Final report to

Independent Competition and Regulatory Commission (ICRC)

Review of Expenditure, Demand Forecasts and Cost Attribution for ActewAGL Gas Distribution Network in the ACT, Queanbeyan and Yarrowlumla

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Background

The Independent Competition and Regulatory Commission (the Commission) is the regulator of the gas distribution businesses in the Australian Capital Territory (ACT) under the National Third Party Access Code for Natural Gas Pipelines Systems (the Code). The Commission is currently undertaking a review of the regulatory arrangements to apply to the ACT, Queanbeyan and Yarrowlumla gas distribution network of ActewAGL from 1 January 2005 to 30 June 2010. The investigations include an extensive economic and financial analysis covering operating expenditure, capital expenditure, rate of return, the initial asset base and depreciation. The investigation will result in a new price path to apply from 1 January 2005.

Cost Allocation

In general, it appears that ActewAGL has attempted to accurately reflect the costs incurred in their joint cost centres by allocating costs to the appropriate areas. There is no reason to believe that allocations from the CEO, Audit, Business Systems, Commercial Executive, Legal & Secretariat, Financial Services, Corporate Facilities and Electricity Networks are not reasonable. Benchmarking of certain aspects of the allocations shows that most of ActewAGL's allocation falls within the benchmark boundaries.

Some concerns do arise from the allocation from Retail area. However, the allocation from this area either lies within the benchmark boundaries or are relatively minor such that any changes to the allocation will have little impact on the overall cost allocation. Accordingly, we do not recommend that any allocations need to be changed.

Ring Fencing

ActewAGL has put in place policies for ring fencing its distribution and retail businesses. The policies provide for training of staff on ring fencing issues, recording of ring fencing issues, breaches and complaints and reviews of policy adequacy. The policies also apply to the electricity businesses.

Apart from concerns regarding the customer service and complaint handling processes managed by the Contact Centre, there is no evidence to suggest that ActewAGL staff, management and board have breached the ring fencing obligations. ActewAGL has provided evidence that it does take its ring fencing obligations seriously. The evidence was supported by policy documents, Board Papers, emails, newsletters, registers and other documents. The remaining concern is the absence of a Complaints Register that is provided for in ActewAGL's Gas Ring Fencing Manual.

Other areas where there may be concerns include:

- Lack of a methodology or process to specifically identify confidential information;
- All marketing activities are handled by ActewAGL Retail; and
- The potential of sharing of confidential information from within the Corporate Divisions due to the lack of physical separation.

Forecasts to be reviewed

ActewAGL initially submitted forecasts with its Access Arrangement Information (Initial Forecasts). MMA reviewed these forecasts and made a series of recommendations in its draft report. MMA considered that if these recommendations were acted upon they would have resulted in forecasts that MMA would consider to be best estimates arrived at on a reasonable basis.

ActewAGL has subsequently produced forecasts in June 2004 (Latest Forecasts). These forecasts took into account and acted upon some of MMA's recommendations, rejected or did not comply with other MMA recommendations and also made significant changes to the methodology, largely due to expected impacts of the Think Water Act Water (TWAW) strategy recently adopted by the ACT Government.

MMA has reviewed these Latest Forecasts in this report.

Review disaggregation and methodology

The ActewAGL forecasts reviewed have been disaggregated into:

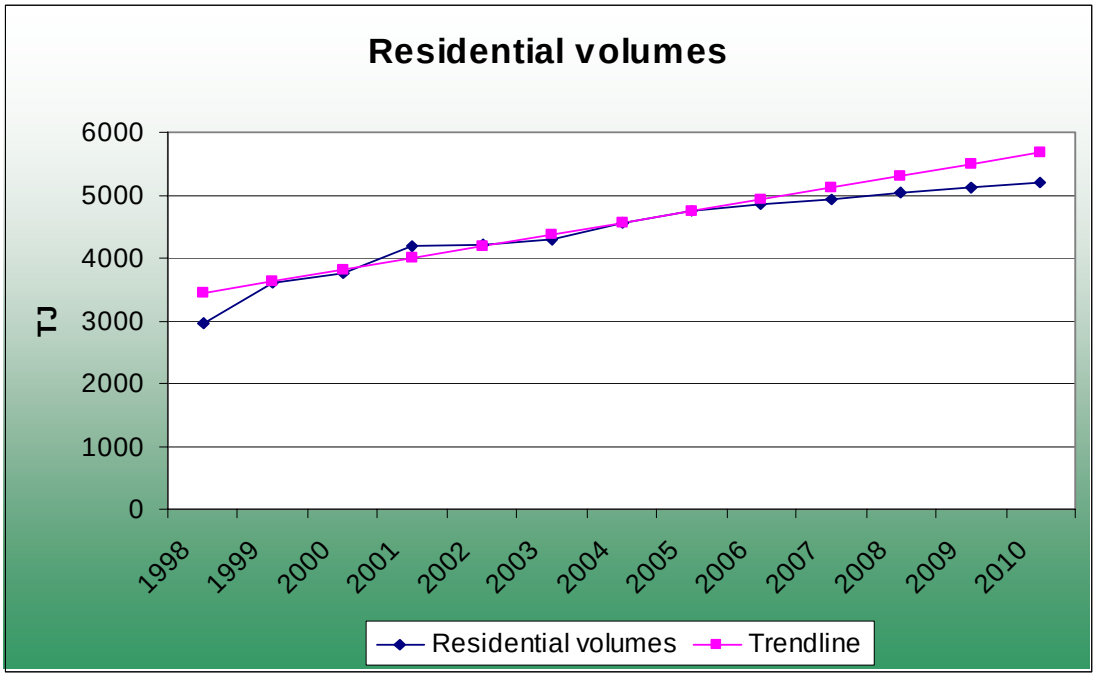
- Residential customer numbers
- Residential average usage
- Small business customer usage
- Contract customer usage and MDQ

In most cases MMA has considered the methodology adopted by ActewAGL to be reasonable. However, in some cases the methodology and in many cases the assumptions made by ActewAGL are not considered to be reasonable or best estimates.

Recent history and forecasts

Recent ActewAGL history and forecasts are best summarised in the following three Figures for the residential, small business and contract markets.

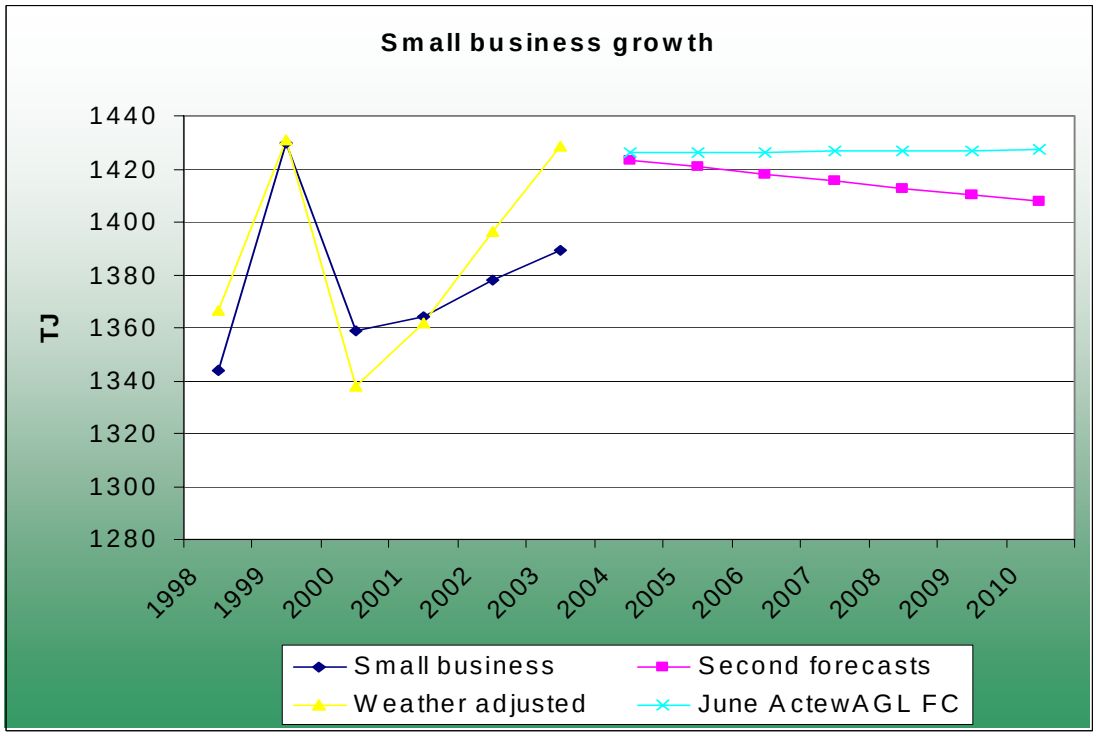
Exec Figure 1 Historical and forecast residential volumes



Note that as ActewAGL has argued that the data for 1997/98 are unreliable, data from that year have not been included within the trendline.

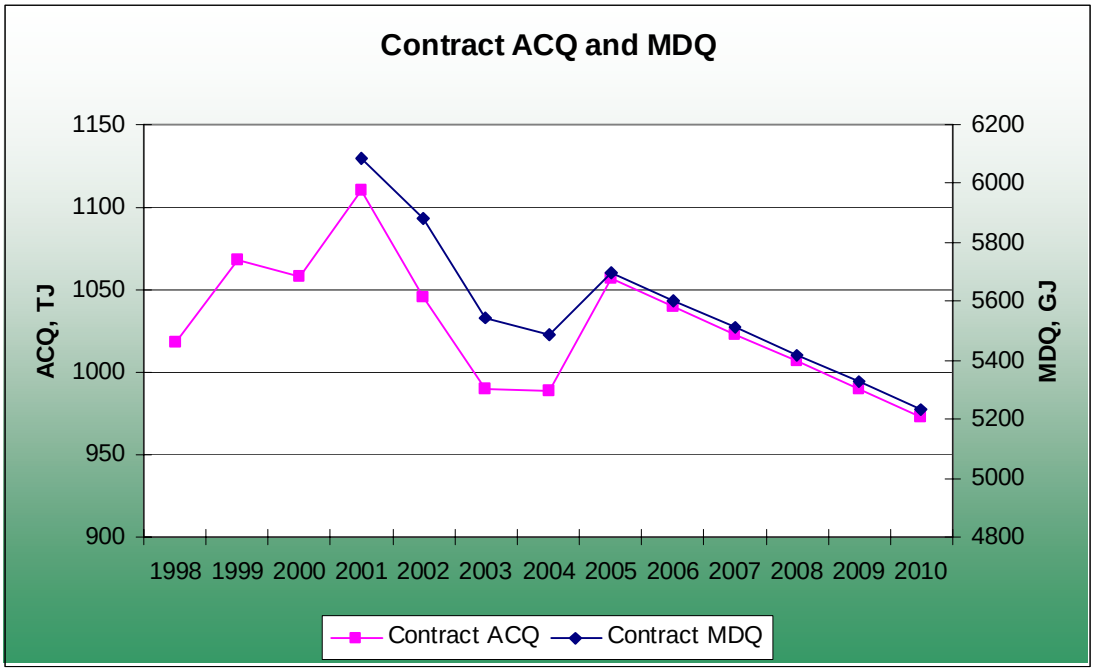
The ActewAGL Latest Forecasts for the residential market (which contributes about 73% of network revenue) can be seen to be significantly less than suggested by the trendline based on recent history. Much of the change is expected by ActewAGL to derive from the expected impacts of the TWAW strategy.

Exec Figure 2 Historical and forecast tariff business volume growth



Despite quite strong growth in weather adjusted sales over the past three years, the Latest ActewAGL forecast for the small business market (which contributes about 23% of network revenue) is for no growth from 2004.

Exec Figure 3 Contract market, recent history and ActewAGL forecasts (change PJ)



Based on trend analysis ActewAGL is forecasting Maximum Daily Quantity (MDQ) contracted by the Contract market (which contributes about 4% of network revenue) to reduce over the period despite the expected connection of a large new contract customer in 2005.

In all cases the forecasts show a reduction of growth compared to recent trend which needs to be explained and tested.

MMA's review of the Latest ActewAGL forecasts for the residential market

Despite MMA accepting that the TWAW strategy will have a significant impact on the residential market, it considers that the latest ActewAGL forecasts are not acceptable in the following areas:

While the difference between the ActewAGL forecasting methodology and assumptions and those that MMA considers to be reasonable has narrowed in some areas since the draft report, principally customer number forecasts, in other areas it has not. The material differences between the Latest ActewAGL forecasting methodology, assumptions and forecasts and those considered to be best estimates by MMA lie in the areas of:

- the number of new home connections forecast for 2003/04
- the number of E to G connections forecast for 2003/04
- the annual increase in average usage by existing customers

- starting usage by new customers
- the analysis of the expected energy impact of AAA fittings under TWAW on new and existing customers
- the expected penetration rate of the fittings for new customers
- the expected penetration rate of the fittings for existing customers
- the expected outcomes of the TWAW strategy for existing customers in the ACT
- the expected outcomes of the TWAW strategy for E to G customers in the ACT

MMA's review of the Latest ActewAGL forecasts for the small business market

MMA considers that the Latest ActewAGL forecasts are not best estimates as they do not factor in the growth seen over recent years after taking into account weather normalisation and transfers of customers between the tariff and contract markets.

MMA's review of the Latest ActewAGL forecasts for the contract market

ActewAGL has provided forecasts for the contract market based on the recommended MMA methodology, but using a "no change" assumption for demand by the major contract customers until discussions are held with these.

MMA considers this to be acceptable until discussions have actually been held.

MMA's overall findings

Overall, based on the reasons provided above and in the full text of the report, MMA considers that the Latest ActewAGL forecasts are not "best estimates arrived at on a reasonable basis". As a result MMA has produced its own forecasts.

MMA forecasts

The MMA forecasts for residential customer numbers, residential sales, small business sales and contract MDQ are provided in Exec Table 1 . Also provided are the ActewAGL Initial and Latest forecasts for these areas.

Exec Table 1 MMA forecasts and comparison with ActewAGL Initial and ActewAGL Latest forecasts

	2004	2005	2006	2007	2008	2009	2010	% pa*
MMA Forecasts								
Res Customers	94617	98551	101988	105291	108475	111553	114535	3.2%
Residential sales, TJ	4596	4784	4943	5093	5237	5379	5518	3.1%

	2004	2005	2006	2007	2008	2009	2010	% pa*
Business sales, TJ	1422	1435	1448	1460	1473	1486	1498	0.9%
Tariff sales, TJ	6018	6219	6391	6554	6710	6865	7016	2.6%
Contract MDQ, GJ	5479	5696	5613	5531	5447	5365	5282	-0.6%
ActewAGL Initial Forecasts								
Res Customers	94942	98527	101803	104946	107971	110889	113713	3.1%
Residential sales, TJ	4656	4839	5003	5162	5317	5469	5617	3.2%
Business sales, TJ	1452	1473	1494	1515	1535	1556	1577	1.4%
Tariff sales, TJ	6108	6312	6496	6676	6852	7025	7194	2.8%
Contract MDQ, GJ	5487	5695	5604	5512	5419	5327	5235	-0.8%
ActewAGL June 2004 Forecasts								
Res Customers	94164	98126	101576	104894	108092	111184	114181	3.3%
Residential sales, TJ	4556	4736	4840	4938	5032	5120	5206	2.2%
Business sales, TJ	1426	1426	1426	1427	1427	1427	1427	0.0%
Tariff sales, TJ	5982	6163	6266	6365	6459	6547	6633	1.7%
Contract MDQ, GJ**	5487	5695	5604	5512	5419	5327	5235	-0.8%

* Compound annual growth rate, 2004 to 2010, ** Initial forecasts

As can be seen there is a material difference between the MMA forecasts, the Latest ActewAGL forecasts and the initial ActewAGL forecasts. There is also a significant difference between the Initial and Latest ActewAGL forecasts. The differences between the forecasts are due mainly to different assumptions about the impacts of the ACT's Think Water Act Water strategy, although differences in the small business area are also material.

MMA is forecasting both residential and small business sales to be intermediate between the forecasts initially provided by ActewAGL and its latest forecasts. MMA has accepted that there will be a significant impact of the TWAW strategy on existing residential customers but does not accept the extent of the impact forecast by ActewAGL. MMA considers that the latest ActewAGL small business forecasts do not properly factor in the growth seen over recent years.

Capital and Operating Expenditure

Historical Capital Expenditure

In aggregate, ActewAGL's actual capital expenditure exceeded the 2000 Final Decision by $2.9m as shown in Exec Table 2. Whilst $2.9m is approximately 6% of the total expenditure, the review ensures that the capital expenditure meets section 8.16 of the Code in the following categories:

- Growth Market Expansion
- Growth Capacity Development
- Stay in Business

Exec Table 2 Comparison of actual capital expenditure versus Final Decision

Year ending 30 June $ million, real 2004-05	**2000**	**2001**	**2002**	**2003**	**2004**	**Total 2000-2004**
Final Decision	9.3	18.8	8.3	7.8	5.6	49.8
Actual	9.6	14.2	11.7	9.8	7.4	52.7
Difference	**0.3**	**(4.6)**	**3.4**	**2.0**	**1.8**	**2.9**

ECG conducted a high level assessment of the capital expenditure in each of the above three categories because expenditure details (eg. quantity and type of mains, services and meters) were not provided.

Based on this assessment, ECG has concluded the following:

- Growth market expansion was overspent by $6.7m primarily due to customer numbers exceeding forecast by 5149 (32%). There is no material difference between the actual average unit rate per customer and that allowed in the 2000 Final Decision.
- Growth capacity development was underspent by $1.2m due mainly to changes in timing and staging of major reinforcement projects. ECG did not find any material differences between its assessment of the Eastern Gas Pipeline expenditure and the assessments conducted earlier by Connell Wagner and Coraldeen. However, in relation to other major projects, no details of the major reinforcement projects were provided. In the absence of project details, ECG can only comment that it is not unusual for changes in the timing and staging of major projects to occur.
- Stay in business was underspent by $2.7m because the bulk of the meter change program has not yet been completed (6827 meters are overdue for replacement). The underspending on the aged meter replacement program was largely due to diversion of resources resulting from unforeseen incidents such as the Canberra bushfires. In the absence of meter replacement program details, ECG has deduced that this expenditure is for the change program for a mix of both domestic and industrial and commercial meters.

As the overspent is primarily due to the market expansion, ECG recommends that the actual costs be accepted as prudent and that this expenditure is used to determine the opening capital base for the next Access Arrangement period.

The table below is the recommended expenditure for inclusion in the opening capital base for January 2005.

Exec Table 3 Recommended Expenditure for 2000 to 2004

Year ending 30 June $'million, real 2004/05	**2000**	**2001**	**2002**	**2003**	**2004**
Growth-Market Expansion	4.6	5.2	2.6	5.1	4.4
Growth-Capacity Development (excluding EGP)	0.3	0.2	3.4	4.6	2.1
Eastern Gas Pipeline	4.6	8.6		0	0
Stay-in –Business	0.1	0.1	0.1	0.1	0.9
Total	**9.6**	**14.2**	**11.7**	**9.8**	**7.4**

Forecast Capital Expenditure

Forecast expenditure is shown in the following table.

Exec Table 4 ActewAGL submitted forecast expenditure

30 June Year ending $ million, real 2004/05	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Distribution system capex						
Growth market expansion	6.09	5.74	5.61	5.41	5.49	5.40
Growth capacity development	1.71	2.88	2.33	1.77	4.42	0.72
Stay in business	2.52	1.28	1.34	1.28	1.36	1.02
Total distribution system	**10.32**	**9.90**	**9.28**	**8.46**	**11.27**	**7.24**
Non-system capex						
Gas networks GIS system	0.50	-	-	-	-	-
Regulatory capitalisation costs	1.60	-	-	-	-	-
Total non-system capex	**2.10**					
Total capex	**12.42**	**9.90**	**9.28**	**8.46**	**11.27**	**7.24**

As far as practicable, ECG has assessed the unit costs which underpin these estimates and whether they are appropriate in accordance with the requirements of the Code. In making its assessment, ECG has compared the unit costs with those used in the 2000 Final

Decision and also benchmarked them against the more recent Essential Services Commission (ESC) 2003-2007 determination for the Victorian distributors.

ECG's assessment was limited because ActewAGL was unable to provide information in a format which showed a breakdown of Agility's direct and overhead costs for the various activities. Overhead percentage rates can vary widely between distributors due partly to the overhead cost each distributor estimates it will incur. ECG has concluded the following for the expenditure categories:

Growth market expansion - the cost to provide the mains, service and meter to a new residential customer is in the range of $1,515-$1,713. This is considered high in comparison to the 2000 Final Decision which is in the range of $975-$1095. This is due to ActewAGL's budget assumptions. Following response to the draft report, ECG has estimated the prudent expenditure per customer is in the range of $1403-$1569.

Growth capacity development forecasts are considered high mainly because the average cost per new customer of $785 is significantly higher than the $467 per new customer for the current Access Arrangement period. Observations from the current Access Arrangement period have shown that there are changes in timing of projects. As such, ECG believes that there is scope for reducing this expenditure. It is therefore recommended that a prudent expenditure for this category is in the order of $668 per customer.

Stay in business forecasts are predominantly for aged meter replacement. On a unit cost basis, the replacement cost for a residential meter is considered prudent. However, the cost for replacing an industrial meter is considered high from ESC benchmark data. ECG recommends using the ESC costs for industrial meters. ECG has included the costs for the non-system capex in its recommendation. However, in relation to the capitalisation cost, there is little information on the overall costs. The recommended costs are shown in the table below:

Exec Table 5 Recommended Capital Expenditure for 2005-2010

30 June Year ending $ million, real 2004/05	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Distribution system capex						
Growth market expansion	6.24	5.50	5.39	5.29	5.32	5.24
Growth capacity development	1.7	2.45	1.98	1.50	3.76	0.70
Stay in business	2.4	1.20	1.29	1.22	1.34	1.02
Total distribution system	**10.34**	**9.15**	**8.66**	**8.01**	**10.42**	**6.96**
Non-system capex						
Gas networks GIS system	0.50	-	-	-	-	-
Regulatory capitalisation costs	1.60	-	-	-	-	-

30 June Year ending $ million, real 2004/05	2005	2006	2007	2008	2009	2010
Total non-system capex	**2.10**					
Total capex	**12.44**	**9.15**	**8.66**	**8.01**	**10.42**	**6.96**

Non- capital Expenditure

The Commission's determination for the 2001 Access Arrangement can be summarised in the following table:

Exec Table 6 2001 Final Decision for Non-Capital Expenditure

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Controllable costs	Operations & Maintenance	4.13	4.13	4.13	4.24
	Corporate Overheads	1.90	1.90	2.01	1.96
	Marketing	3.46	2.90	2.46	1.96
Subtotal		9.49	8.93	8.60	8.06
	Government Levies	1.34	1.34	1.23	1.20
	Contestability	0	0	0	0
	UAG	0.22	0.22	0.22	0.22
Subtotal		1.56	1.56	1.45	1.42
Total		11.06	10.50	10.05	9.48

The actual expenditure incurred by the ActewAGL for the same period is shown in the table below:

Exec Table 7 Actual Non-Capital Expenditure 2001-2004

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004*
Controllable costs	Operations & Maintenance	8.03	7.63	7.10	7.03
	Corporate Overheads	0.52	0.47	1.10	1.69
	Non-system asset charge	0.48	0.48	0.48	0.48
	Marketing	2.83	2.29	1.70	1.48
	Other direct costs	0.12	0.12	0.16	0.24
Sub total		11.98	10.98	10.54	10.90
Other Allowable Costs	Government Levies	0.56	0.39	0.42	0.34
	Contestability costs	0	0	0	0
	UAG	0.17	0.17	0	0.10
	Other Costs	0	0.06	1.06	0.23

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004*
Subtotal		0.73	0.62	1.48	0.68
Total		12.70	11.61	12.01	11.57

*Note: 2004 Expenditure is forecast

From an overall expenditure perspective, the difference per annum varies from $1m to $2m. A detailed analysis of the costs indicates the following:

- ActewAGL has not achieved the savings envisaged by the Commission in the 2001 Access Arrangement decision. It is recommended that the Commission's decision of operations and maintenance expenditure be used as the prudent cost.
- Legal and regulatory compliance costs have increased ActewAGL's corporate overheads. It is recommended that ActewAGL's overhead increase be accepted as prudent.
- There is a decrease in marketing expenditure below the level in the 2001 Access Arrangement decision. Notwithstanding this, there has been an increase in customer numbers. It is recommended that the actual marketing expenditure be accepted as prudent.
- The bushfire in 2003 has resulted in a once off expenditure of $1m and an ongoing annual expenditure of $0.23m. It is recommended that the actual expenditure be accepted as prudent.

As a result, ECG is recommending the following expenditure as prudent under the Code:

Exec Table 8 Recommended prudent expenditure for 2001-2004

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Controllable costs	O&M	5.51	5.51	5.51	6.36
	Corporate Overheads	0.52	0.47	1.10	1.69
	Non-system Asset Charge	0.48	0.48	0.48	0.48
	Marketing	2.83	2.29	1.7	1.46
Subtotal		9.34	8.75	8.79	10.23
Other Allowable Costs	Government Levies	0.56	0.39	0.42	0.34
	Contestability	0	0	0	0
	UAG[1]	0.17	0.17	0.0	0.10
	Other costs	0.0	0.06	1.06	0.23
Subtotal		0.73	0.62	1.48	0.67
Total		10.07	9.37	10.27	10.90

Note: The 2004 operating and maintenance expenditure has been adjusted to reflect the actual growth numbers and the additional market operations expenditure.

ECG has used the recommended 2004 expenditure as the starting point for assessing the forecast expenditure for 2005 to 2010.

[1] UAG was left at the higher number due to the inconsistent information.

ActewAGL forecast expenditure for the period 2005 to 2010 is shown in the table below:

Exec Table 9 Forecast Expenditure for 2005 to 2010

Year ending 30 June	$ million, real 2004-2005						
	Forecast 2004	2005	2006	2007	2008	2009	2010
Controllable costs							
O&M	7.03	7.56	7.60	7.77	7.77	7.73	7.70
Overheads	1.69	1.92	1.92	1.92	1.92	1.92	1.92
Asset charge	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Marketing	1.46	1.84	1.87	1.89	1.90	1.93	1.95
Other controllable costs	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Sub total	10.90	12.04	12.09	12.30	12.31	12.30	12.29
Other Costs							
Government Levies	0.34	0.55	0.55	0.55	0.55	0.55	0.55
Contestability costs	0.00	0.45	0.46	0.46	0.46	0.46	0.45
UAG	0.10	0.26	0.26	0.28	0.29	0.29	0.31
Other Costs	0.23	0.24	0.24	0.24	0.24	0.25	0.25
Total	0.67	1.50	1.51	1.53	1.54	1.55	1.56
Total	11.57	13.54	13.60	13.83	13.85	13.85	13.85

The analysis has led to the following key conclusions:

- For the 2005 to 2010 period, there are no contributing factors that warrant an increase in the prudent operating and maintenance expenditure recommended in 2004. The expenditure for 2005-2010 should be consistent with the prudent expenditure for 2004 adjusted for increased demand and customer numbers and for a 1.5% efficiency factor.
- Overheads should be retained at the 2005 level.
- Insufficient information is provided to warrant increasing marketing expenditure above the 2004 level.
- UAG increased from 0.7% to 1%.

The table below shows the recommended prudent expenditure:

Exec Table 10 Recommended Prudent Expenditure 2005-2010

Year ending 30 June	$ million, real 2004-2005						
	2004	2005	2006	2007	2008	2009	2010
Controllable costs							
O&M	6.36	6.50	6.66	6.89	7.11	7.32	7.52
Overheads	1.69	1.92	1.92	1.92	1.92	1.92	1.92
Asset charge	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Marketing	1.46	1.46	1.46	1.46	1.46	1.46	1.46
Other controllable costs	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Sub total	10.23	10.60	1076	10.99	11.21	11.42	11.62
Other Costs							
Government Levies	0.34	0.55	0.55	0.55	0.55	0.55	0.55
Contestability costs	0.00	0.45	0.46	0.46	0.46	0.46	0.45
UAG	0.10	0.17	0.17	0.19	0.19	0.19	0.21
Other Costs	0.23	0.24	0.24	0.24	0.24	0.25	0.25
Total	0.67	1.14	1.41	1.43	1.43	1.44	1.46
Total	10.90	12.01	12.17	12.42	12.64	12.86	13.08

1 INTRODUCTION

1.1 BACKGROUND

The Independent Competition and Regulatory Commission (the Commission) is the regulator of the gas distribution businesses in the Australian Capital Territory (ACT), Queanbeyan and Yarrowlumla under the National Third Party Access Code for Natural Gas Pipelines Systems (the Gas Code). The Commission is currently undertaking a review of the regulatory arrangements to apply to the ACT, Queanbeyan and Yarrowlumla gas distribution network of ActewAGL from 1 January 2005 to 30 June 2010. The investigations include an extensive economic and financial analysis covering operating expenditure, capital expenditure, rate of return, the initial asset base and depreciation. The investigation will result in a new price path to apply from 1 January 2005.

1.2 THE CONSULTING TEAM

The Commission has engaged MMA to undertake the review of the operating expenditure, capital expenditure, asset management practices, demand forecasting, cost allocation and ring fencing arrangements for ActewAGL's Gas Distribution business. MMA has entered into an alliance with ECG to undertake this assignment.

MMA is responsible for managing the project and reviewed the growth forecasting, cost allocation and ring fencing arrangements. ECG, as sub-contractors to MMA, will carry out the prudency and efficiency reviews of the operating and capital expenditures for the gas distribution sector.

1.3 THE APPROACH

This report aims to capture the progress and results of the entire process. Because of this, in certain sections, it incorporates comments and recommendations included in the Draft Report as well as later developments and forecasts. We consider that the increased transparency and logic trail available from such a report outweighs the slightly clumsy report style and layout which has been the inevitable result.

1.3.1 Cost Allocation and Ring Fencing

Under the Code and the Commission's ring fencing guidelines, the network service providers are to have a transparent accounting reporting mechanism to ensure that all costs are attributed to the services provided by the businesses and therefore allocated accordingly.

The Team undertook an investigation of the ring fencing policy and procedures to ensure that ActewAGL Distribution is complying with the Commission's guidelines and as stated in obligation (f) of the Guidelines to "allocate any costs that are shared between an activity covered by a set of accounts described in clause 3.1(c) and any other activity according to a methodology that is consistent with generally accepted accounting standards and is otherwise fair and reasonable."

This investigation included the:

- Examination of the costs and cost allocation of each business and their related activities and that they are attributed to the appropriate activities
- identification of cross-subsidisation practices, if any.
- Assessment of benchmark costs, activities and margins for the major activities and the reasonableness of the costs attributed to the various activities
- analysis the transparency of the businesses reporting process and the procedures for maintenance of confidentiality required under the guidelines to ensure that information provided to a related business is available to other businesses and customer information is treated confidentially and
- consideration of the reasonableness of the costs, their allocation to the business activities, transparency and satisfactory compliance with the Commission's guidelines.

This investigation is very much dependent on the quality of information supplied by ActewAGL and their cooperation in supplying the information.

1.3.2 Demand Forecasts

To adequately support the forecast of capital and operating expenditure as well as revenue, customer numbers, number of dwellings and gas demand are required at different levels of detail:

- a detailed forecast by customer sector for the regulatory review period 2005 to 2010 as inputs for assessing revenue requirements as well as for forecasting Capex and Opex estimates; and
- a less detailed forecast for the period 2010 to 2015.

Forecasting requirements

The key forecast outputs generally are:

- customer numbers; and
- total gas consumption.

The level of disaggregation required is typically at one or more of the following levels:

- customer categories
- tariff type.

Key drivers

The key drivers of gas demand at a distribution level are:

- economic: including Gross State and Regional Product, changes to housing stock, household disposable income, employment, etc relevant to ActewAGL's area

- trends in appliance penetration, efficiency and use of appliances – for example, use of space heater or gas central heat, gas cooking appliance and gas hot water (instantaneous or storage)
- fuel pricing – real price of gas, impacts of Full Retail Contestability, pricing relative to other fuels (especially electricity) and price elasticities
- major new industry or commercial developments
- climate change and weather conditions that could affect winter demand
- number of single dwellings and multi-dwelling sites.

The key uncertainties underlying the gas projections include:

- reduction in demand growth due to changes in population migration
- winter weather conditions
- increasing use of reverse cycle air-conditioners, which could impact on the growth of gas consumption rates in winter
- changes to town planning requirements related to reduced greenhouse gas emissions, related especially to water heating appliances.

Forecasting gas consumption

Forecasting gas consumption involves detailed modelling of the technical and cost relationships affecting demand for each customer type. As an example, residential customers are modelled as follows:

- determine the gas consumption profile of typical households as a function of appliances used and household characteristics (number of people per house, size of houses, etc)
- forecast growth in the number of customers (or meters). For the residential market this is largely related to the net growth in new dwelling stock in the area covered by the network service provider. Each new dwelling may be a new customer. (For the business sector it is the net number of new businesses)
- forecast average usage per meter. This is a much more complicated consideration because it needs to take into account changes over time to all the factors discussed above.

The main elements considered are economic and price impacts and historic movements over time. Consideration of appliance usage – eg penetration of central heating appliances or gas hot water is also relevant. A similar process is adopted for the business tariff and contract customers. The forecasts for large customers may need to be assessed either through correlation with economic forecasts and, to the extent possible, discussions with individual large customers. The analysis will need to be backed up by desk research and analysis of the key factors affecting demand.

1.3.3 Capital and Operating Cost

We reviewed the submission from ActewAGL with a view to understanding the operating and maintenance expenditure and the capital expenditure submission. In particular, it is important to get an appreciation of the underlying assumptions in developing the forecast expenditure.

In relation to the historical expenditure, we seek to understand the expenditure profile and how it relates to field activities. It is also important to be able to classify the categories of capital expenditure in the four main streams as discussed below.

In reviewing historical expenditure, it must be noted that this expenditure has occurred and the judgement of whether the expenditure is prudent and efficient will be very dependent on the decisions made prior to the expenditure incurred. The review therefore examines ActewAGL asset management plans and any business cases that have been put forward for the expenditure. This is particularly relevant for renewal and augmentation of the network which is more a risk mitigation strategy.

On the projects over the material threshold in particular, we seek to understand the approach used by ActewAGL and how it determines whether the cost is efficient. One measure of the efficiency of the cost is if ActewAGL tenders out the work and accepts the most efficient market rates. When the work is carried out in house, efficiency will have to be assessed through understanding the award conditions of the staff.

Whilst this approach may seem fairly intrusive to the business, it is important to note that until an expenditure pattern can be established over a period of two to three Access Arrangement Reviews, there is a need to review the business operation in detail.

Understanding safety and service obligations

The safety and service obligations are cost driver components for a distribution business. We link these obligations to the capital expenditure in particular the business decision to trade off between operating and capital expenditures.

These obligations are key factors in the distributor's asset management plan. We developed an understanding of the decision process of ActewAGL as outlined in its asset management plan.

In considering the trends in operating expenditure from the current Access Arrangement period to the next, we take into consideration the impact of any new or enhanced requirement on ActewAGL.

Questionnaire and Review of Operations

From the preliminary view, the project team developed a questionnaire for ActewAGL to get a better understanding of its submission and also to seek clarification and justification for the information provided.

The questionnaire takes into consideration indices that have been developed from the information provided so that we can test the assumptions provided by ActewAGL.

2 COST ALLOCATION AND RING FENCING

2.1 COST ALLOCATION (NB: Some commercial-in-confidence tables in this section have been excised from the public document)

2.1.1 Introduction

Cost allocation needs to be undertaken whenever joint costs exist. Joint costs are incurred when services, processes, materials or equipment are used to produce more than one output product or service. A multi-utility like ActewAGL provides gas distribution, electricity distribution, water & waste water services and energy retail services. It is clear that corporate and other services would normally be considered as joint costs for the utility.

The allocation of costs between different parts of a business is often arbitrary and can be highly controversial. Where there are direct cost drivers, costs can be causally allocated. However indirect costs, such as the cost of the corporate support functions, often do not have a simple cost driver. This creates the more complex task of attempting to allocate common costs which are not directly attributable. Proxies must then be found to form the basis for allocation. The key then is to determine an activity based allocator which most closely reflects the actual cost drivers.

2.1.2 Incidence and Quantum of Joint Costs

According to ActewAGL, joint costs occur in three areas as illustrated in Table 2-1.

Table 2-1 Areas of joint costs

Areas with Joint Costs	Functions	Quantum, $ M
Corporate	CEO, Audit, Business systems (IT), Commercial executive, Legal & secretariat, Financial services, Human resource services, and Facilities	$29.6
Electricity Distribution		$3.2
Retail	Billing and revenue collection, advertising and marketing, customer service	$13.1

In total, ActewAGL has categorised $45.9M as joint costs, a portion of which will need to be allocated to the gas distribution business.

2.1.3 ActewAGL's Initial Allocation of Joint Costs

Table 2-2 summarises ActewAGL's allocation of joint costs to all operating businesses[2] and sets the context against the 2004/05 budgeted total O&M costs and revenue. In total the allocation of joint costs to Gas Distribution accounts for some 4.4% of revenue and 13% of O&M costs.

Table 2-2 Allocation of joint costs ($M)

	Gas Distribution	Water Service	Electricity Distribution	Retail	EcoWise
Allocated joint cost	1.9	16.5	16.5	10.0	0.4
Total O & M cost	13.5	39.4	66.2		
Revenue	39.7	95.1	149.0		

2.1.4 Importance of Appropriate Allocation

Joint costs need to be appropriately attributed or allocated to the various ActewAGL operating businesses: gas distribution, electricity distribution, water and waste water services, retail and EcoWise[3] to enable accurate cost recovery and to eliminate potential cross subsidisation between different regulated businesses and between regulated and unregulated services. Of particular concern during this review, which covers only gas distribution, is the apportionment of costs between this regulated business and to retail and the electricity distribution and water businesses. Inappropriately allocating costs from retail, electricity distribution and/or water business to Gas Distribution will not only inflate the level of regulated costs to be recovered from Gas Distribution customers but may also distort electricity and gas retail competition to the detriment of other retail providers. A misallocation of costs could lead to unnecessarily high gas tariffs.

2.1.5 The Approach

The analysis of allocation of joint costs has required discussions with representatives of ActewAGL, consideration of the cost drivers and the basis for allocation and, where required, further analysis against benchmarks established for similar distribution companies and service providers in other Australian states.

In this review of ActewAGL's cost allocation, we have not sought to undertake a micro-analysis of every joint cost. The quantum and efficiencies of the costs are also not directly

[2] ActewAGL's operating businesses are defined as the Gas Distribution, Electricity Distribution, Water & Waste Water Services and Retail operations. ActewAGL's Corporate Divisions are also cost centres but these costs are then re-allocated to the operating businesses.

[3] The ActewAGL subsidiary, EcoWise is small and is largely a stand alone business. The quantity of resources devoted to this business by ActewAGL is negligible and accordingly, the cost allocation to EcoWise is ignored in this analysis.

assessed in this part of the review (efficiencies have been considered in other parts of the report). In this section we have reviewed only ActewAGL's cost allocation methodology and developed a view as to the appropriateness of the cost drivers used to allocate costs to the operating businesses. After considering the methodology and basis of cost allocation, we have in some areas also undertaken further analysis to further assess the cost values allocated from each cost centre to the operating business against indicative benchmarks derived from elsewhere. In instances where the costs levels seem to be beyond reasonable boundaries, further investigations were conducted to ascertain the reasons why and, where necessary, make adjustments to the costs allocated. We have not audited the cost allocation methodology nor checked that it has been properly applied.

In conducting this investigation, we undertook discussions with the responsible ActewAGL staff and management. These discussions centred largely on the nature of the cost centres and the basis for selecting the cost allocation driver.

We have concentrated our attention on the largest joint costs. The impact on regulated revenue of mis-allocations of smaller cost centres is likely to be relatively immaterial. Therefore, while the methodologies for such smaller allocations have been reviewed the level of analysis has been limited.

2.1.6 ActewAGL Cost Allocation Submission

Table 2-3 provides ActewAGL's submission for the allocation of budgeted costs to the various operating businesses within the joint venture.

As seen in Table 2-3, while most of the costs allocated are incurred by ActewAGL Corporate Division, some are from the electricity distribution and some from Retail.

Table 2-3 ActewAGL Cost Allocation Submission – 2004/05 Budget ($'000)

(Note: commercial-in-confidence data in this table has been excised)

Business service divisions	Gas	Water	Electricity	Retail	EcoWise[4]
From Corporate					
CEO					
Audit					
Bus Systems					
Commercial Executive					
Legal & Secretariat					
Finance					
Human Resources					
Facilities					
Electricity Distribution					
From Retail					
Customer Accounts					
Retail Executive					
Wholesale, Strategy & Environment					
Marketing & Communications					
Total allocation[5]					

Source: ActewAGL, 2004-2005 FPSC Income Comparative Data Analysis

According to ActewAGL, the costs have been allocated based on services provided to the various divisions under the "Fixed Price Service Contract (FPSC)" budgeted charges. FPSC are agreed charges developed between Corporate Divisions service providers and the various operating businesses of ActewAGL. The agreements attribute the cost of corporate services, shared services and other corporate overhead costs to the operating business. These charges are fixed at the beginning of the year according to the expected

[4] EcoWise is an ActewAGL subsidiary specialising in Water Testing. It is allocated some costs as it utilises a small amount of corporate resources.

[5] The total allocation fromTable 2-3 amounts to $45.1M. Another $817,800 is allocated back to ACTEW Corp or not allocated to any operating business.

use of services and a proportion of corporate overhead costs. ActewAGL bases the allocation of costs on certain cost drivers that provide an indication of the consumption of such services by each operating business.

ActewAGL has not provided a detailed forecast for such costs beyond 2004/05 and has informed us that for the purposes of budgeting, all costs are simply escalated by CPI. This may be an issue of concern in future years if the pattern of allocation of major projects change for example, should there be a major expansion of the gas system, costs allocated based on current patterns of effort utilisation are likely to differ from the expected effort in 2004/05.

2.1.7 Cost Drivers and Basis of Attribution

Where it is possible to directly attribute costs, ActewAGL has attributed the costs of corporate areas and shared service areas to the various Divisions using those services. Costs not directly attributable to a Division are attributed based on other proxy metrics. A summary of the basis of attribution is provided in Table 2-4. Each cost allocation is then discussed.

Table 2-4 Fixed Price Service Contracts – Basis of Allocation

(Note: commercial-in-confidence data in this table has been excised)

Services	Cost ($M)					Basis of Allocation
Corporate Division	**2000/01 Actual**	**2001/02 Actual**	**2002/03 Actual**	**2003/04 Estimate**	**2004/05 Budget**	
CEO Office						Estimated effort[6] of the CEO's office in dealing with issues arising from Division's activities.
Audit						Estimated effort on planned internal audit program projects related to Division.
Business Systems						
Help desk						Number of calls received and made from Division.
IT infrastructure						Number of PCs, servers, communications and computer equipment utilising the IT infrastructure.
Applications						Estimated effort by applications maintained and supported attributed to the user supported.
Commercial Executive						Estimated effort on planned commercial projects related to Division.
Legal & Secretariat						Estimated effort on projects and ongoing activities from Divisions being provided with service.
Finance						Estimated effort on projects and ongoing management and corporate governance issues.
Human Resources						Number of staff in each Division.
Corporate Facilities						Direct allocation, area utilised.

8 Effort is estimated based on the answers to questionnaires sent to the staff of the various divisions on the quantity of time and effort spent on each operating business or project that is assigned to the operating businesses.

Services	**Cost ($M)**					**Basis of Allocation**
Corporate Division	**2000/01 Actual**	**2001/02 Actual**	**2002/03 Actual**	**2003/04 Estimate**	**2004/05 Budget**	
Electricity Networks						
Warehousing						Square meters of space used and staff time.
Process & Support						Staff time for each division using services
Fleet						Number of vehicles in each Division.
Retail Division						
Customer Accounts						Volume of each service used by Divisions.
Retail management services						Estimated effort on projects related to Divisions.
Total allocation						

Source: ActewAGL, FPSC Income Comparative Data Analysis

Chief Executive Officer's Office

The cost of maintaining the CEO's office is budgeted to amount to some $2.04M in 2004/05. Of this some $52,980 is allocated to Gas Distribution based on an estimate of the effort (time) expended in issues related to these business areas. The effort level, based on the time spent, was estimated by ActewAGL from questionnaires sent to staff members annually. Staff were required to estimate the amount of time they would spend on projects or issues relating to the operating businesses. The proportions of time spent on issues relating to the operation businesses were then used to allocate joint costs.

The allocation from the CEO office forms approximately 0.4% of the total O&M for the Gas Distribution business. The basis of allocation appears sound and given the relatively minor nature of the cost we did not further investigate the allocation.

Audit

The cost of the Audit office is budgeted to amount to some $729,000 in 2004/05. Of this about $46,000 is allocated to Gas Distribution based on an estimate of the time required to undertake the planned audit projects. The allocation from the Audit office amounts to some 0.3% of the Gas Distribution's O&M cost.

The basis of allocation appears sound and given the relatively minor nature of the cost we did not further investigate the allocation.

Business Systems

Business Systems comprises a number of information technology functions. It operates a Help Desk for all IT related problems responding to both hardware and software issues. Business Systems also manages the joint ventures' internal and external communications, IT infrastructure and provides support services for computer hardware and IT applications.

The 2004/05 budgeted cost of providing Business Systems services amounts to some $13.4M. About $217,500M is allocated to Gas Distribution based on various cost drivers including the number of calls to the Help Desk, the quantity of computer hardware used and also an estimate of the effort to maintain and support the applications used. Table 2-5 provides a breakdown of the costs allocated from the Business Systems Division.

Table 2-5 2004/05 Business Systems Division cost allocation ($)

(Note: commercial-in-confidence data in this table has been excised)

	Electricity Distribution	Water	Retail	Gas Distribution
Help Desk				
IT Infrastructure				
IT Applications				
BSD Executive				
Depreciation - specific systems				
Total Budget				

Source: ActewAGL BSD Cost Allocations for the year 2004/05

The allocation from Business Systems amount to some 1.6% of Gas Distribution's O&M costs and 0.6% of revenue. In our view, the basis of allocation seems adequate. In a comparison with the benchmarks developed (see section 2.1.8) by KPMG for the ORG, we also found that ActewAGL's allocation of IT systems costs to be reasonable.

Commercial Executive

The responsibilities of the Commercial Executive Division include implementing integration opportunities and the commercial development of new business opportunities.

This division has budgeted an allocation of some $50,000 to Gas Distribution out of a total budget of some $548,000 in 2004/05. This allocation is based on the estimate of the level of staff effort (in terms of time) required on the various planned commercial projects relating to the various operating businesses.

The allocation from the Commercial Executive office amounts to some 0.4% of the Gas Distribution's O&M cost. The basis of allocation appears sound and given the relatively minor nature of the cost we did not further investigate the allocation.

Legal & Secretariat

This division handles various tasks associated with corporate governance, risk management, complaints handling, government liaison and other legal and secretariat services. The 2004/05 budget provides almost $2.7M for the functions of this division of which about $375,000 is allocated to Gas Distribution. The allocation is based on the amount of time spent

by each staff member on issues related to the operating businesses and other divisions. Allocations from other division are reallocated to the operating businesses in accordance with the cost allocation proportions from those divisions to the operating businesses.

The allocation from the Legal & Secretariat office amounts to some 2.8% of the Gas Distribution's O&M cost. While we noted that the allocation made to Gas Distribution is significantly lower than to the two other regulated operating businesses (Electricity and Water), as a percentage of revenue, Legal & Secretariat costs amounted to some 0.9% for Gas Distribution. This compares against the allocation of 0.9% and 0.6% of Electricity Distribution's and Water Business' 2004/05 revenue approved by the Commission[7]. Given that the basis of allocation appears sound, we find no reason to further question this allocation.

Corporate Finance

The division of Corporate Finance manages ActewAGL's pricing, accounting, tax and other financial management functions. Allocations to the various divisions are based on the time spent by the staff of this division on financial matters relating to the individual divisions. Costs allocated to other corporate groups are re-allocated to the operating businesses based on the weighted average of the allocations from those groups to the operating businesses.

The 2004/05 budget allocates some $428,000 to Gas Distribution out of a total budget of $5.0M.

The allocation from the Commercial Executive office amounts to some 3% of the Gas Distribution's O&M cost and 1.1% of revenue. The basis of allocation appears sound. We have also compared this item of cost against the benchmarks in section 2.1.8 and have found that it fits within the boundaries of the benchmark metric.

Corporate Facilities

Accommodation, lease and property management services are provided by Facilities Management. Where possible, operating businesses are directly charged for the costs in maintaining the premises used. Where facilities are shared, divisions are charged for the costs according to the square meters of area utilised.

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[7] ICRC, *Final decision, Investigation into prices for electricity distribution services in the ACT, March 2004 and Final Report and Price Direction, Investigation into prices for water and wastewater services in the ACT*, March 2004

Out of a total net budget cost of $2.8M in 2004/05, Gas Distribution has been allocated just $5,388. As the basis of allocation appears sound and the given small amount involved, we did not further investigate this allocation.

Electricity Networks

Electricity Networks provides some management support and logistics functions for Gas Networks and other business divisions. The costs of these functions are allocated to the various divisions. The functions include contract management, inventory management, distribution operations, environmental management systems, fleet management and purchasing operations. The allocation of operating costs for this function is based primarily on staff hours with the exception of warehouse rent which is based on area used and fleet management which is based on the number of vehicles operated by each division.

The total budget in 2004/055 for this function is $3.20M. Gas Distribution is allocated $122,600. This amounts to some 0.9% of the Gas Distribution's O&M cost. This is significantly below the allocation to electricity and water due to the fact that many of these functions are managed directly by Agility and AGL as part of the agreements between these entities and ActewAGL to operate the Gas Distribution business. The cost allocated from Electricity Networks reflects the limited involvement of ActewAGL in the direct operations of the gas network.

Retail Management Services

Services provided by Retail Management include

- Marketing, communication and advertising, and
- Strategy, wholesale and environment services.

Costs are allocated based on staff time spent across the various divisions. The 2004/05 budget provides that some $412,000 is allocated to Gas Distribution of which over $365,000 is due to Marketing and Communication costs. The total 2004/05 budget for Retail Management Services amounts to $5.68M with the Retail operating business accounting for over 50% of the budget at $2.91M. Retail is allocated Marketing and Communication cost $1.16M. The allocations form Retail Management Services to Gas Distribution amounts to some 3.1% of its total O&M costs. While the allocations of executive and wholesale and strategy appear reasonable, we compared the allocation of marketing and communications costs against benchmarks given that this allocation made up over 88% of this cost item (Section 2.1.8). We found that the allocation was not unreasonable and fell within the benchmark range.

Table 2-6 provides details of the allocation from Retail (from both Retail Management and Customer Accounts) to the other ActewAGL operating businesses.

Table 2-6 Retail cost allocation

(Note: commercial-in-confidence data in this table has been excised)

2004/2005 Budget ($)					
	Gas Distribution	**Electricity Distribution**	**Water Service**	**Retail**	**Total**
Executive					
Wholesale, Strategy & Environment					
Marketing & Communications					
Total Retail Mmgt Services					
Customer Accounts					
Total Retail Allocations					

Source: ActewAGL Retail Charges - FPSC 2004/05

Gas Distribution cost allocation from Retail is low in comparison with the other operating businesses due to a number of reasons. These include:

- Gas metering costs are incurred by Agility as part of the operating arrangements rather than by ActewAGL Retail as in the case for electricity and water.
- Gas faults and emergency are handled by Agility directly from its own call centre. As a result, the number of calls to the Retail Contact Centre allocated to Gas Distribution is low (see Table 2-8) and reflect mainly allocations of calls to the switchboard ie a proportion of corporate calls based on customer numbers.

Marketing and Communication

ActewAGL Gas Distribution is a monopoly and thus to a large extent, this negates any need for corporate advertising and marketing. Brand marketing should be seen as largely a retail function and the Distribution operating business should not be allocated any advertising costs

in this regard. This would include advertising and marketing costs incurred in sponsorship. It is however appropriate that the costs of communicating distribution related issues, for example, changes to network tariffs, disruptions to network services and bush fire mitigation activities, are borne by the Distribution operating business. The KPMG report to the ORG makes the point that setting an appropriate cost allocation for advertising and marketing for a distribution business is difficult but proposes a range in the region of 0.5% to 1% of revenue. ActewAGL's allocation of $365,000 to the Gas Distribution operating business falls within the range of 0.5% to 1% of revenue. We thus accept the allocated costs from Marketing and Communication as reasonable.

Customer Accounts

The basis of cost allocation in Customer Accounts depends on the category of expenditure. While Full Retail Competition (FRC) related costs are fully allocated to the Retail Business, other costs are attributed to the divisions based on the drivers provided in Table 2-7.

Table 2-7 Customer Accounts – basis of allocation

Contact centre	based on the number of calls received - Calls to specific operating business areas are directly allocated. - Corporate calls are attributed to the Electricity, Gas and Water business areas based on the number of customers in each area.
Account management, billing and cash collection	50/50 split between billing and revenue collection - Billing attributed based on the number of bills - Revenue collection based on $ of revenue collected
Credit management & systems	Estimate of staff time

Source: ActewAGL, Fixed Price Service Charges - retail

Customer Accounts has a total 2004/05 budget of some $7.4M and allocate to the Gas Distribution business a total of $51,000. This amounts to about 0.4% of total O&M costs for the Gas Distribution business.

Switchboard and Contact Centre

The costs of the ActewAGL Switchboard and Contact Centre are included as part of its Customer Accounts costs. We specifically requested further breakdowns of the Contact Centre costs with ActewAGL. The details are provided in Table 2-8.

Table 2-8 Contact Centre and Switchboard calls (2002/03) and cost allocation (2004/05)

	Gas Dist	Elec Dist	Water	Retail	Total Calls
Contact Centre	587	11,609	54,977	106,190	**173,363**
Switchboard	1,905	2,926	5,277	5,472	**15,580**
Total contact & switch calls	2,492	14,535	60,254	111,662	**188,943**
Total of contact centre and switchboard cost	$29,341	$208,170	$771,752		
Contact and Switch - Cost/call	$11.77	$14.32	$12.81		

Source: ActewAGL Call Centre Information

Based on the costs benchmarks developed by KPMG of $7-$8 per call, Gas Distribution's average cost per call of ($11.77) appears excessive. Some of this excess may be explained by cost increases since the KPMG Benchmarking study was conducted in 2000. Increasing call centre costs by inflation over the four years since the KPMG Benchmarking study was conducted results in a benchmark of around 7.70-$8.80. This still leaves an excess cost of around $3 per call. There is some evidence to suggest that the ActewAGL Retail Contact Centre provides a higher level of service than other Australian utilities which again may explain some of the difference. In its *April – June 2003 Survey* on *Comparative Call Centre Performance,* Customer Service Benchmarking Australia P/L rated ActewAGL Retail as one of the three best utilities call centres over a range of measures including:

- greeting;
- manner;
- enquiry resolution;
- complaint handling;
- response times; and
- recorded messages

Taking this higher performance into account could well explain at least part of the higher cost incurred and may be justified by allowing ActewAGL a higher benchmark cost. In any event, the impact of not allowing any higher benchmark would only reduce the cost allocated to Gas Distribution by about $7,500, which is not a significant reduction and will have little impact on the cost of gas distribution charges.

Billing and Revenue Collection

Billing and revenue collection form part of the Retail function of Customer Accounts. ActewAGL allocates the cost of billing based on the number of bills raised and the costs of revenue collection based on the value of revenue collected. The amount allocated to Billing and Revenue Collection is estimated by MMA to be $21,774. This is the difference between the amount allocated by ActewAGL for Customer Services of $51,115 and $29,341 for the Contact Centre/Switchboard.

While we have requested from ActewAGL to confirm this estimation and the details/breakdown of the allocation to Billing and Revenue, ActewAGL has yet to respond. There may be some concern with this allocation as we have estimated that ActewAGL has allocated approximately 57% of total Billing and Collection costs to the regulated services (Gas, Electricity and Water) which seems to be significantly above the benchmarks (see Table 2-9). On the other hand, the total amount allocated to Gas Distribution is less than $22,000 and any change in allocation is unlikely to have any significant impact on the total cost allocated to Gas Distribution.

2.1.8 Comparison Against Benchmarks

In 2000, the (then) Victorian Office of the Regulator-General (ORG) published a cost allocation review which had been carried out by KPMG Consulting. The ORG had commissioned KPMG to review the cost allocation methodologies for the Victorian Electricity Distribution Businesses[8]. A number of categories analyzed in that study may be appropriate benchmarks for comparison with ActewAGL's corporate costs allocation. These include:

- Finance
- Information technology
- Billing and revenue collection
- Advertising and marketing and
- Customer service.

In its report to the ORG, KPMG benchmarked most of these categories against total revenue. In other categories, the benchmark metric was the percentage split between the retail and distribution functions. Table 2-9 provides a summary of the benchmarks applied by KPMG and ActewAGL's performance against this benchmark.

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[8] Office of the Regulator-General, Victoria, *2001 Price Review – Cost Allocation*, KPMG Consulting 30 May 2000.
Office of the Regulator-General, Victoria, *2001 Price Review – Cost Allocation, Final Report*, KPMG Consulting, 19 September 2000

Table 2-9 Benchmark measures

Category	Measure	KPMG Benchmark	Gas Distribution performance against benchmark
Finance	Finance cost as a percentage of regulated revenue	Between 0.8% and 1.3% for companies with revenues between US$100M and US$200M	1.1%
Information technology	Total IT costs as a percentage of regulated revenue	Between 0.5% and 1.5% of revenue	0.6%
Billing and revenue collection	Distribution related costs as a percentage of total Billing and Revenue Collection cost	5% to 20% of total Billing and Revenue Collection cost allocated to Distribution	57%[9]
Advertising and marketing	Advertising and marketing cost as a percentage of total revenue	0.5% to 1% of total regulated revenue	0.9%
Customer service (call centre)	Estimate of the cost per call	$7 per call	$11.77

Source: KPMG, 2001 Price Review – Cost Allocation, Office of the Regulator-General, 30 May 2000,
KPMG, 2001 Price Review – Cost Allocation, Final Report, Office of the Regulator-General, 19 September 2000
MMA analysis

Finance, Business Systems and Advertising and Marketing appear to lie reasonably within the benchmarks. As discussed earlier in Section 2.1.7, we were also satisfied with the basis of allocation used and thus are of the opinion that these allocations are reasonable.

While we are of the opinion that the cost allocated to Gas Distribution from the call centre is high (based on a cost per call of$11.77 from the Contact Centre), the relatively small allocation means that its impact is minor. Also likely to be relatively minor is the proportion of costs

9 This estimate is based on the cost allocation to Gas Distribution, Electricity Distribution and Water Services as a proportion of total Bill and Collection cost. We have been unable to distinguish the proportion of cost allocated to Gas Distribution due to a lack of data from ActewAGL.

allocated from Billing and Revenue Collection despite the disproportionately high allocation as the quantum of cost is only $21,774 from this item of allocation.

2.1.9 Cost Allocation Conclusions

The analysis and review of ActewAGL's cost allocation has led us to the following conclusions:

- It appears that ActewAGL has attempted to accurately reflect the costs incurred in their joint cost centres by allocating costs to the appropriate areas;
- There is no reason to believe that allocations from the various corporate areas are not reasonable. Benchmarking of certain aspects of the allocations shows that most of ActewAGL's allocation falls within the benchmark boundaries.
- While there may be some concerns about the per unit cost of calls to the contact centre, the small number of calls and the small difference between that claimed by ActewAGL and the benchmark together renders the amount largely irrelevant.
- Similarly, while ActewAGL has not provided sufficient information to enable proper analysis of its allocation for Billing and Revenue Collection costs, the small amount of costs involved means that any changes to the allocation will have little impact on the total cost allocated to Gas Distribution.

2.2 RING FENCING

2.2.1 Introduction

Ring fencing requirements are aimed at separating business activities and decisions to ensure that monopoly businesses operating in a regulated environment do not use their monopoly power to provide an advantage to associated businesses operating in a competitive environment to the detriment of market competition.

The introduction of competition into the electricity and gas markets has required that regulated electricity and gas distribution and the competitive retailing activities be ring fenced. In the ACT, all these activities continue to be integrated under ActewAGL. This potentially allows the distribution and retail businesses to continue to maintain certain aspects of the relationship that they had before the introduction of retail competition. This relationship, or affiliation, may give the affiliated retailer a competitive advantage that negatively affects the development of competition in the market, and ultimately reduces the benefits that energy industry restructuring and reform can bring to customers. This business affiliation may also reduce the transparency of costs that the distributor incurs in carrying out its regulated functions as a distributor, potentially allowing the retailer to transfer some of its

costs to the distributor thereby reducing the efficiency of price regulation of the distributor's activities. Ring-fencing addresses these competition and regulatory policy issues, through the application and enforcement of regulatory measures affecting the relationship between distribution and retail business activities.

2.2.2 Ring Fencing Guidelines

As a gas distribution business, ActewAGL Distribution is required to comply with the Code which sets out minimum requirements and allows additional requirements to be set by the jurisdictional regulator. The Commission as the jurisdictional regulator has the responsibility to ensure that ActewAGL meets its ringfencing obligations. In an effort to ensure that ActewAGL Retail is not unfairly advantaged by its affiliation with ActewAGL Distribution and that the regulated costs of ActewAGL Distribution are not inflated by costs from ActewAGL Retail, the Commission has introduced "Ring Fencing Guidelines for Gas and Electricity Network Service Operators in the ACT". These guidelines:

- Aim to promote and safeguard competition and fair and efficient market conduct in the electricity and gas supply industries by stimulating competitive market conduct; and
- Require that electricity and gas utilities have in place arrangements that ensure that related businesses are not treated in such a manner by a utility as to confer a non-commercial discriminatory price or non-price advantage on the related business compared to the treatment of a third party in the same commercial circumstances.

2.2.3 ActewAGL's Ring Fencing Policies

ActewAGL has produced a series of ring fencing policy documents for various areas of their organisation. These include the:

- Gas Networks Ring Fencing Compliance Manual;
- Ring Fencing Obligations – Electricity and Gas Operations;
- Ring Fencing Protocol for Board of Management;
- Ring Fencing Protocol for Executive; and
- Requirements for Agility's Ring Fencing Compliance System.

The Gas Networks Ring Fencing Compliance Manual sets out in significant detail the measures that ActewAGL intends to take to meet its ring fencing obligations arising out of the National Third Part Access Code for Natural Gas Pipeline Systems. Two other ring fencing policy documents are targeted at ActewAGL's executives and Board and covers both electricity and gas ring fencing issues. The final ring-fencing document imposes ring-fencing obligations on ActewAGL's gas network contractor, Agility.

2.2.4 Comparison of ActewAGL Ring Fencing Policies with ICRC Guidelines

The policy documents are aimed at ensuring that the ActewAGL Board, management and staff are all aware of the ring fencing requirements and to ensure compliance with the requirements. Table 2-10 compares ActewAGL's compliance policies and measures with the requirements imposed by the Commission's Ring Fencing Minimum Obligations. Some initial comments are also provided.

Table 2-10 Comparison of ICRC guidelines and ActewAGL compliance policy and measures

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
A utility must: Be a legal entity • incorporated under the Corporations Law; • established as a statutory corporation; or • established by a royal charter;	ActewAGL Distribution is a separately incorporated legal entity responsible for gas and electricity distribution. All operational activities undertaken by separately incorporated legal entities, Agility and AGL. ActewAGL Distribution manages the contract between ActewAGL and Agility & AGL.	ActewAGL Retail is a separately incorporated legal entity.	ICRC guidelines are met.
Not carry on a Related Business;	Does not produce, purchase or sell natural gas (except for safety and operational purposes). Does engage in the business of distribution of electricity and water and sewerage services.	No restriction on activity.	ICRC guidelines are met.
Not cross-subsidise a Related Business;	Accounting separation from Retail. Appropriate cost allocation across Gas & Electricity Distribution and Water Services.	Accounting separation from Distribution activities. Appropriate cost allocation across activities.	Cost allocation must be reviewed regularly to ensure proper allocation to avoid cross subsidising competitive activities.
Establish and maintain a set of accounts for the provision of distribution services	Accounting separation from Retail.	Accounting separation from Distribution activities.	ICRC guidelines are met.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	**ActewAGL Retail**	
that is separate from the accounts it maintains for its other businesses;	ActewAGL Distribution has established a separate set of accounts for the services which are the subject of its Gas Access Arrangement.	Distribution activities.	
Establish and maintain a consolidated set of accounts for its entire business;	Accounting separation from Retail. ActewAGL Distribution maintains a separate consolidated set of accounts for its entire business.	Accounting separation from Distribution activities.	ICRC guidelines are met.
Allocate any costs that are shared between an activity covered by a set of accounts and any other activity according to a methodology that is consistent with generally accepted accounting standards and is otherwise fair and reasonable;	Appropriate cost allocation across activities to allocate its share of ActewAGL Corporate overheads. Cost allocation also occurs from Electricity Distribution and Retail for joint services provided to other operating businesses.	Appropriate cost allocation across activities.	Cost allocation must be constantly under review to ensure proper allocation to avoid cross subsidising competitive activities.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	**ActewAGL Retail**	
Ensure that confidential information provided by an existing or prospective end user or customer is used only for the purpose for which that information was provided and that such information is not disclosed to any other person without the approval of the existing or prospective end user or customer who provided it, except: (i) if the information comes into the public domain otherwise than by disclosure by the utility; or (ii) to comply with any law, any legally binding order of a court, government, government or semi-government authority or administrative body or the listing rules of any relevant recognised Stock Exchange;	Confidential information provided by a user or prospective user to ActewAGL Distribution will not be disclosed to the Management and staff of an ActewAGL Retail managed entity. Confidential information obtained by ActewAGL Distribution in its capacity as provider of gas transportation or associated services will not be disclosed to the Management or staff of ActewAGL Retail if it is reasonable to expect that the information could affect materially the commercial interest of a User or Perspective User. Relevant employees and contractors will be informed of obligations with respect to Confidential Information through a "Ring fencing Compliance Manual and training".	Staff of ActewAGL Retail do not have access to Confidential Information except in relation to their own customers.	ICRC guidelines are generally met. Need to be vigilant that call centre staff (Retail) do not have access to confidential customer information that should only be available to the Distribution business.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
	All agents and contractors with access to Confidential Information agree in writing that they will not misuse that information or disclose it to any other person.		
Ensure that information obtained by the utility and its staff in the course of conducting its business and which might reasonably be expected to affect materially the commercial interests of an existing or prospective supplier or customer is not disclosed to any other person without the approval of the existing or prospective supplier or customer to whom that information pertains, except:	Computer based Network and Retail information is kept separate. Confidential Information in ActewAGL Distribution's possession includes site details and contact details. ActewAGL Distribution staff has access to Confidential Information on a need to know basis.		ICRC guidelines are met.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
(i) if the information comes into the public domain otherwise than by disclosure by the utility; or (ii) to comply with any law, any legally binding order of a court, government, government or semi-government authority or administrative body or the listing rules of any relevant recognised Stock Exchange.	Information regarding End User will only be provided to the existing Supplier.		ICRC guidelines are met.
If requested to do so in writing by a customer, the utility must disclose any customer information of a type described in the customer's written request to the customer or to any existing or prospective supplier nominated by the customer;	An "Authorisation to Release Information" form must be signed by the Users or Prospective User to release any Confidential Information. Information on usage and usage patterns is provided upon the receipt of a request from the User.		ICRC guidelines are met.
Not disclose the fact that the customer has made a request to disclose their information to a existing or prospective supplier;	Confidential information provided by a User or Prospective User to ActewAGL Distribution is used only for the purposes for which it was		ICRC guidelines are met.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
In the case that the information has been disclosed, ensure that the information is not used by another person in a manner that is inconsistent with the guidelines.	provided and is not disclosed to any third party without the approval of the User or Prospective User who provided the information.		
Ensure that, where commercially valuable information is made available to a Related Business, it is also made available to similarly situated entities unless the information comes into the public domain otherwise than by disclosure by the utility;	No information or benefit concerning the distribution business should be conveyed to the retail electricity or gas business respectively where that information is not generally available to competitors of the ActewAGL Retail businesses.		ICRC guidelines are met.
Ensure that its Marketing Staff are not also staff of an Associate that takes part in a Related Business and, if a member of its Marketing Staff does become or is found to be involved in a Related Business contrary to this clause, must remove that member from its Marketing Staff as soon as practicable;	ActewAGL Distribution ensures that any Marketing Staff or employees, consultants, contractors or agents are not also Marketing Staff or employees of an Associate that is in the business of producing, purchasing or selling natural gas. No member of the Executive who are Marketing Staff of ActewAGL Distribution will provide any services to ActewAGL Retail.	No member of the Executive who are Marketing Staff of ActewAGL Retail will provide any services to ActewAGL Distribution. No member of the Executive who are Marketing Staff of ActewAGL Distribution will provide any services to ActewAGL Retail.	ICRC guidelines are met.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
	Associates are defined as ActewAGL Retail and AGL retailers.		
Ensure that its operational staff involved in providing the following services: • enquiries, including fault calls; • connection, disconnection and reconnection; • customer transfers; • meter provision & meter reading; and • processing of data generated from above activities. are not also staff of an Associate that takes part in a Related Business and, if a staff member involved in providing such services does become or is found to be involved in a Related Business contrary to this clause, must remove that member from providing these services as soon as practicable;	ActewAGL Distribution ensures that all employees, consultants, contractors or agents are not also employees of an Associate that is in the business of producing, purchasing or selling natural gas.	Contact centre staff of ActewAGL Retail receive calls from their customers and pass them on to Distribution as required as well as receive customer requests which are passed on to Networks.	Potentially breaches ring fencing provisions, if retail call centre staff are required to provide services regarding distribution matters.
Develop, and have in place, procedures to ensure that confidential information	In any discussion or meeting where confidential information may be	ActewAGL Retail staff are to be excused from any discussion or	ICRC guidelines are met.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
or information that may give a Related Business a competitive advantage is not disclosed to staff of the Related Business by complaints handling staff that are shared between the utility and a Related Business;	exchanged, ActewAGL Retail staff will be excused for the duration of the discussion to ensure that the ActewAGL Retail does not obtain a competitive advantage. Reports that contain confidential information from ActewAGL will be identified as "Confidential" and produced on different coloured paper than reports produced by ActewAGL Retail to easily distinguish them. Reports from ActewAGL Distribution which contain confidential information will not be made available to the Management of ActewAGL Retail. Where a new gas transportation or electricity distribution project is identified by ActewAGL Distribution or a non-ActewAGL Retail supplier, ActewAGL Retail will not be given access to those papers and will not be present during discussions if such access would give ActewAGL Retail a	meeting with ActewAGL Distribution staff when confidential information that may impart a benefit on ActewAGL Retail may be exchanged.	

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
	competitive advantage.		
Develop, and have in place, procedures to ensure that confidential information or information that may give a Related Business a competitive advantage is not disclosed to staff of the Related Business through board meetings or board papers;	Confidential information will not be disclosed by ActewAGL Distribution while staff from ActewAGL Retail are present. ActewAGL staff are to leave the discussion when such issues are under consideration. Reports and Board papers which contain confidential information will be identified as "Confidential" and produced on different coloured paper than other produced by ActewAGL Retail in order to easily distinguish them. Reports from ActewAGL Distribution which contain confidential information will not be made available to ActewAGL Retail. Discussion on new projects relating to gas transportation or electricity distribution services are conducted in the absence of ActewAGL Retail staff where such discussion could provide		Policies that have been developed for ActewAGL's executive and Board are sufficient to meet the ICRC guidelines.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
	ActewAGL Retail with a competitive advantage. Access to papers will also be restricted to avoid giving ActewAGL a competitive advantage.		
Ensure that the utility's office space is physically separate from that of Related Businesses. Physical separation may be accomplished by having office space in separate buildings or, if within the same building, on separate floors or with separate access, unless otherwise approved by the ICRC;	Agility field staff are located at 189 Gladstone Street, Fyshwick ACT 2609 Agility administration and management is at 18 Rodborough Rd, Frenchs Forest NSW 2086 ActewAGL Gas Distribution Contract Manager is located on 5th Floor, ActewAGL House, 221 London Circuit, Canberra ACT 2601	Gas Retail (AGL) is at 111 Pacific Hwy, North Sydney NSW 2060 ActewAGL Gas Retail Contract Manager is located on 2nd Floor, ActewAGL House, 221 London Circuit, Canberra ACT 2601	Businesses are physically separated by being located in different areas and different levels at ActewAGL House in Canberra.
Ensure that employees of a Related Business are unable to gain access to the utility's information system in a manner that would allow or provide a means of transferring confidential information from the utility to the Related Business, lead to customer confusion, or create an opportunity for preferential treatment or other unfair competitive advantage;	Computer-based network and retail information is kept separate. Staff of ActewAGL Retail will only have access to confidential information in relation to their own customers.		ICRC guidelines are met.

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	**ActewAGL Retail**	
Conduct business with Related Businesses at arm's length and in a competitively neutral manner. In particular, where utilities have network use of systems agreements with a Related Business the arrangements: • should be on a contract basis with terms and costs clearly defined; • should be transparent; • should be on terms no more favourable than would be offered to a third party in the same commercial circumstances; and • must be to the ICRC's satisfaction.	ActewAGL Distribution must not enter into an Associate Contract without first obtaining the approval of ICRC. This approval can be refused where the contract would have the effect, or be likely to have the effect, of substantially lessening, preventing or hindering competition. An Associate Contract is a contract between the partners of ActewAGL Distribution and an AGL entity (particularly ActewAGL Retail) for the transportation of natural gas or a non-arm's length contract between ActewAGL Distribution and another person for the transportation of natural which provides a direct or indirect benefit to an ActewAGL entity, an AGL entity or an ACTEW entity.		ICRC guidelines are met.
Not engage in joint marketing, advertising, promotion or product development with a Related Business in a manner that gives the Related Business a competitive edge or misleads	Appropriate cost allocation required.	Joint marketing is undertaken through the Retail business	Marketing/communication of Gas Distribution related matters should be managed separate from Retail to provide greater

ICRC RING FENCING MINIMUM OBLIGATIONS	ACTEWAGL COMPLIANCE POLICY AND MEASURES		Comments
	ActewAGL Distribution (incl Agility)	ActewAGL Retail	
customers. To that end a utility must: • seek to avoid misleading customers into associating the products and services of the Related Business with the utility's products, services and the quality of those services (for example, network reliability); • advise potential and actual customers that they have competitive choices, where appropriate.			cost transparency and regulatory accountability.

The ring fencing policy documents also provide for a number of measures to ensure that ActewAGL's ring fencing obligations are met. These include:

- Requiring all ActewAGL employees to undergo ring fencing training in areas relevant to the individual's or group's exposure to the ring fencing obligations. Training updates will be provided to maintain a sound level of ring fencing awareness. Ring fencing training records will also be maintained.
- Maintaining a Ring fencing Issues Register to record identified ring fencing issues and the actions taken to resolve them. Issues to be registered include:
    - Questions of interpretation;
    - Notification of failures to observe the procedures and requirements of the Ring fencing Compliance System;
    - Notification of possible breaches of the ring fencing obligations;
    - Suggestions for improvements to the ring fencing Compliance System;
    - Cases where the procedures and controls of the System may be inadequate to prevent a breach of the ring fencing obligations; and
    - Improvements identified.
- Investigating complaints received from external parties (including suppliers, end users, the Commission) that ActewAGL has breached its ring fencing obligations. The complaint will be recorded on the Complaints Register. The complainant will be informed of the findings of the investigation. Should the investigation find that the ring fencing obligation is breached; the Commission will be informed of the breach and the actions taken to ensure that the conduct does not recur.

In addition, the Compliance Manual provides for ActewAGL Distribution to undertake regular internal reviews of the performance of its Ring Fencing Compliance System to identify if the system requires modification as a consequence of

- Any matters arising from complaints received from third parties;
- Any issues raised by ActewAGL Distribution; or
- Any issues arising from reported breaches or from independent reviews.

Also, the Compliance Manual provides for an independent review, in accordance with the Australian Auditing Standards, of the Ring Fencing Compliance System on a regular basis to determine the effectiveness and appropriateness of the system.

2.2.5 Verification and Compliance

The policies adopted by ActewAGL for its Gas Distribution business largely comply with the Commission's ring fencing guidelines. ActewAGL has also developed and imposed appropriate policy requirements on Agility, its Gas Distribution contractor, in order to

meet ActewAGL's ring fencing obligations and to ensure that the actions of Agility do not cause ActewAGL to breach these guidelines.

During the review, we have seen some evidence of compliance. These include:

- Colour coded Board Papers with different paper colours distributed to different members representing differing interest on the Board;
- Evidence from some Board Papers which recorded the absence of Retail representatives when confidential Distribution matters were discussed;
- The production of a Ring Fencing Issues Register to record issues relating to ring fencing. The issues on record are:
    - Ring Fencing Awareness for ActewAGL Board and Executive
    - Training for Distribution personnel
    - Agility's Compliance with ActewAGL's Ring Fencing Requirements
    - Marketing – staffing and website issues
    - Associate Contract – formally approved by the Commission
    - Staff Incentive Scheme – concerns expressed by the Commission
- Email evidence of discussion on ActewAGL Distribution staff seconded to ActewAGL Retail. This arrangement was required due to the non-registration of ActewAGL Retail as an employer entity but breaches the ring fencing obligations. As a result of the discussion, ActewAGL Retail was established as an employer entity and staff were then directly employed by ActewAGL.
- Documentary evidence showing the attendance at various ring fencing courses conducted by ActewAGL.
- Evidence that staff are kept informed of their ring fencing obligations through reminders in the in-house newsletter, "*Connected*" dated July 2003. We were also informed that staff have been constantly reminded during meetings of the importance of ring fencing and the need to report any breaches to management.

2.2.6 Other Compliance issues

In the review of ActewAGL's ring fencing policies, certain specific issues have arisen. Some of these issues have been communicated to ActewAGL. In the sections below, these issues are discussed.

Complaints Register

The Gas Networks Ring Fencing Compliance Manual provides for the establishment of a Complaints Register to record complaints from external parties (including the Commission) that ActewAGL Distribution has breached its ring fencing obligations.

When we requested to examine this register, we were informed that such a register does not exist and any complaints would be included in the issues register. However, the procedures for recording and addressing complaints as provided in the Compliance Manual are fairly rigorous and it is our opinion that a separate register would be best able to record any complaints regarding breaches of the ring fencing provisions.

Methodology for Identifying Confidential Information

While ActewAGL seeks to ensure that confidential information obtained by ActewAGL Distribution whether provided by a user or prospective user or in its capacity as a Distribution Network Service Provider is kept confidential from ActewAGL Retail, there does not appear to be a methodology or process to identify confidential information. While processes are in place to ensure appropriate ring fencing by requiring colour coded Board Paper and requiring people to leave meetings when confidential information is discussed, a system to formally identify confidential information may be required to ensure that such information is not inadvertently disclosed to the detriment of competition or the user or prospective user. This may prove to be a difficult area to codify, nevertheless, ActewAGL should consider how best to develop the process to address this concept.

Contact Centre Services

The Commission's guideline require that operational staff involved in handling

- enquiries, including fault calls connection;
- disconnection and reconnection;
- customer transfers;
- meter provision and meter reading; and
- processing of data generated from above activities;

are not also staff of an Associate that takes part in a Related Business. The Contact Centre, as the first point of contact with customers, handles such activities for both Distribution and Retail. Care must be taken to ensure that such retail staff do not breach the ringfencing guidelines by engaging in activity on behalf of the distributor.

Physical Separation of Office Space

Generally, the Retail and Distribution businesses operate out of separate locations in accordance with the Commission's guidelines. However, the ActewAGL Corporate Divisions manage functions which interact substantially with both Retail and Distribution activities. For example, the Regulatory Manager handles Electricity and Gas Distribution issues as well as Retail issues. Other functions like Business Systems have access to both Distribution and Retail data and information. This may breach ActewAGL's own ring fencing policy which provides that computer based Network and Retail information be

kept separate. While these functions may have been so structured to achieve greater efficiency for ActewAGL, it does pose a concern in potentially allowing inappropriate information flows across Related Businesses in breach of the ring fencing provisions.

2.2.7 Ring Fencing Conclusion

In general, ActewAGL Gas Distribution has put in place policies that provide for effective ring fencing. The ring fencing policies and procedures that pertain to gas are fully developed and provide for training of staff, recording of ring fencing issues and complaints and reviews of policy adequacy. However, despite its policy provisions, we note that ActewAGL has not established a separate complaints registers but has informed us that it intends to use the Issues Register as a complaints register if and when any complaints arise.

Apart from some minor concerns regarding the customer service and complaint handling processes managed by the Contact Centre, we have not seen any evidence to suggest that ActewAGL staff, management and board have breached the ring fencing obligations. ActewAGL has provided evidence that it does take its ring fencing obligations seriously and provided to us policy documents, Board Papers, emails and newsletters to support its position. ActewAGL informs us that there have been no complaints regarding ringfencing issues. Care must be taken to ensure that if any complaints do arise, proper recording of such complains are undertaken as provided in its *Gas Networks Ring Fencing Compliance Manual*.

3 DEMAND FORECASTS

3.1 BACKGROUND

The Independent Competition and Regulatory Commission of the ACT (the Commission) has asked McLennan Magasanik Associates (MMA) to review demand forecasts proposed by ActewAGL, the gas distributor in the ACT, Queanbeyan and Yarrowlumla, to ensure that the forecasts meet the Gas Code criterion of "… best estimates arrived at on a reasonable basis".

MMA has carried out the review as a combination of a desktop exercise and detailed interaction with ActewAGL. At the draft report stage MMA established a number of detailed recommendations which, if fully adopted, would have allowed the forecasts to be considered by MMA to meet the Gas Code criteria. This final report documents these recommendations as well as the subsequent responses from ActewAGL, further considerations by MMA and finally provides an independent MMA forecast.

3.2 SCOPE OF ACTEWAGL'S OPERATIONS

ActewAGL operates a relatively small distribution network in the ACT and the New South Wales areas of Queanbeyan and Yarrowlumla. A profile of the company's operations in 2002/03 is provided in Table 3-1.

Table 3-1 Profile of ActewAGL's gas distribution business in the ACT, Queanbeyan and Yarrowlumla in 2002/03

Market	Customers	Volumes (TJ)	MDQ (GJ)	Revenue Contribution* %
ActewAGL Residential tariff market	90,497	4,300		73%
ActewAGL Business Tariff market	2,121	1,389		23%
ActewAGL Contract market	38	990	5,545	4%

Source: ActewAGL Tables 1, 3 and 4 provided to MMA and Tariff Market forecast Methodology apart from Contract market volume which is metered usage * Indicative revenue division within the tariff market in proportion to volume in 2002/03.

3.3 REPORTS AND INFORMATION SUPPLIED

During the course of the review ActewAGL has supplied the following information:

- A report by Agility entitled "ActewAGL distribution system in ACT, Queanbeyan and Yarrowlumla – 2004 Access Arrangement, Tariff Market Forecast Methodology, dated January 2004

- A report by Agility entitled "ACT Contract Market Forecast, 2004 Access Arrangement" dated January 2004
- A report by ACIL Tasman prepared for Agility entitled "Review of ActewAGL gas demand methodology and forecasts", dated February 2004
- Tables in spreadsheet format in response to MMA's initial data request
- A draft written response to MMA's follow-up and clarification questions for ActewAGL
- A number of update spreadsheets and emails during and following discussion on methodology.
- A formal response to the draft MMA report to the Commission dated May 2004
- Subsequent meetings between personnel from the Commission, MMA and ECG
- Further supply of information and responses to recommendations.

ActewAGL has also provided telephone and personal access to key Agility forecasting personnel.

3.4 THE REVIEW PROCESS

Demand and customer number forecasts were provided by ActewAGL for the period 1/7/2004 to 30/6/2010. MMA's main brief has been to review the forecasts and establish that the forecasts can be said to represent …"best estimates arrived at on a reasonable basis" as required under Section 8.2 of the Gas Code.

In reviewing the growth forecasts, MMA has asked the following questions:

- Is the approach taken the best that could be reasonably expected?
- Are the assumptions made the best that could reasonably be expected?
- Is the information/data that are used the latest obtainable?
- Is there a balance between use of "historical trends" and "key drivers" in forecasting?
- Is the methodology properly applied?

The review has been largely based on desktop research, clarification of forecasting methodologies, parameters, assumptions, issues and drivers and discussion and debate about these matters with ActewAGL and Agility.

It must be stressed that while this has been a detailed review of methodologies it has not been intended to validate the actual application of the methodologies through spreadsheets calculations and specific forecasts except in an overview sense.

The review up to the final report stage has been carried out as follows:

- ActewAGL provided their forecasts and some accompanying information in their Access Arrangement Information. These are referred to as the initial ActewAGL forecasts throughout the report
- MMA formulated a series of detailed questions related to historical information, forecasting methodology and key parameters and assumptions. These were sent by MMA to ActewAGL
- The responses were supplied to MMA, generally in the form of spreadsheet tables and reports
- MMA followed up with questions for clarification which were discussed in a meeting with ActewAGL
- Key points of difference between ActewAGL's forecast methodologies and assumptions and those considered reasonable by MMA were also raised during the meetings. In several cases ActewAGL responded to the MMA comments and in some cases further work was undertaken
- ActewAGL provided answers to some of MMA's questions. Where this information has changed the forecasts materially this is mentioned in the report
- MMA prepared a Draft Report to the Commission which was provided by the Commission to ActewAGL. MMA's draft report provided a review of ActewAGL's demand forecasts and included a series of recommendations on methodologies and assumptions.
- ActewAGL provided a formal response to the Draft Report and the issues arising from the Draft Report and the ActewAGL response was discussed at a meeting between personnel from ActewAGL, Agility, ICRC secretariat and MMA/ECG.
- A Preliminary Final Report was prepared for the Commission based on comments and information provided by ActewAGL following the Draft Report. Where ActewAGL had accepted recommendations or argued against the recommendation this was noted in the text of a Preliminary Final Report.
- MMA and ECG presented the Preliminary Final Report to the Commission and ActewAGL with debate following on key issues.
- ActewAGL provided final responses to the MMA recommendations
- ActewAGL provided a further set of forecasts (referred to as the June 2004 forecasts)
- The culmination of this process is the final report.

The approach taken in this review has been similar to that applied in many similar independent reviews of demand forecasts for regulators of gas assets in recent years. The company has initially been asked to provide its forecasts together with appropriately

disaggregated historical, methodological and forecast information. Through a process of questions, answers and discussions with the companies, and research and consideration of historical results and key drivers the consultant has formed an independent view as to whether the forecast methodologies and key assumptions can be considered to meet the requirements of the Gas Code. If the forecasts do not meet the requirements of the Gas Code the consultant is expected to prepare independent forecasts.

The process for this particular review has been more iterative and cooperative than has often been the case elsewhere, in that the consultant and the company have in some cases worked together towards finding a methodological and assumption outcome which will meet the requirements of the Gas Code.

While MMA has reviewed in some detail the forecasts for both tariff and contract markets for ActewAGL, it has taken materiality into account in the extent of the review for different market components.

3.5 CONVENTIONS FOLLOWED AND LAYOUT

Historical and forecast information provided by ActewAGL have been for financial years. Information provided in this report is also in financial year terms unless otherwise stated. The convention followed in the report has been to refer to the financial year as either both the years covered or as the year which contains the 30th June. Thus the financial year commencing 1 July 2003 and concluding on 30 June 2004 is referred to in the text as either 2003/04 or 2004.

Note that if calendar year forecast information is required by the Commission this needs to be calculated using load proportions from each half of the financial year. Typically some 63% or so of tariff gas load is consumed between July and December while the remaining 37% is consumed during the warmer months of January to June.

This report to the Commission contains some information which is considered confidential to ActewAGL. We understand that ActewAGL is to be asked to specify which information it considers needs to be removed from the public report.

As discussed above this process has undertaken a review of two different ActewAGL forecasts, the initial forecasts provided with the Access Arrangement Information and the June 2004 forecasts prepared by ActewAGL at the culmination of the process. Both sets of forecasts are referred to in the report. Where reference is made to the latter set of forecasts these are the latest provided to MMA in the spreadsheet ACT AA Forecast June 2004 Attachment 6.xls.

Please note that this report aims to capture the progress and results of the entire process. Because of this it incorporates the full set of comments and recommendations included in the Draft Report as well as later developments and forecasts. We consider that the increased transparency and logic trail available from such a report outweighs the slightly clumsy report style and layout which has been the inevitable result.

The demand section of this report is organized as follows:

- Chapter 4 reviews forecasts for the ActewAGL residential market. The residential market is the main component of the ActewAGL tariff market in which individual customers generally consume less than 10 TJ per annum (pa).
- Chapter 5 reviews forecasts for the small business market, the remaining portion of the tariff market.
- Chapter 6 reviews the ActewAGL contract market. The contract market is that in which individual customers generally consume more than 10 TJ of gas pa.
- Chapter 7 provides the independent MMA forecasts for the ActewAGL network.

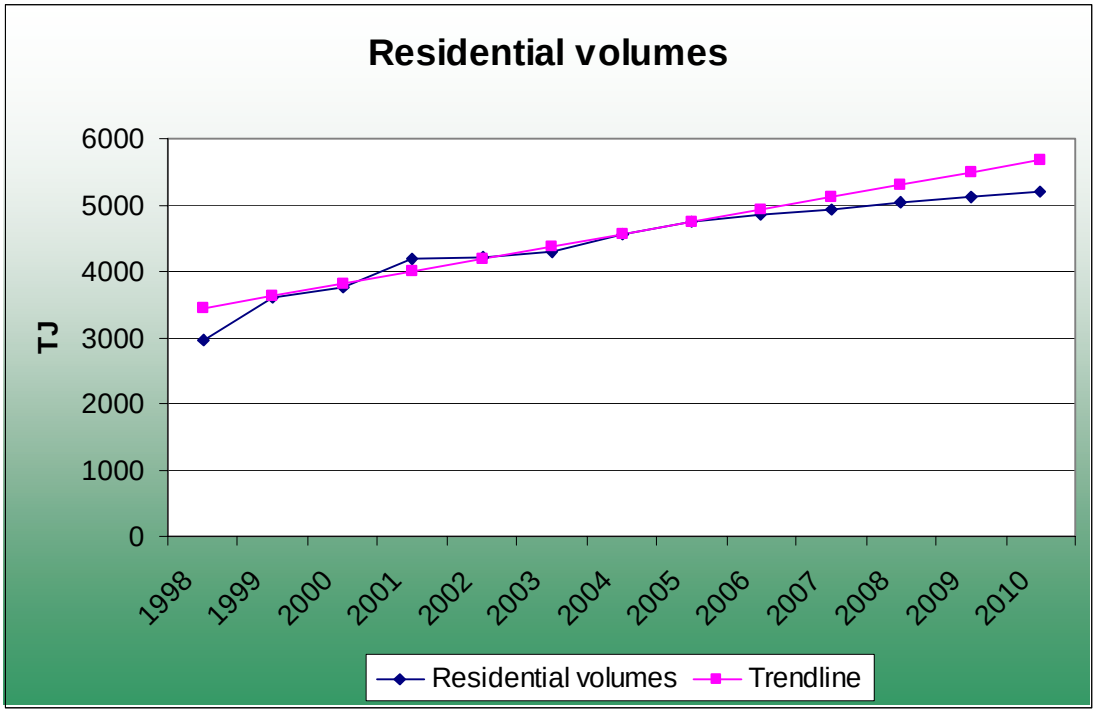
4 DEMAND FORECASTING - THE RESIDENTIAL MARKET

4.1 HISTORICAL AND FORECAST MARKET GROWTH

Figure 4-1 shows historical residential market volumes over the past six years and the latest forecasts by ActewAGL for the coming Access Arrangement (AA) period. Also plotted is a trendline based on the data from 1999 to 2003. The first year of data has been excluded from the trendline as ActewAGL has stated that it does not have confidence in that data as it does not include Queanbeyan and the split between NSW and ACT companies may be inaccurate.

As can be seen, ActewAGL is now forecasting growth into the future which is significantly less than that seen over the past four years[10].

Figure 4-1 Historical and forecast residential volumes



Source: ActewAGL data provided to MMA. Note that as ActewAGL has argued that the data for 1997/98 is not accurate this information has not been included within the trendline.

An examination of recent history in appropriately disaggregated components plays an important part in constructing forecasts. Generally, in the absence of fundamental changes to key drivers, recent history is a good indicator of future expectations. Historical trends are routinely used to help forecast future patterns. In this section, historical information provided by ActewAGL is used to examine recent trends in customer numbers and average usage by residential customers. The methodologies used by ActewAGL are discussed and reviewed in further sections of this Chapter.

10 The initial ActewAGL forecasts were for growth significantly higher than this for the residential market.

Table 4-1 shows the historical residential sales, customer numbers and a calculated average usage figures.

Table 4-1 Historical Residential Sales, Customer Numbers and Average Usage

Parameter	1999	2000	2001	2002	2003	Growth
Sales, TJ	3,589	3,759	4,184	4,204	4,297	4.6%
Customer numbers	74,207	78,542	82,643	86,598	90,497	5.1%
Average usage, GJ/customer	48.36	47.86	50.62	48.55	47.48	-0.5%

Source: ActewAGL Tariff Volume Summary Table (17/03/04) supplied to MMA.

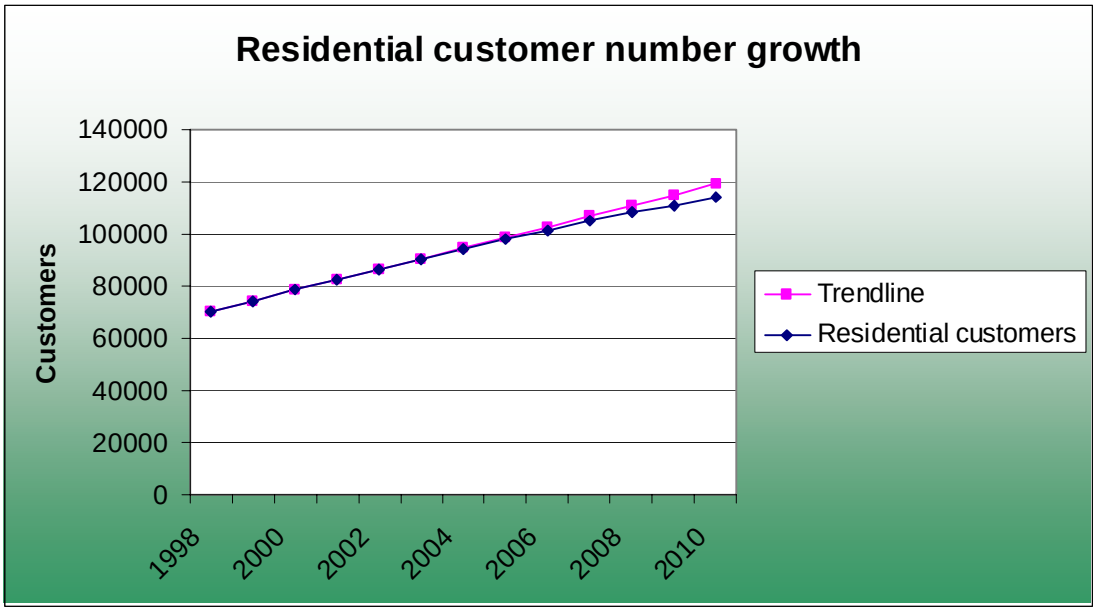
Over the past four years the ActewAGL market has grown moderately at about 4.6% pa. However, this has been made up of customer number growth (5.1% pa) combined with a -0.5% pa increase in average usage per customer.

ActewAGL is forecasting that the rate of growth over the period 2004 to 2010 will reduce significantly to 2.2% pa. The rationale for this is examined below in terms of both changes to customer numbers and average usage per customer.

4.2 GROWTH IN CUSTOMER NUMBERS

An overview of customer number growth over the period 1998 to 2003 and that forecast by ActewAGL to 2010 is provided in Figure 4-2.

Figure 4-2 Historical and forecast residential customer growth



Source: ActewAGL data provided to MMA. Note that this includes the June 2004 forecasts

Residential customer numbers have been growing at about 4,070 per annum. ActewAGL is forecasting that customer number growth will slow somewhat over the coming AA period to an average of 3380 per year.

The source of growth in customer numbers is described in Table 4-2. ActewAGL divides customer number growth into new (detached) houses, new medium/high density and

Electric to Gas (E to G) conversions. The latter are those in which existing houses which previously did not use gas on line of mains have commenced using gas.

Table 4-2 Historical incremental residential customer numbers

Financial year ending June 30th	**1999**	**2000**	**2001**	**2002**	**2003**
Starting numbers	70,232	74,207	78,542	82,643	86,598
Connections - New Houses	1,129	1,344	1,372	1,540	1,646
Connection - New Medium/High Density	358	483	780	659	850
Electricity to Gas	2,691	2,418	2,074	1,866	1,746
Disconnections	(203)	90	(125)	(110)	(343)
Ending numbers	74,207	78,542	82,643	86,598	90,497
Net customer growth	3,975	4,335	4,101	3,955	3,899

Source: ActewAGL Market Forecast Methodology, Attachment 1.

Table 4-2 shows that over the past 5 years over half the growth in customer numbers has been due to electricity customers on-line of main converting to gas, followed by connections from new stand-alone homes (35%) and medium to high density new homes at 14%.

Disconnections over the past five years have averaged about 140 homes per year if bushfire disconnections are included or about 75 if the bushfire disconnections are not included[11]. According to ActewAGL disconnections are generally the result of redevelopment of residential properties which previously had a gas supply point. Disconnections have thus run at about 3 - 7% of all new dwellings connected, depending on whether the bushfire disconnections are included or not.

4.3 FORECAST GROWTH IN RESIDENTIAL CUSTOMER NUMBERS

ActewAGL has forecast growth in net customer numbers in four categories according to methodology outlined in Table 4-3 and described in more detail below.

[11] We understand that there were an estimated 320 gas disconnections due to the bushfires of January 2003.

Table 4-3 ActewAGL Methodology for Forecasting Customer Number Growth

Category	Basis	Information and assumptions
New stand-alone houses	BIS Shrapnel (BS) forecasts of underlying demand for all housing in ACT and an estimation of housing completions for Queanbeyan. Multiplied by the average proportion of stand-alone houses Multiplied by weighted average of gas penetration for such houses in the ACT and Queanbeyan over last 5 years.	Used September 2003 BS forecasts of "underlying demand for new dwellings" and Queanbeyan City Council estimates of building completions. Excluded houses to be rebuilt due to the 2003 bushfires. Assumed the average ratio of houses to medium/high density dwellings over the past 5 years. Assumed penetration rate going forward is the weighted average over the past 5 years.
New medium density houses (other dwellings)	BIS Shrapnel (BS) forecasts of underlying demand for all housing in ACT and an estimation of housing completions for Queanbeyan. Multiplied by the trend proportion of medium density houses. Multiplied by recent penetration of gas in such houses in the ACT and Queanbeyan.	Used September 2003 BS forecasts of "underlying demand for new dwellings" and Queanbeyan City Council estimates of building completions. Excluded houses to be rebuilt due to the 2003 bushfires. Assumed the ratio of houses to medium/high density dwellings from weighted average of the last five years. Assumed penetration rate in medium/high density dwellings is average of the past 5 years
E to G customers	Used exponential trend analysis to forecast new E to G connections. Added 2003 bushfire replacement houses.	Market reaching maturity and connections declining at an exponential rate. New bushfire reconnections in 2004 and 2005 only.
Disconnections	As a proportion of total customers.	0.11% pa based on net customer calculations.

Sources: ActewAGL Tariff Market Forecasting Report, Small summary forecasts provided to MMA and MMA questions and responses.

4.4 NEW DWELLING FORECASTS

4.4.1 Underlying BIS Shrapnel forecasts

ActewAGL's new dwellings forecasts are premised on BIS Shrapnel forecasts of underlying demand for new dwellings in the ACT combined with estimates from Queanbeyan City Council. BIS Shrapnel produces quarterly dwellings forecasts and ideally, the latest forecasts need to be used to derive incremental customer numbers. The most current BIS Shrapnel report available to ActewAGL before the January publication of the "Tariff Market Forecast Methodology" report was dated September 2003. ActewAGL used a combination of numbers from the March 2003 and September 2003 BIS Shrapnel reports, including estimates of completions for 2002/03.

MMA considers the use of BIS Shrapnel forecasts to be acceptable. BIS Shrapnel is an authoritative and well-credentialed independent forecaster of building trends across Australia. It is considered good practice and prudent to use the most recent data available at the time of forecasting. MMA has recommended to ActewAGL that it utilise the latest BIS Shrapnel forecasts and actuals for 2002/03, from the Building Industry Prospects publication in its forecasting.

The latest available BIS Shrapnel numbers (March 2004) for ACT completions in 2002/03, forecast completions in 2003/04 and 2004/05 and average underlying demand for new dwellings for the period to 2008/09 are:

- 1283 houses and 1154 other dwellings in 2002/03
- 1803 houses and 829 other dwellings in 2003/04
- 1600 houses and 850 other dwellings in 2004/05
- 2300 dwelling underlying demand from 2004/05 to 2008/09.

The most recent BIS Shrapnel forecasts are in some cases lower than the number previously used by ActewAGL and in other cases higher. We consider it good practice to use the most recent data available.

Recommendation 1: MMA recommends that forecasts for 2004 to 2010 and actual completions for 2002/03 from the March 2004 BIS Shrapnel report be used in forecasting by ActewAGL.

ActewAGL has accepted this recommendation and this has been incorporated in its latest forecasts.

4.4.2 Queanbeyan forecasts

ActewAGL assumed that the underlying demand for new dwellings in Queanbeyan is equal to 380, the average number of completions over the last four years excluding houses to be rebuilt as replacement for any destroyed by bushfires in 2003. However, this was based on projection from incomplete numbers for 2002/03 and may not have recognised any possible trend towards increased or reduced housing in Queanbeyan.

Recommendation 2: MMA recommends that ActewAGL determine actual numbers of completions in Queanbeyan in 2002/03, estimated 2003/04 completions and ascertain whether forecasts exist for future years. If not, the average over the five years (including estimated 2003/04) should be used.

ActewAGL has accepted this recommendation and provided information from Queanbeyan Council for 2002/03 and year to date to March 2004 to MMA.

4.4.3 Yarrowlumla Shire and New Projects

According to ActewAGL Yarrowlumla Shire is not reticulated (apart from a few streets abutting Queanbeyan) and there are no plans to reticulate more of the Shire. Similarly, ActewAGL has not identified any new project areas for reticulation within the network.

MMA has questioned ActewAGL about the potential impact of the proposed new Defence HQ Australian Theatre which is expected to be located between Queanbeyan and Bungedore, would be the largest construction in the region since Parliament House and would require housing for up to 1000 personnel by 2006/07.

ActewAGL has responded that significant uncertainty surrounds this potential project, including whether the project will proceed, its timing (the project may well be delayed) and whether there will be any gas connection. ActewAGL has asked BIS Shrapnel whether it has factored in any new dwelling growth specifically related to the Theatre. BIS Shrapnel has reportedly answered that this is not specifically taken into account but considers the forecasting methodology adequately captures growth factors over the longer term. BIS Shrapnel has commented that the Theatre may well, at least in part, replace existing facilities and thus not require new housing and also new accommodation may be in parts of NSW not reticulated.

Given the uncertainties it appears reasonable to, at this stage, not factor in any growth specifically for the Theatre.

4.4.4 Proportion which is free-standing

ActewAGL has forecast the proportion of free-standing homes and the proportion which is medium/high-density by using the weighted average of the numbers over the past six years. According to ActewAGL's initial forecasts this makes about 68% of new homes free-standing and it proposed to use this average over the forecast period.

We note that in the March 2004 BIS Shrapnel forecasts the proportion of free-standing to other dwellings forecast for 2004 and 2005 was about 67%, approximately the ratio used by ActewAGL. Given that ActewAGL has used the same average usage for free-standing and medium/high density dwellings, there is relatively little impact of different assumptions in this area apart from in penetration assumptions. We consider the ActewAGL methodology to be reasonable.

4.5 GAS PENETRATION RATES

In order to forecast gas connections in new houses, ActewAGL has multiplied the forecast house completions by the forecast gas penetration rate for houses and the forecast medium/high density completions by the forecast penetration rate for medium/high density dwellings.

ActewAGL has not been able to discern any trend in penetration rates and has assumed that the penetration rates will be the weighted average of the past five years. Based on the previously used numbers this gave a penetration rate of 90.2% for houses and 72% of other dwellings. Based on the new dwelling completion numbers expected to be incorporated this estimate would likely increase to about 93% and 76% respectively.

MMA has also not identified any obvious trend in penetration rate over the past few years, possibly because of a timing mis-match between completion and connections. According to ActewAGL virtually all new dwellings, over 95%, will have access to gas. Although

MMA considers it likely that there will be an increasing trend in penetration of gas into both houses and medium/high density dwellings, especially in Queanbeyan where Basix (which generally favours gas over electric appliances) will become law over the next year or two, we consider that the proportions to be assumed based on the average over the past five years to be relatively high already and reasonable to use. Although there may be some debate as to whether average or weighted average penetration rates are the most suitable to apply, the difference is relatively immaterial.

MMA considers the ActewAGL methodology in determining penetration rates to be reasonable. The actual penetration rates used will depend on the most recent numbers used.

4.5.1 Review of ActewAGL latest forecasts for new home connections

Despite ActewAGL stating that it would accept the MMA recommendations, the outcomes for new connections in the latest forecasts are different from those expected by MMA. Part of the reason may be in assumptions made about Queanbeyan developments; however, this is unlikely to be the cause of all the difference.

Table 4-4 Differences between MMA and ActewAGL in new homes and E to G customers

	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
MMA new stand-alone	1897	1773	1696	1696	1696	1696	1696
MMA new other	705	690	638	638	638	638	638
MMA total new	**2601**	**2462**	**2334**	**2334**	**2334**	**2334**	**2334**
MMA E to G	1521	1359	1215	1086	970	867	775
ActewAGL new s-alone	1,800	1,804	1,642	1,642	1,642	1,642	1,642
ActewAGL new other	507	686	704	704	704	704	704
ActewAGL total new	**2,307**	**2,490**	**2,346**	**2,346**	**2,346**	**2,346**	**2,346**
ActewAGL E to G	1,363	1,359	1,215	1,086	970	867	775

There is a very noticeable difference in the first year which is unlikely to be due to modelling of Queanbeyan. In the other years the difference is small, but the distribution between stand-alone and other houses is also different.

MMA does not accept that ActewAGL has appropriately applied the recommendations in the first year and has used its own numbers in MMA forecasts.

4.6 BUSHFIRE IMPACTS AND RECONNECTIONS

About 500 houses in and around Canberra were destroyed in the bushfires of January 2003. Of these an estimated 320 were connected to gas[12]. The remainder were presumably either not on line of mains (for example in rural villages) or not connected to gas.

ActewAGL initially assumed that half of these (ie 160) would be reconnected with gas in 2003/04 and half in 2004/05. By March 2004, however, only about 60 had actually reconnected. It would appear reasonable to use a more realistic forecast of timing

Bushfire reconnections have in ActewAGL's modelling been treated as E to G connections. This is considered unrealistic as the gas demand from the new bushfire reconnections is expected to more closely approximate that of new freestanding homes.

Recommendation 3: MMA recommends that the bushfire reconnections be dealt with as additional "new house" connections. The timing of the reconnections should be more realistically distributed.

ActewAGL has accepted this recommendation and assumed that 100 houses will be reconnected in 2003/04 and 220 in 2004/05. MMA considers this to be reasonable.

4.7 EXISTING DWELLINGS CONVERTING TO GAS (E TO G)

As discussed in Section 4.2, E to G connections have accounted for over 50% of all new connections over the past six years. However there has been a clear decline in the number of existing E to G connections, from 2,691 in 1999 to 1,746 in 2003 (a decline of about 11% pa). ActewAGL has attributed this decline to the market approaching maturity. According to ActewAGL the availability of gas in its reticulation area is as follows:

- Gas available on line of main (LOM) - 91% of all dwellings (due to a policy decision to lay mains in every street)
- Gas usage on LOM - 65% of all dwellings on LOM
- Gas dwellings - 59% of all dwellings.

Whereas over 90% of houses in the ACT have access to gas, only about two thirds with access have actually connected. The proportion connected is increasing over time with continuing E to G conversions as well as due to a high connection rate for new housing.

ActewAGL has modelled the decline in E to G connections using an exponential trend analysis and used the same curve to project the decline in new E to G connections over the forecast period. This results in about 1520 E to G connections in 2004 reducing to about 770 in 2010.

MMA accepts that the methodology adopted by ActewAGL to forecast E to G connections is reasonable in light of the reducing trend in connections and the maturity of the ACT market.

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12 Response to follow-up and clarification questions by ActewAGL.

Despite MMA accepting the ActewAGL proposals, the latest ActewAGL forecasts have E to G connections in 2004 some 158 homes lower than previously advised (see Table 4-4 . This difference is not considered acceptable by MMA.

4.7.1 Disconnections or customer losses

There have been about 690 disconnections over the past few years, averaging about 138 per year. However this number has been distorted by the large number of disconnections due to the bushfires in January 2003. Based on the period 1999 to 2002 there are on average 87 disconnections per year.

ActewAGL has converted this to a proportion of total customers disconnected pa (0.11%) and used this proportion in its forecasting. As the main cause of disconnections (apart from bushfires) is redevelopment of residential properties, MMA could see no rationale in tying disconnections to total customer numbers and argued that it would be more logical to relate disconnections to new dwelling connection. Historically, disconnections have been about 4-5% of such new dwelling connections.

Given that ActewAGL did not consider there to be a good relationship between disconnections and new dwelling connections, and given the lack of any trend in recent disconnection numbers, it appears reasonable to use the average disconnections over the period 1999 to 2002 (leaving out 2003 because of the impact of bushfires).

Recommendation 4: MMA recommends that ActewAGL should use a 4-year average (omitting 2003 data) disconnection figure of 87 dwellings over the AA period.

ActewAGL has argued strongly that disconnections should be linked to customer numbers.

ActewAGL initially modelled disconnections as the average of the number seen over recent years but growing in proportion to the customer base. MMA has recommended that disconnections be included at 87, the average rate over the past five years. This was based on the fact that there was no obvious relationship between the customer base and disconnections in any year and the assessment that, as customer losses are due largely to redevelopment of properties, the relationship should be with the number of new properties built, not total properties.

ActewAGL has argued that:

- Customer losses occur largely due to the redevelopment of residential properties which had a gas supply point.
- There is a clear relationship between disconnections and the existing customer base. The greater the existing customer base the greater the redevelopment potential of residential properties which previously had a supply point.

The bed debt component of disconnections is also expected to be directly related to the customer base.

MMA has accepted ActewAGL's argument to assume that disconnection numbers increase in proportion to the customer base. MMA has estimated that the disconnection proportion should be 0.11%. This is in line with the disconnections modelled by ActewAGL.

MMA accepts the updated ActewAGL disconnection numbers.

4.8 CHANGES TO AVERAGE USAGE PER RESIDENTIAL CUSTOMER

Changes in average usage per residential customer over time are a good summary of the "net" direction of the key drivers of consumption other than customer numbers. If the average usage per customer is increasing it generally means that customers are, on average, either using more gas appliances or making more use of their appliances. Conversely, a declining average usage is generally a reflection of reduced appliance penetration or reduced use per appliance. Possible reasons for changes in average usage are provided in Section 4.8.1.

4.8.1 Key drivers to changes in average consumption

Key drivers in changes to average usage per residential customer over time include:

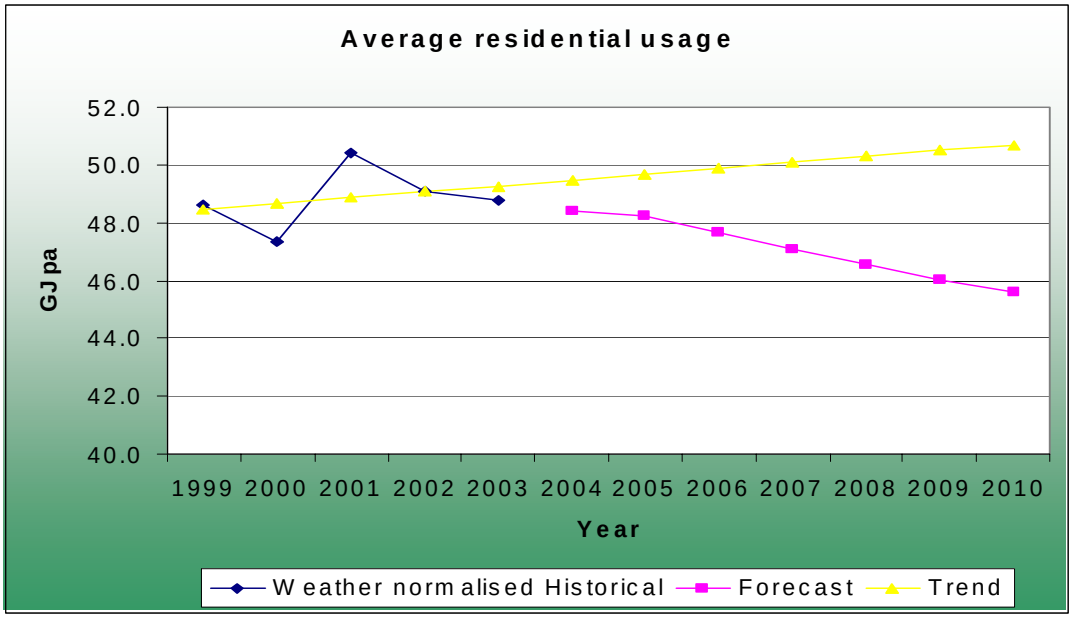
- Weather changes. Many areas across Australia are seeing a reduction in the "coldness" of weather as measured by heating degree days (HDDs)[13]. If such a warming trend exists it will act to reduce the amount of use of appliances in heating and hot water applications.
- Increased gas appliance penetration for economic or environmental reasons.
- Increased use of appliances due to "comfort factors". Such comfort factors include the move towards central rather than space heating and increased size of houses. A factor acting counter to this trend is the reducing number of persons per dwelling
- Increased appliance efficiency over time. New gas appliances are generally becoming more energy-efficient over time. The increasing use of instantaneous rather than storage hot water heaters in new houses is a good example of this.
- New or expanded uses for gas including spas, pool heating etc.
- Displacement of gas by alternative technologies, such as by reverse cycle air conditioning or solar hot water.
- Legislation or housing code requirements, such as the Think Water Act Water (TWAW) strategy for the ACT or Basix for NSW (both discussed in Section 4.13 below), are driving some movement towards potentially reduced usage per household sometimes with in increased gas appliance penetration rate.

[13] For any given day the number of Heating Degree Days is the greater of zero or the difference between the reference temperature (18ºC used in this case by ActewAGL) and the average temperature recorded for the day (average of maximum and minimum used in this case by ActewAGL). Thus, if the average temperature for a day is 15ºC then there are 3 HDDs recorded for the day. If the average temperature is 21ºC then the HDDs recorded is zero.

It is only through an examination of average use per customer that the net overall impact of these, and the myriad other potential drivers over recent periods can be ascertained.

Figure 4-3 provides an overview of historical growth in average usage per residential customer and latest ActewAGL forecasts for this parameter. The trendline shown is based on MMA's assessment of weather normalised average usage, using billing[14] heating degree days from 1999 to 2003. As can be seen, ActewAGL is forecasting that average usage will decline slightly over the coming AA period. After the initial increase in average usage in 2003/04 (due to a move back to normal weather from the unseasonably warm weather experienced in 2002/03), ActewAGL is forecasting a move away from the trend in annual average consumption. Given the recent trend and the significantly higher forecasts initially provided by ActewAGL, this reduction needs to be explained.

Figure 4-3 Historical and forecasts average residential usage



Source: ActewAGL data provided to MMA.

4.9 AVERAGE USAGE ASSUMPTIONS

ActewAGL forecast future changes in average usage by examining likely changes in average usage by each customer sub-sector. These are outlined in Table 4-1.

14 Billing degree days analysis takes account of the fact that HDDs recorded during annual billing cycles are not quite the same as the financial year HDDs.

Table 4-5 Forecast average usage by customer sub-sector

Average Consumption	Assumptions
All existing customers	Average usage for these customers (including connections from previous year) assumed initially to continue growing at 0.45% pa (subsequently changed to 0.03% pa). In its latest June 2004 forecasts ActewAGL has also factored in a reduction of use by existing customers from 2005/06.
New house/ medium density	Assumed initially to reduce from 53.1 GJ pa to 51.7 in 2004/05 and then 47.6 GJ pa thereafter for all new dwellings because of the Think Water strategy. In its latest June 2004 forecasts ActewAGL has factored in a reduction from 53.3 GJ in 2003/04 to 51.7 in 2004/05 and then 49.0 GJ pa thereafter.
E to G	Assumed initially to remain at 38.6 GJ pa throughout. In its latest June 2004 forecasts ActewAGL has factored in a starting usage of 36.4 GJ in 2003/04 and 2004/05 and then an annual reduction by 0.5 GJ pa thereafter.
E to G Bushfires	Initially assumed to be at E to G average but subsequently changed to new house average as recommended.
Disconnections	Assumed to be at average usage for the network.

As is clear from Table 4-5, there are some significant assumptions being made by ActewAGL in terms of consumption by the various residential customer categories in 2003/04 and changes to the market thereafter.

4.10 EXISTING CUSTOMERS

The historical average usage by residential customers is obtained by dividing the total volumes by the number of customers at June 30th of each year as provided by ActewAGL. ActewAGL has only provided data for the past five years, 1998 to 2003. The trendline over this period indicates that average usage has increased by about 2% pa, however, we consider this trendline to be unduly influenced by the low average value in 1997/98. Without the 1997/98 value the average usage has been approximately flat or even declining slightly.

Recommendation 5: If data from the year 1997/98 are included average usage appears to have grown at 2% pa over the past five years – significantly faster than if that data point is ignored. ActewAGL has stated that it considers the data from 1997/98 to be inaccurate but should be asked to explain and substantiate this claim.

ActewAGL has argued that the data for 1997/98 are inaccurate and cannot be relied upon. MMA has accepted this argument for the average usage data and has calculated changes in average usage only from 1998/99. This shows a flat average usage over the period.

However, the influence of weather must be factored into these calculations. The last two years in particular have been very warm. After weather normalising average usage has over the past four years been growing slowly, at about 0.4% pa, as seen in Figure 4-3.

The forecast average residential usage provided by ActewAGL is a composite of assumed average usage for consumption by new and existing residential customers combined with the impact of warming weather projections.

ActewAGL initially forecast that the average usage of all existing customers was growing at 0.45% pa. Subsequently, after re-calculation and reconsideration it re-assessed such growth to be 0.03% pa. However, the methodology used by ActewAGL is subject to significant variation, depending on the initial year chosen for the comparison. For example, MMA estimates that using the same methodology as ActewAGL from 2000 to 2003 results in a growth rate of 1.06% pa. Despite this, the 0.03% pa growth from existing customers is not dissimilar to the 0.08% pa growth estimated by MMA using a somewhat different method[15] but the same values as ActewAGL for average consumption by new and E to G houses.

Recommendation 6: ActewAGL should either use a growth rate in average usage for existing customers of 0.08% pa or provide a more robust justification for calculating usage by its existing methodology.

Since the recommendation in the draft report, ActewAGL has provided new data for average usage by new customers in 2002/03 but has retained the 0.03% pa growth rate. Using this new data has resulted in an estimated increase of growth by existing homes to 0.18% pa. This is materially higher than the increase in average usage used by ActewAGL in its forecasting.

The remainder of the annual growth has come from new dwelling customers consuming at greater than the average value. As shall be seen in the following Sections this is expected by ActewAGL to change over the coming AA period.

4.11 AVERAGE USAGE BY NEW DWELLING CONNECTIONS

4.11.1 Starting level in 2003/04

ActewAGL initially used a weather normalised value of 53.1 GJ pa for its starting year assumptions about usage by new dwellings, separate houses or medium/high density. This was understood to have been based on the usage by all 2001/02 new connections in the following year.

ActewAGL has subsequently provided similar historical consumption information from the previous three years and substantially complete data for the 2002/03 year. The average first year consumptions by new connections and E to G customers (not weather normalised) is provided in Table 4-6 .

[15] MMA has used a similar approach to ActewAGL but on a year by year basis with the growth rate being used to minimise residuals.

Table 4-6 Average usage (GJ) in the first year of connection by new houses and E to G customers

Year of first connection	New Homes, GJ	E to G, GJ	Billing HDDs	Marketing Expenditure, $M real	Proportion Stand-alone houses
1998/99	58.2	47.0	1950		
1999/00	57.8	43.9	2025		26%
2000/01	57.9	42.5	1986	2.83	36%
2001/02	51.5	37.5	1927	2.29	30%
2002/03*	52.3	35.4	1857	1.70	34%

* Incomplete data for the year.

For new homes the average usage over the period 1998/99 to 2001/02 for which complete billing and weather data are available suggest no obvious trend. There were three years of average usage about 58 GJ and then one with 51.5 GJ. The more recently provided data for 2002/03 shows average usage of 52.3 GJ, however, this is based on incomplete data[16].

There are many reasons for average usage in homes changing. These include weather, changing mix of connections (eg new stand-alone houses would be expected to have a higher average usage than new medium or high density housing) and changes to marketing expenditure used to induce customers to use gas[17].

Over the past few years at least three factors may have been acting to reduce the average usage of new houses. There has been a significant reduction in marketing expenditure in real terms, from $2.8 M in 2001 to 1.5 M in 2004[18]. There has also been a higher than average connection of medium or high density houses (32% versus 28% expected over the coming regulatory period). Stand-alone houses are likely to be larger, and thus use more energy, than the medium or high density dwellings. Finally, the weather has been significantly warmer than normal.

The data provided by ActewAGL certainly do not provide any clear evidence of a trend, and while a reduction in average usage has certainly been seen in the past two years this may well have been due to changes in the new home mix, marketing and weather effects. The weather has tended to get warmer in each of the past few years for which full data are available.

16 Note also that the analysis of weather, marketing and housing mix impacts is complicated as connections in (say) 2000/01 may have used gas in both 2000/01 and 2001/02 in the first full year of their connection – the data recorded here.

17 Indeed, as shall be seen in later sections, changes to water usage because of drought considerations may also lead to reductions in gas usage.

18 Information presented by ECG in presentation to the Commission and ActewAGL, June 2004.

MMA considers it inappropriate for ActewAGL to use the latest year value, even weather normalised, as its starting assumption for 2003/04 and beyond. The average value (preferably weather normalised) over the past three or four years would appear to be the most suitable indicator.

New bushfire re-builds are likely to be the same as other new dwellings in terms of average gas usage.

Recommendation 7: ActewAGL should use as its starting point for new dwelling usage (including new bushfire reconstructions) the average value for new dwellings over the past three or four years.

ActewAGL has in its most recent June forecasts used a value of 53.3 GJ as the starting value for new homes in 2003/04. It is not clear how this was derived as it has stated in its further information to MMA that it would use a weather adjusted starting point of 54.3 GJ for new homes[19].

The weather and housing mix are expected to return to normal values over the next few years. ActewAGL is proposing that marketing expenditure increase also compared to the 2004 value, although we understand that ECG, the consultants reviewing expenditures, have recommended that marketing be retained at year 2004 levels.

MMA considers it most reasonable to expect that new home averages will revert to the average of the past three years, weather normalised. MA also considers it reasonable to include the latest set of data in this average.

ActewAGL has proposed using a value of 54.3 GJ pa as the weather adjusted starting point for new homes and medium density (Further Information from ActewAGL page 8). MMA considers this value to be reasonable and has used this number in its forecasting. However, it is not in line with the 53.3 GJ used by ActewAGL in its spreadsheets.

4.11.2 Changes to average usage by new homes over time due to appliance mix

Recent history has shown that the average usage per residential customer, after weather normalisation, is increasing at about 0.4% pa. Part of this is due to average usage by new homes exceeding that by existing houses. Despite information provided by ActewAGL to show that appliances are becoming more efficient, due in part to the changing mix of water appliances, there is no clear evidence to demonstrate that this is actually translating into reduced average usage by new customers over time.

MMA considers it most appropriate to assume that the average usage for new customers will remain at the 2004 level apart from the impact of the think Water Act Water and Basix regulatory changes.

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[19] ActewAGL, Further information in response to the Independent Competition and Regulatory Commission consutants' presentation 10 June 2004", June 2004, page 10.

4.12 AVERAGE USAGE BY NEW E TO G CONNECTIONS

4.12.1 Starting level in 2003/04

As was the case for new dwelling connections, first year usage by new E to G connections in 2001/02 appeared very low by recent history standards. In its draft report MMA considered it inappropriate to use the last year's average usage by new E to G connections in its estimation of new E to G usages and again recommended that the weather normalised average over recent history should be used.

Recommendation 8: ActewAGL should use as its starting point for new E to G connections the average value for such new connections over the past three or four years.

ActewAGL has subsequently provided updated data for E to G connections in the first 11 months of 2002/03. The data have been provided in Table 4-6 . The data seem to indicate a reducing trend for E to G customers.

In its latest forecasts ActewAGL has used 36.4 GJ, based on actuals to date for new E to G customers who connected in 2002/03, weather normalised using 2002/03 weather. MMA considers this number to be reasonable.

4.12.2 Changes to average usage by new homes over time due to appliance mix

ActewAGL has provided evidence to show that the rate of change of usage by new E to G customers has reduced over the past few years. MMA accepts that there has been a shift towards continuous hot water systems in new homes and E to G dwellings over recent years and that this trend is expected to continue.

MMA considers it acceptable to factor in a reduction in starting E to G usage over time due to the change in hot water appliance mix, but only to the extent to which E to G customers actually use gas hot water. The reduction considered reasonable by MMA is discussed further in Section 7.2.

4.13 THE "THINK WATER ACT WATER" STRATEGY AND BASIX IN NSW

4.13.1 Changing conservation regulations

Local and state governments have become increasingly active in requiring that new housing become more environmentally sustainable. For example, the Victorian Government has required implementation of various energy and water efficiency requirements in new houses, while the South East Queensland Regional Organisation of Councils (SEQROC) is considering the adoption of a Sustainable Housing Code with similar requirements.

The ACT Government released its "Think Water Act Water" (TWAW) strategy in April 2004. One component of this strategy is the provision of rebates for AAA showerheads to be installed from 2004/05 possibly followed by the mandating of sale of only AAA

showerheads from 2007. [20] According to the strategy explanatory document[21], a $30 rebate program run over three weeks in 2002/03 resulted in some 3,900 AAA showerheads being sold. The document also states that some 32% of homes in the ACT already had water efficient showerheads in 2001.

The NSW Department of Infrastructure, Planning and Natural Resources (DIPNR) has foreshadowed the introduction of Basix, a building sustainability index, to require improved energy and water sustainability for new houses built in NSW. Basix is intended to apply to all residential developments in Sydney from 1/7/2004 and in the rest of NSW (including Queanbeyan and Yarrowlumla) from 1/7/2005. It is intended to replace other local planning requirements. An initial impact of Basix is also likely to be the requirement for AAA showerheads and tap fittings.

The reduction of water use in showers will also result in reduced energy usage. ActewAGL has factored in energy reductions due to increased use of AAA fittings due to either rebates or regulation. It initially estimated that the saving will be 5.5 GJ pa for new dwellings with such fittings and that 25% of new homes will have such fittings in 2004/05 and 100% in 2005/06.

4.13.2 Penetration rate of AAA fittings

ActewAGL has assumed a penetration rate of AAA showerheads of 25% in new houses in 2004/05 and 100% thereafter. It is not clear that this is the most likely course of events. Firstly, there will not be any impact on the NSW component of new dwellings, about 14% of new dwellings, until 2004/05. As well, given that the program will not be mandatory until 2007, there is no reason to expect that the uptake in new homes in the ACT will approach 100% before then.

After an initial surge of purchases by those especially concerned to conserve water, we expect that efficient new showerheads will only be purchased for new homes or renovations. For example, the Hastings Council Demand Management program in NSW estimated that 4.5% of households took up a $20 rebate over a one year program[22]. Approximately 3% of ACT households took up the showerhead rebate in three weeks. Beyond this, much of the demand is likely to come from new homes and renovations.

ActewAGL considers that new home developers are very likely to take advantage of a rebate. It is unclear whether this is the case, especially if any paperwork will be required to obtain the rebate.

We consider it unlikely that a voluntary rebate scheme of $20-$30 per showerhead will ever achieve close to 100% of new home penetration. However, we accept that some existing homes and renovations will take up this offer.

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20 Think Water Act Water, Volume 1, Draft strategy for sustainable water management in the ACT, November 2003, pages 20, 21.

21 Think Water Act Water, Volume 2, Draft explanatory document, November 2003, pages 20, 21.

22 Case Study 3: Hastings Council Demand Management Program available at www.environment.sa.gov.au/sustainability/ pdfs/casestudy_hastings.pdf .

We estimate that over 30% of households in the ACT already purchase water efficient showerheads (see Section 4.13.3). Without any further evidence from ActewAGL we consider it reasonable to assume that the increased penetration of AAA showerheads in new homes will be 25% in 2004/05, 50% in 2005/06 and stay at this level until 2007/08 when we assume that AAA showerheads become mandatory for new homes.

Recommendation 9: ActewAGL should provide better substantiation of its forecasts of penetration of AAA showerheads or use the penetration rates assumed by MMA.

In its response to the draft report ActewAGL said that it would further review penetration rates, however has not subsequently changed its numbers in the ACT market. MMA continues to expect that a rebate will increase penetration rates, but not at the rate expected by AGLGN. The rate of uptake will be modified by considerations such as budgetary, availability of showerheads in all locations, amount of paperwork required and customer preference.

As well, the AAA tap fittings will not be subject to a rebate, although they may form part of a tune-up program. ActewAGL has assumed that these tap fittings will have the same penetration rate as the AAA showerheads.

Overall, the rate of penetration of AAA fittings (showerheads and taps) estimated by ActewAGL is significantly different from that considered acceptable to MMA and is likely to result in a material difference to forecasts.

4.13.3 Energy savings from the Think Water Act Water strategy and Basix

ActewAGL initially estimated that the average use of gas by new homes for hot water will from 2005/06 reduce by 5.5 GJ per home because of the penetration of AAA showerheads. The analysis provided by ActewAGL appeared to be flawed or requiring further substantiation in a number of areas:

- The basis of the percent reduction in hot water usage assumed due to adoption of AAA showerheads is most uncertain.
    - Firstly, ActewAGL appears to be assuming that there will be a reduction in hot water usage of about 36.4% compared to current levels. However, this calculation appears to include water savings in the area of tap fittings and aerators. While savings from taps may be appropriate to assume for the NSW component of the network's new homes under Basix, this is not the case in the ACT where there are no rebates scheduled for tap fittings.
    - Additionally, in its calculations ActewAGL appears to be comparing water usage for an average Sydney household against that of new homes in the ACT. This does not appear to be the appropriate basis of comparison. The correct comparison would appear to be what is used in new homes in the ACT now against what would likely be achieved under the Think Water strategy (or Basix for the NSW component). According to the Think Water strategy documentation in 2001 some 32% of homes in the ACT already used water efficient showerheads. It would appear reasonable to assume

that new homes already consume a substantial proportion of such water efficient showerheads. Even in 1997 a study by Ellis and White estimated that sales of AAA showerheads represent 27%-30% of total annual shower head sales in NSW[23], much going to new dwellings.

- Only about half of hot water usage is in showers[24] and there is little certainty about the actual level of water savings in showers. For example, the domestic water study in Perth[25], which measured actual water usage with normal and "water-efficient" showerheads, found that water efficient showers used about 10% less than normal showerheads in single residential houses and less than 3% less in multi-residential dwellings. As water efficient fittings were taken to include those with A rating and above, this may be an understatement of the likely savings with AAA showerheads.
- It is unclear whether in its new analysis ActewAGL is including savings from the required increase in efficiency of gas hot water systems. While these may be relevant for new dwellings in NSW under Basix such considerations should not be included in the ACT.
- According to ActewAGL the higher efficiency instantaneous water heaters already make up a high proportion of gas hot water systems in new homes. In such water heaters we would expect that the energy savings would be almost proportional to the hot water saved. This hot water might range from 5% to 20% (saving of 10% - 40% of shower usage which constitutes some half of total hot water usage). In storage systems we would expect the proportional savings to be less as the maintenance rate is still required.

In the absence of further information, MMA assumed that:

- AAA showerheads result in hot water savings of 5%-15% of hot water compared to current systems (which already include at least 30% AAA fitting showerheads).
- Efficient hot water systems to be introduced in the NSW component of the network from 1/7/2005 may reduce average hot water usage but only in new homes there.
- Gas Centralised Hot Water systems will have no efficiency gains or changes to standing energy usage but will have loads reduced by perhaps 10%-15%.

Recommendation 10: ActewAGL will need to provide significantly more substantiation to justify its forecast reductions in new home energy usage after Think Water and Basix are introduced compared to that of current new homes or use the MMA assumptions.

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23 M Ellis and S White, "The water efficient shower market in NSW – a scoping study", Final report to SEDA, 1 December 1997.

24 G Wilkenfeld and Associates Pty Ltd et al, "A mandatory water efficiency labelling scheme for Australia, draft report to Environment Australia, April 2003

25 M Loh and P Coghlan, for the Water Corporation, "Domestic water use study in Perth, Western Australia, 1998-2001, March 2003.

While Basix is also likely to stimulate increased usage of gas in non-hot water applications the impact on the ActewAGL network is relatively small and not requiring modelling.

Further considerations since the draft report on this recommendation are reviewed in Chapter 7.

4.13.4 Changes due to implementation of energy efficient hot water systems

MMA understands that there has been a move towards continuous hot water systems over time and that this may reduce average usage in hot water systems. While MMA accepts that a move to continuous hot water exists, it considers that this is one of many ongoing trends that is taken into account in the overall average usage assumptions. If average usage has not changed significantly over time, in the face of such an ongoing trend, this may mean that other usage (for example for heating) is increasing as compensation.

Recommendation 11: ActewAGL should assume that average usage for new customers will remain constant over time (apart from the impacts of Think Water and Basix) unless it can provide compelling evidence that the average usage for new customers will continue to reduce over time.

ActewAGL appears to have included changes to average usage by existing and new customers over time apart from those due to TWAW and Basix. MMA does not accept such changes as they are not supported by evidence of actual net changes. See the discussion in Section 7.2.

4.14 FURTHER CONSIDERATIONS ON TWAW, BASIX AND AVERAGE USAGE SINCE THE DRAFT REPORT

Several of the recommendations in the draft MMA report referred to attempting to reduce uncertainties about the impact of the implementation of Think Water Act Water (TWAW) which is being implemented by the ACT Government and Basix, the Building Sustainability Index regulation which is being implemented by the NSW Department of Infrastructure, Planning and Natural Resources, on gas usage in new houses.

In general terms, while MMA accepted that TWAW and Basix would impact on average usage by new home customers, it did not accept the initial ActewAGL estimates of the impact of these and recommended that further work be done by ActewAGL to substantiate its position.

ActewAGL and Agility have carried out further work on calculating the likely impact of TWAW and Basix. The documentation of the further analysis and assumptions resulting from this review are included in Revision B of the report entitled "Energy usage impacts for the ActewAGL Gas Network" (Energy Usage Impacts) and dated 15 June 2004. This document re-analysed the impact of TWAW and Basix and other trends on both new and existing homes on the network.

While MMA has considered the analysis in some areas of this report to be reasonable, in several other areas this was not considered to be the case. These areas included:

- the analysis of the expected energy impact of AAA fittings on new and existing customers
- the expected penetration rate of the fittings for new customers(see also Section 7.3)
- the expected penetration rate of the fittings for existing customers
- the expected outcomes for existing customers in the ACT
- the expected outcomes for E to G customers in the ACT.

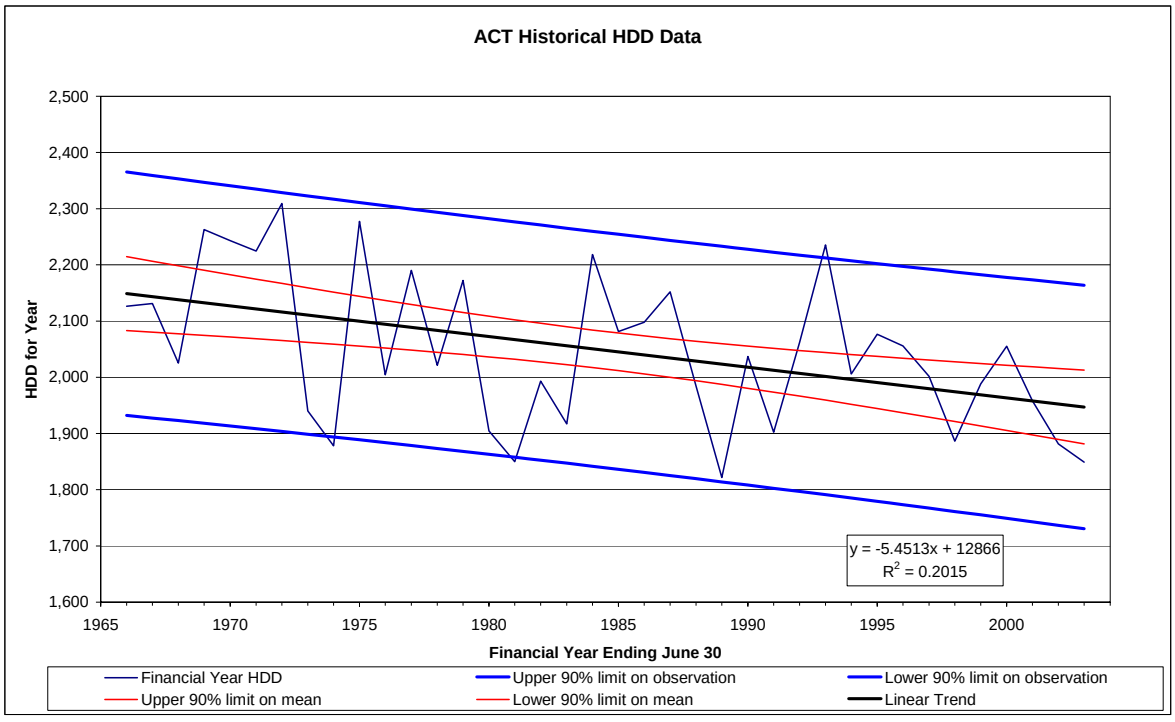
The differences between what ActewAGL has proposed and what MMA considers to be acceptable assumptions are significant and result in material impacts on the demand forecasts. Fuller evaluation of these issues are provided in Chapter 7.

4.15 WEATHER IMPACT

ActewAGL initially provided a graph of financial year HDDs versus time for the Canberra Airport weather station over the period 1976 to 2003. This appears a reasonable weather station to use for the ACT/Queanbeyan and Yarrowlumla region as evidenced by the high correlation between the HDDs and daily injections. While the graph suggested a negative slope and the line of best fit showed the slope to be -3.8 HDDs per year, the data was not adequate to show that the slope was negative at the 95% level of confidence.

Subsequently ActewAGL provided extra data and a graph of HDD analysis from 1966 to 2003 which produced a better r^2 value and statistically significant evidence that the slope was negative at the 95% level of confidence. The graph is provided in Figure 4-4 .

Figure 4-4 HDD analysis for Canberra Airport



Source: ActewAGL

The data provided show a trend towards reducing HDD levels over the period, with a trend-line average of -5.45 HDDs per year. Statistical analysis shows that there is a negative slope at the 95% level of confidence. The 95% confidence limits on the slope are - 2 to -9 HDDs.

However, it appears that the weather history might be divided into several sections, with periods within this showing different trends.

Determining the appropriate time period to use and slope of the line within that period is a matter of judgement. As stated previously, ActewAGL initially used a slope of -3.8 from the period 1976 to 2003 but has subsequently amended this to a slope of -5.5 based on data from 1966 to 2003. Using the period 1972 to 2003 results in a slope of -4.3, while 1973 to 2003 results in a slope of -2.9.

As weather may go through a number of separate "phases" over time, we consider that a reasonable period to use is the shortest period over which the slope is assessed to be less than zero at a level of confidence of 95%. We understand this to be the case for the period 1972 to 2003, resulting in a slope of -4.3 HDDs per year and "normal" weather in 2003 of 1959 HDDs.

Recommendation 12: It is recommended that data from the period 1972 to 2003 be used to provide the weather assumptions made by ActewAGL.

ActewAGL has continued to use its previous forecast weather change (5.5 HDDs) in its latest forecasts.

ActewAGL has conducted further daily receipt analysis of its tariff market to demonstrate a HDD sensitivity for the entire tariff market including unaccounted for gas (UAG) of 1.3 TJ/d. A strong relationship ($r^2 = 0.96$) was established between the HDDs and the usage on any given day.

ActewAGL has assumed that the 1.3 TJ/d is divided between the residential and business tariff markets based on 2002/03 sales. It has ignored the low level of impact of the UAG (estimated at about 50 TJ). Thus, the tariff market is estimated to have a sensitivity of 1.3 TJ/d of which the residential market contributes 76% and the business tariff market the remaining 24%.

MMA has conducted sensitivity analysis which demonstrates that the forecasting results for the market as a whole is relatively insensitive to the allocation of weather sensitivity between the residential and tariff markets, and thus considers this assumption to be reasonable.

4.15.1 Initial normalisation for 2002/03

The year 2002/03 was significantly warmer than the standard year. Assuming that a "normal weather" year in 2002/03 had 1959 HDDs and that the billing HDDs[26] were 1857

[26] Billing HDDs have been used by ActewAGL to reflect that customers are billed quarterly, meaning that some quantities billed in a financial year are from the previous financial year.

in that year results in required weather normalisation of about 128 TJ in that year for the entire tariff market.

We note that ActewAGL in its latest spreadsheet has applied the weather normalisation applicable to 2002/03 to the 2003/04 year.

Recommendation 13: In its calculations the weather normalisation should be applied to the 2002/03 year and this should then be multiplied by the calculated increase to provide the starting 2003/04 usage by existing customers.

The ActewAGL approach to this is somewhat different to that proposed by MMA, but not materially so.

4.16 SUMMARY OF KEY DIFFERENCES BETWEEN MMA AND ACTEWAGL

While the distance between the ActewAGL forecasting methodology and assumptions and what MMA considers to be reasonable has narrowed in some areas, principally customer number forecasts, in other areas it has not. The material differences between the latest ActewAGL forecasting methodology, assumptions and forecasts and those considered to be best estimates by MMA lie in the areas of:

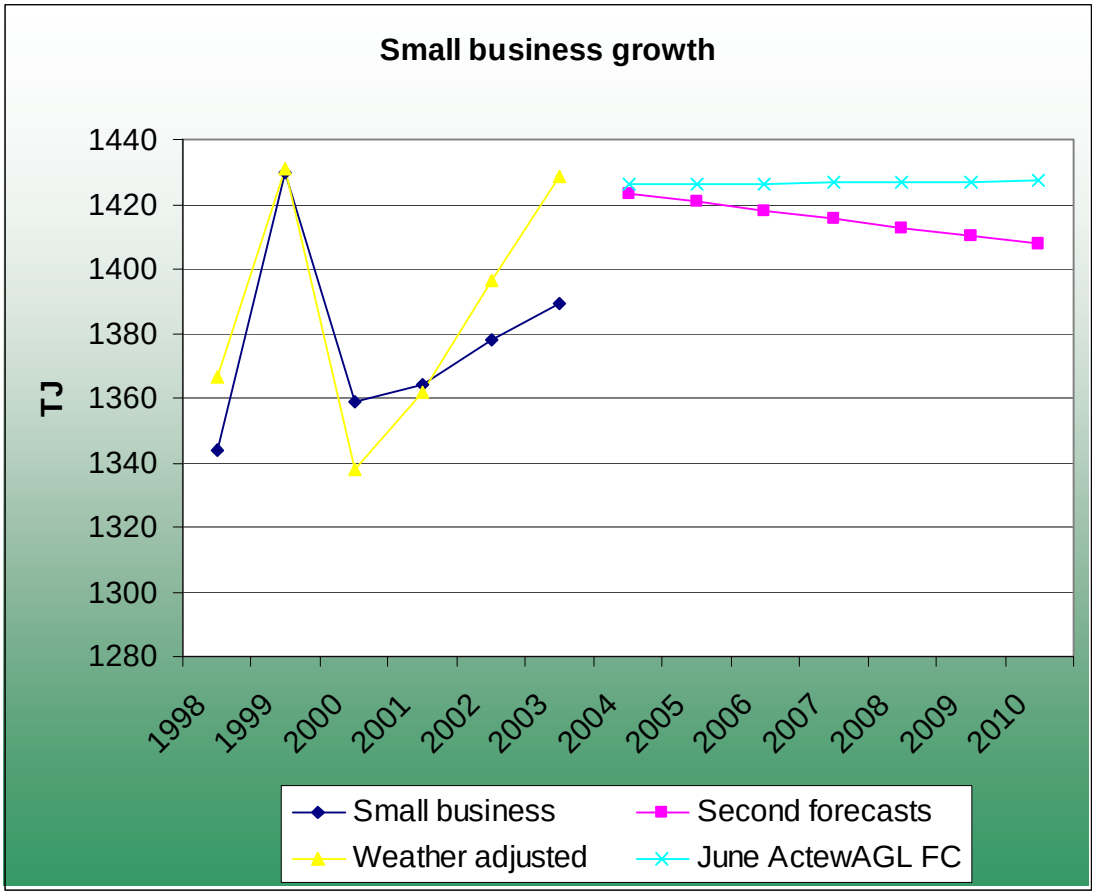
- the number of new home connections forecast for 2003/04
- the number of E to G connections forecast for 2003/04
- the annual increase in average usage by existing customers
- starting usage by new customers
- the analysis of the expected energy impact of AAA fittings under TWAW on new and existing customers
- the expected penetration rate of the fittings for new customers
- the expected penetration rate of the fittings for existing customers
- the expected outcomes of the TWAW strategy for existing customers in the ACT
- the expected outcomes of the TWAW strategy for E to G customers in the ACT

5 FORECASTING SMALL BUSINESS CONSUMPTION

5.1 HISTORICAL AND FORECAST CONSUMPTION

Growth in consumption by the small business (tariff) customers over the period 1998 to 2003, both actuals and weather normalised, is illustrated in Figure 5-1 . Also illustrated are the forecasts for this market provided by ActewAGL after discussions with MMA and then most recently in June 2004.

Figure 5-1 Historical and forecast tariff business volume growth



Source: ActewAGL data provided to MMA. Note that ActewAGL has commented that the data for 1997/98 is not accurate as information from NSW (including Queanbeyan) was not properly handled (see Section 4) . Note that ActewAGL has advised that earlier forecasts for the business market were in error and these have not been included.

5.2 WEATHER NORMALISATION

Business market sales in 2002/03 were 1389 TJ. Using standard weather assumptions discussed in Section 4.14 and weather sensitivity adjustment made by ActewAGL results in weather normalised consumption in 2002/03 estimated at 1427 TJ. Although this is not completely in line with the trend forecasts, it is consistent with the methodology applied by ActewAGL for the residential market.

As was the case for the residential customers, ActewAGL has weather normalised for 2003/04 rather than for 2002/03. This needs to be corrected with the weather normalised 2002/03 values being used as the base year figures and growth taken from there.

Recommendation 14: ActewAGL should weather normalise the business tariff results in line with the standard weather assumptions resulting in estimated initial usage of 1427 TJ. This should be applied to the 2002/03 year.

ActewAGL has accepted this recommendation. The ActewAGL approach to this is somewhat different to that proposed by MMA, but not materially so.

5.2.1 Growth of the business market

ActewAGL appears to have initially used a model similar to that used for the residential market to forecast growth in the small business market, taking into account separately growth from both existing (slow decline) and new customers. Subsequently ActewAGL changed this to a model using only (negative) growth from existing customers, based on an analysis of the changes between the 1998/99 and 2002/03 years. According to that analysis, growth of the market was -0.06% pa (although this appears to have included a mistake in the cell calculating weather sensitivity).

While MMA accepts that the residential type model, distinguishing new and old customers, is not necessarily valid for the more heterogeneous small business market, it does not consider that the more recent methodology used by ActewAGL is appropriate. The most recent ActewAGL methodology can be skewed significantly by the choice of starting year. Thus, while ActewAGL calculates a growth rate of -0.06% pa for the business market over the period 1998/99 to 2002/03[27], the same methodology would result in growth of 2.4% pa from the next year and 2.3% pa if starting from the next two years. It does not appear appropriate to utilise a methodology which is so sensitive to starting year.

Analysis based on weather normalised consumption for the period 1998 to 2003 results in estimated growth over the period of about 0.9% pa. However the data are not homogeneous with recent historical data appearing to be in two phases, an initial drop from 1999 to 2000 followed by steady growth from 2000 to 2003 at about 2.2% pa. It is unclear what caused the drop in 2000. It may have been caused by movement between tariff and contract classes during the early years of the current AA period[28]. While it is also unclear which growth rates are most appropriate to assume post 2003, the most recent growth trend which seems to be relatively uniform seems to be most relevant.

Recommendation 15: ActewAGL should comment as to whether there are any obvious reasons (for example tariff to contract movements) which would account for the apparently anomalous reduction in business tariff usage between 1998 and 2000. ActewAGL has responded that there were some tariff to contract movements in 1998/99 (see Section 5.3.1).

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27 Noting though that with the correction to sensitivity the growth would be +0.15% pa.

28 This is also suggested by the history of the contract market which shows a profile in 1998 to 2000 opposite to that seen in the small business market, see Section 6.1.

Since 2001 there has been little movement between the tariff market and contract market and no net movement is forecast over the coming AA period.

The most recent three years has seen growth at about 2.2 % pa even after taking into account any warming impact. Such growth is not dissimilar to what was forecast by ActewAGL initially and seems to most accurately resemble recent trends.

Recommendation 16: ActewAGL should use a growth rate of 2.2% pa for the business tariff market consistent with that seen (after weather normalisation) over the past three years. As this rate has taken into account any impact of warming it should be maintained despite the warming trend.

5.3 CONSIDERATIONS AFTER THE DRAFT REPORT

5.3.1 Response from ActewAGL

After the draft report ActewAGL:

- Commented that the 1997/98 data were not appropriate to use.
- Informed MMA that the year 1998/99 was anomalous in that three customers transferred from tariff to contract that year. According to ActewAGL the total load billed to the tariff market prior to transfer was 42 TJ.
- Argued that the period 1999 to 2004 should be used for the analysis in line with that in other areas.
- Rejected the MMA recommendation to use the (weather normalised) growth rate experienced over the past three years (2.2% pa) as being unrepresentative of the entire period.
- Provided new June 2004 forecasts which start at 1426 TJ in 2004 and remain at approximately this level throughout the period (see Figure 5-1).

5.3.2 MMA assessment

MMA considers it most reasonable to use the longest available, anomaly-free, data series. ActewAGL has advised that it considers the 1997/98 data to be anomalous and that the apparent anomaly in 1998/99 data was due to tariff to contract movements in that year.

Weather and transfers between the contract and tariff markets are expected to be the key anomalies. ActewAGL has said it does not expect any such transfers over the coming Access Arrangement period.

MMA has analysed the business data after "normalising" for both weather and transfers. It has done the latter by subtracting the volumes understood to have been due to such transfers in the appropriate years.

Linear trend analysis shows growth over the period to have been about 0.9% pa. This is about the same as assessed over the period 1998 to 2003 but less than the 2.2% pa seen over the past three years.

On balance MMA has accepted that it is better to use the longer information period and has forecast according to the linear trend line, resulting in a growth of about 1% pa after taking into account the slight impact of the expected warming trend expected. MMA can see no rationale for the latest flat forecast provided by ActewAGL.

MMA has forecast growth from 1422 TJ in 2004 to 1498 TJ in 2010.

5.4 NEW BUSINESS TARIFF CUSTOMER NUMBER FORECASTS

Business tariff customer numbers represent 5% of the total tariff customer numbers in the ACT. They comprise commercial and industrial customers whose consumption characteristics are diverse. According to ActewAGL, there were 322 customer connections and 92 disconnections in the past 5 years to 2003, giving a net connections figure of 230 over the 5 years or 46 per annum.

ActewAGL has forecast growth to be at this average level over the forecast period. Although ActewAGL has not considered any bushfire-affected customers in 2003 in the business tariff market this is considered immaterial.

As a rule of thumb, business customer connections have tended to be 3% of new residential and business customer connections. A check shows that historically business customer numbers are approximately 3% of all customer connections.

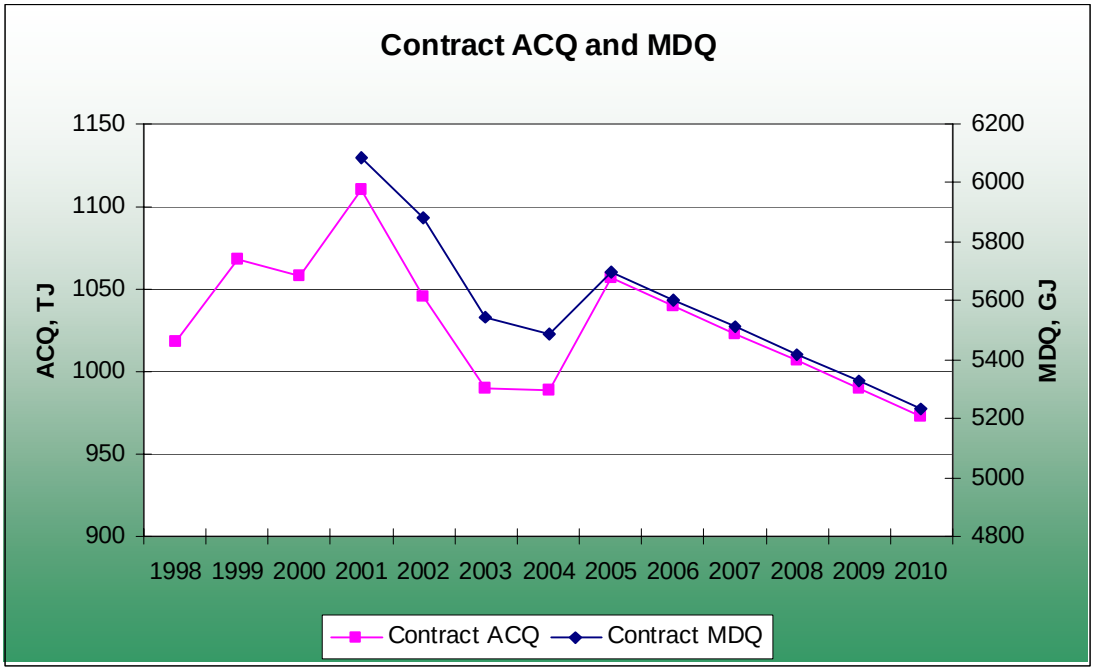
Changes to business customer numbers are relatively immaterial in terms of revenue. Given this, MMA considers reasonable the methodology used by ActewAGL to forecast small business customer numbers growth.

6 FORECASTING THE CONTRACT MARKET

6.1 HISTORICAL CONTRACT MARKET VOLUMES

The recent history of the contract market over the period 1999 to 2003 is illustrated in Figure 6-1 together with ActewAGL's forecasts over the AA period to 2010. The Figure provides both annual quantities distributed to contract customers (ACQ) in TJ and also the contracted or booked MDQs in GJ.

Figure 6-1 Contract market, recent history and ActewAGL forecasts (change PJ)



Source: ActewAGL Tables, 4, 14 and 17 and Table 2.6 in Contract Market Forecast

The figure shows that contract market volumes (ACQs) have, over the past three years fluctuated between 1110 TJ and 990 TJ[29]. Increases in consumption in 2000 and 2001 have been by way of new site additions rather than consumption increases by existing customers. Over the period 1998 to 2003 the number of customers increased from 34 to 38[30] while the volume in these two years was broadly similar.

ActewAGL ACQ forecasts show a reduction in estimated consumption of 1.7% between 2003 and 2010, an average decrease of 0.25% pa. This is despite a step increase in 2005 due to the inclusion of a new site (Note: name of new site excised for commercial-in-confidence reasons) that is projected to have usage of (Note: usage of new site excised for commercial-in-confidence reasons) TJ pa. ActewAGL is also forecasting that the charging parameter, MDQ, will decrease at a somewhat more rapid rate of -0.8% pa, from 5545 GJ in 2003 to 5235 GJ in 2010, again despite the addition of the customer.

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29 Note that the historical graph and analysis is based on metered data information provided by ActewAGL to MMA. This does not agree completely with accounting data also provided by ActewAGL.

30 And forecast to increase to 39 customers.

6.2 OUTLINE OF ACTEWAGL'S FORECASTING METHODOLOGY

6.2.1 ACQ forecasts

ActewAGL has used a top-down approach to forecast ACQs. It has divided the contract customers into three industry groups – Health and Education, Offices and Other. This allocation resulted in 11 delivery points allocated to health and education, 11 to offices and 17 to other. ActewAGL's methodology for forecasting ACQs consisted of three steps, namely:

- Trend analysis using historical consumption data from 1999/2000 to 2002/03 of only the customers that existed during the entire period. This allowed ActewAGL to estimate historical industry growth rates for the three groups, and
- Adopting a forecast baseline of the actual consumption in 2002/03
- Applying the annual industry growth rates to each industry group ACQ to produce forecasts.

6.2.2 MDQ forecasts

To forecast booked MDQ, ActewAGL has used the average ratio of ACQ to booked MDQ by industry sector over the past three years. According to ActewAGL this has resulted in an acceptable level of error when "back-casting" MDQs. Average load factors were 52% for the Health and Education group, 49% for Offices and 47% for Others.

The new customer forecast for inclusion in 2005 was included at the customer's proposed contract MDQ rather than using the average industry group load factor.

6.3 REVIEW OF ANNUAL CONTRACT QUANTITY (ACQ) FORECASTS

6.3.1 Industry based ACQs

According to ActewAGL the ACQ data analysis from 2000 to 2003 shows that each of the three industry groups is declining in ACQ terms. However, this analysis may be flawed in a number of areas:

- Firstly, it is based on trend analysis using only those customers who were present in all four years. Despite ActewAGL providing its rationale for this, MMA can see no compelling reason why the new customers who were added over the period should not be included in this analysis. Whereas there might be some energy efficiency taking place, this has over the past few years been largely balanced by new customers. Trend analysis similar to that conducted by ActewAGL but taking into account all sites results in a trend which is virtually flat, with increases in the "other" category almost balancing decreases in the other two categories.
- Secondly the history is very limited which in MMA's view allows little confidence in the trend analysis. If the overall contract information provided from 1998 to 2003 is included it shows an overall trend reduction of contract usage of about 4 TJ/year.

- Thirdly, it does not take weather into account. Although, overall, the impact of weather on the contract market, according to ActewAGL, is low, estimated to be some 0.1 TJ/HDD, the weather over recent years has been very warm. Weather normalisation of the total contract results provided from 1998 shows an upward trend of 8.5 TJ/year. In some weather-sensitive sector, we would expect the impact to be much greater.
- Fourthly, the analysis used by ActewAGL starts from actuals 2002/03, rather than the trendline estimates which would be more appropriate if using a trend based method.
- Fifthly, ActewAGL has relied on linear time series analysis with a poor correlation coefficient. MMA expects that the use of macroeconomic output analysis would result in a better correlation. For example, MMA's analysis of usage in the Offices sector[31], based on the BIS Shrapnel history provided in the State Industry Prospects publication[32] provided significantly better correlation outcomes than the simple time analysis.

For the above reasons MMA considers the ActewAGL ACQ analysis to be unacceptable. However, taking into account the relatively small size and materiality of the contract market, we consider it would be reasonable to use a combination of discussions with "major customers" and trend analysis to correct many of the above problems.

Recommendation 17: ActewAGL should initially confirm that the metered data provided in Table 2.6 of the Contract Market forecast is accurate and complete and that it considers this information, rather than the accounting information also provided, the most suitable to use.

Then it would appear appropriate for ActewAGL to carry out some "bottoms up" as well as "tops down" analysis. Given that the top six customers consume almost 40% of the total contract load, it would seem reasonable to hold documented discussions about ACQ and MDQ expectations with at least these customers.

Recommendation 18: ActewAGL should hold and document discussions about ACQ and MDQ expectations with at least its six top customers. ActewAGL should also hold and document similar discussions with [name removed], the potential new customer.

ActewAGL can then combine this analysis with trend analysis of all remaining customers over the past five years to make up more realistic forecasts.

Recommendation 19: ActewAGL should then analyse the ACQ data for all non-major customers combined over a period of at least five years. ActewAGL should use the trend numbers, not just the multipliers, in its forecast for 2003/04 and remaining years. Alternatively, if ActewAGL wishes to analyse by industry group it should initially

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[31] Based on analysis of Finance and Insurance + Government and Defence + Property and Business + Community Services and Cultural and Recreational Services for the ACT.

[32] BIS Shrapnel, "State Industry Prospects 2003 to 2018", August 2003

weather normalise and then re-analyse for the three industry groups using the better of time or macroeconomic indicator correlations.

6.3.2 New customer

ActewAGL has factored in a new customer using about 85 TJ pa with an expected contracted MDQ of about 300 GJ from 2004/05. Whereas it would appear appropriate given prior knowledge of such a customer to factor it in, there is the possibility that this would result in double-counting with the trend analysis previously carried out.

For example, if a trendline estimate suggests that a category of usage is expected to gain 10 TJ pa, presumably through either increased usage by existing users or the connection of a new plant, and it is known that a plant which uses 50 TJ intends to start operations next year, is it reasonable to count both the trend increase and the increased usage by the new user?

If the contract market re-assessment is to combine both "bottoms-up" and "tops-down" analysis, the new customer can be treated as a major and added in there. Given that the load factor of the new customer is expected to be significantly less than that of other customers in its industry group this appears a reasonable course of action.

Another possible solution may be to extend the trend analysis for two years to include the timing and impact of the intended new plant and use the new trend analysis results.

Recommendation 20: ActewAGL should either treat the new customer as a "major" by factoring in its expected ACQ and MDQ growth or extend its trend analysis for an additional couple of years to include the customer.

6.4 ADDITIONAL MAJOR LOADS

Apart from the new customer discussed above, the only major new loads considered capable of adding significant load to the network over the next few years are generation and cogeneration. Although some generation and cogeneration projects might start up in that time period, it is considered equally likely that none will or that, if they do, they will either off-take from transmission rather than distribution mains or not significantly increase contracted MDQ.

At this stage we consider it unlikely that any significant new cogeneration or generation project will offtake from the distribution mains over the coming AA period. ActewAGL has confirmed that it is not aware of any such projects as well. While there may be additional smaller cogeneration loads, such as for example at hospitals, this will be relatively minor and is covered in the trend analysis.

Other new loads apart from the natural gas for vehicles which is covered separately are also likely to be relatively small and are again covered by the trend analysis.

6.5 BYPASS

ActewAGL has not expressed concern about bypass by any contract user and has not included any such bypass in its forecasting.

6.6 CONTRACTED MAXIMUM DAILY QUANTITIES (MDQS)

MMA considers the average load factor approach taken by ActewAGL to be reasonable. If the recommended combination of majors and non-majors analysis is undertaken, a similar approach should be taken for the non-majors.

Recommendation 21: ActewAGL should use the "load factor" approach for non-majors combined with "bottoms-up" assessment of majors to calculate its MDQs.

6.7 CONSIDERATIONS AFTER THE DRAFT REPORT

The key thrust of the MMA recommendations was for ActewAGL to change its methodology to a combination of "majors", with whom discussions would be held and "non-majors" for whom trend analysis would be adequate. ActewAGL agreed to do this in principle, but has not yet reported on the results of discussions with the six majors plus the major new customer.

In the meantime, ActewAGL has forecast based on the recommended split and methodology and the assumption that the majors will consume and contract at the same level as in 2003. This appears to be a reasonable assumption until the discussions can be held and recorded and incorporated into final forecasts.

The results of applying this methodology are provided in Table 6-1.

Table 6-1 MDQ forecast using the Major/Non-major split recommended by MMA

	2003	2004	2005	2006	2007	2008	2009	2010
MDQ, GJ	5,545	5,479	5,696	5,613	5,531	5,447	5,365	5,282

Despite ActewAGL commenting that it considers a methodology using a top 3 majors/non-major split to be superior to this methodology, MMA believes that the recommended method which includes discussions with the top six or seven customers adds to the rigour of the methodology.

ActewAGL has also pointed out that this analysis provides very little difference to that using the original methodology. However, the result included above is based on the key assumption that majors will contract MDQ in future as they did in 2003. Only after the discussions are complete and documented, presumably prior to the final report by the Commission, will any differences become evident. In the meantime we consider the above forecast reasonable to use.

7 MMA FORECASTS

MMA has considered the ActewAGL forecasts in several areas to not represent "..best estimates arrived at on a reasonable basis". This Chapter provides the MMA forecasts which it considers to meet that criterion. While much of the methodology used is the same as that applied by ActewAGL, the assumptions in several cases are quite different.

7.1 CUSTOMER NUMBERS

7.1.1 Residential

MMA has used the new customer numbers provided in Section 4.5.1. Disconnections were modelled in accordance with the ActewAGL methodology. The resulting customer numbers are provided in Table 7-1.

Table 7-1 Residential customer numbers used by MMA in forecasting

	2004	2005	2006	2007	2008	2009	2010
MMA new stand-alone	1897	1773	1696	1696	1696	1696	1696
MMA new other	705	690	638	638	638	638	638
MMA total new	**2601**	**2462**	**2334**	**2334**	**2334**	**2334**	**2334**
MMA E to G	1521	1359	1215	1086	970	867	775
Disconnections	-103	-107	-112	-116	-119	-123	-127
Bushfire connections	100	220					
Numbers at year end	94617	98551	101988	105291	108475	111553	114535

7.1.2 Small business customer numbers

MMA has accepted the ActewAGL forecasts for small business customers.

7.2 AVERAGE USAGE BY NEW RESIDENTIAL CUSTOMERS

7.2.1 Starting average usage

Based on the discussion in Sections 4.8 to 4.12 MMA has utilised the following starting average usages for new customers in 2004.

- 54.3 GJ for new home customers
- 36.4 GJ for existing customers.

This is in line with what ActewAGL has said it would use in its latest forecasts, (although it actually used a lower number for the new homes).

7.2.2 Change to hot water mix

According to ActewAGL the choice of gas hot water appliances is in a state of flux. The market share of continuous hot water systems has grown substantially in recent years and is expected to keep growing. The rationale behind the change is provided in the Energy Usage Impacts document. Continuous systems are understood to offer space savings and other features to homeowners and to now be of similar in cost to conventional hot water systems.

After talking with industry representatives ActewAGL has provided the following assumptions about changing market penetration for independent services (both stand-alone and medium density serviced by stand-alone hot water systems) and appliances suitable for centralised services (mainly flats and apartments).

Table 7-2 Forecast change in hot water mix

DWELLING TYPE	HWS TYPE	2003	2004	2005	2006	2007	2008	2009	2010
New Dwellings – Independent Services	Storage	85%	83%	81%	79%	77%	75%	73%	71%
	Continuous	15%	17%	19%	21%	23%	25%	27%	29%
New Dwellings – Centralised Services	Continuous	20%	20%	20%	20%	20%	20%	20%	20%
	Centralised	80%	80%	80%	80%	80%	80%	80%	80%
E-G	Storage	50%	47%	44%	42%	40%	38%	36%	35%
	Continuous	50%	53%	56%	58%	60%	62%	64%	65%
Existing Gas Dwellings	Storage	93%	90%	87%	84%	81%	78%	75%	72%
	Continuous	7%	10%	13%	16%	19%	22%	25%	28%

Source: ActewAGL Table A1

MMA accepts that there has been a shift towards continuous hot water systems in new homes and E to G dwellings over recent years and that this trend is expected to continue. The pace of the trend is also considered reasonable.

MMA has seen no evidence about the changes to hot water systems in existing gas homes. Even if there is such a move it would presumably be subsumed within the 0.18% pa growth in average usage.

7.2.3 Gas usage by different Hot water Appliances

ActewAGL has provided the following assumed gas usages by hot water appliances.

Table 7-3 Assumed current usage by hot water appliances

DWELLING TYPE	HWS TYPE	GJ/yr
New Dwellings – Individual Services	Storage	19.6
	Continuous	15.4
New Dwellings – Centralised Services	Continuous	8.7
	Centralised	18.3
E-G	Storage	19.6
	Continuous	15.4
Existing Gas Dwellings	Storage	19.6
	Continuous	15.4

Source: ActewAGL Table B1

Despite it being unclear whether the information for new and E to G dwellings is directly applicable to the ACT, MMA considers these to be reasonable estimates of current practice for use for this purpose.

ActewAGL has also included usage in existing gas dwelling at the same energy rate as for new dwellings with individual services. However, the source of these estimates is unclear. While MMA would have preferred to see local data for this the differences are likely to be small and the use of this assumption is considered acceptable.

However, it must be pointed out that only some half of existing connections to the ActewAGL network are understood to have gas hot water[33]. This does not appear to have been taken account in some of the ActewAGL modelling.

7.2.4 Resultant Changes per annum

As a result of these changes to appliance mix, the average usage per hot water system in new homes with individual services and in E to G homes is expected by ActewAGL to reduce by about 0.1 GJ each year, cumulative. Use in existing gas homes is also expected to reduce by about 0.1 GJ pa cumulative.

However, this analysis does not take into account any changes to heating and other uses for gas which, based on the above hot water analysis, contributes more than half the load in the ACT. Given the overall annual increase in average usage by existing gas customers it appears clear that any reduction in hot water energy has, overall, been more than matched by increases elsewhere.

MMA has not accepted the assumption of a reducing energy for homes apart from in new E to G homes where there is reasonable evidence that average usage is declining over time. However, as only about half of E to G homes are assumed to use gas hot water, see Section 7.2.3, the reduction has been modified by the same factor.

[33] According to the ABS survey "Environmental Issues: People's Views and Practises, March 2002", Publication 4602.0, of the 123,500 Canberra dwellings 78,800 were connected to gas and of these about 50% had gas hot water.

7.3 IMPACT OF TWAW AND BASIX

7.3.1 Initial ActewAGL position

The reduction of water use in showers and taps due to adoption of AAA fittings is expected to result in associated reductions in energy usage. ActewAGL initially factored in energy reductions due to increased use of AAA fittings due to either rebates or regulation. It initially estimated that the saving would be 5.5 GJ pa for new dwellings with such fittings and that 25% of new homes will have such fittings in 2004/05 and 100% in 2005/06.

7.3.2 Penetration rate of AAA appliances due to regulatory changes

As discussed in Section 4.13.2 MMA does not accept as reasonable the penetration rate adopted by ActewAGL in its forecasts. MMA has adopted the following approach and rates in its modelling.

Think Water Act Water (TWAW)

The TWAW strategy applies only to Canberra. According to ActewAGL this represents some 93% of existing residential homes, 86% of forecast new home connections and 85% of E to G connections[34].

Several items of particular relevance to the gas market in the ACT are foreshadowed in the TWAW document:

- a rebate for AAA showerheads will commence in 2004/05.
- from 2004/05 the ACT Government will provide an incentive for a household indoor water tune-up, including a AAA showerhead and up to two tap valves or flow regulators. The extent of the subsidy has not been published.
- The ACT Government will support a national water appliance labelling scheme expected to apply from mid to late 2005.
- The ACT Government will support a national scheme for water efficient appliances such as AAA showerheads by 2007 and AAAA washing machines by 2010. The timing for AAA tap fittings is not specified.

ActewAGL has forecast the following implementation of the TWAW program:

- New Houses. 25% of combined showerhead and faucet savings in 2004/05 and then 100% from 2005/06 through to 2009/10
- E to G Houses. 12.5% of combined showerhead and faucet savings in 2005/06 increasing by 12.5% pa to 62.5% in 2009/10.
- Existing Gas Houses. 12.5% of combined showerhead and faucet savings in 2005/06 increasing by 12.5% pa to 62.5% in 2009/10.

[34] ActewAGL Energy Usage Impacts spreadsheet, sheet E.

MMA does not accept that the regulatory impact will be as forecast by ActewAGL.

- MMA has assumed that the mandatory availability of only AAA showerheads occurs in 2007, as foreshadowed in the TWAW document, ie half in 2006/07 and 100% thereafter.
- MMA has further assumed the same timing for mandating of AAA faucets
- As discussed in Section 4.13.2, MMA expects the shower rebate to increase penetration of AAA showerheads, but not at the rate expected by ActewAGL.
- MMA expects the tune-up program to be taken up by 4% of householders per annum. This is in line with the results seen in the Rous tune-up program[35].

7.3.3 MMA modelling of penetration

We have modelled penetration of water efficient appliances into existing houses under TWAW in the following way:

- We have started off with an estimated 32% of AAA showerheads and 20% of AAA tap fittings in the market in 2003/04.
- We have estimated that 4% of existing dwellings will have tune-ups every year from 2005 to 2010. We have assumed that each of the tune-ups results in AAA showerheads and full tap fittings being available, even though the tune-up is restricted to only two taps. We have assumed these will go into a population which already has the average number of AAA fittings. The proportion of the tune-up population already having AAA fittings will be unaffected in these areas.
- We have assumed that showerheads and taps are replaced every 12.5 years. This is an estimate derived from a range of sources including White and Campbell[36] who has estimated a replacement life as 10 – 15 years and Ellis and White[37] who have assumed a life of showerheads between 15 and 25 years. This results in an 8% annual change-over rate includes replacements and renovations. Again the measure is assumed to apply to homes with the average existing penetration rate of these fittings.

The resulting modelled penetration of the fittings into new, existing homes and E to G homes and overall is summarised in Table 7-4.

35 Rous Water, "Demand Management Plan – 2004 – 2009", March 2004,

36 S White & S Campbell, Institute of Sustainable Futures, "Integrated water service provision, opportunities and implications on the NSW North Coast, Occasional Paper OCP 1007 for the Healthy Rivers Commission of NSW, November 2002.

37 M Ellis and S White, "The water efficient shower market in NSW – a scoping study", Final report to SEDA, 1 December 1997.

Table 7-4 MMA's assumed penetration rates for AAA fittings - ACT

	2004	2005	2006	2007	2008	2009	2010
AAA Showerheads into New Homes & Renovations	32%	57%	82%	100%	100%	100%	100%
AAA tap fittings into New Homes & Renovations	20%	20%	20%	60%	100%	100%	100%
AAA Showerheads into Existing homes and E to G	32%	37%	43%	50%	56%	61%	66%
AAA tap fittings into Existing homes and E to G	20%	23%	26%	32%	40%	47%	54%
Proportion of all homes with AAA Showerheads	32%	37%	44%	51%	57%	62%	67%
Proportion of all homes with AAA tap fittings	20%	23%	26%	31%	40%	47%	53%

Basix

The Basix strategy applies only to Queanbeyan and other nearby areas of NSW reticulated by ActewAGL. According to ActewAGL this represents some 7% of existing residential homes, 14% of forecast new home connections and 15% of E to G connections[38].

ActewAGL has forecast the following implementation of the Basix program in these areas:

- New Houses. 100% of combined showerhead and faucet savings from 2004/05
- E to G Houses. No impact
- Existing Gas Houses. No impact

MMA has modelled the Basix impact as being on all new houses from 2005/06. We have modelled a slightly higher energy saving on new houses in NSW than the ACT, assuming a current penetration rate of only 20% for all efficient AAA appliances in new houses.

7.4 IMPACT OF AAA SHOWERHEADS AND TAP AERATORS / REGULATORS ON WATER USE

A great deal of uncertainty surrounds the expected water savings from AAA showerheads and tap aerator/regulators.

38 ActewAGL Energy Usage Impacts spreadsheet, sheet E.

7.4.1 ActewAGL estimates for Showerheads

According to ActewAGL, AAA showerheads are expected to save some 45% of water compared to current average and new home usage. This is on the basis that:

- current average showerhead flow rate is 16 L/minute (based on the average of two NSW sources cited by ActewAGL. ActewAGL has not quoted any Canberra studies, although at least one has estimated average flow rates to be 15 L/minute.)
- the AAA showerhead uses at most 9 L/minute
- The saving is thus 45% based on estimated flow rate differences
- Penetration rates of AAA showerheads in both current average homes and new homes is believed to be around 32%.

7.4.2 ActewAGL estimates for tap aerators/regulators

While citing industry claims that water savings from aerators and regulators will save up to 70% of water usage, ActewAGL has assumed that tap aerators (and presumably regulators) will be 42% of free-flow tap usage in households. This estimate is derived from:

- current average tap flow rate is 15-18 L/minute (Source quoted: Wilkenfeld)
- the aerator taps discharge at 8 L/minute (Source quoted: Wilkenfeld)
- 32% of taps already have aerators (a high estimate with conservative impacts on demand according to ActewAGL)
- The saving is thus 42% based on estimated flow rate differences between current average and efficient.

In its latest forecasts ActewAGL is estimating that a set of AAA showerheads and AAA tap fittings will reduce energy usage by some 4.3 GJ pa in both new and existing homes. This must be tested against experience elsewhere.

7.5 MEASURED WATER SAVINGS ESTIMATES

While the above assumptions appear theoretically reasonable, they must be tested against the realities of actual observed savings. Too often actual water or energy savings fall far short of those expected. An example of predicted savings significantly exceeding reality are provided in this quote from a measured savings study carried out in the USA:

"While the above-mentioned savings make for a cost-effective investment, they don't live up to original estimates. Energy savings for both gas and electricity were about half of what had been expected (10.3 therms (1.1 GJ) actual gas savings compared to 22.8 (2.2 GJ) therms predicted, and 237 kWh (0.9 GJ) electric savings compared to 524 kWh (1.9 GJ)

predicted)[39]. (Note that this is on a per showerhead basis, so savings for houses with more than one showerhead would be greater).

The reasons why program results often fall short of theoretical expectation are not always clear and may differ between studies and predictions. For example, the theoretical flow rates of standard showerheads may not be those actually applied during showering. Or people with AAA showerheads may shower for longer than those with standard showerheads. In the Perth Study referred to in the MMA draft report, the actual savings recorded in a domestic water study in Perth[40], which measured actual water usage with normal and "water-efficient" showerheads, found that water efficient showers used only about 10% less water than normal showerheads in single residential houses and less than 3% less in multi-residential dwellings. ActewAGL is forecasting a 28% reduction in both.

Unfortunately a flaw in the study design meant that the study could not differentiate between the A, AA and AAA "water efficient" showerheads. This means that the water flows supplied by the "efficient" showerheads could have ranged from 15 to less than 9 Litres/minute. Agility has highlighted this flaw, and the fact that the study relates to Perth, not NSW, as a concern with the use of the study results.

While MMA accepts these concerns the study does provide two significant considerations for the TWAW/Basix analysis. The first is that "real" savings from AAA showerheads need to be evaluated – not just theoretical savings. The second is that the study measured water flows in "normal flow" showers to be only about 9 L/minute. Even taking into account the possibility of some experimental error this is significantly less than the 15 or so L/minute assumed theoretically to be the average flow rate for normal showerheads. People do not necessarily turn the shower on full when showering.

The most relevant applicable comparison of water savings from AAA showerheads and aerators/regulators appears to be that by Sarac, Day and White of the Institute of Sustainable Futures (ISF) of the University of Technology Sydney. In their comparison group analysis study of three NSW water savings programs [41] they found that:

- Programs with efficient showerheads resulted in statistically significant savings of 14.5 kL per household pa
- While the savings for tap aerator/regulator alone were not statistically significant, those with tap aerators/regulators as well as efficient showerheads achieved statistically significant savings of 19.6 kL pa. This implies a saving of the order of 5 kL pa for the tap regulators and aerators.

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39 "Savings and showers: It's all in the head", Home Energy Magazine Online July/August 1994 report of a PG&E study whioch metered showerheads, available at hem.dis.anl.gov/eehem/94/940713.html.

40 M Loh and P Coghlan, for the Water Corporation, "Domestic water use study ub Perth, Western Australia, 1998-2001, March 2003.

41 K Sarac, D Day, S White, "What are we saving anyway? The results of three water demand management programs in NSW", Institute of Sustainable Futures, University of Technology, Sydney, Proceedings of the International Water Association Congress, Melbourne, April 2002

It would be expected that the retrofits etc in these programs would have been applied largely to standard showerheads and fittings. Therefore, the savings seen here are likely to be greater than those observed if there is already a significant penetration of AAA and aerator appliances.

ActewAGL has critically reviewed this paper and commented that the actual water usage for showers was not provided, meaning that the percentage savings could not be calculated and also that all AAA fittings had not been adopted in all cases. While these short-comings are accepted, MMA considers this study to provide a strong indication of potential water savings from NSW residents intent on saving water.

In a paper dated November 2002 for the Healthy Rivers Commission of NSW[42], White and Campbell of the ISF estimated the following savings from showerheads and tap fittings

Table 7-5 Savings potential of AAA showerheads and aerators/regulators

	Current Average or Standard, kL/household pa	Efficient kL/household pa	Saving Potential
Shower	51	33	19
Taps and other indoor inc leaks, baths and sinks	33	19	
Taps alone			8

Source: ISF for Healthy Rivers Commission Tables 3.2 and Table C-2

The paper then multiplies the savings by a proportion to which the savings apply. This is 80% for both showers and tap flow regulators. It is unclear whether these weightings are due to the proportion of people who already have the efficient showerheads or some other reason[43]. However, the weighted average saving estimated in the paper (Table C-2):

- 15.2 kL pa for AAA showerheads and
- 6.4 kL pa for tap flow regulators

is not dissimilar to the results provided in the Sarac et al paper.

Despite the calculations being for NSW, MMA considers these to be a reasonable methodology for assessing savings likely for the ACT and Queanbeyan. The multiplication by the proportion to which savings apply can be changed to take into account the proportion of homes which already have the features in each jurisdiction.

42 S White & S Campbell, Institute of Sustainable Futures, "Integrated water service provision, opportunities and implications on the NSW North Coast, Occasional Paper OCP 1007 for the Healthy Rivers Commission of NSW, November 2002.

43 Probably the former as the paper assesses a 35 ML pa "tune-up" benefit but applies it only to 70% of the population as 30% are assumed to already be efficient.

7.6 HOT WATER SAVINGS

ActewAGL has used the work of Wilkenfeld et al[44] to calculate hot water savings for showers and aerators/regulators. MMA considers the use of this source for allocation to be reasonable but has applied it to the average usage in the ISF estimates for the sake of consistency.

The total water savings theoretically available is:

- 37% of all water used in showers (19/51 kL pa).
- 24% of hot water used in other tap-based applications (8/33 kL pa).

The total hot water savings theoretically available is:

- 19% of all hot water used due to full adoption of AAA showerheads (13/70 kL pa).[45]
- 9% of hot water used in other tap-based applications (6/70 kL pa).

However, an estimated 32% of Canberra residents already have AAA showerheads and 20% have AAA tap fittings. The total remaining hot water savings theoretically available according to this methodology is:

- 13% of all hot water used due to full adoption of AAA showerheads (9/70 kL pa).[46]
- 19% of hot water used in other tap-based applications (4.8/70 kL pa).

Using the ISF/White estimates of total water usage, the Wilkenfeld estimate of hot water proportions of total usage and the estimation that the ACT already has a penetration rate of 32% of AAA showerheads and 20% of AAA tap fittings results in an estimated potential combined hot water saving by MMA of 20%, attributable:

- 13% for showers
- 7% for taps

This is about 30% less than the savings estimated by ActewAGL (28%) using the more theoretical savings. The main difference appears to be in the assumptions about whether to use theoretical or measured values in calculating savings likely to eventuate and the impact of the proportion of the population who already have the AAA fittings.

Agility has contested the above assumptions, largely on the basis that the full savings identified in the White estimates already take into account those with efficient appliances. However, MMA does not consider this to be the case.

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44 G Wilkenfeld and Associates Pty Ltd et al, "A mandatory water efficiency labelling scheme for Australia, final report to Environment Australia, April 2003.

45 We have applied a 32% current usage rate for the AAA showerheads and a 20% current usage rate for AAA tap fittings.

46 We have applied a 32% current usage rate for the AAA showerheads and a 20% current usage rate for AAA tap fittings.

In the light of the experience regularly noted of theoretical water and energy savings significantly exceeding actual achievements, MMA considers this a reasonable approach to take.

7.6.1 Continuous and storage systems

ActewAGL has estimated that the energy saved in continuous hot water systems will be in proportion to the total hot water used overall and that the absolute amount saved in storage systems will be the same as that saved in continuous. This eliminates the need for calculation of standing energy.

These appear to be reasonable assumptions.

7.6.2 Centralised systems

ActewAGL has assumed that the reduction in usage for a centralised hot water unit will be in direct proportion to the change in usage. Thus, it has assumed that the usage for a centralised system will reduce from 18.3 GJ to 13.2 GJ pa, a reduction of 28%. In other words both the variable and standing components of the CHW systems are expected to see falls in energy usage in proportion to the expected reduction in water usage.

The basis for the reduction is that ActewAGL expects the centralised systems after TWAW and Basix to retain the same design criterion of 0.4 MJ/L[47]. According to ActewAGL, whether or not AAA devices are used the design constraint will stay the same and the standing energy component will thus have to reduce. According to ACTEWAGL this will be achieved through a reduction in size of units and possibly of piping.

MMA does not consider this to be a likely outcome in the short or even medium term. Firstly, it relies on designers having a certainty that the load will drop by the amount forecast. Such security of design is expected to take several years to permeate into the system. It is unlikely to start at all in Canberra until AAA fittings are mandated, expected in 2007. We have seen no evidence that new systems to be installed from July 2004 in Canberra are being designed in any way differently to those designed until now. Secondly, it is not clear how and when the design limit is applied or checked – or the current MJ/L levels achieved in new CHW installations[48].

As well, there must be a limit to how much standing energy can be saved. Taken to an extreme, if no water was used the standing energy component would be expected to drop to zero, clearly an unlikely outcome.

MMA considers it more likely that initially and probably for several years the same centralised and sized units would be used, with approximately the same efficiencies, albeit for less water, and would produce energy savings of the same order as that in continuous units for flats – that is a reduction of 20% of 8.7 GJ or 1.8 GJ per unit. Over time, however,

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47 It is not clear whether or how this design criterion is applied in the ACT.

48 For example, if current performance is below the 0.4 MJ/L limit the same units might well be used to supply the reduced load with the design limit being met.

MMA considers it reasonable to assume that some further efficiencies will be found. MMA has modelled slowly improving efficiency to 30% of standing energy changes modelled by ActewAGL to come about over four years from 2007.

7.7 REGULARY APPLICABILITY OF THE PROGRAMS

7.7.1 Practical application of impact of hot water penetration

Only about 50% of current connected homes in Canberra use gas for hot water. It is also understood that only about half of E to G conversions convert initially to gas hot water.

This penetration rate has been used to multiply the savings expected for these homes under TWAW. Similarly, no change to CHW standing energy is available in existing homes.

7.8 MMA FORECASTS

7.8.1 Residential

The results of modelling by MMA for the residential market using the approach and assumptions discussed in this chapter are provided in Table 7-6 .

Table 7-6 MMA's residential forecasts

	2004	2005	2006	2007	2008	2009	2010
Residential Customers	94617	98551	101988	105291	108475	111553	114535
Residential Sales, TJ	4596	4784	4943	5093	5237	5379	5518

7.8.2 MMA Small Business

As discussed in Section 5.3, MMA has not considered that the ActewAGL forecasts for the small business market to represent best estimates arrived at on a reasonable basis. The ActewAGL approach does not appear to have taken into account growth seen after weather normalisation and accounting for transfers between markets.

The results of modelling by MMA for the small business market using the approach and assumptions outlined in discussed in Section 5.3, are provided in Table 7-7 .

Table 7-7 MMA's small business forecasts

	2004	2005	2006	2007	2008	2009	2010
Business Customers	2156	2202	2248	2294	2340	2386	2432
Business Sales, TJ	1422	1435	1448	1460	1473	1486	1498

7.8.3 Contract Market

In its draft report MMA assessed that the ActewAGL methodology for forecasting the contract market would be accepted as reasonable if the top six current customers and the new customer were treated as "majors" and forecast through discussions while the remaining "non-majors" were treated through trend analysis.

As discussed in Chapter 6, ActewAGL has provided interim forecasts based on adopting MMA's recommendations but assuming[49] that the majors will contract in line with current MDQ while the remaining non-majors have been analysed using trend analysis. This forecast is provided in Table 7-8 .

Table 7-8 MDQ forecast using the Major/Non-major split recommended by MMA

	2003	2004	2005	2006	2007	2008	2009	2010
MDQ, GJ	5,545	5,479	5,696	5,613	5,531	5,447	5,365	5,282

MMA considers this to be a reasonable forecast to use in modelling until discussions with the majors have been held and documented.

7.9 COMPARISON OF MMA FORECASTS AGAINST THE INITIAL AND LATEST ACTEWAGL FORECASTS

The MMA forecasts for residential customer numbers, residential sales, small business sales and contract MDQ are compared against the ActewAGL initial forecasts (provided with the Access Arrangement Information) and the latest June 2004 forecasts provided as a spreadsheet in Table 7-9 .

Table 7-9 Comparison of MMA, ActewAGL Initial and ActewAGL Latest forecasts

	2004	2005	2006	2007	2008	2009	2010	% pa*
MMA Forecasts								
Res Customers	94617	98551	101988	105291	108475	111553	114535	3.2%
Residential sales, TJ	4596	4784	4943	5093	5237	5379	5518	3.1%
Business sales, TJ	1422	1435	1448	1460	1473	1486	1498	0.9%
Tariff sales, TJ	6018	6219	6391	6554	6710	6865	7016	2.6%
Contract MDQ, GJ	5479	5696	5613	5531	5447	5365	5282	-0.6%

[49] Until discussions are held with the majors and documented.

	2004	2005	2006	2007	2008	2009	2010	% pa*
ActewAGL Initial Forecasts								
Res Customers	94942	98527	101803	104946	107971	110889	113713	3.1%
Residential sales, TJ	4656	4839	5003	5162	5317	5469	5617	3.2%
Business sales, TJ	1452	1473	1494	1515	1535	1556	1577	1.4%
Tariff sales, TJ	6108	6312	6496	6676	6852	7025	7194	2.8%
Contract MDQ, GJ	5487	5695	5604	5512	5419	5327	5235	-0.8%
ActewAGL June 2004 Forecasts								
Res Customers	94164	98126	101576	104894	108092	111184	114181	3.3%
Residential sales, TJ	4556	4736	4840	4938	5032	5120	5206	2.2%
Business sales, TJ	1426	1426	1426	1427	1427	1427	1427	0.0%
Tariff sales, TJ	5982	6163	6266	6365	6459	6547	6633	1.7%
Contract MDQ, GJ**	5487	5695	5604	5512	5419	5327	5235	-0.8%

* Compound annual growth rate, 2004 to 2010, ** Initial forecasts

As can be seen there is a material difference between the MMA forecasts, the latest ActewAGL forecasts and the initial ActewAGL forecasts. There is also a significant difference between the Initial and Latest ActewAGL forecasts. The differences between the forecasts are due mainly to different assumptions about the impacts of the ACT's Think Water Act Water strategy, although differences in the small business area are also material.

MMA is forecasting both residential and small business sales to be intermediate between the forecasts initially provided by ActewAGL and its latest forecasts. MMA has accepted that there will be a significant impact of the TWAW strategy on existing residential customers but does not accept the extent of the impact forecast by ActewAGL. MMA considers that the latest ActewAGL small business forecasts do not properly factor in the growth seen over recent years

8 FORECASTING – CAPITAL AND OPERATING EXPENSES

8.1 FOCUS OF CAPEX AND OPEX STUDY

The focus of ECG's study and this report is on providing an overall view of:

- whether the proposed levels of capital and operating expenditure are reasonable and efficient; and
- the prudency of past capital expenditure

taking into consideration the specific objectives and principles of the Code which are referenced throughout this report.

In determining the revenue requirement, the Commission needs to examine the efficiency and prudency of the non-capital and capital expenditure from two perspectives — for the current and next Access Arrangement period. The first of these perspectives establishes the extent to which asset values are to be adjusted for prudent capital expenditure over the last regulatory period. The second perspective determines the efficient costs (capital and non-capital) to be included in the revenue requirement for the coming regulatory period.

The primary objectives of ECG's consultancy are to assess, for the defined security of supply and service standards:

- the prudency of capital expenditure for the period from 1999 to 2003;
- the efficiency of ActewAGL's estimates of operating expenditure for the period from 2004 to 2010; and
- the efficiency of ActewAGL's estimates of capital expenditure for the period from 2004/05 to 2009/10.

8.2 GENERAL APPROACH

In undertaking its study, ECG considered:

- the specific requirements of the Code in assessing the prudency of past capital expenditure and whether proposed levels of capital and operating expenditure are reasonable and efficient;
- the ICRC Act 1997 (ACT) and the Utilities Act 2000 (ACT);
- current and projected system capacity;
- appropriate asset utilisation levels, benchmarked against best practice;
- current demand and likely future demand (as measured by customer numbers, sales and maximum demand);
- current condition of assets and renewal requirements;
- existing operational requirements ;

- opportunities for demand management (taking into account emerging trends in technology and costs);
- current safety standards for the distribution network, and planning standards accepted by the industry;
- customer service standards;
- social requirements; and
- environmental requirements.

To assist its deliberations ECG held meetings with:

- ActewAGL and Agility (ActewAGL's management and asset services provider) staff; and
- the ACT Planning and Land Authority (ACTPLA) and ACT WorkCover. ACTPLA is the authority responsible for gas technical regulation and WorkCover provides inspectorial services to the ACTPLA.

Site visits were also carried out with ActewAGL and Agility staff to assist ECG's understanding of the gas distribution system infrastructure and field operations conducted by Agility.

8.3 EXPENDITURE ASSESSMENT - JULY TO DECEMBER 2004

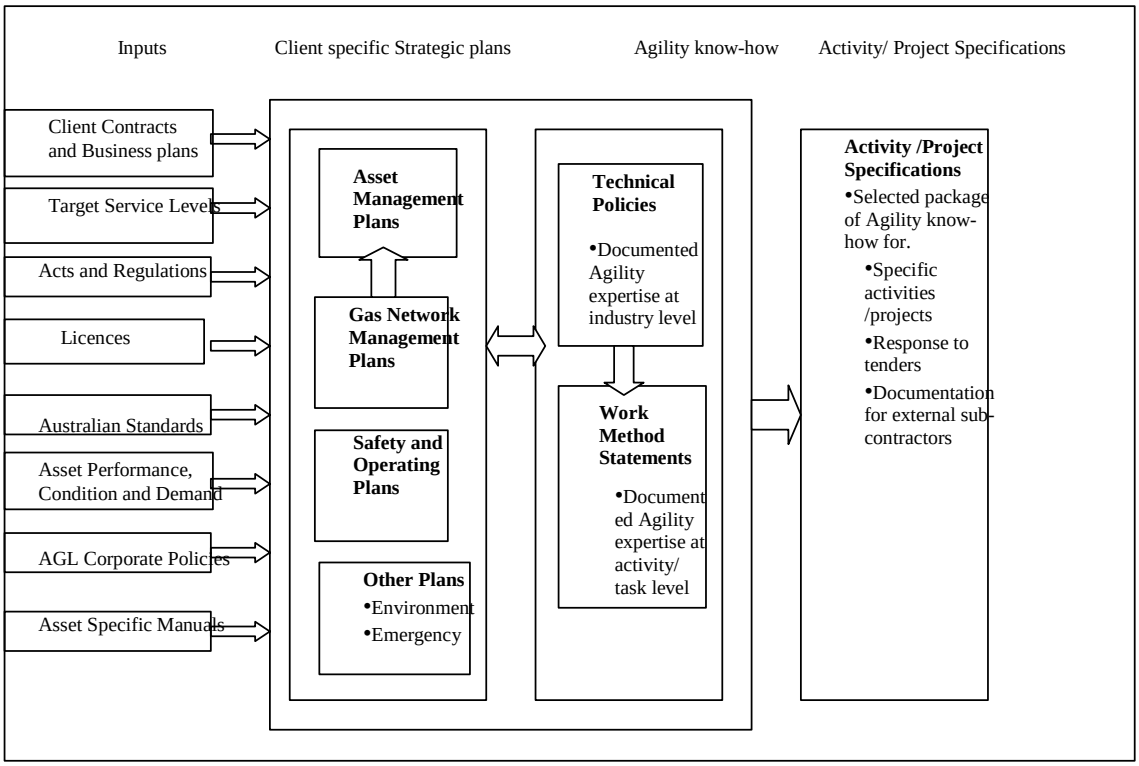
As the current price path is due to expire on 30 June 2004 and the current review will result in the Commission setting a revised price path to operate from 1 January 2005 until 30 June 2010, the efficiency of ActewAGL's operating and capital expenditure proposed for the interim six month period is examined separately.

9 ASSET MANAGEMENT

9.1 ASSET MANAGEMENT PLANS

Agility's framework used for the technical management of ActewAGL's assets is illustrated in Figure 9-1.

Figure 9-1 Technical Management Framework[50]



The asset management plans, in conjunction with the network Safety and Operating Plans and other asset-specific plans, provide the strategic direction for management of ActewAGL's assets. The Gas Network Management Plan for ACT/Queanbeyan details service level targets, activities and capital projects planned for the assets over a five-year period and it is revised annually.

The projected asset growth and required asset performance levels are used as a basis for developing lifecycle plans for the network. The Plan outlines the projects and activities planned to ensure safe and reliable performance of the assets.

High pressure primary pipelines are covered by AS 2885 'Pipelines – Gas and liquid petroleum' and are addressed by separate Agility Pipeline Management Plans.

[50] Gas Network Management Plan 2004 ACT/ Queanbeyan Draft

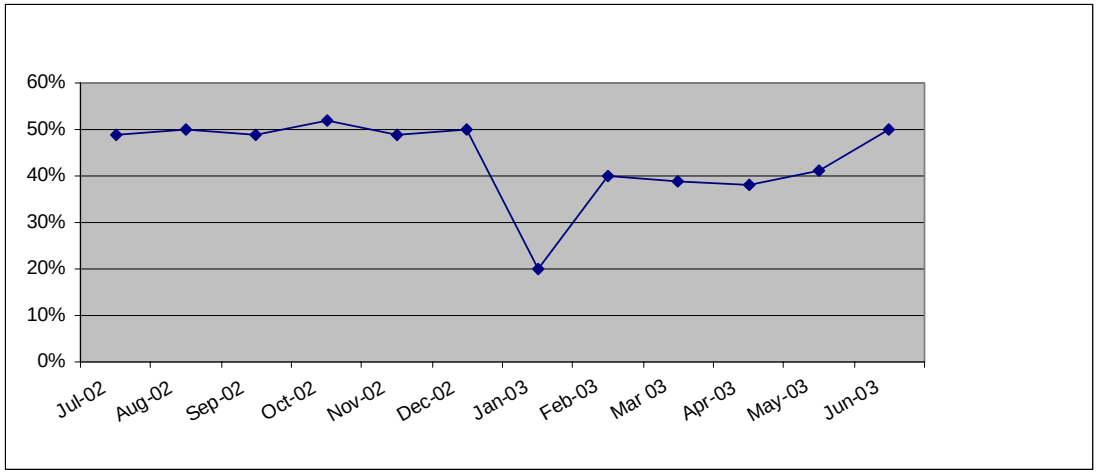
ActewAGL's 'Capital Expenditure Prudency Process' specifies that asset management plans (supplemented by business plans and detailed analysis where required) will include sufficient documentation to satisfy clause 8.16 (b) of the Code, that is, NPV positive, provides system-wide benefits or required for safety and reliability or to meet contracted capacity commitments.

ECG is yet to see ActewAGL's/Agility's asset management plans but has reviewed the Gas Network Management Plan 2004 (March 2003 Draft Revision 1) covering the period 2004/05 – 2008/09 for ACT/Queanbeyan. This Plan covers:

- Levels of service (supply reliability and asset condition performance indicators);
- Network growth projections;
- Risk management;
- Operating plan;
- Lifecycle asset plans for the various asset categories, eg. mains and services, facilities, meters; and
- Corrective maintenance.

The Plan includes a chart presented in the figure below which shows trends in the ratio of Planned Maintenance jobs to total maintenance jobs as a measure of whether Corrective Maintenance is being managed at an acceptable level.

Figure 9-2 Preventative Maintenance Ratio[51]



It is understood that the relatively low ratio experienced in January 2003 was caused by the increase in unplanned maintenance jobs resulting from the Canberra bushfires. ECG is unable to make an informed comment on the absolute ratio level other than to note that except for January 2003 the trend over the two year period is relatively flat which indicates that planned maintenance activity is maintaining the condition of the assets at a relatively constant level.

[51] Gas Network Management Plan 2004-ACT/Queanbeyan Draft

ECG in reviewing the plan provided by ActewAGL has identified a couple of issues that are worth commenting on at this stage. Asset age profiles in the draft Plan have not been updated since June 2001 and there is insufficient asset performance KPI data to indicate historical supply reliability and asset condition trends. It is unclear why the asset condition KPI 'leaks per km from leakage surveys' target for 2004/05 of 0.7 is significantly higher than the 2002/03 actual of 0.03. An increase of this magnitude over two years would not be expected given that the network is relatively new and there is a relatively flat trend in the ratio of planned maintenance jobs to total maintenance jobs.

In order to meet the requirements of clause 8.16 of the Code, ActewAGL's 'Capital Expenditure Prudency Process' specifies that asset management plans (supplemented by a business plans and detailed analysis where required) will include details of any:

- Bases of assumptions (referencing analysis of previous projects);
- Marketing assessments for market expansion projects;
- Technical and risk assessments for system upgrade projects;
- Project evaluation & justification details (economic spreadsheets);
- Technology Reviews [reviews of technology (eg materials, techniques) conducted periodically to ensure the most appropriate technical solutions are being applied].
- Unit rate documentation [to ensure sufficient documentation exists to satisfy clause 8.16 (a) of the Code (prudency and efficient costs];
- Annual Review (each process will be reviewed on an annual basis, by the end of November, to ensure completeness of documentation and Capex transparency); and
- Additional documentation in the form of RUGS records which summarise the details of the minor projects and provide additional supporting documentation to satisfy clause 8.16 (a) of the Code by demonstrating the best technical solution was obtained and options considered.

From the available information, ECG is of the view that ActewAGL's approach to managing its assets and developing its asset management plans should be adequate to ensure that industry best practice is achieved. However asset performance KPIs shown in the draft Gas Network Management Plan should be further developed to show historical trends. This should assist in providing a more informed view of service levels and asset condition, and enhance decision-making processes relating to establishing prudent levels of operating and capital expenditure.

ActewAGL in its response to the draft report has indicated that the leakage rate of 0.7 leaks per km mentioned above was intended to be an acceptable value to aim for in the long term with current levels not expected to rise in the short term. ECG concurs with this comment.

9.2 SAFETY AND OPERATION PLANS

Safe operation of gas distribution networks by network owners/operators is of paramount importance to ensure the safety of the public, gas consumers, employees and contractors.

ActewAGL has three Safety and Operating Plans (SAOPs) which have been prepared by Agility to conform with legislative requirements in the ACT and NSW:

- Safety and Operating Plan – Gas Distribution Network in Australian Capital Territory;
- Safety and Operating Plan – Gas Distribution Network in New South Wales (for Queanbeyan and Yarrowlumla Shire); and
- Safety and Operating Plan –Hoskinstown to the ACT Border Natural Gas Pipeline Licence No. 29 in New South Wales.

Agility, on behalf of the networks' and pipeline owner ActewAGL, manages, operates and maintains the networks and pipeline in accordance with risk assessments, policies, procedures and standards as set out in the SAOPs to ensure:

- The reliability and safe operation of the gas distribution networks and pipeline;
- The safety of the public, gas consumers, employees and its contractors;
- The protection of the environment; and
- Effective incident management.

In essence the ACT and NSW network SAOPs are the same except that in NSW (Queanbeyan and Yarrowlumla Shire) Agility inspects and audits customer installations on behalf of ActewAGL. In the ACT, ACTPLA regulates the safety of customer installations and inspectorial services are provided by ACT WorkCover.

Using the Supervisory Control and Data Acquisition System (SCADA), Agility extensively monitors the networks and critical components. A variety of system parameters are monitored to ensure safe operation. Historical records provide data for analysis and reporting of daily and long-term network performance to internal and external groups, eg. retailers, regulators and major customers.

The ACT and NSW network and pipeline SAOPs state that independent periodic audits will be conducted and audit reports will be submitted to the ACT Planning and Land Authority and the Ministry of Energy and Utilities in accordance with legislative requirements. Written reports on the audit findings will also be provided to ActewAGL's and Agility's senior management.

It is considered that ActewAGL/Agility SAOPs are what would be expected from a prudent owner/operator as required under the General Principles of the Code, clause 8.1(c) which states "A Reference Tariff and Reference Tariff Policy should be designed with a view to achieving the following objective – ensuring the safe and reliable operation of the Pipeline".

9.3 NETWORK CAPACITY PLANNING

Network Capacity Planning is a key function that underpins the capital expenditure program. It is fundamental to assessing the capability of gas networks to deliver gas loads to all customers prudently and efficiently, as required under clause 8.16 of the National Third Party Access Code.

Planning is conducted in accordance with the requirements of technical procedure TPC.PROC.4.99.28, Gas Network Design Criteria and Performance Validation for Supply Reliability and Growth. The principal activities in the process include:

- Forecasting peak loads
- Modelling current network performance
- Predicting future network performance
- Determining timing for network augmentation
- Specifying projects for inclusion in the capital expenditure program.

9.3.1 Peak Load Forecasting

Forecasts of peak hour loads that are needed for developing gas network models are determined from annual sales forecasts for tariff and contract customers. A review of the annual sales forecasts is being undertaken separately by McLennan Magasanik Associates.

Peak hour loads for contract customers (>10Tj pa sales) are determined from the MHQ loads defined in the contracts, and load diversities determined by network performance modelling and validation. Peak hour loads for industrial & commercial customers (<10Tj pa sales) are determined from annual sales forecasts, and load factors for the customer type determined by network performance modelling and validation.

Peak hour loads for residential customers are estimated from the annual sales forecast for normal winter weather conditions, by applying peak hour load factors.

Networks are planned to have sufficient capacity to supply the peak load forecast to occur under 1 in 20 year severe winter weather conditions. The peak loads determined above are adjusted to those expected under severe weather conditions, by applying a severe winter peak load factor.

9.3.2 Network Performance Modelling

Network modelling is conducted using the internationally accepted "Stoner" software. Each of the two high and eight medium pressure gas networks is modelled in accordance with the above technical procedure, Gas Network Design Criteria and Performance Validation for Supply Reliability and Growth.

Model validation is conducted and reported annually, based on a program of pressure measurements used to monitor network performance under winter high load conditions. Results from this program are used to establish current load conditions and diversities so that network model predictions closely match actual field performance, and therefore can be reliably used to predict network capacity and performance.

The specification of pipes and loads in each network is manually updated in accordance with a defined annual review program.

9.3.3 Network Performance Prediction

Future networks performance for each year are predicted from validated network models for the present year, and from forecast severe winter loads for each year, determined as above. These models are used to determine when network minimum pressures are predicted to fall below the allowable values specified in the AGL technical procedure referred to in 4.2.2, and therefore to determine the timing for completion of network augmentation projects to ensure adequate network capacity.

They are also used to predict the network performance after completion of augmentation projects, as part of the process for planning these projects.

The maximum and minimum allowable pressures for the high and medium pressure networks are as given in the following table. They are critical in determining the size of pipes within each network, to ensure the network has sufficient capacity. They are also critical for assessing the capacity of the many regulator stations used to supply gas from higher pressure networks to lower pressure networks.

Table 9-1 Operation Metering Pressure Table

	Maximum Allowable Operating Pressure (MAOP) (kPa)	Normal Operating System Minimum Pressure (kPa)	Emergency System Minimum (kPa)	Standard Metering Pressure (kPa)
Primary	7000	1750	1750	na
Secondary	1050	525	400	100
Medium	210	70	40	35, 5, 2.75

9.4 MARKETING

Increasing utilisation of the network is an essential activity for network owners.

ActewAGL's Marketing Incentive Policy is designed to reward energy retailer behaviour that contributes to the two main sources of increased network utilisation – connection of new tariff customers (Connection Incentive), and the growth in the consumption of existing residential customers (Growth Incentive).

The policy is reviewed annually based on recommendations received from Agility following its consideration of

- Future market drivers and historical data including connections and consumption data;
- Projections of future connections determined from building forecasts and discussions with local government and developers;
- Discussions held with appliance and energy retailers in order to ascertain historical data on sales and future marketing plans; and
- Other inputs such as regulatory factors which can influence consumer behaviour.

Agility administers the policy as part of market development services provided to ActewAGL. These services provide a platform on which to build the ACT gas market and support retailers by:

- Managing network development and utilisation growth activity;
- Managing the development of the high rise market;
- Establishing and managing relationships with industry bodies, local government, land developers, builders, gas users and other stakeholders;
- Providing assistance to any party seeking to expand the application of gas sales within the ACT Area gas network; and
- Providing information and support to retailers.

Besides administering the Marketing Incentive Policy, other activities related to the provision of market development services include:

- Proactively developing and maintaining network utilisation growth strategies and processes for various growth opportunities including network infill;
- Providing market research and analysis to identify opportunities for growth and retention of load; and
- Implementing the utilisation growth plan (as approved by ActewAGL).

Sections 12.2.6 and 13.1.4 will examine whether ActewAGL's forecast marketing expenditure satisfies the requirements of the Code, clause 8.37 which states that "a Reference Service 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.

9.5 PRUDENCY PROCESS

Capital expenditure (capex) is managed for ActewAGL by Agility. A capital expenditure prudency process52 has been established by Agility to ensure that capital expenditure decisions satisfy the Code requirements under clauses 8.16 and 8.17. Expenditure must be prudent and efficient and satisfy the following tests

- Prudency: the capex amount does not exceed the amount that would be invested by a prudent service provider. That is the proposed investment must be technically appropriate and commercially sound.
- Efficient costs: acting efficiently, in accordance with accepted good industry practice, and to achieve the lowest sustainable costs of delivering services. That is,

52 ActewAGL capital expenditure prudency process No GO1271 Revision 1

the capex would result in the lowest long term cost of gas delivery by choice of appropriate technology and in the price paid for the capital installed.

In addition it must satisfy one or more of the following conditions.

- The anticipated incremental revenue generated by the new facility exceeds the new facilities investment; or
- The service provider and/or users satisfy the relevant regulator that the new facility has system wide benefits that, in the relevant regulator's opinion, justify the approval of a higher reference tariff for all users: or
- The new facility is necessary to maintain the safety, integrity or contracted capacity of services

The prudency process includes a number of defined stages depending upon the type of expenditure, non-routine works and projects > $100,000, or routine works < $100,000. Documentation needed to demonstrate compliance with at least one of the three above conditions and the requirements for prudency and efficiency, is defined for each category of expenditure, market expansion and network upgrade (includes capacity development, renewals and upgrades, security of supply and government/authority work).

9.5.1 ActewAGL/Agility Capex Process

Under the contractual arrangements between ActewAGL and Agility, prior to the commencement of each financial year Agility provides, a capital plan and a capital budget that contain the following details:

- An annual capital expenditure plan and budget, containing details of all proposed capital expenditure during the Contract Year, including at least the following:
- For projects with a value of less than $100,000 (Minor Capital Projects), a brief description of the scope, justification, and estimated cost (including monthly cashflow) of each project.
- For projects with a value between $100,000 and $400,000 (Medium Capital Projects), a detailed description of the scope, justification (including financial or other analysis) and estimated cost (including cashflow) of each project.
- For projects with a value in excess of $400,000 (Major Capital Projects), a comprehensive description of the scope, justification (including financial or other analysis) and estimated cost (including cashflow) of each project.

Once ActewAGL has approved a capital plan, the following provisions apply:

- Agility may undertake any Minor Capital Projects referred to in the Capital Plan without obtaining any further approvals from ActewAGL
- Agility must obtain written authorization from ActewAGL before commencing any Medium Capital Projects or Major Capital Projects which are referred to in the Capital Plan; and

If Agility reasonably considers that any Capital Works which are not provided for in the Capital Plan are necessary or desirable, Agility must:

- provide ActewAGL with a detailed description of the scope, justification and estimated cost (including cash flow) for the proposed Capital Works; and
- obtain written authorization from ActewAGL before commencing the proposed Capital Works.

Agility operates a computer based module, the RUGS system, to respond to gas supply requests, obtain capital approval, and manage approved works. Authorisation is provided by Agility for projects <$100,000 provided that a return on capital of at least 12% is achieved with a 15 year project life.

Other projects must be approved by ActewAGL before they proceed. Normally these must meet the hurdle rate of 12% unless they are shown to meet regulatory obligations, or to provide justifiable system wide benefits, or to be essential to maintain safety, integrity or contracted capacity.

Customer capital contributions are obtained if relevant and necessary to meet the 12% hurdle rate, subject to the conditions of ACT's Gas Networks Capital Contributions Code.

The above procedures are complementary to ActewAGL's corporate procedures and delegations.

ECG notes the comment made by ActewAGL in relation to the Utilities Act requiring ActewAGL to connect customers regardless of whether it is economic or not. ECG does not believe that this obligation has a material impact on the conclusions in this report.

9.6 ASSET CONDITION

Gas distribution system by its nature consists mainly of buried pipes and other above ground facilities such as meters and regulators. The condition of the assets can be measured from various operational statistics such as:

- Pipeline material and age
- Network leakage
- Cathodic protection level for steel pipes.
- Leakage of stray currents from the cathodic protection system.
- No of gas leaks reported by the public
- No of gas leaks detected in survey.
- No of mechanical damage incidents
- UAG

The operational statistics provided by ActewAGL for its networks are shown in the table below:

Table 9-2 Key Performance Indicators on Asset Condition[53]

Financial year	2001	2002	2003
Total pipeline length – HP (MAOP > 1050 kpa)	199	225	230
Total pipeline length – M/LP (MAOP < 1050 kpa)	3,319	3,362	3,398
No of gas leaks reported by the public*	867	949	989
No of mechanical damage incidents to mains and services – HP*	0	0	0
No of mechanical damage incidents to mains and services – MP*	507	287	322
UAG[54]	1.10%	1.56%	0.90%

* Note Queanbeyan and Yarrowlumla shire data have not been included for 2001.

Some of the above operational statistics have been incorporated into the reporting requirements for ActewAGL under its distribution licence. ActewAGL is required to report to the Commission no later than three months after the end of the financial year. The key indicators[55] that have been published by the Commission related to ActewAGL are:

- Unplanned interruptions affecting more than 5 customers.
- No of gas leaks reported by the public
- No of gas leaks detected in survey
- No of mechanical damage incidents
- Gas Specification
- Gas regulator and gas meter replacement

The significance of the data on the non-capital expenditure is discussed in section 12.2.3.

9.7 AGILITY CONTRACTUAL ARRANGEMENT

(Note: Some information in this section excised for commercial-in-confidence reasons)

The joint venture arrangement between Actew Distribution and AGL was established on 3 October 2000. Under this arrangement, Agility was contracted to operate and maintain the gas networks. The Distribution Asset Management Services Agreement (DAMS) had a fixed price arrangement for two year. After that there was a DAMS supplementary agreement which set the prices of routine mains and customer service connections. The supplementary agreement will expire in June 2004.

[53] Email received from ActewAGL 26 March 2004.

[54] ActewAGL email 19 March

[55] ICRC Compliance and Performance Report 2002-03

The contract has a number of performance standards that Agility has to perform to and also an incentive payment for cost reduction.

…

The services that have been contracted under the DAMS agreement are:

Asset Services

ECG has amended the text to reflect ActewAGL's comments to the draft report.

Asset services are associated with the operations and maintenance of the network. They include both the planned and unplanned maintenance of the network. Other activities that also form part of asset services include but are not limited to quality assurance, technical and engineering services, measurement services and also control room activities.

Asset Management

Asset management service is associated with the general management of the contract. It also involves other support services such as accounting, regulatory affairs, network research and development and corporate services.

…

10 CAPITAL EXPENDITURE REVIEW 2000-2004

10.1 ACTEWAGL OPENING CAPITAL BASE

Section 8.9 of the Code generally provides for the opening capital base to reflect the capital base at the start of the previous access arrangement period, adjusted for capital expenditure (which passes the test in section 8.16 of the Code), depreciation and redundant capital.

Section 8.16 of the Code enables capital expenditure in the previous access arrangement period to enter the opening capital base provided that:

- the amount does not exceed the amount that would be invested by a prudent service provider acting efficiently, in accordance with accepted good industry practice, and to achieve the lowest sustainable cost of delivering services and
- one of the following conditions is satisfied:
- the anticipated incremental revenue generated exceeds the cost or
- the regulator is satisfied that the capital expenditure has system-wide benefits that justify the approval of a higher reference tariff for all users or
- the capital expenditure is necessary to maintain the safety, integrity or contracted capacity of services.

The Code does not specifically outline the approach that has to be adopted to determine the efficient cost for a level of service. As such, ECG proposes to assess the capital costs in the following manner:

- The Commission's decision in the 2001 Access Arrangement will be the starting basis for the capital expenditure.
- A review of actual costs to assess trends, anomalies, differences in the various input categories.
- An analysis of the input categories to determine the reasonableness of the costs for the service provided.
- Where possible, comparison of overall costs in particular categories (e.g. market expansion costs) with other companies.
- A review of ActewAGL's own forecasts of costs and the methods, processes and data used to derive them.
- A conclusion of the efficient cost for the 2004 Access Arrangement period after taking into account the various input factors. This cost will be the basis for establishing the opening capital base for 2005 to 2010.

Details of the review are provided in the sections below:

ActewAGL has set out its calculation of the opening Capital Base as shown below, including expenditure on the Eastern Gas Pipeline (EGP).

Table 10-1 ActewAGL opening capital base, 2000-04[56]

Year ending 30 June $ million, nominal	**2000**	**2001**	**2002**	**2003**	**2004**
Opening balance	175.0	182.4	198.6	209.6	219.6
Plus Capital Expenditure	8.6	12.7	10.9	9.3	7.4
Less Depreciation	5.5	5.8	5.8	6.3	6.7
Less Disposals	0	1.9	0	0.1	0
Plus Indexation	4.3	11.2	5.9	7.1	5.6
Roll forward amount	**182.4**	**198.6**	**209.6**	**219.6**	**225.9**

In determining the opening capital base, ActewAGL has:

- indicated that all expenditure undertaken met the requirements of section 8.16 of the Code
- based depreciation on the actual level of capital expenditure, rather than using the depreciation forecast made in 2000.
- used the most recent forecast of capital expenditure for 2004
- netted off capital contributions
- adopted the actual (and forecast) CPI (All Groups index for the weighted average of eight capital cities).

10.2 COMPARISION OF ACTUAL WITH FORECAST EXPENDITURE

In aggregate, ActewAGL's capital expenditure in the 2001 access arrangement period has been about $2.9million (real $, 2004/05) more than that forecast in 2001, as shown in the following table. (Note: There are some minor discrepancies in the expenditure data in this table and that in the above Table 10-1 , due to different sources of information. However these do not affect the conclusions drawn in the following sections of this report).

Annual differences have occurred due to higher than expected growth capital (customer numbers exceeded projections by 5149[57]), and timing issues with connection to the EGP and ActewAGL's network reinforcement project.

[56] ActewAGL AA Information Table 3.1, December 2003

[57] ActewAGL AA proposed revisions, December 2003, p14

Table 10-2 ActewAGL capital expenditure for 2000-2004[58]

Year ending 30 June $ million, real 2004-05	2000	2001	2002	2003	2004	Total 2000-2004
Final Decision	9.3	18.8	8.3	7.8	5.6	49.8
Actual	9.6	14.2	11.7	9.8	7.4	52.7
Difference	**0.3**	**(4.6)**	**3.4**	**2.0**	**1.8**	**2.9**

Note: Includes EGP

Original data in real $2000/01 has been adjusted to real $2004/05 using the indexation factors from the following table:

Table 10-3 Inflation Factors[59]

Year ending 30 June	2002	2003	2004	2005
CPI forecast	2.9%	3.3%	2.5%	2.5%

In accordance with section 8.16 of the Code the following sections of the report will assess the prudency of the expenditure incurred in the 2001 access arrangement period for each of ActewAGL's three main expenditure types – Growth Market Expansion, Growth Capacity Development and Stay in Business.

10.3 GROWTH – MARKET EXPANSION

Commission forecast and actual growth market expansion capital expenditure and the total number of customers supplied at the end of each year of this Access Arrangement period are given in the following tables:

Table 10-4 ActewAGL growth market expansion capital expenditure for 2000-2004[60]

Year ending 30 June $ million, real 2004/05	2000	2001	2002	2003	2004	Total 2000-2004
Final Decision	4.5	2.9	3.4	3.7	3.7	18.2
Actual	4.6	5.2	5.6	5.1	4.4	24.9
Difference	**0.1**	**2.3**	**2.2**	**1.4**	**0.7**	**6.7**

[58] ActewAGL final decision vs actual, email 8April 2004

[59] ActewAGL email 24/03/04

[60] ActewAGL final decision vs actual, email 8April 2004

Table 10-5 Customer Numbers by class (historical)[61]

Financial Year Ending June 30	1999	2000	2001	2002	2003	2004[62]
Residential	74207	78,542	82,643	86,598	90,497	94,942
Industrial & Commercial <10 TJ	1936	1,993	2,033	2,075	2,121	2167
Industrial & Commercial >10 TJ (Contract)	35	37	36	38	38	38
Total	**76178**	**80,572**	**84,712**	**88,711**	**92,656**	**97,147**

Table 10-4 shows the actual expenditure for the period ($24.9million, real 2004-05) was 37% more than allowed in the final decision ($18.2million real $2004/05). This was used to supply 20969 customers, which is 32% (5149)[63] more than forecast.

The total actual expenditure was equivalent to an average of $1187 per customer for 20969 customers, compared with a forecast expenditure equivalent to $1150 per customer for 15820 customers. ActewAGL has not provided the expenditure details (i.e. quantity and type of mains, meters and services) for ECG to confirm the prudency of the cost. However, given the difference between the unit cost per customer is not material, ECG recommends that the actual capital expenditure is rolled into the opening capital base. The recommended expenditure is summarised in the following table.

Table 10-6 ActewAGL Recommended growth market expansion capital expenditure for 2000-2004

Year ending 30 June $ million, real 2004/05	2000	2001	2002	2003	2004	Total 2000-2004
New customers	4394	4140	3999	3945	4491	20969
Recommended Capital	4.6	5.2	5.6	5.1	4.4	24.9

However much more detailed information on actual expenditure for the next Access Arrangement period should be provided before such expenditure is accepted for inclusion in the opening capital base for the following Access Arrangement period (post 2010). Arrangements to ensure this happens should be put in place now, to ensure the data is available for future analysis.

In its response to the draft report, ActewAGL has commented that the further details of the above recommendation consistent with the Code are required. Attachment A of the Code details the information disclosure by a Service Provider to Interested Parties. Under Category 2 of the attachment, ECG has taken that the service provider should be able to

[61] Email, ActewAGL to ICRC, 20 February 2004, Tables for MMA ACT

[62] Year 2004 is forecast only

[63] ActewAGL AA proposed revisions, section 5.3.1

provide detailed information on committed capital. In this section, it would apply to the quantity and cost associated with mains, services and meters that have committed for this category of work.

10.4 GROWTH- CAPACITY DEVELOPMENT

Commission forecast and actual growth capacity development capital expenditure at the end of each year of this Access Arrangement period is given in the following table:

Table 10-7 ActewAGL growth capacity development capital expenditure (including EGP) for 2000-2004[64]

Year ending 30 June $ million, real 2004/05	2000	2001	2002	2003	2004	Total 2000-2004
Final Decision	4.8	15.0	3.9	2.6	1.3	27.6
Actual[65]	4.9	8.8	6.0	4.6	2.1	26.4
Difference	**0.1**	**(6.2)**	**2.1**	**2.0**	**0.8**	**(1.2)**

Table 10-8 shows the actual expenditure excluding EGP was $9.8million, which is significantly less than the forecast $11.5million, with the main discrepancies occurring in years 2001 and 2002. A total of 20969 new customers were supplied and the average growth - capacity development cost was $467 per new customer.

Table 10-8ActewAGL growth capacity development capital expenditure (excluding EGP) for 2000-2004

Year ending 30 June $ million, real 2004/05	2000	2001	2002	2003	2004	Total 2000-2004
Final Decision	0.6	3.1	3.9	2.6	1.3	11.5
Actual [66]	0.3	0.2	2.6	4.6	2.1	9.8
Difference	**(0.3)**	**(2.9)**	**(1.3)**	**2.0**	**0.8**	**(1.7)**

These differences would have been mainly due to changes in the scope or timing of major projects, as the total forecast expenditure for minor projects is insufficient to account for them. ActewAGL has advised [67]that the variation in capital from year to year is dependent upon where growth occurs in the network, and that the network performance process identifies opportunities to defer or stage capacity development projects, and has enabled timely capital expenditure.

More information on the network performance process and network validation is provided in section 11.5.1. We confirm that changes to project scope and /or timing are

[64] ActewAGL final decision vs actual, email 8April 2004

[65] Agility File Note, 22.03.04 Email 22/03/04

[66] Response 23.03.04

[67] Agility File Note, ActewAGL Capacity Development Capital Expenditure 2000-2004, March 2004

normally expected to arise from this process, and therefore differences between forecast and actual expenditure over a five year period are not unusual.

The above differences indicate that the annual network validation process is working effectively in identifying necessary changes to forecast projects. This is supported by a review of network validation reports for winters 2002 and 2003, which indicates that project actual timing is appropriate. Predicted networks minimum pressures are close to the minimum normal operating value before a project augmentation is proposed.

The scope of the major projects allowed for in the Access Arrangement has not been provided by ActewAGL. ECG is unable to comment on whether they have been completed, cancelled or deferred, and is unable to confirm if the actual work has been conducted prudently or efficiently.

In its response to the draft decision, ActewAGL indicated that it provided the information was provided and the scope was not requested. The information provided was not sufficient for the purpose of determining this purpose.

In the absence of detailed information on major projects, our assessment is based on a review of the total capital expenditure. The actual expenditure was less than that allowed in the final decision for this Access Arrangement period, and the number of new customers connected was higher than forecast. Therefore, it is proposed that this actual expenditure be allowed for inclusion in the opening capital base for the next period (2005-10).

Also detailed information on major and minor projects for this next Access Arrangement period (2005-2010), including their scope of work, options considered, justification and actual expenditure on each, should be provided before such expenditure is accepted for inclusion in the opening capital base for the following Access Arrangement period (post 2010). Arrangements to ensure this takes place should be put in place now, to ensure the data is available for future analysis.

10.5 EASTERN GAS PIPELINE

In its 2000 Final Decision, the Commission determined that a prudency assessment of the capital expenditure for the whole EGP project will be conducted at the next review to determine the roll forward of the initial capital base.

Commission forecast and actual capital expenditure is given in the following table:

Table 10-9 ActewAGL EGP capital expenditure for 2000-2004

Year ending 30 June $ million, real 2004/05	**2000**	**2001**	**2002**	**2003**	**2004**	**Total 2000-2004**
Final Decision	4.2	11.9	-	-	-	16.1
Actual [68]	4.6	8.6	3.4	-	-	16.6
Difference	**0.4**	**(3.3)**	**3.4**			**0.5**

[68] Response 23.03.04

For ease of comparison with the 2001 Final Decision, the following analysis has been carried out in nominal dollars.

To assist the Commission in its 2000 review, Connell Wagner (CW) assessed ActewAGL's proposed capital expenditure and CW findings were:

- action was needed to ensure gas supply over the 2000 winter;
- the connection to the EGP was a sound long term solution to meet winter demands for the next 20 years; and
- the budget cost estimate of $12m (1999/2000 dollars) was within the range expected.

During the review, ActewAGL submitted a revised budget cost estimate of $14.17m (1999/2000 dollars) supported by a report from Canberra pipeline consultants Coraldeen Pty Ltd. The findings of Coraldeen's report suggested that the original and later estimates were reasonable taking into account that the higher estimate resulted from environmental constraints, licensing issues and EGP offtake/metering facility requirements not previously known.

ECG has confirmed that the size of the connecting pipeline was prudently determined by ActewAGL by carefully evaluating the costs and benefits for three alternative sizes[69].

ActewAGL has advised ECG[70] that expenditure for the whole EGP project was spread over three years as shown in Table 10-10 .

Table 10-10 EGP capital expenditure

Year Incurred	99/00	00/01	01/02	Total
Expenditure $m (Nominal)	4.035	7.705	3.117	14.857
Expenditure $m (Real 99/00)	4.035	7.269	2.866	14.170
CPI Factor[71]	1	1.0600 (00/01)	1.0876 (99/00 to 01/02)	

To assist ECG assess if the actual expenditure is prudent and to support the findings of CW and Coraldeen, ActewAGL was requested to:

- Confirm the actual project expenditure;
- Provide a breakdown of the actual cost incurred; and
- Confirm that the project was competitively tendered and awarded to the lowest tenderer.

[69] Eastern Gas Pipeline Prudency File

[70] Email dated 23 March 2004

[71] Data Room Document – ActewAGL Internal Memo dated 16 Sept 2002 and attached papers

ActewAGL advised that a breakdown of the actual cost incurred is as shown in Table 10-10[72].

ActewAGL in its response has indicated that Table 10-10 and the accompany text is commercial-in-confidence.

Table 10-10 EGP cost breakdown

Item	Total Cost $m (nominal)
Pipe, coating & materials	2.7
Pipeline construction, directional drill, and commissioning	6.2
Scraper station & Meter station	2.6
Easement and land acquisition, cultural heritage & native title	0.6
Project management	1.0
Consultants	0.4
Project fees (AGL Construction)	1.4
Total	**14.9**

ActewAGL further advised[73] that:

- The project was completed in the following three stages:

  ACT Section
  NSW Section
  Hoskinstown Meter Section

- The ACT section was tendered. Clough Lucas was the lowest tenderer and to achieve further savings in construction the contract was awarded under an alliance agreement.
- The NSW section was also constructed under an alliance contract with Clough Lucas. All materials and equipment was purchased on a lowest tender basis and prefabrication of station pipework was awarded similarly.
- Construction of the Hoskinstown meter station was carried out by Agility/AGL Construction and all equipment purchased by a tendering process.

[72] ActewAGL email 14/4/04
[73] Email 14/4/04

Project management (refer Table 10-11) includes all the cost for delivering the project such as engineering, design, drawing, procurement, construction management and approvals.

Project fees (refer Table 10-11) includes project costs associated with project financing, corporate support (legal, project insurance etc) and Agility/AGL Construction project management fees. Table 10-13 costs can also be summarised as shown in Table 10-11 .

Table 10-11 Summary of EGP expenditure

Item	Total Cost $m (nominal)
Construction cost	12.1
Project management (including consultants)	1.4
Sub-total (Direct cost)	**13.5**
Project fees (financing and overheads)	1.4
Total	**14.9**

Project management (including consultants which are considered a cost towards delivering the project) represents 11.6% of the $12.1m construction cost.

Project fees (financing and overheads) represent 10.4% of the $13.5m direct cost.

It is considered that the $12.1m construction cost, which is predominantly the outcome of competitive tendering processes, supports the findings of CW and Coraldeen.

Project management cost is considered high and for this type of project shouldn't normally exceed about 7% suggested by Coraldeen. However it is acknowledged that the higher cost may have been caused partly by the inability to proceed according to the original timetable as noted by Coraldeen. Construction within NSW was delayed because a pipeline licence was required whereas originally it was expected that this section of the pipeline could be constructed under the NSW Gas Act. Environmental constraints and licensing issues had to be addressed which increased the project management costs.

It is questionable whether the full amount of ActewAGL's claimed project management cost should be allowed but in the circumstances described ECG suggests it would reasonable to allow 9% or $1.09m. This represents a reduction of $0.31m or about 2% of the total project cost which is not thought to be material.

For the purpose of this report, ECG has used the project fees of $1.4m. However, the Commission may like to consider the appropriateness of including financing cost.

In summary, it is recommended that the actual total cost of $14.17m (real 1999/00) is rolled forward into the opening capital base.

10.6 STAY IN BUSINESS

Commission forecast and actual stay in business capital expenditure at the end of each year of this access arrangement period is given in the following table:

Table 10-12 ActewAGL stay in business capital expenditure for 2000-2004[74]

Year ending 30 June $ million, real 2004-05	2000	2001	2002	2003	2004	Total 2000-2004
Final Decision	0.0	0.9	1.0	1.5	0.6	4.0
Actual	0.1	0.1	0.1	0.1	0.9	1.3
Difference	**0.1**	**(0.8)**	**(0.9)**	**(1.4)**	**0.3**	**(2.7)**

ActewAGL advises[75] that the $2.7m underspending is due to the bulk of the meter change program planned at the time of submitting the current Access Arrangement not yet being completed. The outstanding 6827 overdue aged replacement meters will not be fully completed until 2004/05.The underspending was largely due to diversion of resources resulting from unforeseen incidents such as the Canberra bushfires which required immediate attention. However, it is noted from Table 10-12 that a significant proportion of the underspending pre-dated the bushfires. Other major unforseen incidents (eg Moomba) have had an impact on the current period (2003/04), further constraining ActewAGL's ability to complete the outstanding balance.

The meter maintenance plan applied by Agility for the ActewAGL network, in response to the ACT "Gas General Metering Code 2000" requirements is as follows:

- Residential meters - 15 year replacement
- Industrial and Commercial meters - 5, 10 or 15 year replacement depending on the type of meter
- Industrial and Commercial pressure regulators, filters and flow correctors (for pressure and temperature correction) are maintained at frequencies ranging from 13 weekly to 208 weekly depending on their supply and delivery pressures.

The Gas General Metering Code provides for the service life of meters to be extended subject to an approved sampling plan. However, there is currently no regulatory approval for statistical sampling of meter populations.

10.6.1 Review of actual expenditure

ECG has noted ActewAGL's comments in its response to the draft report that further explanation of the meter replacement program is provided in sections 10.4.2 and 10.6.

In meetings with ActewAGL and Agility, ECG was advised that all residential meter replacement program meters are new and are non-repairable. It is not clear why this is the

[74] ActewAGL final decision vs actual, email 8April 2004

[75] Emails 23/3/04 and 8/4/04

case and it is recommended in Section 8.4.1 that the matter is further investigated before the next Access Arrangement Review.

As a broad reasonableness check of the $2.7m underspending, it reflects a unit cost of $395/meter for the outstanding balance of 6827 meters. This unit cost suggests that the meters overdue for replacement include a significant proportion of industrial and commercial meters because ActewAGL's unit cost for a residential meter is in the range $150-$160 (refer to Table 11-12).

If the situation is as it appears then ActewAGL should make a concerted effort to meet its objective of eliminating the outstanding balance of meters by the end of 2004/05.

ActewAGL has not provided the expenditure details for ECG to confirm the cost is prudent. For the purpose of establishing the opening capital base for the 2005 Access Arrangement period, ECG has used the actual expenditure.

In response to ActewAGL's query about what expenditure details do the consultants require, ECG had requested information on annual quantities and cost per meter type. As the information was not available at the time of request, ECG had adopted the methodology described above.

10.7 DEPRECIATION

ActewAGL has based its regulatory depreciation calculations on the actual level of capital expenditure as shown in Table 10-1 and on the economic asset lives shown in Table below.

Table 10-13 Asset Lives for Depreciation

Asset Class	Life (years)
Primary (HP) mains	80
HP services	80
Medium pressure (MP) mains	50
MP services	50
Regulators and Valves (TRS,SRS)	50
Contract and tariff meters	15

10.8 DISPOSALS

ActewAGL's Access Arrangement Information indicates that disposals cover replacement or scrapping of aging and redundant capital including assets affected by the January 2003 bushfires.

No adjustment for asset disposal was made in the 2000 Final Decision when projecting the regulatory capital base from 1999-2004.

In setting out its calculation of the opening Capital Base, ActewAGL has included $1.9m and $0.1m for disposal of assets in 2001 and 2003 respectively as shown in Table 6.1.

ActewAGL advises[76] that the $1.9m reflects the transfer of the non-system assets from AGL to Agility on the formation of the Joint Venture and is the rolled forward value from the current Access Arrangement in 1999-2001. ActewAGL further advises that this ensures that the whole class of non-system assets included in the Regulated Capital Base (RCB) was removed from ActewAGL's RCB.

$0.1m is the net book value of services and meters written off as a result of the January 2003 bushfires[77]. It comprises 333 connections and 332 meters in the affected suburbs and ActewAGL advise that the net book value would approximate the regulatory value as on the formation of the Joint Venture the regulatory values were used as the basis of the financial asset books.

10.9 JULY TO DECEMBER 2004

Due to the agreement to extend the current access regime to include the period from July to December 2004, a review of ActewAGL's expenditure for this six month period has been carried out.

Forecast expenditure for the complete financial year 2004 – 05 is shown in Table 11-3 . As advised by ActewAGL, the Growth - Capacity Development expenditure is forecast to be 100% complete by December 2004. The Growth - Market Expansion and Stay-in-Business expenditures are forecast to be 50% complete by December 2004.

From this the forecast expenditure for each category from July to December 2004 has been determined and is shown in the following table.

Table 10-14 ActewAGL Capex forecast, July – December 2004

Category	**Forecast Expenditure $,million (real 2004/05)**
Growth - Market Expansion	3.05
Growth - Capacity Development	1.71
Stay in Business Capital	1.26
Total	**6.02**

Forecast growth – capacity development expenditure of $1.71million for the full financial year 2004 - 05 includes minor projects and one major project ($1.536million), the Gungahlin Primary Regulating Station. The existing PRS in Gungahlin needs to be upgraded to a permanent structure in order to provide for long term network development.

[76] Email to ECG 15/3/04

[77] Email to ECG 15/3/04

While a supply deficiency has been identified[78], ECG is unable to conclude that this major project is prudent. Insufficient information has been provided in support of the stated requirement to provide for long term network development, or to show that lower cost options to defer or minimise major capital expenditure have been considered.

In its draft response, ActewAGL advised that a draft justification for this has been prepared. ECG considers the outline justification provided is reasonable and have previously accepted this expenditure for inclusion in the opening capital base for 2005-2010.

However the forecast total expenditure of $1.71million for this category is comparable with the average actual expenditure of $1.82 million per year for the period 2000 – 2004, and it is recommended that it be accepted for inclusion in the opening capital base for 2005-2010.

Assessment of the prudency and efficiency for the stay – in – business category of the forecast July - December 2004 expenditure is similar to that for the corresponding component of the forecast January 2005 - June 2010 expenditure, fully reviewed in section 10.

It is therefore proposed that the expenditure allowed in this category be reduced to the values shown in the following table.

Table 10-15 ActewAGL Capex proposed, July – December 2004

Category	**Proposed Expenditure $,million (real 2004/05)**
Growth - Market Expansion	3.12
Growth - Capacity Development	1.71
Stay in Business Capital	1.20
Total	**6.03**

10.10 RECOMMENDATIONS FOR CAPITAL EXPENDITURE 2000-2004

Based on the above analysis, it is proposed that the capital expenditure during the period from July 1999 to December 2004, and shown in the following table, be allowed for inclusion in the opening capital base for 1 January 2005.

[78] Data Room, Gungahlin Capacity Development Project 2004

Table 10-16 Expenditure proposed for inclusion in opening capital base, January 2005

Year ending 30 June $'million, real 2004/05	2000	2001	2002	2003	2004	July to December 2004
Growth-Market Expansion	4.6	5.2	5.6	5.1	4.4	3.1
Growth-Capacity Development (excluding EGP)	0.3	0.2	2.6	4.6	2.1	1.7
Eastern Gas Pipeline	4.6	8.6	3.4	0	0	0
Stay-in –Business	0.1	0.1	0.1	0.1	0.9	1.2
Total	**9.6**	**14.2**	**11.7**	**9.8**	**7.4**	**6.0**

It is also recommended that arrangements be put in place to ensure that:

- Data on the quantities of mains, meters and services, and their unit costs, for growth – market expansion expenditure in the 2005-2010 period is collected and made available for analysis prior to the next period, commencing July 2010;
- Data on the scope, costs and justification of facilities provided for growth – capacity development expenditure in the 2005-2010 period is collected and made available for future analysis prior to the next period, commencing July 2010; and
- ActewAGL meets its objective of eliminating the outstanding balance of meters by the end of 2004/05.

ActewAGL has indicated that the last dot point is beyond the scope of this review. ECG acknowledges that to the extent that the completion of the activity does not impact on the overall capital expenditure for the next Access Arrangement period, the comment goes pass the scope of this review and as such accepts ActewAGL remark.

11 CAPITAL EXPENDITURE FORECAST 2005-2010

11.1 ACTEWAGL FORECAST CAPITAL BASE

Section 8.20 of the Code enables reference tariffs to be determined on the basis of forecast capital expenditure, provided that the capital expenditure is reasonably expected to pass the requirements of section 8.16 of the Code.

Section 8.32 enables reference tariffs to reflect forecast depreciation over the Access Arrangement period. Section 8.33 requires depreciation to reflect the economic life of the asset group in question.

The Code does not specifically outline the approach that has to be adopted to determine the efficient cost for a level of service. As such, ECG proposes to assess the capital costs as outlined in section 10.1.

ActewAGL has set out its calculation of the forecast capital base[79] as follows:

Table 11-1 ActewAGL Forecast Capital Base 2005 – 2010

Year ending 30 June $ million, nominal	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Opening balance	225.9	236.6	244.6	252.6	261.0	272.7
Plus Capital Expenditure	12.4	10.1	9.7	9.1	12.5	8.3
Less Depreciation	7.4	8.1	8.6	8.4	8.8	9
Less Disposals	0.1	0.1	0.1	0.1	0.1	0.1
Plus Indexation	5.8	6.1	7.0	7.8	8.1	8.3
Roll forward amount	**236.6**	**244.6**	**252.6**	**261.0**	**272.7**	**280.2**

In determining the forecast capital base, ActewAGL has:

- indicated that all forecast expenditure undertaken meets the requirements of section 8.16 of the Code
- adopted the same depreciation rates as those adopted for the 2001 Access Arrangement period. These are based around the asset lives given in Table 10-13 . Identified disposals as including assets to be replaced or scrapped as the network ages. These include services disconnected, meters replaced prior to the end of their regulated asset lives, and other items such as regulators and valves that fail.
- netted off capital contributions
- adopted the following forecasts of inflation to determine the indexation amount for each year.

[79] Access Arrangement Information December 2003

Table 11-2 Inflation Forecasts for Indexation[80]

Year ending 30 June	2005	2006	2007	2008	2009	2010
CPI forecast	2.5%	2.5%	2.8%	3.0%	3.0%	3.0%

11.2 FORECAST EXPENDITURE

The forecast capex in each year of the next Access Arrangement period has been provided by ActewAGL and is set out in Table 11-3 . It includes distribution system capital for:

- Growth market expansion, required to meet growth in customer numbers and connections
- Growth capacity development, required to meet the requirements of the overall network
- Stay in business items, required for renewal and replacement of aging network assets
- Non-distribution system capital associated with network management.

Table 11-3 ActewAGL Forecast Capital Expenditure[81]

Year ending 30 June $ million, real 2004/05	2005	2006	2007	2008	2009	2010
Distribution system capex						
Growth market expansion	6.09	5.74	5.61	5.41	5.49	5.40
Growth capacity development	1.71	2.88	2.33	1.77	4.42	0.82
Stay in business	2.52	1.28	1.34	1.28	1.36	1.02
Total distribution system	**10.32**	**9.90**	**9.28**	**8.46**	**11.27**	**7.24**
Non-system capex						
Gas networks GIS system	0.50	-	-	-	-	-
Regulatory capitalisation costs	1.60	-	-	-	-	-
Total non-system capex	**2.10**					
Total capex	**12.42**	**9.90**	**9.28**	**8.46**	**11.27**	**7.24**
Total distribution system	**10.32**	**9.90**	**9.28**	**8.46**	**11.27**	**7.24**

In forecasting capital expenditure over the Access Arrangement period, ActewAGL has:

- based "growth market expansion" expenditure forecasts on market growth forecasts of annual quantity for the tariff and contract markets, and MDQ for the contract market

[80] Access Arrangement Information December 2003

[81] Access Arrangement Information December 2003

- based "growth capacity development" expenditure forecast on network performance validation, used to identify the needs and opportunities to reinforce the system to provide for growth, and enhance supply reliability and security
- based "stay in business" expenditure forecast on detailed engineering and design analysis of condition of assets and on meeting statutory requirements
- stated that its forecast expenditure does not exceed the amount that would be invested by a prudent service provider acting efficiently and in accordance with good industry practice
- advised that as part of its asset management services, Agility has established a capital prudency process to review each type of capital expenditure
- conducted network validation in accordance with its technical policies, to verify its network models and establish current network capability for its primary and secondary high pressure systems and for its medium pressure distribution systems
    - defined the standard operating pressures to be maintained in its systems set in the operating metering pressure table (refer section 9.2).

Note that expenditure forecast to occur from July to December 2004, which now forms part of the initial Access Arrangement period, is summarised in section 9.

Assessments for each category of expenditure are given in the following sections.

11.3 REVIEW OF UNIT COSTS

The composition of the forecast capital expenditure for 2005-2010 shown in Table 11-3 is as follows:

- 58% or more than half is for market growth systems ($33.74m)
- 24% or about one quarter is for system reinforcement ($13.83m)
- 15% is for system renewal and replacement ($8.8m)
- 3% is for non-system asset replacement ($2.1m)

As far as practicable, ECG has assessed the unit costs which underpin these estimates and whether they are appropriate in accordance with the requirements of the Code. In making its assessment, ECG has compared the unit costs with those used in the 2000 Final Decision and also benchmarked them against the more recent ESC 2003-2007 determination for the Victorian distributors.

In order to enable more meaningful benchmark comparisons to be made, ECG requested ActewAGL to provide information in a format which showed a breakdown of direct and overhead costs for the various activities. Overhead percentage rates can vary widely between distributors due partly to the overhead cost each distributor estimates it will incur.

ActewAGL was unable to provide the information in the format requested and advised[82] that it does not charge overheads to capital works – costs are ActewAGL direct costs only.

[82] Email to ECG 18/3/04

ECG interpreted this response as meaning that ActewAGL does not charge overheads to capital works carried out by Agility on its behalf but Agility costs (ActewAGL's direct costs) would comprise its direct and overhead components.

Therefore ECG derived unit costs applicable for each of the three system expenditure categories, using capital expenditure information provided by ActewAGL[83]. A full assessment of these with recommendations for acceptable rates is contained in subsequent sections reviewing each system category.

ActewAGL budget assumptions underpinning its market growth capital expenditure estimates include allocations of types and quantities of mains, services and meters for each customer category, as listed in appendix 1. There are six categories:

- Electricity - Gas (E-G)
- New Homes
- Medium Density
- High Density
- Industrial & Commercial
- Contract

Each category requires appropriate mains, services and meters.

The forecast quantity of mains is calculated from historical data on the new homes connection split between new estates and built up areas, metres of main per service for each customer category, and the % distribution for each size of main. The forecast number of meters and services is calculated from historical data on the type of meter and the number of customers per service for each of these customer categories.

ActewAGL in its response said that the cost estimate for major capital works projects include a component to cover all project management costs. These costs include project development, planning, procurement, project management, contractor management, community liaison and management, licences and approval. It also said that the 20% is considered a reasonable assumption for overheads. ECG notes ActewAGL's comments and will give consideration of this overhead in the following sections of the report.

11.4 GROWTH – MARKET EXPANSION PLANS

11.4.1 Review of proposed expenditure

The forecast numbers of new customers to be supplied in each year of this Access Arrangement period are given in the following table[84]. Note that the period from July 2004 – December 2004 is not part of this Access Arrangement period.

[83] ActewAGL Capex ACT AA Forecast _Draft for ICRC ACIL Updated 22 March 2004

[84] Email, ActewAGL to ECG, 15 March 2004, Friday Discussion Information

Table 11-4 Forecast customer numbers

Year ending 30 June	Financial year ending					
Category	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Residential	3692	3387	3258	3143	3040	2948
I and C<10TJ	64	64	64	64	64	64
Contract >= 10 TJ	1	0	0	0	0	0
Total	3757	3451	3322	3207	3104	3012

Estimated expenditure for Growth – Market Expansion projects for the period from July 2004 to June 2010 is summarised in the following table. (Note: There are some minor discrepancies in the expenditure data in the Table 11-5 and that in the above Table 11-1 and Table 11-3 due to different sources of information. However these do not affect the conclusions drawn in the following sections of this report).

Table 11-5 Actew AGL Forecast Expenditure - Market expansion

Year ending 30 June	Forecast Expenditure $,000 (real 2004-2005)					
Category	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Mains Capital	2,768	2,536	2,532	2,529	2,621	2,640
Service Capital	2,746	2,490	2,386	2,293	2,293	2,217
Meter Capital	693	593	578	565	573	563
Total Capital	**6,207**	**5,620**	**5,496**	**5,387**	**5,488**	**5,419**

11.4.2 Review of asset category expenditure

Forecast market growth capital expenditure is related solely to connecting new customers to the existing medium pressure network or to extensions of this network. Connecting new customers to the distribution network requires a service from the main to the customer's premises, a meter and regulator and associated fittings, and may include a mains extension. Connection costs vary between locations and between different types of customer. The most significant variation occurs between different industrial and commercial customers, with meter costs alone ranging from nearly $1,000 to more than $11,000.

ECG has assessed ActewAGL's forecast market growth capital expenditure per new connection in the following two broad categories:

- Residential [E to G, new homes (built up areas and new subdivisions), medium and high density]; and
- Industrial and commercial (tariff and contract).

Analysing connection costs in these two broad categories enables a high level reasonableness check against the 2000 Final Decision and the ESC's determination in Victoria. It calculates the average cost of connection by dividing growth related capital expenditure (the total for mains, services and meters) by gross growth in the number of customers, and is summarised in the following table.

Table 11-6 Unit rates for forecast capital expenditure, $ per customer

Real $2004/05	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Residential:						
Mains	663	718	745	771	826	851
Services	723	714	710	707	730	726
Meters/Regulators	129	129	130	130	135	136
Total per customer	**1515**	**1561**	**1585**	**1608**	**1691**	**1713**
I&C:						
Mains	1648	1653	1656	1661	1728	1731
Services	1123	1126	1129	1132	1177	1180
Meters/Regulators	2420	2426	2432	2438	2536	2542
Total per customer	**5192**	**5205**	**5217**	**5231**	**5441**	**5453**

The residential connection cost of $1,515-$1,713 per customer is well above the range of $975-$1095 ($300-$426 for mains, $455-$478 for services and $182-$191 for meters/regulators) determined at the last review even if the latter is CPI adjusted.

ActewAGL's average mains cost per customer appears high. The increase of about 25% (from $663 to $851) over the forecast period is due to an increasing proportion of new home versus E to G customers. Although the number of new customers is stable over the forecast period the number of E to G is declining. The budget assumptions which underpin the forecast mains capital expenditure allow for 30 metres of main per service for new homes in new subdivisions (the largest component of mains capital) and ECG identified that 10% of extra length was also allowed to account for houses that are passed which do not connect to gas. It is unclear why this extra provision is made when the budget assumption is based on a length of main per service.

It is acknowledged that new Canberra subdivisions may have more open space than in other States. Based on ECG's experience in Victoria, the average length per service is less than 20 metres. Although ActewAGL advised in meetings that 30 was based on about 2 years of historical data for Canberra, it is questionable whether the average length in Canberra would exceed that in Victoria by more than one third.

Unit rates for medium pressure mains ($/m) calculated by ECG based on ActewAGL information appear to be fair and reasonable over the forecast period, e.g. $38-$40/m in new subdivisions.

Based on the above analysis, ECG makes the following recommendations in relation to determining capital expenditure for new mains in new subdivisions:

- The 10% extra length allowance be disallowed;
- The length of mains for new homes in new subdivisions be calculated using an average 24 metres per service (a reduction of 20% from 30 metres);
- Capital expenditure for new mains in new subdivisions be commensurably reduced, that is, revised capital expenditure = ActewAGL forecast capex (0.8/1.1); and
- Commission may wish to consider investigating the basis of ActewAGL's budget assumptions in more detail prior to the next review.

In its response to the above paragraph, ActewAGL has indicated that following a review of the actual data, it has revised its estimate of 30 metres of mains per service to 26 metres. ECG believes that 26 metres is within the accuracy limits of its estimate and proposes to accept ActewAGL's assessment.

In addition, ActewAGL has also stated that the extra provision of 10% extra length is an allowance for major supply mains to estates that do not pass connectable sites etc. Supply mains by its nature does not usually have customers connected to it. In addition, ActewAGL assessment of 26 metres per service would have an allowance for supply mains to pass through parkland and along major arterial road unique to the ACT market. As such, ECG maintains its recommendation that the 10% extra length allowance be not included.

ECG will therefore be revising its recommendation above for the third dot point to:

- Capital expenditure for new mains in new subdivisions be commensurably reduced, that is, revised capital expenditure = ActewAGL forecast capex (0.86/1.1)

The average service cost per residential customer of about $720 is well above the 2000 determination after CPI adjustment but is comparable with the top end of the ESC range ($300-$600 direct cost). Given that the majority of ActewAGL's new residential services are in new subdivisions it is considered that a reasonable benchmark for the average service cost is mid-range of the ESC's determination, i.e. $450/customer direct cost. Allowing for reasonable overheads, it is recommended that ActewAGL's average service cost per residential customer should be reduced to $520.

In its response to the draft report, ActewAGL has revised its service costs to $659. This is based on a mix of new estate and E to G connections. It has also indicated that the cost is based on tendered actual rates. Based on the fact, that the revised service cost is the result of the tendered process, ECG proposes to recommend accepting this cost.

ECG expressed its reservations to ActewAGL and Agility about meter/regulator costs because they appear to exclude the regulator component. ActewAGL has yet to respond with any new information. As such, ECG has used the cost submitted by ActewAGL.

ActewAGL has provided additional information on its meter/regulator cost. The unit cost has not included the cost of a regulator and associated fittings. The revised cost per meter is $180. Based on its comments in the above paragraph, ECG believes that the revised unit cost would be considered efficient and recommends accepting that cost.

The industrial and commercial connection cost of $5,192-$5,453 per customer is comparable with the range of $6,120-$7,537 determined by Connell Wagner at the last review. It is also within the range of direct cost determined by the ESC - $6,675-$13,000 taking into consideration there would be differences between Canberra and Victoria in the type, size and proportion of industrial and commercial customers. Given these differences and the large variation in meter costs as mentioned previously, ECG recommends acceptance of the industrial and commercial connection unit costs shown in Table 11-6 and ActewAGL's forecast industrial and commercial market growth capital expenditure.

In summary, ECG recommends the unit rates shown in Table 11-7 be applied in determining growth market expansion capital expenditure for the forecast period. The overall effect of these recommended changes is to reduce the unit cost per customer to a value much closer to the $1182 per customer accepted for the 2000 - 2004 Access Arrangement period.

Table 11-7 Recommended unit rates for forecast capital expenditure, $ per customer[85]

Real $2004/05	**2004/05**	**2005/06**	**2006/07**	**2007/08**	**2008/09**	**2009/10**
Residential:						
Mains	563	607	629	651	697	718
Services	659	659	659	659	659	659
Meters/Regulators	180	180	180	180	180	180
Total per customer	**1406**	**1451**	**1474**	**1496**	**1548**	**1569**
I&C:						
Mains	1648	1653	1656	1661	1728	1731
Services	1123	1126	1129	1132	1177	1180
Meters/Regulators	2420	2426	2432	2438	2536	2542
Total per customer	**5192**	**5205**	**5217**	**5231**	**5441**	**5453**

Recommended expenditure to be allowed in the growth - market expansion category, based on the above information, is contained in the following table. It is based on the recommended unit rates data in the above table, and the forecast customer numbers as provided by MMA. Note that recommended expenditure for 2004-2005 is 50% of that for the full financial year, as only the period from January 2005 to June 2005 is included in this

[85] Table to be adjusted following the additional information provided by ActewAGL in its response to the draft report.

Access Arrangement period. Expenditure from July 2004 to December 2004 is included in the previous Access Arrangement period (refer section 10.9)

Table 11-8 Recommended growth – market expansion capital expenditure

$,000 real 2004/05	2004/05*	2005/06	2006/07	2007/08	2008/09	2009/10
Residential total	$5,688	$5,163	$5,054	$4,957	$4,966	$4,890
I&C total	547*	333	334	335	348	349
TOTAL	$6,234	$5,496	$5,387,	$5,292	$5,315	$5,239

*Includes costs for 1 contract I&C customer of $215

ActewAGL advised that an allowance has been made for the capital cost recoveries that could be expected from new large customers, or from existing customers with expanded loads, consistent with the Gas Networks Capital Contributions Code.

11.5 GROWTH – CAPACITY DEVELOPMENT PLANS

11.5.1 Network performance assessment

The network capacity planning process outlined in section 9.3 underpins the planning of Growth - Capacity Development projects. Assessment of its key features is that:

- Using load factors and load diversities to determine peak hour loads is common gas industry practice, and the methods used for determining these factors are appropriate.
- Peak hour load factors have been prudently determined from a specific program monitoring flows to a group of residential customers and individual customers, conducted about six years ago.
- Planning for capacity to supply the peak load forecast to occur in a 1 in 20 year severe winter is common gas industry practice and is appropriate
- The severe weather load factor of 1.14 is prudently determined from an analysis of the effect of temperature on peak loads that is conducted about once every five years (last performed in year 2000).
- The process for updating network pipe and load specifications is acceptable, but would be improved if linked to a GIS system. It is understood this is under consideration.
- Network performance validation reports for winter 2002 and 2003 confirmed the validity of models for the eight medium pressure and one high pressure network. Reporting of the performance of the remaining Canberra primary high pressure network was not available, but discussions with ActewAGL indicated that since its recent augmentation by a new supply point at Fyshwick, this network has ample capacity to supply its forecast loads. A formal report on the performance of this network, which is ActewAGL's principal supply network, should be provided.

- The method for predicting the timing of future augmentation projects is appropriate. However forecasting uncertainty means that predictions beyond a short term period can be in error and need to be regularly reviewed. The annual performance validation reports which include predictions for a ten year period are appropriate for this review.

It is not obvious that ActewAGL carries out regular review of the peak hour and severe weather load factors. These should be conducted to ensure that up to date information is used, reflective of current trends in gas consumption profiles for existing and new types of customer. This would minimise the risk of providing for unnecessary network capacity. It is suggested that a review of each of these be conducted at least once every five year Access Arrangement period.

It is also proposed that the appropriateness of planning for a 1 in 20 year severe winter load be reviewed. A risk assessment should be conducted to determine if there is scope to plan to maintain supply under less severe conditions. Reduction of the severe winter load factor from the current 1.14 to (say) 1.10 would, with current growth rates, typically have the effect of deferring the timing of capital expenditure for growth – capacity development projects by one year.

11.5.2 Review of proposed expenditure

Estimated expenditure for Growth - Capacity Development projects is summarised in the following table. (Note: There are some minor discrepancies in the expenditure data in 11-9 and that in the above Table 11-1 and Table 11-3 due to different sources of information. However these do not affect the conclusions drawn in the following sections of this report). Note also that projects in the period from July 2004 to December 2004 are not part of the Access Arrangement for this period, and that there is no expenditure between January 2005 and June 2005.

Table 11-9 ActewAGL Forecast Expenditure – Capacity Development

$'000's (real $2004-05)	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Primary Mains	0	2717	2137	0	2332	534
Medium Pressure Mains	100	111	189	181	397	191
Regulators, Valves (PRS, SRS)	1614	52	0	1588	1693	99
TOTAL	1,714	2,880	2,326	1,769	4,422	824

Proposed projects have been identified in the winter 2003 Network Performance Validation Reports as necessary to overcome predicted network capacity limitations. These are planned for completion just before the winter in which these limitations are predicted to occur. As there are no reported options for network augmentation, ECG has assumed that the most appropriate option is proposed.

These projects are as predicted based on current network performance, but are subject to an annual review that could affect their scope and timing. They will proceed only if authorised in accordance with the requirements of the Capital Expenditure Prudency Process. Assessment of expenditure in this category during the first Access Arrangement period showed the actual expenditure was significantly less than that forecast, as the network validation process identified opportunities to defer or stage capacity development projects[86].

The bulk of projects require relatively minor capital expenditure (each<$100,000). Examination of their benefits in increasing network capacity in localised low capacity areas, as predicted by network modelling, indicates these projects are realistic, effective and prudent.

Most of the proposed expenditure is for six large projects (each>$100,000). Individual project scopes with brief justifications are described below:

1. Mains Interconnection between Gungahlin and Belconnen (2006)

This 5km of 250mm primary main (initially operating as a secondary main) interconnection will improve the security of supply to the secondary network, and provide capacity and support the forecasted growth in the Belconnen network, at an estimated cost of $2.717million.

2. Mains Interconnection between Queanbeyan and Jerrabomberra (2007)

This 4.4km of 150mm secondary main interconnection will improve the security of supply to the secondary network, and provide capacity for forecasted growth and supply reliability in the network, at an estimated cost of $2.137million.

3. Queanbeyan/Jerrabomberra Primary Regulating Station (2008)

This PRS is required to provide capacity for forecasted growth and supply reliability and security of supply of the network, at an estimated to cost $1.536million.

4. Symonston Mains Extension and Secondary Regulating Station (2009)

This 1km of 180mm PE main extension from a new regulator is required to support growth in the Symonston sector of the network, at an estimated cost of $0.387million.

5. Tuggeranong Mains Extension and Primary Regulating Station (2009)

This 4.1km of 250mm primary steel main will provide capacity to support long term forecasted growth as well as improve security of supply in the Tuggeranong sector of the network, at an estimated cost of $3.868million.

[86] Agility File Note: ActewAGL Capacity Development Capital Expenditure 2000-2004, March 2004

6. Forde Mains Extension and District Regulating Station (2010)

This 1.1km of 150mm secondary main extension and installation of a new district regulator is required to provide capacity and to maintain supply reliability, at an estimated cost of $0.633million.

Preliminary justifications for these projects evaluate each specific proposal, but no evidence has been provided to show that lower cost options to defer or minimise major capital expenditure have been considered. In its response to the draft report, ActewAGL advise that an option to do nothing was assessed and rejected. ECG have previously seen and reviewed this option and agree that to do nothing is not realistic. ECG have not sighted any other options. ActewAGL advised that the projects have long term benefits e.g. capacity, security and reliability. However, a long term strategic plan has not been made available to ECG. ActewAGL advised that a capacity development plan was provided in its draft response. ECG concurs but it did not contain strategic information.

While supply deficiencies have been prudently identified, in the absence of further information ECG is unable to conclude that these projects are prudent, especially those later in the program which are subject to the greatest forecasting uncertainty.

Unit costs derived by ECG for secondary and primary steel mains are in the range of $485 to $570 per metre. This range is considered reasonable for the moderate to difficult mainlaying conditions experienced in ACT. Costs for regulator projects and for medium pressure mains are considered acceptable.

Experience from the first Access Arrangement period (refer section 10.4) showed that a significant portion of the capital allowed was not required due to deferral and staging of projects. It is likely that some of the above six proposed major projects will also be deferred or staged, or replaced by alternatives, based on annual network performance assessments to be conducted during 2005-2010.

The estimated total cost for the 5 years from June 2005 to June 2010 is $12.1million, and the forecast increase in customer numbers is 15416. The average cost of $785 per customer is significantly higher than the $467 per customer for the previous Access Arrangement period. This supports the view that there is potential to optimise projects or consider other options to reduce their overall cost.

Because of the above factors it is proposed that the growth - capacity development expenditure allowed for the 2005-2010 five year period be reduced. Based on the level of under expenditure in the 2000 to 2005 Access Arrangement period, ECG has estimated that there is a possible reduction in the range of 10% to 20%. For the purpose of this report, ECG has used 15% as the mid point in the range.

It is recommended the ActewAGL submission of $12.1million be reduced by $1.8m to $10.3 million (costs in $, real 2004/05). In making this recommendation, it should be noted that the allowed expenditure for growth - capacity development projects for this period would then be equivalent to $668 per forecast new customer, which is still high compared

with the $467 per actual new customer achieved in the 2000 - 2004 Access Arrangement period.

In its response to the draft report, ActewAGL consider this benchmarking method to determine allowable capacity development expenditure to be unsound, and that a case by case project assessment should be used. ECG considers the project case by case method to be limited by forecasting accuracy. In ECG's experience the scope and timing of projects of this type and predicted for more than one year in the future are subject to significant alteration, and have significant impacts on planned capital expenditure. This is consistent with ActewAGL's experience in the current (2000-04) Access Arrangement period where there were significant differences between the Final Decision (allowed) and Actual expenditure profiles (refer Table 10-7 and Table 10-8). Therefore, ECG propose that the benchmarking method be used.

Following ECG's presentation, ActewAGL rejected the use of benchmarking particularly in the early years. ECG is still recommending a 15% reduction in proposed augmentation expenditure for the five year period, and has applied this uniformly to each year. This is not intended to constraint the timing of ActewAGL expenditure within the forecast Access Arrangement period.

The recommended allowable expenditure in each year of the 2005 - 2010 Access Arrangement period is summarised in the Table 11-14 in section 11.9. Note that there is zero expenditure between January 2005 and June 2005, as expenditure for the 2004-05 financial year is to be complete by December 2004 (refer section 10.9).

11.5.3 Forecast Capacity and Asset Utilisation

Indicators for the prudency of capital expenditure in the growth - capacity development category would be measures of network asset utilisation or excess capacity. However as capacity in a gas distribution network is affected by a large number of factors, in particular the load amount and its location in a network, it is not possible to provide definitive estimates of capacity, hence excess capacity.

Broad estimates of asset utilisation can be made based on predicted network performance under peak load conditions in a severe winter, assuming future load distribution within a network is the same as current load distribution. Such estimates are highly indicative and cannot be interpreted as meaning that a particular level of load could be available at any location within a gas network.

Subject to these limitations an indicative assessment of asset utilisation has been made for each network, based on the maximum and minimum network pressures at key locations, as predicted by network models with forecast loads. The following table shows the indicative asset utilisation in various years. The level will fluctuate depending on the timing of completion of network augmentation projects, with the lowest level occurring immediately after completion of such projects.

Table 11-10 Network Capacity

Network Name	Average Utilization			
	2004	2008	2010	2013
Canberra Secondary HP	88%	78%		79%
Woden MP	78%	82%		85%
Gungahlin MP	63%		67%	70%
North Canberra MP	76%		90%	90%
Queanbeyan MP	67%	75%		86%
Weston Creek MP	69%	74%		79%
Tuggeranong MP	85%		89%	95%
Belconnen MP	72%	65%		68%
South Canberra MP	71%		67% (2009)	72%

The asset utilisations indicated in the above table have a level and variability typical for established gas systems, reflective of changing load patterns over time and different load growth rates in various network areas. They also reflect differences in the timing and scope of various network augmentation projects. These can be to eliminate capacity deficiencies in localised areas and provide only small changes in network capacity and utilisation, or can be to eliminate capacity deficiencies in significant portions of a gas network and provide large changes in network capacity and utilisation.

Assessment of utilisation data for the period 2004 - 2010 indicates that the on average there is predicted to be a small and desirable increase in asset utilisation over time. However a more detailed review using well defined evaluation processes would be necessary to validate this and to more accurately determine asset utilisation levels.

It is suggested that such a process be established, and its results reported regularly as a performance measure. In its response to the draft report, ActewAGL has requested argument in support of alternative processes. If the capacity of the system is to be used as a key performance indicator, ECG recommends that a process be developed. This may be a topic for a separate discussion.

11.6 STAY IN BUSINESS

Forecast Stay in Business (SIB) capital expenditure comprises mainly meter renewal and upgrade as shown in Table 11-11[87].

[87] ActewAGL email 15/3/04 & ActewAGL email 23/3/04

Table 11-11 SIB – Renewal and Upgrade, real 2004/05 dollars

Item	2004/05		2005/06		2006/07		2007/08		2008/09		2009/10	
	Qty	$000	Qty	$000	Qty	$000	Qty	$000	Qty	$000	Qty	$000
High pressure system – additional cathodic protection	1	11										
Medium pressure system – install valves in high risk areas	2	3,	2	3	2	3	2	3	2	3	2	3
Replace facilities' regulators	1	13	1	13								
Residential meter renewal and upgrade	4,734 6,827*	1,731	4,558	728	5,920	923	5,678	888	7,525	1,153	5,575	873
Water meter renewal and upgrade	17	9	0	5	11	7	1	5	11	7	85	24
I&C meter renewal and upgrade	157	765	143	537	124	407	131	378	87	191	64	118
Third party relocations		20		20		20		20		20		20
Total		**2,552**		**1,306**		**1,360**		**1,294**		**1,374**		**1,038**

*Outstanding balance of aged replacement from first period

ActewAGL advises[88] that:

- the outstanding balance of meter replacements is from 2002/03 and 2003/04 because the major focus in the second half of 2002/03 was dedicated to the bushfire response and recovery and the associated physical field activities continued until June 2003.
- Other major unforeseen incidents (eg. Moomba) have had an impact on the current period (2003/04) further constraining ActewAGL's ability to complete the change out of the outstanding balance. The outstanding balance is currently being addressed, but will not be fully completed until 2004/05.
- some work on statistical sampling of residential meter populations is proposed to enable life extension beyond the current maintenance program, however there is no indication at present of the likely results or regulatory acceptability. ActewAGL has based its forecasts on the same meter replacement intervals that applied during the first Access Arrangement period (refer section 10.6 above).
- the meter provision service is structured to reflect that ActewAGL does not own any meters which would be available for the replacement of existing meters (planned or otherwise), or for new customer installations.

In meetings with ActewAGL and Agility, ECG was also advised that:

[88] ActewAGL email 15/3/04

- all residential meter replacement program meters are new and are non-repairable; and
- a nominal provision is made for unrecovered costs associated with the relocation of ActewAGL network assets requested by third parties.

11.6.1 Review of proposed expenditure

Forecast capital expenditure provisions for cathodic protection, valve installations, facilities' regulator replacement and third part relocations are relatively minor compared to meter renewal. The first three of these items are associated with maintaining the integrity of the network and/or a safe and reliable supply of gas.

ECG considers that ActewAGL's relatively minor forecast expenditure for cathodic protection, valve installations, facilities' regulator replacement and third part relocations is fair and reasonable under the Code.

Given that ActewAGL has contracted out its operation to Agility, ECG requested ActewAGL to provide a breakdown of Agility's direct and overhead cost for meter renewal. ActewAGL was unable to provide this information. This request was made to help facilitate a benchmark comparison with efficient direct costs estimated by the Essential Services Commission (ESC) in its 2002 Final Decision for the Victorian distributors' 2003-07 Access Arrangements.

A comparison of ActewAGL's range of unit costs derived from Table 11-11 and ESC estimates (adjusted for CPI) are shown in Table 11-12 .

Table 11-12 Comparison of meter renewal unit costs, real 2004/05 dollars

	ActewAGL Cost $/meter	ESC Direct Cost $/meter
New residential meter*	150-160	125-135
I&C meter**	1828-4866	870-1770

* Includes new meter cost of $85 (ActewAGL budget assumption – email 15/3/04)
** It is assumed that I&C meters are mainly repaired.

ActewAGL's unit cost for a residential meter renewal is approximately 20% higher than ESC's direct unit cost. If this difference can be attributed to ActewAGL's/Agility's overhead then the costs may be comparable.

Based on the above, ECG has accepted the forecast residential meter renewal costs with some reservations and strongly recommends that the Commission requests ActewAGL to provide a breakdown of costs at the next review.

In its response to the draft report, ActewAGL has clarified the unit cost for the changeover of residential meters. The additional information showed that the meter replacement program also included a regulator replacement program for approximately 60% of regulators with the same age profile as the meters. Based on the additional information provided, ECG maintains its recommendation on accepting the residential meter renewal cost without further qualification.

Note: It is not clear why some ACT residential meters are non-repairable and why ActewAGL has not yet arranged to statistically sample residential meter performance and examined the possibility of seeking regulatory approval to enable life extension beyond the current maintenance program. This offers the potential to legitimately defer some capital expenditure. It is recommended that both these matters are further investigated before the next Access Arrangement Review.

ActewAGL has also responded on the issue of repairable versus non repairable meters. It said that optimal life-cycle cost solution for residential meters is to replace age change meters with new meters rather than refurbished meters. This is due to the marginal cost differential coupled with the reduced performance and life associated with refurbished meters. Based on its knowledge of the type of meters available in Australia, maintains that cost savings can be achieved through a repair program. These repaired meters generally have the same effective life in the field. Whilst it is acknowledged that for ActewAGL to set up such a program will require it to have a buffer stock of meters, the opportunity to do this is within the 2004/05 year after changing the backlog of time expired meters.

However, based on ActewAGL's comments above, ECG is keen to see ActewAGL's technical and economic evaluation of the feasibility of repairing domestic meters.

ActewAGL's total unit cost for an I&C meter renewal is well over double ESC's direct unit cost which suggests factors other than overhead are contributing to the difference. ECG does not consider this to be fair and reasonable and suggests it would be prudent to base the annual levels on half that proposed.

ActewAGL has also responded to the issue of the unit cost for the I&C meters. It has shown the following costs:

Average unit purchase cost 2005 $2531

Average unit purchase cost 2006 $3494

Average unit purchase cost 2007 $3694

It has also said that the variability was due to the different meter mixes encountered each particular year. Based on ActewAGL additional information, ECG has reassessed the forecast expenditure and recommends 80% as being prudent and efficient. This takes into account a mix of new and repaired meters.

ActewAGL's water meter renewal unit costs derived from

Table 11-11 are in the range $282 - $5,000/meter which suggests costs are not aligned to quantities.

Although the level of forecast expenditure for water meter renewal is relatively minor, it is suggested that the annual provision is based on ActewAGL's lowest unit cost of $282 (in 2009/10) and ActewAGL be requested to clarify and provide a breakdown of costs at the next review.

The recommended levels of forecast SIB capital expenditure are shown in Table 11-13 .

Table 11-13 SIB – Recommended Forecast Capital Expenditure, real 2004/05 dollars[89]

Item	2004/05		2005/06		2006/07		2007/08		2008/09		2009/10	
	Qty	$000	Qty	$000	Qty	$000	Qty	$000	Qty	$000	Qty	$000
High pressure system – additional cathodic protection	1	11										
Medium pressure system – install valves in high risk areas	2	3	2	3	2	3	2	3	2	3	2	3
Replace facilities' regulators	1	13	1	13								
Residential meter renewal and upgrade	4,734 6,827*	1,731	4,558	728	5,920	923	5,678	888	7,525	1,153	5,575	873
Water meter renewal and upgrade	17	5	0	0	11	3	1	0.28 2	11	3	85	24
I&C meter renewal and upgrade	157	612	143	430	124	325	131	302	87	153	64	95
Third party relocations		20		20		20		20		20		20
Total		**2,399**		**1,199**		**1,278**		**1,218**		**1,336**		**1,015**
Total Submitted		**2,552**		**1,306**		**1,360**		**1,294**		**1,374**		**1,038**

*Outstanding balance of aged replacement from first period

11.7 NON-SYSTEM CAPITAL EXPENDITURE

ActewAGL has forecast $0.5m in 2004/05 for a gas networks Graphical Information System (GIS). Agility is currently contracted to provide asset management processes and systems including all mapping functions. In meetings with ECG, ActewAGL advised it is planned to add a gas component to the existing water and electricity GIS which it owns. It has not been resolved at this stage whether Agility will operate the system on behalf of ActewAGL. Either way, ActewAGL advise that there will be no material financial impact on its Asset Services contract with Agility.

It is unclear why ActewAGL is planning to change the management arrangements for its mapping functions when all other asset management and asset services are contracted to Agility. Given that ActewAGL has been unable to fully substantiate its forecast provision of $0.5m, it is recommended that this amount is included in the calculation of reference tariffs and that it is subject to a prudency test at the next review.

11.8 DISPOSALS

ActewAGL has forecast $0.1m annually as shown in Table 11-1 for the disposal of assets planned to be replaced or scrapped as the network ages. They include meters replaced, but not at the end of their regulated asset lives, assets scrapped due to service disconnections and regulators, valves and other components planned to be scrapped or replaced.

[89] This table may need to be revised depending on the conclusion in relation to the unit cost of I&C meters.

In the absence of any further specific information from ActewAGL, the $0.1m annually appears to be a nominal provision.

11.9 RECOMMENDATIONS FOR CAPITAL EXPENDITURE 2005-2010

It is proposed that the forecast capital expenditure during the period from January 2005 to June 2010, and shown in the following table, be allowed for inclusion in the capital base for the Access Arrangement period commencing 1 January 2005.

Table 11-14 Expenditure proposed for inclusion in the capital base, January 2005[90]

Year ending 30 June $'million, real 2004/05	January to June 2005	2006	2007	2008	2009	2010
Stay-in –Business	1.20	1.20	1.29	1.22	1.34	1.02
Growth-Market Expansion	3.12	5.50	5.39,	5.29	5.32	5.24
Growth-Capacity Development	0	2.45	1.98	1.50	3.76	0.70
Total	**4.32**	**9.12**	**8.66**	**8.01**	**10.40**	**6.96**

It is also recommended that:

- The peak hour load factor used to determine average winter peak hour loads be reviewed at least once per five years.
- The severe weather load factor used to determine severe winter peak hour loads be reviewed at least once per five years.
- A risk assessment be conducted to review the appropriateness of planning networks to have sufficient capacity to supply peak loads under 1 in 20 year severe weather conditions
- Arrangements be put in place to ensure that data on the scope, costs and justification of facilities proposed for growth – capacity development expenditure in the next Access Arrangement period (commencing July 2010) is collected and made available for assessment prior to this next period
- A process be established to measure and report annually on asset utilization
- Arrangements be put in place for ActewAGL to provide information in a format which shows a breakdown of Agility's direct and overhead costs for the various categories of capital expenditure to facilitate meaningful benchmark comparisons to be made. To be able to get reasonable comparison on the costs between distributors, it is necessary to understand the split between overheads and direct costs. This is particularly relevant with the arrangement between ActewAGL and Agility.

In its response to the draft report, ActewAGL has requested for further justification for the above recommendation. Details of the justification can be found in the relevant section of the recommendations.

[90] Table to be adjusted following the additional information provided by ActewAGL in its response to the draft report.

12 OPERATING EXPENDITURE REVIEW 2000-2004

12.1 INTRODUCTION

Operating, maintenance and other costs are important contributors to determining the final revenue for ActewAGL. Sections 8.36 and 8.37 of the Gas Code sets out the provisions related to recovery of the operating and maintenance expenditure:

- Section 8.36 defines non-capital costs as the operating, maintenance and other costs incurred in the delivery of a reference service.
- Section 8.37 states that reference tariffs may provide for the recovery of all non-capital costs except for any costs that would not be incurred by a prudent service provider, acting efficiently, in accordance, with good industry practice, and to achieve the lowest sustainable cost of delivering the reference services.

The Code does not specifically outline the approach that has to be adopted to determine the efficient cost for a level of service. As such, ECG proposes to assess the non–operating costs in the following manner:

- The Commission's decision in the 2001 Access Arrangement will be the starting basis for the non-capital expenditure.
- A review of actual costs to assess trends, anomalies, differences in the various input categories.
- An analysis of the input categories to determine the reasonableness of the costs for the service provided.
- Where possible, comparison of overall costs in particular categories (e.g. total operating costs) with other companies.
- A review of ActewAGL's own forecasts of costs and the methods, processes and data used to derive them.
- A conclusion of the efficient cost for the 2004 Access Arrangement period after taking into account the various input factors. This cost will be the basis for establishing the non-capital expenditure for 2005 to 2010.

ActewAGL in its follow up response to ECG's presentation advised that in the Commission's Final Decision, it did not mandate to ActewAGL how non-capital costs should be apportioned between O&M, corporate overheads and marketing expenditure. Therefore should a roll forward be calculated it must be done as a whole and then adjusted for the various identified changes in operating costs.

ActewAGL also commented that ECG's approach has considered the costs on a line by line basis and used the lower of the roll forward amount or projected actual 2003/04 spend as not appropriate.

ActewAGL further advised that the ActewAGL's costs are based on efficient costs which have been verified against industry benchmarks including operating costs per kilometre and operating costs per customer.

ECG believes that the review of non-capital costs can be carried out in various ways. The benchmarking carried out by ActewAGL is at a high level and does not take into consideration specific circumstances in each utility e.g. differences in network age and condition. Benchmarking is useful in highlighting differences between networks but in ECG's opinion there are limitations in using benchmarks alone to establish efficient operating expenditure.

An alternative method is to review the amount of work and the unit cost associated with this work to assess the efficiency of such costs. The contract between ActewAGL and Agility is a cost based contract which does not provide ActewAGL with quantities of work. This data is not available for this review and would require a much more intrusive approach.

A further alternative is the method adopted by ECG and described above. ECG believes that this method is appropriate as it takes into consideration the various costs elements that have been considered as part of the Final Decision and the Commission's intent in relation to each of the line items. Essentially the Commission has sought for a productivity improvement of 3% in the operating and maintenance expenditure and a reduction of over 20% for marketing costs.

It is acknowledged that the Commission did not mandate how ActewAGL is to allocate its costs to the various activities. However, it should also be recognised that operating and maintenance expenditure is to ensure that that the network is operating safely and reliably. Whilst marketing expenditure is essentially for the growth and utilisation of the networks. The costs for each of these activities have been justified separately which means that to the extent possible, the majority of the costs should be spent in the appropriate categories.

In this case, ECG is of the view that ActewAGL has exceeded the Final Decision operating and maintenance costs. ECG believes that this is against the intent of the costs allocated for these activities.

In adopting its methodology, ECG has taken into consideration the historical costs and the factors that have influenced these costs.

ECG therefore believes that the methodology adopted is appropriate. It is based on its best endeavours to ensure that the efficient cost reflects the particular circumstances in the ACT.

Details of the review are provided in the sections below:

12.2 ACTEWAGL 2001 NON-CAPITAL EXPENDITURE

In the 2001 Access Arrangement, the Commission decided that ActewAGL's proposed non- capital costs would account for the following:

- A cost reduction before allowance for growth of 23.5 per cent in controllable costs over the four years 2000/01 – 2003/04. Controllable non-capital costs include

operation and maintenance, corporate overheads and marketing expenditure but exclude government levies, UAG and costs associated with retail contestability.

- Operating and maintenance expenditure and corporate overheads, allowance for growth with an equal 50% weighting applied to both total volume load growth and total customer growth.
- Marketing expenditure allowing for growth with an equal 50 per cent weighting applied to both tariff volume load growth and tariff customer growth.
- Initial exclusion of costs associated with retail contestability, but inclusion of a mechanism to allow such costs to be passed through to users/customers.

In its Access Arrangement submission, ActewAGL has indicated that its non-capital expenditure for the 2001 Access Arrangement period is higher than forecast as shown in Table 12-1 .

Table 12-1 ActewAGL non-capital expenditure, Commission forecast and actual, 2001-2004

Year ending 30 June	$ million, real 2004-2005			
	2001	2002	2003	2004
Final Decision	11.12	10.55	10.11	9.77
Actual	12.78	11.58	12.02	11.57
Differences	1.66	1.03	1.91	1.80

In summary, ActewAGL has attributed the increased expenditure to:

- Higher than forecast growth in customer numbers and substantial growth in the size of the network.
- Unexpected costs associated with the January 2003 bushfires
- Higher than anticipated insurance costs
- Costs associated with establishing the new asset management arrangement with Agility.
- The 2001 Access Arrangement and the price and incentive structure not becoming effective until January 2001 whereas the allowed levels assumed it would take effect from July 2000.

In relation to costs associated with not achieving the efficiency factors, ActewAGL indicated that it is not seeking additional compensation for the costs in the current period. Furthermore, ActewAGL believes that any future efficiency gains required by the Commission will be difficult to achieve.

ActewAGL has also indicated that it has achieved an overall real reduction in non-capital costs over the first Access Arrangement period. Table 12-2 shows the key performance indicators provided by ActewAGL over this period:

Table 12-2 Key Performance Indicators[91] Real 2004/05 $

Year ending 30 June	2001	2002	2003	2004
Opex/customer	150.0	130.9	129.7	119.2
Opex/km main	3,611	3,235	3,311	3,117
Opex/TJ	1,908	1,751	1,793	1,630

In its revision to the Access Arrangement, ActewAGL also provided an updated range of performance indicators used by the Commission to review the ActewAGL's cost. Table 12-3 is the table compares ActewAGL's performance with other service providers:

Table 12-3 Comparison of Key Performance Indicators[92 & 93]

	Opex/customer	Opex/km main	Opex/TJ	Customers/km of main
ActewAGL 2002/03 actual	$130	$3,311	$1,784	24.8
Envestra Vic 2000/01	$77	$4,192	$1,152	55.9
Multinet Vic 2000/01	$63	$4,176	$633	65.9
Envestra SA 2001/02	$109	$4,728	$1,310	49.8
Envestra Qld 2000/01	$147	$5,071	$2,408	16.4
Algas Qld 2000/01	$121	$3,717	$764	30.7
Envestra Albury 2000/01	$61	$2,934	$663	47.8
Country Energy Wagga	$108	$2,991	$99	27.6

Note: Opex is total non-capital costs as represented in AAIs

The above table indicates that ActewAGL's performance is broadly similar to the other utilities. However, the Commission in the 2001 Access Arrangement has given regard to the benchmark data in determining the lowest sustainable cost for a prudent operator.

As the Commission used a number of factors including the increase in customer numbers and the increase in network throughput, it is important to use a bottom up approach in assessing the non-capital expenditure. Therefore in considering the validity of

[91] ActewAGL Gas AA Submission page 23

[92] ActewAGL AA submission page 26

[93] In its response to the draft report, ActewAGL suggested using the updated KPI comparison even though the conclusions are the same. ECG take it into consideration in the final report.

ActewAGL's assertion that it has achieved an overall real cost reduction, it is necessary to compare the actual costs incurred by ActewAGL and the prudent cost determined by the Commission.

In its response to the draft report, ActewAGL stated that it compares well with other utilities taking into account market composition and network characteristics. It also questioned the approach adopted by ECG in this review and even if it had considered the approach as appropriate, it said that ECG had interpreted this methodology as rolling forward the costs set in 2000 rather that carrying out a detailed analysis of the reasons for differences in costs.

The Commission in the 2000 review has used benchmarking to determine the efficient level of expenditure. The level of expenditure has taken into consideration the increase in customer numbers and demand. ECG believes that given that a bench mark exercise has already been carried out, the approach to adopt for this review is to analyse the trends and any other factors that has caused ActewAGL to deviate from what is determined as an efficient level of expenditure. This assessment of the inputs into the expenditure will led into determining the efficient level of cost for 2004.

Using the 2004 efficient expenditure as the starting point and considering the impact of any trends in increased service levels such as safety and regulatory compliance will produce the best estimate of forecast costs for the next period. It is reasonable to expect that a prudent service provider can support its expenditure levels based on the service that it needs to deliver. This will lead to a better outcome of the cost estimate then a further benchmarking exercise.

As discussed in section 12.1, the Code is not explicit in the approach to be adopted for assessing the non capital expenditure. ECG therefore believes that the approach outlined above is consistent with the intent of the Code.

12.2.1 Analysis of the 2001-2004 Non-Capital Expenditure

The non-capital expenditure for ActewAGL covers a range of activities including network related maintenance, marketing, UAG and government charges. Therefore to understand the reasons behind the cost increase, it is necessary to categorise the non-capital expenditure in a similar manner to the ActewAGL's submission for non-capital operating expenditure for the 2005 to 2010 Access Arrangement period.

Table 12-4 Actual non capital operating expenditure for 2001 -2004[94]

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Controllable costs	Asset Services	5.10	4.76	4.33	4.18
	Asset Management	2.93	2.87	2.77	2.85
Sub total	Operations & Maintenance	8.03	7.63	7.10	7.03
	Corporate Overheads	0.52	0.47	1.10	1.69
	Non-system asset charge	0.48	0.48	0.48	0.48
	Marketing	2.83	2.29	1.70	1.48
	Other direct costs	0.12	0.12	0.16	0.24
Sub total		11.98	10.98	10.54	10.90
Other Allowable Costs	Government Levies	0.56	0.39	0.42	0.34
	Contestability costs	0	0	0	0
	UAG	0.17	0.17	0	0.10
	Other Costs	0	0.06	1.06	0.23
Subtotal		0.73	0.62	1.48	0.68
Total		12.70	11.61	12.01	11.57

In comparison, the Commission's non-capital expenditure in the 2001 Access Arrangement is divided in the following activities:

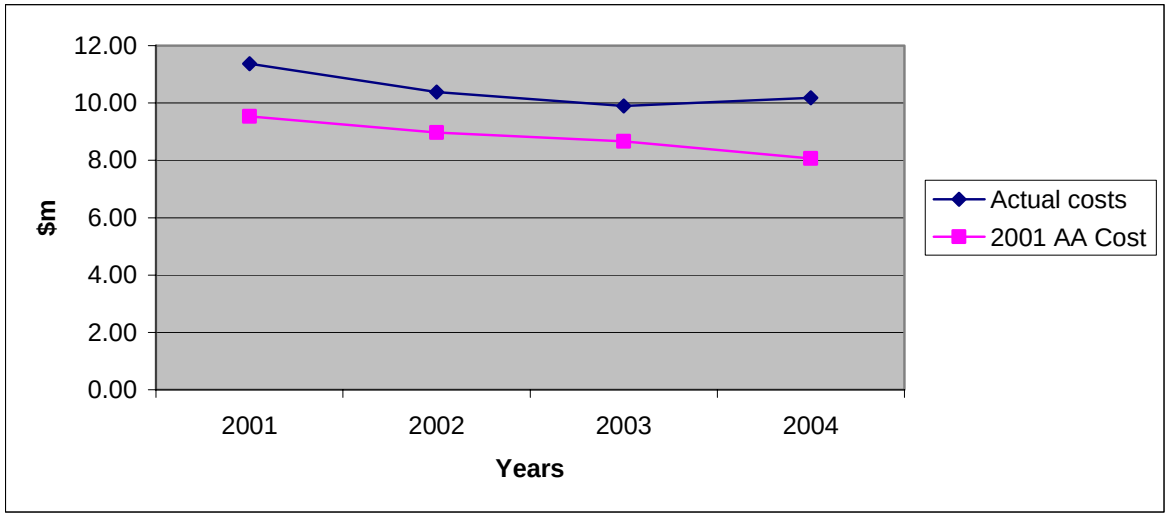
Table 12-5 2001 Access Arrangement Decision

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Controllable costs	Operations & Maintenance	4.13	4.13	4.13	4.24
	Corporate Overheads	1.90	1.90	2.01	1.96
	Marketing	3.46	2.90	2.46	1.96
Subtotal		9.49	8.93	8.60	8.06
	Government Levies	1.34	1.34	1.23	1.20
	Contestability	0	0	0	0
	UAG	0.22	0.22	0.22	0.22
Subtotal		1.56	1.56	1.45	1.42
Total		11.06	10.50	10.05	9.48

The difference between the actual controllable costs and the 2001 Access Arrangement is shown below.

[94] Information from ActewAGL spreadsheet Opex_2001_2010_Table _ICRC. Differences between Table 5.2 and 5.1 is partially due to rounding errors.

Figure 12-1 Comparison between Actual vs AA controllable expenditure Real 2004/05 $



ActewAGL advised that the material differences are due to the additional customer growth resulting in approximately an extra $0.1m per annum ($0.2m for 2003) above forecast and also the set up cost of $0.6 m for the new asset management arrangement with Agility in 2001.

In addition, the Access Arrangement did not become effective until 7 months into 2001 which reflected a difference of $0.5m.

However, in reviewing the costs in Table 12-4 and Table 12-5 , it can be seen that the difference between actual and approved operating and maintenance expenditure for the period is approximately $3m -$4m per annum higher than the approved amount. This is offset by the lower corporate overheads and the underspending in marketing expenditure for the period.

The sections below review the various activities under non-capital expenditure.

12.2.2 Operating and Maintenance expenditure

Table 12-6 below shows the actual versus the Commission's approved operations and maintenance expenditure.

Table 12-6 Comparison between Commission and Actual Operating and Maintenance Expenditure

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Final Decision	Operations & Maintenance	4.13	4.13	4.13	4.24
Actual	Operations & Maintenance	8.03	7.63	7.10	7.03
Difference		(3.90)	(3.50)	(2.97)	(2.79)

ActewAGL contracted the operations and maintenance of the network to Agility in October 2000. Other distribution businesses have also implemented similar arrangements. For example, Envestra contracts these activities to Origin Energy Asset Management and AGL Networks contracts to Agility.

However, it would seem that the ActewAGL arrangement has imposed additional costs rather than achieving cost savings. Before this conclusion is drawn, it is necessary to consider the factors that would affect the overall operating and maintenance expenditure.

Safety and Operating Plans

As discussed in section 9.2, the three SAOPs which have been prepared by Agility to conform to legislative requirements in the ACT and NSW. Sections in the SAOP include:

- ActewAGL/Agility organisational structures and key responsibilities;
- Description of the assets (gas networks/pipelines);
- Risk management;
- Operations and maintenance measures;
- Summary of emergency response plans
- Management of records; and
- Audit schedules, review and updating of SAOPs.

It is considered that the contents of ActewAGL's/Agility's SAOPs should be adequate to underpin the safe and reliable operation of the networks and pipeline and are what would be expected from a prudent owner/operator as required under the General Principles of the Code, clause 8.1(c)

In discussions with ActewAGL there is no material changes in the SAOP that would warrant the increase in costs for the operations and maintenance activities.

In its response to the draft report, ActewAGL stated that at there are increased additional obligations placed on the organisation not considered at the time of the review for the current Access Arrangement. They include additional regulatory and licence compliance, consumer protection requirements and OH&S requirements. In its review of the various activities associated with non operating costs, ECG has taken into consideration these factors. ECG therefore concurs with the comments made by ActewAGL.

Another factor for consideration is the asset condition which has an impact on the planned and unplanned maintenance activities. The key performance indicators in relation to the asset condition is discussed below.

12.2.3 Key Performance Indicators- Asset Condition

A key factor that affects the non-capital expenditure is the condition of the assets. Section 9.6 discussed the performance indicators used in determining the condition of the assets. Whilst there is minimum data provided to determine the condition of the assets, the network by its nature has a long economic life and as such does not usually experience a step change in the condition of its assets. The data provided does not indicate any material change that will require significant additional costs.

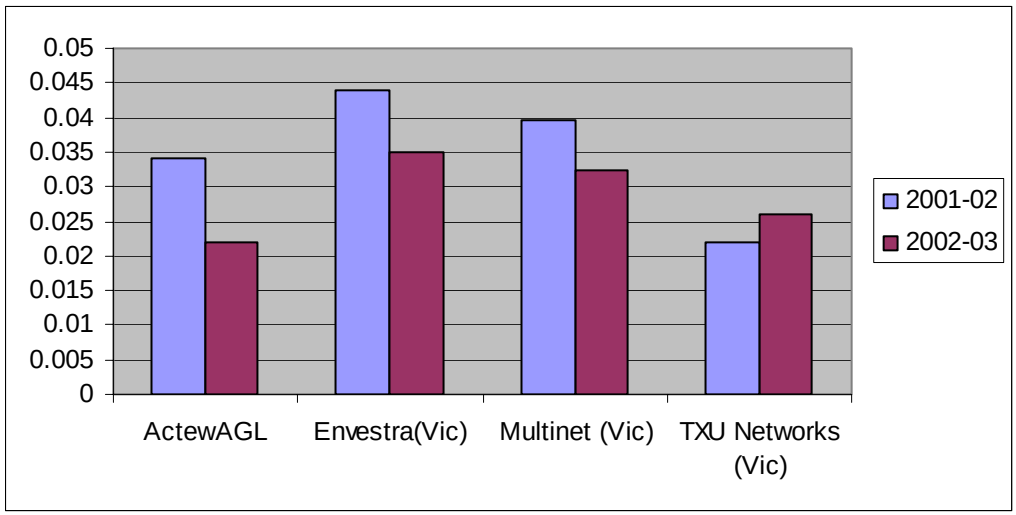
Further analysis has also been carried out on the data provided by ActewAGL to the Commission as part of its licence obligations. The key indicators[95] that have been published by the Commission are:

- Unplanned interruptions affecting more than 5 customers.
- Number of gas leaks reported by the public.
- Number of gas leaks detected in survey.
- Number of mechanical damage incidents.
- Gas Specification
- Gas regulator and gas meter replacement.

Unplanned interruptions affecting more than 5 customers.

Comparison of the number of unplanned interruptions affecting more than 5 customers in the ACT with those of Victoria is shown in Figure 12-2.

Figure 12-2 No of Interruptions per 1000 customers



Leaks

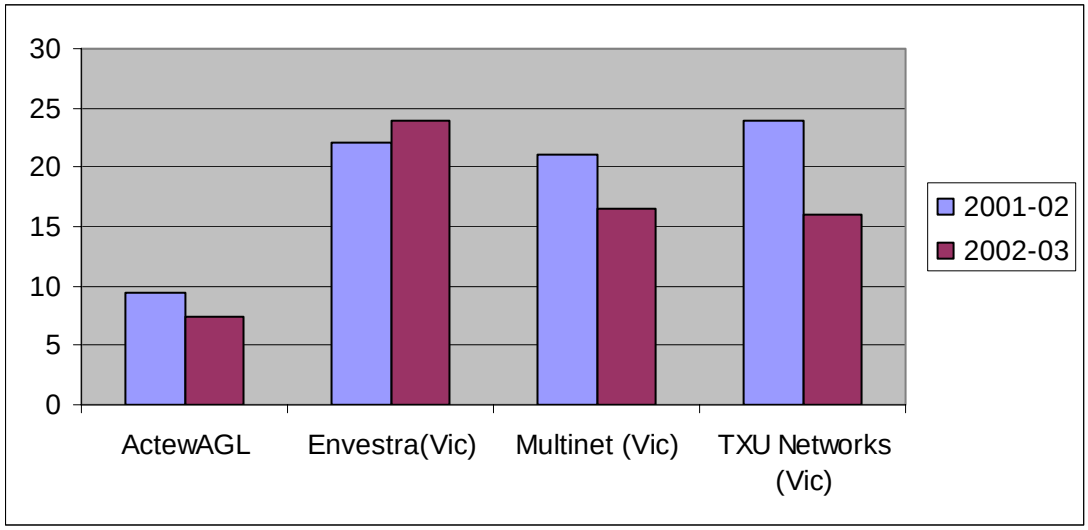
Public reported leaks

The number of gas leaks reported by the public fell by 13.8%, from 9.7 per 1000 customers in 2001-2002 to 8.3 per 1000 customers in 2002-03. All reported gas leaks are related to the medium pressure system, with no reported leaks for the high pressure systems.

Comparison between ACT and Victoria is shown in the following table.

[95] ICRC Compliance and Performance Report 2002-03

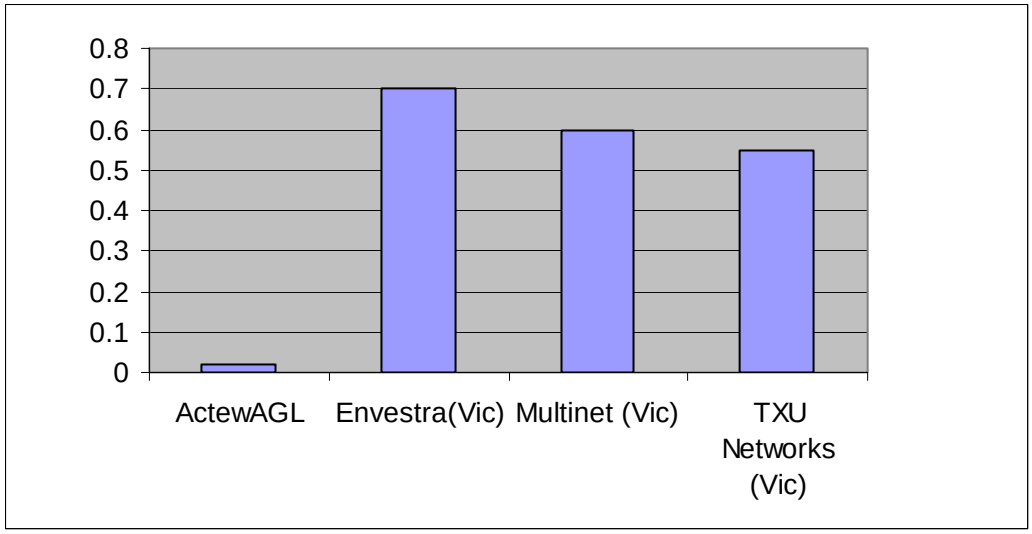
Figure 12-3 No of public reported leaks per 1000 customers



Gas leaks detected by survey

ActewAGL did not conduct any survey in 2002. The last survey (in 2002-03) detected 100 leaks. Comparison with Victorian distributors of the number of leaks per kilometre of main surveyed is shown in the following table.

Figure 12-4 Gas Leaks detected by Survey (per km of main)



Mechanical damage incidents

There were no incidents in the high pressure system. However, in 2002-03 there were 291 damage incidents in the ActewAGL medium pressure distribution system. This represents 92.2 incidents per 1000 kms of medium pressure mains which is 23.3% above the 2001-02 level. ActewAGL attributes this increase to the higher level of construction activity in 2002-03.

Gas Specification

ActewAGL reported that the gas delivered remained within the gas specification.

Gas Regulator and Meter Replacement Program

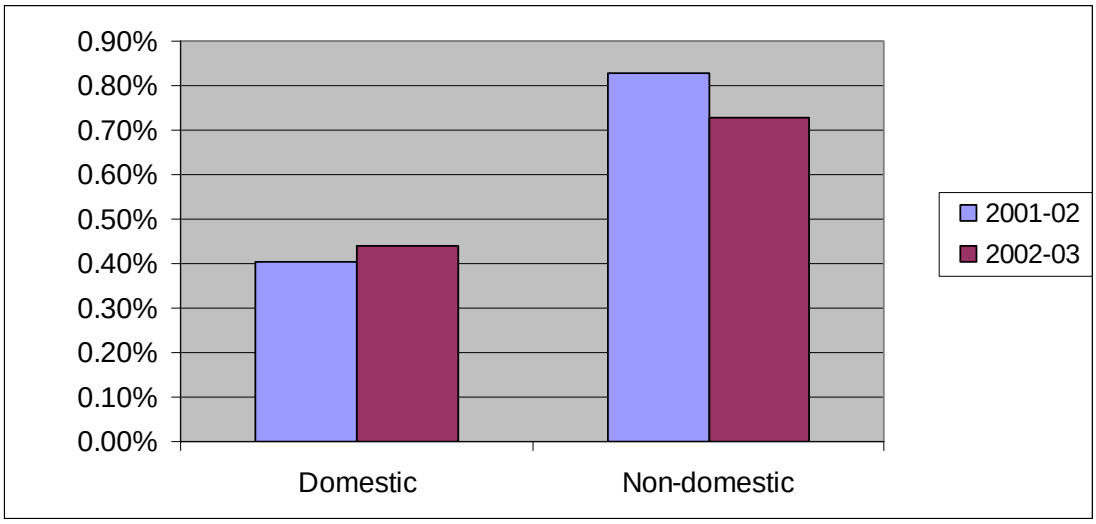
The regulator and meter replacement program in this section refers to equipment that failed whilst in service and required replacement. It provides an indication of the reliability of this equipment.

The number of regulators for domestic customers increased by 20.2%. 357 were replaced in 2001-02 compared to 429 in 2002-03. As a proportion of domestic customers, the number of regulators replaced increased from 0.41% to 0.47%.

For non-domestic customers the replacement program fell from 18 in 2001-02 to 16 in 2002-03. This represents a change from 0.85% of customers to 0.74%.

The charts below shows the regulator and meter replacement program for 2001-02 and 2002-03.

Figure 12-5 Gas Regulator Replacement as a proportion of customers



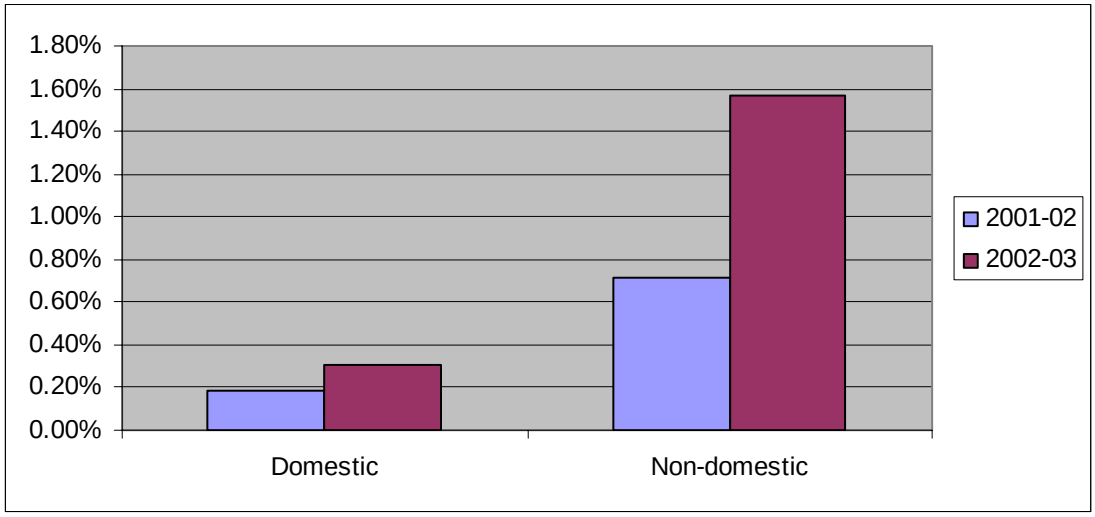
ActewAGL meter replacement numbers increased significantly from 2001-02 to 2002-03. The number of meters replaced for domestic customers increased from 168 in 2001-02 to 279 in 2002-03. This represents an increase from 0.19% to 0.31% of the total meters in service.

For non-domestic customers, the number of meters replaced increased from 15 in 2001-02 to 34 in 2002-03. This represents an increase from 0.71% to 1.57%.

ActewAGL attributed this increasing rate of meter replacement to the meter age profile.

The chart below shows the proportion of meters replaced.

Figure 12-6 Meter Replacement as a proportion of customers



12.2.4 Summary

The information available to draw any conclusion on the condition of the asset is limited. However the following key trends in the condition of the assets can be inferred:

As shown in Table 9-2 , the number of leaks in the medium pressure system reported by the public has not materially increased which implies that the condition of the assets has not changed. In comparison to utilities in Victoria, the leakage rate is considerably lower. This may be due to the amount of aged cast iron pipes in the Victorian system which is prone to leaks.

- The number of incidents of mechanical damage has risen due to increased activity in the housing industry. Better education of third party contractors may assist in reducing the level of these damages. ECG recognizes that Agility does participate in education schemes such as "Dial Before You Dig".

Therefore from the analysis above, the following is concluded:

- The asset condition has not changed, at least not to the extent that there is any material impact on the costs.
- Based on the information provided, it appears that the ActewAGL has not achieved the operating cost savings envisaged by the Commission in its 2001 Access Arrangement decision.
- ActewAGL has not provided evidence that substantiates its position that further efficiency is not achievable

It is recommended that the Commission continues to use the operating and maintenance costs in its current Access Arrangement as the starting point for the next Access Arrangement period.

In its response to the draft decision, ActewAGL stated that the 2000 Access Arrangement did not consider the market management activities it had to carry out. These include management of gas quality entering the network, management of emergency supply

situation, management of daily nominations and imbalance reconciliation process. The situation has become more complex with FRC.

Some of the market management activities such as gas quality monitoring, management of emergency supply situation would have been carried out by ActewAGL even prior to the 2000 Access Arrangement. However, it is acknowledged that since FRC some of these activities would have been more complex requiring additional resources.

ActewAGL has provided a cost of $0.4m for carrying out these activities in 2004. As most of these activities are associated with the Control Room and the additional resources required, ECG proposes to recommend that this expenditure be accepted and be included in the operating and maintenance expenditure.

Based on the above analysis, ECG has calculated the prudent operating and maintenance expenditure using the Commission's final decision for this expenditure and estimated the cost for the activities not directly associated with carrying out the work on the network. ECG has called these activities "Agility overheads".

In addition, as discussed above, the 2004 cost has been adjusted to include the cost for market management activities and adjusted for the higher actual customer growth as compared to the forecast in the current Access Arrangement. The table below shows ECG's estimate of prudent expenditure.

Table 12-7 ECG estimated Operating and Maintenance Expenditure 2001 -2004

Year ending 30 June		**$ million, real 2004-2005**			
		2001	**2002**	**2003**	**2004**
Controllable costs	Operations & Maintenance	4.13	4.13	4.13	4.9
	Agility Overheads[96]	1.38	1.38	1.38	1.46
Total		5.5.1	5.51	5.51	6.36

To adjust the expenditure level to the same categories set out in the Access Arrangement information, ECG has divided the total operating and maintenance expenditure using the proportion[97] of 60% for asset services and 40% for asset management as shown in the table below:

Table 12-8 Recommended Operating and Maintenance Expenditure 2001-2004

Year ending 30 June		**$ million, real 2004-2005**			
		2001	**2002**	**2003**	**2004**
Controllable costs	Asset Services	3.31	3.31	3.31	3.82
	Asset Management	2.20	2.20	2.20	2.54
Total		5.51	5.51	5.51	6.36

[96] Estimated cost for overhead activities estimated by ECG.

[97] Derived using the proportion in Table 12-1

12.2.5 Overheads

From Table 12-4 and Table 12-5 , the corporate overheads for ActewAGL have increased from $0.5m in 2001 to approximately $1.7million in 2004. Table 12-9 below shows the difference between the actual and the Commission approved expenditure.

Table 12-9 Comparison between Actual versus Commission's approved overheads.

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Final Decision	Corporate Overheads	1.90	1.90	2.01	1.96
Actual	Corporate Overheads	0.52	0.47	1.10	1.69
Difference		**1.38**	**1.43**	**0.90**	**0.27**

One of the reasons for the relatively low 2001 and 2002 is due to some of the management costs being transferred to Agility.

There is a significant increase in cost in 2003. ActewAGL has indicated that some of the additional costs are due to increase in insurance premium after the collapse of the World Trade Centre on September 11 2001. The increase in premium as a result of this incident and the collapse of HIH has been well documented in the press and other media. It is therefore considered reasonable that ActewAGL would have experienced significant additional costs for insurance.

Another reason given for the increase in overheads is the additional cost of regulatory and compliance requirements from new and amended legislations. They include:

Increased licence reporting requirements both to Commission in ACT and the Department of Energy, Sustainability and Utilities in NSW.

- NSW – Gas Supply Act
- Environment Protection Act
- Emergency Management Act
- Consumer Protection Code
- Ring-fencing guidelines

The trend in the increased expenditure will be an important factor in considering the appropriate overheads for the next Access Arrangement period.

In its response to the draft report and additional information provided in the email dated 30 April, ActewAGL has provided additional information regarding the overhead allocation. It is also noted that the insurance cost mentioned above has actually been allocated to the line item "Other Direct Costs". As such the comments above on insurance are applicable to section 12.2.8. The additional costs incurred in this section are for legal and consultants costs.

12.2.6 Marketing

A key component of the 2000 Final Decision was that ActewAGL's marketing expenditure be reduced by 41.6% between 2000/01 and 2003/04 from $3.48m to $1.96m.

ActewAGL achieved an actual reduction of 48.4% from $2.83m to $1.46m

The Commission forecast and actual marketing expenditure is shown in Table 12-10 .

Table 12-10 ActewAGL marketing expenditure, Commission forecast and actual, 2001-04

Year ending 30 June	$ million, real 2004-05				
	2001	2002	2003	2004	Total
Final Decision	3.46	2.90	2.46	1.96	10.78
Actual	2.83	2.29	1.7	1.46	8.28
Difference	**0.63**	**0.61**	**0.77**	**0.50**	**2.50**

ActewAGL's Access Arrangement Information and Proposed Revisions submissions do not indicate how the reduced level of marketing expenditure was achieved. It did not provide any additional information in relation to any analysis of or comment on the impact of the lower expenditure on the connection of new customers and the consumption of existing customers.

Over the period 2001 – 2004, ActewAGL has achieved the following:

- Network marketing cost per new customer[98] $499
- Network marketing cost per GJ $8

Comparing the above indicators with other distribution businesses would still rank ActewAGL above the Victorian distributors.

It is also worth noting that in spite of the reduced marketing expenditure, ActewAGL has indicated that its customer growth is above forecast.

ActewAGL in its response to the draft report said that growth does not in itself tell us about the effectiveness of marketing and that it considers the marketing effort to be reasonable.

ECG agrees that the growth in the customer numbers is also influenced by other factors. This is one of the factors that has to be taken into consideration in reviewing the forecast marketing expenditure for the next Access Arrangement period.

12.2.7 Non-System Asset Charge

The non-system asset charge of $480,000 is Agility's charge for the provision and maintenance of assets that were previously included in the regulatory capital base. The assets include a variety of items including computers and the NGV refilling station at Fyshwick.

[98] Information from table supplied to MMA on customer numbers and consumption.

ActewAGL advised that the amount is based on the allowed depreciation of non-system assets in the current Access Arrangement of $540,000 p.a.

The joint venture was in place for only 9 months of the first year of the Access Arrangement period so 9/12 of the cost was included which the basis for the charge is. The $480,000 is the amount escalated by CPI to 2004/05 $. It should be noted that this cost was not included in the 2001 Access Arrangement decision.

As this cost has come about following the contracting out of the operation and maintenance activities to Agility, we propose to recommend accepting this cost as efficient. There will need to be an adjustment to the ActewAGL capital base to allow for this additional cost.

ActewAGL in its response to the draft report has indicated that the non system assets have been removed from the capital base.

12.2.8 Other Direct Costs

Other direct costs are included under Controllable costs in Table 12-1 . ActewAGL has not provided details of this cost. The cost varies from $120,000 in 2001 to $240,000 in 2004. In 2004, $240,000 would represent 2% of the total controllable expenditure.

Given that there is no information provided, ECG is unable to comment on the efficiency of the costs and as such recommends that the cost be excluded from the Access Arrangement.

In its response to the draft report, ActewAGL has advised that it has reallocated the insurance costs to this line item. As discussed previously, insurance costs have significantly increased following the various terrorist incidents and the collapse of HIH. As such, ECG proposes to recommend accepting this cost.

12.3 OTHER ALLOWABLE COSTS

12.3.1 Government Levies

Table 12-4 and Table 12-5 show the difference between the government levies approved by the Commission and the actual incurred.

Table 12-11 Comparison of actual and approved Government Levies

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Final Decision	Government Levies	1.34	1.34	1.23	1.20
Actual	Government Levies	0.56	0.39	0.42	0.34
Difference		0.78	0.96	0.82	0.86

ECG does not propose to comment on Government Levies as they are costs associated by the Government on AGL.

12.3.2 UAG

The following table shows the difference between the Unaccounted for Gas (UAG) approved by the Commission and the actual incurred.

Table 12-12 Comparison of actual versus approved UAG

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Final Decision	UAG	0.22	0.22	0.22	0.22
Actual	UAG	0.17	0.17	0	0.10
Difference		0.05	0.05	0.22	0.12

ActewAGL has also advised that the actual UAFG levels for years 2000 to 2003 are as shown in the following table and that for 2002/03 the UAG amount was 51.5 TJ at a cost of $89,183, equivalent to 0.77% UAG. This is an average cost of $1.73 / GJ.

This expenditure differs to that given in the table above for 2002/03, and ECG is unable to reconcile the information provided by ActewAGL. The Commission approved UAG of $220,000pa at the stated approved level of 0.7% implies about 47TJ pa UAG in 2002/03 at an average cost about $4.68 / GJ, much higher than the above $1.73 / GJ.

Table 12-13 UAG for the Networks[99]

Year	2000	2001	2002	2003
UAG	1.1%	1.56%	0.9%	0.77%

Whilst it is difficult to reconcile data in the tables above it is worth noting that UAG, which is the difference between injections of gas into the network and the withdrawals out of the network, is difficult to determine accurately. There are many factors that affect the percentage of UAG such as metering accuracy, timing of meter reading and leakages through the system. Considering the age and condition of the network, it would be reasonable to assume that leakage through the network would not be a key influence.

The actual UAG from 2000 to 2003 averaged 1.08% compared with the allowed 0.7%. This is not unreasonable, nor is the variability between 0.77% and 1.56%, given the uncertainties in determining UAG. However insufficient information is available to allow a realistic price of UAFG to be determined.

As the actual expenditure claimed by ActewAGL in its submission is significantly less than that allowed by the Commission, it is recommended that this be accepted as an operating cost for this current Access Arrangement period (2000-2004). However much clearer data on the volume and cost of UAG should be provided before expenditure on this is accepted for inclusion as an operating cost during the next period. Arrangements to ensure this occurs should be put in place now, to ensure the data is available for future analysis.

[99] Email from ActewAGL 19 March titled " ActewAGL Response"

In the email dated 30 April, ActewAGL provided different information in relation to the UAG for the network. ECG proposes to adopt the UAG in Table 12-14 .

12.3.3 Other Costs

The "other costs" for the period 2001 -2004 is shown in the table below:

Table 12-14 Other Costs

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Actual	Other Costs	0	0.06	1.06	0.23

The 2002 cost is for training, consultants and legal expenses. The cost is not a material amount and it is recommended that it be accepted.

The major item in the 2003 expenditure is the cost associated with the Canberra bushfires. ActewAGL has shown a cost of $1m associated with the legal expenses and additional resources required at that time. Due to the unexpected nature and magnitude of the incident, it would be reasonable for ActewAGL/Agility to need resources which would be over and above those normally expected of a prudent operator.

The major item in the 2003 expenditure is the cost associated with the Canberra bushfires. ActewAGL has shown a cost of $1m associated with the legal expenses and additional resources required at that time. Due to the unexpected nature and magnitude of the incident, it would be reasonable for ActewAGL/Agility to need resources which would be over and above those normally expected of a prudent operator.

ActewAGL has also advised that the $0.23m[100] is the ongoing compliance costs due to changes in operational practices following the bushfires such as annual clearing of key gas sites to minimise fire risks. In addition the costs also include additional commitments relating to Emergency Management Committees in both the ACT and NSW, ongoing awareness programs and on-going OH&S.

As the coronial inquiry is still in progress, ACTPLA is unable to comment on any future requirements that may arise from the inquiry. However, it would seem reasonable that given the severity of the bushfire, there would be some additional responsibilities placed on ActewAGL, especially in the area of ongoing awareness programs.

On this basis, ECG recommends accepting the cost.

12.4 CONCLUSIONS FOR 2001-2004 NON-CAPITAL EXPENDITURE

From the analysis above, ECG has drawn the following conclusions:

- ActewAGL has not achieved the cost savings envisaged by the Commission in the 2001 Access Arrangement in relation to its operating and maintenance expenditure.

[100] ActewAGL Email dated 15 March "Friday Discussion Information"

- The corporate overheads have increased to effectively the level determined in the 2001 Access Arrangement due to a more appropriate allocation of overheads.
- Marketing expenditure is less than the 2001 Access Arrangement. However no information is provided in relation to the impact that this has had on the connection of new customers and the consumption of existing customers.
- The non-system asset charge has resulted from the transfer of assets to Agility which means that there is a need to adjust the capital base for these assets.
- "Other Direct Costs" is the insurance costs incurred by ActewAGL and as such should be included.
- Government levies are less than approved amount.
- There is inconsistent information presented for UAG making it difficult to determine the appropriate amount. . Improved data should be provided to determine UAG expenditure in the next Access Arrangement period.
- The "Other Costs" category includes the cost associated with the 2003 bushfires and its associated costs should be accepted. The 2002 cost is not a material amount and should also be accepted.

12.5 RECOMMENDATIONS

Based on the above conclusions, the following recommendations show the expenditure that should be achieved by a prudent service provider in accordance with the Code.

Table 12-15 2001-2005 Prudent expenditure[101]

Year ending 30 June		$ million, real 2004-2005			
		2001	2002	2003	2004
Controllable costs	Asset Services	3.31	3.31	3.31	3.82
	Asset Management	2.20	2.20	2.20	2.54
	Corporate Overheads	0.52	0.47	1.10	1.69
	Non-system Asset Charge	0.48	0.48	0.48	0.48
	Marketing	2.83	2.29	1.7	1.46
Subtotal		9.34	8.75	8.79	10.23
Other Allowable Costs	Government Levies	0.56	0.39	0.42	0.34
	Contestability	0	0	0	0
	UAG[102]	0.17	0.17	0.0	0.10
	Other costs	0.0	0.06	1.06	0.23
Subtotal		0.73	0.62	1.48	0.67
Total		10.07	9.37	10.27	10.90

Note: As discussed in section 10.9 on the treatment of the costs for the period July to December 2004, the expenditure for the financial year 2005 should be divided equally between the 2000-2004 and the 2005-2010 Access Arrangement period.
The 2004 operating and maintenance costs has been adjusted to include the actual growth in demand and forecast and also the additional market operations costs
The Asset services and Asset Management costs have been adjusted to include the actual growth in demand and forecast.

[101] Table 12-3 will be modified for changes following the response from ActewAGL and adjusted for growth in customer numbers and demand.

[102] UAG was left at the higher number due to the inconsistent information.

13 OPERATING EXPENDITURE 2005-2010

13.1 ACTEWAGL FORECAST NON-CAPITAL EXPENDITURE

ActewAGL forecast non-capital expenditure is provided in the table below.

Table 13-1 Non-capital expenditure 2005-2010

Year ending 30 June	$ million, real 2004-2005						
	Forecast 2004	2005	2006	2007	2008	2009	2010
Controllable costs							
Asset Services	4.18	4.46	4.52	4.75	4.80	4.84	4.87
Asset Mgt	2.85	3.10	3.08	3.02	2.97	2.89	2.83
O&M	7.03	7.56	7.60	7.77	7.77	7.73	7.70
Overheads	1.69	1.92	1.92	1.92	1.92	1.92	1.92
Asset charge	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Marketing	1.46	1.84	1.87	1.89	1.90	1.93	1.95
Other costs	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Sub total	10.90	12.04	12.09	12.30	12.31	12.30	12.29
Other Costs							
Government Levies	0.34	0.55	0.55	0.55	0.55	0.55	0.55
Contestability costs	0.00	0.45	0.46	0.46	0.46	0.46	0.45
UAG	0.10	0.26	0.26	0.28	0.29	0.29	0.31
Other Costs	0.23	0.24	0.24	0.24	0.24	0.25	0.25
Total	0.67	1.50	1.51	1.53	1.54	1.55	1.56
Total	11.57	13.54	13.60	13.83	13.85	13.85	13.85

ActewAGL provided the following reasons for the costs increase:

- An initial increase of its cost from 2004 to 2005 due to inclusion of contestability costs, higher government fees and levies and increase marketing costs.
- An increase of 2 per cent in real terms over the period from 2005 to 2010.
- An increase in corporate overheads due to better allocation of joint costs and increased legal and It support costs.
- An increase in asset services costs and asset management costs allowing for market growth as provided in the 2001 Access Arrangement decision.

In addition, it assumed an efficiency factor of 1.5%.

Having reviewed the non-capital cost for the 2000 to 2005 Access Arrangement and establishing the recommended prudent expenditure for 2004, ECG propose to roll forward the details of this expenditure as the base for the 2005-2010 expenditure.

13.1.1 Operating and Maintenance Expenditure

ActewAGL's operating and maintenance expenditure is shown in the table below.

Table 13-2 ActewAGL Forecast Operating and Maintenance Expenditure

Year ending 30 June	$ million, real 2004-2005						
	Forecast 2004	2005	2006	2007	2008	2009	2010
Asset Services	4.18	4.46	4.52	4.75	4.80	4.84	4.87
Asset Mgt	2.85	3.10	3.08	3.02	2.97	2.89	2.83
O&M	7.03	7.56	7.60	7.77	7.77	7.73	7.70

ActewAGL advised that the expenditure has been adjusted for growth in accordance with the 2001 Access Arrangement decision with an assumed efficiency factor of 1.5%.

In addition, in 2007, there is an increase in the Asset Services costs when the operations and maintenance of the Hoskinstown metering station transfers from Duke Energy to ActewAGL.

In section 12.4, ECG recommended the cost for 2004 that would be incurred by a prudent service provider for the operation and maintenance activities is $5.62m (includes Agility's overheads). If the recommended expenditure for 2004 is the starting point for the forecast expenditure for the period 2005 to 2010, the prudent expenditure will be as shown in Table 13-3 .

In calculating the values in Table 13-3 , ECG has included an allowance of half the annual load increase and the annual customer increase. There is also an allowance of 1.5%[103] efficiency factor which is consistent with ActewAGL's proposal.

Table 13-3 ECG Estimated Operating and Maintenance Expenditure

Year ending 30 June	$ million, real 2004-2005						
	2004	2005	2006	2007	2008	2009	2010
Agility's Direct Cost	4.9	5.01	5.15	5.35	5.56	5.75	5.94
Agility's Overheads	1.46	1.49	1.51	1.53	1.55	1.57	1.58
O&M	6.36	6.50	6.66	6.89	7.11	7.32	7.52

[103] 1.5% is appropriate if ActewAGL has achieved the operating expenditure consistent with the 2001 Access Arrangement decision.

Note: The above expenditure has taken into consideration the Commission's allowance for 50% of the growth and load increases. The expenditure has also applied an efficiency factor of 1.5% as proposed by ActewAGL. An allowance has been made for the operations and maintenance cost of the Hoskinstown metering station.

However, from Table 13-2 above, the actual expenditure for 2004 incurred is $7.03m. ECG believes that the main reason that the operation and maintenance cost is higher than the 2001 Final Decision is that ActewAGL has not realised the savings anticipated

One way of dealing with this is for the Commission to accept the actual costs in 2004 and impose a requirement on ActewAGL to achieve the prudent cost in 2010 as shown in Table 13-3 . Whilst this may not be strictly in accordance with the Code, realistically operating expenditure can only be decreased gradually without affecting delivery of service.

For the purpose of the report, ECG recommends the prudent expenditure as shown in Table 13-3 .

ActewAGL in its response to the draft report, disagreed with the methodology applied. ECG believes that the approach adopted will give a reasonable estimate of the expenditure. This is discussed in section 12.2. However, ECG proposes to include in the operating expenditure the additional items that it concurs with following ActewAGL's response. The items are in section 12.2.1.

To adjust the expenditure level to the same categories as set out in the Access Arrangement Information, ECG has divided the total operating and maintenance expenditure using the proportion[104] of 60% for asset services and 40% for asset management as shown in the table below:

Table 13-4 Recommended Operating and Maintenance Expenditure 2004-2010

Year ending 30 June	$ million, real 2004-2005						
	2004	2005	2006	2007	2008	2009	2010
Asset Services	3.82	3.90	4.00	4.19	4.32	4.45	4.57
Asset Management	2.54	2.6	2.68	2.70	2.78	2.87	2.95
O&M	6.36	6.50	6.66	6.89	7.11	7.32	7.52

13.1.2 Corporate Overheads

ActewAGL's forecast corporate overheads are shown in the table below:

Table 13-5 Corporate Overheads

Year ending 30 June	$ million, real 2004-2005						
	Forecast 2004	2005	2006	2007	2008	2009	2010
Overheads	1.69	1.92	1.92	1.92	1.92	1.92	1.92

[104] Derived using the proportion in Table 12-1

ActewAGL advised that the corporate overheads include finance services, legal services, business systems, audit and senior executive costs. It claims that following an increase in the overheads to take into consideration the legal and regulatory support, the forecast costs will remain constant in real terms.

In section 12.4, ECG recommended that the prudent expenditure for corporate overheads is $1.69m due to increase in insurance premiums and regulatory and compliance costs. ActewAGL has indicated that the additional cost of $0.3m is for legal and regulatory support which appears to be accounted for in $1.69m in 2004.

We therefore recommend that the prudent cost of $1.69m be accepted for 2004 and consistent to ActewAGL's approach remain constant for the 2005-2010 Access Arrangement period.

As discussed in section 12.2.5, ActewAGL has advised that the 2005 forecast expenditure is more representative of the corporate overhead cost allocated to the gas network. In addition, the conclusion in section 2 is that the corporate overheads have been appropriately allocated. As such, ECG proposes to amend its recommended corporate overheads to the forecast expenditure of $1.92m as forecast in 2005.

13.1.3 Non-system Asset Charge

The non-system asset charge has been discussed in section 12.2.7. Essentially it is Agility's charge associated with the transfer of asset from ActewAGL to Agility. The $0.48 takes into consideration the depreciation of the assets and stays constant for the period of the 2005-2010 Access Arrangement period.

We therefore recommend accepting the cost.

13.1.4 Forecast Marketing Expenditure 2005-2010

ActewAGL's marketing expenditure is forecast to decline in real terms over the period and is shown in the Table 13-6 .

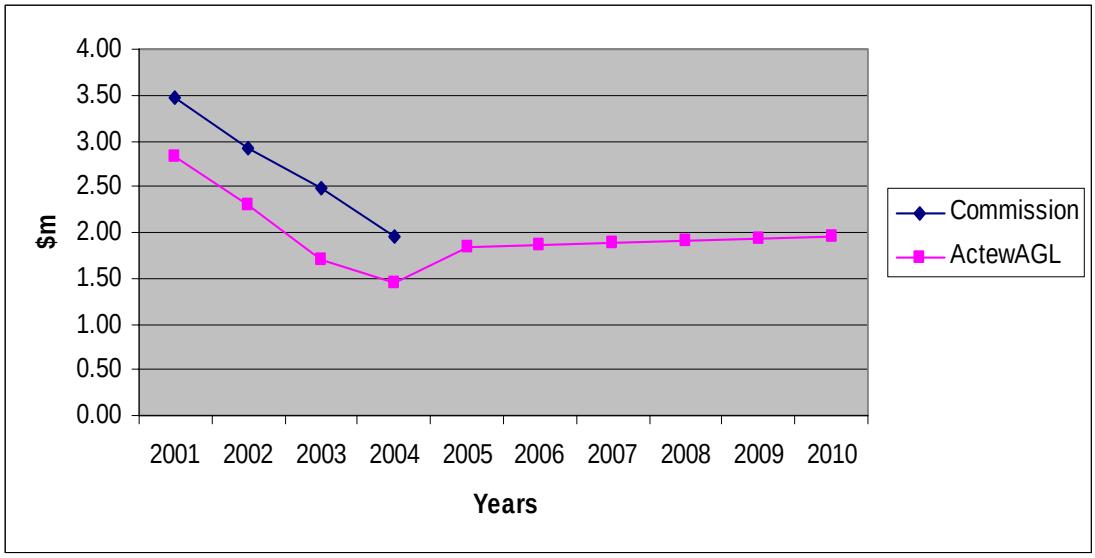
Table 13-6 ActewAGL forecast marketing expenditure, 2005-10

	Real $ million 2004/05						
Year ending 30 June	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Forecast	1.84	1.87	1.89	1.90	1.93	1.95	11.38

ActewAGL's Proposed Revisions state its gas marketing strategy is guided by survey information compiled annually by Agility. A key finding from the most recent survey information is that the scope for growth in new connections to gas is fairly limited because about 70% of all homes which can connect to gas are connected. However, because about one-third of all gas homes use gas for cooking only, there is considerable scope to encourage greater use of gas hot water systems by those who are already connected. Strong growth potential for gas hot water systems in the residential high rise and medium density market has also been identified.

No reasons are presented by ActewAGL for the 26% increase in expenditure between the 2004 actual of $1.46m and 2005 forecast of $1.84m which is also marginally higher than the 2003 actual of $1.7m.

Figure 13-1 ActewAGL Marketing Expenditure 2001-2010



It is accepted that the strength of the relationship between marketing expenditure and the level of gas demand may be uncertain; however no evidence is provided of any objective assessment of the impacts of marketing on demand.

The proposed level of marketing costs was the subject of considerable discussion during the first Access Arrangement Review when the Commission's KPI (marketing cost/operating cost ratio, marketing cost/customer ratio, marketing cost/new customer ratio) analysis suggested that ActewAGL's marketing costs were relatively high.

The Commission decided that ActewAGL's marketing costs should be reduced to $1.8m in 2003/04 which equates to about 23% of controllable operating expenditure. The Commission suggested it could be argued that prudent marketing costs for ActewAGL range between $0.2m and $1.6m, however the determination of $1.8m took into account that particular factors impact adversely on the level of ActewAGL's marketing expenditure relative to other operators including those in Victoria.

In 2002 the Essential Services Commission (ESC) in Victoria allowed for an amount marginally over $16m over the five year period 2003-07 across the three distributors, or individually $0.85m, $1.1m and $1.3m annually[105]. These expenditure levels adopted an assumption that marketing expenditure in the order of the existing levels be maintained for two of the three distributors and the adoption of a proposal by the third distributor for an increase. The levels correspond to a marketing cost/operating cost ratio of between 2.5 – 3.5% which is considerably less than the 23% determined for ActewAGL in 2003/04.

[105] Essential Services Commission Review of Gas Access Arrangement 2002

In adopting its assumption about existing marketing expenditure levels, the ESC decided to seek to implement arrangements whereby the impacts of marketing can be objectively assessed in the Victorian context for consideration in future reviews. Given that similar uncertainty exists in the ACT concerning the impacts of marketing, the Commission may wish to consider adopting an approach similar to the ESC.

Based on the above analysis including the Victorian comparison, ECG believes that the information presented by ActewAGL is insufficient to justify a step increase in marketing expenditure between 2003/04 and 2004/05 followed by a marginal decline in real terms throughout the remainder of the period. ECG recommends that ActewAGL's annual marketing expenditure be maintained at the existing 2003/04 level of $1.46m.

In its response following ECG's presentation, ActewAGL has indicated that ECG has applied an efficiency factor greater than 1.5% by not applying the growth formula to the marketing expenditure. ActewAGL's marketing expenditure consists mainly of marketing incentives. As marketing incentives is dependent on customer growth and the percentage growth is showing a decline over the forecast period, it does not support applying the growth formula to the marketing expenditure.

It is therefore recommended that as stated above, the marketing expenditure be maintained at the current 2003/04 level of $1.46m.

13.1.5 Other Direct Costs

ActewAGL propose an expenditure of 0.24m for the 2005-2010 Access Arrangement period. This cost was not included in the 2001 Access Arrangement period and no justification is provided.

According ECG recommend that this cost not is excluded from the prudent cost for the 2005-2010 Access Arrangement period.

As discussed in section 12.2.8, ActewAGL has clarified that this cost is insurance costs. ECG proposes amend its recommendation to accepting this cost.

13.1.6 Government Levies

ActewAGL has indicated that Government levies will increase from $0.34m to $0.55m for the next Access Arrangement period. There is no information for the additional $0.2m. ECG therefore recommends that the cost be included as prudent expenditure and that the government levies be maintained at $0.34m for the 2005-2010 Access Arrangement periods.

In its response to the draft report, ActewAGL has indicated that due to various reviews in place currently, it anticipates an increase of $0.2m. The increase charges include:

- Review and approval of the Associate Gas Transportation contracts.
- Review of the Gas Network Boundary Code and the development of the Gas Services and Installation Rules
- Review of ICRC and IPART legislation.

- Forthcoming review of the Utilities Act and Associated Code of Practice
- Mains tax
- Other statutory charges

Based on the information provided, ECG proposes to recommend accepting the increased charges.

13.1.7 Contestability Costs

The cost of $0.45m is for the charges based on Agility's charges to ActewAGL for the period 2005 to 2010. In 2002, the Commission accepted the FRC costs based on an independent review carried out by Deloitte Touché Tohmatsu. The review concluded that the FRC cost sought by ActewAGL is those that may be properly recouped under the Code.

The activities that Agility will be carrying out on behalf of ActewAGL are:

- Represent ActewAGL on market committees
- Participate in the formation of market rules on their behalf
- Negotiate changes to market transaction specifications
- Maintain all ActewAGL operational data in Agility systems
- Handle all ActewAGL market transactions (eg. churn etc)
- Perform billing and balancing, reflecting their obligations
- Send market data (i.e. meter readings) to retailers and to the market operator
- Monitor, report and correct compliance

ActewAGL has advised the cost of $0.45m is based on a charge of $4.50 per customer. The $4.50 is derived from an operating expenditure of $4.10 and a recoup of the capital expenditure amounting $0.40.

From the information provided, ECG recommends accepting the costs of $0.45m p.a. as costs that would be incurred by a prudent provider in accordance with the Code.

13.1.8 UAG

ActewAGL's UAG cost is provided in the following table:

Table 13-7 Forecast UAG for 2005-2010

Year ending 30 June	$ million, real 2004-2005						
	Forecast 2004	2005	2006	2007	2008	2009	2010
UAG	0.10	0.26	0.26	0.28	0.29	0.29	0.31

However, as shown in Table 12-13 , the UAG for the current period varies from 1.56% to 0.77%. As such, ECG recommends that the UAG for a prudent operator should be in the range of what is currently experienced. For this report, ECG has proposed 1%, which is approximately the mid point of the range experienced, as a realistic value for UAG.

ActewAGL have indicated the cost of UAG is likely to rise, as they will have to tender for it. It is expected that the tendered price will be significantly higher. Tender price received for operations gas are in excess of $5/ GJ. However no estimate of the likely UAG cost has been provided, but the above data implies a cost about $2.50 / GJ, compared with the $1.73 / GJ in 2003-03. This is not unreasonable given the price of operations gas.

It is proposed that the UAG expenditure allowance for this Access Arrangement period be reduced from that proposed by ActewAGL of 1.5% to that equivalent to 1.0% UAG. Using $2.50/GJ, the table below is the recommended cost for 2005-2010.

Table 13-8 Recommended UAG cost for 2005-2010

Year ending 30 June	$ million, real 2004-2005						
	Forecast 2004	2005	2006	2007	2008	2009	2010
UAG	0.10	0.17	0.17	0.19	0.19	0.19	0.21

ActewAGL has indicated that it will be seeking tenders for the supply of UAG. ECG notes the comment but does not propose to change its recommendation.

13.1.9 Other Costs

The table below provides details of the costs submitted by ActewAGL:

Table 13-9 "Other Costs" for 2005-2010

Year ending 30 June	$ million, real 2004-2005						
	Forecast 2004	2005	2006	2007	2008	2009	2010
Other Costs	0.23	0.24	0.24	0.24	0.24	0.25	0.25

As discussed in section 12.3.3, ActewAGL has provided details in support of this expenditure (cost associated with additional requirements for ActewAGL arising from the bushfire in 2003). ECG therefore recommends accepting the cost as prudent expenditure.

13.2 RECOMMENDATION

From the analysis above, ECG recommends that the expenditure shown in the following table is what would be incurred by a prudent operator:

Table 13-10 Recommended expenditure for 2005-2010

Year ending 30 June	$ million, real 2004-2005						
	2004	2005	2006	2007	2008	2009	2010
Controllable costs							
Asset Services	3.82	3.90	4.00	4.19	4.32	4.45	4.57
Asset Management	2.54	2.6	2.68	2.70	2.78	2.87	2.95

Year ending 30 June	$ million, real 2004-2005						
	2004	2005	2006	2007	2008	2009	2010
O&M	6.36	6.50	6.66	6.89	7.11	7.32	7.52
Overheads	1.69	1.92	1.92	1.92	1.92	1.92	1.92
Asset charge	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Marketing	1.46	1.46	1.46	1.46	1.46	1.46	1.46
Other Controllable costs	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Sub total	10.23	10.60	10.76	10.99	11.21	11.42	11.62
Other Costs							
Government Levies	0.34	0.55	0.55	0.55	0.55	0.55	0.55
Contestability costs	0.00	0.45	0.46	0.46	0.46	0.46	0.45
UAG	0.10	0.17	0.17	0.19	0.19	0.19	0.21
Other Costs	0.23	0.24	0.24	0.24	0.24	0.25	0.25
Total	0.67	1.41	1.41	1.43	1.43	1.44	1.46
Total	10.90	12.01	12.17	12.42	12.64	12.86	13.08

Note: As discussed in section 10.9 on the treatment of the costs for the period July to December 2004, the expenditure for the financial year 2005 should be divided equally between the 2000-2004 and the 2005-2010 Access Arrangement period.

APPENDICES

APPENDIX A - ALLOCATION OF FACILITIES TO NEW CUSTOMERS

New Services

Customer Type	Customers per service
High Density	30
Medium Density	10.74

New Meters

Customer Type	Meter Type Allocation
E-G, New Homes	AL425 – 3%
	AL1000 – 1%
	STANDARD – 96%
Medium/High Density	Central Hot Water – 22%
Medium Density	Individual Hot Water – 78%
I & C	AL425 – 75%
	AL1000 – 15%
	Other – 10%

New Mains

Customer Type	Metres of main per service
E – G	1
Medium density	7
New Homes - new estate	26
- built up	10
I & C	20

Mains size allocations

Customer Type	Mains diameter allocation
Residential	32mm - 70%
	50mm - 10%
	75mm - 10%
	110mm - 6%
	160mm - 4%
Industrial & Commercial	110mm - 100%

APPENDIX B - DETAILS OF THE AGILITY CONTRACT

(Note: information in this section excised for commercial-in-confidence reasons)

APPENDIX C - DESCRIPTION OF ACTEWAGL GAS NETWORK

C.1 General Overview

Construction of the gas network in the ACT commenced in the early 1980s and can therefore assumed to be a relatively new and modern system. Gas is delivered from two sources:

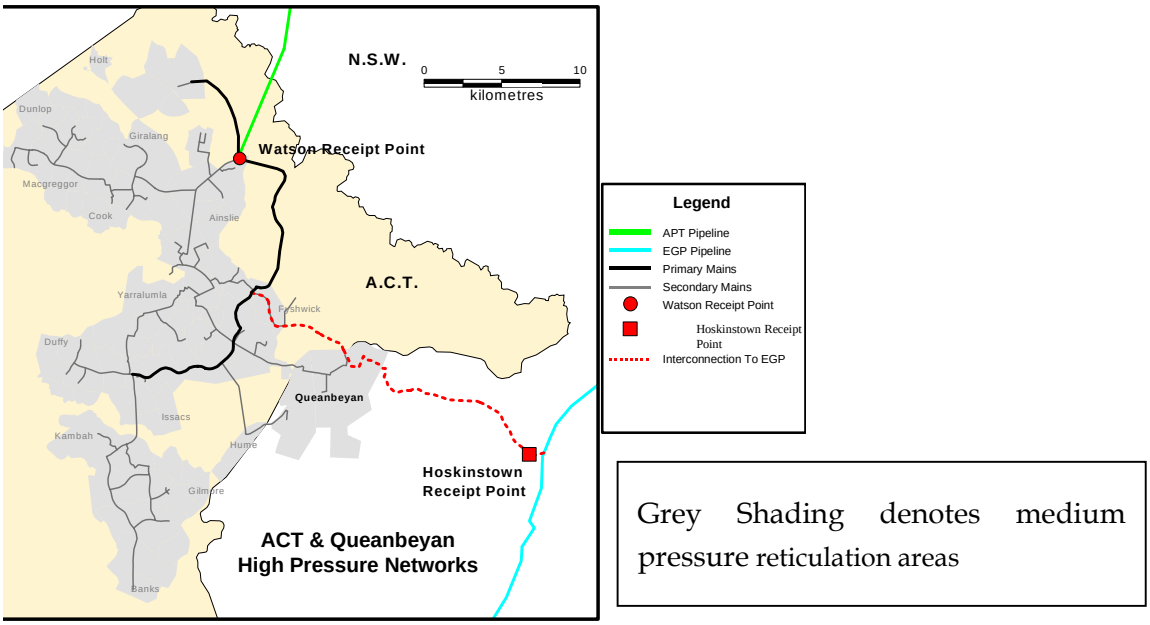
from Moomba (South Australia), the original source, via an offtake at Watson supplied from a lateral pipeline off the Moomba to Sydney pipeline; and

- from Bass Strait (Victoria), via an offtake at Hoskinstown supplied from the Duke Energy Eastern Gas Pipeline (EGP) between Longford (Victoria) and Sydney

The gas network consists of approximately 3,550 kilometres of high and medium pressure mains in total, supplying over 90,000 domestic, commercial and industrial consumers in the ACT, Queanbeyan and Yarrowlumla in NSW.

The network includes facilities of the type and function described below, and the network coverage is shown in Figure C-1.

Figure C-1 Network Coverage



C.2 Receipt Points

Natural gas is introduced into the ACT distribution network via two ActewAGL receipt points as shown in Figure C-1, one at Watson Custody Transfer Station (CTS) and the other at Fyshwick Trunk Receiving Station (TRS).

C.2.1 High Pressure Systems

ActewAGL's high pressure system is constructed of steel pipe and comprises the primary and secondary pressure systems:

- A primary pipeline (7000kPa maximum operating pressure, normal minimum pressure 1750kPa.) from the Watson CTS and Fyshwick TRS supplies the Gungahlin Primary Regulating Station (PRS), Watson PRS, Jerrabomberra Packaged Off-take Station (POTS) and the Phillip PRS;
- The ACT Border Pipeline (14000kPa maximum operating pressure) from the ActewAGL Hoskinstown CTS supplies the above-mentioned primary pipeline via the Fyshwick TRS; and
- Secondary mains (1050kPa maximum operating pressure) are fed from the Watson PRS, Jerrabomberra POTS, Phillip PRS and Gungahlin PRS. These mains supply natural gas to the medium pressure distribution network via over 80 secondary regulating sets (SRS's), as well as directly to many contract customers. The normal minimum pressure is 525kPa, and the standard metering pressure is 100kPa.

C.2.2 Medium Pressure System

ActewAGL's medium pressure system is constructed of plastic pipe [nylon and polyethylene (PE)] and is supplied from the secondary network via the SRSs. It supplies tariff customers and some contract customers. The maximum operating pressure is 210kPa, the normal minimum pressure is 70kPa, and the standard metering pressures are 2.75, 5 and 35kPa. There are some locations where a higher minimum pressure is required, as there are customers with a metering pressure of 100kPa.

C.2.3 Facilities

Gas regulating facilities comprise the following:

- Custody Transfer Stations (CTSs) and Trunk Receiving Stations (TRSs) – regulate pressure from the source transmission pipelines (lateral from the Moomba to Sydney pipeline and the EGP) to the primary high pressure network;
- Primary Receiving Stations (PRSs) – regulate pressure from the primary high pressure network to the secondary high pressure networks;
- Packaged Off-Take Station (POTS) - a smaller modular version of PRS; and
- Secondary Regulator Sets (SRSs) – regulate pressure from the secondary high pressure networks to the medium pressure distribution networks.

These facilities are purpose designed, technically complex and subject to stringent maintenance regimes to provide maximum possible operational redundancy so that gas supply all but certain to be maintained in the event of component malfunction or failure.

C.2.4 Pressure Control

There are five pressure reduction stations in the distribution network which are linked to the Supervisory Control and Data Acquisition (SCADA) system. The Fyshwick TRS,

Canberra PRS, Jerrabomberra POTS and Phillip PRS are fully telemetered and a pressure telemeter near the Gungahlin PRS provides pressure monitoring of the station.

C.2.5 Meters and Services

Each contract and tariff customer is supplied with a meter set for billing purposes. The meter set comprises a pressure regulator and meter to measure customer consumption.

All contract customer meters are linked via telephone lines to Agility's Remote Billing System.

Each meter set is connected to the gas main in the street via a customer service pipe. A service valve installed at the meter set enables gas to be turned off in the event of an emergency and for maintenance of the meter set and customer installations.

C.2.6 Customer Installations

Customer installations comprise customers' appliances and associated pipework downstream of the gas meter. Customer installations are not part of ActewAGL's gas network.