:
1. Figures are for year ending June.
2. Figure for 1999 is actual.

c) revise upwards its residential tariff market forecasts consistent with the following figures:

Residential tariff market forecasts (TJ)

1999	2000	2001	2002	2003	2004
3,581	3,867	4,177	4,511	4,872	5,262

Note:
1. Figures are for year ending June.
2. Figure for 1999 is actual.

Amendment 17 – Gas balancing (chapter 18)

AGL(ACT) is required to amend Schedule 2A, Part 2, Gas Balancing and Schedule 2C, Clauses 14-20 by:

- redrafting the provisions to indicate clearly that sites can be aggregated for the purpose of balancing on the network
- redrafting the provisions to separate the allocation/apportionment, operational gas balancing and participant gas balancing processes
- changing the gas balancing procedures so the following criteria are met:
  - the level of incentives is sufficient to ensure safe and reliable operation of the AGL(ACT) system
  - all users irrespective of size are treated equitably
  - no artificial barriers to entry
  - risks can be managed and/or can be allocated appropriately
  - procedures can be readily understood and the cost of administration to the network and the user is appropriate
  - market solutions are fostered to the greatest possible extent
- adopting a transitional approach with reduced balancing incentive charges for the first 12 months of the new Access Arrangement period. The level of reduction will depend on the complexity of the new gas balancing procedures to be proposed by AGL(ACT)

- developing load profiling / reconciliation systems for tariff customers which take into account the development of these systems in NSW.

Amendment 18 – Metering services (chapter 18)
AGL(ACT) is required to amend metering services by:

- making the provision of metering services transparent by separating the costs of metering services (both capital and operating) from services forming components of the reference services
- amending Schedule 2A, Terms and conditions applying to all reference services, clause 10, "Metering", to communicate in more general terms that the release of end use customer usage information is subject to relevant Code provisions, and by providing details of the format in which information will be released to users.

Amendment 19 – Gas specifications (chapter 18)
AGL(ACT) is required to amend Schedule 3, 'Gas Quality Specifications' by:

adding a statement at the beginning of the schedule to the effect that gas delivered to a receipt point by a user must comply with the specifications prescribed by any law that extends to that gas. If there are no such laws, the gas must comply with specifications determined by AGL(ACT) from time to time. Failing such a determination, the table set out in Schedule 3 (the 'default specification') will apply.

Amendment 20 – Unaccounted for Gas (chapter 18)
AGL(ACT) is required to reduce the UAG figure from 2.5 per cent to 0.7 per cent for the period of the Access Arrangement.

Amendment 21 – Trading policy (chapter 18)
AGL(ACT) is required to amend its trading policy to include response times for granting / refusing trading requests which are not bare transfers.

Amendment 22 – Reference tariffs after 30 June 2004 (chapter 18)
AGL(ACT) is required to amend the clause on reference tariffs after 30 June 2004 which appears on pages 32 and 33 of the proposed Access Arrangement by:

- relating the clause to all terms and conditions of reference services, not just prices
- deleting the proposed CPI adjustment to the 2004 reference tariffs.

Amendment 23 – Commencement and review of Access Arrangement (chapter 18)
AGL(ACT) is required to set the revisions submission date at or before 30 June 2003. The revisions commencement date will be 1 July 2004 or two weeks after final approval of AGL(ACT)'s revised Access Arrangement, whichever is the latter.

EXECUTIVE SUMMARY

This executive summary is provided to assist interested parties and other readers of the Commission's detailed report on its draft decision. It summarises the Commission's decision, the reasons for those decisions, and the analysis applied in reaching the Commission's assessment of AGL(ACT)'s proposed Access Arrangement. The summary is not a substitute for and does not form any part of the Commission's detailed report.

1 Introduction

In January 1999, AGL(ACT) submitted to the Commission its proposed Access Arrangement relating to the natural gas distribution system in the ACT, Queanbeyan and Yarrowlumla. The Access Arrangement describes the terms and conditions under which AGL(ACT) proposes to provide third parties with access to its gas distribution system.

This executive summary provides an overview of the Commission's assessment of the proposed Access Arrangement, the draft decision, and the amendments the Commission requires in order for the Access Arrangement to be approved. The proposed amendments, and reasons for the Commission's draft decisions, are provided throughout this report, as required by section 7.7 of the Code.

In reaching its draft decision, the Commission has considered: the requirements of the Code, AGL(ACT)'s proposal, public submissions, the interests of users and prospective users, business interests of AGL(ACT), and the implications for efficiency and for competitive outcomes.

The draft decision will be subject to a 28 day period of public comment. During that time, the Commission will consult interested parties regarding the amendments. The Commission aims to reach a final decision by mid 2000. The commencement date for the revised Access Arrangement is anticipated to be some time in mid 2000.

2 Key outcomes - revenue and price caps

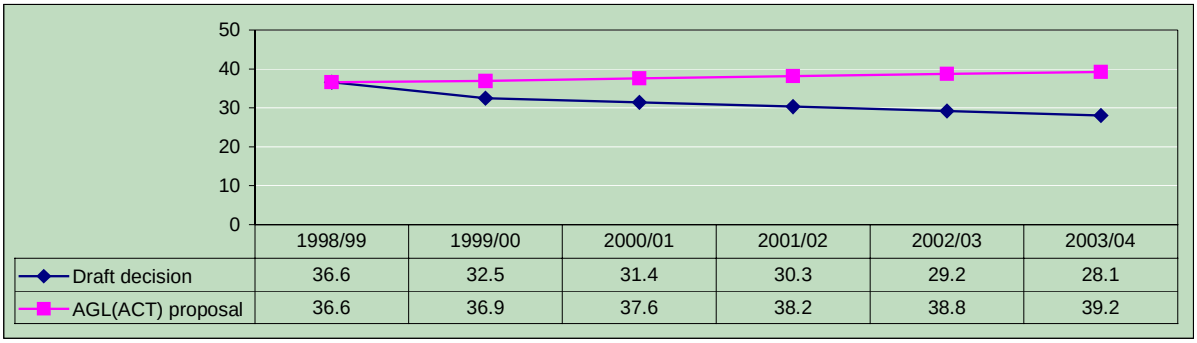
The Commission's draft decision sets out a price path for AGL(ACT)'s reference tariffs from commencement date anticipated in mid 2000 to 30 June 2004.

If capital expenditure associated with AGL(ACT)'s connection to the Eastern Gas Pipeline (EGP)[1] is excluded from the derivation of total revenue (Figure 1), under the draft decision network revenue will fall by 23.2 per cent (in real terms) between 1998/99 to 2003/04. If the EGP connection is included, network revenue will fall by 19.1 per cent (in real terms). The overall revenue reduction will translate into lower prices for contract and tariff customers. During the period 1998/99 to 2003/04, average prices will fall by an annual average rate of

[1] In December 1999, AGL(ACT) submitted to the Commission an additional capital expenditure proposal to connect to the Eastern Gas Pipeline. The Commission has authorised an independent review of this proposal, and will make its final decision on allowed capital expenditure following the completion of this independent review and public consultation through this draft decision. Chapter 9 contains detailed discussion on AGL(ACT)'s capital expenditure.

6.9 per cent per annum. If the EGP connection is included in this calculation, average prices will fall by an annual average rate of 5.9 per cent per annum.[2]

Figure 1 Allowed revenue in real 1999/2000 $m



	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Draft decision	36.6	32.5	31.4	30.3	29.2	28.1
AGL(ACT) proposal	36.6	36.9	37.6	38.2	38.8	39.2

Notes:
1. An inflation rate of 2.5 per cent is assumed in translating AGL(ACT)'s proposed nominal figures into real 1999/2000 figures.
2. Excludes capital expenditure associated with the proposed connection to the EGP.

AGL(ACT) proposes that the same X factor to be applied to contract and tariff customers. In the absence of submissions and evidence concerning the need for different price caps to be applied to the contract market, the Commission has decided to adopt the same price cap for the contract and tariff markets.

AGL(ACT) proposes an X factor of 1 per cent. The Commission's analysis suggests that AGL(ACT) has achieved an above normal return on (historical cost) assets and there is no conclusive evidence of under recovery of past returns and depreciation. AGL(ACT) has forecast growth in the tariff market of 3 per cent per annum during 2000-2004. The Commission considers that the benefit of further growth should be passed on to tariff customers. On this basis, the Commission has decided that the average price reduction should at least equal average growth of 3 per cent per annum.

The Commission considers that AGL(ACT)'s proposed CPI-1 does not represent a fair outcome for tariff customers. AGL(ACT)'s proposed network prices to tariff customers are not cost reflective. The Commission has decided that reference tariffs should reduce in year 1 to achieve cost reflectivity. Prices for years 2-4 should continue to fall, to pass the benefit of growth and efficiency improvements on to customers. The Commission's tariff price path is outlined below:

Table 1 Draft decision: tariff price path[1]

	1999/2000	2000/01	2001/02	2002/03	2003/04
Excluding EGP connection capex	CPI-11	CPI-6	CPI-6	CPI-6	CPI-6
Including EGP connection capex	CPI-10	CPI-5	CPI-5	CPI-5	CPI-5

1: Subject to the Commission's final decision on growth.

2 Based on AGL(ACT) forecast. The price reduction is subject to the Commission's final decision on growth forecasts.

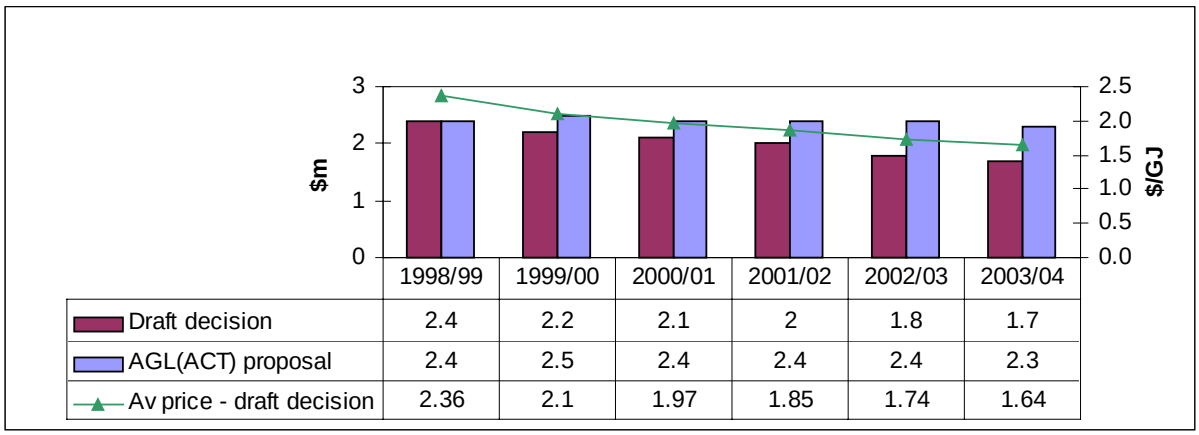
2.1 Pricing outcome – contract market

The Commission does not accept AGL(ACT)'s proposed contract revenue. The draft decision on the contract path is:

- actual revenue will fall from $2.4m in 1998/99 to $2.2m in 1999/2000 in real terms, and continue to fall over the remaining period of the Access Arrangement to $1.7m in 2003/04.

This will set prices on a cost reflective basis. This represents a substantial benefit to contract customers under the national gas reform process. The following figure shows the outcome, excluding the EGP connection proposal.

Figure 2 Trend in real contract revenue and average network prices ($1999/2000)



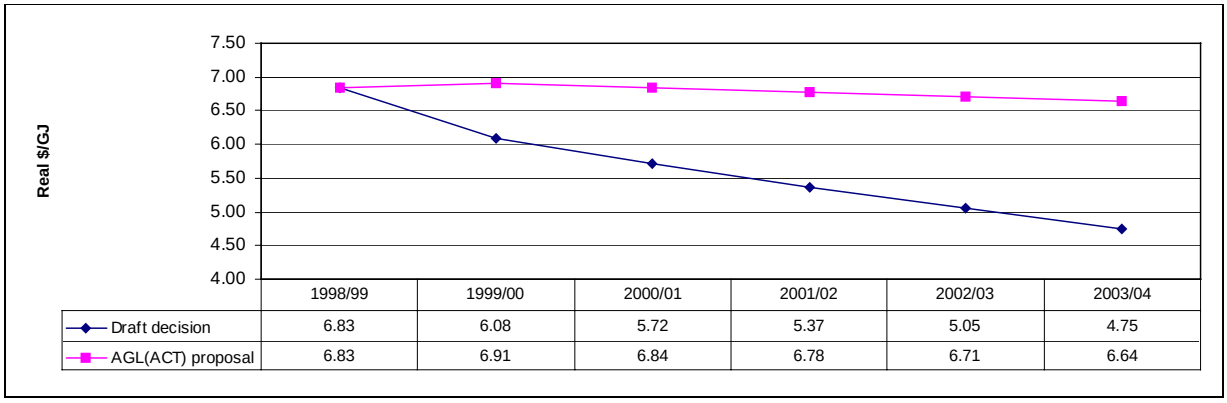
	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Draft decision	2.4	2.2	2.1	2	1.8	1.7
AGL(ACT) proposal	2.4	2.5	2.4	2.4	2.4	2.3
Av price - draft decision	2.36	2.1	1.97	1.85	1.74	1.64

2.2 Pricing outcome – tariff market

The Commission has not accepted AGL(ACT)'s proposed CPI-1 real price changes in the tariff market.

The Commission has concluded that a greater price reduction will apply: an initial price cap of CPI-11 per cent will apply in 1999/2000. A price cap of CPI-6 per cent per annum will apply to tariff reference prices for 2001-2004. This excludes capital expenditure associated with the proposed connection to the EGP. If the EGP capital expenditure is included, the Commission has decided that a price cap of CPI-5 per cent per annum shall apply for 2001-2004. Average network prices in the tariff market are shown in figure 3. These figures exclude costs associated with AGL(ACT)'s proposed connection to the EGP.

Figure 3 Tariff market network average price, 1998/99 – 2003/04
AGL(ACT) proposal vs Commission draft decision (real $/GJ)



	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Draft decision	6.83	6.08	5.72	5.37	5.05	4.75
AGL(ACT) proposal	6.83	6.91	6.84	6.78	6.71	6.64

2.3 Determinants of revenue

Key determinants of the draft decision on AGL(ACT)'s total revenues and price caps are:

- AGL(ACT)'s distribution revenues are determined based on a cost of service methodology which is the sum of:
  - the allowed operating costs incorporating an overall cost reduction of 30 per cent over the five year period to 2003/04
  - an allowance for depreciation of the regulatory capital base
  - a 7.75 per cent real pre tax return on the regulatory capital base (or an expected nominal post tax return on equity of around 12 -13per cent) and
  - a nominal return on net working capital.
- AGL(ACT)'s initial capital base (ICB) has been determined as $170m as at 1 July 1999
- the Commission has yet to form a conclusive view on AGL(ACT)'s forecast capital expenditure. Further opinion is being sought from a technical consultant
- the Commission has made provisional allowance for costs (both operating and capital) associated with retail contestability, based on AGL(ACT)'s estimate. The Commission will assess whether any changes are required to AGL(ACT)'s Access Arrangements as part of its final decision.

3 The process and key issues considered in this draft decision

The Commission has adopted a review process involving extensive consultation, research, and analysis. The draft decision aims to deliver a balanced outcome that has regard to the interest of stakeholders, the objectives of the Code, and its specific requirements.

3.1 Information disclosure

Interested parties have expressed concern with the content of AGL(ACT)'s Access Arrangement Information (AAI) and the level of information disclosure.

In the Commission's view, the information provided by AGL(ACT) in its original AAI does not comply with the requirements of sections 2.6 and 2.7 of the Code. In response to the Commission's request for further information, AGL(ACT) submitted a revised AAI (RAAI) in February 1999 and supplementary AAI (SAAI) in April 1999, as well as additional

information during the course of the review. Consultancy studies undertaken for the Commission provide further information to the Commission and the public.

As part of the information gathering process, the Commission issued a section 41 notice to AGL(ACT). This notice sought information that was outside AAI requirements. AGL(ACT) indicated its willingness to provide the information required by the Commission, but stated that the only mechanism to provide a clear framework for the treatment of confidential information was section 41 of the Gas Pipelines Access (ACT) Law.

AGL(ACT) has complied with this notice. However, it has noted that some of the information provided is regarded by AGL(ACT) as confidential or commercially sensitive.

3.2 Rate of return

In determining the appropriate rate of return for AGL(ACT), the Commission has considered the capital asset pricing model (CAPM) and weighted average cost of capital (WACC) framework. These suggest a rate of return in the range:

- 11.6 – 14.0 per cent nominal post tax return on equity
- 8.0 – 8.2 per cent nominal cost of debt
- 5.0 – 8.5 per cent pre tax rate of return on capital.

The Commission concludes that a real rate of return of 7.75 per cent is appropriate for AGL(ACT). This decision is made after examining: CAPM and WACC, the risks faced by AGL(ACT), evidence concerning market expectations of the rate of return, the regulatory return allowed by local and overseas regulators, and the objectives of the Code.

3.3 Regulatory capital base

The Commission has determined the initial capital base (ICB) for AGL(ACT) at 1 July 1999 to meet the requirements of the National Gas Code.

By applying well-recognised asset valuation methodologies the Commission has considered a number of asset valuation outcomes. However, the Commission notes the variability of valuation under these methodologies for example:

- depreciated indexed historical cost (DIHC) is indicative only due to the history of AGL(ACT)'s operating as a bundled business, and hence the availability and quality of data
- the depreciated optimised replacement cost (DORC) valuation depends on assumptions and parameters. Thus there may be a reasonable range of DORC valuations. In considering the ICB, the Commission has proposed nominating the value submitted by AGL(ACT) as the normal upper limit for DORC
- the optimised deprival valuation (ODV) result varies according to the methodology adopted for allocation to the tariff and contract segments and the DORC value.

Having considered the submissions received in respect of AGL(ACT)'s Access Arrangement and the Code requirements, the Commission concludes that:

- economic analysis provides some guidance on a range of feasible asset values. Whilst the lower bound is set by scrap value, the upper bound is set by the cost of by pass by an

external firm. The Commission acknowledges that the economic justification for using DORC is questionable

- a higher ICB tends to reduce allocative efficiency and may limit the potential for downstream competition
- there is no significant economic argument to support an ICB founded on a DORC valuation for sunk assets, especially considering the consequences of a high initial asset base for economic efficiency
- the ODV analysis and the DIHC have enabled the Commission to assess the factors listed in section 8.10 of the Code in the context of the whole of section 8 and 2.24
- the Commission's analysis suggests that a change of valuation from DAC to the use of full DORC for pricing purposes will in most circumstances generate a return over the whole economic life of the assets which is greater than the initial investment where DORC is higher than DIHC. The Commission notes that AGL(ACT) adopts historical cost accounting. Pricing may not have been based on historical cost, however, historical cost depreciation was charged to its profit and loss accounts. AGL(ACT) enjoyed a healthy return on assets (historical cost) over the period 1990-1999 but suffered from losses / low return in the 1980s. Considering depreciation and past return together, there is no firm evidence of under-recovery
- incentives for future investment are more appropriately taken into account when considering the rate of return and the rules for incorporating new investment, than when considering the ICB.

Under section 8.11 of the Code, the ICB for AGL(ACT) normally should not fall outside the range of $90m (ie DAC) and $255m (ie AGL(ACT)'s estimate of DORC). The latter is 2.83 times the DAC value and $106m higher than AGL(ACT)'s estimate of DIHC. The Commission is of the view that AGL(ACT)'s DORC value is questionable.

In addition to the obvious problems and difficulties arising from the wide range of asset values, the Commission must consider the requirements of the Code, including the interests of network owners and users of services.

Having considered the wide range of feasible asset values, historical depreciation / returns analysis and the requirements of the Code, the Commission believes that the ICB should be below $200m. In deciding the most appropriate ICB for AGL(ACT), the Commission has assessed pricing and financial impacts under revenue outcomes using an ICB within the range of $160-180m. **The Commission has decided that AGL(ACT)'s initial capital base at 1 July 1999 should be $170m.** The Commission considers that this represents a reasonable balance of the interests of stakeholders and promotions of competitive outcomes.

Having also considered issues relating to ICB, the Commission has decided that:

- the regulatory capital base should comprise capital assets (ie fixed assets) plus net working capital
- a real return will be allowed on the regulatory value of capital assets and a nominal return will be allowed on net working capital
- net working capital should be defined to reflect only those items essential for the efficient conduct of the business. In the case of AGL(ACT), deferred income tax

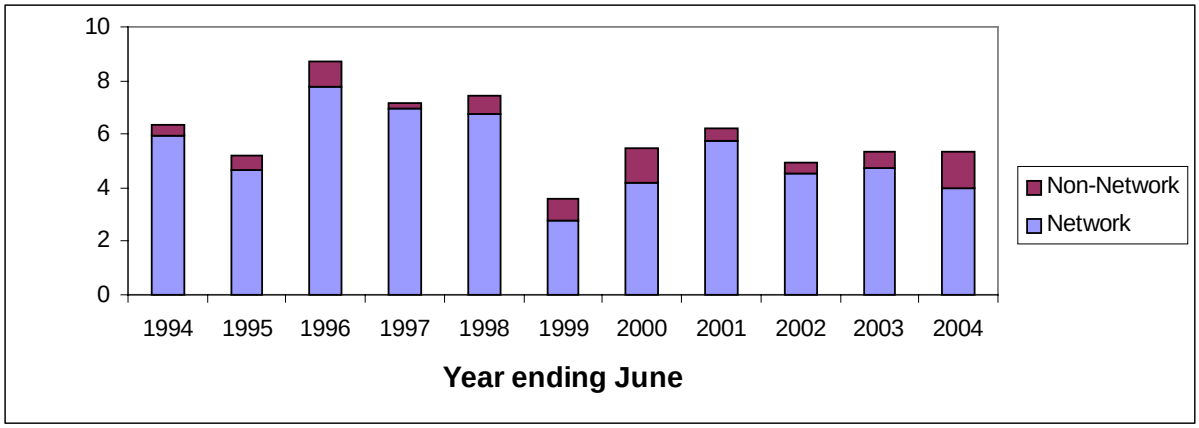
liabilities and future income tax benefits should not be included in the net working capital calculation

- under the cost of service methodology, the depreciation component is to be calculated on the regulatory asset base only, by applying a straight line depreciation over the remaining economic lives of the assets.

3.4 Trends in capital investment

Capital investment is a key driver underlying the network costs. It impacts on the two main cost components – the return *on* and return *of* capital. Recovery of capital spending has a very long term effect on total revenue requirement and hence, pricing. AGL(ACT)'s capital investment program is shown in figure 4.

Figure 4 Capital investment, 1993/94 – 2003/04 (nominal $000's)



Note

1. 1999 actual capital expenditure was taken from AGL(ACT)'s 1998/99 annual report and split between network and non-network based on the proportions in the 2000 forecast numbers.

As illustrated in Figure 4, network capital expenditure constitutes the major share of total capital expenditure. It comprises over 70 per cent of total capital expenditure for each of the periods shown.

The Commission has authorised an independent review of AGL(ACT)'s actual and forecast capital expenditure between 1993/94 to 2003/04. The review has yet to be finalised. However, the draft report comments favourably on the decision making processes.

The Commission has also examined AGL(ACT)'s assumptions on forecast growth and the capital expenditure allowed for new connections.

The Commission has also sought independent review of AGL(ACT)'s proposed connection to the EGP.

The Commission will make its final decision on AGL(ACT)'s proposed capital expenditure once these reviews have been completed. Meanwhile, the Commission has used AGL(ACT)'s proposed capital expenditure in its analysis. The Commission's analysis is generally conducted to provide two scenarios, including and excluding the EGP connection.

3.5 Operating costs and scope for cost reduction

AGL(ACT)'s projections of operating costs, including marketing costs, have attracted strong comments in submissions. Current operating costs represent about 32 per cent of AGL(ACT)'s total costs. The scope for operating efficiency is one of the main drivers of change in network prices and ultimately customers' gas bills.

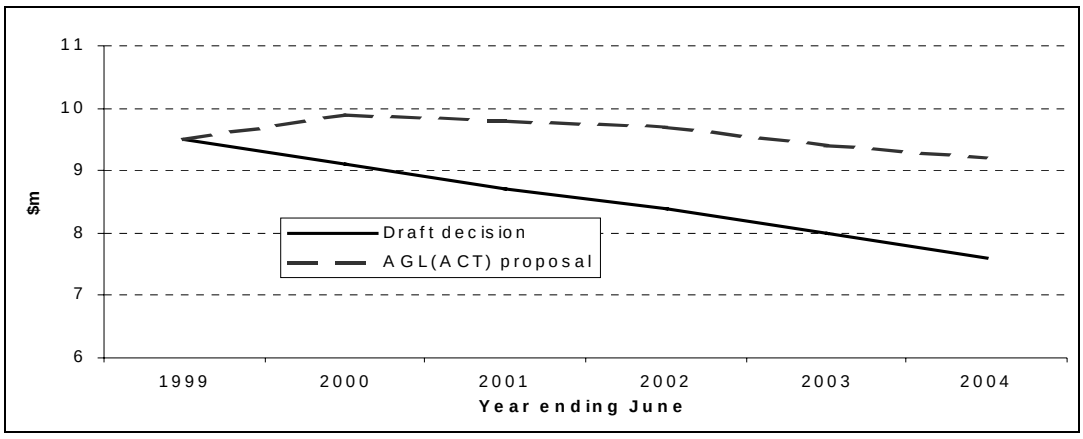
The Commission's analysis indicates that AGL(ACT)'s costs are relatively high, comparing unfavourably with local and overseas gas distribution utilities. When compared with those of other distributors, AGL(ACT)'s marketing costs are high in terms of marketing cost per new customer and as a proportion of total operating expenditure. The Commission is not convinced by AGL(ACT)'s arguments that such high marketing expenditure is justified.

The Commission has considered industry trends for further efficiency improvements, including the 25 per cent real per unit cost reduction targeted by three Victorian gas distributors over the five years 1998-2002.

Concluding that there is significant scope for reduction, the Commission has decided that:

- a cost reduction of 30 per cent in controllable costs is to be phased in over the five years of the Access Arrangement. Controllable operating costs are: operation and maintenance, marketing and overheads. They exclude government levies, unaccounted for gas, and costs associated with retail contestability
- controllable costs are to be adjusted for growth with an equal 50 per cent weighting applicable to volume load growth and customer growth.

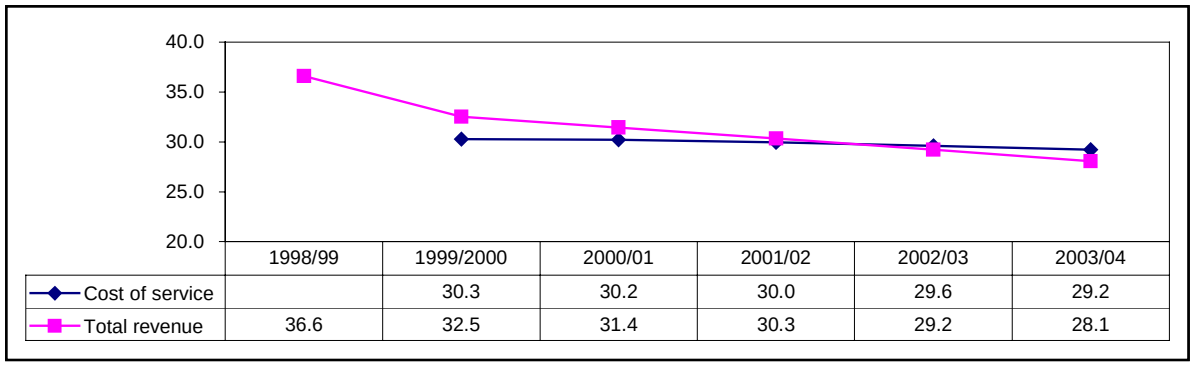
Figure 5 Comparison of allowed controllable operating costs and AGL(ACT)'s projections (real 1999/2000 $m)



3.6 Total revenue vs costs of service

The Commission has compared the net present value (NPV) of the revenue stream under the draft decision with the allowed cost of services for AGL(ACT). The Commission has taken into account assumed additional revenue between 1 July 1999 and the commencement date in the NPV calculation (Figure 6):

Figure 6 Draft decision – total revenue vs costs of service (real 1999/2000 $m)



	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04
Cost of service		30.3	30.2	30.0	29.6	29.2
Total revenue	36.6	32.5	31.4	30.3	29.2	28.1

Note: Excludes the effect of the proposed capex on the Eastern Gas Pipeline connection. If the proposed capex is included, the revenue requirements and cost of service will be higher.

The financial indicators analysis suggests that overall, AGL(ACT) will be able to maintain a satisfactory credit rating for its borrowings equivalent to an investment grade rating under the draft decision. It is expected that AGL(ACT) will have an adequate cashflow to fund part of its capital expenditure and to pay a dividend to shareholders.

3.7 Incentive mechanisms

The Commission has decided to accept AGL(ACT)'s proposal to use price cap regulation in the form of CPI-X. The price cap will be expressed as average price per GJ in real terms. This approach provides the service provider with incentives for efficiency gains, and incentives to grow the market. This is so because the service provider receives the benefit of lower cost outcomes and stronger demand growth.

3.8 Cost allocation between contract and tariff markets

Costs allocations adopted in AGL(ACT)'s proposal are shown below:

Table 2 Cost allocations for contract markets

	AGL(ACT)'s proposal
Contract market asset base	Stand alone system to serve the contract market (SAC)
Asset base to which rate of return will be applied	SAC ORC (ie undepreciated asset value)
Depreciation	SAC system
Operating costs	Operating cost to run the SAC system

The Commission concludes that AGL(ACT)'s proposed cost allocation methodology is questionable. The contract market does not represent a significant part of AGL(ACT)'s total market (either by customer numbers or consumption). The establishment of costs based on a stand alone system for this market is unlikely to be appropriate in these circumstances. The need for AGL(ACT) to effectively 'write down' revenues to the contract market from their stand alone level underlines the Commission's concerns.

AGL(ACT) is required to amend its cost allocation methodology in order to allocate costs on a non discriminatory basis.

3.9 Demand forecast

After considering independent opinion, historical growth trends and submissions, the Commission has decided that AGL(ACT) is required to:

(a) revise its contract market forecasts based on the actual 1998/99 figure and load associated the ACT urban bus fleet

(b) revise upwards its business tariff market forecasts consistent with the following figures:

Business tariff market forecasts (TJ)

1999 (Actual)	2000	2001	2002	2003	2004
1,430	1,459	1,488	1,518	1,548	1,579

Note: Figures are for year ending June.

(c) revise upwards its residential tariff market forecasts consistent with the following figures:

Residential tariff market forecasts (TJ)

1999 (Actual)	2000	2001	2002	2003	2004
3,581	3,867	4,177	4,511	4,872	5,262

Note: Figures are for year ending June.

3.10 Services policy

Some customers are concerned with the inflexibility of existing services offered and the single local network pricing structure proposed by AGL(ACT), particularly in relation to the potential connection of AGL(ACT)'s network to the Eastern Gas Pipeline.[3]

AGL(ACT) is required to provide information on the appropriateness of:

- partial use of assets service
- summer tranche service
- short term services for small and medium users.

3.13 Other terms and conditions

Having reviewed AGL(ACT)'s proposed changes to other terms and conditions, the Commission requires a number of amendments including:

- metering services
  - provision of metering services must be transparent. The costs of metering services (both capital and operating) must be identified separately, and these services must form part of the reference services
- trading policy
  - the trading policy must be amended to include AGL(ACT)'s response times for approving/not approving trading requests which are not bare transfers

[3] The Commission has authorised an independent assessment of AGL(ACT)'s capital expenditure proposal to connect to the Eastern Gas Pipeline.

- unaccounted for gas
  - the Commission requires AGL(ACT) to replace its proposed level of unaccounted for gas (UAG) of 2.5 per cent with an allowance of 0.7 per cent.

4 Duration of the Access Arrangement

AGL(ACT) has proposed a five year Access Arrangement from 1 July 1999 to 30 June 2004. Uncertainty concerning demand and competition arising from the Eastern Gas Pipeline may favour the adoption of a shorter period.[4] In the event that a substantial change in gas demand is caused by changing gas market conditions, the Commission proposes benefit sharing be implemented.

The Commission is aware that under the current timetable, the review process will not be completed until mid 2000. The Commission has decided that the Access Arrangement is to commence at the time of the final approval, and to expire on 30 June 2004. The revisions submissions date will be 12 months prior to the expiry date, thus 30 June 2003.

[4] A new transmission pipeline is to be built by Duke Energy to bring gas from Victoria to NSW. This will facilitate upstream (gas production) and downstream (retail) competition in the ACT gas market.

Summary of the draft decision

	AGL(ACT) proposal	**Commission's draft decision/ proposed amendments**
Information disclosure	AAI, RAAI, SAAI, and various submissions.	AGL(ACT) to amend its AAI to provide a consistent and complete compilation of all information provided.
Determining total revenue and capital base		
Nominal post tax return on equity	12-16%.	11.6-14.0 %.
Rate of return	8% (real pre tax).	7.75% (real pre tax).
ICB – base date	As at 1 July 1999.	Accepted.
ICB expressed as funds employed	A real return applied to the regulatory capital base expressed as funds employed.	A nominal return should be allowed on net working capital (NWC) which is part of regulatory capital base. NWC excludes tax assets and liabilities.
ICB (capital assets)	$244.6m at 1 July 1999.	$170m at 1 July 1999.
Depreciation	Depreciation based on its proposed ICB. Straight line depreciation using economic asset lives.	Depreciation (lower) based on regulatory capital base. Straight line depreciation using economic asset lives.
Rolling forward capital base	CCA approach.	ICB + prudent new facilities investment – depreciation - redundant capital + inflation adjustment
Indexation of regulatory capital base	Sydney CPI.	National CPI (inclusive of GST effects).
Capital expenditure	Actual and forecast revised during the review process.	Pending further review, use AGL(ACT)'s actual/forecast capital expenditure in rolling forward the ICB and calculating target revenue. Require AGL(ACT) to provide information and explanation on capex per connection and revisions between April and August 1999.
Operating cost	Projected increase in nominal terms.	Reduce per unit real cost by 30% over the AA period. Costs to be adjusted to reflect growth.
Cost implications of retail contestability	Proposed to include operating and capital expenditure relating to contestability.	Accepted in principle subject to Code requirement (prudence test). Lack of information at the present time. Provision based on AGL(ACT)'s estimate.
Form of regulation	Contract – CPI-X price cap. Tariff – CPI-X price cap.	Incentive based CPI-X price cap in both markets.
Indexation of reference tariffs	Some prices are expressed in nominal terms and adjusted by actual inflation.	Real prices to be adjusted by national CPI exclusive of the effect of GST.
Company tax issue	Irrelevant at time of submission.	Company tax reductions considered in the WACC range. Changes to tax accelerated depreciation is yet to be fully examined at the next review.

Reference tariff issues		
Services policy	- capacity reservation - managed capacity - throughput service - multiple delivery point - tariff - negotiated	Information requested on appropriateness of additional services: - summer tranche - partial use - short term services for small and medium customers
Cost allocation	Based on stand alone contract market system.	Rejected. AGL(ACT) to revise cost allocation.
Structure of reference tariffs	Contract – trunk charges and local network charges. Tariff – fixed charge plus a declining block tariff volume based charge.	Amendments required.
Growth	Declining demand in the contract and business markets. Growth in the residential tariff market	Require amendments to demand forecasts for the tariff market.
Other non tariff issues		
Gas balancing	Users required to stay in daily balance.	Revisions required to address issues relating to contestability.
Separation of Metering charges	Metering charges cover meter reading only.	Costs of metering to be identified separately. Telemetered information to be disclosed to users.
Gas specifications	Maintain current specifications.	Default specification.
Unaccounted for gas	2.5%, part of network costs.	UAG allowance to be 0.7%.
Trading policy	Bare transfers allowed following notification to AGL(ACT).	Amendment to include AGL(ACT)'s response time etc.
Inter connections	Receipt stations to comply with AGL(ACT) specifications.	Commission seeks information/comment from AGL(ACT) and other stakeholders.
Reference tariffs after 30 June 2004	CPI adjustment between revisions commencement date and 2004.	Not accepted. All prices and conditions to remain the same.

PART II

INTRODUCTION

1 INTRODUCTION

Honouring 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 ACT Government is introducing competition into the supply of natural gas. Reforms have paved the way for new suppliers of gas to enter the ACT gas market. The National Third Party Access Code for Natural Gas Pipeline Systems (the Code) has been developed. Given third party access to pipeline networks facilitated by the Code, suppliers are able to access existing reticulation systems and thus, compete for customers.

Under the Code, third party access to a distribution network requires 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 submitted to the relevant regulator for approval.

The ACT Independent Pricing and Regulatory Commission is assessing the Access Arrangement submitted by AGL Gas Company (ACT) Limited and AGL Gas Networks Limited (collectively AGL(ACT)). The Access Arrangement submitted by AGL(ACT) covers the Canberra - Queanbeyan - Yarrowlumla Distribution System. NSW has cross-vested responsibility for areas of the distribution system that lie in NSW (Queanbeyan and Yarrowlumla) to the Commission as the relevant regulator for the ACT.

Submissions concerning this report should be sent to the Commission by 7 April 2000.

All communication with the Commission should be directed to:

Independent Pricing and Regulatory Commission
GPO Box 447
Canberra ACT 2601
Telephone (02) 6273 0655
Fax (02) 6273 0654

Submissions received by the Commission will be placed on a public register. Copies of submissions may be obtained by contacting the Commission.

1.1 Review process

The ACT Government's *Gas Pipelines Access Act 1998* (the Act) introduces the national gas access arrangements. This consists of the Gas Pipelines Access (ACT) Law and the National Third Party Access Code for Natural Gas Pipeline Systems (the Code).

AGL(ACT)'s Access Arrangement must be assessed under the Code. Upon receipt of AGL(ACT)'s proposed Access Arrangement on 5 January 1999, the Commission assessed AGL(ACT)'s Access Arrangement Information (AAI) to determine whether it meets the requirements set out in sections 2.6 and 2.7 of the Code. Submissions regarding the adequacy of the information disclosure were also received and considered. As a result of that assessment, the Commission requested changes to the AAI to enable the AAI to meet the minimum requirements of the Code. AGL(ACT) made changes to the AAI. However, the Commission considered further information disclosure was necessary to satisfy Code

requirements. As a consequence, AGL(ACT) issued a *Revised AAI* on 15 February 1999, and a *Supplementary AAI* on 22 April 1999. Further submissions have since been made by AGL(ACT). A full list of submissions made by AGL(ACT) can be found in chapter 3.

In conjunction with the above process, AGL(ACT)'s proposed Access Arrangement and Access Arrangement Information were advertised for public comment on 11 January 1999. The Commission received a number of responses from interested parties (see Attachment 2). The Commission has given these careful consideration. As part of the consultation process, a public hearing and a pricing forum were held in Canberra on 11 May 1999 and 22 September 1999 respectively.

1.2 Criteria for assessment (the balance of interests approach)

Under section 2.24 of the Code:

> The Relevant Regulator 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. The Relevant Regulator must not refuse to approve a proposed Access Arrangement solely for the reason that the proposed Access Arrangement does not address a matter that sections 3.1 to 3.20 do not require an Access Arrangement to address. In assessing a proposed Access Arrangement, the Relevant Regulator must take the following 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.

Section 8 of the Code sets out the principles by which reference tariffs and a reference tariff policy included in an Access Arrangement are to be assessed for approval by the Commission.

Section 8.1 of the Code states that 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 regulator must be satisfied in determining whether to approve a reference tariff and reference tariff policy are listed 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;

(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 Commission has applied the provisions of the Code in reaching its draft decision. To assist the Commission[5] in this process, several consultancies were authorised:

- Ewbank Preece (now known as Connell Wagner), an engineering consultancy, conducted a technical review of AGL(ACT)'s DORC valuation and capital expenditure
- ACIL, a consultancy with expertise in economics, policy and strategy, reviewed AGL(ACT)'s growth forecasts
- KPMG provided advice on AGL(ACT)'s working capital proposal. The Commission also obtained a general financial opinion from KPMG.

Copies of the Ewbank Preece (when finalised) and ACIL reports are available from the Commission upon request.

In assessing some of the technical aspects of the proposed revisions, the Commission has considered work undertaken by the NSW Ministry of Energy and Utilities' (MoEU) Gas Retail Project. The MoEU has established a number of broadly representative working groups. They are establishing procedures and systems required for retail contestability in NSW. An official represents the ACT Government on these working groups.

5 These consultancies were managed by IPART on behalf of the Commission.

The findings of the draft and final decisions for Access Arrangements for networks in NSW and other jurisdictions have been taken into account in preparing this report.

1.3 The draft decision

The Commission is not satisfied that AGL(ACT)'s proposed Access Arrangement contains the elements and satisfies the principles set out in 3.1 to 3.20 of the Code. The Commission therefore *does not approve* AGL(ACT)'s proposed Access Arrangement in accordance with section 2.16(b) of the Code.

The amendments (or the nature of the amendments) which would have to be made to the Access Arrangement in order for the Commission to approve it are listed in Part 1 of this report 'Summary list of required amendments'.

In addition, the Commission requires AGL(ACT) to provide the further information as listed in Part 1 of this report, 'Summary list of information requirements', to assist the Commission in assessing AGL(ACT)'s Access Arrangement.

Copies of this draft decision will be sent to AGL(ACT), any person who made a submission on this matter, and any other person who requests a copy. Copies of this draft decision may be obtained from the ACT Government's website – www.act.gov.au

The Commission seeks submissions in response to this draft decision by 7 April 2000. The Commission anticipates that its final decision will be released and third party access under the revised Access Arrangement will commence mid 2000.

1.4 Structure of the draft decision

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

This report is structured as follows:

- PART I DRAFT DECISION AND EXECUTIVE SUMMARY

  sets out the Commission's draft decision on AGL(ACT)'s proposed revisions and an executive summary of the decision. A list of all amendments required by the Commission is also provided.

- PART II INTRODUCTION

  provides the background to the report and a description of AGL(ACT)'s gas distribution system.

- PART III DETERMINATION OF TOTAL REVENUE

  explains the Commission's approach and provides draft decisions on factors and issues determining the appropriate allowed revenue for AGL(ACT)'s provision of distribution transportation services.

- PART IV REFERENCE TARIFFS AND COST ALLOCATION

  discusses the Commission's assessment of AGL(ACT)'s proposed reference tariffs, cost allocation, and associated pricing issues.

- PART V CONTENT AND OPERATION OF THE ACCESS ARRANGEMENT

  discusses mandatory non-tariff requirements, such as gas balancing, unaccounted for gas, and trading policy, and presents the Commission's assessment of the terms and conditions of AGL(ACT)'s proposed revisions of its Access Arrangement and other issues relevant to this draft decision.

- GLOSSARY AND ABBREVIATIONS, ATTACHMENTS

2 THE AGL(ACT) DISTRIBUTION SYSTEM

Canberra's natural gas is drawn from the Moomba-Sydney pipeline via a 58 km lateral pipe running from Dalton in New South Wales to the custody transfer station at Watson in the northern suburbs of Canberra. The lateral pipe was completed in 1981. Around that time, the distribution network was installed using plastic pipe and high pressure steel primary mains. The network was extended to allow for reticulation to Queanbeyan and the Yarrowlumla Shire region.

AGL(ACT)'s gas network consists of approximately 3,252 kilometres of gas pipeline. The network covers the Australian Capital Territory and the local government areas of Queanbeyan and Yarrowlumla. Approximately 76,055 customers are served by the AGL(ACT) network (60,000 of these within the ACT). They represent the following market segments:

- contract customers (>10TJ pa) 41
- industrial and commercial customers 1,943
- residential customers 74,071

These three groups of customers together consumed approximately 6,011TJ of gas in 1998/99. Although residential customers account for 97 per cent of the total number of customers, they consume only 60 per cent of the total load. Commercial and industrial customers account for 3 per cent of customer numbers and consume about 24 per cent of gas sold. Although contract customers represent less than 1 per cent of customer numbers, they consume 17 per cent of the total gas consumed in the AGL(ACT) network.

AGL(ACT) has experienced strong growth in its residential tariff market since natural gas was first made available in 1982. This trend is generally expected to continue. However, the rate of growth is expected to slow. Most of the ACT urban areas are now reticulated (gas pipelines run down 88 per cent of ACT streets). Of this market, AGL(ACT) has achieved a penetration rate of 61 per cent (this represents 'on line of main' penetration). This gives total market penetration of 54 per cent.[6]

Gas tariff prices in the ACT are currently aligned with those charged by AGL in NSW for domestic, commercial and industrial consumers using comparable amounts of gas. ACT customers pay a bundled price to AGL(ACT) for gas delivered to their point of use. Prices to large users are based on the volume of gas used, with a minimum charge, and often do not reflect the location of the user or the pipes used. Prices to other tariff customers are also based on the volume of gas used plus either a fixed 'standing' charge or a minimum charge.

6 AGL(ACT), Presentation at Public Hearing, 11 May 1999.

3 AGL(ACT)'S PROPOSED ACCESS ARRANGEMENT, SUBMISSIONS AND INFORMATION DISCLOSURE

3.1 AGL(ACT)'s proposed access arrangement, access arrangement information and subsequent submissions

AGL(ACT) submitted its proposed Access Arrangement and Access Arrangement Information (AAI) to the Commission on 5 January 1999. Since then, a number of revisions and further submissions have been made by AGL(ACT) (Table 3.1).

Table 3.1 Summary of AGL(ACT)'s proposed Access Arrangement and non confidential submissions

Date	Submission	Purpose/key points
5/1/1999	Access Arrangement and AAI	Proposal submitted under the Code.
15/2/1999	Revised Access Arrangement Information	Update of the January AAI incorporating forecast information and in response to IPARC's s2.9 of the Code notice.
22/4/1999	Supplementary AAI	Amended in response to a further IPARC notice under s2.9.[7]
18/6/1999	Response to matters raised by Commission and by interested parties.	AGL(ACT)'s response to matters raised at the public hearing, including issues of initial capital base, past capital contributions, stand alone allocation, operating costs and pricing.
9/8/1999	Further submission	Response to issues of marketing costs, past under recoveries and gas specification raised by the Commission.
6/9/1999	Further revisions and a report prepared by Arthur Andersen entitled "Review of financial and valuation models prepared by AGL Gas Company (ACT) Limited"	Revision to capital expenditure forecast and submissions of financial analyses.
16/9/1999	Further submission	Deals with matters of windfall gains, role of DORC in the National Access Code and reports from Minter Ellison to AGLGN.
20/12/1999	Further submission	Proposed new capital expenditure to build a connection to the Eastern Gas Pipeline.

Based on the most recent submissions and information provided to the Commission, the key points of AGL(ACT)'s proposed Access Arrangement are:

- *Initial capital base* AGL(ACT) proposes an initial capital base of $246.6m (expressed as 'funds employed')[8] at 1 July 1999, which is slightly higher than the original proposal of $244.6m[9]. In terms of capital assets (ie excluding net working capital of $6m)[10], the

7 The s2.9 information request was sent to AGL(ACT) on 1 April 1999.

8 'Funds employed' represents the source of funds which supports resources and provides the business with its operational capabilities. In its Statement of Accounting Practice SAP1, the Australian Accounting Research Foundation (AARF) defines funds employed as the sum of equity funds, loan capital, and non-monetary liabilities.

9 AGL(ACT) RAAI, p 17.

proposed initial capital base at 1 July 1999 is $240.6m compared with the original proposal of $254.6m in January 1999. The main difference is due to AGL(ACT)'s revised proposal on its treatment of net working capital.

- *Rate of return* AGL(ACT) proposes earning a real pre tax rate of return of 8 per cent for the network business on the regulatory capital base which, from 1 July 1999, will be indexed annually by the CPI.
- *Capital expenditure* Initially, a capital expenditure program costing $29.8m over the five years 2000-2004 was proposed. In August, the capital expenditure proposal was revised downwards slightly to $27.3m. AGL(ACT) then submitted a further proposal in December relating to the proposed connection to the EGP ($12m). Thus, the total capital expenditure proposal to date is $39.3m, which is $9.6m higher than the original RAAI proposal.
- *Operating costs (non-capital cost)* AGL(ACT)'s operating costs forecast includes: operation and maintenance costs, overheads, marketing costs and new costs associated with contestability. Controllable costs (excluding government levies, contestability costs and unaccounted for gas) are forecast to average about $11m in real terms per year.
- *Price path*
  - Contract market: contract revenue is proposed to remain at $2.5m for the first three years and then increase to $2.6m in nominal terms for the last two years. A CPI-1 per cent price cap is proposed to apply to the contract market.
  - Tariff market: average tariff prices are proposed to increase by CPI-1 per cent per year.
- *Cost allocation* AGL(ACT) proposes adopting a stand alone approach to the allocation of costs between the contract and tariff markets.
- *Reference tariffs - contract market*
  - The whole ACT, Queanbeyan and Yarrowlumla regions are treated as a single zone.
  - Pressure reduction charges and local network charges based on MDQ reservations of the contract customers.
- *Reference tariffs - tariff market* A single tariff structure is proposed in the form of a multiple block structure.
- *Services policy* AGL(ACT)'s service policy consists of five reference services (capacity reservation, managed capacity, throughput, multiple delivery point service and tariff) and a negotiated service.
- *Growth forecasts*
  - Volume load forecast: The tariff market is forecast to grow at a faster rate in the initial years. This comprises annual average growth of 4.5 per cent in the residential market and negative growth (1.9 per cent) in the business tariff market.
  - Customer growth: A total increase of 20.3 per cent (or 3.9 per cent pa) in the tariff market is expected. No change is forecast in the number of contract customers.
  - Maximum demand quantity (MDQ) demand forecast. AGL(ACT) forecast contract MDQ demand to decrease by 0.5 per cent per year over the Access Arrangement.

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[10] AGL(ACT)'s proposed net working capital was originally -$10m (ie a deficit in the net working capital), after adopting the Commission's definition of net working capital, its proposal becomes $6m.

- Other terms and conditions include: gas balancing, gas specifications, trading policy, queuing policy, extension and expansions policy.

In response to a Commission request, AGL(ACT) has provided further information on its actual results for 1998/99. In arriving at its draft decision, the Commission has considered AGL(ACT)'s actual results for 1998/99.

3.2 Overview of public submissions

The Commission received submissions from: Esso Australia Ltd (Esso), BHP Petroleum (BHPP), ACTEW Corporation Ltd, the National Library, the National Gallery, and the Australian Institute of Sport. A list of submissions is provided in Attachment 2.

Issues which were raised in submissions include: initial capital base, operating costs including marketing costs, cost allocation, pricing issues, reference tariff structure for contract customers, gas allocation and balancing, gas specifications, interconnections and ring fencing.

In arriving at this draft decision, the Commission has considered all the public submissions.

3.3 Information disclosure, provision, and compliance

3.3.1 Code requirements

Sections 2.6, 2.7 and Attachment A of the Code relate to the information requirements of the Access Arrangement Information.

The information described in Attachment A to the Code relates to:

1. access and pricing principles
2. capital costs
3. operation and maintenance costs
4. overheads and marketing costs
5. system capacity and volume assumptions
6. key performance indicators.

The specific items of information listed under each category are examples of the minimum disclosure requirements applicable to that category. However under sections 2.8 and 2.9, the relevant regulator may:

- allow some of the information disclosed to be categorised or aggregated; and
- not require some of the specific items of information to be disclosed,

if in the relevant regulator's opinion it is necessary in order to ensure the disclosure of the information is not unduly harmful to the legitimate business interests of the service provider or a user or prospective user.

Under section 2.9(a) of the Code, if the relevant regulator is not satisfied that the AAI meets the requirements of the Code, it may require the service provider to make changes to the AAI. Under section 2.9(b) of the Code, if requested to do so by any person, the relevant

regulator must consider whether the AAI meets the requirements of sections 2.6 and 2.7 and decide whether or not to require the service provider to make changes to the AAI accordingly.

In addition to information provided by the service provider in its AAI, any person, including the service provider, may provide information voluntarily. In these circumstances, sections 7.11 and 7.12 of the Code provide for the treatment of confidential information.

Under the Code, apart from the AAI and information provided voluntarily by a person, the power of the relevant regulator to obtain information and documents is governed by section 41 of the Gas Pipelines Access Law, subject to the restriction concerning the disclosure of confidential information (section 42).

3.3.2 AGL(ACT)'s information disclosure

On 5 January 1999, AGL(ACT) submitted its AAI in conjunction with the Access Arrangement.

In response to a request by the Commission under section 2.9(a) of the Code, AGL(ACT) submitted a revised AAI (RAAI) on 15 February 1999. A supplementary AAI (SAAI) was submitted on 22 April 1999 in response to a further notice[11] issued after the Commission had considered submissions concerning the adequacy of the AAI.

During the review process, AGL(ACT) provided further information in response to section 41 requests issued by the Commission. AGL(ACT) stated that some of the information was confidential and commercially sensitive.

3.3.3 Public submissions

BHPP lodged a formal request to the Commission under s2.9(b) of the Code. This request relates to the adequacy of information disclosure in AGL(ACT)'s Access Arrangement.[12] In its letter of 9 March 1999, BHPP states:

> … the RAAI falls short of the Code in material respects and we request that the RAAI be amended as soon as practicable to include the information specified below. We seek two groups of information:
> - information required to satisfy Attachment A of the Code
> - information that would enable a user or prospective user to form an opinion in relation to whether the proposed AA complies with the Code and to understand the derivation of the elements of the AA.

3.3.4 Commission's considerations

Access Arrangement Information

The Commission assessed AGL(ACT)'s AAI for compliance with the requirements of sections 2.6 and 2.7 of the Code. The Commission decided the AAI did not satisfy those requirements, and under section 2.9(a) required AGL(ACT) to make changes.

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11 The s2.9 information request was sent to AGL(ACT) on 1 April 1999.

12 BHPP, *submissions to AGL(ACT) Access Arrangement Review*, 29 January 1999 and 9 March 1999.

On 22 January 1999, the Commission asked AGL(ACT) to provide additional access arrangement information including relevant forecast information. AGL(ACT) submitted a revised AAI (RAAI) on 15 February 1999.

After assessing the RAAI and considering BHPP's request, the Commission, under section 2.9(a), again required AGL(ACT) to make changes to the AAI. AGL(ACT) responded to this request with a SAAI.

The Commission notes that in June 1999, AGL(ACT) responded to issues raised at the public hearing clarifying some information and providing further information on a range of issues, including marketing costs.

Late in the review process, AGL(ACT) submitted details regarding additional capital expenditure requirements, namely the connection to the Eastern Gas Pipeline. The Commission is currently assessing AGL(ACT)'s capital expenditure proposal, including this latest addition.

The Commission has assessed the information provided by AGL(ACT) in the RAAI, SAAI and subsequent submissions containing revisions and additional information to clarify the AAI. The Commission requires that the original AAI, the RAAI and SAAI be consolidated in a new AAI.

Further changes to the AAI will be required as a consequence of the Commission's draft decision and proposed amendments.

Other information requirements

During the review process, the Commission identified additional information required before it could assess AGL(ACT)'s proposal. The Commission obtained some of this information under section 41 of the Gas Pipelines Access (ACT) Law.

In preparing this draft decision, the Commission has endeavoured to provide reasons and supporting information. However, there are limits on the Commission disclosing information obtained under section 41.

In the public interest, and given the benefit of not delaying release of the draft decision, the Commission has withheld information from this report where that information was provided by AGL(ACT) under section 41 and where that information was claimed by AGL(ACT) to be confidential or commercially sensitive.

3.3.5 Commission's draft decision

Amendment 1 – Access Arrangement Information

AGL(ACT) is required to amend the Access Arrangement so that it includes the following:

a) consolidation of the information in its original AAI submitted to the Commission on 5 January 1999, its RAAI of 15 February 1999 and its SAAI of 22 April 1999, consistent with this draft decision

b) amendments required by this draft decision

c) actual results in 1998/99 including capital costs, non-capital costs, system capacity, sales volume, MDQ, and key performance indicators

d) cost allocation information consistent with the revisions required by the draft decision.

PART III

DETERMINATION OF TOTAL REVENUE

4 AGL(ACT)'S REVENUE AND COST PROPOSALS

4.1 Code requirements

The overview to section 8 of the Code describes the principles for determining reference tariffs and total revenue for a service provider. Assessing reference tariffs involves:

- establishing total revenue
- determining the allocation of total revenue
- obtaining per unit prices for each reference service.

The reference tariff principles are designed to provide a high degree of flexibility so that reference tariffs can be designed to meet the specific needs of each pipeline system.

To provide background, the overview summarises the reference tariff principles as:

- the overarching requirement that when reference tariffs are determined and reviewed, they be based on the efficient cost (or forecast efficient cost) of providing the reference service
- that service providers be given market based incentives to improve efficiency and promote efficient growth of the gas market
- the reference tariff policy requires that all reference tariffs be designed to achieve a number of objectives, including to recover the costs of delivering the reference service over the expected life of the asset, to replicate the outcome of a competitive market, and to be efficient in level and structure.

Under the Code, reference tariffs are to be based on the sales of all services provided by the covered pipeline delivering (or forecast to deliver) a certain amount of revenue (total revenue) over the period for which the reference tariffs are to remain in effect (the reference tariff period). 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.

Interested readers are referred to sections 8.4-8.6 of the Code, which detail the determination of total revenue.

4.2 Overview of Commission's approach

Return *on* and return *of* capital comprise a significant proportion of the costs of network service. Over 60 per cent of AGL(ACT)'s gas distribution costs relate to capital costs. The determination of an appropriate asset base and rate of return is often difficult. The Commission considers that an approach which heavily emphasises asset value and rate of return, without considering other factors, may lead to an outcome which is inconsistent with the terms of the Code.

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

Consistent with the objectives and requirements of the Code, the Commission has adopted a process which involves:

- assessing operational and capital expenditure
- analysing financial indicators, including rate of return, and assessing the service provider's past, current and future commercial performance
- considering the impact on consumers and service standards
- providing appropriate signals for efficient new investments
- implementing incentive-based regulation to encourage efficiency gains, thereby ultimately delivering lower prices to customers
- enhancing economic efficiency and competition (including upstream and downstream competition).

Some of the issues, such as rate of return and asset valuation have been debated in similar access reviews in other jurisdictions. Where appropriate, the Commission has therefore considered other regulatory decisions. These include decisions made by: the Independent Pricing and Regulatory Tribunal (IPART), Australian Competition and Consumer Commission (ACCC) and the Office of the Regulator General (ORG) in 1998 and 1999.

The Commission has considered various asset valuation methodologies and views on the appropriate rate of return. The Commission's determination of the rate of return and the initial capital base is discussed in more detail in chapters 5 and 6.

4.3 AGL(ACT)'s proposed revenue paths

AGL(ACT)'s proposed revenue paths are based on its assessment of the cost of providing network services in each of the contract and tariff markets. AGL(ACT) proposes that a price cap of CPI-1 per cent per annum be applied to each of its contract and tariff market over the Access Arrangement period 1999 / 2000-2003 / 04.

The Commission understands that AGL(ACT)'s proposed current cost accounting (CCA) approach and price path approach imply the adoption of a cost of service methodology for total revenue. However, the application of these approaches does not strictly adhere to the methodology, since total revenue is less than the cost of service for the period. The difference has resulted from the price path adopted, which was designed to achieve approximately the allowed return in the last year of the Access Arrangement period.

Since its original proposal on 5 January 1999, AGL(ACT) has advised the Commission of revisions to the elements of cost of services, including the initial capital base, expenditure projections, and volume forecasts.

Based on the most recent information available, AGL(ACT)'s proposed target revenue for each year is the sum of:

- operations and maintenance costs, marketing, and overhead costs
- an 8.0 per cent real pre tax return on an initial capital base (ICB) expressed in terms of funds employed (FE) of $246.6m at 1 July 1999
- depreciation on regulatory capital base (capital assets).

AGL(ACT) proposes an ICB using a funds employed approach, ie the sum of the initial value of the capital assets ($240.6m) and net working capital ($6m).

Key components underlying AGL(ACT)'s proposed price paths are summarised in Table 4.1.

Table 4.1 AGL(ACT) revenue/price path proposal

	1998/99 Actual	1999/2000	2000/01	2001/02	2002/03	2003/04
Contract price path		CPI-1	CPI-1	CPI-1	CPI-1	CPI-1
Tariff price path		CPI-1	CPI-1	CPI-1	CPI-1	CPI-1
Nominal $m						
Contract revenue	2.3	2.5	2.5	2.5	2.6	2.6
Tariff revenue	33.4	34.4	36.0	37.6	39.2	40.7
Total revenue	35.7	36.9	38.5	40.2	41.7	43.3
Cost of service						
Non capital cost	11.5	12.3	12.6	12.8	12.8	12.9
Depreciation	7.2	7.7	8.0	8.3	8.6	8.9
Return on capital	17.0	17.0	17.9	19.1	20.3	21.5
Total	35.7	36.9	38.5	40.1	41.7	43.3
Average funds employed		249	254	258	262	265
Rate of return		7.0%	7.2%	7.6%	8.0%	8.3%
Customer numbers	76,182	79,649	83,095	86,270	88,979	91,228
Total volume (TJ)	6.011	6,044	6,192	6,336	6,470	6,591
Contracted booked MDQ GJ		5,610	5,527	5,445	5,365	5,286
Real revenue 1999/2000$m						
Contract revenue	2.4	2.5	2.4	2.4	2.4	2.3
Tariff revenue	34.2	34.4	35.1	35.8	36.4	36.9
Total revenue	36.6	36.9	37.6	38.2	38.8	39.2
Real cost of services						
Non capital cost	11.8	12.3	12.3	12.2	11.9	11.7
Depreciation	7.4	7.7	7.8	7.9	7.9	8.0
Return on capital	17.2	17.0	17.5	18.2	18.9	19.5
Total	36.6	36.9	37.6	38.2	38.7	39.2
Real average price $/GJ						
Contract	2.36	2.33	2.31	2.29	2.26	2.24
Tariff	6.83	6.91	6.84	6.78	6.71	6.64
Total	6.09	6.11	6.07	6.03	5.99	5.95

Source: AGL(ACT), RAAI for ACT, Queanbeyan and Yarrowlumla Network and subsequent email correspondence.

Notes:

1. Inflation rate is assumed to be 2.5 per cent per annum.
2. Due to rounding, total figures may not add up.

Under its proposal, AGL(ACT)'s target revenue will increase in real terms by 7.1 per cent over the five years 1999-2004 and profitability and rate of return will gradually increase to 8 per cent on the proposed regulatory capital base (funds employed). In year 5, the rate of return is projected to be 8.3 per cent.

4.4 Specific issues in assessing AGL(ACT)'s revenue and cost proposals

In assessing AGL(ACT)'s proposed revisions to its current Access Undertaking, the main issues are: rate of return, initial capital base, operating efficiency, and capital efficiency. The Commission's assessment is presented in chapters 5-11. In addition, the Commission has considered specific issues:

- assessing the funds employed approach to establishing the ICB
- assessing the cost implications of retail contestability for AGL(ACT).

4.4.1 Funds employed approach and net working capital

Code requirement

The Code does not expressly define the treatment of net working capital.

AGL(ACT)'s proposal

AGL(ACT)'s proposed regulatory capital base is based on a funds employed approach, ie

regulatory capital base = system assets + other assets + net working capital.

Commission's assessment

In its original proposal dated 15 January 1999, AGL(ACT) estimates its net working capital as negative $10m, which is 4 per cent of the proposed ICB for its capital assets ($245m) at 1 July 1999. The deficit in the net working capital is caused by the inclusion of deferred income tax liabilities.

The Commission notes that in most access decisions, the issue of working capital is insignificant, as the return on working capital represents a very small percentage of the total revenue requirement. In some cases (eg Albury Gas Company), net working capital is assumed to be zero. In its recent decision on access arrangements in NSW, IPART determined that net working capital should be treated differently when calculating return on capital assets.[13] A nominal return is allowed on a forecast working capital level. This contrasts with the real return on capital assets (ie system and non-system assets), which is to be indexed by the CPI over time.

AGL(ACT)'s proposed treatment of net working capital is the same as the Access Arrangement proposal submitted by AGLGN in NSW. This issue has been the subject of a consultancy study by KPMG. In its report on the issue of net working capital, KPMG considers that:[14]

- taxation assets and liabilities should be excluded from the regulatory net asset base under a pre tax rate of return regulatory regime
- for price regulation purposes, net working capital normally comprises current assets and current liabilities, and should be net of cash and borrowings, investments and

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13 IPART, *Access Arrangement for Great Southern Energy Networks Pty Ltd*, Final Decision, March 1999, *Access Arrangement for Albury Gas Company Limited*, Draft Decision, July 1999 and *Access Arrangement for AGL Gas Networks Pty Ltd*, Draft Decision, October 1999.

14 KPMG Consulting, *Report to IPART on the treatment of net working capital in establishing the regulatory asset base for AGLGN*, October 1999.

investment income accruals, interest and dividend accounts, taxation assets, and liabilities

- provisions should be accounted for as funds employed and not deducted from the regulatory capital base.

The Commission notes that in IPART's draft decision report on AGLGN's Access Arrangement, Arthur Andersen, on behalf of AGLGN, accepted that tax liabilities should not be included in net working capital:[15]

> AGLGN's proposed price path and its base financial model represent a funds employed valuation. In arriving at this amount, AGLGN has discounted pre tax nominal cashflows using a pre tax nominal discount rate. By excluding tax cashflows, this funds employed valuation is therefore exclusive of all tax balances and takes no account of potential tax liabilities or assets.

AGL(ACT) has revised its ICB for its capital assets accordingly. Based on its 1998/99 financial statement, AGL(ACT)'s net working capital at 1 July 1999 is estimated at $6m.

Commission's draft decision

The Commission considers the treatment of net working capital in the draft decision for AGLGN as reasonable.

The Commission has decided:

- the regulatory capital base should comprise capital assets (ie fixed assets) plus net working capital
- net working capital should be defined to reflect only items which are essential for the conduct of the business
- deferred income tax liabilities and future income tax benefits should not be included in the net working capital calculation
- a real return should be allowed on the regulatory value of capital assets
- a nominal return should be allowed on net working capital.

Amendment 2 - Funds employed and net working capital

AGL(ACT) is required to amend:

a) its funds employed approach by separating regulatory capital assets (system and non-system assets) from net working capital when the rate of return component is calculated. A real rate of return is to be applied to the regulatory capital assets (ie system assets and non system assets). A nominal return is to be applied to net working capital

b) its level of net working capital to exclude taxation assets and liabilities (ie taxation provisions, deferred income tax liabilities and future income tax benefits)

c) its net working capital forecast with disclosure of the assumptions and parameters underlying such forecasts.

15 Arthur Andersen's letter of 23 August 1999.

4.4.2 Cost implications of retail contestability for AGL(ACT)

Code requirement

Under sections 8.36 and 8.37 of the Code, the Commission is required to assess costs associated with retail contestability as a component of non-capital costs.

AGL(ACT)'s proposal

In its proposed Access Arrangement, AGL(ACT) has included its assessment of costs associated with the introduction of contestability for the purpose of calculating total revenue. The costs include:

- an initial capital expenditure outlay of $0.7m in 1999/2000
- additional operating costs of $0.6m in 1999/2000 increasing to $0.7m in 2003/04.

Commission's assessment

Under the timetable for gas retail contestability in ACT, customers consuming between 1 and 10 TJ (ie large users in the tariff market) have been contestable from 1 October 1999. Full retail contestability for the ACT gas market is scheduled from 1 July 2000.

The process and the costs associated with retail contestability are some of the important matters being addressed by the Gas Retail Steering Committee in NSW.[16] These issues include:

- whether the costs are reasonable
- how these costs should be recovered and allocated between customers; should the costs be borne by specific customers, or should they be spread across all customer classes?

New systems and procedures will be required from 1 July 2000 to deal with full contestability. Working groups have been established to address these issues.

At this point in the access review and approval process for AGL(ACT), insufficient information is available to assess AGL(ACT)'s proposed contestability costs. The Commission notes that the development of systems and procedures relating to full contestability may impact on the Access Arrangement for AGL(ACT) in the near future.

Commission's draft decision

The Commission considers that the pass through of contestability costs and the mechanism for recovering the costs of contestability should be dealt with at a later time, when full contestability and other retail contestability issues are clearer. The Commission will continue to consult with the ACT Government on the progress of this matter.

Even though the full costs of contestability have still to be determined, the Commission has decided to make an interim provision for retail contestability costs on the basis of AGL(ACT)'s estimate. However, it must be stressed that this does not represent the

[16] A steering committee has been established by the Ministry of Energy and Utilities in NSW in relation to the introduction of and preparation for retail competition in gas (the Gas Retail Project). A wide range of interested parties, including network operators, retailers, customer groups, government departments (including representatives from the ACT) and IPART are represented on the committee.

Commission's acceptance of AGL(ACT)'s proposal. When sufficient information is available to form its judgement, the Commission will make a further assessment.

See chapter 18 for further discussion of retail contestability.

5 RATE OF RETURN

5.1 Code requirements

In determining the rate of return for AGL(ACT), the Commission must have regard to the objectives set out in section 8.1 of the Code, other relevant factors under section 8, and the matters in section 2.24 of the Code. Interested readers are referred to these sections of the Code for specific details.

5.2 AGL(ACT)'s proposed WACC

AGL(ACT) has proposed a rate of return of 8 per cent. At the public hearing, AGL(ACT) stated that:[17]

> The proposed rate of return of 8 per cent recognises recent regulatory decisions and is commensurate with the prevailing conditions in the market for funds and the risks faced by AGL(ACT) in delivering the reference services...

Table 5.1 presents the parameters that AGL(ACT) has used in deriving its cost of capital:

Table 5.1 WACC parameters used by AGL(ACT)

Parameter	AGL(ACT) (RAAI)
Inflation	2 – 3%
Tax rate	36%
Dividend imputation utilisation rate	30 – 50%
Nominal 10 year bond rate (risk free rate)	4.8 - 5.2%
Debt margin	1.00 - 1.45%
2010 CPI linked bond rate	3.2 - 3.5%
Market risk premium	6.0 - 7.0%
Asset beta	0.5 – 0.65
Equity beta	1.1 – 1.4
Debt to equity ratio	60:40
Nominal cost of debt	6.0 – 7.25%
Nominal cost of equity	12 – 16%
WACC (pre tax real)	**8%**

Source: AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 9.

In its RAAI, AGL(ACT) states that the WACC-CAPM approach does not readily account for asymmetric and self-insured risks. AGL(ACT) believes these are real risks that should be considered when determining the rate of return. AGL(ACT) has therefore incorporated these risks into the upper ranges of the nominal cost of equity. [18]

[17] AGL(ACT), Presentation at Public Hearing, 11 May 99.

[18] AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 9.

AGL(ACT) has submitted a report by Arthur Andersen dated 6 September 1999. After conducting a high level review of AGL(ACT)'s WACC calculations, Arthur Andersen has commented that the methodology adopted appears consistent and reasonable. However, it notes that:[19]

- the debt margin of 1.2% used by AGL(ACT) in the base case appears high. A value of 0.9-1.1% would more accurately reflect AGL(ACT)'s current debt margin.
- the Market Risk Premium (MRP) adopted is in the range of 6-7%. Whilst this is not unreasonable and is a commonly accepted range, in a low-inflation environment, this could be argued to be around 5.5%.

> The changes noted above, if adopted, may alter the base WACC value. However, we believe that the range of the WACC values estimated by AGL(ACT) is not unreasonable.
>
> Recent movements in long term bond rates will affect the WACC. These changes have not been reflected in the WACC calculated by AGL(ACT).

5.3 Public Submissions

Several submissions have been presented to the Commission regarding AGL(ACT)'s proposed WACC. BHP Petroleum submits that:[20]

> **The real pretax WACC should therefore be not more than 7.0 per cent** based on an equity beta of 0.8, along with present bond rates, inflationary expectations, 50 per cent usage of imputation credits, tax rate of 36 per cent, a market risk premium of 5.5 per cent, leverage of 60 per centand a debt premium of 100 basis points.

ACTEW notes in its submission that:[21]

> … the price path outcomes will lead to a rate of return in excess of the stated WACC by the fourth year of the price path.

At the public hearing ACTEW commented that:[22]

> There is a degree of risk but there is also a degree of assurance in these businesses, so somewhere between the full risk premium and the absolutely no risk interest rates seems to be a proper balance and at the moment it seems to be between 7 and 8 per cent.

5.4 Commission's analysis and assessment

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. Rate of return is also a significant factor in total revenue and prices for the service provider.

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19 AGL(ACT) Arthur Andersen, *Review of Financial and Valuation Models prepared by AGL Gas Company (ACT) Limited*, July 1999, p 32.

20 BHP Petroleum, *Submission to AGL(ACT) Access Arrangement review*, 1 April 1999, p 9.

21 ACTEW, *Submission to the AGL(ACT) Access Arrangement Review*, 26 March, p 4.

22 ACTEW, *Presentation at Public hearing*, 11 May 1999.

5.4.1 Approaches to rate of return

The CAPM approach is a commonly used methodology for determining the cost of equity and the WACC. The basis of CAPM is the relationship between risk and return. Although there has been considerable debate concerning the strength of the risk/return relationship, there appears to be a linear and positive relationship over the very long term. The cost of capital can be expressed in nominal terms, or in real terms (ie return over and above inflation).

The difference between the 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 using the Fisher equation.

As stated in section 8.31 of the Code, the rate of return may be determined on the basis of a well accepted financial model such as CAPM. Other approaches may be adopted if the relevant regulator is satisfied that to do so would be consistent with the objectives contained in section 8.1 of the Code. Other methods could be used to estimate the cost of equity, might include the price/earnings (P/E) ratio, the dividend growth model (DGM), and the arbitrage pricing theory (APT).

These alternative models are all based on the same underlying assumptions of discounted cashflows. The price earning ratio and dividend growth models are used in the financial markets, but are difficult to implement. Given the lack of data and the circumstances of the gas transportation industry, alternative approaches are impracticable at this stage.

5.4.2 Practical issues associated with CAPM/WACC

CAPM classifies risk into two categories:

- systematic risk (ie risk applicable to the market as a whole, such as inflation, tax rises, interest rates) which is *not* diversifiable
- specific/unique risk (ie residual risk unique to an entity or to a small group of companies forming a subset of the market), which can be eliminated through diversification.

Under CAPM, there is no compensation for specific risk. 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
β	=	beta, ie the relative volatility of the specific stock to the market, a measure of systematic risk

Under a WACC approach, the required returns for equity and debt are weighted in proportion to the relative amounts of equity and debt used in the financing mix to obtain the overall cost of capital.

The Commission has applied the formula developed by Officer[23] to calculate the post tax WACC.

Recent research and study has revealed potential deficiencies inherent in applying CAPM, particularly in respect of the individual component parameters. Problems associated with CAPM include:

- it may not provide 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
- it is difficult to measure the market portfolio
- estimating difficulties are varied and complex, particularly the estimation of expected return on equity. When 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 CAPM was highlighted in the regulatory process preceding the ACCC/ORG final decision on the Victorian Access Arrangements in 1998 and has been canvassed in the recent regulatory decisions of IPART, ORC and the ACCC.[24]

Despite these potential deficiencies, CAPM is widely used. However the potential deficiencies of CAPM indicates the need for judgement and careful interpretation in using the CAPM results.

5.5 Assessment of AGL(ACT)'s proposal

The Commission has considered the individual parameters, current market conditions, and the risks faced by AGL(ACT). On the whole, the Commission considers AGL(ACT)'s proposed pre tax real WACC of 8 per cent does not fully reflect current market conditions and its business risks. The reasons are presented in the following sections.

Current market conditions

Risk free rate

AGL(ACT) has used the nominal 10 year bond rate and 2010 CPI linked bond rate as proxies for the risk free rate. It has submitted ranges for these rates along with a range for the inflation rate. The inflation rate implied by the two rates is in the vicinity of 1.6 per cent.

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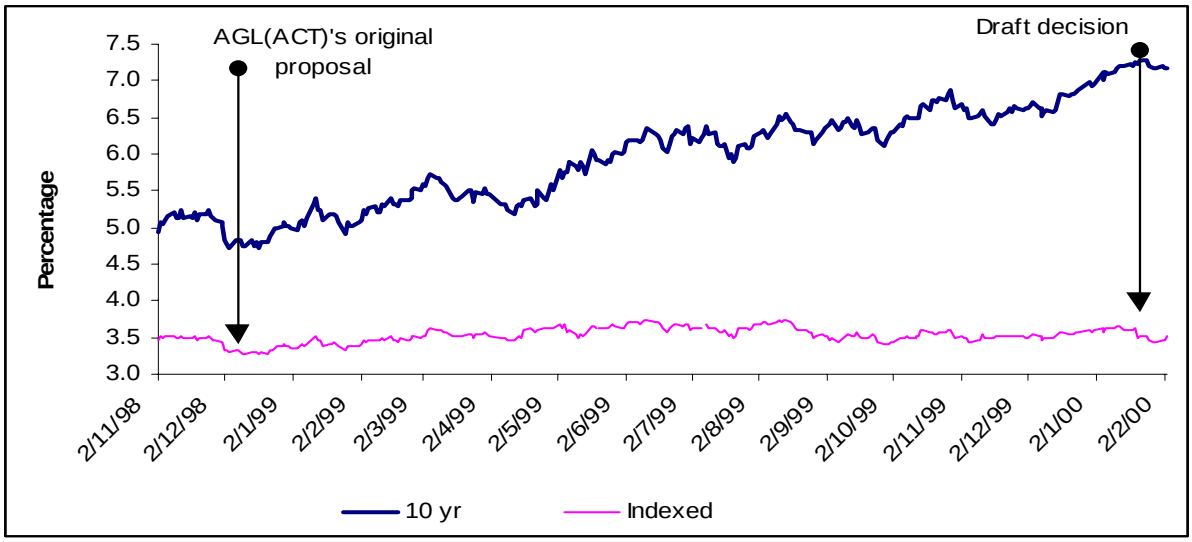
23 Officer RR, *The Cost of Capital if a Company under an Imputation Tax System, Accounting and Finance*, 34, 1 May 1994, pp 1-18.

24 For detailed discussions refer to the IPART draft determination of AGLGN's access arrangement released in October 1999, and the ACCC's draft Statement of Principles for the Regulation of Transmission Revenue released in May 1999.

The Commission has based the risk free rate on the 20 day average of the 10 Year Commonwealth bond rate. Whilst it is theoretically correct to use the 'on-the-day' rate under CAPM, the use of on-the-day rates introduces a degree of short term variability. To smooth daily variations, the Commission considers it appropriate to adopt an average over a relatively short period. The Commission notes that IPART has adopted a similar method, while ORG and ACCC applied a 40 day average in their decisions on the Victorian Access Arrangements and ACCC's Draft Statement of Principles for the Regulation of Transmission Revenues.

Since AGL(ACT) submitted its proposed Access Arrangement on 5 January 1999, nominal interest rates fell before rising to their current levels. Indexed bond rates have risen by only a small amount. Figure 5.1 presents the trend of the nominal and indexed 10 year bond rate from November 1998 to date:

Figure 5.1 10 Year Commonwealth government bonds vs 2010 indexed bond



Source: Reserve Bank of Australia, January 2000.

The 10 Year Commonwealth government bond rate, the 2010 indexed bond rate and the resultant implied inflation rate are set out in Table 5.2:

Table 5.2 Bond yields and inflation rates (%)

	AGL(ACT) proposal (Jan 99)	IPARC assessment (Jan 2000)*
Nominal 10 year bond rate	4.80 – 5.20	7.13
2010 CPI indexed linked bond rate	3.20 – 3.50	3.59
Inflation	2.00 – 3.00	3.42

* 20 day average as at 25 January 2000.

Market risk premium

AGL(ACT) has proposed a range of 6.0-7.0 per cent for the market risk premium (MRP).

In arriving at the recent regulatory decisions of IPART and the ACCC, discussion of the appropriate MRP has been extensive. The Commission has examined these studies in

considering the appropriate level for the MRP. Most estimates of the MRP are based on long term data series. The important underlying assumption is that the MRP is constant. However there is no reason for this to be so. Finance theory suggests the MRP is a function of investor risk preference and other variables such as interest rates, investment opportunities, savings patterns and wealth. These factors vary over time[25].

Recent overseas research[26] suggests the MRP has fallen. In its final determination for water and sewerage charges for 2000-2005, OFWAT adopted an equity risk premium of 3.0-4.0 per cent.[27]

In its recent final proposal for the distribution price control review, the Office of Gas & Electricity Markets (OFGEM) adopted an equity risk premium of 3.5 per cent.[28]

In its most recent draft decision on the Central West Transmission Pipeline, ACCC adopted a value of 5.5 per cent. This is consistent with Arthur Andersen's recommendation for AGL(ACT). In its earlier draft regulatory principles for electricity, ACCC comments that it is probable that a 5.0 per cent MRP is more appropriate than the 6.0 per cent allowed in the Victorian decisions.[29]

Table 5.3 shows the risk premiums applied by financial academics and regulators in recent pricing decisions:

Table 5.3 Market Risk Premium

	Market risk premium (%)
ACCC (Victorian TPA 1999 gas final decision)	6.0
ORG (1998 Victorian gas distributors)	6.0
Officer	6.0
Davis	4.5-7.0 (with a preference towards the lower end of this range)
IPART (AGLGN draft decision, Oct 99)	5.0-6.0
IPART (Electricity determination, Dec 99)	5.0-6.0
ACCC (Central West Pipeline, Sep 99)	5.5
IPARC (ACTEW, May 99)	5.0-6.0

After considering these studies, reports and earlier information on the market risk premium, the Commission is of the opinion that AGL(ACT)'s WACC range should be calculated based on a MRP range of 5.0-6.0 per cent. The Commission will continue to monitor evidence of appropriate measurement of the MRP.

25 For detailed discussions refer to the IPART draft determination of AGLGN's access arrangement released October 1999 and its determination for electricity networks released December 1999.

26 *The Equity Risk Premium: Another Look at History*, Dr Tim Jenkinson, Oxford University in The Utilities Journal, April 1998. See also CSFB Equity Gilt Study (January 1999).

27 In arriving at this range, OFWAT considered the results of a survey of institutional investors carried out by Credit Lyonnais Securities Europe (CLSE), recent research published by equity analysts, academic studies, and a Price Waterhouse survey.

28 OFGEM, *Reviews of Public Electricity Suppliers 1998-2000 Distribution Price Control Review*, Final Proposal, December 1999, p 43.

29 ACCC, *Draft Statement of Principles for the Regulation of Transmission Revenue*, 27 May 1999, p 79.

Beta

Beta is the measure of a company's non-diversifiable risk relative to the equity market as a whole.

Under CAPM, the beta factor is theoretically intended to capture only systematic or non-diversifiable risk. Diversifiable risk is managed through diversification. Insurable risk should be allowed for in the cashflows. Practically, there are difficulties inherent in quantifying risk in this way. The Commission considers that any risks not adequately allowed for under the CAPM approach, should be factored into the rate of return by considering a rate towards the upper end of the WACC range established under CAPM, rather than by selecting a high beta factor.

In accordance with section 8.31 of the Code, the Commission has adopted an equity beta in the range of 0.9 - 1.1 based on a debt beta of 0.06[30], a debt level of 60 per cent, an asset beta of 0.4-0.5, a tax rate of 36 per cent and a gamma range of 0.3-0.5.

Table 5.4 Comparison of AGL(ACT) and IPARC betas

	AGL(ACT) proposal	IPARC assessment
Asset beta	0.5-0.65	0.4-0.5
Equity beta	1.1-1.4	0.9-1.1

Dividend imputation

With the introduction of dividend imputation in Australia, calculations of the cost of capital must 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. The parameter of gamma (γ) is used to represent the imputation utilisation rate in WACC calculations. The lower the gamma, the higher the pre tax WACC.

Having considered the market estimates and the level of utilisation under differing scenarios of ownership, the Commission believes an imputation utilisation rate between 0.3-0.5 represents an acceptable range. The Commission therefore concludes that AGL(ACT)'s proposal of a range of 0.3-0.5 is reasonable.

Tax rate

CAPM provides a basis for calculating the post tax cost of equity, ie an after tax return to equity investors. The required post tax rate of return is translated to a pre tax return by reference to a tax rate. AGL(ACT) has assumed a statutory tax rate of 36 per cent. The incorporation of tax is one of the most controversial issues in the application of CAPM.

The Commission must make two decisions:

1. whether to apply a pre tax or post tax rate of return
2. whether to use statutory or effective tax rates in allowing for tax liabilities.

30 Currently a debt beta of 0.06 has been adopted. Further analysis will be undertaken.

If tax is incorporated in the WACC, pre tax income is used in measuring the utility's rate of return (ROR). If a post tax WACC is used, tax is included in the cashflows and post tax income is used in measuring the ROR. In either case, a regulator must decided which tax rate to use.

Often the effective tax rate for a company is below the statutory tax rate. However, over the life of the pipelines system, utilities generally move from a low to full tax paying position. This may increase price volatility. Table 5.5 presents AGL(ACT)'s past performance and the tax position from 1992-1999:

Table 5.5 AGL(ACT)'s past performance and tax position (1)

$m	Financial year ending 30 June							
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Operating profit before tax (OPBT)	10.0	13.7	11.5	8.9	9.7	12.1	15.8	21.3
Income tax expense	3.9	5.3	3.7	2.9	3.8	4.4	5.7	6.8
Income tax paid	2.9	3.8	3.4	2.7	0	5.8	3.5	4.3
Effective tax rate (%)								
Tax expense/OPBT	39	39	32	33	39	36	36	32
Statutory tax rate (%)	39	39	33	33	36	36	36	36

Source: AGL Gas Companies (NSW) annual accounts and AGL(ACT)'s annual reports.
Notes:
1 1992-97 figures are for the bundled retail and network business segments.

The table above shows that except in 1996 and 1999, AGL(ACT)'s tax expense is generally at the corporate rate. However, the amount of tax paid is generally below the income tax expense.

Recent access reviews have raised the question whether a post tax rather than a pre tax approach should be adopted. The Commission believes there are arguments for a post tax approach. These deserve further consideration. Developments will be monitored and considered prior to finalisation of the current review or at the next review.

The Commission acknowledges the practical difficulties associated with establishing an estimate of the long term effective tax rate. If the approach is to be consistent with the other parameters in the model, an estimate of the average effective tax rate for the industry, rather than the individual utility is required. Although the use of an effective tax rate[31] would pass some tax benefits on to end users, in establishing a feasible range for WACC, the Commission has accepted AGL(ACT)'s proposal to apply the statutory rate of 36 per cent.

As a consequence of the Ralph Business Tax Review, there will be a reduction in the corporate statutory tax rate from 36 to 34 per cent and then 30 per cent in two steps. The effect of this on the value of imputation credits is yet to be assessed. These will be changes to accelerated depreciation for tax purposes. All else being equal, adopting a tax rate assumption of 34 or 30 per cent will have marginal impact on the WACC. [32] However, changes which affect the value of imputation credits are likely to have a more substantial

[31] The effective tax rate compares the tax expense to operating profit. The corporate tax rate for companies is 36 per cent. Due to various timing and permanent differences of tax deductions, the actual expense for tax charged against profit is rarely equal to 36 per cent. Major differences can arise from investment allowances, tax losses etc.

[32] Reducing the tax assumption from 36 per cent to 34 or 30 per cent reduces the WACC (real, pre tax) by between 0.1 and 0.3 per cent.

impact on the WACC. The exact magnitude is difficult to quantify at this stage. For these reasons, the Commission has calculated the WACC at both the existing and proposed statutory tax rates, and had regard to the impact on a range for WACC.

The Commission agrees with IPART, ORG and the ACCC that the post tax return may be higher if the long term effective tax rate is below the current statutory rate of 36 per cent. The treatment of taxation will be examined prior to the final decision.

The Commission has decided to:

- express the rate of return in terms of both 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 regulatory capital base.

Cost of debt

The cost of debt varies, 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.[33] A margin can be derived by assuming a mix of long term and short term debt. It is important to note that both absolute rates and 'margins' change over time, according to economic conditions.

AGL(ACT) has proposed using a debt margin ranging from 1.0 to 1.45 per cent.

Since the recent sales of gas distribution businesses in Victoria, the cost of debt margin achieved by the new owners has fallen. IPART states:[34]

> The margin of 1.2 per cent allowed in the AGC draft decision stems from market commentary that the number of lenders in the syndicated bank market and the size of commitments are decreasing. This is a result of difficulties at the time (the second half of 1998) in the Japanese and Asian economies, which placed upward pressure on debt margins.

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33 Note that this is the Commission's practice and general market practice. However, some market practitioners use bonds with different maturities. eg the ACCC uses 5 year Commonwealth bonds.

34 IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, Oct 1999, p 67.

Debt margins used in recent regulatory decisions and advised by academics are as follows:

Table 5.6 Debt margin

	Debt margin (%)
ACCC Victorian gas (draft) – May 1998	0.80
ACCC Victorian gas (final) – Oct 1998	1.00
ACCC TransGrid (draft) – May 1999	0.80 – 1.20[35]
IPART section 12A report – Jun 1999	1.00
ACCC Central West Pipeline (draft) – Sep 1999	0.80 – 1.20[36]
Davis (advice on Envestra gas access) – Oct 1999	1.2[37]
IPART- AGLGN (draft decision) – Oct 1999	0.90 – 1.10[38]
IPART – Electricity (determination) – Dec 1999	0.80 – 1.00

In its draft decision on the Central West Pipeline, the ACCC, notes:[39]

> Since the release of the *Victorian Final Decision* in October 1998 the uncertainty in global financial markets has reduced.

BHP Petroleum has also commented that:[40]

> Recent privatisation also high lighted that debt premiums for such transactions – even at high multiples to the underlying asset base were occurring at only 100 basis points above the risk free rate.

Arthur Andersen has commented that a value of 0.9-1.1 per cent more accurately reflects AGL(ACT)'s current debt margin.[41]

At the time of making this draft decision, the Commission concluded that a reasonable range for the cost of debt facing AGL(ACT) is 0.9-1.1 per cent above the risk free rate of return. Adding the debt margin to the risk free rate results in a cost of debt of 7.42-7.62 per cent. The Commission will review this range prior to the final decision to ensure that it captures developments in the capital markets.

Debt funding/capital structure

A gearing (debt to asset) ratio is required to:

- identify a beta factor to use for estimating the cost of equity
- establish the appropriate weighted average cost of debt and cost of equity in WACC.

AGL(ACT) has assumed a capital structure of 60 per cent debt and 40 per cent equity. This is consistent with the ratio the NSW and Victorian regulators have adopted in their draft and final decisions.

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35 But use 1.00 for calculation.

36 But use 1.00 for calculation.

37 Based on a BBB rating.

38 As proposed by Arthur Andersen.

39 ACCC Draft Decision, *Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline*,10 September, p 37.

40 BHP Petroleum submission, April 1999, p 9.

41 AGL(ACT) and Arthur Andersen, *Review of Financial and Valuation Models prepared by AGL Gas Networks Limited*, July 1999, p 32.

The actual gearing ratio for a utility is likely to fluctuate over time. This is due to several factors, including the state of the capital market and individual circumstances.

The Commission notes that in the recent privatisation of the three stapled (distribution and retail) gas businesses in Victoria, the reported gearing (debt to total debt plus equity) level exceeded 60 per cent of the purchase price and is likely to be closer to 100 per cent of the regulatory capital base of the network business. Though some submissions indicate that a higher gearing would be reasonable, the Commission's draft decision estimates the average gearing level for reasonably efficient gas distributors. It is not necessarily a matter for concern if a gas distributor deviates from the average level in a particular year.

The Commission considers that a gearing ratio of 60 per cent is reasonable. This financing structure is reflective of standard industry structures for a going concern and best practice, in accordance with section 8.31.

Transformation of nominal post tax WACC to pre tax WACC

The order of transforming a nominal post tax return on equity to a real pre tax return on capital has an effect on the resulting WACC.

AGL(ACT) has adopted the so-called 'market practice' by:

1. grossing up a nominal post tax WACC to a nominal pre tax WACC by applying an estimated tax rate and then
2. de-escalating to a real pre tax WACC using estimated inflation.

A transformation using the reverse order has been suggested by Macquarie Risk Advisory Services.[42] Professor Davis[43] has suggested a formula for conversion which depends on asset life and generates a lower result than 'market practice', and closer to Macquarie's method.

The Commission notes that in their final decision on the Victorian gas distribution access arrangements, ACCC/ORG conclude there is no simple or unique solution to the transformation methodology. Envestra used an average of the two approaches in the Access Arrangement submitted for the South Australian distribution system.[44]

The Commission has considered these transformation methods in determining the WACC range (see Attachment 3).

5.5.1 Establishing a feasible range for the rate of return

Cost of equity

Table 5.7 presents the cost of equity, based on the assessment in section 5.5 above. Note that AGL(ACT)'s nominal cost of equity includes asymmetric and self-insured risks. This partially explains why the Commission's WACC assumptions yield a lower range for the nominal cost of equity.

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42 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.

43 K Davies, *Access Arrangements and Discount Rates: Real Pre Tax and Nominal Post Tax Relationship*, May 1998.

44 Envestra, *Access Arrangement Information for the South Australian Distribution System*, 22 February 1999, Appendix B – WACC calculation.

Table 5.7 Cost of equity

	AGL(ACT)'s proposal	IPARC assessment
Risk free rate (nominal)	4.8 – 5.2%	7.1%
Equity beta	1.1 – 1.4	0.9 – 1.1
Nominal cost of equity	12.0 – 16.0%	11.6 – 14.0%

Nominal cost of debt

Having considered recent debt margins, the Commission has concluded that an appropriate debt margin for AGL(ACT) is 0.9-1.1 per cent above the risk free rate of return, ie a cost of debt of 8.0 – 8.2 per cent.

Table 5.8 Cost of debt

	AGL(ACT) proposal	IPARC assessment
Risk free rate (nominal)	4.8 – 5.2%	7.1%
Debt margin	1.0 - 1.45%	0.9 – 1.1%
Nominal cost of debt	6.00 - 7.25%	8.0 – 8.2

AGL(ACT)'s proposal is based on market conditions as at December 1998. Since then, the bond rate has moved up due to the influence of US interest and inflation rates. Thus the Commission's range is higher largely because of the higher risk free rate (10 year bond rate) used in the input parameters.

Cost of capital – a feasible range

In the Commission's assessment, the use of the CAPM/WACC model suggests a rate of return in the range of:

- **11.6 – 14.0 per cent nominal post tax return on equity, or**
- **5.0 – 8.5 per cent pre tax real rate of return on capital.** [45]

[45] The lower and upper ranges are the real pre tax WACC using the alternative conversion methods from nominal post tax WACC to real pre tax WACC.

Table 5.9 presents the results of the parameters adopted in this draft decision:

Table 5.9 Comparison of recent regulatory decisions

	AGL(ACT) Proposal (Jan 99)	**IPARC's assessment (Jan 2000)**	IPART AGLGN draft decision (Oct 99)	ACCC draft decision Central West Pipeline (Aug 99)	ACCC/ORG Victorian final decisions (Oct 98)
Risk free rate (%)	4.8 – 5.2	**7.1**	6.35	5.83	6.0
CPI (%)	2.0 – 3.0	**3.6**	2.76	2.31	2.5
Real risk free rate (%)	3.2 – 3.5	**3.4**	3.49	3.44	3.4
Market risk premium (%)	6.0 – 7.0	**5.0 – 6.0**	5.0 – 6.0	5.5	6
Debt margin	100 – 145 basis points	**90 – 110 basis points**	90 – 110 basis points	100 basis points	120 basis points
Debt to total assets (%)	60	**60**	60	60	60
Gamma	0.3 – 0.5	**0.3 – 0.5**	0.3 – 0.5	0.5	0.5
Tax rate (%)	36	**30-36**	36	36	36
Asset beta	0.5 – 0.65	**0.4 – 0.5**	0.4-0.5	0.6	0.55
Debt beta	Not stated	**0.06**	0.06	0.0	na
Equity beta	1.1 – 1.4	**0.9 – 1.1**	0.9 – 1.1	1.48	1.2
Cost of equity (nominal post tax) (%)	12 – 16	**11.6 – 14.0**	10.8 – 13.2	14.0	13.2
Cost of debt (nominal pre tax) (%)	6 – 7.25	**8.0 – 8.2**	7.3 – 7.5	6.83	7.2
WACC (nominal post tax) (%)	Not stated	**7.2 – 8.0**	6.2 – 7.4	7.0	na
WACC (real pre tax) (%)	8.0	**5.0 – 8.5**	7.75	7.5	7.75

Source: AGL(ACT) Revised Access Arrangement Information, p 9 and the Commission's own analysis, ACCC draft decision on Access Arrangement by AGL Pipelines (NS) Pty Ltd for the Central West Pipeline, IPART draft decision on Access Arrangement for AGLGN, ACCC/ORG final decision on Access Arrangement for the gas pipelines in Victoria.

Note: This table can be cross referenced to the estimates of WACC parameters in tables 5.2, 5.5. 5.7 and 5.8 in the preceding paragraphs.

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

The range of WACC estimates for utilities will depend on the nature of the risks in the utility's industry. In choosing a WACC within the feasible range for the utility, factors to be considered include: risks in the business, the size of the business, the maturity of the market in which the utility operates, and prevailing market conditions.

5.5.2 Risk assessment of AGL(ACT)

AGL(ACT) argues that the Victorian decision should be used as a benchmark for assessing risk faced by AGL(ACT). However, AGL(ACT) claims that differences between the ACT and Victorian markets should be factored into the decision on the appropriate rate of return. They argue that the ACT gas market is not as mature as the Victorian market and hence is more risky.

Section 8.30 of the Code states that the rate of return should provide a return commensurate with prevailing conditions in the market for funds and the risks involved in providing the reference service. Risk factors faced by AGL(ACT) and the gas utilities are considered below.

Risks faced by the gas distribution industry have been discussed at length in the regulatory determinations of IPART[46], ORG and the ACCC[47] and are relevant to this draft decision. They are canvassed only briefly here.

Risk assessment of gas utilities generally

Some stakeholders argue that the risks facing the gas transportation business are higher than for the electricity business. They attribute the increased level of risk to greater volatility in revenues and a higher proportion of fixed costs relative to variable costs. In the residential and small business markets, gas may face greater competitive risks than electricity, as it is 'a fuel of choice'. This distinguishes it from electricity, which for practical purposes, is an essential requirement.

Following the explosion at the Longford plant in September 1998, and the consequent interruption to the Victorian gas supply, some industry participants have argued for a higher risk to be assigned to the gas transportation businesses. The ACCC has commented that the risk of incidents such as the Longford explosion is small, and this risk was fully taken into account in the Victorian final decisions.[48]

The Commission considers that although a competitive market is evolving, gas transportation and distribution is substantially a natural monopoly or near natural monopoly with low risks. The transparency of the regulatory process should help to reduce uncertainty.

Risk of redundant capital

Section 8.27 of the Code relates to capital redundancy:

> A Reference Tariff Policy may include (and the Relevant Regulator may require that it include) 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 so as to:
>
> (a) ensure that assets which cease to contribute in anyway to the delivery of Services are not reflected in the Capital Base; and
>
> (b) 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.
>
> Before approving a Reference Tariff which includes such a mechanism, the Relevant Regulator must take into account the uncertainty such a mechanism would cause and the effect that uncertainty would have on the Service Provider, Users and Prospective Users. If a Reference Tariff does include such a mechanism, the determination of the Rate of Return (under sections 8.30 and 8.31) and the economic life of the assets (under section

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46 IPART, *Final decision on Great Southern Networks Access Arrangement*, March 1999, pp 32-34, and IPART, *Draft decision on Albury Gas Company Access Arrangement*, June 1999, pp 30-33.

47 ORG / ACCC *Final Decision on the Access Arrangement of Multinet, Westar and Stratus networks* released October 1998, pp 70-79.

48 ACCC, *Access Arrangement by AGL Pipelines (NSW) Pty Ltd for the Central West Pipeline*, Draft Decision, 10 September 1999, p 41.

> 8.33) should take account of the resulting risk (and cost) to the Service Provider of a fall in the revenue received from sales of Services provided by means of the Covered Pipeline or part of the Covered Pipeline.

Some industry participants argue that the risk of asset stranding is high, as is the potential risk of not receiving a return on redundant capital. Other stakeholders and commentators have questioned 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 expansions are based on dedicated investments or user contributions.[49]

The Commission has considered this issue and the implications for setting a rate of return. Noting the uncertainty that this may bring, the Commission has taken this factor into account when considering the risks faced by AGL(ACT). The issue of redundant capital is discussed in chapter 7 in relation to rolling forward the capital base.

Risks faced by AGL(ACT)

Gas utilities have traditionally been regarded as stable, 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.

In regard to risks, the Commission makes the following comments:

- *Labour risk* Over the five year period 2000-2004, labour costs are projected to comprise about 11 per cent of the operating cost of AGL(ACT) (as per the figures in the SAAI). Relative to the Victorian distributors (28 per cent) and AGC (32 per cent), this is much lower. Hence, it could be argued that they face lower risk in this aspect. It should also be noted that the risk of escalating wages is a risk all managements must deal with.
- *Obsolescence* The ACT gas distribution system is relatively young and 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* The financial risk of stranded investment is considered to be largely a regulatory risk. With the introduction of natural gas to the ACT, AGL(ACT) adopted the strategy of laying mains on a mass scale rather than piecemeal, as this was perceived as being more economical. This is a business decision. Thus, the risk of investments being stranded as a result of incorrectly forecasting boom areas should be borne largely by AGL(ACT). However, asset stranding can also arise from competition.
- *Network competition* In the network business, competition may arise from bypass and alternative energy sources (eg electricity). 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 or regulation and variations and price structures are inappropriate. The partial indicators in chapter 10 suggest that the AGL(ACT) gas users pay relatively high network prices. The lower revenue stream in this draft decision will lower prices. This reduction should help to reduce this risk. Such risks can and should also be managed by AGL(ACT) through the negotiation of prices or more appropriate reference price structures.

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[49] Submissions to ACCC/ORG by the Energy Action Group, 17 July 1998.

- *Capital expenditure* Most utility businesses face large capital expenditure outlays whenever they replace, upgrade, or build new assets. Cost efficiency in capital expenditure outlays has a critical impact on the business. AGL(ACT) has four components in its proposed capital expenditure: renewal/replacement, growth, system reinforcement and contestability. The key issue for the utility is how these costs are to be factored into future determinations.
- *Market risk* AGL(ACT) claims that the lower level of market maturity in ACT is a source of higher risk. However, the ACT system is of a similar age to the Albury and Wagga Wagga natural gas systems and faces a similar climate, yet these markets have attained penetration rates beyond AGL(ACT)'s 54 per cent. It should be noted that the risk of losing customers cannot be attributed solely to market risk, and hence compensated for in the rate of return. Growth and retention of customers depends on AGL(ACT)'s ability to attract new loads and maintain service and customer satisfaction.
- *Regulatory environment* Regulatory risk associated with network prices depends on the frequency and consistency of determinations, and the nature of the regulatory formula. The Commission considers there is a fair degree of certainty for AGL(ACT) under the principles and requirements of the Code. Nevertheless, the Commission accepts that utilities face regulatory risk at the early stage of implementation, and it may be high. The proposed term of the Access Arrangement will reduce regulatory uncertainty. Furthermore, it should be noted that compared with the electricity regime under the National Electricity Code, the Gas Code provides more certainty. Thus, is can be argued that in this respect, gas utilities face a less risky regulatory environment.

5.5.3 Other evidence and considerations

Market expectations

Market information suggests that from 1987-1996 the average return on equity in the Australian equities market was around 11.1 per cent, with a standard deviation of 13.4 per cent.[50]

The Commission is aware that the rate of return needs to be sufficient to attract lenders and investors so that service providers can continue to finance the operation of, and investment in, their networks. However, the market should not expect the rate of return to be so high that customers face prices which include a significant monopoly profit element.

The Commission notes that in the recent privatisation of the three stapled gas businesses in Victoria, the purchase price for the Victorian gas distribution/retail businesses was 2.6-2.9 times the regulatory capital base for the distribution business. The purchase price outcomes appear to provide some evidence of an implied return on the regulatory capital base, which is well below 7.75 per cent (pre tax real) in recent gas distribution access pricing decisions.

Regulatory return allowed by overseas regulators

In the UK, the cost of capital for utilities in general has been estimated by regulators as 6.0–8.0 per cent in real terms before tax. However, recent draft determinations indicate that the cost of capital is trending downwards. Table 5.10 summarises the methods used in the UK:

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[50] From the Journal of the Australian Securities Association, JASSA, Autumn 1998 p 31. A table in that report was reproduced in IPART's draft decision on GSN (September 1998, p 27).

Table 5.10 Comparison of WACC parameters with recent UK decisions

		IPARC	OFWAT	OFGEM	AGL(ACT)
Risk free rate (%)		3.4	2.5-3.0	2.5	3.2-3.5
Debt Premium (%)		0.9-1.1	1.5-2.0	1.4	1.0-1.45
Equity beta		0.9-1.1	0.7-0.8 (adjusted)	1.0	1.1-1.4
Equity risk premium (%)		5.0-6.0	3.0-4.0	3.5	6.0-7.0
Gearing (%)		60	Around 50	50	60
WACC (%)	- post tax	6.7-8.0	4.25-5.25		
real	- pre tax	5.0-8.0		6.5	8.0

In the USA, it appears that a nominal cost of equity capital is around 11 per cent[51] 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.

5.6 Commission's draft decision

The Commission has determined the rate of return in accordance with section 8.30 of the Code. At present, CAPM is the most widely accepted procedure for estimating the cost of capital. Industry and market participants support this view. Regulatory agencies have applied CAPM to estimate the cost of capital for regulated industries in the USA and UK.

There are differences in opinion regarding how WACC should be calculated under a CAPM framework. The treatment of asymmetric risks and sensitivity to current interest rates are causes of concern. Neither can be factored into CAPM easily, but both are relevant to a regulator in determining the appropriate rate of return.

In recent months, the real rate of return has remained at around 3.5-3.6 per cent. The Commission considers the movement in real interest rates is an important factor as the regulatory regime applies a real rate of return.

From the evidence currently available on the cost of equity at the time of making this draft decision, the use of CAPM suggests that the **nominal post tax return on equity should be 11.6 – 14.0 per cent.** Applying this approach, the WACC for the regulated gas distribution network should be **5.0 - 8.5 per cent (real, pre tax)** on the basis of alternative transformation methodologies**.**

The Commission's draft decision is that a real pre tax rate of return within the range of 7.0–8.0 per cent is appropriate for gas utilities. This is towards the higher end of the range under the CAPM framework.

[51] Submissions on ACCC/ORG draft decisions by J Makholm, National Economic Research Associates, June 1998 and July 1998.

The Commission notes that in recent final determinations by the UK regulators OFGEM and OFWAT, the proposed rate of return is lower than those set at the last price control. Their proposals are based on extensive research on WACC parameters and market surveys.

In addition to CAPM, the Commission has considered other factors, including an assessment of the risks faced by AGL(ACT), and additional evidence on market expectations of the rate of return and risk inherent in the regulatory system.

AGL(ACT)'s proposed rate of return (8.0 per cent) is at the top of the range 7.0-8.0 per cent for gas utilities. The Commission considers that AGL(ACT)'s proposed rate of return is not justified for the following reasons:

- AGL(ACT) has adopted a transformation methodology which yields a higher real pre tax rate of return. Under alternative transformation approaches, the return should be lower. Other parameters of market risk premium and equity beta adopted by AGL(ACT) are too high.
- AGL(ACT)'s claims that its risks are higher due to lower market maturity compared with other gas distributors are not supported. AGC and GSN's natural gas networks were commissioned at a similar time to the ACT system and they have been able to attain greater penetration in their markets.
- Real interest rates have not changed much in the past 12 months and there are no additional reasons to support a higher rate of return than allowed in the access reviews during this period.

Within the range 7 – 8 per cent, the Commission must decide on the most appropriate rate of return for AGL(ACT). This decision has been made after examining the initial capital base, the implications for prices, new investments, competition, AGL(ACT)'s cashflow positions and financial projections for the next ten years, and other risks, including revenue risk due to supply interruptions, capital redundancy and other matters including the objectives of the Code. These issues are discussed in the following chapters.

The Commission concludes that **a real pre tax rate of return of 7.75 per cent** is appropriate for AGL(ACT) for this Access Arrangement period. This is consistent with a **nominal post tax return on equity of approximately 12-13 per cent**.

Amendment 3 - Rate of return

The rate of return used in the proposed cost of service methodology for calculating total revenue must not exceed 7.75 per cent in real, pre tax terms. This is consistent with a nominal post tax return on equity of approximately 12-13 per cent.

6 INITIAL CAPITAL BASE

6.1 Code requirements

This chapter focuses on determining the initial value for AGL(ACT)'s asset base (ie network and non-system assets). The Commission's consideration of the 'funds employed' approach, and treatment of net working capital are provided in section 4.4.1.

Under the Code, the following factors should be considered in establishing the initial capital base (ICB) (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.

Section 8.11 of the Code provides that the ICB for covered pipelines in existence at the commencement of the Code normally should not fall outside the range of values determined by applying the depreciated actual cost and depreciated optimised replacement cost.

In addition to the factors listed in section 8.10 (a)-(k), the Commission has considered whether the ICB is consistent with a reference tariff and reference tariff policy which meets the objectives, factors and requirements of sections 8.1 to 8.3 and other Code requirements, including section 2.24.

In determining AGL(ACT)'s 1999 ICB, the Commission has considered a range of values by applying the various well recognised asset valuation methodologies including: depreciated actual cost (DAC), depreciated optimised replacement cost (DORC), optimised deprival value (ODV) and depreciated indexed historical cost (DIHC). The Commission has also considered a number of financial and economic issues arising from the Code's requirements.

The Commission has undertaken its own financial analysis and has reviewed AGL(ACT)'s financial and valuation models. Consultant, KPMG was engaged to provide an independent assessment of the Commission's analysis.

As capital costs make up over 60 per cent of network charges, the ICB is a key factor in determining the overall level of charges. Within the terms of section 8.10, the Code provides the regulator with some discretion in setting the ICB. Section 8.10 provides for the Commission to consider several specific factors. In some circumstances, tensions may arise between some of those factors. Accordingly, the Commission considers that the discretion available under section 8.10 exists to enable the Commission to reach a decision where tensions arise.

In reaching its decision, the Commission has carefully considered all the factors outlined in section 8.10. It has had regard to the impact of alternative scenarios on reference prices and considered whether the overall Access Arrangement meets the requirements of section 2.24 of the Code.

6.2 AGL(ACT)'s proposal

In its proposed Access Arrangement, AGL(ACT) presents an ICB of $244.6m, expressed as funds employed at 1 July 1999. The amount proposed is based on AGL(ACT)'s consideration of DAC, DORC, ODV, and a review of past returns and depreciation.[52]

Submissions received subsequently from AGL(ACT) and its consultant, Arthur Andersen, present new analyses intended to take into account the approaches adopted by IPART in its recent decisions on GSN and AGC. AGL(ACT) has made further submissions in response to comments made in public submissions and issues raised by the Commission during the review process. The key points presented by AGL(ACT) are summarised below:

[52] AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 17.

"Windfall gains" and revaluation arising from establishing the initial capital base

AGL(ACT) contends that:[53]

- The benchmark to identify whether an ICB determined by the regulator represents a "windfall gain" must be determined by reference to the Code
- The Code does not establish DAC as the appropriate benchmark - rather it establishes the expectation that the benchmark is between DAC and DORC
- To determine the appropriate benchmark, it is necessary to consider the other matters which the Code requires the Commission to take into account.
- Under the Code, the reasonable expectations of parties under the prior regulatory regime, and the level of past returns and depreciation, must be taken into account in assessing whether a particular value for the initial capital base would represent a windfall to the service provider
- AGL(ACT) has presented analyses that demonstrates that an ICB set at the ODV, equal to $245m, could not be considered as a "windfall". Similarly, it has demonstrated that an ICB set at the DORC would not be a "windfall" if the benchmark for measurement of windfalls is the level of past returns.
- If the Commission considered an alternative benchmark as appropriate to determine whether a gain is in fact "windfall", then it should also consider the equitable balance of the legitimate interests of the stakeholders. Under the scheme of the Code, AGL(ACT) has been deprived of valuable proprietary rights without compensation, whilst other stakeholders have received gains typified by the right to use the distribution network at regulated price.

The role of DORC in the Code

In its submission of 16 September 1999, AGL(ACT) states:

- DORC is the upper limit set by the Code and in economic theory. This concept can be implemented only if the Code's definition of DORC is consistent with the economic definition of DORC.
- DORC is based on replacement, not refurbishment, value. To date, regulators have determined the capital base having regard to a DORC valuation based on the cost a 'new entrant' would face to replace the network.

53 AGL(ACT)'s letter of 16 September 1999 summary section 1.3.

AGL(ACT)'s proposed ICB at 1 July 1999 and supporting analysis are summarised in Table 6.1:

Table 6.1 AGL(ACT)'s proposal and submissions on the initial capital base

	AGL(ACT) original proposal (Jan 1999)	AGL(ACT) submissions (Sep 1999)
Initial capital base		
- capital assets	254.6	240.6
- net working capital	-10.0	6.0
Funds employed	244.6	246.6
DORC		
- network assets	252	252
- other fixed assets	3	3
- net working capital	-10	+6
Funds employed	245	261
DAC		
- network assets	89	89
- other fixed assets	3	3
- net working capital	-10	+6
Funds employed	82	98
Optimised deprival value		
- capital asset base		239
- working capital		6
Funds employed	Support DORC	245
Net present value (NPV) of future cashflows		
- sustainable revenue	na	246.6
DIHC		
- capital asset base	na	148.5
- working capital	na	6.0
Funds employed	na	154.5
Historical returns and depreciation model		
CCA analysis		
- with imputation	231.9	279.6 (excl working capital) 285.6 (inc working capital)
- without imputation	381.4	
NPV analysis		
- with imputation	209.1	
- without imputation	332.8	
Historical return analysis	na	16.67%
(EBIT/WDV Fixed assets)		Av 1987-1998
DORC/DAC (capital assets)(%)	277	277
ICB/DAC (capital assets)(%)	277	262
ICB/DORC (capital assets)(%)	100	95

Source: AGL(ACT), 1999 AAI and subsequent submissions.

6.3 Public submissions

BHPP has expressed concern with using a DORC asset base to establish the ICB. It claims that AGL(ACT) customers will face higher charges under a DORC asset base than under a DAC asset base:[54]

> The AGL(ACT) proposed capital base for pricing purpose is 275 per cent higher than the current capital base … BHP calculates that figure of $163m actually works out to about $215 per household per annum in additional network costs…
>
> We believe it is obvious that AGL(ACT) has earned an extremely healthy return from a low risk investment, in anyone's language….
>
> AGL's claims of an under-recovery seem to conflict directly with AGL's actions over the past decade. AGL has consistently invested in the ACT over the past 10 years and we ask: why would an economically rational organisation continue to invest if it were not satisfied with the return it was receiving on investment?

BHPP is concerned about the 'free lunch' associated with a massive and unjustified increase in asset value.

Further details of the public submissions are presented throughout this chapter.

6.4 Depreciated actual cost

The depreciated actual cost (DAC) is 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 prior to the commencement of the Code. Simple to apply, the DAC approach 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 the basis for recording asset values, DAC should be used by regulators as the initial capital base.

Disadvantages of DAC are that it does not allow for the impact of inflation and technological change. If the effect of inflation is not taken into account, the rate of financial return to the business will tend to be overstated. Returns may appear to be adequate, but if fully distributed to owners, they 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, and has no direct relationship with future cashflows generated by an asset in its normal use.

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54 Transcript, AGL(ACT) Public hearing 11 May 1998, p 48.

6.4.1 Commission's assessment of AGL(ACT)'s DAC

The Commission has reviewed the DAC value presented by AGL(ACT) in its RAAI by:

- considering the asset value ($82.9m) reported in AGL(ACT)'s financial statement and the RAAI ($92m)
- examining the accounting treatment of deferred expenditure.

Reported DAC value

AGL(ACT) has advised that the difference between the asset value reported in AGL(ACT)'s financial statement and the RAAI is partly due to the Queanbeyan and Yarrowlumla assets and the ACT retail business. The reconciliation is as follows:[55]

DAC as per ACT financial accounts	$82.9m
Add Queanbeyan assets	$7.4m
Less retail assets	($0.3m)
Subtotal	$90m
DAC as per RAAI	$92m
Difference between actual and forecast	$2m

AGL(ACT) explains that the lower DAC ($90m) relates to lower capital expenditure in 1998/99. Actual capital expenditure was below budget due to a lower than expected amount spent on mains. Main expenditure was forecast to stay at historic levels but there were no major projects during the year.

Deferred expenditure

AGL(ACT) has advised the Commission that in its financial statement, the distribution assets are reported under two categories (a) property, plant and equipment (b) deferred expenditure. Deferred expenditure includes AGL(ACT)'s cost of customer connection within customers' property. As AGL(ACT) does not have property right over these assets, they are treated as deferred expenditure which is amortised over time.

AGL(ACT)'s DAC value therefore includes deferred expenditure. The Commission considers that this inclusion is acceptable.

Draft decision

The Commission has determined a DAC value of $90m (capital assets) and has considered this value in determining the ICB.

6.5 Depreciated inflation adjusted historical cost

Indexed historical cost is another method of asset valuation using historical data. This method adjusts historical asset values for inflation by applying either inflation or appropriate indices to the actual capital costs. This value is consistent with a regulatory regime which adjusts the asset base according to inflation and allows a real rate of return on this base. Depreciated inflation adjusted historical cost (DIHC) is one form of current cost valuation. The Commission considers DIHC may be a useful reference point for setting the initial capital base.

[55] AGL(ACT)'s email of 16 November 1999.

6.5.1 Comparison of Commission and AGL(ACT) estimates of DIHC

The Commission has estimated AGL(ACT)'s DIHC by applying the approach adopted by IPART in its access decisions for GSN, AGC and AGLGN.[56] The principal data requirements are inflation, actual capital expenditure, depreciation, book value, and asset disposal.

Information for the analysis has been gained from the following sources:

Date	Source
1981-1994	Audited financial statement - AGL Canberra Limited
1995-1999	Audited financial statement for the AGL Gas Company (ACT) Limited
1998/99	Unaudited profit and loss statement, statement of funds employed and cash flow – ACT – Gas Networks

Most of the financial information available is for the bundled gas business, including retail and sales of appliances. As a result, there is uncertainty which constrains the quality of the conclusions.

The Commission has estimated a DIHC range using available information and has undertaken sensitivity testing of key drivers. The Commission has also considered the estimate of AGL(ACT)'s DIHC as submitted in September 1999. The Commission's review of data and assumptions used by AGL(ACT) are as follows:

- *Inflation* AGL(ACT) has used the Sydney CPI for the December quarter to index the asset base. If the Canberra CPI is used, the DIHC will be lower by approximately 3-4 per cent. If the national average CPI is used, the DIHC will be lower by 2 per cent.
- *Capital expenditure* AGL(ACT) has used capital expenditure values that are presented in the cash flow statement or sources and application of funds. In earlier years, the capital expenditure is derived on the basis of depreciation, opening and closing book value. The Commission has cross checked these values with the AGL(ACT)'s financial statement. The figures are largely consistent with one another. However, in 1998/99, the value used in the AGL(ACT) model is forecast capital expenditure which is $2m higher than actual capital expenditure.
- *Queanbeyan assets* The Access Arrangement covers the Queanbeyan region. However, capital expenditure for this region is reported internally by AGLGN as part of the NSW gas business. Thus, to account for the Queanbeyan region, AGL(ACT) has made a 10 per cent adjustment to DIHC. AGL(ACT) claims that this 10 per cent is derived by considering customer numbers, volumes and revenues of the Queanbeyan region as a percentage of the AGL(ACT) distribution system. However, the Commission notes that in terms of DAC, Queanbeyan assets represent approximately 8 per cent of total ACT assets. In 1998/99, distribution revenue in Queanbeyan accounts for around 8 per cent of total revenue.
- *Depreciation* A check of the depreciation figures in the AGL(ACT) model against the annual reports shows that the figures are generally consistent.
- *Asset disposal* AGL(ACT)'s model does not account for assets disposed over the period analysed. Total capital expenditure incurred during 1981-1999 ($136m) is greater than

[56] IPART, *Final decision on the Access Arrangement for Great Southern Energy Network Pty Ltd*, March 1999, Albury Gas Company and Draft decision on AGLGN.

the closing gross asset value (undepreciated) as at 1999 ($120m). This indicates that some assets must have been either fully depreciated, sold, retired or scrapped. By not accounting for asset disposals, AGL(ACT)'s calculation results in an overstatement of the DIHC.

Based on the above factors, the Commission concludes that AGL(ACT)'s DIHC represents an upper bound estimate. A lower estimate is feasible given the uncertainty and questions about asset disposal, adjustment for Queanbeyan assets and lower actual capital expenditure in 1998/99. The following table compares the Commission's assessment with AGL(ACT)'s own estimates:

Table 6.3 Assessment of DIHC as at 1 July 1999

DIHC result & assumptions	IPARC's estimate	AGL(ACT)'s estimate	IPARC findings
DIHC	**Lower bound = $130m Upper bound < $148m**	**$148.5m**	**AGL(ACT)'s estimate is overstated due to the adoption of assumptions listed in this table. The upper bound should be below AGL(ACT)'s estimate.**
Analysis period	1981-1999	1981-1999	Capex may contain retail business in ACT.
Inflation rate	Used annual average: ACT and national CPI	Used Sydney CPI for Dec quarter	The inflation series used by AGL(ACT) generates a higher indexation outcome than IPARC's. DIHC is higher by 2% using Sydney CPI for Dec quarter.
Capital expenditure	Sourced from annual report and statistics provided to the Commission	Sourced from annual report	Generally consistent. Capex forecast in 1998/99 is $2m lower than actual capex.
Adjustment for Queanbeyan assets	A slightly lower figure, say 8% should be used	Add 10%	A figure of 8% should be used on the basis of DAC and revenue.
Depreciation	From financial statement	From financial statement	Accumulated depreciation is estimated to establish the percentage of written down value.
Asset disposal	Partly included using "assets scrapped" in AGL(ACT) financial statement	Not considered	Both estimates are likely to over estimate DIHC. However, IPARC's DIHC incorporates some asset disposal

Source: IPARC's analysis and AGL(ACT) submissions.

Commission's draft decision

The estimation of DIHC for AGL(ACT) is indicative only due to the lack of data for capital expenditure on the network business. AGL(ACT)'s assumptions of inflation, adjustment for Queanbeyan assets, and asset disposal appear to lead to a higher DIHC.

After considering AGL(ACT)'s analysis, and testing the sensitivity of key assumptions, the Commission estimates AGL(ACT)'s depreciated indexed historical cost to be within the range $130-149m with a mid value of $139m.

6.6 Depreciated optimised replacement cost

Depreciated optimised replacement cost (DORC) is an estimate of the value of an asset in use. The valuation is equivalent to the net current cost of replacing that 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. DORC allows for the depreciated state of the asset but incorporates engineering optimisation of the utility's asset. An optimised system is a reconfigured system designed to serve a specified load. Excluding any unused or under utilised assets, this method allows for potential cost savings which 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. Arguments in favour of DORC are:

- the revenue profile under DORC (applying a real rate of return) is more stable than using DAC (applying a nominal rate of return) (see section 6.8.2)
- DORC provides efficient price signals because prices using depreciated replacement cost as the ICB reflect the cost of additional capacity.

Arguments against DORC are:

- DORC valuation is subjective
- use of DORC values increases the problems of information asymmetry facing the regulator
- switching from DAC to DORC midway through an asset's life may provide a windfall gain for the utility (see section 6.8.2)
- in some cases, assets will be maintained, but not replaced and entry is not always feasible, rendering DORC asset values purely hypothetical.

6.6.1 Assessment of DORC

AGL(ACT)'s DORC asset valuation was estimated at $252m as at 1 July 1999. This figure is based on DORC value of $248m as at 30 June 1998 plus forecast capital expenditure ($4.4m) in 1998/99. The main component of DORC is the low pressure system serving the tariff market. This represents 70 per cent of DORC.

The DORC is estimated by AGL(ACT) based on the unit rates adopted in the JP Kenny report for the NSW system during the 1997 access review process.

The Commission engaged Ewbank Preece (EP) to conduct an independent assessment of AGL(ACT)'s DORC valuation. EP submitted its draft report to the Commission on 23 June 1999. Chief findings of the report are:[57]

- questions about the robustness of the asset valuation processes and assumptions adopted by AGL(ACT)

[57] Ewbank Preece, *Technical Review of AGL(ACT)'s DORC and Capex for ACT, Queanbeyan and Yarrowlumla,* Draft Report, 23 June 1999.

- the adoption of the 1996 JP Kenny unit rates for Newcastle and Sydney does not appear to reflect a 'new entrant' replacement cost for the ACT, Queanbeyan and Yarrowlumla gas networks
- certain network parameters and assumptions used during the optimisation process do not reflect an 'optimised' solution (eg the medium and low pressure systems)
- the variability in asset valuation is affected by several factors, including unit rates (which depend on the cost of restoration), optimisation, the assets included, and asset lives (depreciation)
- depreciation using economic lives is acceptable.

During the review, AGL(ACT) undertook a further DORC valuation prepared by PPK.[58] Table 6.4 compares valuation outcomes:

Table 6.4 Summary of DORC estimation – system assets at 1 July 1999 ($m)

	RC	ORC	DORC
AGL(ACT) proposal (RAAI in Jan 1999)	330	325	252
AGL(ACT) further study (PPK) (October 1999)	NA	323.8	251 (sensitivity range: 234-270)

Source: AGL(ACT) RAAI, Supplementary Report on Canberra Gas Network Depreciated Optimised Replacement Cost for AGL Gas Networks prepared by PPK and Kinhill.

There are a number of issues arising from DORC valuation and AGL(ACT)'s comment that a DORC valuation be based on the cost of a "new entrant"[59], including:

- interpretation of DORC for a 'new entrant' versus an 'incumbent owner'
- variability in DORC valuation
- capitalisation of project overheads used in the DORC value.

6.6.2 Whether DORC should be interpreted as applying to a new entrant or the incumbent owner

The principal steps in the assessment of DORC are to:

1. define and verify the asset base
2. assign replacement costs to the assets based on the modern equivalent asset (MEA). This involves the use of standard unit replacement costs for each asset class and size of asset
3. optimise the asset base for over design, over capacity, and redundant assets
4. depreciate the assets based on an assessment of used and remaining economic lives.

58 PPK Environment and Infrastructure Pty Ltd, *Canberra Gas Network Depreciated Optimised Replacement Cost Supplementary Report*, 14 October 1999.

59 AGL(ACT)'s submission, 16 September 1999.

The Commission has noted the debate during the NSW access review regarding the issue of new entrant and incumbent owner.[60] The same issue may also apply to the medium pressure DORC valuation of the ACT system. AGL(ACT) has submitted to the Commission that the new entrant DORC valuation should be adopted.

Issues arising from the EP report for the NSW distribution network system were:

- whether the incumbent owner's DORC and/or new entrant's DORC is a reasonable interpretation of what is meant by DORC
- whether replacement cost/DORC value should be limited to a third party or the incumbent owner.

The Commission has considered the above issues for the purpose of this draft decision, from economic and accounting perspectives. The Commission has also sought EP's comment on this issue for the ACT network.

Economic perspective

Within the context of the economic theory of contestability, DORC could be interpreted as applying to a new entrant. Another economic justification for using DORC is to prevent 'inefficient bypass' by a new entrant. Therefore, it could be argued that from an economic perspective, a new entrant DORC is appropriate for determining the maximum value for the ICB.

Historical accounting perspective

Replacement cost/optimised replacement cost is a current cost valuation methodology. The cost of an asset/system is measured by reference to the lowest cost at which the gross service potential of that asset could be obtained currently in the normal course of business.

The use of DORC as a valuation method originates with the current cost accounting (CCA) debate of the 1970s and 1980s. The underlying principles of CCA are to:[61]

1. provide the basis upon which the owner of the asset being valued would be compensated if the owner was deprived of the asset
2. identify the amount which the owner should recover (through depreciation charge) to ensure that the asset can be replaced as/when its capacity to provide services declines.

One way of viewing this valuation is to regard the initial capital base as being valued in order to ensure that the incumbent owner is properly compensated for the use of the network assets by third parties.

A third party wishing to enter the market to supply gas must either gain access to the incumbent owner's gas network, or construct a new network. The 'new entrant' approach assumes the latter. The cost of constructing a new network clearly sets an upper limit on any valuation. However, it is questionable why the cost of replicating the entire network with new assets should be used as the base for calculating compensation of the incumbent owner. Furthermore, there has been evidence of using insertion technology to renew the

60 The two concepts (incumbent owner and new entrant valuation) resulted in a wide variability in DORC valuation within a range $1.5-3.3b for AGLGN in NSW.

61 Walker, Clarke and Dean, 1999.

mains.[62] DORC value using this technology could be lower than the traditional engineering replacement solution.

EP's commentary

The EP's review report did not expressly discuss "incumbent owner" DORC but has provided the following comment to the Commission:

> We are of the view that philosophically it should be technically feasible to insert plastic inside plastic for some of the ACT system. However, we have not considered the economics of the concept. The possible financial benefits seen in NSW from use of this concept may not apply in the ACT due to different factors. These factors include:
>
> - more modern basic system design
> - possible higher average system pressures
> - a different customer demand profile and customer mix to NSW
> - different obligations for restoration.
>
> In summary, while the NSW incumbent owner DORC concept may apply in ACT it may not be an economic option for an asset owner. This should be considered properly to assess its relative merits and costs.

Commission's view

Under the current provisions of the Code, DORC is not defined. The Commission is of the view that the Code is not clear whether it intends to assign a DORC valuation to a new entrant or to the incumbent. In light of the economic and accounting perspective, the Commission considers DORC can be interpreted as the value to either the new entrant or the incumbent. However, the Commission acknowledges that for the ACT system, the economics of alternative replacement option is yet to be fully explored and assessed.

6.6.3 Variability in DORC valuation

The EP draft report highlights the issue of variability of DORC valuation, depending on assumptions of replacement options, optimisation, and depreciation. Some have argued that CCA or replacement cost valuations cannot be audited in the conventional sense.

The issue of variability is highlighted in the above discussion (section 6.6.2) of 'new entrant' versus 'incumbent owner'. The debate is similar to the cost differential between the 'brownfield' vs 'greenfield' DORC. A 'brownfield' DORC is based on estimates of unit costs allowing for the need to dig up and restore roads and footpaths when replacing pipes. This approach appears to be acceptable under the Code. However, use of a brownfield valuation raises a number of questions.

Firstly, if the valuation is intended to reflect the future costs of maintaining system capacity, brownfield may well be a fictitious concept. The true cost may be the cost of relining. Secondly, where the development occurs following construction of the original pipeline, the use of a brownfield estimate may be seen as providing the utility with a windfall gain from subsequent urban development. This is illustrated in the recent EP review for the NSW distribution system, which shows that AGLGN's actual capital expenditure for 1995/96 was

[62] For example, the Goldline project was undertaken during the late 1980s and 1990s by AGLGN to replace old leaking pipes in NSW.

$66m whereas the ORC for these capital additions was $98m. The difference is due to new mains being laid in 'new estates'. Actual costs are less than the modern engineering equivalent used to calculate replacement cost, based on laying mains in a developed area. If DORC is adopted as the asset base, it is possible that the network service provider/owner would obtain a return of, and on, the higher value.

The Commission acknowledges that the actual capital outlay paid by the original investors/owners may be somewhere between the brownfield and greenfield optimised replacement costs, particularly where the system was built and then gradually expanded in a developing area. To the extent that pipes are replaced rather than refurbished and/or relined, future replacement costs may more closely approximate the brownfield estimate.

6.6.4 Capitalisation of project overheads

The JP Kenny asset valuation incorporates a 10 per cent increase in unit rates to cover internal project management costs. The EP review suggests that 10 per cent may understate internal operating costs. The Commission notes that in IPART's assessment of the access arrangement for GSN, the issue of the rate of capitalisation of overheads was also raised. EP has suggested that an appropriate overhead rate is 14-16 per cent.

The Commission understands that the AGL(ACT) system is operated by AGLGN. Operation and maintenance of the NSW and ACT systems are provided jointly by the same staff. The same accounting and recording system applies to both networks. The Commission notes that the NSW regulator, IPART, has obtained information regarding the proportion of capitalised internal operating cost in the NSW review. IPART has found that capitalised internal operating cost represents only 2-3 per cent of capital expenditure during the period 1991-1997. The percentage is higher in 1998 but is still below 10 per cent.

As the same accounting system applies to the ACT and NSW, the Commission believes the following questions identified in IPART's draft decision on AGLGN are relevant to the ACT review:

- Has AGL(ACT) historically undercapitalised its project management costs? The implications are that internal costs associated with capex would have been charged to the profit and loss account, resulting in higher operating costs and lower profits.
- Has double counting occurred, since DORC (if used for pricing) would incorporate a 10 per cent markup to take account of project management/overhead costs? However, a large proportion of the overhead costs would have been expended (ie charged to the profit and loss accounts) or recovered in the past. That is, even if AGL(ACT) had undercapitalised its overheads, the implication is that users would have contributed to the recovery of this cost component which would have become part of the asset base to be recovered via return of and return on capital.

It may be argued that adoption of a DORC incorporating capitalisation of project management costs which are higher than the actual proportion capitalised by AGL(ACT) would result in a windfall gain to AGL(ACT).

6.6.5 Comparison of DORC and DAC value

At the public hearing, BHPP questioned AGL(ACT)'s DORC estimate by comparing this value with DAC. The Commission has therefore compared the application of DORC and DAC used in recent access decisions.

Table 6.5 DORC vs DAC value

	AGL(ACT) proposal	AGL(NSW)	AGL(NSW) based on revised DORC[1]	GSN (Wagga Wagga, NSW)	AGC (Albury, NSW)	TPA (Victoria)	CMS-Parmelia (WA)
DAC	90	1002	1002	14.9	9.8	186	0
DORC	255	2009	2500	34	23.6	373.9	114
DORC/DAC ratio(%)	283	200	250	228	241	201	nc
ICB [2]	240.6	1550	1550	28	22	363.7	62
ICB/DORC(%)	95	77	62	82	93	97	54
ICB/DAC(%)	267	155	155	188	224	196	nc

Source: IPARC analysis.
Note:
1. The revised DORC has yet to be assessed by IPART.
2. Except for AGL(ACT), the ICB is the regulatory asset value. Some of the ICB figures are draft decisions only.

The Commission notes that the AGL(ACT) natural gas system was built around the same time as the Wagga Wagga and Albury gas distribution systems. However, the DORC/DAC ratio is highest for AGL(ACT). Whilst the difference may be caused by different engineering estimates and accounting polices, the comparison does raise the question why the DORC/DAC ratio is so high. The comparison suggests that AGL(ACT)'s DORC may be too high.

6.6.6 Conclusion on DORC

The ORC estimate presented in AGL(ACT)'s proposed Access Arrangement is based on the JP Kenny asset valuation study for the NSW network. AGL(ACT) estimates DORC based on its assumed economic and remaining lives. In a second DORC study submitted by AGL(ACT), a slightly lower ORC and DORC are estimated. A range is presented to express the sensitivity of assumptions.

The EP consultancy review finds that there are deficiencies in AGL(ACT)'s approach to optimisation and that the unit rate assumptions are too low if a new entrant DORC is to be established. To some extent, the effects of these two factors are likely to offset each other.

The Commission recognises DORC as one of several approaches to asset valuation. Based on information available to the Commission, DORC for AGL(ACT)'s network may fall within the range $234-270m on the basis of 'new entrant' DORC. AGL(ACT)'s proposed DORC of $252m at 1 July 1999 is within this range. However, the Commission considers that a lower range may be feasible if the valuation is based on the concept of 'incumbent owner'.

The Commission notes the feasible range in the various estimates of the DORC value of AGL(ACT)'s assets. This is indicative of the uncertainties of this asset valuation approach. The Code places an obligation on the regulator to consider a specific value as the DORC value for the assets. For this purpose, the Commission considers that the value of $252m (system assets) submitted by AGL(ACT) on 1 July 1999 is an acceptable estimate of the DORC value as this lies within the feasible range for DORC for a new entrant.

6.7 Optimised deprival value

Optimised deprival value (ODV) is expressed as:[63]

ODV = *minimum* { DORC, *maximum* [NPV,NRV] }
NPV = net present value of future earnings (ie economic value)
NRV = net realisable value (ie disposal value)
EV = economic value
= maximum (NPV, NRV)

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

- factors constraining cashflow
- potentially competitive energy sources or substitutes.

In principle, the process of comparing the economic value of assets with the DORC value should be carried out on an asset-by-asset basis.[64] Assets should then be allocated to customer groups. However, this process is time consuming and expensive. In practice, simplified approaches are often adopted. For example, the New Zealand Ministry of Commerce[65] suggests a simplified approach in which assets are first assigned to segments of the distribution system comprising assets which service customers with similar characteristics. The assets are then valued at either DORC or economic value, as appropriate. Only where there is some doubt about which is correct, are both asset values calculated.

Deprival value can never exceed DORC, but may be less than DORC if the potential income from a group of assets is insufficient to finance their replacement. When DORC is asset based, its economic value focuses on service to the customer. Economic value is inherent in the maximum long term sustainable earnings from a group of assets.

6.7.1 Steps in estimating optimised deprival value

The principle underlying optimised deprival value (ODV) is well accepted. However, the practical application of ODV is problematic as the process involves notional asset partition and cost allocation.

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63 *Review of the Asset Valuation Guidelines of the Steering Committee on National Performance Monitoring of GTEs*, Johnstone, DJ, and Gaffikin, JR, Department of Accounting and Finance, University of Wollongong, June 1995, p 4.

64 KPMG advises that the economic value is likely to be overstated if it is derived on a global basis rather than on a more detailed basis of separable groups of assets.

65 NZ Ministry of Commerce, *Handbook for Optimised Deprival Valuation of Electricity Line Businesses*, April 1999.

In the NZ handbook for ODV, the process for valuing system fixed assets at ODV is described as follows:

> Once ODRC has been determined it is necessary to establish which segments of the network cannot, because of constraints on sustainable tariffs, earn a normal commercial rate of return on their ODRC value. The assets for these segments should be valued at EV not ODRC.
>
> The process for determining which segments should have EV values, what those values should be, and the final network ODV, has the following steps
>
> I. Partitioning the network into segments and the selection of segments for EV analysis
> II Determining the maximum long run sustainable tariffs for those segments subject to EV analysis
> III Determining whether EVs or ODRCs should be applied to those segments subject to EV analysis
> IV For those segments where EV applies, determining their EV values
> V Aggregation of segment values (whether ODRC or EV) to produce the network ODV.

In light of cost characteristics in the ACT system, the Commission considers that the network assets should be partitioned into two network segments serving the contract and tariff market. In determining maximum long run sustainable tariffs, the issue is whether current prices are reasonable. If prices contain super normal profits, it is likely that the relevant regulator will remove such profits from prices. Regulatory constraints may prevent pricing in excess of current levels or price increases may be smoothed over time to achieve cost reflectivity.

Key issues in the ODV analysis involve determining:

- whether to use the economic value or DORC.
- the relative profitability of the contract and tariff markets. This will provide an indication whether an economic valuation or DORC asset write down is necessary.
- whether a specific cost allocation methodology should be used.

Determining whether to use EV or DORC

The Commission notes the following guidelines in the NZ handbook:

- Once the maximum long run sustainable tariff (or tariffs) has been determined this enables the long run annual revenue earning power of the network segment to be assessed. This should then be put together with the long run annual costs for the network segment to determine the annual net operating profit after tax (NOPAT):

  NOPAT = Operating Revenue - Operating Costs - Depreciation - Income Tax
- Historical accounting information on operating costs may need to be referred to in order to estimate future operating costs of the segment. Historical information on average network operating costs is likely to include elements of fixed operating costs that are unavoidable by the core network, even if the network segment under study were to close. Any such fixed costs, if material, should be deducted from average costs to estimate operating costs for the segment.
- Depreciation for the network segment is obtainable from the workings to calculate ODRC for the segment. Income tax should be calculated at the corporate tax of 33 per cent.

- The decision rule is:
  - NOPAT < WACC x ODRC : use EV
  - NOPAT > WACC x ODRC : use ODRC.

  (note WACC is the post tax weighted average cost of capital)

Profitability of the contract and tariff markets

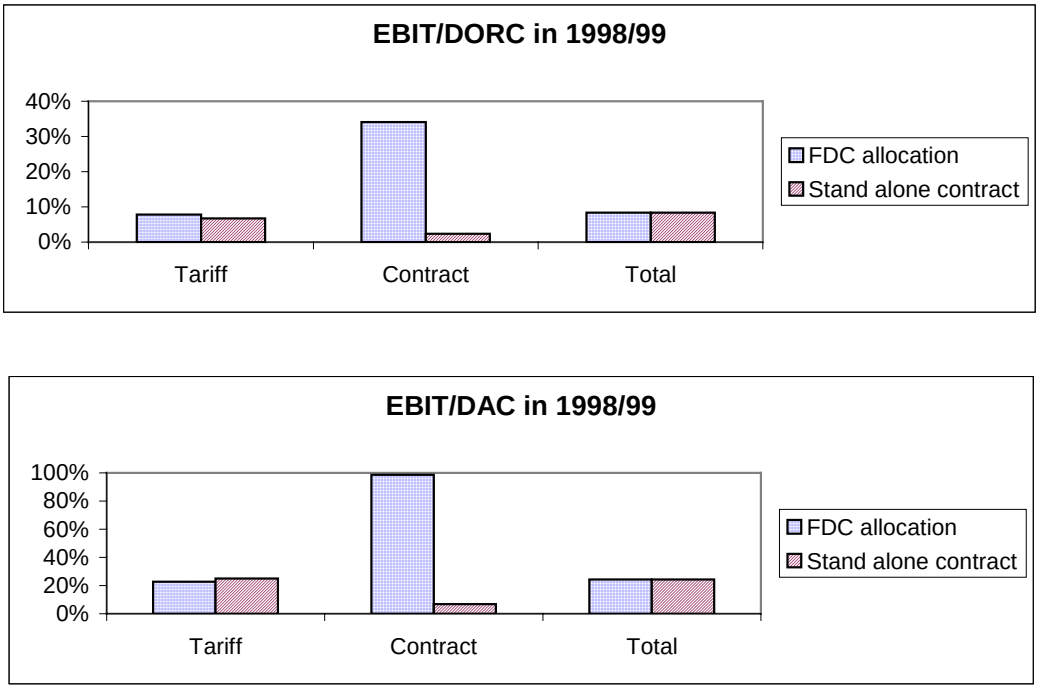
The Commission has assessed the returns on DORC asset values in each of AGL(ACT)'s contract and tariff markets. As the proposed rate of return is a pre tax return, the Commission has considered earnings before interest and tax (EBIT ie net operating profit before tax) and compared this with the pre tax return.

The rate of return is estimated by dividing EBIT by allocated DORC asset value. As shown in Figure 6.1, returns on DORC assets servicing tariff and contract customers are estimated at 6.7 per cent and 2.3 per cent respectively under a stand alone contract allocation method. If fully distributed cost is used, the return in the tariff market will be higher (7.8 per cent), whereas the return in the contract market will be considerably higher at 34 per cent. The combined return on DORC assets is 8.3 per cent.

On the face of this analysis, a write down of DORC asset value in the contract market is required under a stand alone asset allocation methodology. However, this does not imply a write up in the tariff market, as the ODV test should be applied to separable segments.

Although it is irrelevant to the ODV analysis, the Commission has also assessed the return on assets by market segment on a DAC basis. On the basis of fully distributed cost (FDC) and stand alone contract (SAC) allocation methodologies, EBIT/DAC is estimated at 23-25 per cent in the tariff market compared with a return within the range 7-99 per cent in the contract market, as shown in Figure 6.1.

Figure 6.1 Estimated profitability in the contract and tariff market



Source: IPARC analysis.

This analysis shows that the current return on DORC for the whole system is 8.3 per cent. However if the DAC asset value is applied, the overall return increases significantly to 24 per cent. The gap between the return outcomes is due primarily to the difference in asset valuation.

In light of the return comparison, the Commission is of the view that:

- there is considerable variability in the return on assets in each of the markets, depending on the asset valuation methodology
- the network segment serving the tariff market is sustainable in its own right, earning a normal return on assets valued at AGL(ACT)'s proposed DORC. However, the Commission is surprised at the high return when assets are valued at historical cost, as reported in AGL(ACT)'s financial statement. If tariffs reflect a super profit on DAC, setting an ICB at DORC raises an important equity issue that customers may be required to pay for the same assets twice
- the network segment serving the contract market earns a relative low return on SAC DORC. However, if FDC cost is applied, there will be a turnaround in the profitability to an above normal rate of return
- given the dominance of the tariff market and its profitability, there seems little justification for considering the profitability of the contract market on a SAC basis.

Asset and cost allocation issue

Economic efficiency suggests pricing can be set within a range where the upper limit is based on a stand alone cost allocation, and the lower limit uses an incremental cost approach (see chapter 14). However, like other cost allocations, the estimation of stand alone costs and incremental costs requires judgement.

The ODV assessment is therefore prone to some uncertainty, depending on the reliability and precision of cost and asset allocation calculations.

6.7.2 AGL(ACT)'s estimate of optimised deprival value

AGL(ACG) has estimated the optimised deprival value (ODV) for its existing assets by considering the net present value of cashflows in each of the two market segments. In doing so, AGL(ACT) has adopted a stand alone contract allocation. Under this approach, costs are allocated to the contract market as a stand alone system. Remaining costs are allocated to the tariff market.

The Commission notes that an alternative cost allocation may be applied to establish the ODV. For example, fully distributed cost is a common approach to pricing and tariff setting. Costs are allocated to each market based on its utilisation of the system.

It should be noted that ODV may change if the allocation of costs to tariff and contract markets changes. As there is no expectation that the network is to be retired, it is reasonable to assume that on a going concern basis the NRV of the assets will be the same as NPV.

AGL(ACT)'s ODV as reviewed by Arthur Andersen

During the review process, AGL(ACT) submitted further assessments of its ODV.[66] In the most recent submission, AGL(ACT) engaged Arthur Andersen to review its new ODV analysis. AGL(ACT)'s new analysis is summarised below:

Table 6.6 AGL(ACT)'s ODV analysis [1] ($m)

	Contract segment	Tariff segment	Total funds employed [(2)]	Total capital assets
A – NPV	8.4	339.9	347.4	341
B – DORC	11.3	>=233.7 <=245.0	245	239
ODV (Lower of A&B)	8.4	>=233.7 <=245.0	>=242.1 <=245.0	>=236 <=239

Note:

1. In Arthur Andersen's review report of financial and valuation models prepared by AGL(ACT) submitted in September, four scenarios were presented assuming different SAC DORC contract revenue ($3m and $2.5m) and inclusion/exclusion of stay-in-business (SIB) capex. The result in the above table shows the NPV without SIB capex and SAC DORC contract revenue of $2.5m.
2. AGL(ACT)'s NPV calculation includes working capital movements. ODV in terms of total capital assets was estimated by deducting working capital.

In the new analysis, the Commission notes:

- AGL(ACT) accepts that the ODV valuation is for *existing* assets, and not for an ongoing *expanding* network
- AGL(ACT) argues that asset and cost allocation should be based on a stand alone approach to the contract market
- Arthur Andersen asserts 'a conceptual inconsistency' and questions the inclusion of both stay-in-business capital expenditure *and* residual value in the NPV calculation.

The Commission has considered the comments of AGL(ACT) and Arthur Andersen. The Commission's view is:

- *Cost allocation issue* In practical terms, the methodology used should result in cashflow allocations which reflect the true economic costs and revenue associated with customers' use of distribution assets. However, the Commission acknowledges that in using historical accounting information concerning operating cost allocation, judgement is required. This is because average network operating costs are likely to include elements of fixed operating costs which are unavoidable by the core network. When considering network segments which are not profitable, fixed costs should be deducted from average costs to estimate operating costs for the segment.
- *Exclusion of stay in business (SIB) capex/residual value in the NPV analysis* Arthur Andersen/AGL(ACT) assumes the *same* real revenue stream over a 40 year analysis period (ie the remaining asset life) and argues to exclude SIB capital expenditure. This is 'internally inconsistent' because:

66 Includes a review report by Allen Consulting.

- valuation of *existing* assets is based on the earning potential represented by cashflow – the NPV valuation can be seen as the business which the 1999 assets represent, not necessarily the physical assets. Therefore SIB capital expenditure should be allowed
- if all SIB capital expenditure is excluded from the cashflow projections, earning potential should decline over time for the remaining asset lives (about 42.3 years for AGL(ACT) at 1 July 1999). Accordingly, the revenue stream should decline over this period or O&M cost should increase to maintain the same service potential at 1 July 1999. This is not reflected in AGL(ACT)'s cashflow.

- As a result, the Commission believes AGL(ACT)'s net present value (NPV) is likely to be overstated.

  The Commission concludes that SIB capex should be included in the cashflow. This implies earning capacity will be maintained in perpetuity. In light of this, the Commission has extended its analysis period to 50 years. The present value of cashflow beyond year 50 will be insignificant.

Sensitivity analysis

Using AGL(ACT)'s ODV model, the Commission has undertaken a sensitivity analysis of ODV, taking account of factors such as the discount rate (at 7.75 per cent), cost allocation methodology, operating cost and capital expenditure to include the proposal to connect to the Eastern Gas Pipeline. The Commission considers that given the current profitability in the tariff market, the NPV for network segments serving tariff customers will be greater than AGL(ACT)'s proposed DORC. This means ODV will equal AGL(ACT)'s proposed DORC for the tariff segment. The issue of asset write-down is only relevant for the contract market. As the contract market revenue is small in ACT[67], any such asset write down (under certain assumptions) is unlikely to change substantially the ODV result for the whole system.

However, the Commission considers that there is uncertainty in ODV due to variability in the DORC valuation. As discussed in section 6.6, the question is whether AGL(ACT)'s estimate is too high as implied in the DORC / DAC ratio comparison. Arguably, if DORC is valued at a lower figure than $245m, the ODV will decrease accordingly.

6.7.3 Summary and conclusion

The economic value (underlying ODV calculation) depends on an assumption regarding the discount rate. At a discount rate of 7.75 per cent, the economic value of tariff asset groups supports the DORC value. However, this is not the case for the contract assets if a stand alone cost allocation is assumed. Consequently, AGL(ACT) assumes a small asset write down. Given that the majority (95 per cent) of network assets relate to the tariff market, the contract asset write down does not have a material impact on the ODV calculation. Indeed, given the small contribution of this market segment to AGL(ACT), SAC allocation seems inappropriate.

[67] In 1998 / 1999, the contract market revenue represents 6 per cent of AGL(ACT)'s total network revenue.

The Commission acknowledges the uncertainty associated with ODV valuation due to the issue of variability in DORC valuation. The Commission's analysis suggests that:

- AGL(ACT)'s DORC estimate appears high, as seen in the DORC / DAC ratio comparison
- in the tariff network segment, the return on AGL(ACT)'s DORC is above 8 per cent. However, profitability in the tariff market measured by the return on DAC is very high, suggesting that AGL(ACT) is earning an above normal profit from the tariff segment. This implies tariff customers have contributed more than a fair share of capital and assets invested by AGL(ACT).

The Commission concludes that the estimate of the ODV of AGL(ACT)'s distribution assets depends very much on the reasonableness of the DORC asset valuation. At $242-245m, AGL(ACT)'s ODV appears to be high given the questions surrounding its DORC valuation.

6.8 Assessment of asset valuation methodologies

Asset valuation is one of the most controversial issues associated with determining the revenue requirement of a service provider. The methodologies applied to value assets for pricing purposes can be evaluated in terms of:

- degree of subjectivity – the key factor, this related to the availability of an asset value which can be independently verified and audited
- implications for economic efficiency
- equity – impacts on customers and the service provider
- transparency – stakeholders' expectations
- practicability – future implementation as the capital base is rolled forward.

Advantages and disadvantages of methodologies considered by the Commission are summarised in Table 6.7:

Table 6.7 Evaluation of asset valuation methodologies for existing assets

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

As discussed above, there is a degree of subjectivity in each methodology. There is also a high degree of disagreement among stakeholders. Consistent with the Code, the Commission considered a range of matters before arriving at its draft decision on AGL(ACT)'s initial capital base:

- economic guidance for asset valuation under access regulation
- recovery of capital investment over time
- implications of asset valuation for economic efficiency
- equity issues.

6.8.1 Economic guidance for asset valuation

The Commission considers that:

- economic analysis can place limits on the valuation of sunk assets which embody a natural monopoly service. The lower limit is represented by a 'scrap value' or 'exit price valuation'.[68] This is the opportunity cost of retaining assets in their current use. The upper limit is the opportunity for inefficient bypass. Often, DORC is used as a proxy for this upper limit. Thus, setting an asset value above DORC may create the potential for inefficient bypass.
- productive efficiency suggests that the asset valuation should lie between the 'exit' value and the 'bypass' value. Principles of pricing for allocative efficiency suggest that fixed costs should be recovered in a manner which minimises distortion of behaviour. If the fixed costs are increased, the initial asset valuation may rise, making it difficult to achieve this objective.

In a submission from the Energy Markets Reform Forum on AGLGN's Access Arrangement proposal for NSW, Professor David Johnston questions the economic justification for the replacement cost DORC regulatory asset valuation[69] by considering the regulatory objective under Tobin's *q* theory.[70]

Applying Tobin's *q* theory, Johnston contends:
$q = M/RC$
where
M = market value of the firms securities (debt plus equity)
RC = the minimum (optimised) cost of replacing its current productive capacity.

The economic logic is that q=1. If q is greater than 1, the market value of the firm (the present value of its projected cashflows) will be greater than the replacement cost of its assets. This will encourage new entrants or expansion by existing firms, with the effect that prices will be reduced and q driven towards a value of 1.

Distinguishing the cost of replacing used infrastructure (RC_{used}) from the cost of replacing new infrastructure (RC_{new}), Johnston comments that:

- DORC is a proxy for RC_{used} that is, *used* infrastructure. This implies $q = M/DORC$
- the true cost of duplication is $RC_{new.}$ Therefore owners can make DORC as high as RC_{new} without the threat of a new entrant or competition. If precluding the possibility of a new entrant was a genuine basis for asset valuation, the excuse of using DORC is not valid as the regulatory asset base could be two or three times DORC

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68 Whilst King (1996) uses the term 'scrap value', Ergas (1998) uses the term 'exit price valuation'.

69 David Johnston comments on Tobin's *q* and the supposed economic justification for replacement cost regulatory asset valuation: report to the Energy Markets Reform Forum, 23 August 1999.

70 Tobin's *q* is defined as the ratio of the market value of a company's debt and equity to the replacement cost of its assets. Tobin argues that firms have an incentive to invest when *q* is greater than 1 (ie when capital equipment is worth more than its replacement cost), and that they will stop investing only when *q* falls to 1. Conversely, there may be occasions when *q* is less than 1 (ie when equipment is worth less than its replacement cost). At these times, firms have no incentive to invest. This ratio is like the market-to-book value, but there are several important differences. The numerator of *q* includes all the firm's debt and equity securities, not just its common stock. The denominator includes all assets, not just the firm's net worth. Moreover, these assets are not entered at their original cost, as shown in the firm's books, but at what it would cost to replace them.

- the regulatory objective of q=1 is therefore incorrect.

Johnston makes the following observations about broader economic arguments against DORC in an interpretation of replacement costs:

- replacement cost is not required to ensure continued optimal asset use
- use of replacement cost impedes downstream allocative efficiency
- replacement cost based asset value is not necessary to preclude duplication
- replacement cost provides existing asset owners with a 'free lunch'. Writing up the value of AGL(ACT)'s assets is a mere book entry and does not involve any actual cash investment.

One argument put forward to support a DORC valuation is that it allows the relevant utility to charge a price equivalent to the maximum price that a 'perfectly contestable' market would support. Contestability is based on the concept of a 'new entrant' disciplining an incumbent firm. A DORC valuation is sometimes considered to relate to the costs that would have to be incurred by a new entrant that wanted to compete system wide with the incumbent firm. On this basis, if the incumbent's assets are valued above DORC for pricing, this might lead to system wide new entry.

The assumptions underlying contestability are extremely onerous. In relation to the gas industry, they are unrealistic. For example, the standard approach to perfect contestability requires that an entrant should not incur any sunk entry costs. Entry into gas distribution involves significant sunk investment. Even if the gas utilities were regulated on the basis of a value that significantly exceeded DORC, it is highly unlikely that any firm would enter and engage in system wide competition through infrastructure duplication.

The Commission acknowledges the controversy surrounding the application of economic principles in setting a regulatory asset base and the implications for economic efficiency. The Commission considers that the valuation generated by DORC is not necessarily suitable for pricing and may not be applicable to a particular situation. However, the Commission understands that section 8.10 of the Code requires it to consider DORC, which is normally the upper bound. The economic consideration of DORC is just one of many aspects the Commission considers in the review process.

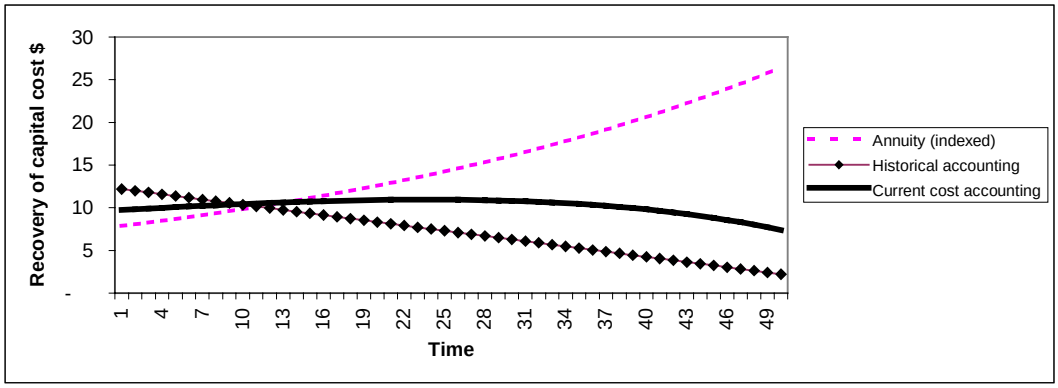
6.8.2 Capital recovery over the life of an asset

The depreciation profile and the rate of return component enable a service provider to recover its capital investment (past and new) over time. The Commission 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* an annuity formula expresses how, over time, the present value of the annuities will equal the present value of capital investments.

A comparison of allowable revenue (excluding non-capital operating cost components) is presented in Figure 6.2:

Figure 6.2 Allowable revenue under alternative methodologies ($ of year)



Note: This analysis is based on the following assumptions:

a. An investment in an infrastructure asset of $100m.
b. Asset life = 50 years and depreciation calculated using a straight line method.
c. Allowed rate of return = 7.75%.
d. Inflation = 2.5% per annum which is used to index the asset value.

Over the economic lives of assets, the present values of the allowable revenue are the same for the three approaches, provided the chosen method is adopted consistently throughout the period. However, significant differences occur. These relate to: timing, the pattern of allowable revenue, and hence, cashflows 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 provided:

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

AGL(ACT) proposes the CCA approach which is a compromise between the annuity approach and the capital market preference for a front-ended income stream.

However, one of the arguments put 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 Commission has examined net present value (NPV) under such circumstances. In so doing, the Commission has assumed that the 'switch over' occurs after one third of an 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 overall return to the utility is greater than the initial investment. The size of the additional return depends on assumptions about inflation, timing of the switch over, and cost of capital.

Whether, in practice, there will be a premium return over the asset life depends on past pricing. If under pricing occurred in the past, the service provider may be unable to earn an adequate return, let alone additional returns, over the asset life.

The above analysis suggests that where there is a change of valuation from DAC/historical cost accounting to DORC/CCA for pricing purposes, the use of DORC/CCA may be inequitable from the customers' perspective. If the initial capital base is set below the DORC value when setting future prices, this may offset the benefit for the utility.

Different time profiles of various income streams have important implications for prices, economic efficiency, investors' preferences, and inter-generational issues over the life of assets beyond one regulatory period.

6.8.3 Implications of asset valuation for economic efficiency

Economic efficiency has three aspects: productive efficiency, allocative efficiency and dynamic efficiency. In this discussion, given that the existing assets are sunk costs, the relevant issues are allocative and dynamic efficiency. Productive efficiency is more relevant to the assessment of non capital costs.

Allocative efficiency

To the extent that regulated asset valuations feed into uniform prices which exceed (congestion adjusted short run) marginal cost, either directly or further up the production chain, the deviation of price from marginal cost will lead to a reduction in economically efficient trade. Such a reduction leads to what economists call 'allocative inefficiency' or a 'dead weight loss'. It represents a decrease in gains from trade from the production and consumption of the relevant product(s) compared to the best achievable level of gains from trade.

The relationship between asset valuation and allocative inefficiency can be moderated by using non-linear prices. These prices allow the regulated firm to recover a higher asset valuation on infra-marginal sales while not distorting marginal prices. However, the regulated firm or the regulator is unlikely to have sufficient information to be able to perfectly avoid allocative inefficiency through non-linear pricing, particularly when facing a wide variety of relatively small customers.

The potential undesirable effects of high asset valuations are exacerbated when the regulated firm provides an input to further production. In order to use non-linear tariffs to avoid a gap developing between marginal and average prices, it must be possible to 'pass' non-linear prices down the production chain to final consumers, thus avoiding allocative inefficiency. In other words, even if the regulated firm can set non-linear prices without restriction, if firms further down the production chain are limited in their ability to set non-linear prices, upstream non-linear prices will be unravelled downstream, leading to an allocative loss.

If there is imperfect competition downstream from the regulated firm, double marginalisation of pricing will occur, increasing any gap between marginal costs and prices.[71] A principal aim of the regulatory regime is to promote entry and competition downstream of the regulated firm. A higher asset valuation will tend to limit the ability of firms to enter and compete downstream. Downstream competition will be muted in order

[71] In vertical production chains, double marginalisation is recognised as a standard issue.

to allow these firms to earn sufficient revenue to be passed upstream to the regulated firm to cover the higher asset value.[72]

Taken on its own, the static trade off between asset valuation and allocative efficiency suggests regulators should err on the side of lower asset valuations for sunk assets.

Dynamic efficiency

In recent access reviews, some parties have argued that a low asset valuation will act as a 'disincentive' to new investment. The Commission notes that Duke Energy (a new entrant which is building the Eastern Gas Pipeline) does not support the joint AGA/APPIA submission to the AGC draft decision arguing for the use of DORC.[73] In its submission to the AGLGN Access Arrangement review in NSW, Incitec comments that the use of DAC methodology does not inhibit pipeline construction in North America.[74]

The economic arguments have been outlined in recent reviews conducted by IPART[75] which are relevant to this draft decision. The Commission believes that:

- whilst a higher asset valuation may be less likely to lead to a perception of regulatory opportunism, it can also be argued that any valuation above the 'exit' value will signify that the regulator is not behaving in an opportunistic fashion
- a DAC valuation or an ODV valuation may be viewed as equally valid 'signals' of non-opportunistic intent as a DORC valuation.

Once an initial capital base has been chosen, it may not be changed in subsequent reviews except due to circumstances specified in the Code. Therefore, the key issue regarding incentives is how new investment is to be brought into the capital base.

6.8.4 Equity

As discussed above, economic analysis provides input for the valuation of sunk assets for access regulation. However, it does not suggest that one specific asset valuation is unambiguously superior to all others.

Consideration of customer impact is another important issue to be addressed in setting the initial capital base. It has implications for total revenue and network prices. Assessing the impact on users and service providers is not a mechanistic process, particularly if cross subsidies exist between customer classes. Often the issue is complicated by historical factors, eg past pricing decisions may not have been made efficiently.

Network users favour applying DAC to recover asset costs. 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.

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72 King (1997) presents a simple model which analyses the regulatory trade-offs between asset valuation, pricing and efficiency for access.

73 AGA/APIA, *Submission to AGL Access Arrangement Review*, 4 August 1999.

74 Incitec, *Submission to AGLGN Access Arrangement Review*, 25 August 1999.

75 IPART, draft decision on AGC's Access Arrangement, July 1999, final decision on GSN's Access Arrangement, March 1999.

In establishing an initial capital base for AGL(ACT), the Commission has considered the matters set out in section 8.10 of the Code. Among other factors, the Commission has considered the basis on which tariffs have been (or appear to have been) set in the past, economic depreciation, and historical returns to the service provider (see section 6.10.2).

6.9 A feasible range for the initial capital base

As provided in the Code, the Commission maintains it is reasonable to consider a range of feasible asset values under various methods. The range of asset values obtained using alternative valuation methodologies is summarised in Table 6.8.

Table 6.8 Summary of alternative valuation methodology ($m)

Valuation methodology	AGL(ACT) proposal	IPARC comment/analysis
Initial capital base (capital assets)	**240.6**	**Revised ICB = 95% DORC**
DORC		
- ***System assets***	**252**	**Variability in DORC valuation**
- ***Other fixed assets***	**3**	
- ***Total capital assets***	**255**	
- ***Net working capital***	**+6**	
- ***Funds employed***	**261**	
DAC		
- ***System assets***	**87**	**Clarified by AGL(ACT) per email of 16 Nov**
- ***Other fixed assets***	**3**	
- ***Total capital assets***	**90**	
- ***Net working capital***	**+6**	
- ***Funds employed***	**96**	
ODV Optimised deprival valuation	**239** **(Stand alone allocation)**	**Subject to allocation methodology and uncertainty re DORC valuation**
Estimated depreciated indexed historical cost (DIHC) – capital assets	**148.5**	**Between 130-148m** **AGL(ACT) estimation tends to overstate DIAC due to asset disposal etc**
Economic written down value assuming CCA depreciation and CCA return	**279.6 (using AGL(ACT)'s estimate of WACC)** **204.1 (using cost of equity = LTBR plus 3% up to 1991, then AGL(ACT)'s WACC estimate)**	**AGL(ACT)'s WACC parameters are higher than those used in this draft decision.** **A range of $140-190m is estimated after adjusting for actual 98/99 CPI, capex and using alternative assumptions on rate of return**

To summarise:

- allocative efficiency suggests that a low asset value should be allowed; the lowest value for AGL(ACT) is its DAC of $90m (excluding working capital)
- a DORC valuation depends on optimisation of the system as reflected by a range of engineers' estimates and the assumptions used in the valuation process
- dynamic efficiency indicates that DORC is the maximum value, as values above DORC may encourage inefficient bypass
- combining the DIHC value with a real rate of return reduces the potential for a windfall gain to the owner of the pipelines, as discussed above. The Commission's estimate of this value is within the range $130–148m with a mid value of $139m
- an ODV valuation depends on the allocation methodology and assumptions on costs and revenues. AGL(ACT)'s estimate of ODV at $239m is a possible outcome, but is prone to the same variability as a DORC valuation
- AGL(ACT)'s DORC is considerably higher than DIHC. Given the age of AGL(ACT), it is questionable why there is such a large gap between these two valuations.

6.10 Other considerations required by the Code

Analysis of AGL(ACT)'s proposed tariffs reveals that its transportation charges comprise over 60 per cent of the price for tariff customers, but represent a lower proportion of delivered gas prices for contract customers. The level of transportation charges will influence demand and the likelihood of competitive entry into gas supply. This, in turn, has major implications for the efficient use of existing gas networks and future investments.

In determining the ICB, the Commission has also considered the following factors.

6.10.1 International best practice and impact on energy consuming industries

Under section 8.10(e) of the Code, the Commission should consider international best practice of pipelines in comparable situations and the impact on the international competitiveness of energy consuming industries.

North American regulatory practice is based largely on DAC. UK utility asset values for price regulation are based on values which are usually below depreciated replacement costs.[76] Current replacement cost is also adopted by NZ utilities.

The Commission notes that under section 8.11 of the Code, the initial capital base should normally not fall outside the range of DAC and DORC values.

The flow on effect to pricing (of an asset valuation) has important implications for network users, particularly energy consuming industries.[77] Higher charges to downstream users will jeopardise recovery of their costs and the viability of the business, as they may not be able to pass on the higher charges to their customers. The impact will depend on the availability of

[76] For example, the regulatory capital base for the UK water services companies in 1994/95 is around 15b English pounds compared with a modern equivalent asset value of 156b English pounds. The exceptions are British Airports Authority and British Telecommunication Plc.

[77] The Commission notes that the size of energy consuming industries in ACT is less significant than in other states.

alternatives to gas. Higher gas input costs will lead to higher prices, which are likely to hurt the competitiveness of energy consuming industries.

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

6.10.2 Historic tariffs, economic depreciation, and returns

Under section 8.10(f) of the Code, the Commission should consider the basis on which tariffs have been (or appear to have been) set in the past, economic depreciation of the covered pipeline, and historical returns to the service provider from the covered pipeline.

AGL(ACT) has supported comments on these issues, with analyses of CCA, NPV and historical returns.

In considering historical tariffs, economic depreciation and historical returns, the Commission has considered AGL(ACT)'s past regulatory regime and used data in the company's directors' report and audited financial statement.

Having considered submissions received, AGL(ACT)'s analysis and in light of its own analysis, the Commission concludes that:

- whilst there is under-recovery of past return during the period 1981-1989, the return since 1990 is above the level that would be earned by AGL(ACT) if it were to recover its WACC. The Commission's analysis shows that in aggregate, there appears to be an over recovery of historical post tax return over the period 1981-1999 in present value terms. By contrast, the pre tax analysis suggests that there was under-recovery of historical return. Therefore the analysis of AGL(ACT)'s historical return is not conclusive.
- in past years, AGL(ACT) appears to have depreciated some asset categories based on asset lives less than economic asset lives.
- AGL(ACT)'s CCA analysis takes into account rate of return and depreciation. This analysis can be used to provide a broad indication about the overall under/over recovery, in net present value terms. However, AGL(ACT)'s estimate of economic WDV is questionable. The Commission's assessment is that AGL(ACT)'s economic WDV lies within $140-190m.
- there is no firm evidence to support AGL(ACT)'s claim of significant under recovery of capital.

The Commission's assessment and findings are provided in Attachment 5.

6.10.3 Reasonable expectations of persons under the regulatory regime which applied to the pipeline prior to commencement of the Code

Inevitably there are differences in the expectations of AGL(ACT) and other interested parties (eg customers). The Commission should consider the reasonable expectations of stakeholders under the regulatory regime which applied to the pipeline prior to commencement of the Code.[78]

[78] Section 8.10(g) of the Code.

In its submission of 16 September 1999, AGL(ACT) argues:

> Prior to access regulation, AGL(ACT) was only constrained in the prices it could charge to tariff users and that constraint was not determined according to a capital valuation. AGL(ACT) was not constrained in what it could recover from contract users, and it was also not constrained in what profits it could earn and retain. The aim of the government policy reflected in this regime was not to regulate profits but to use the profit incentive to encourage AGL(ACT) to higher levels of efficiency. AGL(ACT)'s reasonable expectation was that future revenue would sustain a capital base founded on economic value (ie equivalent to ODV).
>
> A determination of the initial capital base at a level equivalent to the optimised deprival value of the network would recognise those expectations - it would not constitute a windfall gain.

On this issue, the Commission is of the view that:

- Historically, AGL(ACT) operated its gas business under a regulatory regime which had changed from dividend restriction to price regulation on the basis of the price control formula adopted in NSW. During those years under formal dividend regulation (1981-1991), AGL(ACT) is unlikely to have had any expectation that past under recovery for the gas / network business would be compensated by future regulation.
- users would expect to pay a fair share of asset costs associated with AGL(ACT)'s investments. Current prices paid by customers include a high return on DAC. It is unlikely that customers would expect the high return to continue over the remaining asset lives. Users would have no expectation that they would be charged to recover a return on assets resulting from switching from DAC to an asset base close to DORC, which appears to be very high.

6.10.4 Impact on the economically efficient utilisation of gas resources[79]

The Commission considers that the valuation methodology adopted should yield pricing signals which provide incentives to efficiently develop and use the gas resources of the AGL(ACT) system. As far as practicable, prices to end users should be cost reflective. The price set for existing assets may influence the expectations of investors about the regulator's future treatment of investment.

In theory, efficient use of resources requires pricing which reflects marginal costs. However, for monopoly networks, revenue generated from marginal cost pricing is likely to fall short of the network's ongoing business obligations, such as operating costs, debt repayment and dividend payments. This is a key practical problem for efficient network pricing which reflects the difference between marginal costs and average costs.

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.

In a competitive market it is expected that prices will be sufficient to provide the investor with a 'normal' return over the life of the asset. However, annual returns are likely to vary, reflecting market conditions. As noted above, the use of either a nominal return on DAC, or

[79] Section 8.10(h) of the Code.

a real return on DORC should, in principle, provide a similar income stream over the life of an asset.[80] Whilst both can approximate market outcomes over the life of the asset, the profile of prices will vary over time.

In regard to the impact on upstream and downstream markets, lower prices are likely to encourage gas use. 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 Commission has compared network profiles and average network prices for gas distribution companies.

Table 6.9 Comparison of network profiles, characteristics and average network prices

	AGC 1997/98 (NSW)	Multinet 1998 (Vic)	Westar 1998 (Vic)	Stratus 1998 (Vic)	GSN 1997/98 (NSW)	AGL (ACT) 1998/99 (ACT)	AGL (NSW) 1998/99 (NSW)	Envestra 1999 (SA)
Customers/km main	48.8	67.2	54.3	51.3	27.3	22.2	36.1	47.7
TJ transported/km pa	8.7	6.7	9.6	7.1	3.0	1.8	4.9	5.3
DORC/GJ	8.3	12.6	9.4	10.6	20.3	41.9	21.0	22.7
DORC/customer	1,482	1,262	1,665	1,454	2,238	3,306	2,865	2,477
Av GJ/customer								
Contract/demand	215,000	60,304	165,971	104,745	59,605	25,641	153,772	na
Volume/tariff	57	74	66	66	52	66	35	na
Total	179	100	177	138	110	79	136	109
Average network price $/GJ								
Contract/demand	0.13	0.10	0.12	0.10	1.70	2.30	1.36	0.47
Volume/tariff	4.13	2.97	3.74	3.72	5.77	6.67	7.87	10.19
Total	1.40	2.22	1.47	1.82	3.62	5.94	3.04	3.36

Note: The results for Multinet, Westar and Stratus are based on ORG's final decision of 7.75% on the initial capital base.

The above comparison may be useful as a reasonable check against a DORC valuation and implications for pricing. The results should be interpreted in the context of the density of natural gas users along a distribution system, climatic factors, and the effect of large gas users. The Commission notes that:

- AGL(ACT)'s gas distribution network predominantly serves domestic tariff customers. Only a small number of contract customers exist on the network. Of the larger loads, the customers are largely commercial.
- AGL(ACT)'s network is characterised by its low supply pressure at the city gate station. Analysis of the supply capacity of the secondary system shows that the system is

[80] Subject to the impact of technological change and construction costs.

constrained due to the minimum supply pressure at the city gate and the load composition being mainly domestic customers.

- The ACT system has mains laid on both sides of street.

The Commission considers that given the characteristics of the ACT systems, the comparison in Table 6.9 must be interpreted carefully. The Commission notes that the new Eastern Gas Pipeline connection, if proceeded, will remove the network constraint at the city gate. In this context, lower network charges are more likely to encourage growth and new connections.

6.10.5 Comparability with the cost structure of new pipelines which may compete with the pipeline in question[81]

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

In some cases the alternative to the existing network may not be a bypass pipeline but rather, use of another energy source or feedstock, or the importation of a processed product. In this case, the DORC asset value may not be applicable and the 'bypass price' may be lower than DORC.

6.10.6 The price paid for any asset recently purchased by the service provider and the circumstances of that purchase[82]

This matter is irrelevant to AGL(ACT).

6.11 Financial indicator analysis

Sections 8.6 and 8.7 of the Code permit the regulator to have regard to financial performance indicators. Details of this analysis are presented in chapter 11.

The Commission has assessed financial outcomes under AGL(ACT)'s proposal and alternative ICB scenarios between $130m and $200m. The Commission has considered the extent of 'profit' shock to AGL(ACT) within this range. The cases of most interest to the Commission are $160-180m. The financial indicator results for this ICB range are considered to be satisfactory in terms of future viability.

81 Section 8.10(i) of the Code.
82 Section 8.10(j) of the Code.

6.12 Commission's draft decision

Having considered the submissions received in relation to this review of AGL(ACT)'s Access Arrangement, the Commission concludes that:

- economic analysis provides some guidance on a range of feasible asset values; whilst the lower bound is set by the scrap value, the upper bound is set by the cost of bypass by an external firm. However, the Commission acknowledges that the economic justification for using DORC is questionable
- a higher ICB tends to reduce allocative efficiency and may limit the potential for downstream competition
- there is no significant economic argument that requires an ICB founded on a DORC valuation for sunk assets, especially considering the consequences of a high initial asset base for economic efficiency
- the ODV and DIHC analyses help the Commission to assess the factors listed in section 8.10 of the Code in the context of the whole of section 8 and section 2.24
- the Commission's analysis suggests that a change of valuation from DAC to the use of full DORC for pricing purposes will in most circumstances generate a return over the whole economic life of the assets greater than the initial investment where DORC is higher than DIHC. The Commission notes that AGL(ACT) adopts historical cost accounting. Although pricing may not have been based on historical cost, historical cost depreciation was charged to its profit and loss accounts. AGL(ACT) has enjoyed healthy return on assets (historical cost) over the past years 1990-1999 but suffered from losses/low return in the 1980s. Taking depreciation and historical return together, the Commission's analysis suggests that there is no firm evidence of under-recovery of capital
- AGL(ACT)'s estimate of economic WDV is excessive. The Commission considers that an economic WDV for AGL(ACT) should be within a range $140-190m
- incentives for future investment are more appropriately taken into account when considering the rate of return and the rules for incorporating new investment, than when considering the ICB.

Under section 8.11 of the Code, the ICB for AGL(ACT) normally should not fall outside the range of $90m (ie DAC) and $255m (ie AGL(ACT)'s estimate of DORC). The latter is 2.83 times the DAC value and $106m higher than AGL(ACT)'s estimate of DIHC. The Commission is of the view that AGL(ACT)'s DORC value is questionable.

After considering the objectives of the Code and the particular circumstances of the AGL(ACT) system, the Commission considers that neither DAC, nor AGL(ACT)'s proposed ICB is an appropriate asset value for setting AGL(ACT)'s target revenue.

Having considered the wide range of feasible asset values, historical depreciation/returns analysis and the requirements of the Code, the Commission believes that the ICB should be below $200m. In deciding the most appropriate ICB for AGL(ACT), the Commission has assessed pricing and financial impacts under revenue outcomes using an ICB within the range of $160-180m. **The Commission has decided that AGL(ACT)'s initial capital base at 1 July 1999 should be $170m.** The Commission considers that this represents a reasonable balance of the interests of stakeholders and promotions of competitive outcomes.

This initial capital base and other amendments required by the Commission, will mean real price reductions for contract customers in excess of AGL(ACT)'s proposal. The adoption of $170m as the ICB will reduce AGL(ACT)'s revenue stream and profits. Nevertheless, its revenue should be sufficient to allow AGL(ACT) to continue to operate and maintain its network while earning a reasonable return.

Amendment 4 - Initial capital base as at 1 July 1999

AGL(ACT) is required to set the initial capital base for its covered pipelines at 1 July 1999 (including ACT, Queanbeyan and Yarrowlumla) at a value no higher than $170m.

7 ROLLING FORWARD THE CAPITAL BASE

7.1 Code requirements

The value of the regulatory capital base is used to establish the total revenue of the service provider. Section 8.9 of the Code states in part:

> …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.

Consistent with section 8.9, the roll 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 each of these elements:

- initial capital base (section 8.10)
- 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)
- depreciation (section 8.32 and 8.33).

The Code also provides guidance on dealing with forecast capital expenditure in determining reference tariffs and the timing for recognising new facilities investment in the capital base.

As discussed and explained in section 4.4.1 of this report, the Commission has decided that AGL(ACT)'s regulatory capital base should include capital assets (ie network assets and non-system assets) and net working capital. The return will be calculated separately for each component, and the value of each component will be adjusted separately over time.

In this access review for AGL(ACT), the Commission has considered how to:

- project the value of the regulatory capital base over the proposed Access Arrangement period in order to establish target revenue for AGL(ACT) in respect of capital assets
- ascertain the value of net working capital at 1 July 1999 and the projected level over the period 1999-2004.

7.2 AGL(ACT)'s proposal

AGL(ACT) presented its proposed ICB in terms of funds employed. In September 1999, AGL(ACT) revised its ICB from $245m to $246.6m following changes to working capital to exclude deferred income tax liabilities. AGL(ACT) did not provide changes to its roll forward value at 1 July 1999.

In regard to the future adjustment, AGL(ACT) proposes to adopt a current cost accounting (CCA) approach under which assets are revalued each year, in line with inflation and depreciation calculated on a straight-line basis on the revalued capital base. The written down value (WDV) of assets is expressed as follows:

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

7.3 Public submissions

No public submissions have been received on this issue.

7.4 Issues in rolling forward the value of regulatory capital assets

The roll forward of the asset base can be expressed as follows:

Regulatory capital base = initial capital base + new facilities investments (excluding speculative investment) - depreciation - redundant capital

Each of these elements is discussed in detail in the relevant chapter of this report. If a CCA approach is adopted, all the elements in the roll forward will be adjusted over time by an inflation factor.

7.4.1 Financial - vs - operating capital, and indexation

Under CCA, the concept of capital maintenance can be expressed as financial equity or operating capability. Broadly speaking, financial equity defines the maintenance of the equity of the business in real terms. Operating capability means the ability of the enterprise to maintain the same level of goods and services over time.

The key issue is whether the regulatory capital base should reflect the shareholders' financial investment in the business, or the physical assets of the business. The choice will have implications for the depreciation and indexation of the regulatory capital base.

The Commission agrees that a CCA approach should be adopted and believes that, consistent with the Code requirements, this should be based on the principle of maintaining financial capital. The Commission notes that IPART, ACCC and ORG have adopted indexation of the capital base and a real rate of return on the capital base in their decisions on the NSW and Victorian Access Arrangements.

7.4.2 Prudency test of investments

Under the Code, new facilities investment must pass a 'prudent investment' test (as provided in section 8.16 of the Code) to be included in the capital base within the Access Arrangement period. The Commission is reviewing AGL(ACT)'s forecast capital expenditure. Having considered Ewbank Preece's draft report, the Commission has used AGL(ACT)'s original forecast in projecting regulatory capital base over the Access Arrangement period (pending the completion of the EP report). The Commission seeks further comments on whether AGL(ACT)'s new proposal for the Eastern Gas Pipeline connection is consistent with the requirements of section 8.16 of the Code. For further details of proposed capital expenditure, see chapter 9.

7.4.3 Capital redundancy

Section 8.27 of the Code provides a mechanism which 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 so as to:

- ensure that assets which cease to contribute in any way to the delivery of services are not reflected in the capital base
- 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.

Within a competitive environment, a firm faces risks associated with redundant capital. Within a regulated environment, some of these risks are reduced as redundant capital can be removed from the capital base. Exposing the firm to a 'competitive' redundant capital environment shifts risk from the customers and the firm, solely to the firm. It may then have the desired economic effect of improving asset management. If the firm bears a greater risk of redundant capital and stranded assets, it will exercise care when making investments. If this approach is more risky for the firm, this extra risk should be reflected in the allowed return. As required by the Code, the Commission will assess whether there is any need for an adjustment at the next access review.

The Commission has considered and accepted AGL(ACT)'s proposed statement in its reference tariff policy that redundant capital is to be removed from the capital base (see section 13.6).

7.5 Projected regulatory capital value, 1999-2004

Changes in the regulatory capital value over time depend on the service provider's capital efficiency, the level of prudent new investment, and regulatory depreciation.

7.5.1 Indexation of regulatory capital value

On the issue of future indexation, the Commission has considered the relative merits of the underlying rate and the headline rate of inflation, and the trend of the ACT and All Capitals inflation rates over time. The movement in the average rates over time suggest that the rates are closely aligned. It is important that the rate applied be consistent over time.

With the development of a national energy market, the Commission considers that indexation of the regulatory capital base should be based on the actual national CPI for each financial year of the Access Arrangement period. A real rate of return is to be applied to the indexed capital base.

For the purpose of indexing the capital base, the CPI is inclusive of the Goods and Services Tax (GST). This is considered to be consistent with the financial capital concept of maintaining the real equivalent purchasing value of shareholder investments. The following definition is to be used:

> CPI means the Consumer Price Index: All Groups, index number weighted average of eight capital cities published by the Australian Bureau of Statistics from time to time and if the Australian Bureau of Statistics ceases to calculate and publish such an index, then CPI will mean any index that substantially replaces that index.

7.5.2 Projected movement in regulatory capital value 1999-2004

The Commission has yet to form a conclusive view on the reasonableness of AGL(ACT)'s capital expenditure proposal (see chapter 9). To assist interested parties to understand the derivation of total revenue, an indicative movement in the regulatory capital value over the Access Arrangement period is provided below. In this projection, the Commission has assumed indexation of 2.5 per cent inflation per annum.

Table 7.1 Indicative movement in the regulatory capital value, 1999–2004 (network and non system assets, nominal $m)

	1999/2000	2000/01	2001/02	2002/03	2003/04
Capital base opening value	170	175	181	185	189
Capital expenditure (excl EGP capex) (1)	6.2	6.9	5.4	5.7	5.6
Depreciation	-5.3	-5.6	-5.8	-6.0	-6.2
Indexation	4.3	4.5	4.6	4.7	4.8
Indicative capital base rolled forward (2)	175	181	185	189	193
Indicative capital base rolled forward with EGP capex	180	193	197	201	205
Comparison: AGL(ACT)'s original proposal (3)	245	250	254	257	261

Notes:

1. Excluding the new proposed capital expenditure on connecting to the Eastern Gas Pipeline.
2. It is assumed that no asset is disposed of during the period 1999-2004. The indicative capital base rolled forward is only provided to assist the determination of total revenue pursuant to section 8.20 of the Code.
3. The Commission's analysis is based on AGL(ACT)'s RAAI by considering the proposed funds employed capital base adjusted by net working capital.

The Commission stresses that the figures in the above table represent its draft decision on the ICB only. The figures adopt AGL(ACT)'s forecast capital expenditure as at September 1999, plus the proposed connection to the EGP. Changes may be made in the final decision.

7.5.3 Projections of net working capital

AGL(ACT) has not provided details of projected movement in its net working capital. Based on AGL(ACT)'s unaudited financial statements for 1998/99, net working capital at 1 July 1999 is $6m. This figure is calculated based on the Commission's proposed definition of net working capital for price regulatory purposes:

Current assets	$m
- receivables	10.9
- inventories	0.2
Total current assets	11.1
Current liabilities	
- creditors	5.0
Net working capital	6.1

The Commission requires AGL(ACT) to provide its revised projections of net working capital excluding deferred tax liability. The basis of its projection should also be provided.

7.6 Commission's draft decision

The Commission concludes that:

- under the cost of service model, the capital base (including future new facilities investment) and depreciation will be indexed by the CPI and a real rate of return will be allowed on the regulatory capital base
- the proposal stated in its reference by AGL(ACT)'s tariff policy to remove redundant capital from the capital base is accepted. In deciding the rate of return for AGL(ACT), the risks of any uncertainty which may arise have been considered
- at the present time the Commission is not able to decide on the prudency of forecast capex for 1999-2004 (see chapter 9). For the purposes of this draft decision, the Commission has made a provisional allowance, on the basis of AGL(ACT)'s September 1999 capital expenditure forecast, to roll forward the capital base in determining total revenue
- subject to the provisions of the Code, and provided safe and reliable operation is met, actual prudent capital expenditure will be included in the regulatory capital base over the next regulatory period.

Amendment 5 - Rolling forward the regulatory capital base

For the purpose of calculating reference tariffs during the Access Arrangement period, AGL(ACT) is required to roll forward the regulatory capital base by:

a) including forecast capital expenditure which meets the prudency test for the period 1999/2000 to 2003/04

b) deducting forecast regulatory depreciation

c) indexing the regulatory capital base annually from 1 July 1999 using the CPI defined as the All Groups Consumer Price Index (weighted average of eight Australian capital cities) as published by the Australian Bureau of Statistics.

8 DEPRECIATION

8.1 Code requirements

Sections 8.32 and 8.33 of the Code provide for the depreciation schedule to be calculated in accordance with the cost of service method.

8.2 AGL(ACT)'s proposal for depreciation

AGL(ACT) has used current cost accounting methods and economic lives to calculate its proposed depreciation. AGL(ACT) notes that this is in line with the ORG / ACCC decisions for the Victorian distributors. AGL(ACT) has adopted the method used by ORG / ACCC which calculates depreciation as follows: [83]

(a) Depreciation = accounting charge * $(1+CPI)^n$
(b) Return = written down value (WDV) of assets * real WACC
(c) WDV of assets = Accounting WDV of assets brought forward * $(1+CPI)^n$ + 50% of current year capex * (1+CPI)

AGL(ACT)'s proposed regulatory capital base at 1 July 1999 ($240.6m) is equivalent to 95 per cent of DORC (ie $255m[84]). The depreciation values proposed by AGL(ACT) in January 1999 for its original initial capital base proposal (ie $255m) are presented in Table 8.1.

Table 8.1 AGL(ACT)'s proposed depreciation (nominal $m)

	1999/00	2000/01	2001/02	2002/03	2003/04
Depreciation	7.7	8.0	8.3	8.6	8.9

Source: AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 6.

In the consultant's report prepared by Arthur Andersen, the following asset lives are shown:

Table 8.2 AGL(ACT) system assets at 1 July 1999 – weighted average age and remaining life

	ORC $m	DORC $m	% depreciated	Total life (years)	Av age	Av remaining life
HP-mains	49	41	16	80	12.9	67.1
HP-services, regs	1	1	26	50	12.9	37.1
MP-mains	213	164	23	50	11.5	38.5
MP-services, regs	38	31	17	50	8.7	41.3
Meters	20	10	48	15	7.2	7.8
Total	**321**	**248**	**23**			
Weighted av age		11.2				
Weighted av remaining age		41.3				
Weighted total life		52.5				

Source: Arthur Andersen, Review of Financial and Valuation Models prepared by AGL(ACT), 6 September 1999.

83 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 6.
84 Includes $252m network assets and $3m other fixed assets.

8.3 Public submissions

An issue relevant to depreciation is the basis for arriving at asset valuation. BHPP contends that depreciated actual cost (DAC) should be used. If DAC is used, depreciation will be based on historical cost.

8.4 Commission's analysis and assessment

The two asset related costs are depreciation and return on capital. Depreciation can be defined as economic depreciation or accounting depreciation. *Economic depreciation* is a measure of the decline in economic value of an entity's asset base over time, as its remaining useful life becomes shorter. Estimation of economic depreciation is based on changes in the market value of assets. In practice, this is problematic for monopolies, because the market value of infrastructure assets is often not readily available.

From an accounting point of view, a depreciation charge is important because it matches the decline in the value of an asset with revenue generated by the asset base. *Accounting depreciation* may not reflect economic depreciation. It is very difficult to apply the economic concept of depreciation within the limitations imposed by the accounting data produced, while satisfying accounting standards. Under the cost of service model, the annual depreciation expense component provides the utility's capital investment to be recovered over the anticipated economic life of the depreciable assets.

The other asset related cost is return on capital. The profile of the return on assets over time 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 depends on assumptions about depreciation and the asset base. To assess overall capital costs over the life of an asset, return *of* capital (depreciation) must be considered together with return *on* capital.

8.4.1 Methods of depreciation

Under the conventional accounting approach, the depreciation profile depends 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 most commonly used method. AGL(ACT) proposes using straight line depreciation to determine annual depreciation charges based on estimates of economic lives. The Commission considers this to be an acceptable method. It provides an acceptable approximation of asset consumption.

8.4.2 Asset lives

The table below summarises the asset lives adopted by Great Southern Networks, Sinclair Knight Merz in its review of the ORC/ACCC Victorian gas asset DORC valuations, Albury Gas Company, AGL(ACT)'s proposal, and the assessment by consultant, Ewbank Preece (EP).[85]

Table 8.3 Comparison of asset lives (years)

Asset	AGLGN (1997 undertaking)	AGL(ACT) (1999 AAI)	Ewbank Preece	Albury Gas Company	GSN	Sinclair Knight Merz/Victorian gas assets
Mains:						
Cast iron	50	50	50-80		100	50 – 120
Steel	50	80	60-120	120	80	30 – 120
Polyethylene/ nylon	50	50	40-60	60	50	60
Customer services	20	50	40-60	-	50	As for mains
Meters	15	15	10-25	25 – 30	15	25 – 30
District regulators	15	50	40-50	45 – 50	40	45 – 50
City gate		50	40-60	50	50	50
SCADA system		5 – 10	-	5 – 7	20	5-7
Plant and equipment	5 – 10	5 – 20	-	-	5	-

Note: In NSW there is a statutory requirement for meters to be replaced after 15 years' service.

The results show that AGL(ACT)'s asset lives generally accord with those adopted by the engineering consulting firms and other gas distribution utilities.

8.5 Depreciation and regulatory capital value

The Commission has examined approaches to depreciation used in other regulatory regimes. The US allows historical cost depreciation on the rate base using historical cost net book value (ie DAC). In UK, the approaches adopted are:[86]

- electricity industry: in setting price controls, the previous regulator, OFFER, allowed depreciation on the regulatory asset value of assets only. All new capital expenditure was 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, but only to the extent that investment exceeds the renewal charge in respect of underground assets, or exceeds the depreciation charge in respect of above ground assets.
- gas industry: the 1997 Monopolies and Mergers Commission (MMC) reports on the price control of TransCo.[87] The report states that depreciation will be allowed on the regulatory value of assets only. It includes actual capital expenditure incurred over the

85 The Commission engaged Ewbank Preece to undertake an independent review of AGL(ACT)'s asset lives assumptions.

86 See a paper prepared by Tim Tutton of PricewaterhouseCoopers for IPART. This paper is published in IPART's discussion paper, *Asset Valuation and Roll Forward of Capital Base*, January 1999.

87 Monopolies and Mergers Commission, BG Plc, May 1997.

previous price control period. Depreciation is profiled in TransCo's book depreciation, and adjusted downwards to reflect difference between regulatory value and book value.

AGL(ACT) proposes calculating depreciation based on an accounting charge of the written down value (WDV) of assets indexed by inflation. The Commission understands that AGL(ACT) actually intends to base regulatory depreciation on the WDV of its regulatory asset base. The Commission considers AGL(ACT)'s current use of terminology is confusing. AGL(ACT) is required to state its approach clearly and in accordance with this draft decision.

The Commission considers that to allow 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) to be included in the capital base. The Commission therefore accepts AGL(ACT)'s proposal to allow regulatory depreciation on forecast new facilities investment.

AGL(ACT) is required to amend its depreciation based on the 1999 regulatory capital value.

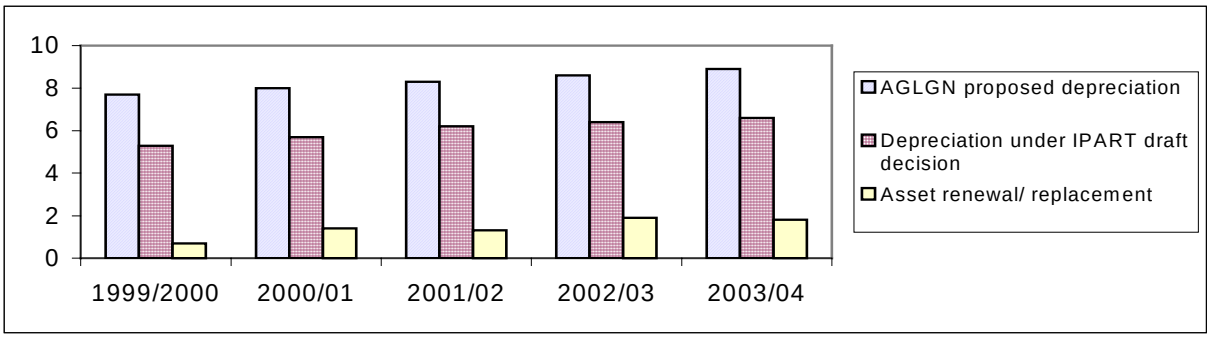
8.6 Depreciation and replacement capital expenditure

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.

If depreciation is allowed as a return *of* capital, that is, capital repayment, the Commission considers 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 whether those assets have a service potential greater than the original expectation.

Figure 8.1 presents the cumulative total depreciation, maintenance and replacement capital expenditure proposed by AGL(ACT).

Figure 8.1 Regulatory depreciation and replacement capital expenditure (nominal $m)



Source: AGL(ACT) RAAI and the Commission's draft decision.

The above figure indicates that proposed regulatory depreciation exceeds proposed capital expenditure for the renewal and replacement of AGL(ACT)'s system and non-system assets. Thus, the revenue requirement of depreciation will still be able to provide a source of valuable funding for AGL(ACT) for other capital investment. However, the Commission acknowledges that the ACT gas distribution system is relatively new with a weighted average age of 11 years. Renewal and replacement capital expenditure is expected to be low during the early years of the asset life cycle. The Commission will continue to examine the trend of renewal / replacement capex in future access reviews.

8.7 Commission's draft decision

Depreciation will be allowed on the ICB 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. In this draft decision, for the purpose of determining a reference tariff over this Access Arrangement period, depreciation based on AGL(ACT)'s forecast capital expenditure (see chapter 9) will be assumed.

Amendment 6 – Depreciation

AGL(ACT) is required to amend its depreciation so that:

a) the depreciation component is calculated on the regulatory capital base only, thus reflecting the initial capital base at 1 July 1999 as determined by the Commission

b) depreciation must be calculated using a straight line method based on economic lives by asset category:

Asset category	Economic life
Mains:	
- cast iron	50
- steel	80
- polyethylene / nylon	50
Inset services	50
Meters	15
District regulators	50
City gate	50
SCADA systems	5-10
Plant and equipment	5-20

9 CAPITAL EXPENDITURE

9.1 Code requirements

Sections 8.15 to 8.22 of the Code set out matters relating to forecast capital expenditure.

Under section 8.16 of the Code, actual new facilities investment must pass a 'prudent investment' test to be included in the capital base at the beginning of the next Access Arrangement period.

For the purposes of this chapter, wherever reference is made to 'prudency' or the 'prudent investment test', such reference is to be taken to be a reference to the tests set out in section 8.16 and 8.20 of the Code.

9.2 AGL(ACT)'s forecast capital expenditure

AGL(ACT)'s forecast capital expenditure is shown in Table 9.1 (excluding the proposed connection to the EGP):

Table 9.1 AGL(ACT)'s capital expenditure forecast (nominal $m)

April 1999 submission	2000	2001	2002	2003	2004	5 year total
Renewal/replacement						
Meters/regs/filters	0.1	0.8	0.9	1.4	0.6	3.8
Non system assets	0.6	0.5	0.4	0.6	1.3	3.3
Total renewal/replacement	0.7	1.4	1.3	1.9	1.8	7.1
Growth related						
Medium/low pressure	4.3	4.2	4.0	3.7	3.3	19.6
Non system assets	0.0	0.0	0.0	0.0	0.0	0.0
Total growth related	4.3	4.2	4.0	3.7	3.3	19.6
System reinforcement						
High pressure	0.4	1.3	0.0	0.0	0.4	2.1
Total system reinforcement	0.4	1.3	0.0	0.0	0.4	2.1
Others						
Contestability	0.7	0.0	0.0	0.0	0.0	0.7
Total capital expenditure	**6.2**	**6.8**	**5.4**	**5.7**	**5.6**	**29.7**
August revisions						
Total capital expenditure	5.5	6.3	4.9	5.3	5.3	27.3
Real capital expenditure (1999/2000 $m)						
April proposal	6.2	6.7	5.1	5.3	5.2	28.4
August revisions	5.5	6.2	4.7	4.9	4.9	26.2

Source: AGL(ACT) SAAI submission in April.
Note: Totals may not add up due to rounding.

Arthur Andersen submits:[88]

> During our initial review of the model, we noted that Capex growth was forecast to increase at CPI-1.5%. In our discussions with AGL(ACT), we formed the view that Capex should be inflated at CPI and requested that AGL(ACT) reflect this change in the Base Financial Model.

It seems that AGL(ACT)'s originally assumed CPI-1.5 per cent capital efficiency is based on the current price constraint for the delivered gas price. Arthur Andersen's view appears to question the relevance of this cap to capital cost projection.

The ACIL review finds that the load from lost customers is not accounted for in total load, resulting in an overstatement of load for the residential tariff segment. Arthur Andersen has verified that the AGL(ACT) model has been changed to incorporate this aspect. This could explain the overall decrease in forecast capital expenditure, given that the tariff market growth assumption is a primary driver calculating capital expenditure.

9.2.1 Proposed extension to Eastern Gas Pipeline

In a recent submission to the Commission, AGL(ACT) sought to amend its proposed Access Arrangement to include additional capital expenditure required to extend the ACT Network to the Eastern Gas Pipeline (EGP). The submission also outlined the alternatives that had been considered, including:[89]

(a) Augmentation of the EAPL lateral by
  (i) Installation of a compressor station at Dalton or;
  (ii) Looping (duplication of the existing pipe).
(b) Extension of supply to the Queanbeyan Secondary Main.
(c) Third Party Constructs the Network Extension.
(d) Market Growth Suspension and Possible Supply Curtailment.

Based on the criteria of satisfying the short and long term requirements of the ACT market, establishing a connection to the EGP as soon as possible and low cost, AGL(ACT) has decided that the construction of a high pressure main from the existing primary main near Canberra airport is the best option. Proposed expenditure on the construction of the pipe is to be spent over two years. The cost is estimated to be $11-12m. AGL(ACT) states that the benefits are:[90]

> A significant increase in the security of supply to the ACT Network. Connection to the EGP would diversify supply, reducing exposure to both pipeline and producer failure risks. Recent incidents at Longford and Moomba gas plants have highlighted the impact of these risks.
>
> A significant increase in the opportunity for competitive gas supply. Competition will be possible at the producer level. The main initial competitors will be the Cooper Basin and Bass Strait joint ventures. At a retail level the addition of a further supply source will increase the opportunities for retailers to acquire gas to sell into the ACT market, which might otherwise be more limited.

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88 Arthur Andersen's Review of Financial and Valuation Models prepared by AGL Gas Company (ACT) Limited, 6 September 1999, p 30.

89 AGL(ACT) submission, 20 December, 1999, p 3.

90 AGL(ACT) submission, 20 December, 1999, p 4.

9.3 Public submissions

BHPP comments on the capital expenditure forecasts, stating:[91]

> Prudent growth capex forecasts for the tariff market can only be set once a bottom-up cost reflective target revenue has been set.

9.4 Ewbank Preece capital expenditure review

Ewbank Preece (EP) was engaged to review AGL(ACT)'s actual capital expenditure for the past five years (1993/94-1997/98) and forecast capital expenditure for 1998/99-2003/04. Draft findings of EP's review are summarised below:

Review of project evaluation methodology

EP has found that the network models, options and planning criteria developed by AGL(ACT) are generally sound. However, EP has some concerns about the 'severe winter' forecasts for tariff customers. The development of more robust models is warranted. Collection of the necessary data is likely to take several years. In the interim, continuing to use the existing approach is the only practical course of action.

Review of capital expenditure decision making process

AGL(ACT) has published procedures for evaluating proposed capital expenditure. Minor projects are assessed using an automated system based on direct costs, benefits and a hurdle rate.

A review of the documents seeking approval of capital expenditure did not provide sufficient detail to enable an informed comment to be made on the prudence of those particular projects.

Review of historical capital expenditure (1993/94 – 1997/98)

EP reviewed AGL(ACT)'s actual capital expenditure between 1993/94 and 1997/98, as shown in Table 9.3:

Table 9.3 Actual capital expenditure, 1993/94 to 1997/98

Nominal $'000	1993/94	1994/95	1995/96	1996/97	1997/98
Market expansion	5,923	4,651	7,742	6,953	6,780
Others	402	567	990	232	648
Total	**6,325**	**5,219**	**8,732**	**7,185**	**7,428**

Source: Ewbank Preece technical review of AGL(ACT) capital expenditure.
Notes:
1. Some of the total figures are slightly different from AGL(ACT)'s AAI.
2. Totals may not add up due to rounding.

91 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 7.

EP's preliminary findings in each of the review areas are summarised in Table 9.4:

Table 9.4 EP draft review findings – AGL(ACT)'s capital expenditure

Review area	Findings
Checking unit rates	Systems may be adequate for its original purpose, but has not been capable of providing data to assess prudence under the Code.
Comparison of actual vs previous forecast	From the documentation[92] available, it seems that the projections have not been reviewed or revised as actual information has become available. On the basis of EP's review of the documentation, the accuracy of AGL(ACT)'s domestic customer load projections is questionable.
Review of post audits	Although the capex procedures refer to the need to carry out project post audits, these are rarely undertaken by AGL(ACT) as they are difficult to do with sufficient precision.
Generic analysis (ie IRR)	This is a discounted cashflow analysis to calculate the IRR for the overall expansion capex program. The overall result suggests the connection of new customers and the associated upstream developments were economic.
Review of performance indicators	Overall insufficient information is available to enable conclusions to be drawn regarding the effectiveness of AGL(ACT)'s activities in delivering improved or more cost effective service, although some indicators do show encouraging trends.

Review of forecast capital expenditure (1999/2000 – 2003/04)

EP has reviewed AGL(ACT)'s capital expenditure forecast, which has five components, as detailed in Table 9.5:

Table 9.5 EP draft review findings – AGL(ACT)'s forecast capital expenditure

Component	Findings
Growth related ($19.63m)	Based on future customer connections. The unit rates for the residential and business customers appear reasonable, while the mains costs do pass a broad reality check.
System reinforcement ($2.13m)	At this stage, no information on the system reinforcement projects has been provided.
Renewal/ Replacement ($7.15m)	AGL(ACT) uses a recently developed 20 year forecasting model. This is a reasonable approach for estimating longer term requirements. For shorter term estimates, more detailed technical and economic assessments of the condition of the particular assets involved are needed. Based on the information available at present, EP is unable to comment on the justification of the capex.
Contestability ($0.74m)	Unable to comment.

Note: The capital expenditure values are the amounts that EP reviewed based on the April submission and not the updated August submission.

92 No previous capex forecasts were available to allow a reconciliation with actual expenditure to be carried out. However a document entitled, 'Canberra Marketing Model Projections-Domestic Customers' dated January 1995 was available.

9.5 Commission's assessment

The Commission believes forecast capital expenditure should depend on the characteristics of the network, growth forecasts and the need for refurbishment and replacement. The Commission is required to satisfy itself that forecast new investment is reasonably expected to meet a 'prudency test'[93] before allowing for new investment in the target revenue and price path.

Overall, following the review of its financial and valuation models by consultant, Arthur Andersen, AGL(ACT) has revised its capital expenditure forecast downwards. The decrease is around $2.3m (real) over the Access Arrangement period.

The composition of the forecast capital expenditure for 1999-2004 is as follows (based on the revised August forecasts and excluding the proposed extension to the EGP):

- more than half is accounted for by market growth ($17.26m)
- 14 per cent is for system renewal and replacement ($3.81m)
- 12 per cent is for non system asset replacement ($3.34m)
- 8 per cent is for system reinforcement ($2.13m)
- 3 per cent is for contestability ($0.74m).

The Commission has examined AGL(ACT)'s assumptions about the growth forecast, the method of arriving at capital expenditure per customer, and components of the forecast capital expenditure.

9.5.1 Commission's consideration and analysis

The Commission has considered the findings of EP's draft review. EP raises uncertainties about some aspects of AGL(ACT)'s actual and forecast capital expenditure. However, the Commission notes that the findings are generally favourable in respect of AGL(ACT)'s capital expenditure decisions and approval process. In EP's view, AGL(ACT) appears to have outlined good network planning practices.

The Commission considers that AGL(ACT) would benefit by implementing necessary changes to ensure that in future a prudency review is not hindered by an information deficiency.

The Commission will consider AGL(ACT)'s growth related capital expenditure in light of the ACIL review of growth forecast (see chapter 17). The Commission will also consider the revised capital expenditure figures submitted in August 1999 and EP's assessment of the proposed extension to the EGP.

The Commission's final decision on AGL(ACT)'s proposed capex will not be made until it has had an opportunity to consider EP's final report.

93 Per section 8.16(a) of the Code.

Growth related capital expenditure

The Commission notes that capital expenditure on market expansion/system reinforcement represents 97 per cent, 91 per cent and 96 per cent of total capital expenditure on the network in 1996/97, 1997/98 and 1998/99 respectively. Over the Access Arrangement period, capital expenditure for market expansion is around 63 per cent of total capital expenditure.

The Commission has examined AGL(ACT)'s proposed market expansion capital expenditure per new connection in the tariff market. This analysis assesses trends and provides a high level reasonableness check. It calculates the average cost of connection by dividing growth related capex by gross growth in the number of customers. This measure is only an approximation of the costs and does not take into account expenditure relating to load growth for existing customers. The unit rate per new connection will also depend on other factors such as mix of domestic/business connections.

Table 9.6 Market expansion - assessment of average cost per new connection in the tariff market (nominal $m)

	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04
Growth related capex Nominal $m	3.49	3.75	3.59	3.50	3.25	2.96
New connections (gross)	4,588	4,340	4,222	3,986	3,551	3,118
Av growth capex/new connection ($) (gross)	761	865	852	879	915	949

Note: Growth related capex has been worked out based on AGL(ACT)'s unit rates, as assessed in the EP draft report, and the growth values from the August submission. Hence, they are lower than the values presented in table 9.1, which are the April figures.

The average cost per new connection increases steadily over the Access Arrangement period, with the exception of 2000/01. It should be noted that this analysis excludes marketing costs which are, on average, over $1,000 per new connection (see section 10.4.4).

The Commission's final decision on the proposed capital expenditure will not be made until it has had an opportunity to consider EP's final report.

Capital expenditure relating to retail contestability

For this draft decision the Commission has made provision for capital expenditure based on AGL(ACT)'s forecasts. This should not be interpreted as acceptance of AGL(ACT)'s proposed costs.

In its draft report, EP concludes that based on its review 'other' expenditure for 1997/98, it is satisfied with the expenditure classified as 'other'. However, EP is of the view that: [94]

> … the expenditure for "contestability" would be more appropriately included in the Contract Stand Alone System, as it relates more closely to customers with MHQ and MDQ metering.

The Commission will examine this item further.

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94 Ewbank Preece, *Draft Report to IPART on Technical Review of AGL(ACT)'s DORC and Capex for ACT, Queanbeyan and Yarrowlumla,* June 1999, p 72.

9.5.2 Impact of proposed capital expenditure on price path

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

Under the cost of service model, the revenue allowed to cover capital costs (ie depreciation and rate of return) which relate to 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, total revenue allowed under the cost of service model will remain stable or change gradually as a result of the level of capital expenditure. The capital base will also change over time. The issue of rolling forward the capital base is discussed in chapter 7.

Based on AGL(ACT)'s capital expenditure forecast, it is expected that the total revenue requirement will increase by approximately $1.3m ($2.3m if the extension to the EGP is included) by year 5. This is estimated by applying a rate of return of 7.75 per cent to the cumulative capital expenditure and assuming an average economic life of 50 years for new assets.

9.6 Commission's requirement

The Commission will wish to consider EP's final report. However, the Commission notes EP's draft findings on AGL(ACT), which indicate AGL(ACT)'s decision making process for capital expenditure is appropriate. The Commission is seeking further input on various aspects of asset management and capital expenditure planning.

The Commission has examined AGL(ACT)'s assumptions regarding forecast growth and the capital expenditure allowed for new connections. Pending further advice and review, especially in relation to the extension to the EGP, the Commission has used AGL(ACT)'s forecast capital expenditure (both including and excluding the extension to the EGP project) to calculate target revenue for this draft decision. Further justification from AGL(ACT) will be required before the Commission can decide whether the full amount of the capital expenditure should be allowed in its final decision.

Requirement 1 – Capital expenditure

AGL(ACT) is required to provide further information and explanation concerning:

a) the downward revision in the capital expenditure forecasts submitted in August, prior to the new proposal on the Eastern Gas Pipeline connection, compared to the April submission

b) whether the capital expenditure per connection includes or excludes mains costs.

10 OPERATING COSTS (NON CAPITAL COSTS)

10.1 Code requirements

The Code specifies non capital costs in section 8.36 and 8.37:

> 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 (or forecast Non Capital Costs, as relevant) except for any such costs that would not be 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).

10.2 AGL(ACT)'s proposal

AGL(ACT)'s proposed operating costs (net of miscellaneous incomes) are set out in Table 10.1:

Table 10.1 AGL(ACT)'s operating costs (nominal $m)[1]

Year ending June	1998	1999	2000	2001	2002	2003	2004
Marketing	5.1	4.3	4.0	4.0	4.0	3.8	3.7
New customers[2]			0.1	0.2	0.3	0.4	0.5
UAG	0.3	0.1	0.2	0.2	0.2	0.2	0.2
Contestability	-	0.1	0.6	0.7	0.7	0.7	0.7
Government levies	1.1	1.0	1.1	1.2	1.2	1.2	1.2
Other O&M	6.8	5.0	5.8	5.8	5.8	6.0	6.0
Total	**13.3**	**10.4**	**11.8**	**12.1**	**12.3**	**12.3**	**12.4**

Source: AGL(ACT), information provided in September 1999. This differs from that contained in AGL(ACT)'s RAAI and *SAAI for ACT, Queanbeyan and Yarrowlumla Network*.
Note:
1. Figures for 2000 onwards are forecasts.
2. New customers' costs relate to incremental costs associated with the connection of new users.

Overall, nominal non capital costs increase slightly over the course of the Access Arrangement, driven mainly by costs associated with connecting new customers. Many of the network services relevant to AGL(ACT) are provided by AGLGN (AGL's NSW network operator). It is stated that in recent years, AGLGN has been re-engineering its processes in preparation for the new regulatory environment. These improvements have resulted in lower operating costs for all AGLGN's activities. These changes are reflected in reduced operating costs for the AGL(ACT) network.

However, AGLGN states:[95]

> Having fundamentally restructured its business AGLGN see no opportunity for further significant improvements. Nevertheless, it has assumed that AGLGN will achieve costs savings in line with national productivity. National productivity is reflected in movements in the CPI. In this context AGLGN has assumed that its base operating costs will increase in line with CPI.

After achieving cost reductions between 1998 and 2000, AGL(ACT)'s operating costs are expected to increase in nominal terms during the term of the Access Arrangement.

AGL(ACT)'s assessment of efficient costs

As well as presenting operating costs as above, AGL(ACT) has accessed its non capital cost efficiency through key performance indicators (KPIs). To benchmark its efficiency AGL(ACT) has developed two indicators which compare its performance with that of other local distributors and US distributors. The following information has been presented by AGL(ACT):

Table 10.2 Operating cost KPIs over access period

Year ending June	1996	1997	1998	1999	2000	2001	2002	2003	2004
Operating cost									
Nominal ($m)	17.2	14.7	13.1	12.4	12.0	12.5	12.8	12.8	12.8
Real ($m)	17.8	15.2	13.4	12.4	11.7	11.9	11.9	11.6	11.3
Operating cost per customer									
Nominal ($)	307	244	182	163	151	150	148	144	140
Real ($)	319	252	186	163	147	144	137	130	124
Operating cost per km									
Nominal ($'000)	5.1	4.3	3.8	3.4	3.2	3.1	3.1	3.0	2.9
Real ($'000)	5.3	4.5	3.9	3.4	3.1	3.0	2.9	2.7	2.6

Source: AGL(ACT), RAAI for ACT, Queanbeyan and Yarrowlumla Network, 15 February 1999, p 19.
Note: Figures for 1996 and 1997 relate to AGL(ACT) as a bundled service provider. Later figures relate to AGL(ACT)'s network operations only. AGL(ACT) has not updated these numbers to take account of any changes since the RAAI was issued.

Using the same KPIs as above, AGL(ACT)'s performance was also compared to that of other Australian distributors.[96] However, this table compares AGLGN (rather than AGL(ACT)) with other Australian gas distribution operators. The KPIs are adjusted to take into account Victoria's higher market penetration rates and network marketing costs. Some costs (government levies, meter reading and call centre costs) which are not included in the Victorian distributors' numbers, are excluded from AGLGN's operating costs.

AGL(ACT) argues for similar adjustments to be made to its KPIs.[97] It contends that the main reason for its lower penetration levels in the ACT and Queanbeyan compared to similar cool regions in Australia is the very recent development of the gas network. The first supply of gas to ACT customers occurred in 1982. AGL(ACT) states that since then the network has been developed and market penetration continues to increase in line with customers'

95 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 23.
96 Refer to AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, p 25.
97 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, p 25.

replacement cycle for energy consuming appliances. When operating costs per customer are normalised for differences in penetration, AGL(ACT) states that its performance is comparable to that of Stratus.

AGL(ACT) has also argued that during this continuing growth phase, it has had to invest more in marketing than other operators whose markets are more mature. By removing marketing costs from the comparisons, AGL(ACT)'s cost per customer falls from $109 to $86 and is then below GSN, Stratus and Westar.

AGL(ACT) also compares its performance to that of US distributors, using the same performance indicators. Market exchange rates are used to convert AGL(ACT)'s costs into US dollars. To account for exchange rate volatility, AGL(ACT) has used two exchange rates, 62 and 78 US cents per Australian dollar for the benchmarking exercise.

AGL(ACT) compares its performance for 1997/98 against the performance of the US distributors for 1997. It also presents a comparison of the percentage change in the indicators between 1988 and 1997. However, this comparison is done for AGLGN, not AGL(ACT). AGL(ACT) suggests its analysis indicates it is 'in the range of costs where an efficient utility would be expected to fall', and that AGLGN 'is achieving improvements in line with the better US performers'.[98]

10.3 Public submissions

Comments received on operating costs have highlighted concerns regarding the total level of these costs. Submissions comment of the level of some individual cost components, particularly marketing. Marketing costs are estimated to be around $4.5m in 1998/99, 36 per cent of operating costs (based on figures from Table 10.1).

BHPP comments on the level of operating expenditure proposed by AGL(ACT):[99]

> Based on cost per customer AGLACT's proposal exceeds all available local benchmarking including GSN, Multinet, Stratus, Westar, AGC and AGLGN (NSW)…
>
> AGLACT has failed to demonstrate that its non capital costs are costs that would be incurred by a prudent service provider. In the absence of evidence that they are, IPARC must reject above any claim for costs that are greater than the benchmarks set by other gas distributors in Australia. In particular, the claimed marketing costs.

A greater number of submissions was received by IPART in its current review of AGLGN.[100] Although these submissions relate to AGLGN, the general intent of many of those submissions is equally applicable to AGL(ACT). Some of these are produced below.

98 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, pp 27-28.

99 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 6.

100 IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999.

EnergyAustralia comment on the level of AGLGN's costs and its ability to make efficiency gains in the future:[101]

> The assertion by AGLGN that its cost base cannot be reduced further, having exhausted all option, is unsupported. EnergyAustralia believes that the Australian benchmark information supplied by AGLGN indicates that it is a long way from best industry practice and that costs can be further reduced.

Similarly, Kinetic Energy states:[102]

> AGL proposes that its cost base be increased on an annual basis at CPI reflecting the national changes in economic efficiency… It is interesting to note that AGL has higher average costs than Victorian gas utilities and could therefore be considered less efficient, yet is not subject to a more stringent CPI-X regime. The Victorian utilities have X's in their Access Arrangements which are much higher than the 0 proposed by AGL.

Envestra comments that network marketing is an important tool for increasing utilisation of the network, with associated benefits flowing to consumers in the form of lower prices:[103]

> … we consider it essential that genuine activities associated with increasing the utilisation of the network are seen as network costs and to the extent that these are prudent costs, they should be allowed to be recovered through the reference tariffs … Envestra therefore believes its is crucial to the long-term survival and growth of the gas industry that network operators have the capability to increase network utilisation. An essential tool for increasing network utilisation will be Network Marketing. Envestra submits that an effective Network Marketing program will benefit consumers in the longer term by providing lower prices than would be the case otherwise.

10.4 Commission's assessment

Under the requirements of the Code, the Commission may allow only those costs that would 'be 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'. The Commission is required to form a view on total operating costs to be allowed in deriving prices. In forming a view, the Commission may examine individual components of costs. However, the decision by the Commission on costs to be allowed in deriving prices is not a forecast of actual costs likely to be incurred by the utility. Indeed, the Code requires the regulator to examine the prudent costs of an efficient operator rather than actual costs incurred. The decision on costs for deriving prices does not in any way limit the level or composition of costs actually incurred by the utility. Such decisions are a matter for the utility.

It should be noted that the AGL ACT and NSW gas networks are operated as a single business unit by AGLGN. Costs are allocated between the ACT and NSW networks based on an activity based costing system.

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101 EnergyAustralia, *Submission to AGLGN Access Arrangement Review*, 22 March 1999, p 3, in IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, p 158.

102 Kinetic Energy, *Submission to AGLGN Access Arrangement Review*, 19 March 1999, p 2, in IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, p 159.

103 Envestra, *Submission to AGLGN Access Arrangement Review*, 28 April 1999, p 2, in IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, Gas 99-7, October 1999, p 160.

In making its assessment of non capital costs, the Commission has reviewed aspects of AGL(ACT)'s proposed costs and considered the benchmarking work performed by IPART, as presented in its draft decision for AGLGN.[104] The benchmarking work included performance comparisons between Australian and US gas distribution operators. These performance comparisons were done for both partial and global performance indicators.

The Commission has assessed the extent to which AGL(ACT)'s operating cost assumptions meet the tests contemplated by section 8.37 of the Code by considering the following issues:

- Are the individual cost components reasonable / verifiable?
- Are the costs comparable to those for other gas utilities?
- Are the costs reasonable over time?
- Do the costs meet the tests of prudence, efficiency, good industry practice, and lowest sustainable cost?

As the following sections indicate, before a final assessment of operating costs and efficiency can be made, further information through submissions and from AGL(ACT) is required.

10.4.1 Commission's concerns with AGL(ACT) approach

The Commission has several concerns about the performance assessment made by AGL(ACT) and the performance indicators presented. Issues are:

- inconsistent operating costs across jurisdictions
- adjustments for the recent development of the gas network
- removal of marketing costs
- the number of indicators used for benchmarking
- use of market exchange rates instead of purchasing power parity exchange rates to convert AGL(ACT)'s costs into US dollars
- composition of AGL(ACT) in US performance comparisons
- the substantial change in the regulation of gas distribution and the structure of utilities over recent years which may cast doubt on assessing AGL(ACT)'s performance over 1988 to 1997.

Many of these concerns were also raised by IPART in reference to AGLGN in NSW. These key problems are discussed briefly below. Where relevant, IPART's comments from its draft decision are summarised:[105]

- *Inconsistent comparisons* – during the course of the IPART analysis, it became apparent that AGLGN's operating costs included cost components not included by the Victorian distributors. It is reasonable to expect that a similar process was undertaken by AGL(ACT) in compiling its performance comparisons. The Commission has some concerns in regard to the consistency of AGL(ACT)'s performance comparisons.

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104 IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999.

105 See IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, pp 162-165.

IPART also had concerns in relation to the US performance comparisons supplied by AGLGN. In particular, there were inconsistencies in the Federal Energy Regulatory Commission (FERC) codes used to develop operating costs for AGLGN and the US distributors.

- *Adjustments for market maturity* – the Commission does not accept AGL(ACT)'s approach of adjusting the indicators to offset the perceived disadvantage of delivering gas in a relatively 'new' market. The Commission notes that natural gas was introduced to Albury and Wagga Wagga at a similar time as for the ACT, 1977 and 1981 respectively compared to 1982 in the ACT.

  In addition, there are a number of factors that influence the retail demand for gas, for example, population density, climate and the price of gas relative to competing fuels (eg electricity). It is not certain which of these factors exerts most influence on gas penetration and consumption. Nor is it clear that adjusting for one factor results in better indicative results than adjusting for all.

- *Marketing costs* – the removal of marketing costs by AGL(ACT) is not accepted by the Commission. AGL(ACT) is seeking approval of its overall level of expenditure. It is therefore relevant that its performance inclusive of marketing costs be assessed. Indeed, rather than supporting the removal of marketing costs for comparative purposes, analysis net of marketing costs may provide an indication of the level of costs AGL(ACT) may need to remove in order to be comparable to other operators.

- *Number of KPIs* – in comparing its performance to other Australian and US operators, AGL(ACT) has provided information on two performance indicators: operating cost per customer and operating cost per kilometre.

  In order to gain a reasonable understanding of a firm's performance and factors influencing that level of performance, the Commission advocates using a range of indicators. The Commission's approach therefore builds on the information already provided by AGL(ACT), developing additional performance indicators.

- *Purchasing power parity* – purchasing power exchange rates reflect the real purchasing power of a national currency and should be used in preference to market exchange rates.

- *Composition of AGL(ACT)* – in comparing its performance with US operators over the period 1988 to 1997, figures for AGL's entire network (ie both the NSW and ACT sections of its network) were used. However, the Code requires the Commission to assess performance for the relevant utility, which in this case is the network of AGL(ACT). The US performance comparisons supplied by AGL(ACT) cannot be used by the Commission to assess AGL(ACT)'s performance. Clearly the information in the KPIs does not represent the utility whose performance they claim to measure. On this issue, IPART has acknowledged the practical difficulties in mapping FERC data separately for the NSW and ACT networks as they are operated as a single business unit.

10.4.2 Commission's approach and assessment

The concerns discussed above have influenced the Commission's approach to assessing the performance of AGL(ACT). To provide a broader perspective of performance, the Commission has utilised additional performance indicators. The Commission has not focussed on any individual performance indicators to assess AGL(ACT)'s performance. Similarly, the Commission has not relied on any particular technique to assess AGL(ACT)'s performance. Information from partial performance indicators and global techniques such

as data envelopment analysis have been used. In making its assessment, the Commission has considered the analysis carried out by IPART which is relevant to this draft decision.[106]

Commission's assessment

The Commission's performance indicators for local gas distribution are presented in Tables 10.4 and 10.5. Where possible, the Commission has updated IPART's data for AGL(ACT).

Table 10.4 KPIs for local gas distributors, 1998

Company	State	O&M ($m)	Customers/km	O&M/ customer ($)	O&M/ km ($)	Deliveries/ km (TJ)
AGL(ACT)[1]	ACT	11.1	19	171	3,255	1.5
AGL(ACT)[2]	ACT	8.8	22	116	2,589	1.8
AGLGN[1]	NSW	97.1	35	134	4,666	4.9
Envestra[1]	SA	33.6	48	102	4,875	6.7
Envestra[1]	QLD	8.9	37	119	4,350	5.2
Multinet	VIC	45.8	68	78	5,325	10.2
Stratus	VIC	40.8	57	98	5,578	7.8
Westar	VIC	33.7	57	82	4,684	8.7

Source: IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, p 165.
Note:
1. Figures for Envestra (SA) 1998-99, AGLGN, AGL(ACT), and Envestra (Qld) 1997/98.
2. Figures are for 1998/99 as calculated by the Commission.

The information presented suggests that AGL(ACT)'s performance is relatively poor in terms of O&M costs per customer (although there is a marked improvement in 1998/99), deliveries per kilometre of main, and customers per kilometre of main. Hence, an important element in improving the performance of the network may be AGL(ACT)'s ability to increase the volume of gas it transports. AGL(ACT) is relatively efficient according to O&M costs per kilometre of main. To enable meaningful comparisons to be made with the other operators, costs associated with government levies, UAG and customer account expenses have been removed from AGL(ACT).

106 IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, pp 165-168.

Table 10.5 KPIs for local gas distributors, 1998

Company	State	O&M/delivery (TJ) ($)	NM costs/O&M (%)	UAG (%)	Asset life expired (%)[3]
AGL(ACT)[1]	ACT	2,142	46	0.9	23
AGL(ACT)[2]	ACT	1,468	49	-	-
AGLGN[1]	NSW	954	37	2.3	21
Envestra[1]	SA	938	17	4.4[4]	22
Envestra[1]	QLD	2,236	11	13.3[4]	20
Multinet	VIC	782	2	2.0	33
Stratus	VIC	714	12	1.6	28
Westar	VIC	461	2	1.3	31

Source: IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, p 166.
Note:
1. Figures for Envestra (SA) 1998-99, AGLGN, AGL(ACT), and Envestra (Qld) 1997/98.
2. Figures are for 1998/99 as calculated by the Commission.
3. Asset life expired is the ratio of depreciated optimised replacement cost to optimised replacement cost.
4. Envestra UAG is for the 12 months to 31 May 1999.

Table 10.5 reveals that AGL(ACT) performs relatively poorly in terms of operating cost per delivery. Network marketing costs as a percentage of operating cost are relatively high. Its UAG is the lowest of the mentioned operators. This may be explained by the relative age of the network in the ACT. Additional comments on UAG are made in chapter 18.

The Commission is concerned with the level of costs proposed by AGL(ACT). For the majority of indicators, AGL(ACT)'s O&M costs appear high. Moreover, the costs proposed are higher than the current costs of comparable efficient operators in Australia. The Victorian distributors, which currently appear relatively efficient, are pursuing efficiency gains in the order of 25 per cent over the course of their Access Arrangements.

Marketing costs

Previous discussions have focussed on the magnitude of AGL(ACT)'s marketing expenditure. This issue is assessed in more detail in section 10.4.4 below. The information presented in Table 10.6 excludes marketing costs from the calculation of the KPIs. With this level of costs removed, the performance of AGL(ACT) in terms of O&M costs per customer and O&M costs per delivery improves significantly, and is more in line with that achieved by other operators.

This analysis should not be used to support the removal of marketing costs for comparative purposes. It is an indication of the extent of AGL(ACT)'s marketing expenditure relative to other operators (see Table 10.5). Also, it may provide an indication of the level of costs that AGL(ACT) must remove in order to be comparable with other operators. The analysis suggests that the removal of costs in line with AGL(ACT)'s current marketing expenditure will result in the removal of the performance gap between AGL(ACT) and other operators.

Table 10.6 KPIs net of network marketing costs, 1998

Company	State	O&M /customer ($)	O&M /km ($)	O&M /delivery (TJ) ($)
AGL(ACT)[1]	ACT	93	1,760	1,158
AGL(ACT)[2]	ACT	59	1,327	753
AGLGN[1]	NSW	85	2,950	603
Envestra[1]	SA	89	4,222	813
Envestra[1]	QLD	106	3,874	1,988
Multinet	Vic	77	5,220	767
Stratus	Vic	87	4,908	628
Westar	Vic	80	4,578	451

Source: IPART, Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW, Draft Decision, October 1999, p 167.
Note:
1. Figures for Envestra (SA) 1998-99, AGLGN, AGL(ACT), and Envestra (Qld) 1997/98.
2. Figures are for 1998/99 as calculated by the Commission.

AGL(ACT)'s performance compared to US gas distributors

The Commission has revised AGL(ACT)'s US comparisons to address the concerns discussed previously. The Commission's sample includes 51 US distributors.

The Commission's analysis suggests AGL(ACT) ranks 52nd for deliveries per kilometre of main and 16th for UAG. AGL(ACT) ranks 52nd for O&M per delivery. AGL(ACT) ranks 21st for O&M costs per customer and 6th for O&M costs per kilometre of main.

Given the results of the US performance comparisons, the Commission is concerned about AGL(ACT)'s proposed level of costs to be incorporated in prices. Under the Code's requirements, the Commission may allow only for the recovery of costs incurred by a prudent service provider acting efficiently. The results of the partial performance indicator analysis suggest that considerable scope for cost reductions may exist.

In reaching this assessment, the Commission acknowledges limitations in assessing performance using partial performance indicators, in particular the disparity of results that can occur across indicators. Assessment of the weight to be placed on individual indicators requires judgement. To this end, IPART undertook a statistical analysis of the significance of the different possible cost drivers (eg customer numbers, GJ deliveries, length of mains, climate) for 45 gas distribution companies in Australia and the US. This analysis did not support the common perception that kilometres of main is the major cost driver.

On the whole, the indicators point to low utilisation of AGL(ACT)'s network. The relatively cold climate in the ACT assists AGL(ACT) in overcoming barriers to gas connection. However, the historical nature of gas market development (ie the mass laying of mains) is likely to have contributed to the low utilisation. AGL(ACT) may not be able to do much about this in the short term.

10.4.3 Data envelopment analysis

IPART recently released a benchmarking report on Australian gas distributors.[107] For this study, IPART applied data envelopment analysis (DEA) to assess AGLGN's efficiency. This analysis, like the KPI analysis discussed above, compares the performance of Australian operators and US gas distribution operators. AGL(ACT) is included in the DEA comparisons. The Commission has considered the IPART benchmarking report.

DEA is one way of assessing performance. The Commission is aware that in applying such benchmarking techniques, the application of judgement and assumptions is required. Alternative judgements and assumptions could be applied. Further, the Commission is mindful of the data requirements of DEA. It notes that some data problems were encountered in the DEA work.

Generally, such factors may place limits on the applicability of DEA.

The work of IPART is summarised here by the Commission.

The DEA scores are presented in the table below. In principle, these provide a guide to the maximum extent that inputs can be reduced while maintaining existing outputs. A score of 100 per cent indicates that the distributor is technically efficient. A score of 70 indicates that inputs could be reduced by 30 per cent for the same output level. However, the distributors may not be able to achieve the maximum savings indicated. This may be due to regulatory constraints, labour and operational constraints, and the broader environment. The DEA scores reflect some aspects of the broader environment, such as population density and customer mix. The extent of any inefficiency is a combination of managerial efficiency (ie how well a distributor converts inputs into outputs) and the scale or size of the distributor.

Table 10.7 Summary statistics: efficiency of gas distributors (59 observations)

Distributor	Technical efficiency (%) (1)	Managerial efficiency (%) (2)	Scale efficiency (%) (3)=(1)÷(2)
AGL(ACT)	41.6	**67.4**	61.7
AGLGN (NSW)	59.1	**59.2**	99.8
Envestra (SA)	77.3	**81.2**	95.2
Envestra (QLD)	63.8	**98.3**	64.9
Multinet (Vic)	100.0	**100.0**	100.0
Stratus (Vic)	84.8	**86.6**	98.0
Westar (Vic)	96.9	**100.0**	96.9
Allgas (QLD)	59.3	**100.0**	59.3
Aust. Mean	72.9	**86.6**	84.5
Sample mean	73.0	**82.0**	89.9
Minimum	41.6	**47.8**	42.1
Maximum	100	**100**	100
Efficient distributors (no.)	8	**16**	9

Source: IPART, *Benchmarking the Efficiency of Australian Gas Distributors*, Research Paper, December 1999, p 61.

107 IPART, *Benchmarking the Efficiency of Australian Gas Distributors*, Research Paper, December 1999.

Technical efficiency scores indicate the presence and extent of inefficiency of input use. For example, local distributors are on average only 73 per cent efficient. This suggests their inputs need to be reduced by 27 per cent to achieve best practice performance. The average Australian operator's performance is comparable to that for the entire sample of gas companies.

The emphasis of the exercise is on managerial efficiency. The size of each distributor is beyond the control of current management. Local distributors' managerial efficiency ranges from 59.2 per cent to 100 per cent. Most local distributors are relatively efficient compared to the sample mean.

The DEA results support earlier analysis indicating that AGL(ACT) ranks unfavourably when compared to other Australian operators. This suggests that the most efficient costs for AGL(ACT) may be up to 33 per cent below those proposed. The DEA analysis therefore suggests that a lower level of costs should be included in AGL(ACT)'s prices. The Commission wishes to emphasise that a distributor's being 67 per cent efficient does not imply that it can reduce its costs by 33 per cent overnight. However, it would be reasonable to assume that AGL(ACT)'s costs could be reduced at a faster rate than other operators who are relatively efficient.

The analysis also indicates that scale is a significant source of inefficiency for smaller distributors like AGL(ACT), Envestra (QLD) and Allgas.

In carrying out the DEA work, IPART attempted to assess the influence of the broader environment on efficiency. The analysis indicates that environmental factors such as climate and age of the network are not statistically significant factors in determining efficiency. This finding is generally supported through additional analysis using stochastic frontiers, ordinary least squares and cost driver regressions, which examine potential costs drivers of O&M costs. The additional analysis suggests there is little support for placing particular emphasis on O&M costs per kilometre of main as a measure of performance, as AGL(ACT) has done.[108]

The insignificant influence of climate on efficiency may seem counter-intuitive. However, it is not unreasonable for the net benefits of delivering gas in a cold climate to be small. A cold climate increases the demand for gas (through heating), but distributors located in cold regions have to install additional capacity to satisfy peak winter demands.

10.4.4 Marketing costs

The proposed level of marketing costs has been the subject of considerable discussion and criticism in submissions and public hearings. In responding to matters raised in submissions and public hearings, AGL(ACT) has provided further information on its marketing expenditure[109], including a paper developed in conjunction with Andersen Consulting. Key findings of this paper are:[110]

- growth should be pursued as gas distribution assets enjoy economies of scale

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108 IPART has stressed that this aspect of its analysis is a statistical analysis designed to test the proposition about the relative weight to be given to certain cost drivers. It is not designed to model input-output relationships.

109 AGL(ACT), *Response to matters raised in submissions and hearings*, 18 June 1999.

110 AGLGN and Andersen Consulting, *Network marketing expenditure for AGLGN*, May 1999, pp 1-2.

- for gas companies operating in colder climates (such as Victoria), the natural level of demand for gas heating is sufficient to overcome potential connection and appliance cost barriers
- the network operator has a greater incentive to promote gas load than retailers do.

AGL(ACT) states there are important differences between the ACT and Victorian markets (which both have relatively cool climates) that influence gas penetration. The most significant of these are:[111]

- differences in gas cultures at the time of the arrival of natural gas
- the relative maturity of the markets
- the level of competition from electricity.

Gas culture – when natural gas became available in Canberra in 1982, an estimated 15 per cent of households were gas users through bottled LPG. By comparison, when natural gas became available in Melbourne in 1970, two-thirds of Melbourne households were already gas users.

AGL(ACT) argues that greater marketing expenditure was required because it started from a lower level of penetration. However, it could also be argued that where market penetration is relatively high, it is more difficult to connect potential customers. Market growth may be more difficult in this environment.

Market maturity – Victorian markets have higher penetration levels than Canberra. AGL(ACT) states this reflects the overall maturity of the markets. In addition, specific factors have influenced the development and maturity of market segments, particularly hot water and heating:

- the then Gas and Fuel Corporation of Victoria was able to reduce the electric hot water market share because natural gas arrived well before the advent of dual element, mains pressure hot water systems. AGL(ACT) states that the bulk of existing systems would have been low pressure storage systems, subject to running out of hot water, and thus were more easily displaced by natural gas systems. In contrast, dual element mains pressure systems were well established in Canberra when natural gas arrived.
- although there has been strong growth in natural gas heating penetration, it has tended to displace oil. The penetration of electric heating has also risen from pre-natural gas days.

In the case of hot water, there may be factors that inhibit the growth of gas penetration. However, the Commission believes there should be a proper assessment of the effectiveness of marketing expenditure. It is not sufficient to state that significant barriers to penetration exist, and so relatively high marketing expenditure is required. There should be an overall economic benefit from the expenditure.

Competition from electricity – AGL(ACT) states that the rate at which a market is able to develop is influenced by competitive factors acting on the market. It states that there has been a history of robust marketing tactics by the electricity supplier in Canberra as natural gas was introduced progressively. Slowing the growth of a 'gas culture' in the ACT, this has

111 AGL(ACT), *Response to matters raised by Commission and by interested parties*, June 1999, pp 20-21.

necessitated additional marketing and promotions to enhance the attractiveness of connecting to natural gas.

It is the Commission's view that competition within and between fuels will play an important role in encouraging the efficient supply of energy services to customers. Competition may promote marketing expenditure. However, it is still important that such expenditure be justified. In this environment, AGL(ACT) should be working to apply its marketing expenditure in an efficient manner. The expenditure levels should produce net economic benefits to the firm.

Retailer rebate scheme

AGL(ACT) has stated that the retailer rebate scheme is structured to address barriers to connection. A system of rebates on transportation charges, it separates and targets the tariff market in three broad groupings: business, project areas, and residential. Varying rebates are applied between and within these groups. The scheme constitutes over 95 per cent of AGL(ACT)'s total marketing expenditure.

Within the business segment, the rebate scheme differentiates between new connections and growth of existing customers. In both cases, a rebate per GJ on first year load is allowed and a bonus for accurately estimating load is paid. To provide an incentive to connect profitable customers, the retailer's rebate account is subject to an initial negative balance for new connections.

Within project areas, rebates are paid for both residential and business connections. Payments are determined by an initial negative rebate balance (which differentiates between residential and business customers) and a rebate per GJ on first year load.

Within the residential market, the rebate scheme differentiates between new connections and growth of existing customers. The rebate paid for new connections is based on an initial negative rebate balance plus a rebate per GJ for first year load. Rebates for growth and retention of customers are based on the number of new appliances installed and vary with the type of appliance. Rebate rates vary between new and existing houses, and by region. In some cases, rebates as high as $23 per GJ are payable.

Marketing expenditure

AGL(ACT)'s proposed level of marketing expenditure is relatively high. It has been the subject of comments in submissions and the public hearing. The following information on marketing expenditure and total operating and maintenance costs has been supplied by AGL(ACT).

Table 10.8 Marketing expenditure (nominal $m)

Year ending June	1998	1999	2000	2001	2002	2003	2004
Marketing	5.1	4.3	4.0	4.0	4.0	3.8	3.7
O&M costs	13.3	10.4	11.8	12.1	12.3	12.3	12.4
Ratio (%)	38.3	41.3	33.9	33.1	32.5	30.9	29.8

This information suggests that as a proportion of operating costs, marketing expenditure will fall over the course of the Access Arrangement period. However, this scenario does not provide the Commission with an indication of the reasonableness of the expenditure levels. The following table compares AGL(ACT)'s marketing expenditure with that of other Australian distributors. In the analysis, some of AGL(ACT)'s costs have been removed to allow a meaningful comparison to be made with the other operators.[112] Insufficient information was available to remove these costs from the two Envestra distribution networks.

Table 10.9 Network marketing cost comparison, 1998

Company	State	O&M costs ($m)	NM /O&M (%)	NM costs/ customer ($)	NM costs/new customer ($)
AGL(ACT)[1]	ACT	11.1	46	79	1,020
AGL(ACT)[2]	ACT	8.8	49	56	1,069
AGLGN[1]	NSW	97.1	37	49	1,489
Envestra[1]	SA	33.6	17	18	1,450
Envestra[1]	QLD	8.9	11	13	553
Multinet	Vic	45.8	2	2	180
Stratus	Vic	40.8	12	11	377
Westar	Vic	33.7	2	5	210

Source: IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, p 173.
Note:
1. Figures for Envestra (SA) 1998-99, AGLGN, AGL(ACT), and Envestra (Qld) 1997/98.
2. Figures are for 1998/99 as calculated by the Commission.

The information suggests that AGL(ACT)'s marketing costs are significantly higher than those of other operators. Although broader environmental factors may contribute to this outcome, the DEA analysis suggests that climate is not significant in determining efficiency. As a proportion of O&M costs, network marketing costs range from 2 to 17 per cent for operators in other states (excluding the AGLGN NSW operations). These benchmarks suggest that AGL(ACT)'s network marketing costs for 1997/98 should lie between $0.2m and $1.9m, as opposed to the figure of $5.1m.

The Commission's analysis also compares AGL(ACT)'s network marketing costs with those of US operators. For most US distributors, network marketing costs were 2 - 5 per cent of operating and maintenance costs. This implies network marketing costs of between $0.2m and $0.6m for AGL(ACT). If AGL(ACT) achieved a network marketing cost ratio equal to the highest for a US distributor (12 per cent), its network marketing costs would be $1.4m, roughly one quarter of AGL(ACT)'s 1997/98 figure.

112 Costs associated with government levies, UAG and customer account expenses have been removed from AGL(ACT)'s operating costs.

As part of its submission to the AGLGN Access Review, BHPP provided an analysis of network marketing costs.[113] The following table presents BHPP's analysis:

Table 10.10 Marketing cost per GJ of growth

Year ending June	1998	1999	2000	2001	2002	2003	2004
AGLGN (ACT)							
Network marketing ($m)	5.1	4.5	4.3	4.3	4.3	4.0	3.9
Tariff market growth TJ/pa	na	215	206	190	188	182	168
$/GJ of growth	na	20.93	20.87	22.63	22.87	21.98	23.21
AGLGN (NSW)							
Network marketing ($m)	35.7	27.6	28.6	27.7	28.4	28.8	29.1
Tariff market growth TJ/pa	1094	483(1)	1625	1357	1356	1348	1236
$/GJ of growth	32.63	57.14(2)	17.60	20.41	20.94	21.36	23.54
Envestra (SA)							
Network marketing ($m)	na	5.8	5.9	6.1	6.2	6.4	6.5
Tariff market growth TJ/pa	na	Na	100	110	100	90	100
$/GJ of growth	na	Na	59.00	55.45	62.00	71.11	65.00
Calendar year	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Multinet (Vic)							
Network marketing ($m)	0.9	0.8	0.8	0.8	0.9	na	na
Tariff market growth TJ/pa	na	722	669	674	694	na	na
$/GJ of growth	na	1.11	1.20	1.19	1.30	na	na
Stratus (Vic)							
Network marketing ($m)	4.9	4.1	4.1	4.5	4.5	na	na
Tariff market growth TJ/pa	na	975	994	961	1015	na	na
$/GJ of growth	na	4.21	4.12	4.68	4.43	na	na
Westar (Vic)							
Network marketing ($m)	2.1	1.9	1.9	2.0	2.0	na	na
Tariff market growth TJ/pa	na	820	826	832	816	na	na
$/GJ of growth	na	2.32	2.30	2.40	2.45	na	na

Source: BHPP submission on the AGLGN access review in NSW
Note:
1. Tariff growth is 1,483 TJ in 1999 if adjustment is made for the transfer of customers to contract tariffs.
2. The figure is $18.6/TJ if adjustment is made for the transfer of customers to contract tariffs.

As Table 10.10 indicates, costs associated with AGL(ACT)'s marketing expenditure are significantly higher than those associated with the Victorian gas distributors. BHPP comments that best practice marketing budgets are 1-4 $/GJ of tariff market growth.[114]

Assessment of AGL(ACT)'s analysis and justification

AGL(ACT)'s calculation of retailer rebates (which constitute over 95 per cent of marketing expenditure) is based largely on the hypothetical costs of an alternative network marketing strategy. Under this alternative strategy, AGL(ACT) undertakes the marketing role as opposed to its new strategy of channelling marketing efforts through retailers.

113 BHP Petroleum, *Submission to AGLGN Access Arrangement Review*, 24 August 1999, pp 3-4.
114 BHP Petroleum, *Submission to AGLGN Access Arrangement Review*, 24 August 1999, pp 3-4.

AGL(ACT) has provided the Commission with a net present value (NPV) analysis of its marketing expenditure. This analysis is carried out solely for 1999/2000 growth, with the time frame extending for 20 years. The Commission has a number of specific concerns with AGL(ACT)'s NPV analysis:

- the analysis assumes that all additional customers are attributable to marketing expenditure. There is no recognition of growth that would naturally occur in the absence of marketing
- capital expenditure associated with new customers is based on a unit rate per connection. The Commission has not been able to verify these values
- average consumption per new residential customer from 2000 is significantly higher than in the previous year, and increases throughout the analysis period. For the I&C market, average consumption decreases sharply to 2003/2004, before increasing marginally over the remaining analysis period. The Commission has not seen information supporting these pronounced variations in average consumption values.

More generally, the Commission has concerns with the network marketing costs of AGL(ACT) and the analysis presented to justify these costs:

- network marketing costs are a major component of AGL(ACT)'s operating and maintenance costs. The proportion of operating and maintenance costs is significantly above those of most other Australian gas distributors and US operators. It is not clear to the Commission that AGL(ACT) has been able to justify this level of network marketing expenditure
- the key question which remains is the impact of marketing expenditure. Some existing analysis involves many arbitrary assumptions:
  - AGL(ACT) has not provided sufficient evidence to support any relationship between marketing expenditure levels and customer growth. No information is provided on what 'base' growth may be (ie with reduced or zero marketing expenditure), or how marketing expenditure affects growth. No evidence is provided to show that similar growth levels could not be achieved with reduced marketing expenditure, or what growth would be achieved with no marketing expenditure
  - under AGL(ACT)'s approach, rebate levels depend on the costs of an alternative marketing strategy. It is not clear to the Commission that AGL(ACT) has selected a least cost alternative in calculating its expenditure or an alternative that it might reasonably be expected to implement in the absence of the retailer rebate scheme
  - 'efficiency' factors have been applied to the costs of the alternative strategy. The Commission requires information on how the efficiency factors have been derived
- a thorough cost-benefit analysis of the scheme would consider the NPV of other programs that might increase the throughput of gas.

It is important to note that AGL(ACT) is attempting to estimate its marketing costs during a period when fundamental market changes are taking place. However, AGL(ACT)'s estimates are likely to be based largely on experience. Increasing competition and the Eastern Gas Pipeline will fundamentally change the market and provide powerful drivers for growth. Indeed, this may well overwhelm the effects of network marketing. Analysis based on past trends or which does not take this information into account is inadequate.

10.4.5 Corporate overheads

In assessing the level of non capital costs, the Commission has also looked at the level of corporate overheads. The figures for corporate overheads supplied by AGL(ACT) represent costs associated with running AGL's Gas Network Business Unit as a separate entity, and do not represent the cost of services paid to AGL Group.[115] The following table shows the proposed level of AGL(ACT)'s corporate overheads relative to its operating costs over the period of the Access Arrangement.

Table 10.11 AGL(ACT)'s corporate overheads ($m)

Year ending June	1998	1999	2000	2001	2002	2003	2004
Overheads	1.7	1.6	1.6	1.7	1.7	1.7	1.7
O&M	13.1	12.4	12.0	12.5	12.8	12.8	12.8
Ratio (%)	13.0	12.9	13.3	13.6	13.3	13.3	13.3

Source: AGL(ACT), SAAI for ACT, Queanbeyan and Yarrowlumla Network, 22 April 1999, p 3.
Note:
1. The figure for overheads includes only those costs that AGL(ACT) identifies as 'corporate overheads'. It does not include 'support services'.
2. Figures have not been updated for AGL(ACT)'s revised operating cost figure of $10.4m for 1998/99 and other revised figures given to the Commission in September 1999. The Commission has not been supplied with a breakdown of these costs, ie the new level of corporate overheads.

As a proportion of operating costs AGL(ACT)'s corporate overheads are much lower than those of other operators. For Multinet, Westar and Stratus, overheads as a proportion of O&M costs are 20.5 per cent, 29.1 per cent and 27.9 per cent respectively for the calendar year 2000.[116] The note accompanying the table should be kept in mind when comparing AGL(ACT)'s performance. If 'support services' are included in corporate overheads, the proportion of O&M costs would be 25 per cent. This is a similar result to the Victorian suppliers.

10.4.6 Other costs

UAG has been treated as an operating cost by AGL(ACT). The Commission's comments and recommendations on this issue are contained in chapter 18.

AGL(ACT) has stated that government levies comprise contributions to the Gas Act Levy and Energy and Research Development Trust. The Commission considers government levies and charges should be passed through to customers.

AGL(ACT)'s non capital costs include costs associated with tariff market contestability. These costs relate to such activities as customer churn, capacity enquiries, gas balancing, and information technology. Projected by AGL(ACT) to total $600,000 in 1999/2000, these costs rise to $700,000 for the remainder of the Access Arrangement. These costs have been included for the purpose of calculating reference tariffs. They are a provisional allowance based on AGL(ACT)'s estimates and their values have not been approved (refer to section 4.4.2 for additional discussion).

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115 AGL(ACT), *Supplementary Access Arrangement Information for ACT, Queanbeyan and Yarrowlumla Network*, 22 April 1999, p 3.

116 Calculated based on the Victorian Access Arrangement Information for Distribution Pipeline by Multinet, Westar and Stratus – Final as at 30 November 1998.

10.5 Scope for cost reduction

AGL(ACT) notes that in recent years AGLGN has re-engineered its processes, effecting sizeable costs reductions which have been passed on to AGL(ACT). AGL(ACT) states that significant improvements are not attainable in the future.

In determining the costs incurred by a prudent service provider acting efficiently, the Commission has utilised a broad range of performance indicators which apply a number of techniques to assess AGL(ACT)'s current and proposed costs. This analysis has compared the performance of AGL(ACT) with that of Australian and US operators. The analysis indicates that there is, in fact, considerable scope for AGL(ACT) to reduce its costs.

Compared with Australian and US operators, AGL(ACT) generally compares unfavourably on a range of indicators. Under the Code's requirements, the Commission may allow an operator to raise only sufficient revenue to recover the costs incurred by an efficient service provider. Thus there is a need to align AGL(ACT)'s costs with the current costs of efficient operators. In addition, further efficiency improvements should be factored in to match the ongoing improvement in the performance of others, including best practice companies. The Commission acknowledges that the low level of utilisation of AGL(ACT)'s network is likely to influence its relative performance.

AGL(ACT)'s network marketing costs are very high compared with those of other operators. The Commission has not found any justification for the level of expenditure. However, it is not the Commission's role to mandate how much AGL(ACT) may spend on marketing.

The Commission has based its cost reduction target for AGL(ACT) on:

- cost reduction targets being pursued by other (relatively efficient) operators
- AGL(ACT)'s performance relative to other Australian and US operators
- the scope for reductions in marketing expenditure.

The Commission believes that AGL(ACT) can achieve productivity growth in line with industry trends. This calls for improvements of around 3 per cent per annum.[117] However, the analysis presented in sections 10.4.2 to 10.4.4 indicates that AGL(ACT) performs relatively poorly compared with other operators. Under section 8.37 of the Code, the level of non capital costs recovered through a reference tariff must be consistent with costs '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'. Thus, there is a requirement that AGL(ACT) pursue additional efficiency gains.

The Commission believes that in balancing these factors, the derivation of prices should be based on a reduction in controllable costs to 30 per cent below AGL(ACT)'s current controllable operating costs. For these purposes, the Commission has defined controllable costs as total non capital costs less government levies, UAG and contestability costs.

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117 Based on IPART's research of industry studies, see IPART, *Benchmarking the Efficiency of Australian Gas Distributors*, Research Paper, December 1999.

The calculation of the cost reduction will be adjusted for growth, with an equal weighting (50 per cent each) applied to volume load growth and customer growth. The Commission favours this approach rather than using only one measure for two main reasons:

- measuring cost reductions in terms of $/GJ encourages the connection of relatively higher use, profitable customers
- IPART's data suggests that customer numbers is a key cost driver.

The Commission proposes that the 30 per cent reduction in controllable costs be phased in over the five year course of the Access Arrangement to 2003/2004. A phased approach is favoured to allow reasonable time for change to be implemented.

The following table shows the basis for the Commission's operating cost calculations and the overall result of these decisions over the period of the Access Arrangement. This is compared to AGL(ACT)'s proposal.

Table 10.12 Amended operating costs (1999/2000 $m)

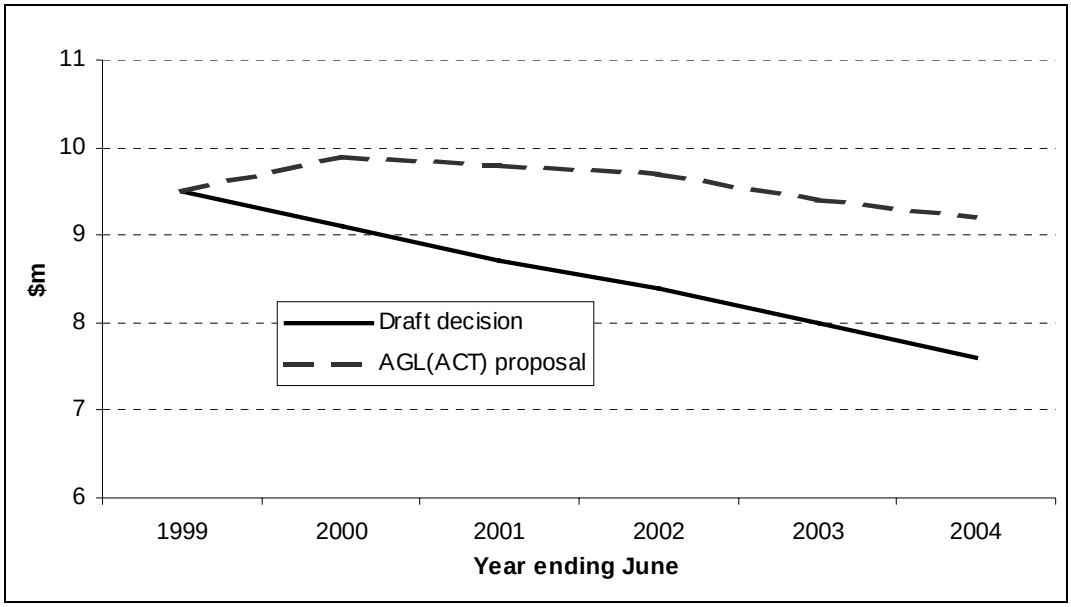
Year ending June	1999 (Actual)	2000	2001	2002	2003	2004	Cumulative %
Assumptions[1]							
Load growth (%)	6.7	0.6	2.5	2.3	2.1	1.9	
Customer growth (%)	5.6	4.6	4.3	3.8	3.1	2.5	
Draft decision[2]							
Load growth (%)		0.3	1.2	1.2	1.1	0.9	4.7
Customer growth (%)		2.3	2.2	1.9	1.6	1.3	9.5
Controllable unit target (%)		-6.9	-6.9	-6.9	-6.9	-6.9	-30.0
Real controllable opex ($m)	**9.5**	**9.1**	**8.7**	**8.4**	**8.0**	**7.6**	**-19.7**
AGL(ACT) proposal ($m)	**9.5**	**9.9**	**9.8**	**9.7**	**9.4**	**9.2**	**-3.2**
Other costs ($m)							
Real uncontrollable opex ($m)	1.2	1.9	2.0	2.0	2.0	2.0	
Allowed opex (real $m)	**10.7**	**11.0**	**10.7**	**10.4**	**10.0**	**9.6**	**-9.8**
AGL(ACT) proposal	**10.7**	**11.8**	**11.8**	**11.7**	**11.4**	**11.2**	**5.1**

1: Figures are subject to the Commission's final decision on growth.
2: These figures include the 50 per cent weighting.

The Commission's draft decision results in a cumulative real decrease in total operating costs of 9.8 per cent over five years to 2003/2004. This compares to AGL(ACT)'s proposal of a real increase of 5.1 per cent.

The following figure compares the real controllable operating costs under the Commission's decision and AGL(ACT)'s proposal.

Figure 10.1 Real controllable operating cost



10.6 Commission's draft decision

After considering the requirements of the Code and the analysis of AGL(ACT)'s proposed operating costs, the Commission has decided to amend AGL(ACT)'s non capital cost forecast as follows:

- require that cost efficiencies of 30 per cent be applied to controllable costs for the period of the Access Arrangement, with the decrease to be phased in over the five year course of the Access Arrangement
- allow growth in operating costs with an equal 50 per cent weighting to be applied to both volume load growth and customer growth.

Amendment 7 – Non capital costs

AGL(ACT) is required to amend its non capital cost (operating cost) forecast to:

a) allow for a cost reduction of 30 per cent in controllable costs, phased in over the five year course of the Access Arrangement (ie 1999/2000 to 2003/2004). Controllable non capital costs are: operation and maintenance, marketing and overheads, and exclude government levies, unaccounted for gas and costs associated with retail contestability

b) allow for growth with an equal 50 per cent weighting applied to both volume load growth and customer growth

c) the allowed controllable costs and the Commission's provisional allowance for non controllable costs (ie government levies and new costs associated with retail contestability) plus UAG are:

Forecast non capital costs – real 1999/2000 $m

Year ending June	**2000**	**2001**	**2002**	**2003**	**2004**
Controllable costs	9.1	8.7	8.4	8.0	7.6
Other	1.9	2.0	2.0	2.0	2.0
Total	11.0	10.7	10.4	10.0	9.6

Subject to Commission's final decision on growth forecasts.

11 FORM OF REGULATION AND TOTAL REVENUE

11.1 Code requirements

Section 8.3 of the Code provides for the form of regulation, stating that a reference tariff may be designed on the basis of a price path approach, a cost of services approach, or variations and combinations of these approaches.

Relevant provisions for the determination of total revenue are sections 8.4-8.9 of the Code. Chapters 4-10 of this report present the Commission's consideration of key components underlying the determination of AGL(ACT)'s total revenue. Sections 8.44 to 8.46 of the Code provide guidance on the use of incentive mechanisms.

11.2 AGL(ACT)'s proposal

AGL(ACT) proposes adopting a price path approach to the determination of reference tariffs: [118]

> Prices will vary as a function of actual CPI and will follow the price paths shown. The projected revenue paths are based on an assumption of 2.5% in all years, and volume as estimated.
>
> The reference tariffs price paths which are specified in 2.10 above are based on assumptions about costs and throughputs achieved in each of those years, creating an incentive to reduce costs by increasing efficiency and to increase throughput. In the event that AGL(ACT) is able to exceed the earnings proposed because of lower costs or higher throughput, it will retain them. Equally in the event that revenues are below those proposed or costs greater it will not have the ability to recover shortfalls or under-recoveries from the assumed amounts.

AGL(ACT)'s proposed price paths for contract and tariff customers are as follows:

Table 11.1 AGL(ACT)'s original price path proposal (January 1999)

Nominal $m	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04
Revenue path						
Contract market	2.3	2.5	2.5	2.5	2.6	2.6
Tariff market	33.4	34.6	36.5	38.3	40.2	42.0
Contract price path		CPI - 1	CPI - 1	CPI - 1	CPI - 1	CPI - 1
Tariff price path		CPI - 1	CPI -1	CPI -1	CPI - 1	CPI - 1
EBIT/funds employed (%)		6.8	7.1	7.6	8.1	8.5

Source: AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 17.

Note: In September 1999, AGL(ACT) submitted minor adjustments to its proposed tariff revenue path due to revised tariff growth forecasts.

11.3 Public submissions

There were no direct comments on the form of regulation that should be applied to AGL(ACT).

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118 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 18.

11.4 Commission's consideration of form of regulation

The price path approach is, in effect, a forecast average price. Individual prices are calculated from costs attributed to different services / customers or classes of customers using a cost of service methodology.

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

CPI-X regulation sets a cap on the change in average prices or revenues relative to the CPI. The strength of this approach is the incentive it gives utilities to pursue efficiencies which may eventually result in long term price reductions. The Commission believes that the utility itself is best placed to set prices. The Commission favours an approach which provides a degree of flexibility for the regulated utility to determine its own pricing structure within a cap on overall revenues or average prices.

The Commission does not formally accept or reject AGL(ACT)'s proposal to use price cap regulation in the form of CPI-X. Rather, the Commission has adopted a cost of service approach, the results of which are expressed in the form of CPI-X. The price cap is expressed as average price per GJ. This approach, like CPI-X regulation, provides:

- *Incentives for efficiency* The use of a CPI-X approach ensures that if the service provider is able to achieve lower cost outcomes while maintaining service standards, it may retain the benefits over the regulatory period.
- *Incentives to grow the market* The use of a price cap encourages the service provider to increase load growth in the contract market and to expand the volume market. 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.

Under the CPI-X price cap regulation, risks will be borne as follows:

- the capital base and prices will be linked to inflation and the risk of inflation will be borne by customers
- the risk of cost over-runs, both operating and capital, will be borne by AGL(ACT). However, any out-performance efficiency gains will be retained by AGL(ACT), at least over this Access Arrangement period
- the risks of increases / decreases in volume transported (relative to assumed growth) will be borne by AGL(ACT).

11.4.2 Establishing the reference tariffs in year 1, subsequent indexation, and variation

The relevant issues are:

- inflation assumptions incorporated in the financial modelling
- whether regulated prices should be expressed in real or nominal terms
- whether indexation should be based on the ACT or national CPI
- whether prices should be varied over the Access Arrangement other than for CPI
- what is an effective date for price changes during the Access Arrangement period.

Real vs nominal prices

The Commission prefers to express total revenue and reference tariffs in real terms excluding the effect of inflation. This allows customers to see price changes in real terms over the Access Arrangement period and to compare them with today's prices.

Total revenue will be determined in real terms in each year of the Access Arrangement period. On the basis of total revenue, AGL(ACT) will determine and express reference tariffs for both contract and tariff customers in real terms each year, consistent with average price movements under the draft decision.

CPI indexation

In light of the development of a national energy market for gas and electricity, the Commission considers that the national CPI, rather than the Sydney CPI should be used. This will ensure consistency across jurisdictions in future price changes. Accordingly, the Access Arrangement for AGL(ACT) should incorporate the use of the national consumer price index (all groups, weighted average of eight capital cities) as published by the Australian Bureau of Statistics (ABS).

For the purpose of adjusting the reference tariffs, the CPI is exclusive of GST. The following definition is to be used:

> "**CPI (Ex -GST)**" means the consumer price index, All Groups index number weighted average of eight capital cities (a classification employed and published by the Australian Bureau of Statistics), exclusive of the net effect across those eight capital cities of:
>
> (a) the 'GST' (as that expression is defined in *A New Tax System (Goods and Services Tax) Act 1999*) ; and
>
> (b) changes to any other Commonwealth, State or Territory taxes or charges, consequent upon the introduction of the GST,
>
> (the "Index"),
>
> as calculated and published by the Australian Bureau of Statistics from time to time, or if the Australian Bureau of Statistics does not, or ceases to calculate and publish the Index then CPI (Ex-GST) will mean:
>
> (c) an index published by Commonwealth Treasury which is its best estimate of the Index; or
>
> (d) if Commonwealth Treasury does not, or ceases to publish an index then an index published by the Reserve Bank of Australia which is its best estimate of the Index; or
>
> (e) if the Reserve Bank of Australia does not, or ceases to publish an index, then at the Relevant Regulator's discretion, either:
>
> (i) an index published by a person appointed by the Relevant Regulator which is that persons best estimate of the Index; or
>
> (ii) an index published by the Relevant Regulator that is its best estimate of the Index.

Other variations associated with changes to government taxes and levies

Apart from annual indexation of reference tariffs during the Access Arrangement period, AGL(ACT)'s Access Arrangement should provide for variations in reference tariffs reflecting any change in the level of any new government or statutory fee or tax (eg GST, authorisation fees) subject to:

- AGL(ACT)'s making application to the relevant regulator
- the relevant regulator's having the discretion to appoint an independent auditor to ascertain the impact on reference tariffs before approving a change in reference tariffs in accordance with the independent auditor's advice.

The required amendment on varying the reference tariffs is discussed in chapter 15.

Effective date for price changes during the Access Arrangement period

AGL(ACT)'s proposed Access Arrangement runs for five years from 1 July 1999 to 30 June 2004 with price changes to occur on 1 July each year.

In assessing Access Arrangements for GSN and AGC, IPART suggested that service agreements should cover a full year including the peak winter load. Before making its final decision, the Commission will consider whether it is practical for prices to change midwinter on 1 July.

The financial modelling and implementation of AGL(ACT)'s Access Arrangement is complicated by the fact that it was not possible to complete the review by 1 July 1999. The Commission does not consider that it is possible to apply the reference tariffs in the Access Arrangement retrospectively. Furthermore, there is uncertainty as to whether the Code permits the Commission to consider prices and revenues prior to the commencement of the Access Arrangement.

The Commission proposes to:

1. model financial projections and reference prices for the first year of the Access Arrangement as if it applied from 1 July 1999
2. implement the Access Arrangement and prices calculated under (1) following the final approval.

Given current progress, the Commission anticipates AGL(ACT)'s Access Arrangement period will be approximately four years, from July 2000 to June 2004.

11.5 Commission's assessment of AGL(ACT)'s proposed revenue and price paths

In assessing AGL(ACT)'s proposed price and revenue paths, the Commission has considered the requirements of the Code regarding:

- allocation of revenue (costs) between services (section 8.38-8.41)
- allocation of revenue (costs) between users (section 8.42).

Chapter 14 presents the Commission's assessment of AGL(ACT)'s proposed cost allocation methodology.

The Commission's assessment of the revenue paths for the contract and tariff markets is presented below. The Commission's analysis shows that the price/revenue paths under this draft decision are consistent with its assessment of cost allocation between services and customer groups.

In considering the revenue and price paths, the Commission has considered the characteristics of contract and tariff markets in the ACT. As shown in Table 11.2, the contract market in ACT is small compared to the tariff market.

Table 11.2 Statistics: tariff vs contract market

	Tariff	Contract	% tariff	% contract
1999 DORC (SAC)	240.4	11.5	95	5
1997/98 Opex (SAC)	11.3	1.7	87	13
1997/98 revenue	30.7	1.6	95	5
1998/99 revenue	33.4	2.3	94	6
1998/99 volume	5,010	1,000	83	17
1998/99 customer no	76,009	41	99.9	0.1
1998 MDQ (GJ)	41,205	5,679	87.9	12.1

Note: 1997/98 and 1998/99 revenues are sourced from AGL(ACT)'s financial model and pricing model.

11.5.1 Contract market revenue

In the absence of submissions and evidence concerning the need for different price caps to be applied to the contract market, the Commission has decided to adopt the same price cap for the contract and tariff markets.

Under the total revenue determined by the Commission, there will be an immediate real price reduction of 11 per cent in year 1. Real average price will decrease by a further 6 per cent per annum during the period 2000/01 to 2003/04.[119]

11.5.2 Tariff revenue analysis

The delivered price of natural gas to tariff customers served by AGL(ACT) in the ACT is not directly subject to price cap regulation. However, as required under the Conditions for the Reticulation of Gas in the ACT, established on 17 December 1992, tariffs charged for gas supplied to tariff customers using comparable amounts of gas were to be identical to the lower of the tariffs charged by AGL Sydney Limited in metropolitan Sydney or by City of Goulburn Gas and Coke Company Limited in the City of Queanbeyan.[120] The price

119 This scenario is applicable to AGL(ACT)'s capital expenditure proposal excluding the EGP project. Including capital expenditure associated with connection to the EGP, the analysis results in an immediate real price reduction of 10 per cent in year 1, followed by real price falls of 5 per cent for each remaining year of the Access Arrangement.

120 Condition 14 of the Conditions for the Reticulation of Gas in the ACT.

constraints imply that the current price control formula for AGL's delivered gas price in NSW indirectly applies to AGL(ACT).

It can be argued that AGL(ACT)'s distribution charges for tariff customers are implicitly regulated through the current price control formula in NSW.

Under AGL(ACT)'s proposal, a price cap of CPI-1 per cent will be applied to the network cost component. This is slightly lower than the CPI-1.5 per cent implicit in the price control formula in NSW. Total network revenue increases by $7.3m (22 per cent) in the tariff market by 2003/04, driven by assumed nominal price increases, overall volume load growth (11 per cent) and an increase in customer numbers (20 per cent).

AGL(ACT) has achieved consistently strong growth in its tariff market. The Commission's analysis suggests that there is no firm evidence of under-recovery of depreciation/historical return in the tariff market. The Commission is of the view that current network prices for tariff customers incorporate above normal profits in historical cost terms.

AGL(ACT) forecasts growth in the tariff market, but at a declining rate. In its RAAI, AGL(ACT) predicts that the tariff market will continue to grow at an average of around 3 per cent per annum during 2000-2004. The Commission considers that the benefit of further growth should be passed on to tariff customers. On this basis, the Commission has decided that the average price reduction should be at least equal to the average growth rate of 3 per cent per annum.

Draft decision

Having considered all these factors and its decision on the determinants of total revenue, the Commission considers AGL(ACT)'s proposed CPI-1 price cap for the tariff market does not represent a fair outcome for tariff customers. AGL(ACT)'s proposed network prices to tariff customers are not cost reflective. The Commission has decided that to achieve cost reflectivity there should be a price reduction in the reference tariffs in year 1. Prices for years 2-4 should continue to fall to pass through the benefit of growth to customers and efficiency improvement. The price cap will vary depending on the Commission's decision on AGL(ACT)'s capex proposal for the EGP (Table 11.3). The Commission considers this is a more balanced outcome for tariff customers.

Table 11.3 Draft decision: tariff price path

	1999/2000	2000/01	2001/02	2002/03	2003/04
Excluding EGP capex	CPI-11	CPI-6	CPI-6	CPI-6	CPI-6
Including EGP capex	CPI-10	CPI-5	CPI-5	CPI-5	CPI-5

11.6 Commission's assessment of the total revenue requirement

Under the cost of service model, the Commission has determined AGL(ACT)'s total revenue to cover:

- AGL(ACT)'s forecast operating costs, adjusted for the efficiency improvement and allowing for growth
- a rate of return of 7.75 per cent (real, pre tax) on the capital base. The initial capital base has been set at $170m at 1 July 1999 after considering a number of asset valuation methodologies, historical depreciation and returns analysis, and the requirements of the Code (see chapter 6)
- depreciation of the regulatory capital base
- a nominal return on net working capital.

Table 11.4 provides a breakdown of the total cost of service allowed for AGL(ACT). Table 11.5 presents the revenue and price paths allowed for AGL(ACT). The Commission has yet to decide on AGL(ACT)'s new capex proposal to connect to the Eastern Gas Pipeline (EGP). For the draft decision, the Commission has decided to show alternative revenue outcomes with and without the EGP capex.

Table 11.4 Break down of total cost of services and revenue allowed for AGL(ACT) (real 1999/2000 $m)

	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	NPV
Draft decision							
Excluding EGP capex							
Cost of services							
Return on av capital base	18.6	13.3	13.4	13.5	13.5	13.4	
Depreciation	7.4	5.3	5.4	5.5	5.6	5.6	
Return on working capital	-	0.6	0.6	0.6	0.6	0.6	
Operating costs	10.7	11.0	10.7	10.4	10.0	9.6	
Total	36.6	30.3	30.2	30.0	29.6	29.2	**99**
Including EGP capex							
Cost of services							
Return on av capital base	18.6	13.5	14.1	14.4	14.3	14.3	
Depreciation	7.4	5.3	5.6	5.9	5.9	6.0	
Return on working capital	-	0.6	0.6	0.6	0.6	0.6	
Operating costs	10.7	11.0	10.7	10.4	10.0	9.6	
Total	36.6	30.5	31.0	31.2	30.8	30.4	**103**
AGL(ACT)'s proposal							
Return on av capital base	18.6	17.4	17.9	18.7	19.4	20.0	
Depreciation	7.4	7.7	7.8	7.9	7.9	8.0	
Return on working capital	-	-	-	-	-	-	
Operating costs	10.7	11.8	11.8	11.7	11.4	11.2	
Total	36.6	36.9	37.5	38.2	38.7	39.2	**128**

Note: The NPV is for the 4 years 2000-2004 calculated using a real discount rate of 7.75 per cent. Inflation of 2.5 per cent is assumed in translating AGL(ACT)'s proposed nominal figures into real 1999/2000 figures. Due to rounding, total figures may not add up.

As discussed in section 11.5, the price and revenue paths for the contract and tariff revenue are:

Table 11.5 Revenue and price paths allowed for AGL(ACT) (real 1999/2000 $m)

	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	NPV[1]
Draft decision							
Excluding EGP capex							
Contract revenue	2.4	2.2	2.1	2.0	1.8	1.7	
Tariff revenue	34.2	30.3	29.4	28.4	27.4	26.3	
Total revenue	**36.6**	**32.5**	**31.4**	**30.3**	**29.2**	**28.1**	**99**
Real average price $/GJ							
Contract	2.36	2.10	1.97	1.85	1.74	1.64	
Tariff	6.83	6.08	5.72	5.37	5.05	4.75	
Total	6.09	5.38	5.08	4.79	4.52	4.26	
Real price change							
Contract		-11.0%	-6.0%	-6.0%	-6.0%	-6.0%	
Tariff		-11.0%	-6.0%	-6.0%	-6.0%	-6.0%	
Including EGP capex							
Contract revenue	2.4	2.3	2.1	2.0	1.9	1.8	
Tariff revenue	34.2	30.6	30.0	29.3	28.6	27.8	
Total revenue	**36.6**	**32.9**	**32.1**	**31.3**	**30.5**	**29.6**	**103**
Real average price $/GJ							
Contract	2.36	2.12	2.02	1.91	1.82	1.73	
Tariff	6.83	6.15	5.84	5.55	5.27	5.01	
Total	6.09	5.44	5.19	4.95	4.71	4.49	
Real price change							
Contract		-10.0%	-5.0%	-5.0%	-5.0%	-5.0%	
Tariff		-10.0%	-5.0%	-5.0%	-5.0%	-5.0%	
Comparison: AGL(ACT) proposal [2]							
Contract revenue	2.4	2.5	2.4	2.4	2.4	2.3	
Tariff revenue	34.2	34.4	35.1	35.8	36.4	36.9	
Total revenue	36.6	36.9	37.6	38.2	38.8	39.2	**128**
Real price change							
Contract		-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	
Tariff		-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	

Notes:
1. The NPV is for the five years 1999-2004 calculated using a real discount rate of 7.75 per cent.
2. Inflation of 2.5 per cent is assumed in translating AGL(ACT)'s proposed nominal figures into real 1999/2000 figures.
3. The total figure may not add up, due to rounding.

Under the Commission's draft decision, network revenue will fall by 19.1 per cent (in real terms) between 1998/99 and 2003/04 if the EGP is included in the derivation of total revenue. During this period, average prices will fall at an annual average rate of 5.9 per cent per annum. If the EGP is excluded, average prices will fall at an annual average rate of 6.9 per cent per annum.

The Commission's consideration of AGL(ACT)'s total revenue involves analysing its financial viability and considering the rate of return, along with the composition, level and funding of expenditure. In reaching its draft decision on the determinants of the cost of services and revenue paths for AGL(ACT), the Commission has assessed the financial impact of the draft decision on AGL(ACT).

11.6.1 Financial indicator analysis

Sections 8.6 and 8.7 of the Code state:

> 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 under section 8.4 that is most consistent with the objectives contained in section 8.1.
>
> If the Relevant Regulator has considered financial and operational performance indicators for the purposes of section 8.6, it must identify the indicators and provide an explanation of how they have been taken into account.

The Commission has considered the various accounting measures and cashflow based financial ratios commonly used by credit rating agencies.[121]

The Commission considers that the draft decision should allow AGL(ACT) to receive a return on investment equal to the cost of capital. In addition, the draft decision should allow AGL(ACT) to maintain an adequate level and trend in its key financial indicators. The projected outcomes should be consistent with maintaining an investment grade credit rating. They should provide AGL(ACT) with the capacity to finance necessary capital investment in the debt markets. The Commission understands that market practitioners have emphasised the trend of financial indicators rather than the level of any particular indicator in a particular year.

Rating agencies commonly assess an organisation's financial capacity and ability to service debt by using ratios including:

- funds flow interest cover - to assess ability to service debt
- net cashflow / capital expenditure - to assess internal financing capacity
- funds from operation / net debt - to assess ability to repay debt.

[121] The Commission has used a financial model developed by KPMG to consider financial projections and impacts on AGL(ACT) under alternative cost and revenue scenarios.

Ratios and related ratings provided by Standard & Poors (S&P) for gas distributors are:

Table 11.6 S&P ratio guidelines for gas distributors (1995)

Indicator and business risk	AA	A	BBB	BB
Pre tax interest coverage (x)				
Above average	3.75	3.00	2.00	1.50
Average	4.25	3.75	2.75	2.00
Below average	-	4.25	3.25	2.25
Total debt/total capital (%)				
Above average	46	51	58	64
Average	41	46	53	59
Below average	-	42	49	55
Funds from operations/interest coverage (x)				
Above average	4.25	3.50	2.50	2.00
Average	4.75	4.25	3.25	2.25
Below average	-	4.75	3.75	2.50
Funds from operation/total debt (%)				
Above average	27	20	15	12
Average	33	26	20	14
Below average	-	32	27	18
Net cashflow/capital expenditure (%)				
Above average	95	75	50	35
Average	115	90	65	45
Below average	-	100	75	55

Source: S&P Corporate Finance Criteria.
Note: These ratios were last published in 1995.

S&P has published the financial ratio medians for energy utilities including overseas utilities. The S&P financial medians are available on three indicators only. The Commission notes that OFGEM, the UK regulator for gas and energy markets considered these median ratios to arrive at its set of benchmark ratios (Table 11.7).

Table 11.7 Ranges for financial indicators used by OFGEM and OFWAT vs S&P financial medians

Indicator	OFGEM	OFWAT	S&P financial medians for transmission and distribution companies [1]	
			A	BBB
EBIT interest coverage	Min 1.5x	Min 2x		
EBITDA interest coverage	Min 2.25x	Min 3x		
FFO interest coverage	Min 2 x	Min 2x	3.25	2.0
FFO to total debt(%)	Min 12	na	15	10
Gearing D/(D+E)(%)	Max 65	45-55	55	65
Debt payback period	na	5 yr (EBITDA basis) 7 yr (EBDA)		

Source: OFGEM Draft Proposals - Distribution Price Control Review.
Note:
1. S&P published these ratios in October 1997 and September 1998 in the Global Utilities Credit Review.

These more recent ratios are consistent with those shown in Table 11.6, but appear to imply ranges for 'above average' business risk category (ie less risky) at the same rating as A and BBB. In using the 'average' ranges to analyse financial projections for AGL(ACT), the Commission has adopted a conservative approach.

The Commission has assessed the adequacy of the allowed revenue in terms of AGL(ACT)'s financial performance and cashflow requirements. The financial indicators under this draft decision are shown in Table 11.8. It should be emphasised that this analysis is based on the modelling of AGL(ACT)'s regulatory accounts, rather than the projected financial accounts for financial reporting.

Table 11.8 Draft decision on AGL(ACT)'s total revenue – financial indicators analysis for price regulatory purposes

	1999/2000	2000/04
Fund flow adequacy(%)	90	130
Funds flow interest cover (x)	8.1	9.7
	AA	AA
Funds from operation/total debt(%)	35	42
	AA	AA
Internal financing(%)	84	165
	BBB	AA

Source: IPART's financial modelling.

Notes: In establishing this financial model, a number of assumptions were made by the Commission, including:

1. an inflation forecast of 2.5 per cent per annum.
2. a tax rate of 36 per cent.
3. a dividend payout ratio of 70 per cent.
4. actual debt level per AGL(ACT)'s proforma financial statement for the network business.
5. expenditure forecasts and revenue as per this draft decision including capex on EGP connection.

Table 11.8 shows that the ratios meet the minimum ratios adopted by OFGEM. The analysis suggests that AGL(ACT) will be able to maintain a satisfactory credit rating for its borrowings equivalent to an investment grade rating. It is expected that under the draft decision, AGL(ACT) will have an adequate cashflow to fund part of its capital expenditure and to pay a dividend to its shareholders. The Commission has considered longer term financial forecasts for AGL(ACT) beyond 2004. All the credit rating ratios show an improvement over future regulatory periods.

11.7 Commission's draft decision

The Commission is not satisfied that AGL(ACT)'s proposed revenue and price paths are consistent with the principles and objectives contained in section 8 of the Code. The Commission requires AGL(ACT) to resubmit price and revenue paths consistent with the Commission's draft decision.

Under the Commission's draft decision:

- AGL(ACT) is to adopt a price path approach whereby the reference tariffs are pre-determined over the Access Arrangement period to follow a path forecast to deliver a revenue stream consistent with the principles set in the Code. The allowed revenue will be allocated between the contract and volume markets. AGL(ACT) will have a degree of flexibility in structuring the reference tariffs for these two market segments.

- The Commission's decision on total revenue is expressed in the form of CPI-X average price regulation ($/GJ). This provides incentives for AGL(ACT) to be efficient, innovative, and to reduce the overall cost of services. If AGL(ACT) reduces its operating costs below the level allowed, or achieves capital efficiency while maintaining safe and reliable operation of the network, it will be able to retain the additional profits which will accrue over this Access Arrangement period.
- AGL(ACT) is to retain any additional revenue that results from demand or volume of sales being higher than its forecast (the Commission will consider the use of a benefit sharing mechanism in its final decision). This provides an incentive for AGL(ACT) to grow its market and develop new services.
- Only prudent new investments are to be rolled into the regulatory capital base.
- There are no formal arrangements for monitoring AGL(ACT)'s capital and operating expenditure. The Commission considers there is merit in implementing reporting arrangements for both capital and operating expenditures.
- An effective price cap of CPI-X% per annum will apply to AGL(ACT)'s contract and tariff reference price as follows:

	1999/2000	2000/01	2001/02	2002/03	2003/04
Excluding EGP connection capex	CPI-11	CPI-6	CPI-6	CPI-6	CPI-6
Including EGP connection capex	CPI-10	CPI-5	CPI-5	CPI-5	CPI-5

Note: EGP = Eastern Gas Pipeline.

Amendment 8 – Price and revenue caps

a) AGL(ACT) is required to submit reference tariffs which, if applied over the whole year 1999/2000 and subsequent years to 2003/04, must be consistent with total revenue as follows:

Revenue path in real 1999/2000 $m [(1)]

	1999/2000	2000/01	2001/02	2002/03	2003/04
Contract revenue	2.2	2.1	2.0	1.8	1.7
Tariff revenue	30.3	29.4	28.4	27.4	26.3
Total	32.5	31.4	30.3	29.2	28.1

Note:
1. Subject to the Commission's final decision on new facilities investment on connecting to the Eastern Gas Pipeline (EGP). The revenue paths shown in this table exclude capex on connection to the EGP.

b) within this revenue cap, AGL(ACT) is required to establish reference tariffs in each of the years, 1999/2000 to 2003/04, expressed in real 1999/2000 dollars. The reference tariffs will be adjusted by the change in CPI (EX-GST) over the year to March quarter immediately preceding the start of the relevant financial year. CPI (EX-GST) is defined as follows:

"**CPI (Ex -GST)**" means the consumer price index, All Groups index number weighted average of eight capital cities (a classification employed and published by the Australian Bureau of Statistics), exclusive of the net effect across those eight capital cities of:

(a) the 'GST' (as that expression is defined in *A New Tax System (Goods and Services Tax) Act 1999*) ; and

(b) changes to any other Commonwealth, State or Territory taxes or charges, consequent upon the introduction of the GST,

(the "Index"),

as calculated and published by the Australian Bureau of Statistics from time to time, or if the Australian Bureau of Statistics does not, or ceases to calculate and publish the Index then CPI (Ex-GST) will mean:

(c) an index published by Commonwealth Treasury which is its best estimate of the Index; or

(d) if Commonwealth Treasury does not, or ceases to publish an index then an index published by the Reserve Bank of Australia which is its best estimate of the Index; or

(e) if the Reserve Bank of Australia does not, or ceases to publish an index, then at the Relevant Regulator's discretion, either:
  (i) an index published by a person appointed by the Relevant Regulator which is that persons best estimate of the Index; or
  (ii) an index published by the Relevant Regulator that is its best estimate of the Index.

c) reference prices must apply from 1 July 2004 or two weeks after the final approval of AGL(ACT)'s revised Access Arrangement, whichever is the latter.

PART IV

REFERENCE TARIFFS AND COST ALLOCATION

12 SERVICES POLICY

12.1 Code requirements

Section 3.1 of the Code requires that an Access Arrangement include a services policy listing the service or services to be offered. Section 3.2 requires the services policy to comply with the following principles:

> (a) The Access Arrangement must include a description of one or more Services that the Service Provider will make available to Users or Prospective Users, including:
> (i) one or more Services that are likely to be sought by a significant part of the market; and
> (ii) any Service or Services which in the Relevant Regulator's opinion should be included in the Services Policy.
>
> (b) 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.
>
> (c) To the extent practicable and reasonable, a Service Provider must provide a separate Tariff for an element of a Service if this is requested by a User or Prospective User.

12.2 AGL(ACT) proposal

AGL(ACT)'s service policy comprises a negotiated service and five reference services for:

- capacity reservation
- managed capacity
- throughput
- multiple delivery point
- tariff (customers withdrawing less than 10TJ per year).

The services are:

Negotiated service an agreement negotiated to meet users' needs which differ from those specified in the reference services.

Capacity reservation service a transport service from the receipt point to a single non-tariff delivery point with charges determined on the basis of capacity reserved ($/GJ of MDQ). Overrun charges are payable.[122] Where new equipment is commissioned or daily metering has not been installed at the commencement of a service agreement, the user may increase the MDQ reserved within the first three months. The increased MDQ will be deemed to take effect from the commencement of the service agreement.

[122] Overrun charges apply when a user withdraws more than its reserved capacity on any day. Overruns may be authorised or unauthorised. The proposed charges are equal to the daily usage charge for capacity where the overrun has been authorised. A 50 per cent premium on the daily usage charge is proposed where the overrun is unauthorised. As the number of overruns increases, the penalty for overruns increases.

Managed capacity service a transport service from the receipt point to a single non-tariff delivery point with charges determined on the basis of capacity reserved. No overrun penalties apply. However, the MDQ must be equal to or greater than the maximum quantity of gas withdrawn at the delivery point on any day in the previous 12 months.

Throughput service a transport service from the receipt point to a single non-tariff delivery point with charges determined on the basis of $ per GJ of throughput. No overrun charges are payable. A minimum bill applies, based on 10 TJ per annum.

Multiple delivery point service a transport service from the receipt point to a number of non-tariff delivery points. Charges are based on the relevant service at each delivery point.

Tariff service a transport service from the receipt point to one or more tariff delivery points with charges determined on the basis of throughput.

Availability of reference services

All reference services are available to delivery points existing on the network as at 1 July 1999. Capacity reservation, managed capacity and throughput service are available to new delivery points served from facilities where the maximum allowable operating pressure is less than or equal to 1,050kPa. The tariff service is available to new delivery points served from facilities where the maximum allowable operating pressure is less than or equal to 500kPa.

12.3 Public submissions

The Commission received a number of submissions concerning AGL(ACT)'s services policy. In addition, at the public hearing on 11 May 1999 and pricing forum on 22 September 1999, several presenters expressed concerns regarding AGL(ACT)'s proposed reference services. These concerns are largely in regard to the following:

- capacity reservation service
- throughput service
- lack of sufficient flexibility
- competitive advantage from particular services
- additional services.

12.3.1 Capacity reservation service

In relation to the capacity reservation service, numerous submissions have commented that as recipients of gas, users are interested in buying gas, not in reserving sections of pipeline. They argue that the requirement to book MDQ forces end users to reserve pipeline capacity for a period of time that does not match their demands or plant performance. In particular, most users in the ACT exhibit a winter peak demand profile associated with extra heating costs in the cooler months. Users oppose MDQ requirements which lock them into high MDQ costs for a full 12 month period.[123]

[123] Australian Institute of Sport, *Submission to AGL(ACT) Access Arrangement Review*, 22 October 1999, p 1, and BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 12.

12.3.2 Throughput service

BHPP commented that the only way users can deal with the inflexibilities associated with booking an MDQ level for 12 months is to use the throughput service. BHPP notes that if all contract users were to choose this service, greater revenue would be earned by AGL(ACT), tariffs associated with the throughput service are, on average, higher than those under MDQ based charging.[124]

12.3.3 Lack of sufficient flexibility

It has been claimed by users that AGL(ACT)'s Access Arrangement proposal does not offer sufficient flexibility to users, particular in relation to MDQ bookings. During the course of IPART's review in NSW, claims were made that the lack of flexibility in reference services has led to reduced production and staffing levels in some firms. Small manufacturing plants have been particularly affected as the following example demonstrates: [125]

> The concept of a pricing structure based on hourly and daily limitations is a disincentive to small and medium businesses like ours. The negative effect of overrun penalties could be deterrent to taking on additional work. Conversely making provision for MDQ's that are not required can be even more damaging. It seems that for a service industry like ours the uncertainty of demand renders MDQ and MHQ prediction akin to a gamble.

12.3.4 Competitive advantage

ACTEW comments that retailers may be able to gain a competitive advantage over other retailers based on which reference service they use, the retailer's risk management skills, and the nature of the end users:[126]

> ACTEW notes that the price options available to retailers may create the potential for competitive advantage in network charges. AGL have identified options for a capacity reservation service and a throughput service. The capacity reservation service would appear to be at a lower cost because it involves a penalty charge for non-compliance with the declared capacity, whereas the throughput service charge includes an up-front payment for load variability. This approach may inadvertently give a competitive advantage to some retailers in terms of the risks taken with network charges. If the retailer is willing to take a demand forecast risk, then the network charge will be lower … ACTEW would be concerned if some retailers were in a better position to manage this risk, either by way of pre-existing gas retail load which would smooth the peaks and troughs, or better knowledge of historical customer usage patterns and behaviour.

12.3.5 Additional services

Some submissions suggest that an additional service which recognises new receipt points needs to be offered by AGL(ACT). These submissions consider this service as particularly relevant given the construction of the Eastern Gas Pipeline. Concern has been expressed that if these services are not specified as reference services in the Access Arrangement, long and protracted negotiation will result, to the detriment of effective competition in the ACT.

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124 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 12.

125 All Paint Powder Coaters, *Submission to AGLGN Access Arrangement Review*, 16 March 1999.

126 ACTEW, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 3.

Esso comments:[127]

> Uncertainty surrounding reference service pricing both prior to and subsequent to the EGP's connection forms an unnecessary barrier to competition. The pricing principles should, as a minimum include:
>
> (i) the method for determining reduced throughput and MDQ charges for customers who do not use complete network sections as currently defined in the draft access arrangement, and
>
> (ii) the impact, if any, on prices for existing services.
>
> The principle should state that any loss of revenue which results from a reduction in the use of a different part of the network due to competitive pipelines or distribution systems cannot be recouped by increasing the charges for the use of other parts of the AGL(ACT) network.

12.4 Commission's assessment

The Commission welcomes the range of services proposed by AGL(ACT). However, the Commission has explored options for additional services. Only a few submissions from stakeholders other than AGL(ACT) have been received. Nonetheless, these submissions have helped the Commission to identify potential additional services. In particular, these submissions have called for the addition of a reference service which recognises different receipt points. The Commission has noted issues raised in other reviews in relation to potential additional services. These options are discussed in the following sections.

In assessing the merits of including the range of additional services sought by the various submissions, the Commission has applied the criteria contained within sections 3.1 and 3.2 of the Code. The inclusion of any of these additional services would necessitate an amendment to the Access Arrangement proposed by AGL(ACT).

12.4.1 EGP and alternative pricing structures

AGL(ACT) recently submitted to the Commission an additional capex proposal to connect the ACT system to the Eastern Gas Pipeline (EGP). This connection would be between Duntroon in the ACT and Hoskinstown in NSW, through which the EGP passes. AGL(ACT) states that this connection would ensure supply to the ACT for the 2000 winter and thereafter.[128]

In its submission to the review, Esso emphasises the importance of defining the principles of a service which accommodated new receipt points. This would facilitate the entry of competitive source gas into the ACT network.

Esso states that the EGP will be in a position to commence supply into the ACT soon after the Access Arrangement takes effect. One of its suggestions is for the Access Arrangement to include a method of determining reduced throughput and MDQ charges for customers which do not use complete network sections as currently defined.

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127 Esso, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 2.

128 AGL(ACT) also looked at other alternatives to ensure supply, such as augmentation of the EAPL lateral. AGL(ACT)'s original capex proposal contained in its AAI and RAAI does not include any expenditure associated with ensuring supply as discussed here.

Similar comments have also been received from BHPP, which states that at the moment the Access Arrangement does not acknowledge that interconnection is a service which a significant portion of the market may want. BHPP also states that there is a reasonable possibility that an interconnection may be made from the Eastern Gas Pipeline.[129]

AGL(ACT) is proposing to treat the distribution system as a single zone, with all contract customers of the ACT system paying the same local network unit charge. The local network charge for the ACT relates to all assets required for the contract market downstream of the pressure reduction station.[130] Under such a proposal, users would pay the same price regardless of their receipt point, and hence regardless of the assets they may use.

A reference service meeting the concerns of Esso and BHPP may be achieved in a number of ways. The Commission has considered the following additional reference services:

- interconnection
- partial use of assets.

Interconnection reference service

An interconnection reference service may be used to recognise where a user's gas is connected to the AGL(ACT) system. When interconnection with the EGP is operational, users will be able to get their gas from either the EAPL pipeline (receipt point Watson) or the EGP (receipt point Duntroon).

A pricing proposal recognising different receipt points for connection to the AGL(ACT) system may at first glance appear to be similar to the revised trunk pricing proposal presented by AGLGN in NSW.[131] Its proposal recognises that gas may be delivered into the trunk system at different points, and users should be required to pay for only those parts of the trunk which they actually use.

However, the Commission notes that a key difference between the AGLGN proposal and any proposed interconnection service in the ACT is that the AGLGN proposal relates to the trunk system. The trunk system is essentially a single pipeline. With different receipt points on the trunk, it is relatively easy to separate the trunk into different zones, with a separate price applying to each zone as AGLGN has done. Identifying which zone gas is received and which zone gas is delivered (ie leaves the trunk system) is a relatively straightforward process.

However, such an approach is not as feasible for the ACT as the receipt points are connections into the high pressure system, not a trunk transportation service.

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129 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 11.

130 A pressure reduction charge applicable to the pressure reduction station at Watson ($21.747/GJ MDQ in 99/00). The charge for MDQ is comprised of the pressure reduction charge and the local network charge ($408.078/GJ MDQ in 99/00).

131 See IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, Gas 99-7, October 1999, pp 201-203.

Partial use of assets

Another option for recognising new receipt points may be partial use of assets service. Esso's and BHPP's arguments are essentially that a different level of assets (reduced) may be used to transport gas from receipt point to delivery point, and that this should be recognised in prices.

There may be a number of approaches to developing a pricing structure that recognises partial use of assets, depending on whether that use came about through bypass or not.

Partial use of assets – no bypass

The EAPL lateral connects into the ACT system at Watson, which is in the north of the ACT. The EGP connection is proposed to connect into the ACT system at Duntroon, which is approximately in the centre of the AGL(ACT) gas network. A simple approach may be to have a 'northern' price zone (ie associated with a gas receipt point at Watson and use of those assets in the 'northern' zone) and a 'southern' price zone (ie associated with a gas receipt point at Duntroon and use of those assets in the 'southern' zone).

A separate price would then be adopted for each of the zones, and users would pay a tariff associated with the assets they utilised. Users would either pay a 'northern' tariff, a 'southern' tariff or the sum of both tariffs if the receipt point and delivery point were in different zones.

Esso's and BHPP's comments raise the issue of the appropriateness of a single pricing zone for the ACT. Both are saying that users should be charged for the assets they use, and that price averaging as implied by AGL(ACT)'s proposal is not appropriate.

To implement price averaging, AGL(ACT) would be required to separate out assets and costs for each of the zones. The Commission notes that under the AGLGN proposal for NSW, there are local network charges based on the postcode in which the user resides. The local networks are Sydney, Newcastle, Wollongong and Country. The Sydney, Newcastle and Wollongong local networks each contains a number of postcodes.

Given the small size of the ACT network and the nature of its customers, the Commission questions the practicality of breaking down charges into smaller regions within that network. For the AGL(ACT) network, it is possible that the administrative costs of implementing such a pricing proposal would outweigh any economic benefits arising from the separation.

If the Commission required AGL(ACT) to provide varying prices depending on a user's receiving point, and AGL(ACT) constructed an interconnection, the Commission might effectively be penalising AGL(ACT) for what could be a necessary and commercially sound investment decision.[132] AGL(ACT) has stated that the proposed interconnection is necessary for security of supply reasons. By requiring varying prices, the Commission may impose extra administrative costs on AGL(ACT) where it has made an appropriate investment decision. The Commission is of the view that AGL(ACT) should not be penalised for such an undertaking.

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[132] The Commission would like to stress at this point that no decision has been made on the prudence of AGL(ACT)'s proposed capital extension to the Eastern Gas Pipeline. The comments here are of a general nature only.

Partial use of assets – bypass

A more important scenario arises where a new receiving point is created through bypass. In its draft decision IPART requires AGLGN to provide a reference service for the partial use of assets. This requirement was made in response to comments in submissions that there are opportunities for bypass which may not connect to the trunk system.

If bypass occurred on AGL(ACT)'s network, the user would still be liable for the single local network charge proposed by AGL(ACT). Under the current proposal the user would effectively be charged as if it was connected to the existing EAPL-ACT connection point at Watson.

Bypass of monopoly networks should not normally be viable. If it is, it raises questions about the efficiency of the reference services available. Unlike the AGLGN review, the Commission has received no submissions stating that bypass opportunities are currently being considered.

This situation makes it difficult for the Commission to require AGL(ACT) to provide a partial use of assets service. However, if bypass was to occur, it would raise concerns in regard to the appropriateness of existing reference services. In such a situation, a user who had bypassed part of the network should not be required to pay a price consistent with the single local network charge.

The Commission requires AGL(ACT) to present information on the appropriateness of a reference service for the partial use of assets. The Commission also invites comments from other stakeholders.

12.4.2 Summer tranches

The Commission has considered the appropriateness of AGL(ACT)'s providing a summer tranche service. In response to calls from submissions for additional flexibility for seasonal contract customers, in its draft decision, IPART required AGLGN to include a summer tranche based on a submission / proposal from AGLGN. This service allows users who experience a peak load in the summer months to book a summer tranche of capacity. A shorter term is allowed for transportation service between the months of October and April.

Given the relatively cold ACT climate and winter peak demand requirements, the system will exhibit excess capacity in summer. AGL(ACT)'s assets are sized to cater for system peak (winter) and fixed long term assets are required to meet this. Thus, as was the case for NSW, an argument exists for customers who exhibit a summer peak demand profile to be able to access a service that allows them to book a summer tranche of demand.

However, the Commission has not received any submissions from users requesting such a service. Examination of AGL(ACT)'s contract customers indicates that they are predominantly commercial and government buildings, hospitals, education facilities and hotels. These users do not exhibit a summer peak demand profile.

Under these circumstances it would not be appropriate to require AGL(ACT) to offer a summer tranche service. The Commission requests information from AGL(ACT) on the need for such a service in the ACT. Comments from other stakeholders are invited.

12.4.3 Short term requirements – small and medium users

Following calls for such a service in NSW, the Commission has looked at the option of AGL(ACT)'s providing a reference service which meets the short term requirements of users. In reaching its draft decision on AGLGN, IPART heard claims that the lack of flexibility in reference services had led to reduced production and staffing levels in some firms. Small manufacturer plants have been affected particularly.

The Commission has considered the information from the AGLGN review and the nature of the market served by AGL(ACT). The Commission considers that it does not have sufficient information to require AGL(ACT) to offer a service to meet the short term requirements of small and medium users. The Commission requests information from AGL(ACT) on the need for such a service in the ACT. Comments from other stakeholders are invited.

12.5 Commission's requirement

Requirement 2 – Services policy

AGL(ACT) is required to present information on the appropriateness of:

a) a partial use of assets reference service

b) a summer tranche reference service

c) a short term requirements reference service for small and medium users.

13 AGL(ACT)'S PROPOSED REFERENCE TARIFFS AND COST ALLOCATION

13.1 Code requirements

Sections 3.3 to 3.5 of the Code detail the requirements of an Access Arrangement in relation to reference tariffs and reference tariff policy. Section 3.3 of the Code requires, amongst other things, an Access Arrangement to include a reference tariff for at least one service that is likely to be sought by a significant part of the market.

Section 8.1 of the Code outlines the objectives of a reference tariff and reference tariff policy (see chapter 1). Sections 8.38-8.41 of the Code cover the allocation of revenue (costs) between services, and section 8.42 covers the allocation of revenue (costs) between users.

13.2 AGL(ACT)'s proposed reference tariff policy

In section 4 of its Access Arrangement, AGL(ACT) includes a reference tariff policy[133] which:

- outlines a description of principles, including its adoption of a price path approach and the determination of prices for particular market segments
- states that AGL(ACT) may undertake new facilities investment that does not satisfy the requirements of the Code for inclusion in the capital base
- sets out fixed principles providing for actual new facilities investment to be included at the commencement of the subsequent Access Arrangement period and redundant capital to be removed from the capital base
- sets out incentive mechanisms.

13.3 AGL(ACT)'s proposed reference tariffs

AGL(ACT)'s 1999 proposed Access Arrangement contains reference tariffs for five reference services:

- capacity reservation
- managed capacity reservation
- multiple delivery point
- throughput
- tariff.

The reference services are discussed in chapter 12. Four of the five apply to contract market customers. The exception is the tariff service, which applies to tariff market customers only. The focus of this chapter is AGL(ACT)'s proposed reference tariffs and the derivation applicable to its reference services.

133 AGL(ACT), *Access Arrangement for ACT, Queanbeyan and Yarrowlumla Network*, 5 January 1999, p 26.

13.3.1 General charges: capacity reservation and managed capacity service

The general charges applicable to AGL(ACT)'s capacity reservation service and managed capacity service are:

- charge for maximum daily quantity (MDQ)
- meter reading charge
- overrun charge (applicable to the capacity reservation service only).

Charge for MDQ

The charge for MDQ is the annual unit charge (AUC) for capacity, multiplied by a customer's reserved MDQ. The AUC is the total of the pressure reduction unit charge plus the local network unit charge.[134]

Proposed to be $21.747 / GJ of contract MDQ, the pressure reduction charge is to be escalated annually. The pressure reduction charges (in nominal terms) are detailed in the table below:

Table 13.1 AGL(ACT)'s proposed pressure reduction charges ($/GJ of MDQ per annum)

Year ending June	Charge
2000	21.747
2001	22.254
2002	22.590
2003	23.672
2004	24.026

Source: AGL(ACT), Access Arrangement, p 18 and AAI, p 32.

In relation to local network charges, AGL(ACT) proposes a single (postcode) local network charge be applied to all users. Such an approach implies a degree of price averaging. Local network charges for contract customers are based on their MDQ reservation. AGL(ACT)'s local network charges are escalated by the same formula as for the pressure reduction charge. The local network unit charge for 1999 / 2000 is $408.078 / GJ of contract MDQ.

Meter reading charges

Meter reading charges are to be charged per device. The charge is based on assets and operating costs associated with the meter reading devices. The nominal charge is proposed to start at $1,703 for the year ending 30 June 2000, reducing to $1,509 over the period of the Access Arrangement.

Overrun charges

Users who exceed the MDQ reservation stipulated in the capacity reservation service incur overrun charges.[135] Overrun charges apply to each unit of overrun on the day. The charge will be the daily capacity charge for authorised overruns, plus the daily capacity charge

134 AGL(ACT), *Access Arrangement for ACT, Queanbeyan and Yarrowlumla Network*, p 18.

135 Unless the overrun is authorised by AGL(ACT).

multiplied by 1.5 for unauthorised overruns. If more than nine overruns occur in a year, the charge increases.

AGL(ACT) has proposed that overruns be measured against the maximum hourly quantity (MHQ) nominated by the user. Although no charges will be incurred based on MHQ, AGL(ACT) has indicated that the end user will be liable for any damage caused as a result of any overrun of MHQ.

13.3.2 General charges: multiple delivery point service

The general charges applicable for the multiple delivery point service are as per the capacity reservation service and/or the managed capacity reservation service. They depend on the service nominated for each delivery point.

13.3.3 General charges: throughput service

AGL(ACT) has proposed that two general charges apply to the throughput service: a throughput charge and a meter reading charge.

The throughput charge is to be based on the volume of GJs transported. A charge of $4.012/GJ of throughput is proposed for 1999/2000. The meter reading charge applicable to the capacity reservation and managed capacity services also applies to the throughput service. The charge is to be subject to annual escalation during the Access Arrangement period.

13.3.4 Capped prices

AGL(ACT) has proposed that prices applying to individual end users be subject to a cap. Capped customer prices have been set so that they will not exceed reasonable relativity with tariff customers. The cap recognises that the application of full cost reflectivity would result in some customers attracting such high transportation tariffs, that continued use of gas would be prohibitive. The shortfall in revenue that results from these customers paying less than they would if they were to pay the reference tariff, is reallocated to the reference tariffs of remaining customers.[136]

Customers in AGL(ACT)'s proposal have been capped based on volume usage for the previous 12 months and their estimated MDQ booking. The equivalent MDQ charge is calculated by multiplying the capped rate (in $/GJ) by the annual load and dividing by the MDQ. The charge is then adjusted for the metering charge as the capped rate is inclusive of the metering charge.

AGL(ACT)'s proposal assumes that customers will be capped/recapped at the anniversary of the transportation agreement (when the MDQ can be reset). The cap may be reassessed when the retailer chooses, once during the term of the agreement. AGL(ACT) has provided that the change in transportation charges due to capping will be applied forward and will not be retrospective.

136 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 33.

Capping levels for 1999/2000 are shown in Table 13.2.

Table 13.2 AGL(ACT)'s proposed capped prices ($/GJ)

Contract customer class	Capped price
Customers using less than 20 TJ	3.825
Customers using between 20 and 50 TJ	3.57
Customers using greater than 50 TJ	3.06

Source: AGL(ACT), Presentation at Pricing Forum, Canberra, 22 September 1999.

AGL(ACT) has proposed that capped prices be escalated by 80 per cent of the CPI on 1 July each year. The CPI has been estimated by AGL(ACT) to be 2.5 per cent. The capped prices applied by AGL(ACT) are aligned with those of AGLGN in NSW.

13.3.5 General charges: tariff service

AGL(ACT) propose that the tariff service be available to any delivery point where customers are expected to withdraw less than 10TJ of gas per year. Where maximum hourly quantity (MHQ) is expected to exceed $6m^3$ per hour, customers will be required to specify a level of MHQ that fairly reflects the maximum hourly requirement at the delivery point.[137]

The tariff proposes is a single, multiple block tariff comprising fixed and throughput charges to be escalated annually. AGL(ACT) proposes that throughput charges for the tariff service in 1999/2000 be as follows:

Table 13.3 AGL(ACT)'s proposed throughput charges for the tariff service

Block size (GJ per month)	Block size (GJ Per Qtr)	$/GJ
First 1.25	First 3.75	7.754
Next 1.5	Next 4.5	5.539
Next 5.75	Next 17.25	5.891
Next 75	Next 225	6.123
Next 333.5	Next 1000.5	5.035
All additional	All additional	3.525

The fixed charge for the tariff service for 1999/2000 is $5.35 per month or $16.11 per quarter ($64.45 per annum).

AGL(ACT) indicates that the aim of the tariff schedule is to have a single transport tariff applicable to all tariff customers. The structure has been designed to arrive at a price for customers which relates to usage level and does not require knowledge of the customer appliance and usage profile which is now the role of gas suppliers.

137 AGL(ACT), *Access Arrangement for ACT, Queanbeyan and Yarrowlumla Network*, 5 January 1999, p 12.

13.4 AGL(ACT)'s cost allocation proposal

AGL(ACT) determines its revenue requirement by looking at the cost of serving the total market. The market is split into two distinct groups: the contract market, and the tariff market. The contract market generally utilises only the high pressure pipelines. The tariff market shares the high pressure pipelines with the contract market, but uses the medium and low pressure pipelines more extensively.

13.4.1 Cost allocation between markets

AGL(ACT) has proposed / attempted to allocate costs to the contract market based on the stand alone cost of serving the contract market. The residual has been allocated to the tariff market. To determine the stand alone cost of serving the contract market, AGL(ACT) has considered a hypothetical system built to serve the contract market only. Return, depreciation and operating costs are based on the hypothetical stand alone system. AGL(ACT) has estimated this cost to be $3.5m based on ORC, and $3.0m based on DORC (in nominal terms).

Despite these estimates of the cost of serving the contract market on a stand alone basis, AGL(ACT) has chosen to allocate only $2.5m to the contract market. AGL(ACT) justifies this reduced allocation (relative to the stand alone ORC and DORC estimates) on the basis that it minimises price shocks to the contract market.

The following table shows the allocation:

Table 13.4 AGL(ACT)'s proposed allocation of costs/revenues between markets (nominal $m)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total revenue	37.1	39.0	40.8	42.8	44.6
Contract market revenue	2.5	2.5	2.5	2.6	2.6
Tariff market revenue	34.6	36.5	38.3	40.2	42.0

13.4.2 Allocation of revenue within the contract market

Costs allocated to the contract market are to be covered by the charges applicable to the capacity reservation services and metering charges. These charges have been derived by taking the costs allocated to the contract market and further allocating them to asset groups of the stand alone contract market system. Asset groups have been broken into trunk receiving station facilities, local network pipelines, and meter reading assets.

Although AGL(ACT) also offers a throughput service, no costs have been allocated to this service. When allocating costs, AGL(ACT) assumes that all customers will use capacity reservation services. A customer is likely to choose the throughput service only if this service provides it with a net financial benefit. Therefore, when a customer chooses this service, revenue received is likely to be less than the revenue which might otherwise have been received from the capacity reservation service.

Allocation of capital costs

The capital cost of each asset group has been allocated based on the optimised replacement cost (ORC) of the stand alone cost of the assets in each group. The cost allocation model isolates the meter reading assets in the meter reading asset group, and includes the metering assets in the local network asset groups.

The following table shows AGL(ACT)'s proposed asset groups and the proportion of capital costs allocated to those assets:

Table 13.5 AGL(ACT) proposed asset groups and capital cost allocation

Asset groups	Description	Cost allocation model (%)
TRS	Pressure reduction stations.	4.2
Local network	Includes primary, secondary and MP/LP mains, secondary regulators, meter and services.	
HP		88.5
LP		3.9
Meters and services		2.5
Meter reading devices	Meter reading devices in the ACT	0.8
Total		**100.0**

Note: Due to rounding, the total figure may not add up to 100.

Allocation of operating costs

Operating costs of the stand alone contract market system have been estimated at $1.8m. This amount was calculated by identifying all the activities (42) required to operate the hypothetical stand alone contract market system. AGL(ACT) has estimated the cost of each of those activities. Total system operating costs have been allocated to the asset groups by either:

- type of operating activity, where activities related to specific assets, or
- a proportion of optimised replacement cost where the costs are shared (eg overheads).

Total system operating costs have been allocated to markets and assets based on 43 operating activities. These were recorded against pipe size and asset location. The following table provides the allocation of total operating costs by market and asset:

Table 13.6 AGL(ACT)'s proposed total operating cost allocation by market and assets

Market	%	$'000
Contract	3.5	459
Tariff	96.5	12,561
Total	100.0	13,020
Assets		
TRS	0.5	
Local network		
HP	11.4	
MP	82.1	
Meters and services	4.1	
Meter reading devices	2.0	
Total	**100.0**	

Note: Due to rounding, the total figure may not add up to 100.

The allocation of stand alone operating costs to assets is shown in the following table. Two figures are shown for each asset group. The first does not include the allocation of overheads. The second figure distributes overheads based on the allocators calculated by AGL(ACT). These are based on the assets share of ORC.

Table 13.7 AGL(ACT)'s proposed allocation of contract stand alone operating costs (%)

	Excluding overheads	Including overheads
TRS	2.7	5.2
Local network		
HP	31.2	83.3
MP	1.1	3.4
Meters and services	5.5	6.9
Meter reading devices	0.7	1.2
Overheads	58.9	-
Total	**100.0**	**100.0**

Note: Due to rounding, the total figure may not add up to 100.

Total cost allocation

The following table shows the allocation of asset and operating costs under AGL(ACT)'s proposal:

Table 13.8 Contract market – allocation of total costs to asset groups, $'000

Asset groups	AGL(ACT) asset cost allocation from model	AGL(ACT) operating cost allocation from model	AGL(ACT) revenue allocation from model
TRS	27	95	122
Local network			
HP	575	1,525	2,100
MP	25	62	88
Meters and services	16	127	144
Meter reading devices	5	21	27
Total	**649**	**1,831**	**2,480**

Note: Due to rounding, the total figure may not add up.

13.4.3 Allocation of costs to the contract market charges

Once the costs attributed to the contract market have been allocated to asset groups, charges are determined by dividing those costs by the maximum demand served by each asset group. AGL(ACT) proposes three types of charge based on the revenue allocated to asset groups:

- pressure reduction stations
- local network
- meter reading.

Pressure reduction charges

Pressure reduction charges (PRCs) have been derived by taking the costs allocated to the trunk asset group and dividing them by the reserved MDQ. The MDQ used as an allocator is the MDQ assumed by AGL(ACT) to be booked by contract customers.

Local network charge

The local network capacity charge is derived by taking the revenue allocated to local network assets and dividing it by the MDQ of all contract customers within that network. Revenue has been allocated to the local network based on the assets used in serving the market. These assets are contained in the model used to generate the stand alone contract system. This model contains pipe size and length estimations as well as meter and TRS requirements. The unit costs are those used for Newcastle as presented by JP Kenny for 1996, and adjusted to 1999 values.[138] The Commission is led to assume that the unit rates derived for Newcastle are a good approximation for those of the ACT. The final EP report will comment on the appropriateness of using Newcastle unit rates. AGL(ACT) has not provided information supporting such an assumption.

138 JP Kenny, *Natural Gas Distribution Networks of New South Wales Asset Valuation 1 July 1996*, June 1996.

Meter reading charges

Meter reading charges are derived by taking the revenue allocated to the meter reading devices and dividing it by the number of meter reading devices throughout AGL(ACT)'s distribution network.

13.4.4 Other charges

In addition to the charges covering the costs of providing transportation service to the contract market, AGL(ACT) has proposed that users be liable for overrun charges.

The overrun charge is designed to provide an incentive to users to reserve an appropriate level of capacity. When a user consumes more than the reserved capacity, these charges are to apply. An estimation of the revenue collected through overrun charges has been removed from the derivation of capacity and meter reading charges. Overrun revenue has been estimated to be $20,000 in year 1 of the Access Arrangement, reducing to $10,000 in Year 2, and $2,000 in each of years 3,4 and 5.

The following table shows revenue to be collected through charges to contract customers.

Table 13.9 AGL(ACT)'s proposed contract revenue allocation to charges (nominal $'000)

Charge	Year 1	Year 2	Year 3	Year 4	Year 5
Capacity	2,393	2,407	2,418	2,521	2,524
Overrun	20	10	2	2	2
Meter reading	87	83	80	77	74
Total	**2,500**	**2,500**	**2,500**	**2,600**	**2,600**

13.4.5 Allocation of costs to tariff customer charges

Cost allocation within the tariff market is based on a customer's usage and previous revenue level. Currently, up to four separate tariffs for determination of the delivered prices are applicable to tariff customers: general, economy, economy plus, and industrial and commercial rates. These tariffs are generally applied on the basis of end user consumption.

The Access Arrangement proposes providing a single transport tariff applicable to all tariff customers, regardless of usage.[139]

Tariffs are derived by the following steps:

1. determine overall revenue earned from tariff market customers in 1997/98
2. design a tariff block structure which maintains competitiveness with substitute fuels, minimises price movements to individual market segments, and achieves appropriate relativity between tariff and contract prices
3. calculate the revenue that would have been generated had the proposed block structure been applied, using the AGL(ACT) customer database which contains all load data from monthly and quarterly invoices for 1997/98

139 As long as they do not use more than 10 TJ per year.

4. adjust the block structure if target revenue is not achieved
5. escalate the 1997/98 block structure to yield 1999/2000 tariff revenue.

By replicating the 1997/98 billing process, the proposed tariff structures were tested to ensure target revenue was achieved. This ensured that the seasonal nature of tariff segment usage was taken into account when calculating revenue that would result from the block structure. The 1997/98 year was used because it provided a gas billing history for the full year.

13.5 Public submissions and forums

The Commission received some submissions on reference tariffs and cost allocation. To provide an opportunity to discuss issues, the Commission held a pricing forum on 22 September 1999 in Canberra.

Focusing on pricing structure specifically,[140] end users, retailers, network operators and regulators participated in the forum. Some participants were critical of AGL(ACT)'s proposed level of prices to contract customers resulting from the allocation methodology. Revenue issues are discussed in this draft decision in chapters 4 to 11. The submissions outlined in this section comment on the price structure itself and the level of prices to the contract market resulting from AGL(ACT)'s stand alone allocation methodology.

13.5.1 Reference tariffs and price structure

The main topics discussed in submissions and at the pricing forum are: the pricing of new receipt points, the postcode price structure, the flexibility of the proposed price structure, non-discriminatory pricing, and the implications for prices.

Recognition of new receipt points

Esso has advocated that the Access Arrangement include principles which define how reference service prices will be determined following the addition of new receipt points to the AGL(ACT) network, in particular, the potential for interconnection of the Eastern Gas Pipeline.[141]

BHPP has also commented on interconnection pricing and terms, in particular, that the Access Arrangement does not recognise that an interconnection service may be demanded by users:[142]

> One of the critical determinants of success for the access regime will be the ease with which other pipelines can be connected into the system… At the moment the Access Arrangement does not contemplate that interconnection is a service that a significant portion of the market might want. However, there is a reasonable possibility that an interconnection may be made from the Eastern Gas Pipeline. Interconnection is a monopoly service and should be priced and subject to clear terms. We require that IPARC require AGL(ACT) to provide an interconnection service as a Reference Service under the Code and for it to be priced at cost.

140 Copies of a summary paper of the forum can be obtained from the Commission.
141 Esso, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 2.
142 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 11.

Postcode price structure

During the course of the AGLGN draft decision[143], the pricing forum noted that although postcode pricing is positive from a transparency perspective, it is not as cost reflective as the molecule approach adopted in the 1997 Access Undertaking for the NSW network.

BHPP has made similar comments to the Commission on this issue:[144]

> BHP believes that the AGL(ACT) proposal for a single zonal price for contract market users is not cost reflective and does not comply with the Code. The size of the single zone means that there is a significant amount of cost averaging. This means that the price charged to large users within the zone is increased over true cost reflective prices, and the prices for small users is decreased. This results in retail margins being shifted from large contract users to small contract users, a segment with higher barriers to entry.

Flexibility of price structure

Comments have been made on the flexibility of the reference services. In particular, contract users may find it difficult to tailor their MDQ reservation to meet variable operating demands. BHPP comments:[145]

> A user cannot reduce their MDQ reservation and if they wish to increase it, the increase must be for at least a year and have the same commencement or termination date as the users existing reservation. Thus, a customer is required to reserve and pay for MDQ for a significantly longer period than it may require.

BHPP also comments that the only way users can deal with this MDQ reservation problem is to select AGL(ACT)'s throughput service. However, this would involve higher unit charges.

Capacity reservation charges

The Australian Institute of Sport (AIS) has commented in a submission and through the pricing forum on the constraints imposed on users who have to nominate an annual MDQ figure. Demand by the AIS exhibits a strong seasonal influence, with consumption peaking during the winter months. Such a demand profile would be representative of many large ACT gas consumers. The AIS states:[146]

> Clearly, the adoption of an annual maximum demand quantity as a key pricing element in the proposed tariff structure will impose a considerable 'baseline' or infrastructure cost on gas users in the ACT. The 'fairness' of this annual demand approach to the ACT consumer is a pivotal issue in the access arrangement pricing structure. I would suggest that a monthly or quarterly maximum demand, similar to the electricity market approach, is more equitable to the consumer and will encourage energy conservation/consumption reduction programs.

The Commission notes that the reference services penalise off-peak users as much as peak users. Instead, incentives should be offered to off-peak users. This is true for businesses with summer peaks, or where longer working hours do not add to the system peak.

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143 IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, Gas 99-7, October 1999.

144 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 12.

145 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 12.

146 Australian Institute of Sport, *Submission to AGL(ACT) Access Arrangement Review*, 22 October 1999, p 1.

Managed capacity service charges

Although the Commission did not receive any specific comments on the proposed managed capacity service, it feels that it is appropriate to highlight a number of issues. The service requires the user to nominate an MDQ figure at least as great as the previous year's figure. This structure may delay any benefits from programs a user may introduce to reduce gas consumption. This outcome may be contrary to energy efficiency programs to reduce greenhouse emissions.

Tariff service

ACTEW has commented on AGL(ACT)'s proposal to implement a multiple block tariff for the throughput service. Specifically, ACTEW seeks clarification of why AGL(ACT) has proposed a multiple block structure even though it has stated in its AAI that network costs do not vary with throughput.[147]

Non-discriminatory pricing

The issue of non-discriminatory pricing has been raised in submissions and at the pricing forum. The common theme is that all customers should pay the same amount for the same service.

BHPP proposes that the tariff and contract markets be allocated the same costs on a $ per km basis, assuming that the contract market uses only the 188km of high pressure assets. Thus the tariff and contract markets are to pay the same price to use the common pipes. This exemplifies non-discriminatory pricing.[148]

The issue of non-discriminatory pricing has also been raised by ACTEW. However, it does not approach the issue in terms of pricing between contract market and tariff market users, but rather in terms of non-discrimination between retailers:[149]

> ACTEW seeks confirmation that the network services being offered by AGL(ACT) to prospective third party network users are the same for all parties and that there is no discrepancy between the level of network charges for these services. This is a critical aspect as it is fundamental to the achievement of a level playing field… The non-discriminatory nature of the arrangement should be clearly demonstrated in the RAAI. Supporting details that confirm all retailers will be treated equally under the proposed arrangement would be useful.

13.5.2 Cost allocation

Public submissions have been received on the issue of cost allocation, particularly with regard to the level of revenue to be collected from the contract market as a result of AGL(ACT)'s stand alone cost allocation proposal.

147 ACTEW, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 3.
148 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, pp 5-6.
149 ACTEW, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 2.

Stand alone cost allocation to the contract market

Submissions have been very critical of AGL(ACT)'s proposal to allocate costs to the contract market on a stand alone basis. BHPP comments on the allocation of operating costs to the contract market, and the performance benchmarks that flow from this:[150]

> … the AGL(ACT) proposal would allocate to the Contract Market, $1.8m [in operating costs] in 1999/2000 which is equivalent to $9.7m per 1000km of pipe. This is 2.75 times AGL(ACT)'s average and around twice the Victorian average. It is over 3 times the unit operating costs of the Central West pipeline. It involves a cost allocation approach that fails to meet the test in the Code of being a 'methodology that is fair and reasonable'.

BHPP states emphatically that the stand alone allocation methodology is not in accordance with the Code and should be rejected:[151]

> AGL(ACT)'s attempt to price the Contract Market on an ORC stand alone basis (with no benefits for an ongoing depreciation of the capital base) is without doubt non-compliant with the provisions of the Code. BHP has no legal doubt about this and seeks a very definitive rejection of this approach.

Cost reflective prices

BHPP's comments above can also be taken to apply to the issue of whether prices are cost reflective. That is, has AGL(ACT)'s cost allocation methodology resulted in prices that are not cost reflective. BHPP comments:[152]

> The revenue target for the Contract Market should move in 1999/2000 to a cost reflective amount of $1.0 million… The revenue target for the Tariff Market should move in 1999/2000 to a cost reflective amount of $17.0 million.

On the issue of cost reflective network charges, ACTEW states:[153]

> It is important that end use customers are confident that network tariffs are set at a level which reflects the cost of providing the service including a reasonable return on assets. The prices provided in the proposed access arrangement for AGL(ACT) services should be supported by an adequate level of detail on network supply costs.

13.6 Commission's assessment of reference tariff policy

This chapter has outlined the AGL(ACT)'s proposed reference tariffs and cost allocation methodology. Submissions on these aspects of AGL(ACT)'s proposal have also be discussed. The Commission has made its assessment in regard to these aspects (eg cost allocation, services policy) in other chapters of this report. The following section focuses on AGL(ACT)'s proposed reference tariff policy.

150 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, pp 5-6.
151 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 6.
152 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 2.
153 ACTEW, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 2.

The Commission considers that AGL(ACT)'s proposed reference tariff policy should be amended. The assessment of each proposed point and required amendments are presented in Table 13.10:

Table 13.10 Assessment of AGL(ACT)'s proposed reference tariff policy

AGL(ACT)'s proposed policy (section 4 of Access Arrangement)	IPARC assessment	Required amendments
1. Description of principles.	As a result of this draft decision, AGL(ACT)'s current description of principles is no longer applicable.	Modified to reflect the draft decision.
2. AGL(ACT) may undertake new facilities investment which does not satisfy the requirements of the National Code for inclusion in the capital base.	Inconsistent with objectives in section 8.1 (recovery of efficient cost). The Commission considers that new facilities investments should be added to the capital base subject to the requirements in sections 8.16 and 8.17 of the Code in regard to "prudency test" (see chapters 7 and 9).	This policy statement must be removed.
3. Treatment of recoverable portion of the new facilities investment.	This relates to speculative investment. AGL(ACT) capital expenditure forecast does not include any speculative investment. As such, this policy is irrelevant.	This policy statement must be removed.
4. New facilities investment will be included at actual cost at the commencement of next review.	Only prudent and efficient actual capital expenditure should be allowed.	This policy statement must be removed.
5. Redundant capital will be removed from the capital base.	This is consistent with section 8.14 of the Code. In reaching its draft decision on rate of return, the Commission has considered the implications for risks.	Accepted.
6. Incentive mechanism, in that reference tariffs will apply regardless of the actual outcomes of forecasts.	This is consistent with sections 8.44, 8.45 and 8.46 of the Code.	Accepted.

13.6.1 Draft decision

Amendment 9 – Reference tariff policy

AGL(ACT) is required to amend its reference tariff policy (section 4 of the Access Arrangement) by:

a) modifying the policy to reflect the draft decision on revenues (Amendment 8) and cost allocation (Amendment 10)

b) removing policy statements regarding treatment of new facilities investments.

14 COST ALLOCATION TO THE CONTRACT MARKET

14.1 Introduction

As outlined in chapter 13, sections 8.38, 8.39 and 8.42 of the Code deal with the allocation of revenue and costs between users. In allocating costs between customer classes, the Commission has considered the provisions of section 8.1 of the Code.

Ideally, 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 recorded precisely by service or customer. Where costs are aggregated, they must be allocated on an acceptable basis. Choosing an allocator can be arbitrary, because the particular cost driver can be hard to identify. Where costs are separated, and cost drivers are relatively simple to identify, detailed allocation methodologies may be feasible.

The following terminology applies in the discussion of cost allocation methodology set out in this chapter:

- *stand alone costs of serving the contract market (SAC)* This allocation methodology assumes cost recovery based on the optimised stand alone assets required to service the contract market. This allocation may apply to capital cost and / or operating cost.
- *fully distributed cost (FDC)* This allocation methodology assigns directly identifiable costs to each of the market segments (contract and tariffs) along with a share of joint / common costs and assets serving both markets.
- *incremental cost* This is the additional cost of serving an additional customer or group of customers and / or unit of production.

14.2 AGL(ACT)'s proposal

AGL(ACT) has proposed allocating revenue to the contract market based on the stand alone cost of serving that market. These costs are based on:

- a return on the optimised replacement cost of the assets required to provide transportation services to the contract market only
- depreciation on that value
- capital expenditure required for the stand alone system
- an estimate of the cost of operating the stand alone system.

AGL(ACT) has based its stand alone asset costs on the undepreciated ORC. Rather than using the fully distributed operating costs as a proxy for the operating costs of a new entrant, AGL(ACT) has estimated the stand alone operating and maintenance cost of the system separately.

AGL(ACT)'s proposal charges contract customers based on an allocated proportion of the stand alone cost of providing the contract market. For most end users, the price resulting from this methodology is likely to be less than the individual stand alone cost. However, it may be greater for some.[154]

Where the prices generated under this methodology are greater than the individual stand alone cost,[155] AGL(ACT) has proposed providing capped prices. The shortfall in revenue is rolled back into the prices charged to customers with individual stand alone costs greater than the costs allocated to them under this proposal. When prices to individual customers continue to be less than the individual stand alone cost, and greater than the marginal cost of serving these customers, they fall within bounds of 'cross subsidy free' prices.

The Commission notes that although AGL(ACT) has estimated the stand alone costs of serving the contract market, it has allocated a reduced amount to contract customers.

14.3 Cost allocation methodologies

14.3.1 Guidance from economic theory

According to economic theory, pricing sets bounds for charges. Outside these bounds, cross subsidies or inefficiencies will result. The upper limit is the price above which a new entrant would find it attractive to enter the market in competition with the network. The lower limit is the price below which the network service provider suffers financially by serving the customer. Stand alone costs and incremental costs are common proxies for these bounds. Economics provides less guidance on pricing structures within these bounds, except that for a given level of average revenue, more efficient price structures would see prices vary inversely with the price elasticity of users. In practice, the regulator has very limited information on price elasticity. Thus, price structures resulting from this rule may be inequitable.

14.3.2 Measuring stand alone costs

The economic argument for stand alone cost pricing is that it is a proxy for the maximum price an incumbent may charge without encouraging inefficient duplication of networks. In fact, when calculated on an individual customer basis, stand alone cost pricing may exceed new entrant prices if:

- new entrants can build a network connecting a number of customers. In this case, the maximum capital cost is set by the recovery of the stand alone costs for the entire sub-network, shared across all customers over the life of the assets
- new entrants can optimise the configuration of the network to serve particularly attractive customers
- a new entrant can share O&M and overhead costs of the new network across its other activities.

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154 The stand alone cost to an individual is assumed to be the lesser of the cost of duplicating the facilities required to provide the service and the threshold at which the service is no longer demanded.

155 This can occur when the price for a customer exceeds its next best alternative (ie another fuel or not producing). Under these circumstances, the service provider may offer caps and decrements.

AGL(ACT) has estimated the stand alone costs of serving a group of customers (contract), as opposed to individual customers' stand alone costs. Nonetheless, the fact that AGL(ACT) has found it necessary to 'write down' the level of costs allocated to the contract market and provide capped prices to some customers indicates that when calculated for a group of customers, stand alone cost pricing may also exceed new entrant prices. This may be due to similar reasons as those given above.

It may be argued that measuring the stand alone cost based on optimised replacement asset costs and stand alone operating cost is not consistent with the way a new entrant may measure its stand alone cost. A new entrant may require a price based on providing an annuity over time or its equivalent in net present value (NPV) terms. The NPV of an annuity is likely to be less than the NPV of charges based on an asset value which remains undepreciated over time.

A new entrant may allocate operating costs anywhere between the stand alone operating costs proposed by AGL(ACT), and marginal cost. This could be for either of two reasons:

- an individual or group of individuals may price its operating costs marginally, resulting in relatively low costs, if the individual or group is already involved in service provision
- the stand alone costs proposed by AGL(ACT) have not been accompanied by supporting information, and do not seem reasonable for some line items. Any assessment of the appropriateness of a particular estimate is arguable.

AGL(ACT) has provided the Commission with an estimate of fully distributed operating costs. These represent the costs allocated to the contract and tariff markets based on direct allocation where possible, or on some reasonable allocator where assets and/or activities are shared between markets. It should be kept in mind that any allocator could be regarded as arbitrary.

14.3.3 Contract market revenue

Typically, discussion has focused on stand alone, incremental, and fully distributed cost allocation methodologies. However, there are other allocation methodologies. Cases can be made for basing contract market revenue on a particular cost allocation methodology or any combination of methodologies. A range of asset valuation methodologies can be applied when measuring these costs. The following table shows the costs which could be allocated to the contract market under a range of allocation and valuation methodologies.

Table 14.1 Revenue scenarios for the contract market under different allocation methodologies

	Asset valuation methodology			
	ORC	**DORC**	**ICB**	**DAC**
Scenario 1				
Stand alone allocation of capital and operating costs	$3.2m	$3.0m	$2.6m	$2.3m
Scenario 2				
Stand alone allocation of capital costs and fully distributed allocation of operating costs	$1.9m	$1.7m	$1.3m	$1.0m
Scenario 3				
Fully distributed allocation of capital and operating costs	$1.1m	$1.0m	$0.9m	$0.7m
AGL(ACT)'s proposal	***$2.5m***			
Contract revenue 1998/99	$2.3m			

Note:
1. Capital costs include return on capital base and depreciation.
2. Return on assets is based on a pre tax rate of return of 7.75 per cent for the scenarios of ORC, DORC and ICB. A nominal return of 10.44 per cent is assumed for the scenario of DAC.
3. Depreciation is assumed to be 2 per cent per annum for ORC, 2.5 per cent for the other asset valuations.
4. Outcomes under ICB relate to the Commission's decision on asset value, ie an ICB of $170m.

The stand alone allocation of capital costs is based on the cost of a stand alone system to serve the contract market only. The fully distributed allocation of capital costs allocates shared assets based on the capacity required at the system maximum daily quantity.

AGL(ACT)'s estimate of stand alone operating costs in the above table relates to those required to operate the stand alone system to serve the contract market only. The fully distributed operating costs in the above table are the costs under the Commission's draft decision allocated in the same proportion as AGL(ACT) provided to the Commission as its fully distributed allocation of the costs of the total system. AGL(ACT)'s activity based cost categories are set out in Attachment 8. Operating cost allocation under the SAC methodology is presented in Attachment 9.

When considering allocation and valuation methodologies, allocation of capital cost has least impact on the magnitude of costs. The following table shows the variation in costs allocated under the different methodologies presented in the previous table.

Table 14.2 Impact of valuation and allocation methodologies

	Capital cost allocation	**Operating cost allocation**	**Asset valuation**
Impact on revenue	$0.3m – $0.8m	$1.3m	<= $0.9m

Based on the cost estimations presented by AGL(ACT), the contract market could be allocated costs of between $0.7m and $3.2m. Although these assumptions may be consistent with economic theory on pricing, some scenarios are more efficient than others. Efficiency is an important consideration under the Code.

ORC asset valuation

BHPP has indicated that the stand alone methodology proposed by AGL(ACT) is unjustified and appears to breach the Code.[156]

Under the Code, total revenue is to be determined based on costs and the initial capital base is a key determinant of capital costs. Prices are based on an allocation of costs to services. The key questions are:

- whether the costs allocated to individual services (including capital costs) can be estimated on a different basis to the costs on which total revenue is based
- whether the capital costs allocated to services should be based on an asset value which is normally between DORC and DAC.

The Commission considers the answers to these questions may be unclear. Although the Code permits asset values greater than DORC for the pricing of reference services, the Code provides for the Commission to exercise judgement in accepting the pricing proposals.

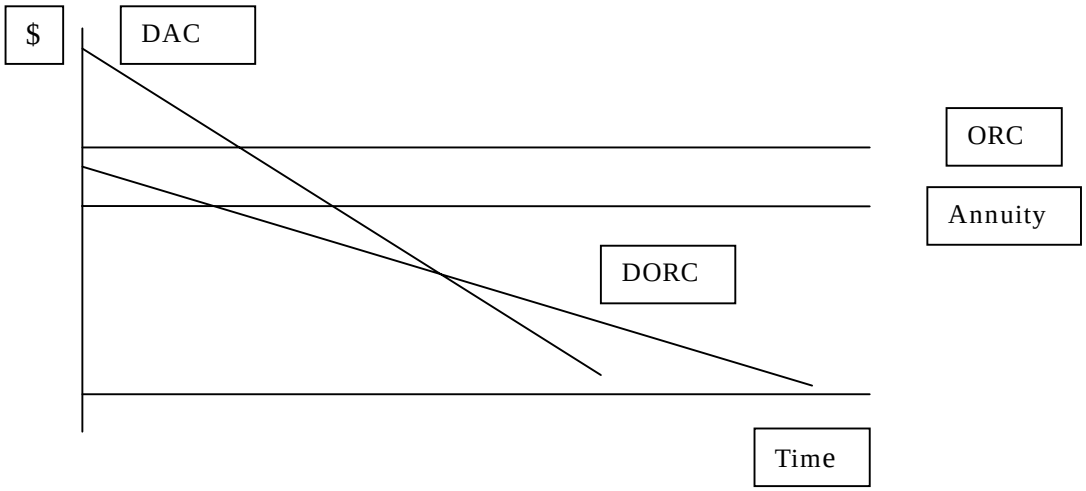
Section 8.1 of the Code requires the regulator to consider a number of matters when assessing the derivation of reference tariffs. One of these is the efficiency of the structure and level of prices. AGL(ACT) has proposed that a system valued at the undepreciated optimised replacement cost is consistent with the cost a new entrant would incur in providing the service. Hence, AGL(ACT) argues that this is consistent with efficient pricing. AGL(ACT) has proposed basing the cost to the contract market on the undepreciated ORC plus an annual depreciation charge in each year of the Access Arrangement. This level of cost is consistent with economic theory on stand alone cost pricing in a static environment where decisions were made each year with no prior information. This does not reflect the environment in which the Commission is considering the AGL(ACT) proposal. AGL(ACT) subsequently allocated less than the stand alone undepreciated ORC to the contract market.

When entering into gas contracts, most users consider a term greater than one year. Many users prefer to enter into much longer contracts. When users consider alternative options, they consider not only periods 10 or 20 years into the future, but also past patterns of behaviour, and expectations about future behaviour and environments. If the Commission was to approve the AGL(ACT) proposal, users might anticipate that prices would approach the stand alone level in future periods. AGL(ACT) may have reasonably estimated the stand alone cost in a static environment, but it would have overestimated the stand alone cost in the more realistic dynamic environment. Alternative options become much more attractive to users, resulting in inefficient outcomes.

156 BHPP's presentation at the Pricing Forum, 22 September 1999.

An ORC asset value will give rise to monopoly rents over a period of time. The return on an ORC asset value will exceed the return on a historic or DORC asset value over the life of the assets. This is illustrated in the figure below:

Figure 1 Profile of return on capital base - a simplified illustration



$DORC_{NPV} = DAC_{NPV} = (approx)\ Annuity_{NPV} < ORC_{NPV}$

The gap between ORC and the annuity or between ORC and DORC represents monopoly rent. A reference tariff or reference tariff policy should be designed to provide the service provider with the opportunity to earn a commercial stream of revenue. This revenue should recover the efficient costs of delivering the reference service over the expected life of the assets used to deliver the service. The efficient costs should exclude any monopoly rent.

Excluding allocated cost scenarios based on an ORC asset valuation narrows the range of allocated costs to between $0.7m and $3.0m.

Other asset valuation methodologies

Under section 8.11 of the Code, asset valuation should normally fall between DORC and DAC. The Commission has determined an ICB between DAC and DORC for AGL(ACT)'s network. Thus, an asset value in the contract market which is based on either DORC, ICB or DAC will be consistent with the Code. Many arguments for DAC have been presented by stakeholders to the various gas access reviews undertaken in Australia. However, despite its wide acceptance in North America, Australian regulators have not adopted this valuation methodology.

When determining total revenue, the Code requires regulators to consider the reasonable expectations of stakeholders. It may be argued that revenue based on an asset value between DORC and DAC, as outlined in the Code, is within the reasonable expectations of stakeholders. The Commission has considered an asset valuation between DORC and DAC. In determining the value of AGL(ACT)'s ICB, the Commission has taken into account section 8.1 of the Code. It has decided on an ICB for the AGL(ACT) system that is greater than DAC.

Stand alone allocation of costs

Stand alone cost allocation may discourage growth and network utilisation where the resulting price is greater than the existing or potential user's marginal valuation of the service. Nevertheless, stand alone allocation is consistent with economic principle as a means of defining a maximum price.

However, if stand alone allocation was to be endorsed as a basis for maximum prices, it would need to be accompanied by an effective regime for negotiation. Without effective negotiation provisions, the inflexible application of this approach would lead to inefficiencies and would restrict market growth.

AGL(ACT) has estimated annual operating costs for a stand alone system serving the contract market to be $1.8 million.

If the Commission was to approve stand alone operating costs, it would need to consider the stand alone operating costs of the contract market as thoroughly as it has considered the total operating costs. Efficiency targets may also be required.

AGL(ACT)'s assumptions and stand alone cost allocation methodology result in a gradual increase of nominal average prices to contract customers over the period of the Access Arrangement. Average contract prices have risen from $1.57/GJ in 1997/98, to $2.35/GJ in 1999/2000, the first year of the Access Arrangement.[157] AGL(ACT) proposes that prices rise to $2.50/GJ in 2003/04.

The Commission has some concerns with the stand alone approach adopted by AGL(ACT). The need for AGL(ACT) to effectively write down the allocation of stand alone costs to the contract market from $3.4m to $2.5m raises questions about the appropriateness of AGL(ACT)'s attempt to apply the stand alone cost allocation methodology. Furthermore, the contract market does not comprise a significant proportion of total network revenues. Contract market revenue was equal to around 6.4 per cent of total revenue in 1998/99. In the NSW market, where AGLGN has also proposed a contract stand alone system methodology, contract market revenue was around 32.9 per cent of total revenue in 1998/99.[158] The Commission believes a uniform cost allocation approach may be more appropriate.

Fully distributed allocation of costs

Allocating costs on a fully distributed basis involves an element of arbitrariness. However, it does allow costs to be shared across activities. The benefits of a shared system can be passed on to users when a fully distributed cost allocation results in lower prices. A new entrant may be able to spread some operating and overhead costs across other activities or attribute only the marginal costs of some functions to a new pipeline. Hence, an allocation of non-capital cost through some sharing of costs may better approximate the costs of a new entrant.

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157 AGL(ACT) has informed the Commission that the apparent increase in unit rates between 1997/98 and 1998/99 is a notional increase due to a change in the allocation of revenues to the contract market. AGL(ACT) states that delivered prices to contract customers over this period have not changed significantly.

158 IPART, *Access Arrangement for AGL Gas Networks Limited Natural Gas System in NSW*, Draft Decision, October 1999, p 41.

Equity considerations

The Commission has considered the implications of setting equitable prices in accordance with the terms of section 8.1 of the Code. Prior to this review, the contract market was not regulated. To a degree, prices were based on the ability of users to pay.

On the other hand, the tariff market has been 'regulated' since 1992. Prices for tariff market customers in the ACT have been set with reference to prices charged to similar customers in NSW. Therefore, ACT tariff prices depended on AGL's set of assets in NSW and the NSW regulatory regime. In carrying out this review, the Commission is concerned that any price variations are cost based.

The interaction of AGL(ACT)'s proposal to charge customers based on stand alone costs is a cause of concern. AGL(ACT)'s market is considerably different from that of NSW. Contract market customers in the ACT are not a significant proportion of the total AGL(ACT) market (either by customer numbers or volume). In contrast, the AGLGN's contract market customers in NSW account for around 75 per cent of total gas consumption. It does appear appropriate to calculate costs to contract customers on a stand alone basis within the ACT system.

Under such an approach, some contract customers connected to pipes in areas where the majority of customers are tariff users, could face large increases in price. This occurs because the hypothetical system designed to serve the contract market assumes that a pipe serves one customer only, and ignores the tariff load that actually shares this pipe. This assumption results in costs being allocated to a single customer as if it was served from a dedicated pipe. The proposal ignores the possibility that if the customer was considering its energy options on the basis of these prices, it might choose an alternative. The hypothetical pipe would then be optimised out of the system. This may typically be the case for hospitals which, once connected, have little choice when faced with price increases except to pay more or incur the expense of switching fuels.

These problems can be addressed through the price structure as well as revenue allocation. Under the Commission's amendments, customers should face price decreases. If some prices are likely to increase, efficiency and equity considerations could be taken into account to develop a price structure which results in no increases, and smaller decreases.

14.3.4 Other reviews/regulators

The valuation and allocation methodologies adopted by regulators for reviews vary widely, particularly between Victoria and NSW. The following table provides a summary of the valuation and allocation methodologies adopted by regulators for other reviews:

Table 14.3 Summary of allocation of costs to the contract market in other reviews and jurisdictions

Review	Regulator	Asset valuation	Capital cost allocation	Non-capital cost allocation
AGLGN 1997	IPART	DORC	Stand alone	Fully distributed
AGLGN 1999 (draft)	IPART	ICB	Stand alone[1]	Fully distributed[1]
GSN	IPART	DORC	Fully distributed	Fully distributed
AGC (draft)	IPART	ICB	Fully distributed	Fully distributed
Victorian transmission	ACCC	DORC	Fully distributed	Fully distributed
Victorian distribution	ORG	DORC/ICB	Fully distributed	Fully distributed
EAPL (proposed)	ACCC	DORC	Fully distributed	Fully distributed
AlintaGas (proposed)	OFFGAR	ICB	Fully distributed	Fully distributed

Note:
1. The draft decision by IPART stated that capital costs allocated to the contract market should be no greater than efficient stand alone capital costs, and that the allocation of non capital costs should be closer to fully distributed costs.

14.3.5 Capital contributions

AGL(ACT) has indicated to the Commission that users have not provided capital contributions in the past. In the future, the treatment of capital contributions should be specified in the contract for service agreed by the user and the service provider. Consistent with this approach, the Commission expects user contributions to be reflected in the price for service charged to the contributing user. Sections 8.23 and 8.24 of the Code deal with capital contributions. The Commission has considered these Code requirements.

14.4 Commission's draft decision

The Commission considers that a range of costs could be allocated to the contract market. This would be consistent with the Code. However, the Commission considers that the use of ORC and stand alone operating costs is not consistent with the Code. This approach results in prices which can be inefficient and can exceed the costs of new entrants.

The Commission believes key differences between the ACT and NSW markets limit the applicability of the stand alone approach to AGL(ACT)'s network. In particular, there are important differences in the size of the contract market in each of the ACT and NSW natural gas markets. Also, within the NSW market there has been a long history of tariff market regulation and an unregulated contract market. For a significant period of time, regulation of the tariff market had regard to the overall profitability of the NSW market. This approach resulted in an 'over recovery' of costs in the contract market.

Within AGL(ACT)'s market, tariff regulation (whereby charges have been set with reference to prices charged to similar customers in NSW) commenced more recently and did not have regard to overall profitability. As discussed in chapter 6, the profitability of AGL(ACT)'s tariff and contract markets is reasonable on a fully distributed cost basis. Reasonable returns are earned on both a DORC and DAC asset valuation. Given that both markets appear to be reasonably profitable, questions are raised in regard to a cost allocation methodology based on contract stand alone costs. Such a proposal necessarily allocates a greater relative share of costs to the contract market.

The Commission is concerned that AGL(ACT) needs to reduce its contract revenues below the estimated stand alone costs of serving that market. The Commission believes this may indicate that this approach to allocating costs between the contract and tariff markets may not be appropriate for the ACT network.

The Commission has not seen any information to suggest that costs should be allocated differently between the contract and tariff markets. The Commission believes that 'non-discriminatory' cost allocation should be implemented for the AGL(ACT) network.

Amendment 10 – Cost allocation between contract and tariff markets

AGL(ACT) is required to apply a non discriminatory cost allocation methodology to the contract and tariff markets.

15 PRICING

15.1 Pricing objectives

As noted in chapter 13, pricing for monopoly network services should fulfil several potentially conflicting objectives. A particularly challenging task in setting the structure of tariffs is to:

- signal the marginal costs of providing network costs
- provide a financially sustainable revenue for network owners
- ensure prices are simple, transparent, stable and predictable.

At the core of the problem is the fact that for monopoly networks, marginal costs are commonly less than average costs.

Practical pricing strategies must combine the benefits of *marginal* pricing, which signals 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. The objective is to recover the gap between marginal and average costs in a manner which has as little impact on behaviour as possible.

15.1.1 Non-linear tariffs

A *linear* tariff is a pricing structure based on a unit rate. The total cost to the consumer depends entirely on the quantity of product consumed. A *non-linear* tariff contains a component which 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 by utility services, where the costs of providing the service are largely fixed in nature.

A 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 which may be associated with transport services. The variable component should be closely linked to the marginal cost of providing the service.

The option adopted for AGL(ACT)'s capacity service for the contract market, is to set the 'fixed' component based on the amount of capacity booked. This means that unless the customer exceeds booked MDQ, the charge is 'fixed' for the year and does not vary with throughput. However, while it is 'fixed' in the short term, it is 'variable' in the long term. From an economic perspective, it may lead to inefficient outcomes if the capacity charge exceeds the forward-looking cost imposed by the additional load.

Basing the charge on maximum demand may seem fair to many users, as it reflects the design criteria. This may be seen as an equitable approach under which 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.

There can be concerns that different price structures may result in cross subsidies between customers at different locations or different load characteristics. Fully distributed cost allocations do not provide a reliable guide to this. As long as users are covering the incremental cost of a service, they are not being cross subsidised. Incremental costs set a minimum charge, but customers usually pay in excess of incremental costs. The extent to which charges for each customer group should vary from incremental costs is a matter of judgement. There are many issues to consider when arriving at this judgement. These are likely to vary when considered by the service provider, users or the regulator. The ceiling is provided by the costs of a potential new entrant. Stand alone cost is a proxy for this.

In summary, efficient pricing may require the service provider to:

- structure prices to combine a mix of fixed, capacity-based and energy-based components, and/or
- offer a menu of price structures involving a mix of fixed, capacity and energy-based components.

Under the latter approach, customers may choose the charges which have the least impact on their behaviour. This may help them to minimise the adverse impacts of the recovery of average, rather than marginal, costs where or when there are capacity constraints. It would be reasonable to limit the availability of non-demand based prices.

15.1.2 Allocation of costs to services

The first step in translating the revenue requirement into reference tariffs is to identify the cost drivers of each service.

Once the total cost of the services provided by the service provider has been determined, the price of each service can be derived by identifying the service provided and allocating some of 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. In practice, economic theory provides limited guidance on the allocation of a given pool of sunk costs. Subject to the requirements of the Code, issues of customer impact and equity may have greater direct relevance.

15.2 Pricing for the contract market

15.2.1 Allocation of costs to asset groups

The allocation of costs between asset groups is based on the type of operating activity where activities relate to specific assets, and/or the assets' share of optimised replacement cost. The following table shows cost allocation to asset groups under AGL(ACT)'s proposal.

Table 15.1 Allocation of total costs to asset groups, $'000

Asset groups	AGL(ACT) asset cost allocation from model	AGL(ACT) operating cost allocation from model	AGL(ACT) revenue allocation from model
TRS	27	95	122
Local network			
HP	575	1,525	2,100
MP	25	62	88
Meters and services	16	127	144
Meter reading devices	5	21	27
Total	**649**	**1,831**	**2,480**

Note: Due to rounding, the total figure may not add up.

The Commission has determined revised (reduced) charges for AGL(ACT), and requires AGL(ACT) to alter specific aspects of its cost allocation methodology, and more generally, to review its cost allocation methodology. This is likely to result in a variation in the allocation of costs.

15.2.2 AGL(ACT)'s capacity pricing approach

The Commission is of the view that the capacity based pricing methodology adopted by AGL(ACT) is acceptable, provided it is supported by a menu of alternative pricing options.

Capacity based prices are designed to compensate the service provider for the sunk costs of the pipeline capacity provided. The majority of costs incurred in providing a transportation service through a gas pipeline are fixed. Capacity based charges are designed to recover fixed costs; that is, those costs that do not vary with the volume of gas transported. These charges compensate the network owner for capital invested to provide the amount of capacity the customer has contracted to receive. Thus, these charges should be payable irrespective of actual throughput. Under AGL(ACT)'s proposal, the capacity contracted is based on peak daily demand as the most relevant measure of the capacity requirement.

Capacity based charges encourage customers to improve their load factors. To the extent that there are capacity constraints (current or future), they can reduce or defer future costs. However, there is concern that reliance on capacity charges requires the capacity charge to be set at average (sunk) costs which may exceed marginal costs. In the case of AGL(ACT)'s proposals, capacity charges may encourage inefficient outcomes and discourage additional economic loads. In the extreme, such an approach can make it cheaper for some users to transport gas in trucks rather than through pipes. Placing too much weight on capacity charges can cause users to reschedule production inefficiently, at considerable cost to users, to avoid MDQ charges that exceed the marginal costs of handling the loads.

In principle, a charge based solely on capacity is likely to be more efficient than a charge based solely on commodity throughput, as the marginal costs of handling additional throughput are very small. Where capacity charges exceed marginal costs, the potential economic inefficiencies could be minimised by:

- structuring charges to include both capacity and commodity components, where the latter is the smaller
- offering a menu of services including a commodity or throughput service.

AGL(ACT) has chosen the latter option in its proposed Access Arrangement. The Commission accepts this in principle. It can improve the equity and efficiency of the system. However, the level of charges must be set with care. The throughput charge must be set sufficiently low to provide a cap to the potential inefficiencies of very high capacity charges. However, it should not be so low that it is used by a large proportion of loads. Otherwise, the overall charging arrangements may become less efficient rather than more efficient.

The Commission considers that:

- the proposed charges provide an appropriate menu of choices for users
- charges for capacity and managed capacity services must be adjusted consistent with the total contract market revenues specified in Amendment 8
- the throughput charge should be further reduced to ensure it is a feasible option which limits potential inefficiencies and inequities arising from sole reliance on capacity charges based on average costs.

The Commission has received few submissions on local network charges. Subject to submissions on the revised charges under the draft decision, the Commission is prepared to accept the proposal.

Draft decision

Amendment 11 – Contract market reference tariffs

AGL(ACT) is required to recalculate its contract reference tariffs on the basis of non discriminatory cost allocation between contract and tariff markets, and revised contract demand forecasts.

15.2.3 Metering charges

Discussion of metering issues is presented in chapter 19.

15.2.4 Capped pricing

The pricing model devised by AGL(ACT) in the proposed Access Arrangement results in two contract customers being subject to a cap. In the absence of a cap, AGL(ACT) admits that prices generated from those customers would be unsustainable. Under AGL(ACT)'s proposal, the revenue shortfall from capped customers accounts for less than 1 per cent of reference revenue in year 1 of the Access Arrangement.

The Commission does not object to AGL(ACT)'s approach to capped pricing, and considers the proposed capping arrangements to be in accordance with the Code. However, the Commission notes that no customers are likely to need capping under the draft decision.

AGL(ACT)'s proposal to increase contract market revenues and/or the restructure of contract network charges results in these users facing higher charges. The extent of the increase is sufficiently high for two customers to require capped prices.

The Commission is of the view that unless they are clearly warranted by an analysis of the economic costs incurred, real price increases are inappropriate. In the past, customers made decisions to use gas at a certain price and were able to enter into a contract with a monopoly supplier on mutually agreed terms. The Commission does not support raising prices to these customers once they have been captured, particularly when the marginal cost of serving these customers is small, and is likely to be covered under their existing price agreements. It does not make economic sense to potentially strand customers' assets on the basis of the allocation of sunk costs of the network. The Commission's draft decision should ensure that individual contract customers do not face real price increases under regulation.

Amendment 12 – Contract charges: price constraints

AGL(ACT) is required to ensure that no existing customer will face a real increase in transportation charges over the Access Arrangement period from the current prices as at 30 June 1999.

15.2.5 Overrun charges

The Commission understands that overruns of MHQ are not counted when determining overrun payments. However, in the proposed Access Arrangement it is not entirely clear that this is the case. To remove any doubt, the Commission believes this requirement should be clarified within the proposed revisions. A statement to this effect should be placed in schedule 2B of the Access Arrangement, in the overrun section on pages 45 and 46.

Amendment 13 – Overrun charges

AGL(ACT) is required to state that overruns of MHQ are not counted for the purposes of overrun payments. A statement to this effect should be placed in schedule 2B of the Access Arrangement, in the overrun section on pages 45 and 46.

15.2.6 Postcode pricing

AGL(ACT) proposes establishing a single local network charge for the ACT, effectively adopting a single postcode for its network. This approach involves some averaging. Given that charges are derived by taking the revenue associated with the AGL(ACT) local network and dividing this value by the level of demand, users pay the same price, regardless of the assets used. Although this may be seen as 'fair' in so far as customers next door to each other pay the same price, customers utilising only some of the assets in the network contribute to all of them. However, postcode averaging reduces the extremes in pricing which result under other pricing options, eg 'the follow the molecule approach'.

The Commission is of the view that the single local network approach is a relatively transparent approach. Under the follow the molecule approach, end users would be required to contact AGL(ACT) to find out their price. Under AGL(ACT)'s proposal, prices are publicly available to everyone.

The Commission notes that one pricing structure is not intrinsically superior to the other. The critical issue is to re-balance tariffs following a transition to a new pricing structure which involves price increases, rather than to adopt the postcode structure itself.

The Commission is of the view that the form of price structure should not be decided for AGL(ACT), provided it can be demonstrated that the structure AGL(ACT) adopts does not result in adverse impacts for customers. This will also serve as a positive signal to customers that any future change in price structure will not affect customers adversely.

Therefore the Commission is inclined to accept the single network / postcode based approach subject to AGL(ACT)'s response to the Commission's requirements under service policy (see chapter 12). It is satisfied that the structure is transparent, simple and predictable. However, it notes that any rebalancing of prices at future reviews may affect customers adversely. The Commission's draft decision should result in all contract customers facing lower prices. The Commission formally requires AGL(ACT) to ensure that the postcode approach does not result in real price increases for any customer.

15.2.7 Other services

The Commission has explored the applicability of alternative service options including: a summer tranche, interconnection, partial use of assets and short term requirement reference service. At present, the Commission has not required AGL(ACT) to include additional services in its Access Arrangement (see chapter 12). However, the Commission invites comments from interested parties on the options discussed, and other services which users believe AGL(ACT) should offer. The Commission reserves its right to require AGL(ACT) to offer additional services.

15.3 Pricing for the tariff market

The rate for each tariff block relates to the revenue earned by customers in particular usage patterns. AGL(ACT) has allocated revenue in this market to tariff blocks in accordance with revenue allocated to tariffs prior to the Access Arrangement. AGL(ACT) has not allocated costs based on the cost of serving different customers (or customer classes). It is assumed that current tariffs reflect costs. The Commission questions whether this complies with the Code, in particular, section 8.42.

15.3.1 Allocated costs

AGL(ACT)'s proposal calls for price increases to tariff customers over the period of the Access Arrangement based on a CPI formula and a z factor. At the pricing forum AGL(ACT) stated that tariff charges would increase annually at CPI-1 per cent.

Having examined AGL(ACT)'s recovery of costs, the Commission considers AGL(ACT) earns enough revenue to cover the fully distributed operating cost of serving this market and a return on AGL(ACT)'s proposed DORC of tariff market assets.[159] The Commission has considered whether or not this market should be paying a higher return.

AGL(ACT) has not demonstrated that the current price control results in an under recovery of costs. The Commission has required that contract market prices be derived based on a non-discriminatory cost allocation methodology. The Commission does not consider the SAC approach to be appropriate, as contract customers are unable to sustain these prices. The Commission has also considered matters such as revenue growth in this market (see chapter 11).

[159] On a fully distributed basis (assets allocated by usage).

15.3.2 Price structure

The Commission has some concerns with regard to AGL(ACT)'s price structure. Having numerous tariff blocks may be seen as too complicated. The tariff structure has been designed to match the current revenue profile for particular types of customer, rather than to cover the differing costs of different types of customer. Therefore, there is scope to simplify the number of blocks and the block sizes.

The Commission has received a submission from ACTEW Corporation in relation to AGL(ACT)'s proposed pricing structure for the tariff services.[160] ACTEW seeks to understand the basis for having network charges that involve a multiple block structure for the throughput tariff service when AGL(ACT) claims that network charges do not vary with throughput. Before making a final decision, the Commission wishes to consult further. At the present time, AGL(ACT) is required to amend its reference tariffs for the tariff service consistent with the revenue, price cap and revised growth forecasts as determined by the Commission.

Amendment 14 – Pricing in the tariff market

AGL(ACT) is required to recalculate its reference tariffs for the tariff service on the basis of non discriminatory cost allocation between contract and tariff markets and revised demand forecasts as stipulated by the Commission in amendment 16.

15.4 Variation in reference tariffs

15.4.1 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). In the Commission's view, the Code does not preclude the regulator from approving changes to reference tariffs that operate automatically (if considered appropriate) as part of the public process now being conducted to review AGL(ACT)'s proposed Access Arrangement.

15.4.2 AGL(ACT)'s proposal

In Section 3, Impost and other statutory charges[161], AGL(ACT) states that it will vary reference tariffs in respect of:

- the introduction of new or increased imposts
- the imposition of the goods and services tax.

AGL(ACT) states that it will pass on to customers the benefits of any reductions in imposts. Similarly, if there is an identifiable reduction in the cost to AGL(ACT) of goods and services, AGL(ACT) will pass through to users the benefit of that reduction. The amount of the reduction will be supervised by the ACCC.

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160 ACTEW Corporation, Submission, 26 March 1999, p 3.

161 AGL(ACT), *Access Arrangement for ACT, Queanbeyan and Yarrowlumla Network*, 5 January 1999, p 24.

15.4.3 Public submissions

No public submissions have been received on this issue.

15.4.4 Commission's assessment

Although noting the ACCC's responsibility in respect of the goods and services tax, the Commission maintains that it is responsible for approving reference tariffs including any pass through of taxes or other statutory charges included in reference tariffs.

This issue was recently examined by IPART in respect of Great Southern Network's, Albury Gas Company's and AGLGN's Access Arrangements. IPART permitted the pass through of these costs subject to it having some discretion in respect of changes in the level of any new government charges, fees or taxes. In these decisions, the service provider is required to apply to IPART, proposing the change. An independent auditor may be appointed by the Tribunal to ascertain the impact on reference tariffs.

The Commission considers that a similar arrangement should also apply to AGL(ACT).

The Commission has noted recent press articles regarding a proposed joint venture between ACTEW and AGL.[162] Included in this arrangement is a proposal by AGL to build a 90MW gas-fired power plant. This may have a significant impact on network volumes and reference tariffs in the ACT system. In regard to this proposal, the Commission has requested the following information:

- What is the timing of the construction of the proposed gas-fired power plant?
- Will the gas-fired power plant be supplied from the network?
- What is the size of the gas-fired power plant as a percentage of contract and total load for the ACT system?

The Commission has received information in response to this inquiry from AGL(ACT) in a commercial-in-confidence form.

Nonetheless, there is obviously some market uncertainty regarding the cogeneration plant. The issue is whether this needs to be taken into account in the Access Arrangement. For example, the use of a trigger or a benefit sharing mechanism could be incorporated to recognise increased load volumes resulting from this project. The Commission invites comments on this issue. The Commission's final decision on this issue will be incorporated in its final decision.

[162] For example, the Australian Financial Review, Tuesday 7 December 1999, p 7.

Draft decision

Amendment 15 - Variations in reference tariffs

AGL(ACT) is required to amend Section 3 of the proposed Access Arrangement, 'Impost and other statutory charges', to include statements to the following effect:

AGL(ACT) may vary the reference tariffs from time to time, arising from any change in the level of any government charges or statutory fee or tax, and/or the introduction of new charges (eg the Goods and Services Tax). The statement must indicate that:

(i) AGL(ACT) is required to make application to the Commission proposing a revision to the Access Arrangement to reflect the change

(ii) the Commission has the discretion to appoint an independent auditor to ascertain the impact on reference tariffs. The approval of a change in reference tariffs will be based on the Commission's review of the independent auditor's advice

(iii) any burden or benefit of any adjustment to the reference tariffs to which AGL(ACT) is entitled will be allocated on the same basis as AGL(ACT) allocated the relevant costs or similar costs to develop the reference tariff or in the manner prescribed by law.

16 DEMAND FORECASTS

16.1 Code requirements

Section 8.46 of the Code sets out the objectives to be achieved in designing an incentive mechanism. Section 8.2(e) of the Code requires that the regulator be satisfied that:

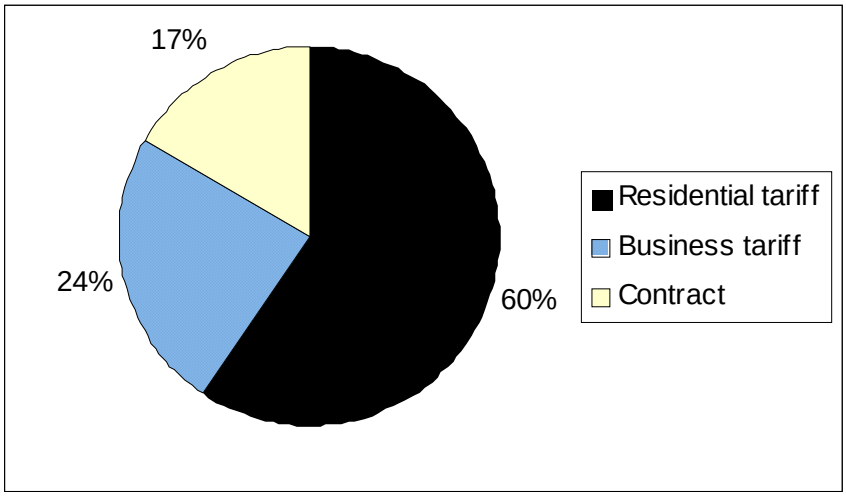
> … any forecasts required in setting the Reference Tariff represent best estimates using a reasonable basis.

16.2 AGL(ACT)'s proposal

Although the RAAI includes estimates of customer numbers, volumes and capacity, no information has been provided publicly on the methodology used by AGL(ACT) to derive these estimates.

AGL(ACT)'s demand forecasting methodology is similar to that used by AGLGN in NSW. The methodology is divided into three main sectors: contract, business tariff and residential tariff. The contribution of these markets to total gas demand in the ACT is illustrated in Figure 16.1 below.

Figure 16.1 Composition of gas demand on AGL(ACT)'s network (by volume) – 1998/99[163]



Source: AGL(ACT).

Contract market

Contract customers in the ACT are predominantly commercial and government buildings, hospitals, universities and hotels. There are no heavy industrial customers. AGL(ACT) states that since 1989 there has been a steady decline in contract demand due to the closure of some commercial buildings and the development of energy efficiency programs in government and commercial buildings. Expecting this trend to continue, it has forecast a steady decline in volume over the period of the Access Arrangement.

163 Actual.

Table 16.1 Contract volume

Year ending June	1995	1996	1997	1998	1999 forecast	1999 actual	2000 Year 1	2001 Year 2	2002 Year 3	2003 Year 4	2004 Year 5
Volume (TJ)	1,135	1,170	1,111	1,018	1,068	1,000	1,063	1,057	1,052	1,047	1,042
Change	*-11.5%*	*3.1%*	*-5.0%*	*-8.4%*	4.9%	*-1.8%*	*6.3%*	*-0.6%*	*-0.5%*	*-0.5%*	*-0.5%*
MDQ (TJ)					5.610		5.610	5.527	5.445	5.365	5.286
Change							*0%*	*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*

Source: AGL(ACT).
Note: MDQ data is forecast based on the assumption that all customers will switch from ACQ to MDQ contracts.

AGL(ACT)'s actual contract volume in 1998/99 was 1,000TJ. This was 6.8 per cent lower than its original contract volume forecast for that year of 1,068TJ. It should be noted that forecast volumes for the Access Arrangement period were made in December 1999, and are based on the forecast value for 1998/99. MDQs have been estimated by AGL(ACT) to decline by 1.5 per cent per annum based on the assumption that customers moving to MDQ contracts will significantly improve their demand management.

Contract market methodology[164]

Currently, there is no MDQ pricing available to contract customers. The methodology adopted by AGL(ACT) takes account of a potential change in customer behaviour. It is assumed that ACQ customers switching to MDQ tariff arrangements will adjust their operations to minimise their maximum daily demand for network capacity. AGL(ACT)'s methodology is summarised as follows:

1. 45 per cent of the contract load in the ACT is metered daily and the 1997/98 data is assumed to be representative of the total load
2. the ninth highest daily demand for each of the metered sites was assumed to be the ACQ to be contracted (this is the same methodology used by AGLGN in NSW)
3. for non-metered sites, the ACQ and MDQ estimates for the metered sites were used to calculate an average load factor of 54.11 per cent. This load factor was applied to the ACQs of the non-metered sites to calculate their MDQs
4. AGL(ACT) has estimated MDQ to decline at 1.5 per cent per annum.

16.2.1 Tariff market

Residential tariff market

AGL(ACT) has experienced strong growth in its residential tariff market since natural gas was first supplied in 1982. This trend is generally expected to continue. However, the rate of growth is expected to slow. Eighty-eight per cent of ACT urban areas are now reticulated (ie gas pipelines run along 88 per cent of ACT streets). Of this market, AGL(ACT) has achieved a penetration rate of 61 per cent (this represents 'on line of main' penetration).[165] This yields total market penetration of 54 per cent (ie 0.88 times 0.61 equals 0.54).[166] AGL(ACT) considers this level of penetration to approach 'saturation'.[167] The Commission

164 Outlined by ACIL Consulting's Review of AGL(ACT)'s Gas Demand Forecasts, July 1999.
165 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 25.
166 AGL(ACT), Presentation at Public Hearing, 11 May 1999.
167 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 4.

notes that the percentage of households connected is relatively low compared to a state like Victoria with on line of main penetration of 90 per cent.[168]

Business tariff market

AGL(ACT) has forecast slow customer number growth and declining demand in the business tariff market over the period of the Access Arrangement. The RAAI attributes this to the transfer of some customers to the contract market, the contraction in the Commonwealth public service, and the continuing use of energy efficiency programs by the management of commercial buildings. AGL(ACT) notes that opportunities for growth in this segment of the market are also expected to diminish as penetration is also approaching 'saturation'.[169]

Tables 16.2 and 16.3 show past and forecast tariff customer numbers and volumes respectively.

Table 16.2 Tariff market customer numbers

Year ending June	1994	1995	1996	1997	1998	1999	2000 Year 1	2001 Year 2	2002 Year 3	2003 Year 4	2004 Year 5
Residential tariff	49,974	55,043	60,918	65,374	70,232	74,220	77,619	81,028	84,174	86,859	89,089
Business tariff	1,542	1,672	1,725	1,820	1,891	1,923	1,989	2,026	2,055	2,079	2,098
Total tariff	51,516	56,715	62,643	67,194	72,123	76,143	79,608	83,054	86,229	8,938	91,187
% Net Growth		*10.1%*	*10.5%*	*7.3%*	*7.3%*	*5.6%*	*4.6%*	*4.3%*	*3.8%*	*3.1%*	*2.5%*

Source: AGL(ACT).

Table 16.3 Tariff market volume (TJ)

Year ending June	1994	1995	1996	1997	1998	1999	2000 Year 1	2001 Year 2	2002 Year 3	*2003 Year 4*	*2004 Year 5*
Residential tariff	2,197	2,625	2,694	3,016	3,267	3,581	3,687	3,875	4,050	4,208	4,343
Change		19.5%	2.6%	12.0%	8.3%	9.6%	3.0%	5.1%	4.5%	3.9%	3.2%
Business tariff	1,289	1,357	1,382	1,379	1,347	1,430	1,294	1,260	1,233	1,215	1,206
Change		5.3%	1.8%	-0.2%	-2.3%	6.2%	-9.5%	-2.6%	-2.1%	-1.5%	-0.7%
Total tariff	3,486	3,982	4,076	4,395	4,614	5,010	4,981	5,135	5,2843	5,424	5,549
Change		14.2%	2.4%	7.8%	5.0%	8.6%	-0.6%	3.1%	2.9%	2.7%	2.3%

Source: AGL(ACT).
Note:
1. Totals may not add, due to rounding.
2. Forecast numbers for 2000-2004 have been made by AGL(ACT) based on a forecast number for 1998/99, not the actual 1998/99 result.

Tariff market volume is forecast to grow by approximately 11 per cent over the period of the Access Arrangement.

168 AGL(ACT), *RAAI for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 25.

169 AGL(ACT), *Revised Access Arrangement Information for ACT, Queanbeyan and Yarrowlumla Network*, 15 February 1999, p 4.

Residential tariff market methodology[170]

AGL(ACT) has segmented its growth projections for the residential tariff market into the following categories:

- existing customers
- electricity to gas line of main (E-G LOM) customers
- project areas
- new homes line of main (NH LOM) customers
- new homes new estates (NH NE) customers.

Forecasts for each of these market segments are based on historical data.

Business tariff market methodology[171]

AGL(ACT) has segmented its business tariff growth projections into industrial and commercial areas. Customer numbers and load for the industrial and commercial sectors have been based on historical data for the years 1994-1998.

16.3 Public submissions

No public submissions on this issue have been received.

16.4 Commission's assessment

Growth assumptions are integral to an Access Arrangement because forecast demand is used to derive reference tariffs from allowed revenue. The costs of providing gas transportation services are largely fixed. Therefore, the number of units from which those costs are recovered will affect the price of each service.

During the period of an Access Arrangement, the price is set and the service provider bears the volume risk.[172] 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 may have 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 which 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, and prospects for future market development.

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170 Outlined in Arthur Andersen, *Review of Financial and Valuation Models prepared by AGL Gas Company (ACT) Limited* September 1999, pp 26-28.

171 Arthur Andersen, *Review of Financial and Valuation Models prepared by AGL Gas Company (ACT) Limited,* September 1999, pp 26-28.

172 Subject to any volume trigger or risk sharing mechanism incorporated in the Access Arrangement.

Revenue earned by AGL(ACT) must be consistent with the revenue requirement set by the Commission in its draft decision. To ensure this, the Commission must be satisfied that any forecasts required in setting the reference tariff represent best estimates arrived at on a reasonable basis. The key issues in relation to growth forecasts are therefore:

- the methodology used to determine the forecasts
- the reasonableness of the forecasts.

The Commission engaged ACIL Consulting to assess and review the methodology and estimates proposed by AGL(ACT) in its Access Arrangement. ACIL reviewed past results and future growth projections. ACIL noted the difficulty in assessing the reasonableness of forecast data given the lack of separate data for gas demand in the ACT.

ACIL's findings[173]

Contract market

ACIL understands that almost all contract customers will have MDQ contracts. ACIL also notes that despite the fact that there are only 41 contract customers, they have not been surveyed to ascertain their future demand intentions. To this extent, ACIL indicated that the forecasts made by AGL(ACT) are likely to be unreliable.

AGL(ACT)'s forecasts result in an overall level of contract gas demand in 2003/04 which is almost 20 per cent below that of 1993/94, despite the fact that the number of customers is forecast to have increased by 10 per cent. ACIL concludes that in the absence of a substantive explanation of the factors driving this outcome, it cannot verify the reasonableness of the forecast. The contract market methodology should be adjusted to reflect factors in the ACT rather than relying on the general NSW methodology.

Business tariff market

ACIL comments that the business tariff market exhibits historical volatility with gas demand ranging from an increase of 5.3 per cent in 1994/95 to a decrease of 2.3 per cent in 1997/98. ACIL concludes that in the absence of an explanation for this volatility, and for the very significant fall in average consumption ranging between –1.3 per cent and –6 per cent, it is difficult to make sound forecasts.

The combination of AGL(ACT)'s methodology and assumptions will result in business tariff gas demand falling 6.4 per cent between 1993/94 and 2003/04 while customer numbers grow by 150 per cent.[174] ACIL comments that it is difficult to conclude that this outcome is reasonable.

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173 The ACIL report can be obtained from the Commission or the Independent Pricing and Regulatory Tribunal's web page *www.ipart.nsw.gov.au*

174 The figure of 150 per cent has been quoted by ACIL in its report. Figures from AGL(ACT) indicate that customer numbers have increased by 36 per cent. The Commission is checking the figure supplied by ACIL.

Residential tariff market

In contrast to the contract and business tariff markets, AGL(ACT) forecasts steady (but declining in rate from the third year of the Access Arrangement) growth in the residential market. ACIL outlines the drivers behind the lower forecast growth rates as:

- significantly lower growth in line of main connections (falling from over 3,000 per annum to less than 1,400 by the end of the period)
- lost connections assumed to be 1 per cent per annum (approximately 700 per annum) based on NSW experience
- lower growth in new dwelling construction based on BIS-Shrapnel forecasts.

ACIL concludes that AGL(ACT)'s forecast is conservative.

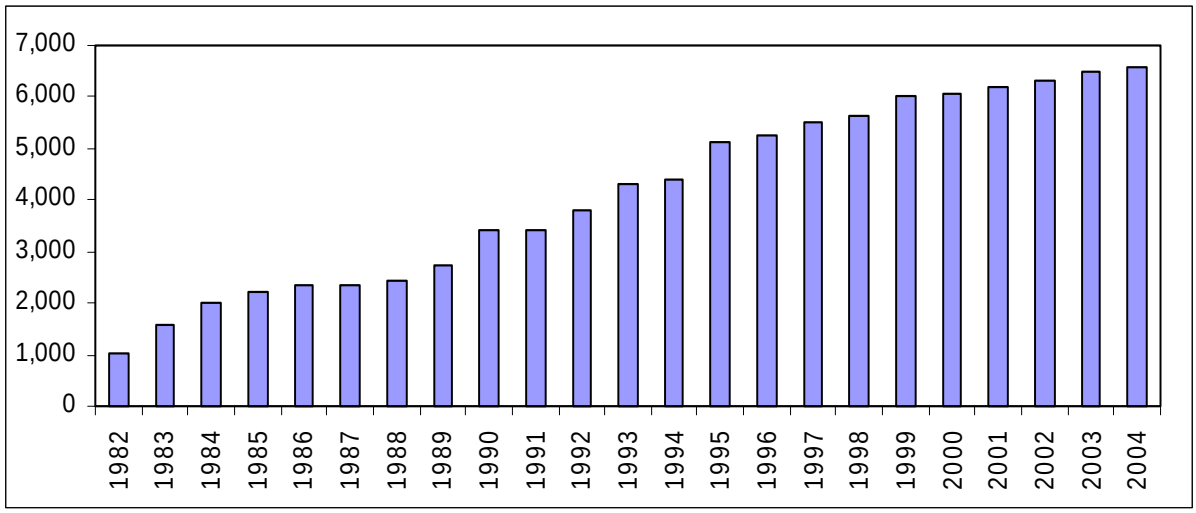
Overall ACIL assessment

ACIL concludes that AGL(ACT)'s forecasts are likely to underestimate demand. This conclusion is founded on the fact that AGL(ACT) does not appear to have undertaken a separate, in depth analysis of the forces driving demand in the ACT market. As such, existing forecasts are unlikely to be the best achievable.

Commission analysis – total market volume

The overall trend for growth in natural gas demand from all AGL(ACT) customers has been one of consistent increase since supply began in the early 1980s. Figure 16.2 below illustrates this:

Figure 16.2 Trend analysis – total market volume in TJ (1982 – 2004)

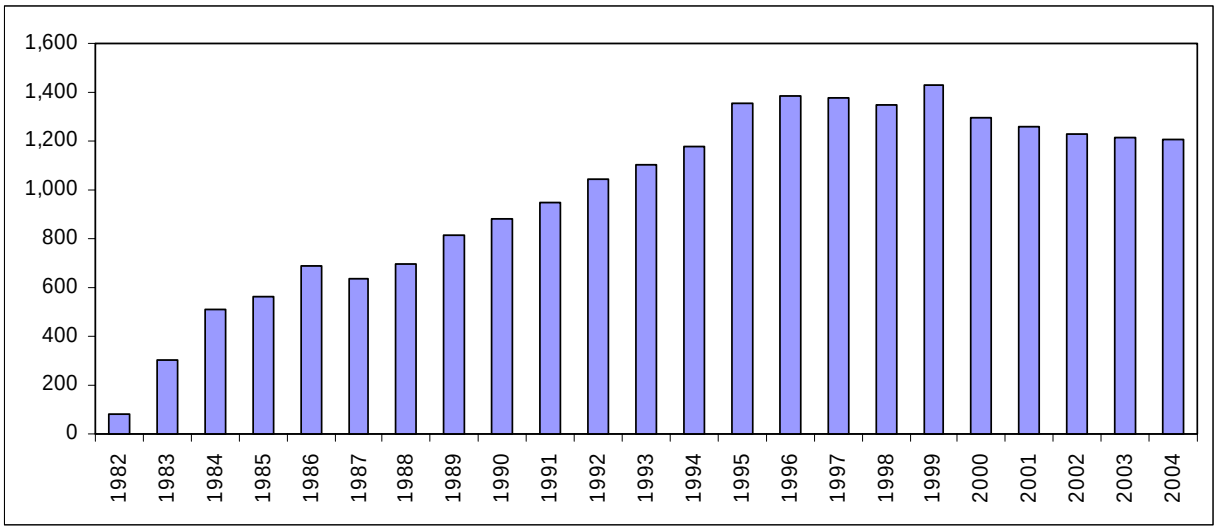


Note: 1982 -1994 volumes exclude Queanbeyan.

Commission analysis – business tariff market

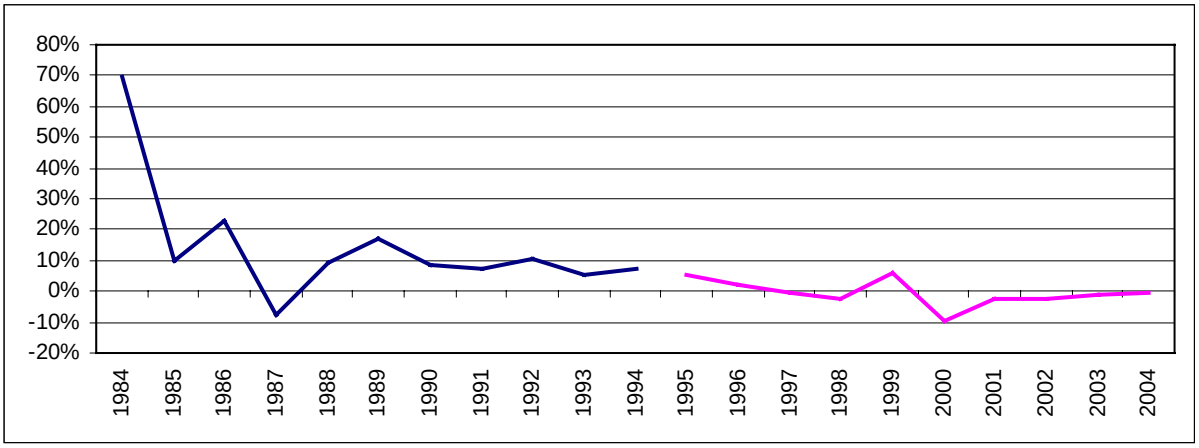
The business tariff market accounts for 24 per cent of total demand. The Commission has separately considered the trend for demand in the business tariff market over past years, and forecasts for the Access Arrangement period. The rate of growth in this market segment has trended downwards over the past few years, with negative growth rates experienced in 1997 and 1998. The trends for volume and growth rates are illustrated in figures 16.3 and 16.4 respectively:

Figure 16.3 Trend analysis – business tariff market volume in TJ (1982 – 2004)



Note: 1982 -1994 volumes exclude Queanbeyan.

Figure 16.4 Business tariff load growth rate (%) 1984 – 2004



Note: 1984 -1994 growth rates exclude Queanbeyan.

Volume data (and hence, growth rates) for the business tariff market exhibits some volatility. With the exception of one year (1987), the overall yearly trend for volume between 1982 and 1996 in this market was one of steady increase. AGL(ACT) forecasts that the declining demand trend from 1996/97 will continue over the period of the Access Arrangement.

The Commission notes the ACT's climate and the changing nature of the ACT economy as having influenced the pattern of gas demand in this market. The Commission appreciates that business demand for gas in the ACT is a function of the size, structure and historical aspects of the ACT economy. In 1983 public administration and defence, general government, education, and health and community services sectors accounted for 55.5 per cent of the ACT's gross state product. By 1996 this had declined to 43.3 per cent.[175]

175 ACT Government Budget Overview, 1997/98.

Whilst the public sector remains significant in the ACT economy, the diversification of activity away from this sector should make the economy less vulnerable to changes in Commonwealth budget policies. The ACT Government's economic policy is focused on initiatives aimed at encouraging investment by business and the residential sector. One such initiative, the ACT Business Incentive Scheme, is designed to create new jobs and support the private sector by providing a range of incentives for relocation, expansion or new business activity in the ACT. Another initiative, the Regional Economic Centre Policy, aims to promote and enhance Canberra's role as the economic centre of the south-east region of NSW, servicing a population of over half a million. These policies should stimulate both residential and commercial activity and thus, the demand for competitively priced energy sources.

The Commission believes there is sufficient potential for growth in the ACT business segment to warrant more robust demand forecasts. This growth is likely to be further encouraged by competition and lower prices.

AGL(ACT)'s business tariff volume forecasts are largely based on historical data, and appear conservative even on this basis. The Commission does not accept the business tariff market forecasts proposed by AGL(ACT). The variability of business tariff demand limits the applicability of forecasting based on historical trends only. Greater analysis identifying factors influencing the market needs to occur, so that these can be included in forecasts.

The ACIL report reaches similar findings.

For the four years leading up to the Access Arrangement (ie up to 1998/99), the business tariff market grew at an annual average rate of 1.3 per cent. Within this period, annual growth rates ranged from -0.2 per cent to 6.2 per cent. Importantly, the highest annual growth rate of 6.2 per cent over this period was experienced in 1998/99. For the five years to 1994, an annual average growth rate of 7.8 per cent was achieved.

In contrast, AGL(ACT) has forecast an annual average growth rate of -3.3 per cent. AGL(ACT) forecast business tariff demand to fall sharply in the first year of the Access Arrangement (-9.5 per cent), with the magnitude of annual decreases falling over the remainder of the period.

The Commission considers higher business tariff market growth to be reasonable. The Commission has forecast what it considers to be reasonable growth rates, taking into account factors such as historical data, and the likely effects of price decreases and competition on consumption. The business tariff market grew by 6.2 per cent in 1998/99, sharply reversing a slowing growth rate over recent years. Further, over the ten years to 1998/99, annual average growth was 5.8 per cent for the business tariff market.[176] Combined with ACT Government policy encouraging business investment, the Commission believes these factors warrant stronger business tariff market growth relative to AGL(ACT)'s forecasts.

[176] The inclusion of Queanbeyan consumption numbers from 1995 onwards has a marginal impact on this calculation.

AGL(ACT) is expected to amend its Access Arrangement consistent with average annual growth of 2.0 per cent for the business tariff market. This is illustrated in table 16.4 below:

Table 16.4 Business tariff market volume (TJ) – Commission's requirement

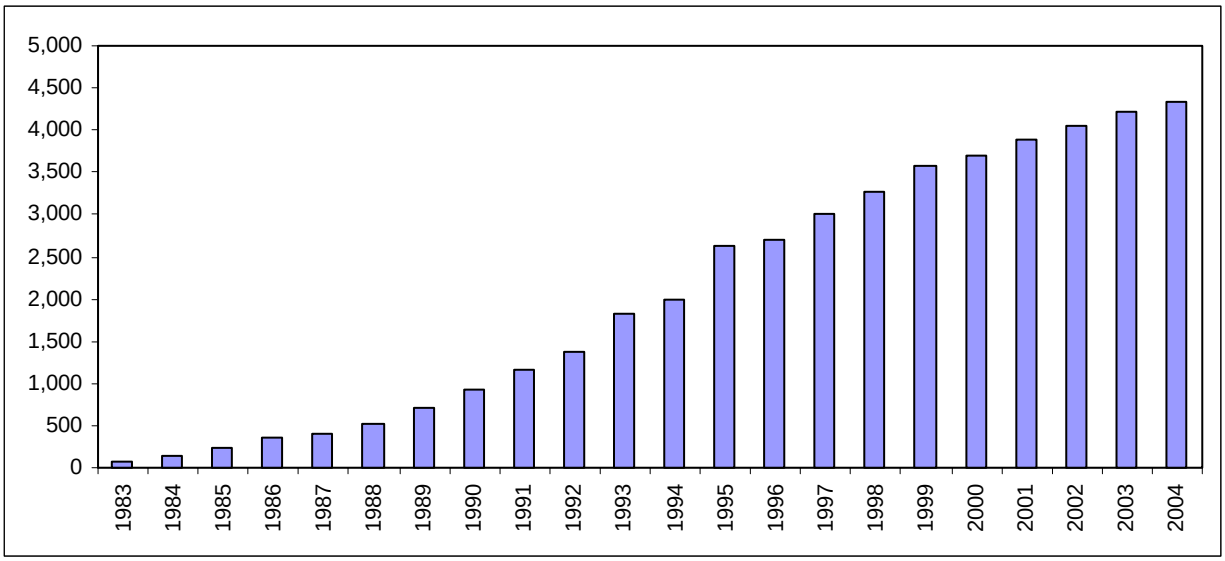
1999	2000	2001	2002	2003	2004
1,430	1,459	1,488	1,518	1,548	1,579

Note:
1. Figures are for year ending June.
2. Figure for 1999 is actual.

Commission analysis – residential tariff market

The residential tariff market accounts for the largest component of natural gas demand in the ACT, representing 60 per cent of total market demand. The Commission has separately considered the trend for demand in the residential tariff market in past years and over the Access Arrangement period as illustrated below:

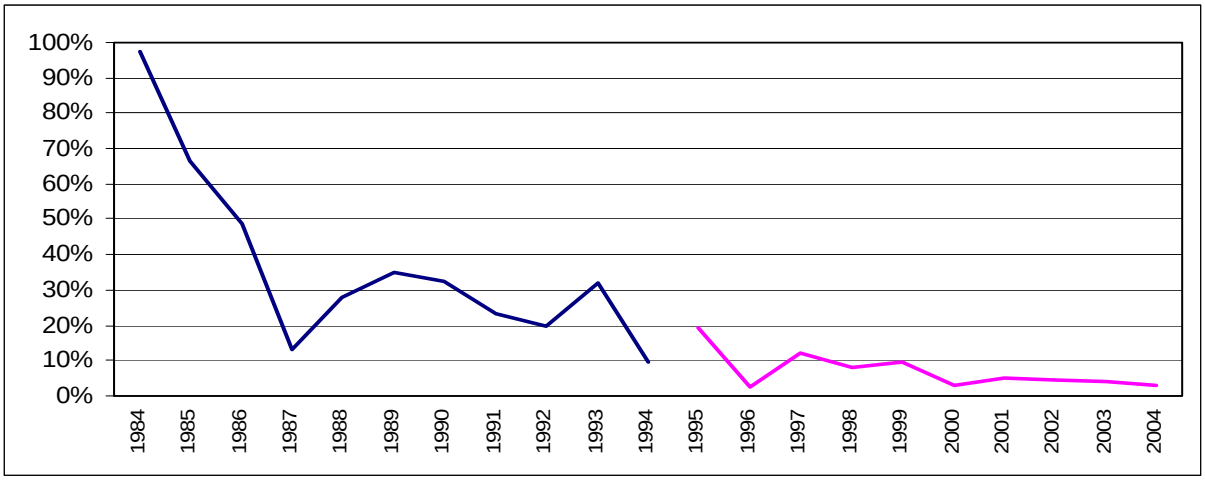
Figure 16.5 Trend analysis – residential tariff market volume in TJ (1983 – 2004)



Note: 1983 -1993 volume numbers exclude Queanbeyan.

There has been strong growth in the residential tariff market since the ACT was first reticulated in the early 1980s. While market penetration has increased since first supply, the annual growth rate has slowed. This is apparent in figure 16.6, which graphs the growth rate for residential tariff market load from 1984 to 2004:

Figure 16.6 Residential tariff volume growth (%) 1984 – 2004



Note: 1984 -1994 growth rates exclude Queanbeyan.

Between 1996 and 1999, residential tariff volume growth ranged between 2.6 per cent and 19.5 per cent, with an annual average growth rate of 10.0 per cent. For the five years to 1999, annual average growth was 8.1 per cent. For the five years to 1994, annual average growth was 23.0 per cent. In contrast, AGL(ACT) has forecast growth for the five years to 2003/04 to range from 3.2 to 5.8 per cent. This translates into an annual average growth rate of only 3.9 per cent.

The Commission agrees with ACIL's observation that AGL(ACT)'s methodology for the residential tariff market results in conservative load demand forecasts. This may be partly attributable to the application of AGLGN's NSW assumptions and methodology, which are not necessarily relevant in the ACT residential market.

The Commission considers higher residential tariff market growth to be reasonable. AGL(ACT)'s forecast growth is considerably lower than that achieved over recent years.

Between 1994/95 and 1998/99, residential tariff volume growth ranged between 2.6 per cent and 19.5 per cent, with an annual average growth rate of over 10.0 per cent. For the five years to 1999, annual average growth was 8.1 per cent. For the five years to 1994, annual average growth was 23.0 per cent. These factors, combined with the relatively cool climate in the ACT suggest that higher growth rates than AGL(ACT) has proposed are achievable. AGL(ACT) has forecast growth for the five years to 2003/04 to range from 3.2 to 5.8 per cent. This translates to an annual average growth rate of only 3.9 per cent.

AGL(ACT) will be required to amend its Access Arrangement consistent with annual average growth of 8 per cent for the residential tariff market. This is illustrated in table 16.5 below:

Table 16.5 Residential tariff market volume (TJ) – Commission's requirement

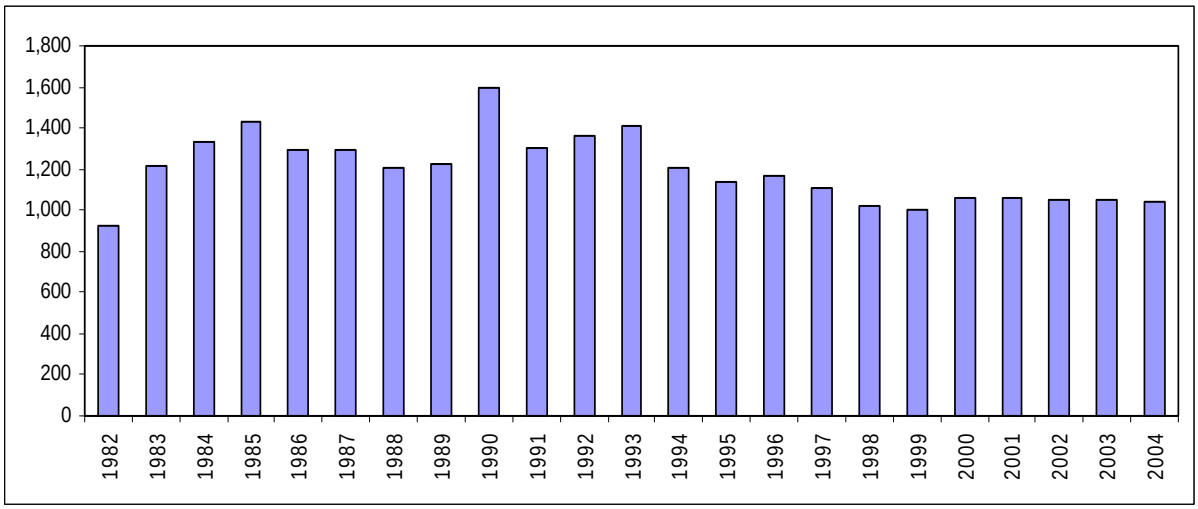
1999	2000	2001	2002	2003	2004
3,581	3,867	4,177	4,511	4,872	5,262

Note:
1. Figures are for year ending June.
2. Figure for 1999 is actual.

Commission analysis - contract market

The contract market accounts for approximately 17 per cent of total gas demand in the ACT. The Commission has considered the long term trend of contract market volume. Figure 16.7 indicates a declining trend over time for contract market volume. Figure 16.8 illustrates the rate of growth over the period 1982 to 2004.

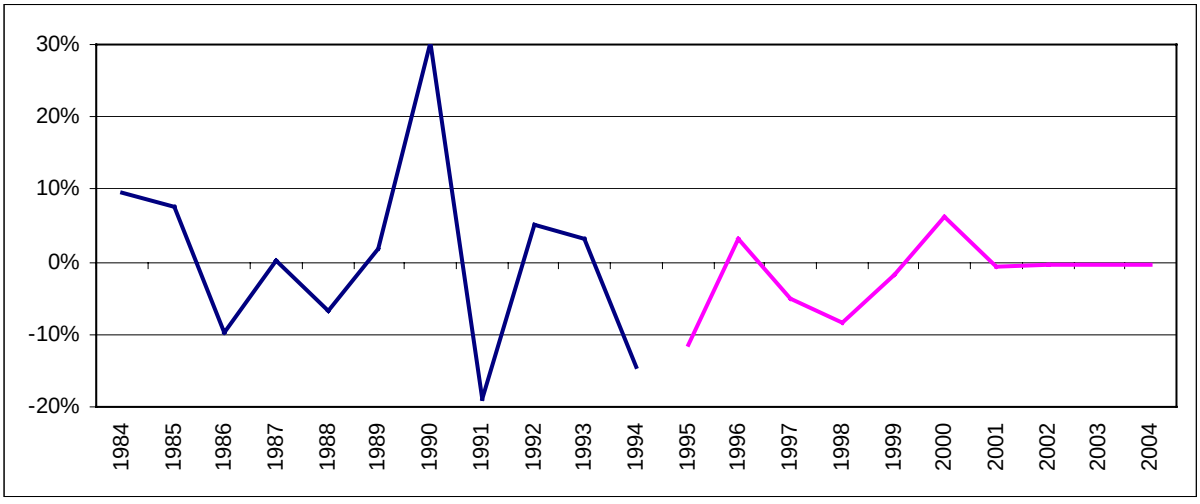
Figure 16.7 Contract market volume in TJ (1982 – 2004)



Note: 1982 -1994 volume numbers exclude Queanbeyan.

The factors contributing to the declining trend in contract volume include: government spending cuts, energy efficiency programs, and the use of AGL(ACT)'s growth forecasts in the analysis. Contract volume is expected to decline by approximately 0.5 per cent for each year of the Access Arrangement. At the same time, contract MDQs are forecast to fall by 1.5 per cent per year from 2000/01 to 2003/04 based on AGL(ACT)'s assumption of improved demand management by contract customers.

Figure 16.8 Contract market volume growth rate (1984 – 2004)



Note: 1984 -1994 growth rates exclude Queanbeyan.

For the five years to 1999, the contract market grew at an annual average rate of –4.9 per cent. At the time of preparing the proposed Access Arrangement, AGL(ACT) forecast a decline of 0.5 per cent per annum over the Access Arrangement period based on the forecast volume of 1,068TJ for 1998/99. Subsequently, an actual volume level of 1,000TJ was experienced.

Whilst the Commission appreciates the factors underlying the declining trend, it believes that the extrapolation of growth rates from past periods and prices is not necessarily appropriate for the forthcoming Access Arrangement period. Further, the EP draft report on AGL(ACT)'s proposal to connect to the EGP highlighted a recent request to AGL(ACT) for a new 200TJ per annum natural gas load associated with the ACT urban bus fleet.

The Commission is of the view that AGL(ACT) should provide greater explanation of its forecast volumes. Forecasts should also be revised to take into account the 1998/99 actual figure. The Commission agrees with the findings reached by ACIL. AGL(ACT) should provide adequate explanation of factors driving the contract market forecasts, and revise its methodology for the contract market to reflect factors in the ACT. This may include surveying contract customers on their expected future demand. Further, AGL(ACT) should revise its contract market forecasts to take account of gas load associated with the ACT urban bus fleet.

Empirical observations on gas demand forecasting

A recent study by ABARE reviews the current approach to demand forecasting. It comments on gas demand forecasting methodologies, in particular, the accuracy of using linear extrapolation as the basis for forecasting:[177]

> If a linear trend is used to forecast demand (as occurs in current approaches), and these forecasts underestimate actual demand growth, the revenue and profits of transmission and distribution companies are likely to be greater than forecast. The companies would then achieve a higher rate of return on assets than identified by the regulator as the rate commensurate with market returns and associated risk.

The ORG of Victoria undertook a review of demand forecasts in 1998.[178] This report also indicates that appropriate forecasting methodology should not be based solely on extrapolating recent trends and should take into account the pivotal role of prices and economic behaviour.

The study advocates a more inclusive approach which incorporates other relevant factors influencing gas demand:[179]

> Projections of gas demand generally rely on exogenous assumptions about changes in prices and rates of economic growth. They can also incorporate assumptions about changes in regulatory structures and technical change. If these assumptions are clearly specified and appropriate indexes for all variables are available, the gas demand projections produced offer useful information for the gas industry and for regulatory

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177 Harman, J and Anderson, J., *Gas demand forecasting and transmission and distribution tariffs,* ABARE Conference Paper 99.28, 28th Annual Conference of Economists, Melbourne, 26 September 1999, p 9.

178 Cited in Harman, J and Anderson, J., *Gas demand forecasting and transmission and distribution tariffs,* ABARE Conference Paper 99.28, p 3.

179 Harman, J and Anderson J, *Gas demand forecasting and transmission and distribution tariffs,* ABARE Conference Paper 99.28, 28th Annual Conference of Economists, Melbourne, 26 September 1999, p 10.

> bodies. Accurate long-term demand forecasts can also assist in longer term planning of capital investment…

Volume forecasts estimated by assuming a simple linear extrapolation of past trends may be practical and relevant in the short run, when gas demand is largely a function of established connections and usage patterns. However, using this approach in the long run is likely to ignore valuable information such as changing prices and the influence of competition.

The changing gas market

The Commission notes the construction of the Eastern Gas Pipeline (EGP) by Duke Energy International, which is expected to be operational by September 2000. The pipeline is planned to be laid approximately 30 kilometres east of the ACT and the surrounding areas. Subject to physical and commercial feasibility, a lateral to the EGP could be built, thus providing an alternative supply into the ACT network.[180] AGL(ACT) has proposed such a connection. If the new transmission pipeline owners and/or the new entrant retailers are successful in expanding the gas market in the ACT, this is likely to have an overall favourable effect on utilisation of AGL(ACT)'s distribution network.

The availability of gas from another source will facilitate the development of competition in the ACT gas market. Competition alone should put downward pressure on the price of gas. The Commission has also considered the likely impact of lower transport costs on demand. Although considerable debate surrounds the elasticity of demand in the tariff market, there is little debate that the take up and level of gas usage is sensitive to the delivered price of gas in the large user market. The transportation component of the delivered gas price is still a significant component of the delivered price. Reductions to this component in line with this draft decision are considerable, and should be expected to have an additional impact on the demand for gas in the ACT.

Other relevant considerations

The Commonwealth Department of Industry, Science and Resources engaged Allen Consulting and McLennan Magasanik Associates to review the impacts of energy market reforms on greenhouse gas (GHG) emissions. The report assesses fuel substitution, which has implications for future levels of natural gas demand:[181]

> A driving force of the GHG savings that were expected to flow from energy market reform was enhanced use of natural gas, mainly through the substitution of gas for coal or oil. The reforms had been widely expected to increase the relative attractiveness of gas over other fuels and result in increased energy market penetration by gas.

The report notes that although natural gas consumption is expected to account for about 28 per cent of Australian energy consumption by fuels in 2009-10, rising from around 17-18 per cent at present, the outlook has become more pessimistic:

> Recent data releases and anecdotal evidence indicates that there has been no growth in the market share for gas. In fact energy market reform has corresponded with a reduction, although overall gas usage has increased.

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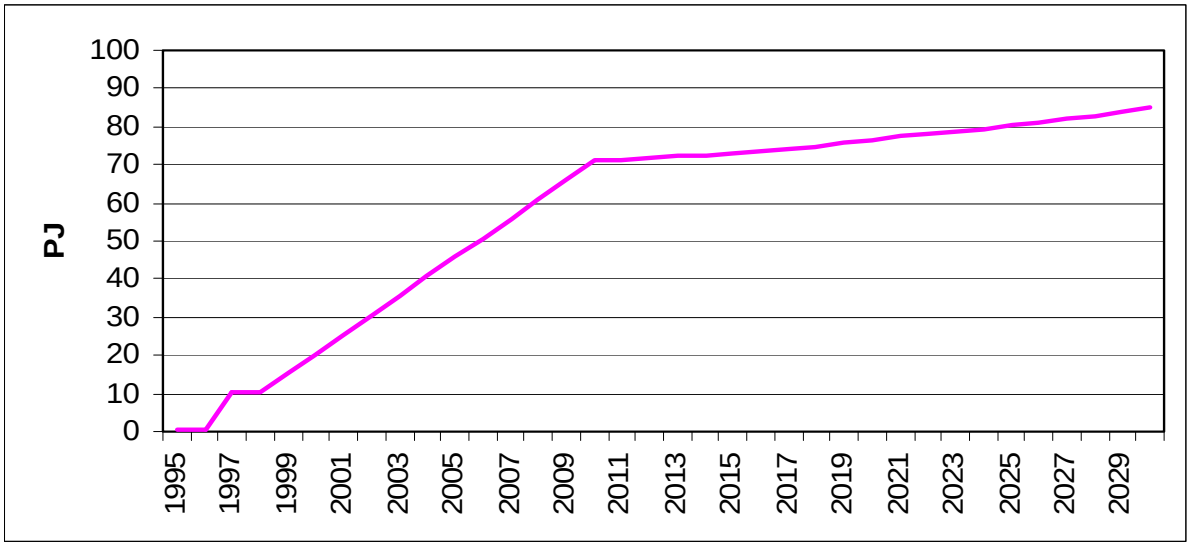
180 Esso Presentation at AGL(ACT) Public Hearing, 11 May 1999.

181 Allen Consulting and McLennan Magasanik Associates Pty Ltd, *Energy Market Reform and Greenhouse Gas Emission Reductions: A Report to the Department of Industry, Science and Resources*, March 1999, p 4.

Notwithstanding, the report considers there is considerable scope for growth in the use of gas for electricity generation. Figure 16.9 below illustrates the Australian Gas Association's long term projections for natural gas consumption for electricity generation in NSW and the ACT:

Figure 16.9 Projections for natural gas consumption for electricity generation in NSW and the ACT (PJ)



Source: AGA Modified Estimates in *Gas Supply and Demand Study* 1997.

The Commission believes that the gas fired power generation will strengthen growth in natural gas demand. However, it is difficult to gauge the probability of these projects going ahead in the period of the Access Arrangement, particularly in a relatively small market such as the ACT. The Commission notes the recent joint venture proposal between AGL and ACTEW, and the possible construction of a gas fired power plant. However, given the uncertainty of the timing and location of such projects, the Commission has not factored them into its consideration of growth forecasts. This scenario may support an assessment that contract market growth forecasts are conservative.

16.5 Commission's draft decision

The Commission has decided not to accept AGL(ACT)'s demand forecasts. This view is based on historical growth trends for AGL(ACT)'s market, the expected impact of competition and lower transport prices on demand, recent research on demand forecasting techniques, and ACT Government policies aimed at stimulating business activity. Before AGL(ACT)'s contract market forecasts are accepted, the Commission requires adequate explanation of factors driving the forecast outcomes. The forecasts should also be revised in light of the 1998/99 actual demand figure and ACIL's conclusions, which the Commission accepts. AGL(ACT) should revise its methodology for the contract market to reflect factors in the ACT. This may include surveying contract customers on their expected future demand. AGL(ACT) should revise its contract market forecasts to take account of gas load associated with the ACT urban bus fleet.

In relation to the business tariff market, the Commission requires AGL(ACT) to apply the demand forecasts given below. These assume an annual average growth rate of 2.0 per cent over the Access Arrangement period.

Although the general methodology for forecasting residential tariff demand has been assessed by ACIL as reasonable, the values forecast are conservative. The Commission requires AGL(ACT) to apply the demand forecasts given below. These assume an annual average growth rate of 8.0 per cent over the Access Arrangement period.

Amendment 16 – Demand forecasts

AGL(ACT) is required to amend its Access Arrangement and AAI to:

a) revise its contract market forecasts based on the actual 1998/99 figure and load associated with the ACT urban bus fleet

b) revise upwards its business tariff market forecasts consistent with the following figures:

Business tariff market forecasts (TJ)

1999	2000	2001	2002	2003	2004
1,430	1,459	1,488	1,518	1,548	1,579

Note:
1. Figures are for year ending June.
2. Figure for 1999 is actual.

c) revise upwards its residential tariff market forecasts consistent with the following figures:

Residential tariff market forecasts (TJ)

1999	2000	2001	2002	2003	2004
3,581	3,867	4,177	4,511	4,872	5,262

Note:
1. Figures are for year ending June.
2. Figure for 1999 is actual.

16.6 Commission's requirement

Requirement 3 – Demand forecasts

AGL(ACT) is required to:

a) provide an adequate explanation of factors driving the contract market forecasts, and revise its methodology for the contract market to reflect factors in the ACT

b) provide a satisfactory outline of its forecasting methodology in the Access Arrangement Information.

17 PRICE IMPACTS

17.1 Code requirements

In assessing a proposed Access Arrangement, section 2.24 of the Code specifies, amongst other matters, that the regulator must consider the interests of users and prospective users. Complying with this requirement, the Commission has undertaken a customer pricing impact analysis.

17.2 Pricing impact under AGL(ACT)'s proposal

AGL(ACT)'s Access Arrangement and AAI documents do not discuss the impact of its tariff proposal on customers. However, the RAAI does discuss the level of revenue to be collected from the contract and tariff market segments. In nominal terms, AGL(ACT) proposes to collect $2.5m from the contract market in years 1 to 3 of the Access Arrangement, and $2.6m in years 4 and 5. For the tariff market it proposes a steady increase over the period of the Access Arrangement, rising from $36.9m in year 1 to $43.3m in year 5.

17.2.1 Pricing impact analysis – contract market

Assessment of pricing impact under AGL(ACT)'s proposal

Average contract customer prices per GJ are forecast to increase under AGL(ACT)'s proposal. The table below shows the increase in average nominal prices from 1997/98 to 2003/04. It shows a significant price increase in 1998/99. AGL(ACT) has commented to the Commission that over this period, unit rates for delivered gas prices have not changed significantly. Rather, there has been a change in the notional allocation of revenue to the contract market. This change has resulted in higher revenues being allocated to the contract market (from $1.6m in 1997/98 to $2.3m in 1998/99).

Table 17.1 Average contract prices per GJ 1997/98 – 2003/04 under AGL(ACT)'s proposal

Average price ($/GJ)	1997/98[1]	1998/99[1]	1999/00	2000/01	2001/02	2002/03	2003/04
Nominal	1.57	2.30	2.35	2.37	2.38	2.48	2.50
Real (1999/00)		2.36	2.33	2.31	2.29	2.26	2.24

Note:
1. There are no network charges. These are notional estimates only.
2. Inflation assumption equals 2.5 per cent.

Prices are proposed to increase slightly in nominal terms over the period of the Access Arrangement. Between 1998/99 and 2003/04, the forecast average nominal increase in prices under AGL(ACT)'s proposal is 8.7 per cent, equivalent to an annual average increase of 1.7 per cent. This proposed increase in below the inflation rate. Hence real prices fall over the Access Arrangement period.

Distribution of price changes – 1998/99 vs 1999/00 (Year 1 of AGL(ACT)'s proposal)

AGL(ACT)'s proposed services policy introduces capacity based (MDQ) charging in the ACT. Prior to this, customers in the ACT paid a bundled price for transportation on AGL(ACT)'s network. Due to this change in price structure, the Commission is unable to conduct an analysis of the impact of the price change on individual contract customers. The above price analysis shows average results for contract customers (keeping in mind the change in the notional allocation of revenues to the contract market effects the results presented). The Commission's analysis extends to an indicative comparison of average prices per GJ under its draft decision and AGL(ACT)'s proposal. This is presented in section 17.3 below.

Capped customers

Under AGL(ACT)'s pricing proposal, there are two capped customers in the ACT. These customers account for 58.4TJ or 5.5 per cent of total contract market load in year 1 of the Access Arrangement period.

Table 17.2 below indicates the revenue shortfall from the capped customers:

Table 17.2 Capped customer revenue shortfall ($'000)

Capped customer reference revenue	Capped revenue	Shortfall	Contract revenue	Proportion of contract revenue
225	208	16	2,500	0.66%

Note: For year 1 of the Access Arrangement.

The shortfall above represents the difference between revenue that would have been generated from these customers had they paid the same reference price applicable to all customers, and the revenue actually generated under capped prices. The two capped customers have had their reference price capped by around 10 and 5 per cent respectively. The resulting shortfall represents 0.66 per cent of total contract revenue. AGL(ACT) has proposed that this shortfall be borne by the remaining customers. The increase in the reference price paid by the remainder of contract customers in the ACT is not significant.

17.2.2 Pricing impact analysis – tariff market

As presented in chapter 4, under AGL(ACT)'s proposal, tariff revenue is forecast to increase in nominal terms over the Access Arrangement period. Despite growing customer numbers, average prices per GJ for tariff customers are forecast to increase under AGL(ACT)'s proposal. However, it should be noted that this increase is below the inflation rate. The table below shows the increase in average nominal prices from 1997/98 to 2003/04:

Table 17.3 Average nominal tariff prices per GJ 1997/98 – 2003/04 under AGL(ACT)'s proposal

Average price ($/GJ)	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Nominal	6.65	6.67	6.91	7.01	7.12	7.23	7.33
Real (1999/00)		6.83	6.91	6.84	6.78	6.71	6.64

Note: Inflation assumption equals 2.5 per cent.

The average nominal increase for the tariff market between 1998/99 and 1999/00 is forecast to be 3.6 per cent. Between 1998/99 and 2003/04, nominal prices are forecast/proposed by AGL(ACT) to increase by 9.9 per cent, equivalent to an annual average increase of 1.9 per cent.

The above analysis presents a very broad indication of price impacts on tariff market customers from AGL(ACT)'s proposal. Given the relative share of the tariff market and the availability of information, the Commission has conducted a more detailed analysis of price impacts on tariff customers. This analysis has focused on the move from a choice of multiple tariff schedules to a single tariff schedule.

At present, four different tariff schedules are offered by AGL(ACT): the residential general rate, the residential economy rate, the residential economy plus rate, and the industrial and commercial tariff.

The price impact on individual tariff customers will depend on their consumption pattern and their existing tariff schedules. Residential customers currently on the general tariff will experience nominal network price reductions of between 2 and 16 per cent.

Residential customers currently on the economy class will experience nominal network price reductions of between 0 and 26 per cent for consumption up to 12TJ. Customers whose consumption levels are above 12TJ will face price nominal increases of between 4 and 6 per cent (up to 100TJ). Increases for some larger consumers range up to 12 per cent.

Residential customers currently on the economy plus tariff will experience nominal network price reductions of between 6 and 44 per cent for consumption up to 14TJ. Consumers with higher consumption levels will face increases of 2 to 7 per cent. Increases for some larger consumers range up to 12 per cent.

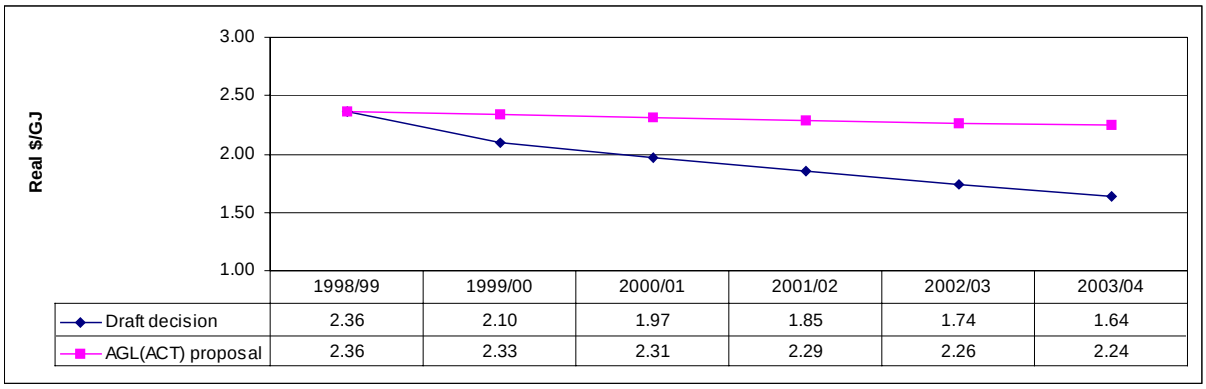
I&C customers consuming 1-70TJ will face nominal network price decreases under AGL(ACT)'s price proposal. These decreases will range from 1 to 49 per cent. I&C customers consuming over 85TJ will face nominal increases of up to 15 per cent. Price reductions apply again at 5,500TJ and above.

17.3 Indicative pricing outcomes under the draft decision

17.3.1 Average contract market prices under the draft decision

The Commission's draft decision on financial outcomes considers two separate scenarios: excluding and including the proposed interconnection with the EGP. Illustrated below are the outcomes excluding the interconnection. Under the Commission's draft decision, real contract market revenue will be reduced to $2.2m in 1999/2000. Over the period of the Access Arrangement, contract market revenue decreases gradually to $1.7m in 2003/04. Under the draft decision, it is expected that there will be an overall real price reduction of 31 per cent between 1998/99 and 2003/04. By comparison, under AGL(ACT)'s proposal, the overall real reduction is 5 per cent over the same period. Figure 17.1 compares average real prices under the Commission's draft decision with AGL(ACT)'s proposal.

Figure 17.1 Contract market network average price 1998/99 – 2003/04 AGL(ACT) proposal vs Commission draft decision (real 1999/2000 $/GJ)

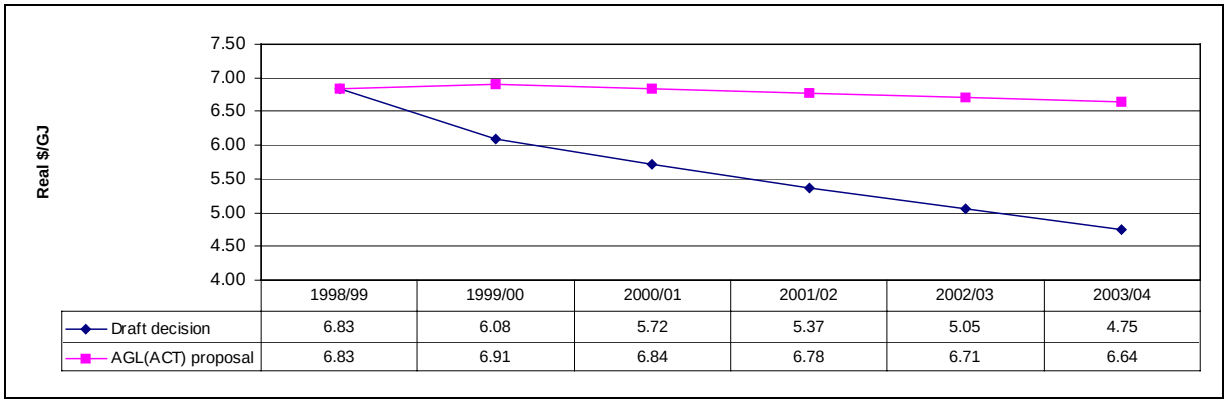


	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Draft decision	2.36	2.10	1.97	1.85	1.74	1.64
AGL(ACT) proposal	2.36	2.33	2.31	2.29	2.26	2.24

17.3.2 Average tariff market prices under the draft decision

Echoing the presentation for the contract market, illustrated below are the outcomes for the tariff market excluding the interconnection. The Commission has decided on a CPI-11 per cent price path for year 1 of the Access Arrangement, followed by a CPI-6 per cent price path for the remainder of the Access Arrangement period. Under the draft decision, it is expected that there will be an overall real price reduction of 30 per cent between 1998/99 and 2003/04. By comparison, under AGL(ACT)'s proposal, the total reduction is 3 per cent over the same period. Figure 17.2 below compares average real prices under the Commission's draft decision with those under AGL(ACT)'s proposal.

Figure 17.2 Tariff market network average price 1998/99 – 2003/04 AGL(ACT) proposal vs Commission draft decision (real 1999/2000 $/GJ)



	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04
Draft decision	6.83	6.08	5.72	5.37	5.05	4.75
AGL(ACT) proposal	6.83	6.91	6.84	6.78	6.71	6.64

PART V

CONTENT AND OPERATION OF THE ACCESS ARRANGEMENT

18 NON PRICING ISSUES

There are several paragraphs in this chapter where the Commission states there are no specific Code requirements which apply to the matters outlined in those paragraphs. The Commission considers section 2.24(g) of the Code entitles it to consider these matters.

18.1 Gas balancing

18.1.1 Code requirements

There are no specific Code requirements dealing with gas balancing arrangements.

18.1.2 AGL(ACT)'s proposal

AGL(ACT)'s gas balancing proposal is outlined in Schedule 2A, Part 2, of its proposed Access Arrangement for references services (with the exception of the tariff service).

The detailed procedures set out in the proposed Access Arrangement are not reproduced in this report. Put simply, they require users to stay in daily balance.[182] Where users are out of balance by more than 6 per cent, they are required to pay a gas balancing incentive charge. This charge increases progressively, the greater the imbalance. The net collections of gas balancing incentive charges are redistributed to the users in proportion to the users' input for the day (ie the collection of gas balancing charges is revenue neutral to AGL(ACT)). Users must endeavour to ensure that their monthly cumulative imbalances do not exceed 10 per cent of the average daily quantity.

All users whose services utilise any part of the trunk section constitute one group of users. For users not utilising the trunk, any two or more users who share a common receipt point constitute a group.

Users may trade their imbalances as a means of moving into balance.

Provisions dealing with gas balancing for the tariff service are outlined in Schedule 2C, Clauses 14-20. The costs of installing daily metering in this market segment are currently considered prohibitive. To support gas balancing and retail competition in the ACT, it will be necessary to develop procedures for estimating daily withdrawals by tariff customers. This form of estimation is often referred to as 'load profiling'. AGL(ACT) states in clause 17 of Schedule 2C that it intends to implement a tariff market daily load profiling system[183] that will enable the daily allocation of tariff market volumes to be estimated.

The proposed gas balancing arrangements in NSW and the ACT are essentially the same.

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182 The imbalance is measured by comparing the user's actual/allocated input to the network on the day with the user's aggregate quantity withdrawn from the network for the day, adjusted for any change in the user's allocation share of linepack in the network.

183 AGL(ACT) expects this system to be operational by July 2000.

18.1.3 Public submissions

AGL(ACT)'s proposed balancing procedures have been criticised as being overly complex compared to other jurisdictions. For example Esso Australia states:[184]

> … daily allocation and gas balancing procedures appear unnecessarily complicated, provide incorrect incentive, and may under certain circumstances favour large users over small.

Esso also expresses concern that balancing takes place at individual customer sites rather than being aggregated at retail level. The Commission believes that this concern is due to a misunderstanding of how the market operates. Retailers can aggregate sites for the purpose of gas balancing.

ACTEW has similar concerns to those of Esso and suggests there may be merit in a transitional period where no charges apply but imbalances are monitored.[185] Essentially, this would provide new retailers with experience in this area.

BHPP believes AGL(ACT)'s gas balancing provisions are unnecessarily complex and imposes onerous penalties. BHPP states that the proposed arrangements are unlike any others in Australia and are, in effect, a real barrier to entry for new gas suppliers, users and retailers.[186]

In a submission dated 18 June 1999, AGL(ACT) acknowledges at least a 'perceived' complexity with its proposed gas balancing arrangements. To improve clarity, the concepts of allocation / apportionment, system gas balancing and participant gas balancing could be separated in the Access Arrangement.[187]

18.1.4 Commission's assessment

Gas balancing is required for two purposes:

- operational / system balancing
- participant balancing.

Operational balancing is required to maintain sufficient pressure in the network to ensure safe and reliable supply to all users. Participant balancing is action taken by users to manage their daily and cumulative imbalances and to foster upstream gas trading in imbalances. Gas balancing also involves actions taken by network operators to determine imbalances and provide incentives designed to encourage users to maintain their imbalances within allowable tolerances.

In NSW, the Ministry of Energy and Utilities (MoEU) has established a Gas Retail Project to facilitate the introduction of full retail competition. As part of this process, a working group is examining the existing and proposed gas balancing arrangements. Preliminary findings suggest that daily balancing is required on AGLGN's system but whether gas balancing incentive charges should apply on a daily basis is still being reviewed. However, AGLGN's

184 Esso Australia Ltd, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 1.
185 ACTEW, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999 pp3-4.
186 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999 p 12.
187 AGL(ACT) submission dated 18 June 1999, p 23.

specific gas balancing arrangements are considered unsuitable. There would be no circumstances in which a single large user would face net balancing incentive charges. That is, after the redistribution of incentive charges for balancing, large users[188] would always be in net receipt of fees collected and would have no incentive to balance. In NSW, AGLGN has acknowledged this unintended bias in the current arrangements.

The proposed gas balancing arrangements in NSW and the ACT are essentially the same. Taking account of the above findings, the Commission concludes that AGL(ACT)'s proposed balancing procedures are not conducive to competition. They appear to benefit incumbent AGL retailers at the expense of new entrants to the market.

As a consequence, the Commission believes there is a need to fundamentally change the proposed gas balancing arrangements. The Commission believes that the balancing arrangements should be redesigned to ensure:

- a sufficient level of incentives to maintain safe and reliable operation of the AGL(ACT) system
- equitable treatment of all users (irrespective of size)
- no artificial barriers to entry
- risks can be managed and/or can be allocated appropriately
- procedures can be readily understood and cost of administration to the network and the user is appropriate
- market solutions are fostered to the greatest possible extent.

To improve clarity, the Commission requires the separation of the allocation/apportionment, operational gas balancing and participant gas balancing processes within the Access Arrangement.

The Commission is monitoring developments in NSW regarding the development of a load profiling system. The NSW gas distribution networks, in conjunction with the Gas Retail Project, are proposing to conduct a major consultancy to examine load profiling options for the NSW market. Based on this consultancy, recommendations will be made on the form of load profiling/reconciliation system(s) that should be adopted for the NSW market. AGL(ACT)'s proposed revisions will need to take account of the load profiling system(s) being recommended for NSW. If appropriate, it would be desirable for consistency, for similar systems to operate in the ACT and NSW.

The Commission believes that to address the lack of gas balancing experience by users and to take account of the complexities of these procedures, it may be appropriate to adopt a transitional approach. For example, balancing incentive charges could be reduced for a period of 12 months.[189] A 12 month period is proposed because of:

- the current limited amount of competition
- the current lack of mechanisms to foster trading.

188 The associated AGL retailers.

189 The Commission believes that this will be necessary, even when taking into account other changes to the gas balancing procedures required by the Commission.

Amendment 17 – Gas balancing

AGL(ACT) is required to amend Schedule 2A, Part 2, Gas Balancing and Schedule 2C, Clauses 14-20 by:

- redrafting the provisions to indicate clearly that sites can be aggregated for the purpose of balancing on the network
- redrafting the provisions to separate the allocation/apportionment, operational gas balancing and participant gas balancing processes
- changing the gas balancing procedures so that the following criteria are met:
  - the level of incentives is sufficient to ensure safe and reliable operation of the AGL(ACT) system
  - all users irrespective of size are treated equitably
  - no artificial barriers to entry
  - risks can be managed and/or can be allocated appropriately
  - procedures can be clearly understood and cost of administration to the network and the user is appropriate
  - market solutions are fostered to the greatest possible extent
- adopting a transitional approach with reduced balancing incentive charges for the first 12 months of the new Access Arrangement period. The level of reduction will depend on the complexity of the new gas balancing procedures to be proposed by AGL(ACT)
- developing load profiling/reconciliation systems for tariff customers which take into account the development of these systems in NSW.

18.2 Metering services

18.2.1 Code requirements

There are no specific Code requirements dealing with metering arrangements.

18.2.2 AGL(ACT)'s proposal

In its proposed revisions AGL(ACT) indicates that where it is technically and commercially feasible, the network will provide a daily metering system for all reference services to the contract market (see Schedule 2A, clause 11 of the Access Arrangement).

AGL(ACT) states that it will own and maintain the measuring equipment at each tariff service delivery point. Unless otherwise agreed, it will install all measuring equipment (see clause 10, Schedule 2C of the Access Arrangement).

In the metering section, AGL(ACT) states that where daily metering is installed, it will provide telemetered information to the user and any other person nominated by the user.

In respect of tariff service meter reading, AGL(ACT) has indicated that industrial and commercial customers have a monthly billing cycle while residential customers meters are read quarterly. AGL(ACT) will nominate the cycles in which meters are read and consult with users regarding any changes to these cycles. A user may request AGL(ACT) to vary a reading cycle for any delivery point and AGL(ACT) will advise whether it agrees to such a request and at what cost (see Schedule 2C, clauses 5-9).

18.2.3 Public submissions

ACTEW states that metering, meter reading and billing appear to be bundled into network charges. In a contestable market, ACTEW would expect a move to competition in these areas.[190]

18.2.4 Commission's assessment

When the Code was being developed, CoAG's Gas Reform Implementation Group[191] examined whether meter services should become contestable. However, no resolution of this issue was achieved. In the ACT, AGL(ACT) continues to own and read all metering equipment.

As the gas market becomes more competitive, and the electricity and gas industries converge, issues of meter ownership and responsibility for meter reading may need to be re-examined by Government. In this environment, the Commission believes there is potential for metering services to become contestable in the future.

The proposed Access Arrangement does not include metering charges separately, but introduces metering reading charges. The Commission believes it is important that the costs of metering services (both capital and operating) be transparent and identified separately.

The Commission notes that the National Gas Pipelines Advisory Committee is proposing changes to the Code regarding the provision of usage data to end use customers.[192] This has the potential to impact on provisions of the Access Arrangement dealing with the supply of telemetered information. The Commission believes that a modification to this section would be appropriate to take account of this proposed Code change.

It may be appropriate for AGL(ACT) to outline how it proposes to provide daily usage data to users. For example, does AGL(ACT) propose to provide only aggregate usage data for users' delivery points, or will this figure be broken down for each delivery point?

Amendment 18 – Metering services

AGL(ACT) is required to amend metering services by:

- making the provision of metering services transparent by separating the costs of metering services (both capital and operating) from services forming components of the reference services
- amending Schedule 2A, Terms and conditions applying to all reference services, clause 10, "Metering", to communicate in more general terms that the release of end use customer usage information is subject to relevant Code provisions, and by providing details of the format in which information will be released to users.

190 ACTEW, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 3.

191 The body responsible for development of the Code.

192 The Commission understands that the proposed Code change has the support of all jurisdictions.

18.3 Gas specifications

18.3.1 Code requirements

There are no specific Code requirements dealing with gas specifications.

18.3.2 AGL(ACT)'s proposal

Essentially, AGL(ACT) proposes to maintain the current specifications, as stipulated in the AGL contract with the Cooper Basin Producers.

18.3.3 Public submissions

Esso suggests that the current gas specifications are too narrow and could prevent gas from the Gippsland Basin being supplied to the ACT market.[193] Esso contends that the gas specifications should be made as broad as possible, within the bounds of safe appliance operation, thereby encouraging a greater number of gas supply sources. Esso also suggests some parameters of gas specification be changed immediately to enable supply from Victoria.

18.3.4 Commission's assessment

The Australian Gas Association (AGA) has established a Gas Quality Specification Working Group with the aim of developing a uniform gas specification standard for SE Australia. The Commission understands that this working group has reached consensus on the adoption of a uniform gas specification for NSW, Victoria and the ACT.

The gas specification issue has recently been examined as part of the Access Arrangement process in NSW. Lacking expertise in this area, IPART has relied on advice from MoEU, NSW's technical and safety regulator of gas. Based on this advice, IPART has required an additional statement in AGLGN's and Great Southern Networks' Access Arrangements to the effect that the gas delivered to a receipt point by a user must comply with the specifications prescribed by any law which extends to that gas. If there are no such laws, the gas must comply with specifications determined by the service provider from time to time. Failing such a determination a 'default specification' outlined in the Access Arrangement will apply.

Hopefully, by the time AGL(ACT)'s Access Arrangement is finalised, a uniform gas specification for South Eastern Australia will have been adopted. Failing this, the Commission proposes to take a similar approach to that applied in NSW, as outlined in the following amendment:

193 Esso Australia Limited, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 1.

Amendment 19 – Gas specifications
AGL(ACT) is required to amend Schedule 3, 'Gas Quality Specifications' by:

adding a statement at the beginning of the schedule to the effect that gas delivered to a receipt point by a user must comply with the specifications prescribed by any law that extends to that gas. If there are no such laws, the gas must comply with specifications determined by AGL(ACT) from time to time. Failing such a determination, the table set out in Schedule 3 (the 'default specification') will apply.

18.4 Unaccounted for gas

18.4.1 Code requirements

There are no specific Code requirements dealing with unaccounted for gas (UAG).

18.4.2 AGL(ACT)'s proposal

UAG is treated as part of the network's operating costs. In 1998 the cost of UAG was $300,000. In the proposed Access Arrangement, AGL(ACT) is seeking between $600,000 (1999-2001) and $700,000 (2002-2004) for UAG. This amount has been determined based on AGL's gas supply contract, which includes an escalation factor. AGL(ACT) has since advised the Commission that the actual UAG in 1998/99 was only $124,000, and has revised downwards UAG in its financial model.

The AGL(ACT) has assumed a UAG level of 2.5 per cent. This is the same level of UAG used by AGLGN in developing its proposed Access Arrangement for NSW, this has been carried over into the ACT Access Arrangement.

18.4.3 Public submissions

No public submissions were received on this issue.

18.4.4 Commission's assessment

The Commission would expect a low UAG figure on a relatively young system like AGL(ACT) network. The Commission sought advice from AGL(ACT) on actual UAG measured on the system. In a submission dated 18 June 1999 AGL(ACT) advises that in the past three years UAG has been measured as follows:

1996	0.6%
1997	0.0%[194]
1998	1.0%

In that submission, AGL(ACT) suggests a UAG allowance of between 0.6 per cent and 0.8 per cent would be appropriate for the ACT.[195] The Commission considers that this range is within industry best practice for a network of this type. The Commission proposes that the UAG allowance be set at 0.7 per cent for the Access Arrangement period.

194 The Commission assumes that this figure is incorrect.
195 AGL(ACT) submission dated 18 June 1999, p 22.

The Commission notes that in its draft decision on AGLGN's proposed revisions to the Access Arrangement, IPART required UAG be treated as a direct retailer's cost rather than part of the service provider's operating costs. The Commission understands that IPART is concerned about rising UAG costs in NSW and believes it is desirable for UAG to be treated consistently by networks.[196] In respect of the AGL(ACT), the Commission notes that at 0.7 per cent, UAG costs are very low when compared to other networks. For this reason, the Commission is prepared for UAG to remain part of the network's operating costs.

Amendment 20 – Unaccounted for Gas
AGL(ACT) is required to reduce the UAG figure from 2.5 per cent to 0.7 per cent for the period of the Access Arrangement.

18.5 Trading policy

18.5.1 Code requirements

The Code requires that the Access Arrangement for a contract carriage pipeline include a policy explaining the rights of a user to trade its right to obtain a service to another person (trading policy).[197] The Code sets out the following principles, which should be followed when developing a trading policy:

> 3.10 The Trading Policy must comply with the following principles:
>
> (a) A User must be permitted to transfer or assign all or part of its Contracted Capacity without the consent of the Service Provider concerned if:
> (i) the User's obligations under the contract with the Service Provider remain in full force and effect after the transfer or assignment; and
> (ii) the terms of the contract with the Service Provider are not altered as a result of the transfer or assignment (a ***Bare Transfer***).
>
> In these circumstances the Trading Policy may require that the transferee notify the Service Provider prior to utilising the portion of the Contracted Capacity subject to the Bare Transfer and of the nature of the Contracted Capacity subject to the Bare Transfer, but the Trading Policy must not require any other details regarding the transaction to be provided to the Service Provider.
>
> (b) Where commercially and technically reasonable, a User must be permitted to transfer or assign all or part of its Contracted Capacity other than by way of a Bare Transfer with the prior consent of the Service Provider. The Service Provider may withhold its consent only on reasonable commercial or technical grounds and may make its consent subject to conditions only if they are reasonable on commercial and technical grounds. The Trading Policy may specify conditions in advance under which consent will or will not be given and conditions that must be adhered to as a condition of consent being given.
>
> (c) Where commercially and technically reasonable, a User must be permitted to change the Delivery Point or Receipt Point from that specified in any contract for the relevant Service with the prior written consent of the Service Provider. The Service Provider may withhold its consent only on reasonable commercial or technical grounds and may make its consent subject to conditions only if they are reasonable on commercial and technical grounds. The Trading Policy may specify conditions in

196 Networks in Victoria, Albury and Wagga Wagga treat UAG as a direct cost to retailers.
197 See section 3.9 of the Code.

advance under which consent will or will not be given and conditions that must be adhered to as a condition of consent being given.

3.11 Examples of things that would be reasonable for the purposes of section 3.10(b) and (c) are:

(a) the Service Provider refusing to agree to a User's request to change its Delivery Point where a reduction in the amount of the Service provided to the original Delivery Point will not result in a corresponding increase in the Service Provider's ability to provide that Service to the alternative Delivery Point; and

(b) the Service Provider specifying that, as a condition of its agreement to a change in the Delivery Point or Receipt Point, the Service Provider must receive the same amount of revenue it would have received before the change.

18.5.2 AGL(ACT)'s proposal

AGL(ACT)'s trading policy is outlined in Section 5 of the Access Arrangement. Users are allowed to undertake bare transfers after providing notification to AGL(ACT). A bare transfer is one where the user's obligations to the service provider remain in full force and the terms of the contract with the service provider are not altered in any way (eg the delivery point remains the same).

All other transfers require the consent of AGL(ACT). AGL(ACT) may withhold its consent only on reasonable commercial or technical grounds and may make its consent subject to reasonable conditions.

AGL(ACT)'s trading policy is expressed in similar terms to the requirements in section 3.10 of the Code.

18.5.3 Public submissions

No public submissions were received on this issue.

18.5.4 Commission's assessment

The Commission has discussed with AGL(ACT) what constitutes reasonable, commercial, or technical grounds. AGL(ACT) is of the view that it may not be possible to list further examples of reasonable and commercial grounds since each transfer will depend on individual circumstances. The Commission welcomes further comments by stakeholders on whether more clarification by AGL(ACT) can be provided. In the interim, the Commission believes that, at the very least, the Access Arrangement should outline AGL(ACT)'s response time for granting / refusing any trading requests which are not bare transfers.

Amendment 21 – Trading policy
AGL(ACT) is required to amend its trading policy to include response times for granting / refusing trading requests which are not bare transfers.

18.6 Interconnections

18.6.1 Code requirements

There are no specific Code requirements concerning interconnections.

18.6.2 AGL(ACT)'s proposal

AGL(ACT) has set out some requirements within the proposed revisions dealing with new receipt points and receipt stations (see clauses 19-21 of Schedule 2A). Essentially, the revisions state that a receipt station will comply with specifications approved by AGL(ACT). The facilities that a receipt station should comprise are listed. AGL(ACT) indicates that it may, upon reasonable notice, operate the pressure and flow control facilities at any receipt station not owned by AGL(ACT).

18.6.3 Public submissions

Esso states that the Eastern Gas Pipeline will follow a route close to the ACT. If commercial terms can be satisfied, this pipeline will be in a position to supply the ACT market soon after the Access Arrangement takes effect.[198] Esso emphasises the importance of including pricing principles for new receipt points in the Access Arrangement in order to facilitate the entry of competitive source gas into the ACT network.

BHPP believes an 'Interconnect service' should be made a reference service with full terms and conditions (including pricing) clearly outlined in the Access Arrangement.[199]

18.6.4 Commission's assessment

Construction of the Eastern Gas Pipeline has commenced and is scheduled for completion in September 2000. AGL(ACT) has proposed to interconnect with the EGP.

The Commission believes that the lack of guidelines for interconnections in the Access Arrangement may lead to delays and hence barriers to entry. The Commission has considered the issue of interconnection in regard to a partial use of assets reference service. Discussion of this issue is contained in chapter 12, including a requirement for AGL(ACT) to provide information on the appropriateness of such a service.

18.7 Other Issues

18.7.1 Capacity management policy

Code requirements

An Access Arrangement must state whether the covered pipeline is a contract carriage pipeline or a market carriage pipeline.[200]

198 Esso Australia Limited, *Submission to AGL(ACT) Access Arrangement Review*, 26 March 1999, p 2.
199 BHPP, *Submission to AGL(ACT) Access Arrangement Review*, 1 April 1999, p 11.
200 See section 3.7 of the Code.

AGL(ACT)'s proposal

AGL(ACT) has indicated that the network is a contract carriage pipeline.[201]

Commission's assessment

The Commission notes that AGL(ACT)'s capacity management policy accords with the Code.

18.7.2 Queuing policy

Code requirement

An Access Arrangement must include a policy defining the priority prospective users have to negotiate capacity.[202]

AGL(ACT)'s proposal

AGL(ACT)'s queuing policy is outlined in clause 6 of the proposed revisions. Where there is insufficient capacity to satisfy a request for service, a queue will be formed. When capacity becomes available to meet the needs of any prospective user on a queue, capacity will be offered progressively to each prospective user in order of priority. Priority is given to requests for reference services over requests for negotiated services. Within these categories a first come, first served basis is observed.

Commission's assessment

The Commission notes that the queuing policy accords with the Code.

18.7.3 Extension/expansion policy

Code requirement

An Access Arrangement must include a policy setting out a method for determining whether an extension or expansion of the covered pipeline is or is not to be treated as part of the covered pipeline for the purposes of the Code.[203]

AGL(ACT)'s proposal

AGL(ACT) has proposed an extension/expansions policy for inclusion in the Access Arrangement.[204] The policy states:

- any extension or expansion carried out in ACT or in a distribution system in the Queanbeyan or Yarrowlumla Local Government Areas by AGL(ACT) will be part of the network
- no extension or expansion will affect reference tariffs
- surcharges may apply, pursuant to the Code.

Commission's assessment

The Commission considers the proposed extension/expansion policy to be acceptable and in accordance with the Code.

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201 See clause 9 of the proposed Access Arrangement.
202 See sections 3.12-3.15 of the Code.
203 See section 3.16 of the Code.
204 See clause 7 of the proposed Access Arrangement.

18.7.4 Reference tariffs after 30 June 2004

AGL(ACT)'s proposal

AGL(ACT) has proposed that where the revision commencement date is later than 30 June 2004, the reference tariff for the transportation service for the period between 30 June 2004 and the revisions commencement date will be charges applicable on 30 June 2004 plus CPI adjustment.[205]

Public submissions

BHPP states that AGL(ACT)'s proposal that all tariffs escalate at 100 per cent of CPI if revisions to the Access Arrangement are not implemented by 30 June 2004 should be rejected. BHPP has expressed concern that AGL(ACT) may delay the next access review if it forms the view that it would be financially advantageous to do so.[206]

Commission's assessment

Recent experience in NSW provides a strong argument that it is highly desirable for an Access Arrangement to specify the continuation of terms and conditions (including reference tariffs) beyond the anticipated Access Arrangement period. This is necessary to avoid market uncertainty if an access review is delayed.

The CPI adjustment to reference tariffs proposed by AGL(ACT) may be inappropriate in the event that the access review results in lower reference tariffs. A decrease in reference tariffs may be equally inappropriate. The Commission believes that in the event of a delay in the next access review, the 2004 reference tariff should be maintained at the existing level until the access review has been completed.

The Commission is also requiring a change to extend the revision submission date (see section 19.8.5 of this report). This reduces the likelihood that a provision extending the 2004 terms and conditions will be required.

Amendment 22 – Reference tariffs after 30 June 2004

AGL(ACT) is required to amend the clause on reference tariff after 30 June 2004 which appears on pages 32 and 33 of the proposed Access Arrangement by:

- relating the clause to all terms and conditions of reference services, not just prices
- deleting the proposed CPI adjustment to the 2004 reference tariffs.

18.7.5 Commencement and review of Access Arrangement

AGL(ACT)'s proposal

AGL(ACT) is seeking a five year Access Arrangement period with the next revisions commencement date to be 1 July 2004. AGL(ACT) has proposed a revisions submission date of 10 December 2003.

205 See Section 3, pp 24-25 of the proposed Access Arrangement.

206 BHPP's submission dated 1 April 1999, p 12.

Code requirements

The Code does not set any limit on the period of an Access Arrangement. Notwithstanding, if an Access Arrangement period is greater than five years, the regulator must consider including mechanisms that address the risk that forecasts on which the terms of the Access Arrangement were made, may be incorrect.[207]

Commission's assessment

For incentive regulation to be effective, the general regulatory consensus is that a review period should normally be four to five years.

The Commission does not intend to extend the time for the next revisions commencement date due to delays in considering the Access Arrangement. As a consequence, the Access Arrangement period will be approximately four years.

The Commission believes the proposed revisions submission date should be amended. Experience in ACT and other jurisdictions has shown that access reviews take approximately 12 months to complete. The Commission will therefore require the revisions submission date for the Access Arrangement to be set on or before 30 June 2003. In the event that the Commission finishes its review in under 12 months, this will be considered a good policy outcome because users would become aware of the new terms and conditions of access before the revisions took effect.

Amendment 23 – Commencement and review of Access Arrangement
AGL(ACT) is required to set the revisions submission date at or before 30 June 2003. The revisions commencement date will be 1 July 2004 or two weeks after final approval of AGL(ACT)'s revised Access Arrangement, whichever is the latter.

18.7.6 Allocation methodology at receipt points

AGL(ACT)'s proposal

AGL(ACT)'s proposed revisions indicate that where a receipt point is used by more than one user, the quantity of gas received into the network each day on behalf of the user will be the quantity determined as the 'user's input' under the gas balancing arrangements in Part 2 of Schedule 2A (see clause 18 of Schedule 2A). Each user is deemed to have received its confirmed nomination, plus, for certain users, an allocated share of the difference between the total confirmed nominations of all users of the receipt point and the metered quantity of gas received for users at the receipt point (excluding any quantity acquired by AGL(ACT) for UAG).

The matter becomes further complicated when supply to non-daily metered tariff customers is taken into account. AGL(ACT) outlines its approaches to determining tariff users' input at a receipt point in Schedule 2C clauses 17 – 20. AGL(ACT) indicates that it will implement a tariff market daily load profiling system, which will enable the daily allocation of tariff market volumes between multiple users within a network section. Prior to this, where there are multiple users on a receipt point, the allocation methodology will be based on agreement between the users. Where there is no agreement, AGL(ACT) will determine the method of allocation.

207 See section 3.18 of the Code.

Code requirements

There are no specific Code requirements dealing with allocation methodologies.

Commission's assessment

Multiple users are now accessing AGL's NSW distribution system. There is potential for this to occur in the ACT as well due to the following developments:

- the introduction of retail competition
- the increased availability of alternative sources of natural gas due to the operation of the Wodonga to Wagga Wagga pipeline and the construction of the EGP.

The Commission considers that the Access Arrangement should clearly outline an allocation methodology for receipt points on the network. The Commission acknowledges that the determination of an allocation methodology is complicated by the introduction of retail contestability and the consequent need to develop a load profiling system.

In NSW, the Ministry of Energy and Utilities' Gas Retail Project is currently examining gas balancing, gas allocation, load profiling and reconciliation systems necessary for the introduction of retail contestability in that state. The Commission is monitoring the work of this project and expects the output from this group will influence allocation at receipt point methodologies within the Access Arrangement. The Commission will re-examine this issue as part of its final decision when more information is available.

18.7.7 Retail contestability

Additional requirement proposed by the Commission

New procedures and systems for the introduction of retail contestability are currently being developed. These new systems and procedures are likely to have an impact on the AGL(ACT) proposed Access Arrangement. The Commission will assess the need for any changes to the proposed Access Arrangement which may result from the introduction of retail competition as part of its final decision. More information is likely to be available at that time.

GLOSSARY AND ABBREVIATIONS

ACCC	Australian Competition and Consumer Commission.
Access Arrangement	An arrangement for access to a Covered Pipeline that has been approved by the Relevant Regulation in accordance with the *Gas Pipelines Access (Australian Capital Territory) Act 1998 and the Gas Pipelines Access Law*
AAI	Access Arrangement Information
ACQ	Average contract quantity
AGC	Albury Gas Company
AGLGC	AGL Gas Company, the gas distributor in NSW prior to the company restructure in August 1997
AGL(ACT)	AGL Gas Company (ACT) Limited and AGL Gas and AGL Gas Networks Limited
AGLGN	AGL Gas Networks Limited
Bare transfer	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
BHPP	BHP Petroleum Pty Ltd
Bypass	To construct a pipeline which avoids a distribution system or part thereof
CAPM	Capital asset pricing model, a financial model that relates the required return of an asset, to the risks associated with that asset
CCA	Current cost accounting
City Gate	Transition point from high pressure transmission pipelines to a distribution network
CoAG	Council of Australian Governments
CPA	Competition Principles Agreement
CPI	Consumer Price Index
Code	The National Third Party Access Code for Natural Gas Pipeline Systems
Contract customers	End use gas customer consuming more than 10 TJ per annum

DAC	Depreciated actual cost
DIHC	Depreciated indexed historical cost
Distribution	Transportation 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
DORC	Depreciated optimised replacement cost, an asset valuation approach that reflects both the age of the assets and the required size of the assets. Sometimes referred to as ODRC, optimised depreciated replacement cost
EAPL	East Australian Pipelines Limited
EBIT	Earnings before interest and tax
EBITD	Earnings before interest, tax and depreciation
EP	Ewbank Preece
EPD	Energy Projects Division, the Victorian Treasury
FDC	Fully distributed costs
FE	Funds employed
FFO	Funds from operation
GHD	Gutteridge, Haskins and Davey Limited
GJ	Gigajoule, a measure of the heat content of gas (an average residential customer in NSW consumes approximately 20 GJ of gas per year)
GSN	Great Southern Energy Gas Networks Pty Limited
GTE	Government trading enterprise
ICB	Initial capital base
IPARC	Independent Pricing and Regulatory Commission of ACT, otherwise referred to as "the Commission"
IPART	Independent Pricing and Regulatory Tribunal of NSW, otherwise referred to as "the Tribunal"
Load factor	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
LPG	Liquefied petroleum gas

MDQ	Maximum daily quantity
MHQ	Maximum hourly quantity
MoEU	Ministry of Energy and Utilities (NSW)
NPV	Net present value
NRV	Net realisable value
ODV	Optimised deprival value
OFFER	Office of Electricity Regulation – the former UK electricity industry regulator
OFGAS	Office of Gas Supply - the former UK gas industry regulator
OFGEM	Office of Gas and Electricity Market – the new UK energy industry regulator
OFWAT	Office of Water Services - the UK water industry regulator
ORG	Office of Regulator General, Victoria
PJ	Petajoule, equal to 1,000,000 GJ
Prospective user	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
PRS	Primary reduction station
RAAI	Revised Access Arrangement Information submitted by AGL(ACT)
Retail	Sale of gas as a commodity, independent of a transportation service
Reticulation	See distribution
Ring fence	To clearly separate subsidiaries or divisions of a company that may be viewed as having competitive advantages in their dealings with each other
SAC	Stand alone cost allocation
SAAI	Supplementary Access Arrangement Information submitted by AGL(ACT)
Service provider	As defined in the Gas Pipeline Access Law: the person who is, or is to be, the owner or operator of the whole or any part of the pipeline or proposed pipeline

SIB	Stay in business
Substituted transfer	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
Tariff reference price	Transportation charges to be paid by a user who is supplying tariff gas users
Tariff users	An end use gas customer consuming less than 10 TJ per annum
TJ	Terajoule, equal to 1,000 GJ
Transmission	Long haul transportation of gas via high pressure pipelines
TRS	Trunk receiving station
Trunk mains	High pressure pipelines within the distribution network used to transport large quantities of gas to sections of the network downstream from the city gate
User	A person who has a current contract for a service or an entitlement to a service as a result of an arbitration
WACC	Weighted average cost of capital
WDV	Written down value

ATTACHMENT 1 PUBLIC HEARINGS AND CONSULTATION

Presenters at public hearing, Tuesday 11 May 1999

Organisation	Represented by
AGL(ACT)	Mr Bruce Connery, General Manager Regulatory Affairs Mr Chris Harvey, Manager Regulatory Affairs Gas Networks
Esso	Mr Stuart Price, Gippsland Gas Marketing Group Mr Allan Dixon
ACTOSS	Mr Peter Sutherland, Executive Member Mr Adam Stankevicius, Policy Officer
BHPP	Mr Colin Martin, Marketing Manager Mr Bill Henson, Manager BHPP NSW and ACT
ACTEW	Mr Alan Morrison, General Manager ACTEW Retail Mr David Graham, Manager Regulatory Affairs
AGL(ACT)	Mr Bruce Connery, General Manager Regulatory Affairs Mr Chris Harvey, Manager Regulatory Affairs Gas Networks

Presenters at the pricing forum, Wednesday 22 September 1999

Organisation	Represented by
AGL Gas Networks	Ms Linda Gyzen, Manager Sales and Marketing
Great Southern Energy	Mr Peter Hoogland, Manager Retail Pricing and Strategy
Australian Institute of Sport	Mr Alan McGraph, Chief Engineer
BHP Petroleum	Mr Colin Martin, Marketing Manager

ATTACHMENT 2 LIST OF SUBMISSIONS

Organisation	Contact name	Date
ACTEW	J.A. Mackay	26 March 1999
Australian Institute of Sport	A.L McGrath	22 October 1999
BHP Petroleum	B. Henson	29 January 1999
BHP Petroleum	B. Henson	9 March 1999
BHP Petroleum	B. Henson	1 April 1999
BHP Petroleum	B. Henson	25 October 1999
Esso Australia Ltd	S.R. Price	26 March 1999
National Gallery of Australia	A. Froud	26 March 1999
National Library of Australia	T. Pidd	11 March 1999

Details of submissions presented by AGL(ACT) are contained in chapter 3 of this draft decision.

ATTACHMENT 3 RATE OF RETURN – WACC RANGES

		IPARC Range		
		Low	**Medium**	**High**
Risk free rate*	Rf	7.13%	7.13%	7.13%
CPI*		3.59%	3.59%	3.59%
Real risk free rate*		3.42%	3.42%	3.42%
Market risk premium	Rm	5.0%	5.5%	6.0%
Debt margin		0.90%	1.0%	1.10%
Debt funding	D	60%	60%	60%
Equity funding	E	40%	40%	40%
Total funding (debt+equity)	V	100%	100%	100%
Gamma	γ	0.50	0.40	0.30
Asset beta	βa	0.40	0.45	0.50
Debt beta		0.06	0.06	0.06
Tax rate	T	30%	34%	36%
Equity beta (calculated)	βe	0.90	1.02	1.14
Cost of equity (nominal post tax)	**Re**	**11.62%**	**12.74%**	**13.98%**
Cost of equity (real post tax)		7.75%	8.83%	10.03%
Cost of debt (nominal pre tax)	**Rd**	**8.03%**	**8.13%**	**8.23%**
Cost of debt (nominal post tax)		5.62%	5.37%	5.27%
Cost of debt (real post tax)		1.96%	1.71%	1.62%
WACC (nominal post tax)		7.20%	7.44%	7.95%
Rate of return (real, pre tax)			**5.0% - 8.5%**	
Conversion 1 (Macquarie): nominal post tax real post tax gross up to real pre tax				
WACC (real post tax)		3.49%	3.72%	4.20%
WACC (real pre tax)		**4.98%**	**5.64%**	**6.57%**
Conversion 2 (K. Davis formula): nominal post tax real post tax real pre tax				
WACC (pretax real)		**5.01%**	**5.67%**	**6.61%**
Conversion 3 (Market Practice): nominal post tax nominal pre tax real pre tax				
WACC (pre tax nominal)		10.29%	11.28%	12.41%
WACC (pre tax real)		**6.47%**	**7.42%**	**8.52%**

* Note that these rates are the 20 day average.

ATTACHMENT 4 OPTIMISED DEPRIVAL VALUATION FOR AGL(ACT)'S DISTRIBUTION ASSETS – ASSUMPTIONS AND PARAMETERS

Steps in estimating optimised deprival valuation

In applying optimised deprival valuation (ODV), the Secretariat has adopted an approach broadly similar to that adopted in the final decision for GSN. The process involves matching assets with particular groups of customers. Factors to be considered when determining how the system should be partitioned include tariff structure and asset location.

Within the AGL(ACT) system, the medium and low pressure mains are dedicated to serving the tariff market. The majority of the contract market is serviced by the high pressure system and the primary mains. In terms of tariff structure, AGL has separate prices for the contract and tariff markets. Whereas the contract market is not regulated, the tariff market is currently subject to price regulation.

AGL(ACT) has provided an asset allocation using contract stand alone methodology. In response to the section 41 notice, AGL(ACT) has provided the FDC asset allocation (which is claimed to be confidential).

In the allocation of assets, AGL(ACT)'s gas distribution system is first partitioned into segments comprising assets servicing customers with similar characteristics. DORC valuations of asset groups are determined and allocated to various parts of the system in a way which reflects the use made of those asset components by customers. This establishes a DORC asset-based value for each part of the system. The broad steps involve:

- allocating DORC asset values to various parts of the system as described above (ie trunk, high pressure, medium pressure, meters, country local TRS)
- partitioning the system in two: one part servicing volume, the other servicing contract customers
- allocating current revenues and expenses to each part of the system. The revenue allocation is based on 1997/98 results. Based on the AGL(ACT) proposal and section 41 information, the cost allocation depends on the nature of expenditure
- projecting the future revenues and expenses of each part by estimating sales growth and efficient expenditure levels
- calculating the future free cashflow based on projected revenue and expenditures for each market
- discounting the free cashflow to derive the NPV
- determining the ODV asset value as the lower of DORC asset value and NPV.

Assumptions

The Commission has reviewed the assumptions used by AGL(ACT) and undertaken sensitivity analysis using AGL(ACT)'s ODV model.

Revenue estimate

The current network price for tariff customers is to be maintained in real terms. Given the findings of the profitability analysis, the Commission has tested tariff revenue to be lower over time. Contract revenue is assumed to remain at current prices.

Operating costs

The Commission has used the operating costs forecast produced by AGL(ACT) for up to 2019. Costs are assumed to remain constant in real terms. AGL(ACT) has assumed that the operating expenditure is allocated into the two market segments by SAC. The Commission has also considered the use of FDC allocation.

Capital expenditure

AGL(ACT)'s forecast submitted in August 1999 is used and adjusted for the growth assumption. Capital expenditure is assumed for other non-system assets.

Growth

The estimate assumes half growth in the tariff market between 2000-2004, as forecast by AGL(ACT). It is assumed that there is no growth in the contract market.

Analysis period

An analysis period of 50 years is used. This is a longer period than the one assumed by AGL(ACT).

Residual value

Estimation of residual value is extremely subjective and can influence the NPV/ODV result. The basis of estimation may be either written down value, or some arbitrary judgement of a scrap value, or even some cashflow value that could be generated over an extended period after the end of assets' useful lives.

In establishing the initial capital base for the purpose of setting prices, there is a question of whether residual value should be included in the ODV. To the extent that the utilities will benefit from the residual value at the end of the life of the infrastructure, it may not be equitable that prices include a rate of return on a capital base including a residual value.

Given the analysis of 50 years, it is assumed that residual value is nil. Sensitivity analysis has been undertaken.

ATTACHMENT 5 ANALYSIS OF ECONOMIC DEPRECIATION AND HISTORICAL RETURNS TO AGL(ACT)

Basis on which tariffs may have been set in the past

In ACT, supply of natural gas to industrial and commercial consumers commenced in January 1982 with subsequent connection of a number of domestic consumers. Since then, there has been continued extension and expansion of the reticulated system to enable supply of natural gas to consumers and the supply of natural gas and gas appliances to consumers already connected to the supply system.

AGL Canberra Limited, a wholly owned subsidiary of the Australian Gas Company, was set up to build and operate the ACT system. The principal activities of the company are the reticulation and sale of natural gas and the sale of gas appliances. In 1994/95, the Company was renamed as AGL Gas Company (ACT) Limited.

The regulatory arrangement for the gas business in ACT is described below.

1981-1991

AGL Canberra Limited was regulated under the Gas Ordinance 1983. Among other things, the Gas Ordinance set the maximum dividends of licensee. Therefore AGL Canberra's profits and prices were effectively regulated through regulation of dividend payments.

The Ordinance used a bond rate benchmark in its dividend regulation. The benchmark was the local government or semi-government bond rate (SGBR) 30 days after the close of the financial year for which the dividend was being paid. For ordinary shares, the effect of the ordinance is:

Value of SGBR	*Level of ordinary share dividends*
Less than 6.67%	SGBR + 2%
Between 6.67 and 10%	1.3 x SGBR
Greater than 10%	SGBR + 3%

During the years 1981 to 1992 the SGBR always exceeded 10 per cent. The allowed dividend payable was SGBR+3%. AGL(ACT) has referred to the T-Corp bond rate as an approximation of SGBR.

Price regulation since 1992

Under the ACT Gas Act 1992, gas prices for the tariff market in ACT are regulated by reference to prices in NSW set under a price control formula.

Access price regulation

Distribution network prices are now regulated under the National Gas Code.

Commission's view on historical tariffs

Throughout the period 1981-1999, AGL(ACT)'s financial reporting is based on historical cost accounting. Historical cost depreciation was charged to its profit and loss accounts. Prior to 1992, the dividend payments to shareholders were restricted. As dividends are paid from earnings, it could be argued that there was implicit profit regulation although a company's dividend policy also depends on cash flow and funding requirement for reinvestment.

In light of the above consideration, the Commission is of the view that historically, AGL(ACT)'s tariffs appear to have been set based on historical cost.

Economic depreciation

Depreciation is viewed as a process of allocation of costs or valuation. Accounting depreciation as a process of allocation of cost is a well accepted accounting practice.

Economic depreciation is viewed as a process of valuation. This can be measured as the change in the value of an asset between the beginning and the end of a reporting period. There is a measurement issue as accounting standards are designed for general purpose financial reporting and do not necessarily embrace economic concepts of costs.

Recovery of depreciation

Throughout the 1980s, AGL(ACT) was required to adopt depreciation rates as set out in the ACT Gas Ordinance. In the earlier years, it would appear that plants and equipment were depreciated on a diminishing value method. The method was changed in the 1990s. Deferred expenditures (ie customer connection assets) are amortised over periods not exceeding thirteen years. Property, plant and equipment are depreciated at rates based upon the expected useful economic lives of the assets.

The Commission notes that as at 30 June 1999, accumulated depreciation amounts to 32 per cent of the assets in terms of historical cost ie AGL(ACT)'s historical cost written down value represents 68 per cent of its original cost. In terms of DORC, AGL(ACT)'s proposed value represents 78 per cent of ORC. This means that if DORC were to be adopted for pricing, some of the assets (up to 10 percent) would be depreciated again.

Table A5.1 Asset value and depreciation

	$m	
Historical cost (excluding Queanbeyan assets)		
At cost	120	
Less accumulated depreciation & amortisation	38	32%
Written down value	82	68%
ORC	324	
Less accumulated depreciation	72	22%
DORC	252	78%
	Years	
Weighted average age	11.2	21%
Weighted average remaining economic life	42.3	79%
Estimated asset life	53.5	

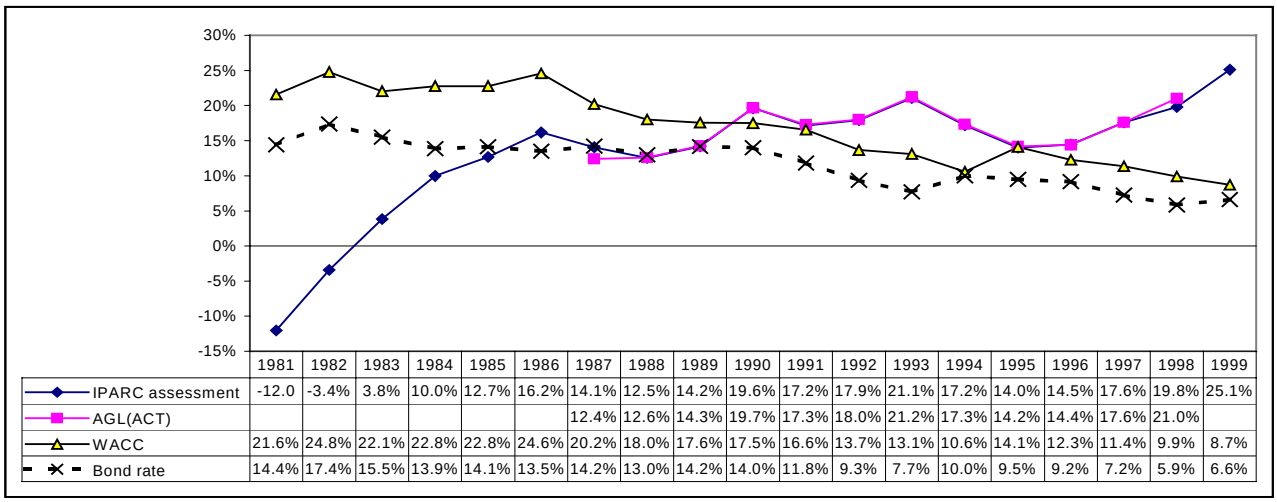
Source:
AGL Gas Company (ACT) Ltd 1999 financial statement, Report on *Canberra Gas Network Depreciated Optimised Cost Supplementary Report* prepared for AGL Gas Networks by PPK Environment & Infrastructure Pty Ltd and Kinhill Pty Ltd, Arthur Andersen report on R*eview of financial and valuation models* prepared by AGL(ACT).

The Commission therefore considers that in the past, AGL(ACT) was able to recover depreciation on historical cost basis. On average, the asset lives used for accounting purpose appear to be shorter than the economic lives adopted in the DORC estimation. If the economic lives in the DORC assessment were to be applied in the past, the depreciation would be lower than actual depreciation over the period of 1981-1999.

Historical return analysis

The Commission has undertaken a historical return analysis using the data sourced from the audited financial statement. The Commission has compared the result with AGL(ACT)'s own analysis. On the whole, the returns are consistent. The result is shown in Figure A5.1:

Figure A5.1 EBIT/fixed assets



	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
IPARC assessment	-12.0	-3.4%	3.8%	10.0%	12.7%	16.2%	14.1%	12.5%	14.2%	19.6%	17.2%	17.9%	21.1%	17.2%	14.0%	14.5%	17.6%	19.8%	25.1%
AGL(ACT)							12.4%	12.6%	14.3%	19.7%	17.3%	18.0%	21.2%	17.3%	14.2%	14.4%	17.6%	21.0%	
WACC	21.6%	24.8%	22.1%	22.8%	22.8%	24.6%	20.2%	18.0%	17.6%	17.5%	16.6%	13.7%	13.1%	10.6%	14.1%	12.3%	11.4%	9.9%	8.7%
Bond rate	14.4%	17.4%	15.5%	13.9%	14.1%	13.5%	14.2%	13.0%	14.2%	14.0%	11.8%	9.3%	7.7%	10.0%	9.5%	9.2%	7.2%	5.9%	6.6%

Note:

1. IPARC assessment:
   - 1981-1984: EBIT / fixed assets for the natural gas business
   - 1985-1999: EBIT / fixed assets for the network business assuming a net retail margin of 2 per cent.
2. AGL(ACT) assessment: 1987-1998 EBIT / fixed assets for the network business assuming a net retail margin of 2 per cent.
3. EBIT = earnings before net interest and tax.
4. The WACC is estimated based on the following parameters: 60% gearing, a market risk premium of 5.5%, an asset beta of 0.45, a debt beta of 0.06 and a debt margin of 1%.
5. The bond rate is the T-Corp bond rate.

The analysis shows that:

- AGL(ACT) made losses in 1981 and 1982
- over the period 1983-1999, AGL(ACT) had earned a positive return. The return was above WACC (nominal pre tax) from 1990.

AGL(ACT) contends that under previous regulatory regimes applied to the tariff market, it did not recover the costs of services and suffered from under recovery of depreciation and returns. The Commission has examined this issue and undertaken further analysis.

Comparison of actual return with a notional nominal return on DAC

As discussed earlier, one regulatory approach is to allow a nominal return on DAC. If the actual return is below this notional allowed return, the amount of under-recovery (in terms of return component) can be estimated. Conversely, if the actual return is above the notional allowed return, there will be an over recovery of the return component.

The 1983 ACT Gas Ordinance regulated licensee dividend payments until 1991. Therefore it could be argued that the relevant regulated profit measure was profit after tax. The Commission has therefore compared profit after tax (but before interest) with a notional post tax return on DAC. The analysis shows that in early years up to 1984 and in 1995, there was under-recovery of post tax return. In net present value terms, there was an overall surplus over the period 1981-1999.

In addition to the post tax return analysis, the Commission has also considered a similar analysis based on pre tax return. It is found that if a notional pre tax return were compared with actual EBIT, there would be an overall deficit over the period 1981-1999.

The results show that the NPV of cumulative surplus and deficit varies a great deal between the pre tax and post tax approach. The Commission notes that during 1981-1984, there was no tax payment due to the losses in the early years of developing the gas market. In some of the subsequent years, the effective tax rate was lower than the corporate tax rates. The variation in the cumulative return outcome appears to be due to the taxation effect. This taxation issue is indeed similar to the debate on the treatment of tax as to whether tax should be separately allowed and whether the regulated rate of return should be made on post tax basis.

In light of AGL(ACT)'s regulatory history, financial performance and history of tax expenses, the Commission is of the view that there is no firm evidence to support AGL(ACT)'s argument of under-recovery of past return.

Historical cost return and depreciation

As discussed earlier, the Commission considers that AGL(ACT) had recovered depreciation based on accounting asset lives shorter than economic lives. If the regulatory asset base were to be depreciated on the remaining economic asset lives, it could be argued that there would be over-recovery of depreciation in the past.

Considering the issue of historical return and depreciation together, the Commission considers that there is no firm evidence of under cost recovery.

AGL(ACT)'s historical returns and depreciation model using current cost accounting approach

AGL(ACT) applied a current cost accounting (CCA) analysis to determine:

- CCA depreciation for each year since 1981. CCA depreciation is calculated using CCA written down value (CCA WDV)
- CCA returns for each year since 1981 (using real pre tax WACC and CCA WDV for each year)
- shortfall/surplus of book depreciation and returns vis à vis CCA depreciation and returns. The present value of the annual shortfall/surplus is calculated using nominal pre tax WACC
- CCA WDV as at 1999 adjusted to take account of the actual shortfall/surpluses in recovery of depreciation and returns.

Table A5.2 shows the results of AGL(ACT)'s CCA analysis to estimate total capital to be recovered.

Table A5.2 CCA analysis - AGL(ACT) model, $m

	Cost of Capital		
	Equity = TCORP+3% up to 1991, then WACC	Equity = LTBR+3% up to 1991, then WACC	WACC/CAPM [(1)] With imputation AGL(ACT)'s estimate
Opening CCA WDV-1/7/99	177.3	177.3	177.3
NPV of shortfalls/surpluses	18.8	8.3	76.9
Sub total	196.1	185.6	254.2
Add 10% Queanbeyan	19.6	18.6	25.4
Total (excluding net working capital)	215.7	204.1	279.6
AGL(ACT) submission		210.1[2]	285.6[2]

Note:

1. In its RAAI, AGL(ACT) presents two WACCs, one with imputation and the other without imputation. In the September 1999 submission, only the WACC with imputation is shown. It should be noted that the WACC is based on AGL(ACT)'s judgement on various parameters.
2. AGL(ACT) has added working capital in its submission.

Commission's assessment and implication for asset valuation

The Commission considers AGL(ACT)'s CCA analysis is an estimate of the 'economic written down value' for its assets using economic depreciation as approximated by CCA depreciation. The purpose of the analysis is to estimate the 'outstanding unrecovered' capital value arising from past tariffs. This assumes the asset owner would be able to set prices based on economic depreciation (depreciation using CCA asset value) and a rate of return on the CCA asset value. The NPV of the annual surplus/shortfall based on the difference between actual revenue and the revenue requirement using CCA approach will be summed up to determine the economic written down value.

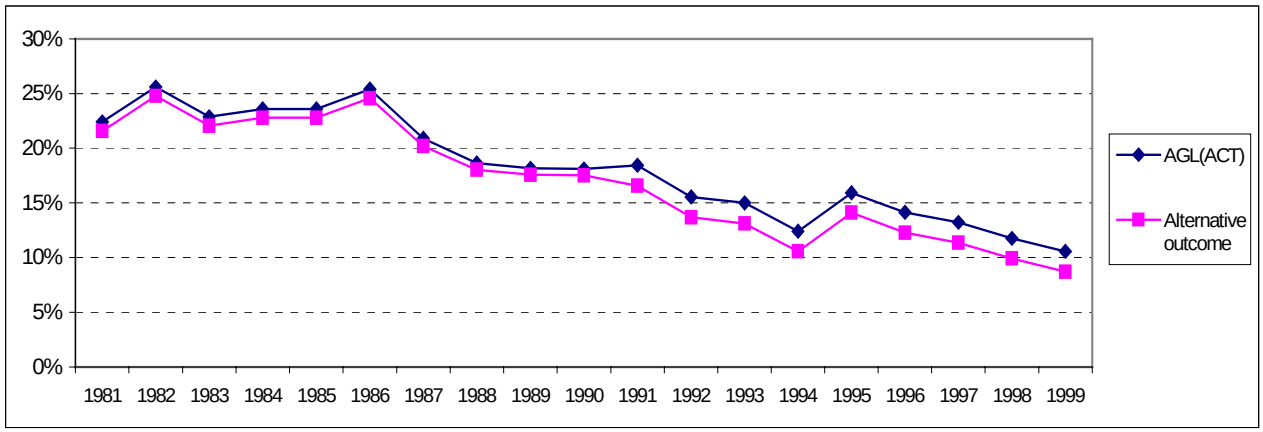
Although AGL(ACT) puts it forward, the Commission does not necessarily accept that prices should be set on the basis of CCA WDV and shortfall/surplus. However, it is useful to consider this analysis as a component in the overall approach to asset valuation.

The Commission has assessed AGL(ACT)'s model and undertaken sensitivity of the assumptions. The Commission finds that:

- AGL(ACT)'s estimate of CCA WDV is overstated as asset disposal is not accounted for in the analysis
- AGL(ACT)'s CCA and economic WDV results were based on an inflation assumption using Sydney December quarter CPI index. The results would be lower if the national CPI was used as the inflation assumption
- AGL(ACT)'s calculation of CCA WDV in 1998/99 should be corrected to remove the reference to the rate of return (or WACC) for indexation purpose
- the results vary significantly depending on the assumptions on the rate of return (real pre tax) and the CCA WDV

- AGL(ACT)'s allowed equity return before 1992 was defined under the ACT Gas Ordinance as the semi-government bond rate plus 3 per cent. The Commission therefore considers AGL(ACT)'s claim of an economic WDV ($279.6m) using its estimate of WACC throughout 1981-1999 is not appropriate.
- some of the parameters used in estimating AGL(ACT)'s WACC are questionable eg market risk premium (7 per cent), debt margin (125 basis points) and asset beta (0.6). These are higher than the Commission's assessment. The Commission considers the resulting effect is a higher WACC than it should be. The Commission has compared AGL(ACT)'s estimate of WACC with the WACC using the mid value of the parameters adopted in this draft decision. The comparison is shown below:

Figure A5.2 Comparison of WACC estimates (nominal pre tax)



Note:

1. AGL(ACT)'s estimate of WACC is based on 60 gearing ratio, 7% market risk premium, 0.45 asset beta until 1990 then a 0.6 asset beta (reflecting profit control to 1990 and price control thereafter), 0.12 debt beta and 0.125 debt margin.
2. The alternative WACC outcomes are based on 60% gearing, 5.5% market risk premium, 0.45 asset beta, 0.06 debt beta and 1% debt margin.

As 1998/99 actual capex and CPI is now available, the Commission has made adjustments to AGL(ACT)'s model and undertaken sensitivity testing (Table A5.3).

Table A5.3 Estimated AGL(ACT)'s CCA WDV and capital recovery under alternative scenarios ($m)

Rate of return	Test 1: AGL(ACT)'s WACC estimate (with imputation)	Test 2: Alternative WACC	Test 3: Cost of equity = T corp + 3%	Test 4: Cost of equity = T Corp +3% up to 1991, then AGL(ACT)'s WACC	Test 5: Cost of equity = T Corp +3% up to 1991, then alternative WACC
CCA WDV	161	161	161	161	161
Deficit (surplus)	66	11	(33)	9	(21)
Economic WDV	227	172	127	170	139
Adj for Queanbeyan					
Add 8%	246	186	138	184	151

Note:
1. The results are based on actual capital expenditure and inflation outcomes in 1998/99.
2. National CPI is used in this analysis.
3. Please see figure A5.2 for the parameters underlying the alternative WACC.
4. The analysis is undertaken for the natural gas business, including retail and distribution.
5. Adjustment for Queanbeyan is based on the proportion of assets in historical cost.

As shown in Table A5.3, the so-called deficit or surplus as measured by the NPV of the estimate of cost under/over recovery in each year is sensitive to the rate of return assumptions. As discussed before, the result of test 1 using AGL(ACT)'s WACC estimate should not be considered given its regulatory history on return on equity up to 1991. The Commission, however, notes that as a result of various adjustments to capex/inflation and adjustment to the spreadsheet:

- the CCA WDV (excluding Queanbeyan assets and assuming an asset life of 50 years) falls to $161m, or 9 per cent below AGL(ACT)'s estimation. If Queanbeyan assets are included, the CCA WDV is estimated at around $174m. As AGL(ACT)'s model does not account for asset disposal, the true CCA WDV would be lower than $174m.
- theoretically, the CCA WDV in this analysis should be consistent with the DIHC ($130-149m). The difference can be explained by the adoption of different depreciation rates. In this analysis, an economic asset life of 50 years is assumed. In the DIHC analysis, the accounting depreciation rate (based on shorter asset life) is used resulting in a lower depreciated asset value.
- the NPV of cumulative economic surplus and deficit between 1981-1999 under tests 2-5 is within a range of $11m (deficit) and $33m (surplus). However, the Commission considers that the scenarios of "deficit" are unlikely once the CCA WDV is adjusted for asset disposal.

The Commission's assessment is that test 3 can be seen as the lower bound for the economic WDV assuming the allowed return continued throughout the analysis period 1981-1999. Taking a conservative approach with no adjustment for asset disposal, the upper bound for the economic WDV is represented by results under test 2 where WACC is used as the rate of return.

The Commission's overall assessment is that AGL(ACT)'s economic WDV estimation is not justified. The Commission concludes that a more reasonable and conservative range is estimated at $140-190m.

NPV analysis

In its RAAI, AGL(ACT) presents an alternative approach to assessing the under recovery of returns. This is based on a NPV analysis of cash expenditure and cash returns since the inception of the ACT network. The NPV of cost under recovery is estimated at $209m based on WACC with imputation. If WACC without imputation is used, the NPV of the deficit is $333m.

In its revised historical return model submitted in September 1999, the NPV is lower at $171m using AGL(ACT)'s estimate of WACC with imputation.

The Commission considers that the NPV result using WACC without imputation is inappropriate, as AGL issued franked dividends. Also, there is some uncertainty surrounding assumptions on cashflow. This is due to cost allocation between the ACT and NSW, and possible distortion arising from the unbundling of network and retail business.

Other considerations

The Commission notes that the ACT and NSW systems are jointly operated by AGLGN. As such the calculation of EBIT is subject to cost allocation between the two network systems. Whilst the Commission has not undertaken a full investigation, there is evidence to suggest that the reported profit may differ from the cost allocation generated by detailed activity based cost analysis.

Summary and conclusions

The Commission considers that the historical return / depreciation analysis should be considered in conjunction with the CCA analysis covering the period 1981-1999 since the commissioning of the ACT system. The Commission acknowledges that there is some uncertainty about the data as in most years, the data used in the analysis is for the bundled gas business.

In summary, the Commission concludes that:

- whilst there is under-recovery of past return during the period 1981-1989, the return since 1990 is above the level that would be earned by AGL(ACT) if it were to recover its WACC. The Commission's analysis shows that in aggregate, there appears to be an over recovery of historical post tax return over the period 1981-1999 in present value terms. By contrast, the pre tax analysis suggests that there was under-recovery of historical return. Therefore the analysis of AGL(ACT)'s historical return is not conclusive.
- in past years, AGL(ACT) appears to have depreciated some asset categories based on asset lives less than economic asset lives.
- AGL(ACT)'s CCA analysis takes into account rate of return and depreciation. This analysis can be used to provide a broad indication about the overall under / over recovery, in net present value terms. However, AGL(ACT)'s estimate of economic WDV is questionable. The Commission's assessment is that AGL(ACT)'s economic WDV lies within $140-190m.
- there is no firm evidence to support AGL(ACT)'s claim of significant under recovery of capital.

ATTACHMENT 6 NETWORK PRICING BY OTHER GAS DISTRIBUTORS

Over the last few years, Australian gas transportation service providers have been required to develop access arrangements for their systems. The price structures featured in these Access arrangements have varied. However, they all appear to maintain two similar features:

- the provision of a service to customers using more than 10TJ per year with charges based on capacity reservation
- the provision of a service to customers using less than 10TJ per year with charges comprising a fixed annual charge and a commodity based charge.

Albury Gas Company

The AGC Access Arrangement currently under consideration contains two tariff categories: tariff V (volume based) and tariff D (demand based). Tariff V customers use less than 10TJ, tariff D customers use more than 10TJ per year.

Tariff V

Tariff V consists of a declining block structure and a fixed charge. The variable charges are based on volume consumed, but differ in peak and off-peak periods. The off-peak period is considered to be between September and April and applies only to Tariff V customers consuming in excess of 1.4 GJ per day.

Tariff D

The Tariff D customer tariff is a declining block rate based on the single maximum hour of consumption metered in a calendar year. Initially each customer is charged on the basis of the previous year's peak MHQ. New customer charges are based on a negotiated level. Where a customer's actual usage exceeds the previous year's demand, the charges will be recalculated based on the new MHQ. If a customer does not reach the estimated peak by September, the bill is reduced to reflect actual metered MHQ.[208] The charge is same for the whole AGC system.

Great Southern Networks (Wagga Wagga)

In the recently approved Access Arrangement for GSN, the reference tariff structure consists of two basic tariffs: a contract tariff and a volume tariff.

Contract tariff

Contact customers pay a charge based on their nominated MDQ prior to the commencement of each year. Charges vary by zone and there are three zones. Contract customers also pay a monthly metering charge, any overrun charges, and any capacity trading charges.

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208 IPART, *Access Arrangement Albury Gas Company Ltd, Draft Decision July 1999* pp 108-109.

Volume tariffs

Volume tariff customers are grouped according to the maximum flow rate of their meters. They must advise GSN of the maximum hourly flow rate of their metering facilities. Volume tariff customers are charged a monthly fixed charge based on the nominated metering facilities size, and a monthly charge per GJ of actual gas consumption (throughput charge).

Victorian distributors

The Access Arrangements for the Victorian distributors, Multinet, Westar and Stratus, also provide for a volume based tariff (tariff V) and a demand-based tariff (tariff D). Tariff V customer charges are determined largely by throughput and differentiated by a peak/off-peak element to reflect the sizing of the distribution system to meet winter demand. Tariff D customers are charged on the basis of their maximum flow of gas (ie use of network capacity), which is determined exclusively by the annual anytime MHQ of gas in GJ. The MHQ charge for tariff D customers is set on a rolling annual basis so that if a customer exceeds its previously highest recorded MHQ for the past year, its distribution charge will be based on the new higher MHQ for the following twelve months.[209] Charges vary by regions.

Envestra in South Australia

Three haulage reference services are offered in the Envestra Access Arrangement proposal:

- domestic haulage
- demand haulage
- commercial haulage.

The domestic haulage service applies to delivery points where gas is used for domestic purposes. The charges for this service consist of a fixed charge and a declining block commodity charge which applies to the whole region.

The demand haulage service is available to delivery points where more than 10TJ per year is used. Charges for this service consist of an annual fixed charge plus a charge per unit of MDQ which reduces as the MDQ increases. The charges vary by region. Within the Adelaide region there are four zones with different tariffs in each.

The commercial haulage service applies to delivery points which are not domestic or demand delivery points. Charges to these delivery points consist of a fixed charge and a declining block commodity charge which applies to the whole region.

AlintaGas in Western Australia

The AlintaGas Access Arrangement currently under consideration by the Office of Gas Regulation (OffGAR) in Western Australia contains 4 tariff categories: Reference tariff A, B1, B2 and B3.

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209 ORG, Access Arrangements – Multinet, Westar, Stratus, Final Decision, October 1998, p 123.

Reference tariff A

Reference tariff A is for uses requiring more than 35TJ/year or a contracted peak rate greater than or equal to 10 GJ/Hour. The tariff design is based on location. The tariff consists of a fixed charge as well as demand, usage and user specific charges. The demand charge consists of a declining block structure with two distance-based blocks adopted to better reflect costs. User's greater then 10km from the nearest transmission pipeline are supplied at a lower cost, as the cost of laying pipes in this area is cheaper. The usage charge is a charge per GJ-km and has a distance based declining block structure. The charge covers the portion of the cost of use of the AlintaGas network determined by the users location. The tariff also has a user specific charge, which is determined by the costs incurred by AlintaGas in connecting the user's facilities to the network.

Reference tariff B1

Reference tariff B1 is applicable to commercial and industrial customers (less than 35TJ/year or peak rate less than 10 GJ per hour). Unlike reference tariff A, the tariff design is related to the volume of gas delivered to the user. The tariff consists of a fixed charge and a usage charge that covers the portion of the cost of use of the AlintaGas Network determined by the volume of gas delivered to a user at a delivery point. There is also a charge for user specific delivery facilities.

Reference tariff B2 and B3

Reference tariff B2 and B3 are for small commercial and industrial customers and residential customers. The tariff consists of a fixed charge and a declining block charge based on the volume of gas delivered to the user.

ATTACHMENT 7 ECONOMIC PRINCIPLES FOR NETWORK PRICING

Economic principles for network pricing

Network pricing can be a difficult, technically complex subject, especially if economic costs are to be reflected in a dynamic fashion. Hunt and Shuttleworth summarise the regulatory objectives with respect to pricing as follows:[210]

Economic efficiency This requires that prices give the correct signal for the location of new users' use of the network by existing users and investment in the development of the network. This encompasses both allocative and dynamic efficiency.

Revenue sufficiency For a commercial network service provider this objective is paramount. Revenues must be commercially sustainable and prices set accordingly. If not, the owner will not maintain and invest in the network unless coerced. This objective is achieved primarily through the determination of the total revenue. However, the structure of prices can affect long term asset values and the capacity to recover these revenues.

Efficient regulation Efficient regulation should encourage minimum cost operations and minimise regulatory intervention. Design of the regulatory scheme should match incentives to economically efficient outcomes. However, regulation should also be simple, transparent, and encourage efficient outcomes without excessive administrative costs.

Economic efficiency is normally considered under three headings:

- ***productive efficiency*** – the efficiency with which the existing services are produced. The key question is whether the same output could be produced using fewer inputs or the same inputs could produce more output.
- ***allocative efficiency*** – the efficiency with which existing resources are allocated between competing uses. An important test is whether the prices for inputs and outputs reflect their economic costs.
- ***dynamic efficiency*** – the efficiency of decisions by the network to expand or replace network capacity or introduce new technologies, and the efficiency of end users' decisions to invest or introduce new technologies to alter their consumption patterns or location.

Simultaneously satisfying each of these efficiency criteria is not an easy task, but they share a common element: the efficient, forward-looking costs of meeting additional network loads.

Productive efficiency

Regulation has an impact on productive efficiency through its effects on a utility's incentives to improve efficiency. It is generally accepted that incentive regulation, which commonly uses a CPI-X formula, provides stronger incentives to improve efficiency than rate of return regulation. Incentives are primarily a function of the form of regulation and of the reset principles for the next review rather than the X factor chosen.

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210 S Hunt and G Shuttleworth, Competition and Choice in Electricity, Wiley, Chichester, 1996, pp 206-8, cited in IPART, *Pricing for Electricity Networks and Retail Supply, Volume II*, June 1999, p 11.

The structure of prices has a second order impact on productive efficiency.

Allocative efficiency

The starting point for determining economically efficient network prices is the marginal cost of transmission and distribution.

In principle, the marginal costs of transmission and distribution are changes in the future costs of transmission and distribution incurred for a small but measurable change (either up or down) in demand over a defined period. There are three important features of marginal costs:

- with marginal costs, future costs matter, not past or sunk costs
- marginal costs depend on the size of the change modelled
- marginal costs will vary during the period over which the change in costs is measured.

The principle that future costs rather than sunk costs influence efficient pricing leads to the conclusion that prices based on allocations of accounting costs are unlikely to yield efficient prices.[211]

Dynamic efficiency

Regulation affects dynamic efficiency. A utility's investment incentives are driven more by regulation and provisions for rolling forward the asset base than by the price structure and locational differences between prices. Regulation operates in two stages: firstly, to determine total revenues and secondly, to allocate the revenues/costs which determine the structure and level of prices at each point or for each customer group. Incentives for the utility to invest depend on the link between an investment decision and the determination of the total revenues, rather than on the prices or price structures at each point.

Incentives for efficient investment require the utility to earn at least a commercial return on efficient investment. If the investment is inefficient, the utility may not earn a commercial return or may not recover its investment. Dynamic efficiency requires that the incentives guide the utility to choose the most efficient option/s to expand its capacity. Ideally, this should treat all options equally, irrespective of the mix of costs between capital and operating costs. One of the criticisms of rate of return regulation is that it encourages utilities to favour options involving higher capital costs.

For the user, incentives to invest in new gas using or saving technology, or to choose a particular location will depend on current and projected energy prices. The extent to which prices reflect allocative efficiency criteria over time will be critical for the achievement of this objective. Since users must make long term decisions on capital investment and location, it is important that the basis for pricing be stable and predictable. Adequate information on the basis for calculating network prices and, as far as possible, future changes in network prices must be provided. This will reduce any uncertainties faced by the user in responding to current price signals and reduce the prospect of stranding customers' investments through large unexpected changes in network charges to the overall detriment of the economy.

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211 R Tabors, *Transmission System Management and Pricing: New Paradigms and International Comparisons*, Paper for IEEE, 1993, p 4. Similar comments are expressed by S King, *Review of Transmission Pricing for Electricity*, IPART, Research Report No.5, 1995, pp 2-3.

Consideration of other objectives

Financial sustainability

Financial sustainability has a significant impact on the structure of pricing and the setting of individual prices. The economics of networks are such that, on average, across various points in the network, both short run marginal cost (SRMC) and long run marginal cost (LRMC) are below the average costs of the network.

The pricing problem is to recover the gap between marginal costs and average costs in a manner which distorts consumption as little as possible. The way in which the gap is recovered must have the smallest possible impact on the behaviour of end users and generators.

One option is to vary prices inversely with the sensitivity of users to prices (ie Ramsey pricing). It is unlikely to be feasible. If this is so, the element of pricing designed to recover the gap between marginal and average costs should, as far as possible, not vary by location or nature of load, and not be based solely on the maximum demand or commodity of gas supplied. Recovery across a broad range of factors can be desirable.

Competition

Network pricing and investment can affect competition at a number of levels: in upstream markets, in downstream (retail and end-use) markets, and in the market for competing network and non-network solutions. Competition in these separate markets is interlinked. For example, while stronger retail competition is dependent on up stream competition, it may increase the competitive pressure in the upstream markets.

Setting lower access prices for networks can encourage greater competition in retail markets. Lower network charges create a wider gap (or margin) between end use prices and the wholesale/transmission costs. Growth in demand may be stimulated by having lower prices. Both elements will encourage new entrants into the market.

Prices should not stimulate competition artificially. Nor should they discourage competition at the retail or wholesale level or restrict competitive pressures on the networks through competing networks or demand management options where the costs of these options are less than the forward-looking economic costs of the incumbent network. The requirements for competitive pricing match those for efficient pricing:

- recover marginal costs through demand or usage related charges where variations in locations and customer-class tariffs reflect variations in the marginal costs of additional maximum demand or energy throughput
- recover the gap between marginal costs and average costs in a manner which has the smallest possible impact on behaviour
- allow scope for negotiation to allow for circumstances where the recovery of the gap may unduly impact on usage of the network.

Such an approach would allow AGLGN to manage the risks of ‘uneconomic’ bypass through pricing strategies, while reducing risks.

Equity

'Equity' in pricing structures is essentially a matter of judgement. Various notions of equity suggest different pricing structures. Importantly, 'user pays', as it is often called in reference to fully distributed pricing models, owes more to equity objectives than efficiency objectives.

Within the community there is strong support for the view that users should pay for the assets they use. This view of 'equity' supports pricing approaches which allocate costs based on models of the flow of gas through the network. However, the strong locational signals that are sent can conflict with the requirements of efficient pricing. An alternative view for which there is also strong support is that the network was largely designed to meet the needs of the community as a whole and that the costs of the shared network at least should be allocated evenly across all users. This suggests a pricing structure with more muted locational signals which may also be more consistent with principles of efficient pricing.

A third view is that end users have made decisions on location, production, and investments in energy-consuming equipment based on existing pricing structures and locational differences. It would be inequitable to substantially change prices in the short term. The adjustment costs, which this view highlights, are real resource costs. It is appropriate to consider these adjustment costs when restructuring prices, especially where the restructuring goes beyond signalling marginal costs and seeks to achieve equity in pricing or other objectives, such as financial and environmental sustainability, simplicity and competition.

The various views of equity in pricing have different implications for pricing. Clearly the views of stakeholders can provide very important input to decisions about equitable pricing structures. This is an area where direct input from the regulator may be vital in balancing stakeholder interests.

Simplicity and transparency

Simplicity and transparency are desirable features of the pricing system, especially when prices are likely to impact on smaller users of energy. Intensive energy users are better able to deal with more complex pricing structures as these users have a greater incentive to invest time and effort in understanding the operation of the electricity market and network pricing.

Prices should be:

1. **Transparent**. Pricing schedules and their applicability to different customer groups should be readily available and able to be understood by end users. This information should be supported by the publication of the basis for calculating prices.
2. **Simple**. Subject to the requirements of the other pricing objectives, a simple, easily understood pricing structure is preferred. To the extent that prices are intended to provide signals to which end users respond, the signals will be clearer and more effective if the price structure is relatively simple.
3. **Predictable**. Prices should be predictable. Unpredictability of prices, either in their application and calculation during the course of a year, or in trends over time as utilities restructure tariffs, creates uncertainty for end users. Such uncertainty can dilute or confuse the intended signals and may encourage consumers to respond in a inappropriate / undesirable manner.

Administrative and regulatory costs

Although regulatory costs are likely to be minimised by certainty and continuity in regulatory practice, detailed involvement of regulators in setting prices is likely to add to administrative and regulatory costs. The setting of detailed price structures by regulators is likely to add to the costs for both the regulator and the utility. Furthermore, regulators do not have the necessary information on costs and customer needs to set efficient prices. Better outcomes may be achieved if the regulatory framework can provide appropriate incentives for the utility as well as responsibility for pricing within overall revenue or average price constraints. However, this must be supported by agreed guidelines for pricing and the disclosure of cost allocations and the basis for pricing.

Summary: Implications for pricing

In summary, the consideration of the above objectives suggests that prices should:

- reflect economic costs
  - reflect the level of available capacity
  - signal future investment costs
  - discourage uneconomic bypass
  - allow negotiation to reflect economic costs of specific services better
  - provide a commercially sustainable revenue stream
  - recover the gap between marginal and average costs in the least distorting manner possible
- avoid discouraging competition by
  - being the same for all retailers
  - maximising the potential market
- reduce regulatory burdens by being
  - simple
  - transparent
  - stable
  - predictable.

It is not easy to design pricing and regulation to meet these desirable characteristics as they can be in conflict. For example, a pricing structure which attempts to faithfully reflect the marginal costs of each service may not be simple or stable over time, due to the variability of marginal costs between services and over time. A simple price structure may reduce regulatory burdens and promote competition, but it may also introduce scope for uneconomic bypass. A particularly difficult tension exists between the efficiency of marginal costs pricing and the need to provide a commercially sustainable revenue stream. Underpinning this is the gap between average and marginal costs, a gap which will be larger if a higher asset valuation is chosen.

ATTACHMENT 8 AGL(ACT)'S ACTIVITIES BASED COST CATEGORIES

HP Network Operation and Maintenance		M/LP Network Operation & Maintenance	*Urgent Response*	Auditing	*Customer Support*	Sales and Marketing	*Support Services*	*Govt. Levies & Overhead*
Perform Cathodic Protection	Perform SCADA Monitoring	Perform Line Valve Inspection & Maintenance (pipe related)	Perform Urgent Response work	Audit Quality for Regulatory Compliance (after the meter)	Support Service Requests for Access	Market Network Utilisation – Residential Existing Customer	Exercise Management Control & Set Strategic Direction	Government Levies
Perform Pipeline Surveillance	Unplanned R & M – HP System	Perform Pressure Survey & Maint. Of Customer Meter Sets		Audit Quality of R & M work including Life Guard (before the meter)	Collect Meter Readings - Tariff	Market Network Utilisation – Residential New Home	Perform Financial Accounting	Corporate Overhead
Perform Regular Maintenance – Trunk System	Perform System Design, Monitor and Model Network	Perform Regular Maintenance of M/LP System		Audit Quality of Capital work including Life Guard (before the meter)	Operate and Maintain Daily Metering Devices	Market Network Utilisation – Residential Line of Main	Perform Management Accounting	Insurance Expense
Perform Regular Maintenance – Secondary System		Unplanned R & M – M/LP System			Process Enquires & Complaints	Market Network Utilisation – Business Sales Tariff	Maintain Regulatory Relationship	
Perform Pressure Survey & Maint. Of Customer Meter		Perform System Design, Monitor and Model Network Performance			Perform connection & disconnection	Market Network Utilisation – Contract Customer	Perform Research and Development	
					Maintain Customer Accounts	Market Network Utilisation – New Area Expansion	Manage Corporate Services	
						Market Network Utilisation - NGV	Manage Personnel and Human Resources	
							Coach and Lead Colleagues	

ATTACHMENT 9 OPERATING COST ALLOCATION: STAND ALONE CONTRACT METHODOLOGY

Activity Description	Act ID	Contract ($000's)	Tariff ($000's)	ACT total ($000's)
Perform cathodic protection	B10	39	49	88
Perform pipeline surveillance	B11	69	83	152
Perform regular maintenance of Trunk System (Trunk ALB Valves)	B12	0	0	0
Perform regular maintenance of Primary System (TRS & Primary Valves)	B13	50	4	54
Perform regular maintenance of Secondary System (PRS, POTS & Secondary Valves)	B14	0	0	0
Perform pressure survey and maintenance of customer meter sets (Customer related)	B15	100	43	143
Perform SCADA monitoring (incl. gas quality and balancing monitoring)	C16	20	6	26
Perform unplanned repairs & maint. - HP	D17	10	-9	1
Perform system design and monitor and model network performance	E18	50	53	103
Perform Line valve inspection & maintenance (pipe related)	F20	0	2	2
Perform pressure survey and maintenance of customer meter sets (Customer related)	F21	0	77	77
Perform regular maintenance of M/L Pressure System (SDRS & governor)	F22	0	5	5
Perform unplanned repairs & maint. - M/LP	G23	0	585	585
Perform system design, monitor and model network performance	H24	0	246	246
Perform urgent response work	I26	200	81	281
Audit quality for regulatory compliance - (after the meter)	J27	10	239	249
Audit quality of R&M work including Life Guard (before the meter)	J28	10	117	127
Audit quality of Capital work including Life Guard (before the meter)	J29	10	56	66
Support service requests for access	K30	10	87	97
Collect meter readings (Excl. collect meter reading from SCADA)	K31	0	247	247
Operate and maintain daily metering devices (incl. collect meter reading from SCADA)	K32	12	0	12
Process enquires & complaints	K33	10	172	182
Perform connection & disconnection (excl. turn-on and turn-off)	K34	10	14	24
Maintain customer accounts	K35	5	5	10
Market Network Utilisation - Residential Existing Customer (Increase gas load)	L40	0	406	406
Market Network Utilisation - Residential New Home	L41	0	530	530
Market Network Utilisation - Residential Line of Main	L42	0	3,387	3,387

Activity Description	Act ID	Contract ($000's)	Tariff ($000's)	ACT total ($000's)
Market Network Utilisation - Contract Customer	L44	14	0	14
Market Network Utilisation - New Area Expansion	L45	20	9	29
Market Network Utilisation - NGV	L46	104	0	104
Exercise management control & set strategic direction (including general management)	M50	200	379	579
Perform Financial accounting	M51	50	177	227
Perform Management accounting	M52	50	50	100
Maintain Management relationship	M53	100	35	135
Perform research, improvement projects & technical development (Incl. Setting technical standards/policies)	M55	100	530	630
Manage corporate services	M56	100	127	227
Manage personnel & human resources	M54	100	105	205
Government levies	N61	100	960	1,060
Corp. Overhead	N62	200	1,471	1,671
Coach and lead colleagues	M57	10	117	127
Insurance Expense	N63	68	82	150
Total		**1,831**	**11,189**	**13,020**

Source: AGLACT).

Note:

1. Under stand alone contract cost allocation, operating costs to the tariff segments equals total operating costs less stand alone operating costs to serve the contract market.
2. Based on 1997/98 result.