

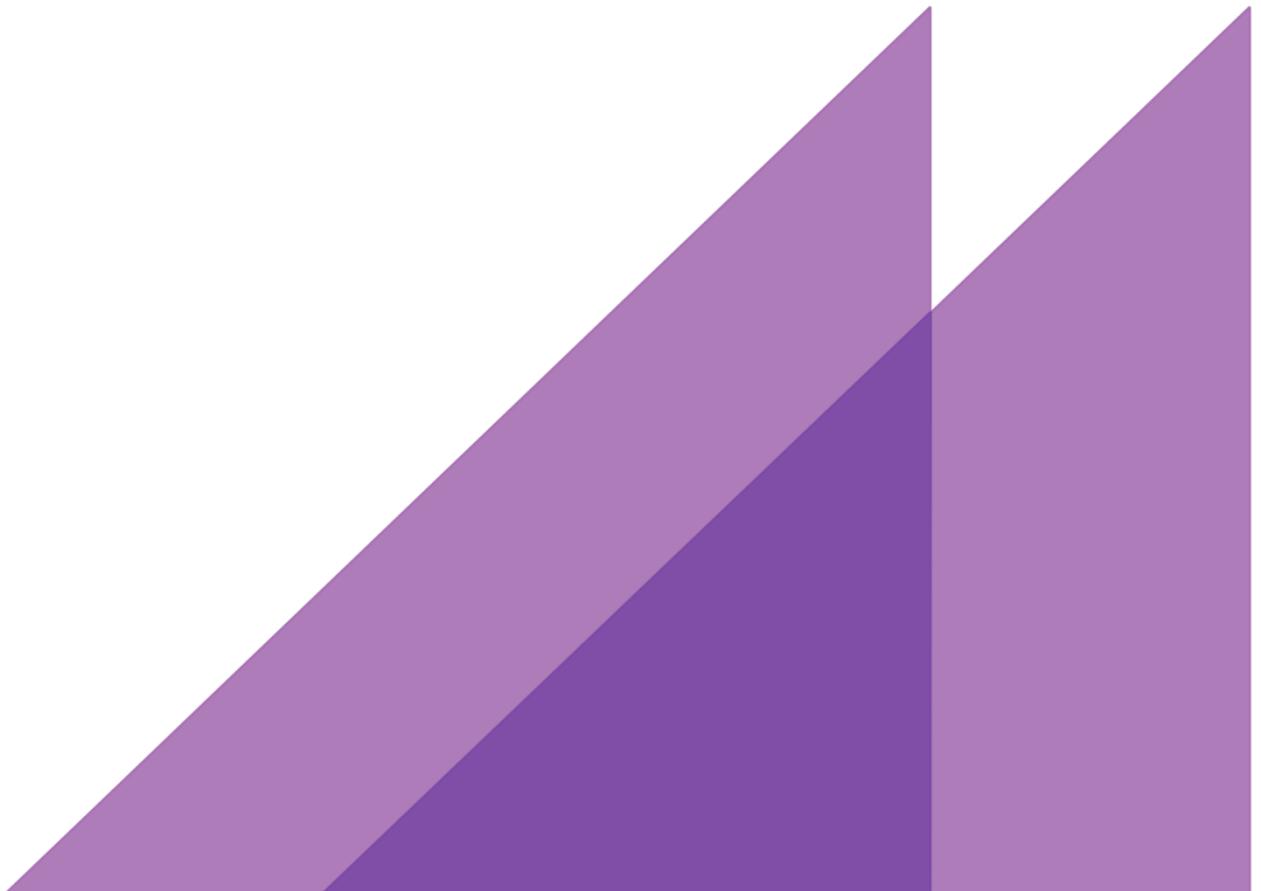
REPORT TO
ATCO GAS

11 MARCH 2014

GAS DISTRIBUTION BENCHMARKING

 PARTIAL PRODUCTIVITY
MEASURES

FINAL REPORT





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Compliance with the Code of Conduct for Expert Witnesses

I am a Principal of ACIL Allen Consulting and have prepared this expert report.

I have read, understood and complied with the Expert Witness Guidelines (Federal Court Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*") in preparing this report.

I have made all inquiries that I believe are desirable and appropriate and no matters of significance that I regard as relevant have, to my knowledge, been withheld from the report.

Necessary limitations to the scope and depth of the analysis undertaken, and the resulting findings that can be made based on the analysis, are outlined in the report.



Deirdre Rose
Principal

Consultant qualifications

Deirdre Rose, a Principal of ACIL Allen Consulting, has prepared this expert report. Deirdre has undertaken productivity and efficiency benchmarking of a range of regulated industries and government services over a period of close to 20 years.

Deirdre was initially trained in economic benchmarking techniques by leading international academics while a research economist at NSW Treasury.

Deirdre has undertaken economic benchmarking for regulators and regulated firms using a range of benchmarking techniques including Total Factor Productivity index number analysis and Data Envelopment Analysis.

A CV is provided in Appendix C.

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Executive summary

Study scope

ACIL Allen has been engaged by ATCO Gas to prepare an expert report that benchmarks ATCO Gas against eight Australian gas distribution businesses. In particular, ACIL Allen has been engaged to update the analysis in the Marksman Consulting Services 2010 report, titled “*Gas Distributor Benchmarking Report Envestra South Australia and Queensland*” (the Marksman Report), providing updated benchmarks for the period 2005-06 to 2012-13.

This report has been prepared for use by ATCO for its submission to the ERA and for use by the ERA in assessing that submission.

Benchmarking approach

In accordance with the Marksman Report and many other efficiency benchmarking studies, this study estimates partial productivity performance indicators to benchmark the costs of the gas distributors. The performance benchmarks and operating environment indicators estimated in the study are shown below.

Performance benchmarks			Operating environment
Opex benchmarks	Capex benchmarks	Totex benchmarks	Indicators
Opex/km	Capex/km	Totex/km	Customers/km
Opex/customer	Capex/customer	Totex as a percentage of RAB	TJ/km
Opex/GJ delivered	Capex/GJ delivered		TJ/customer
Opex as a percentage of the Regulated Asset Base (RAB)	Capex as a percentage of RAB		

Note: Opex is operating expenditure; Capex is capital expenditure; Totex is capex + opex

Conclusions

Operating environment for ATCO Gas

Previous benchmarking studies of gas distributors (including the Marksman Report) have identified customer density (customers per kilometre of mains) and energy density (energy delivered per customer and per kilometre of mains) as material drivers of cost and hence relative efficiency.

Higher customer density means that less pipelines and associated assets need to be built and maintained per customer, resulting in relatively lower costs and a relatively higher efficiency. Similarly, greater energy density has been associated with lower inputs to deliver a given volume of gas.

ATCO Gas has among the lowest energy density of the gas distributors in the sample and its energy density has been declining over the study period. ATCO Gas is in the mid-range of customer density as measured by customers per km of network and customer density has risen over the study period. Hence, ATCO's customer density profile may not be as important as its energy density profile in terms of explaining potential cost differentials.

Cost benchmarks

The efficiency analysis undertaken within this study is by its nature partial as individual cost categories are assessed relative to single outputs. In addition, the measures do not account for potential explainers of cost differences between the firms in the sample such as the differing quality of service provided or operating environment differences.

This means that the efficiency measures do not provide a comprehensive picture of overall efficiency performance and the performance of individual firms may appear better or worse than they would if the measures accounted for these other explainers.

However, strengthening the insights from the analysis, a significant proportion of the gas distributors' costs are measured and compared, the costs have been normalised against a range of relevant output measures and assessed in conjunction with the key operating environment indicators of customer and energy density.

Based on the results of the analysis, the opex and capex performance indicators for ATCO Gas would suggest that they have efficient costs over the study period and relative to the sample of Australian gas distributors.

Capex unit costs were below the sample average across all of the output measures. Opex unit costs were below the sample average on a per mains km and per customer basis. Opex unit costs are above the sample average on a per TJ basis. This in part reflects ATCO Gas's low energy density relative to the sample.

However, the consistently low unit costs for ATCO Gas relative to the other gas distributors could warrant further investigation to understand whether there are factors in addition to cost efficiency that are driving this outcome. As noted, these factors could include differences in quality of service, age of assets, historical levels of investment or other unexplained operating environment factors.

1 Introduction

1.1 Context

Benchmarking is used to compare the costs proposed by a regulated business against those of comparable firms. Benchmarking provides insights into the relative efficiency of firms' costs and the potential for efficiency and productivity improvements over time. The use of benchmarking analysis is becoming a more formalised part of regulatory processes in Australia, including under the Australian Energy Regulator's *Better Regulation* reform program.

The Economic Regulation Authority of Western Australia (ERA) is undertaking a review of the Gas Access Arrangement for ATCO Gas Australia (ATCO Gas) for the period 2014-2019. ATCO Gas owns and operates the Mid West and South West Gas Distribution System. A fundamental aspect of the ERA's review is to assess the efficiency of ATCO Gas's proposed expenditure.

1.2 Scope

ACIL Allen has been engaged by ATCO Gas to prepare an expert report that benchmarks ATCO Gas against eight Australian gas distribution businesses. In particular, ACIL Allen has been engaged to update the analysis in the Marksman Consulting Services 2010 report, titled "*Gas Distributor Benchmarking Report Envestra South Australia and Queensland*" (the Marksman Report), providing updated benchmarks for the period 2005-06 to 2012-13. The Marksman Report compared the performance of nine Australian gas distributors (including ATCO Gas) using partial performance indicators benchmarking operating and capital expenditure.

The following additional specific questions are addressed within the report at the request of ATCO Gas:

- the basis on which data was sourced and the extent to which that data can be considered robust and appropriate for the benchmarking analysis
- the methodology used to ensure comparability of data between the analysed businesses
- the uses which can be made of a benchmarking analysis and any strengths and weaknesses of the analysis
- your view, as an expert, as to whether benchmarking is a useful mechanism for assessing the efficiency of a business.

The full Terms of Reference (TOR) for the study are shown in Appendix B.

This report has been prepared for use by ATCO for its submission to the ERA and for use by the ERA in assessing that submission.

1.3 Report structure

The report is structured as follows:

- Section 2 provides an overview of the benchmarking study including a description of the benchmarking measures and the businesses included in the study
- Section 3 addresses questions posed by ATCO Gas regarding the use of benchmarking analysis
- Section 4 describes the benchmarking data including questions posed by ATCO Gas in relation to the data
- Section 5 presents the performance indicators and expert opinion on their interpretation.

2 Overview of benchmarking study

This section provides an overview of the benchmarking approach used in the current study, the performance benchmarks estimated and the gas distributors included in the study.

2.1 Partial productivity benchmarking

In accordance with the Marksman Report and many other efficiency benchmarking studies, this study estimates partial productivity performance indicators (PPIs) to benchmark the costs of the gas distributors.

Gas distributors use a range of inputs including labour, pipelines, vehicles, information technology, land and materials. These inputs may be used more or less efficiently by different gas distributors and hence gas distribution services may be provided at lower or higher costs by different firms.

The benchmarking approach used in this study compares the cost efficiency of ATCO Gas against other Australian gas distributors via ratios of major cost inputs relative to the amount of services or output produced.

That is, the performance benchmarks are estimated as:

$$\text{Performance benchmark} = \frac{\text{Input measure}}{\text{Output measure}}$$

In the current benchmarking study, a significant proportion of the gas distributors' costs are measured and compared including:

- operating expenditure: key costs include maintenance, network operation and control and billing and revenue collection
- capital expenditure: encompasses mains renewals, network augmentation, IT and data systems and meters.

These costs are measured in relation to key outputs including the amount of gas delivered and the number of customers served.

A full listing of the performance benchmarks produced in the study is shown in Section 2.2.

The benchmarks measure the level of unit costs incurred by the nine Australian gas distributors to provide comparable gas distribution services. Low unit costs relative to the sample can indicate that a firm is cost efficient. As explained in more detail in Section 3, there can also be other factors that explain costs differences between firms including:

- the relative quality of service they provide
- historical or legacy features of the business such as the relative age of the network and historical levels of maintenance and renewals expenditure
- for businesses such as gas distributors that make large, lumpy capital investments there can be temporal differences in measured efficiency due to their relative stage in the investment cycle
- a range of features of the environment in which the firms operate which impact on costs including customer and energy density and business regulations.

2.2 Performance benchmarks

Table 1 lists the performance benchmarks and operating environment indicators estimated in the study.

Key indicators of the operating environment of the gas distributors that may explain differences in costs are also presented.

Table 1 Performance and operating environment indicators

Performance benchmarks			Operating environment
Opex benchmarks	Capex benchmarks	Totex benchmarks	Indicators
Opex/km	Capex/km	Totex/km	Customers/km
Opex/customer	Capex/customer	Totex as a percentage of RAB	TJ/km
Opex/TJ delivered	Capex/TJ delivered		TJ/customer
Opex as a percentage of the Regulated Asset Base (RAB)	Capex as a percentage of RAB		

Note: Opex is operating expenditure; Capex is capital expenditure; Totex is capex + opex

The performance benchmarks and operating environment indicators are calculated for the nine Australian gas distributors described in Section 2.3 for the period from 2005-06 to 2012-13.

2.3 Benchmarked businesses

This study benchmarks ATCO Gas against eight Australian gas distributors. An overview of each firm included in the benchmarking study is provided in Table 2 including the service area coverage, key outputs and recent access arrangement periods (as the approved access arrangements and associated submissions provide a key data source for this study).

Table 2 Benchmarked gas distribution businesses

Gas distributor	2012 outputs	Access arrangement periods
Western Australia		
ATCO Gas Australia		
ATCO Gas owns, operates and maintains the reticulated gas infrastructure in Western Australia serving Geraldton, Kalgoorlie, Albany, Bunbury, Busselton, Harvey, Pinjarra, Brunswick Junction, Capel and the Perth greater metropolitan area including Mandurah	2011/12	1 Jan 2010 to 2013/14 (WA ERA)
	Network length 13,182 km	
	Customers 639,227	
	TJ delivered 26,554	2005 to 2009 (WA ERA)
South Australia		
Envestra South Australia		
Envestra is the largest gas distribution company in Australia with natural gas distribution networks and transmission pipelines in South Australia, Victoria, Queensland, New South Wales and the Northern Territory. Envestra's South Australian gas distribution network serves Adelaide, Mt Gambier, Whyalla, Pt Pirie, Barossa Valley, Murray Bridge and Berri	2011/12	July 2011 to 30 June 2016 (AER)
	Network length 7,786 km	
	Customers 410,706	
	TJ delivered 33,231	13 November 2006 to 30 June 2011 (ESCOSA)

Gas distributor	2012 outputs	Access arrangement periods
Victoria		
<p>Envestra Victoria</p> <p>Envestra's Victorian gas distribution network serves the northern, outer eastern and southern areas of Melbourne, Mornington Peninsula, rural communities in northern, eastern and north-eastern Victoria, and south-eastern rural townships in Gippsland</p>	<p>2012</p> <p>Network length 10,226 km</p> <p>Customers 576,635</p> <p>TJ delivered 55,420</p>	<p>1 Jan 2013 – 31 Dec 2017 (AER)</p> <p>1 Jan 2008- 31 Dec 2012 (ESC)</p>
<p>Multinet</p> <p>Multinet Gas serves customers throughout Melbourne's inner and outer east, the Yarra Ranges and South Gippsland</p>	<p>2012</p> <p>Network length 9,980</p> <p>Customers 669,631</p> <p>TJ delivered 56,791</p>	<p>1 Jan 2013 – 31 Dec 2017 (AER)</p> <p>1 Jan 2008- 31 Dec 2012 (ESC)</p>
<p>SP AusNet</p> <p>SP AusNet distributes gas to approximately 620,000 customers across central and western Victoria. Its service area includes metropolitan Melbourne growth corridors including Caroline Springs and Werribee.</p>	<p>2012</p> <p>Network length 10,046 km</p> <p>Customers 602,040</p> <p>TJ delivered 71,000</p>	<p>1 Jan 2013 – 31 Dec 2017 (AER)</p> <p>1 Jan 2008- 31 Dec 2012 (ESC)</p>
ACT		
<p>ActewAGL</p> <p>ActewAGL Distribution operates the gas distribution network in the ACT, Queanbeyan, Palerang and Nowra. The data presented in this report excludes Nowra, as it is excluded from the access arrangement</p>	<p>2011/12</p> <p>Network length 4,200 km (approx.)</p> <p>Customers 123,470</p> <p>TJ delivered 7,696</p>	<p>1 July 2010 - 30 June 2015 (AER)</p> <p>1 January 2005 to 30 June 2010 (ICRC)</p>
New South Wales		
<p>Jemena Gas Networks</p> <p>The Jemena Gas Network distributes natural gas to 1.1 million homes and businesses in Sydney, Newcastle, the Central Coast and Wollongong as well as to over 20 country centres including those in the Central West, Central Tablelands, South Western, Southern Tablelands, Riverina and Southern Highlands regions of New South Wales. It is the largest gas distributor included in this study</p>	<p>2011/12</p> <p>Network length 24,221 km</p> <p>Customers 1,147,291</p> <p>TJ delivered 101,878</p>	<p>1 July 2010 - 30 June 2015 (AER)</p> <p>1 July 2005 – 30 June 2010 (IPART)</p>
Queensland		
<p>Envestra Queensland</p> <p>Envestra Queensland's gas distribution network serves customers in Brisbane (north of Brisbane River), Ipswich, Rockhampton and Gladstone</p>	<p>2011/12</p> <p>Network length 2,643 km</p> <p>Customers 87,550</p> <p>TJ delivered 16,465</p>	<p>1 July 2011 - 30 June 2016 (AER)</p> <p>1 July 2006 to 30 June 2011 (QCA/AER)</p>
<p>Allgas Energy</p> <p>APT Allgas owns and operates gas distribution pipelines in Queensland and northern New South Wales that supply natural gas to customers in Brisbane (south of the river), and in other regional centres including Toowoomba and the Gold Coast</p>	<p>2011/12</p> <p>Network length 3,000 km (approx.)</p> <p>Customers 87,315</p> <p>TJ delivered 9,897</p>	<p>1 July 2011 - 30 June 2016 (AER)</p> <p>1 July 2006 to 30 June 2011 (QCA)</p>

Note:

WA ERA – WA Economic Regulation Authority; AER – Australian Energy Regulator; ESCOSA – Essential Services Commission of SA; ESC – Victorian Essential Services Commission; IPART – Independent Pricing and Regulatory Tribunal; QCA- QLD Competition Authority

ATCO Gas has the second largest network among the benchmarked firms. However, its network is a little over half the size of Jemena Gas Networks in New South Wales. ATCO Gas serves a network that is closest in size to the Victorian gas distributors, but faces less than half their demand for gas. The characteristics of the gas distributors are described in more detail in Section 5.1 below.

3 Use of benchmarking

This section addresses the questions in the TOR regarding the use of benchmarking.

3.1 Benchmarking to assess efficiency

— *your view, as an expert, as to whether benchmarking is a useful mechanism for assessing the efficiency of a business*

The economic regulation of monopoly service providers aims to ensure services of a desired quality are provided at efficient cost. Benchmarking is useful in this context as it provides objective, empirical measures of the productivity and efficiency of regulated firms.

Productivity is the maximum level of output attainable from inputs given the current state of technology and is represented by an efficient production frontier. Efficiency analysis compares the performance of individual companies in relation to the production frontier, that is, whether they are on or beneath the efficient frontier.

Benchmarking can be used to compare the cost efficiency of a regulated firm over time and against the performance of other similar firms. When undertaking benchmarking it is important to recognise that economic performance can be affected by:

- efficiency change, for example, due to improvements in the use of existing technologies, scale efficiency or allocative efficiency
- technological change through the creation of new technologies
- the environment in which production occurs, as these environmental factors can drive costs but are outside the control of firm. In the case of gas distributors relevant environmental factors could include:
 - government regulations
 - characteristics of the customer base such as size and geographical spread
- historical or legacy factors such as the condition and age profile of assets
- the quality of services provided.

Different approaches to benchmarking and the quality and availability of data will determine the ability to measure some or all of these contributors to overall efficiency.

Total factor productivity (TFP) measures seek to capture the multiple inputs used and outputs produced within a single measure. Common benchmarking techniques include index number TFP analysis, Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA). The use of partial measures of productivity is also common. Partial productivity assesses output relative to a single input such as labour or operating costs. This approach is used in this benchmarking study.

In recognition of the value of benchmarking for assessing the efficiency of firms, it is increasingly used as part of the process of determining efficient cost for regulated network service providers (NSPs) in Australia. Under the AER's Better Regulation reform program, economic benchmarking techniques will be used in future price reviews for electricity NSPs to analyse their efficiency over time and compared to their peers, to estimate a top down forecast of expenditure and to estimate productivity change.

The use of efficiency benchmarking is common as part of economic regulatory processes internationally, including in New Zealand, the United Kingdom and Ireland and many European countries including the Netherlands, Austria and Denmark.¹

It is important to recognise that due to the limitations of data and of the benchmarking techniques, the efficiency and productivity measures produced are typically approximate rather than exact. There are often challenges associated with accounting for differences in relevant operating environment factors, in accurately measuring inputs and outputs and in gaining comparable, quality data over long time periods.

3.2 Uses, strengths and weaknesses

— *the uses which can be made of a benchmarking analysis and any strengths and weaknesses of the analysis*

This question is answered in relation to the benchmarking approach that has been used in this study, i.e. in relation to partial performance indicators (PPIs). PPIs are a valid approach to assess cost efficiency over time and/or between firms.

The strengths of the PPI approach are that:

- comparable data is typically available to produce these measures
- they are simple to calculate
- they can be readily understood and interpreted and hence aid transparency between regulated firms and regulators
- they are commonly used by the industry and economic regulators
- insights are provided into individual areas of cost performance that are not available from more summary measures.

The ACCC and AER (2012) recently reviewed the use of PPIs and found that they had been used by a number of energy regulators to assess the cost efficiency of electricity and gas distributors including in Australia, New Zealand, Ireland, the United Kingdom and the Netherlands.

However, it is important to understand that there are limits to the information that the partial indicators provide. As their name indicates, partial measures provide measures of performance in relation to a single input or aspect of performance, but do not provide a measure of the overall economic performance of a firm or insights into the trade-offs that different firms make between inputs (e.g. capital, labour) over time or between locations. The comprehensive efficiency benchmarking techniques including TFP analysis, DEA and econometric approaches are used to provide these more comprehensive performance measures.

These limitations do not invalidate or undermine the use of PPIs, but must be recognised when interpreting the measures. This is true of all efficiency and productivity measurement approaches.

This study, in common with the Marksman Report and many other studies that have used PPIs, jointly assess a range of partial cost performance indicators and operating environment indicators. This retains the positive features of the measures (such as their ease of interpretation), while strengthening the insights that can be gained.

¹ Useful reviews of this overseas experience are provided in ACCC and AER (2012), WIK-Consult (2011) and the Brattle Group (2008).

4 Benchmarking data

This section describes the data used for the benchmarking study and answers the data-related questions in the TOR.

4.1 Data definitions

4.1.1 Inputs

Operating expenditure

The operating expenditure amounts used in this benchmarking study reflect the costs classified as operating expenditure within each businesses' Access Arrangement. This typically includes a range of operating costs (including network operations, regulatory costs and billing cost), maintenance costs (including for pipelines, meters and network control) and other management and administration costs.

As had been identified in the Marksman Report, unaccounted for gas (UAFG) is treated differently between the jurisdictions. As a result, it has been excluded from operating costs for this study. Full retail competition (FRC) associated expenditure is included in the reported costs within this study.

The expenditure data sourced for the benchmarking study were reported in a range of nominal and constant dollar values within the source documents. All dollar amounts have been converted to December 2013 dollars using the Australian Bureau of Statistics All Groups, Weighted average of eight capital cities, CPI (Series ID: A2325846C).

Capital expenditure

The capital expenditure amounts used in this benchmarking study reflect the costs classified as capital expenditure within each businesses' Access Arrangement.

4.1.2 Outputs

Network length

The network length for the gas distributors includes the mains that the businesses classify as low, medium and high pressure distribution mains and transmission pressure mains operated above 1,050kPa.

Customers

The customer number measure is the total number of customers including residential and non-residential volume customers and contract customers.

Gas delivered

The gas delivered measure is the total gas delivered to the above customers measured in Terajoules (TJ).

4.1.3 Regulatory asset base (RAB)

In accordance with the Marksman Report, measures of costs as a percentage of RAB are provided. The measure of RAB is the closing value for each year.

4.2 Data sources

— *[describe] the basis on which data was sourced*

ACIL Allen compiled a benchmarking database for the nine gas distributors for the period from 2005-06 to 2012-13.

The benchmarking data were sourced from public reports including:

- gas distributor Access Arrangement Information statements
- regulatory determinations by the AER and jurisdictional regulators
- AER performance reports
- annual and other reports published by the businesses
- consultant reports prepared as part of access arrangement review processes.

A reference list is provided in Appendix D.

The data for ATCO Gas were drawn from a mix of public sources including its current Access Arrangement Information and from data provided to ACIL Allen for this benchmarking study.

This benchmarking study relies to the greatest extent possible on data from reported actual costs and outputs, rather than on forecasts. Where it has been necessary to use forecasts, the data reflect final forecasts agreed with the regulator (and amended by appeal where relevant). Approximately 25 per cent of the data items used are forecasts.

ACIL Allen has been able to access all required data with the exception of mains length data for a small number of observations. The missing mains length observations have been estimated based on reported mains length before and after the missing year. This assumption should not affect the analysis given that network length does not change substantially from year to year.

4.3 Ensuring data comparability

— *[describe] the methodology used to ensure comparability of data between the analysed businesses*

As indicated above, the benchmarking study relies on cost (operating and capital expenditure) and output (including length of network, number of customers and gas delivered) data that were reported publicly by the gas distributors and, in most cases, verified by their economic regulator.

Within the time available for this study, it was not possible to undertake a detailed review of the data items used in the study to ensure comparability between the businesses. However, high level checks of the basis on which each data item is defined among the firms were undertaken.

A number of prior benchmarking studies of Australian gas distributors have also been examined to understand the appropriate sources of data and to draw on the experience of these studies in ensuring that the data used was comparable across the firms. The previous reports were submitted as part of regulatory processes and include Marksman Consulting Services (2010), Economic Insights (2012a), Economic Insights (2012b), Marchmont Hill

Consulting (2012), Economic Insights (2010), ACTEWAGL (2009a), WorleyParsons (2007) and Meyrick and Associates (2004). The lessons from those studies in terms of ensuring data comparability have been applied in ACIL Allen's updated analysis.

4.4 Data suitability for benchmarking

— *[describe] the extent to which that data can be considered robust and appropriate for the benchmarking analysis*

The public data used in the study is robust and appropriate for benchmarking analysis. The rationale for this view is that the data were:

- prepared by the gas distribution businesses and their experts
- subject to scrutiny by the economic regulator and in many cases also by expert consultants to the economic regulator.

As noted above, the time available for this study has limited the extent of the analysis of data comparability. Therefore, this study relies on the previous significant testing of the data for comparability in other similar benchmarking studies, as well as a high level review of the basis on which the data items are defined between the firms. This process is considered to be sufficient to provide a benchmarking dataset that is appropriate for benchmarking analysis.

5 Performance benchmarks

The performance indicators that benchmark the operating environment, operating expenditure and capital expenditure of the gas distribution businesses are presented below. The benchmarks are presented in the tables in Appendix A.

5.1 Operating environment

Costs between firms may differ due to their individual actions and decisions and due to the characteristics of the environment in which they operate. The features of the external environment may drive costs but are outside of the control of the business. Relevant environmental factors could include labour, safety and environmental regulations, the geographical size and spread of the customer base, the level of population growth and weather conditions.

Previous benchmarking studies of gas distributors (including the Marksman Report) have identified customer density (customers per kilometre of mains) and energy density (energy delivered per customer and per kilometre of mains) as material drivers of cost and hence relative efficiency.

Higher customer density means that less pipelines and associated assets need to be built and maintained per customer, resulting in relatively lower costs and a relatively higher efficiency. Similarly, greater energy density has been associated with lower inputs to deliver a given volume of gas.

Customer and energy density measures for the nine gas distributors are shown in Figures 1 to 3 below.

Figure 1 Customer density (customers per km mains)

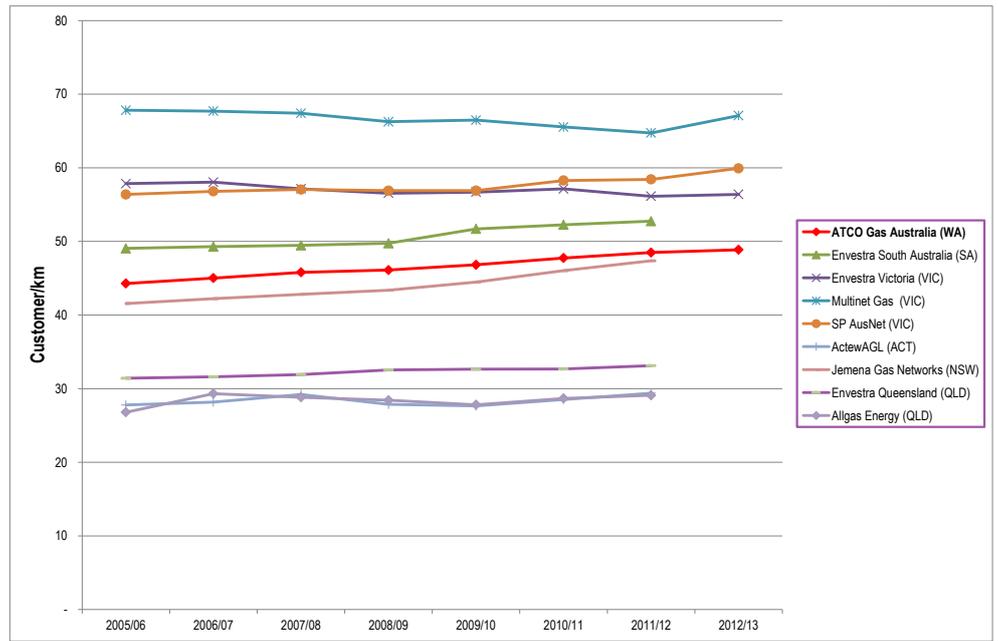


Figure 2 Energy density (TJ per mains km)

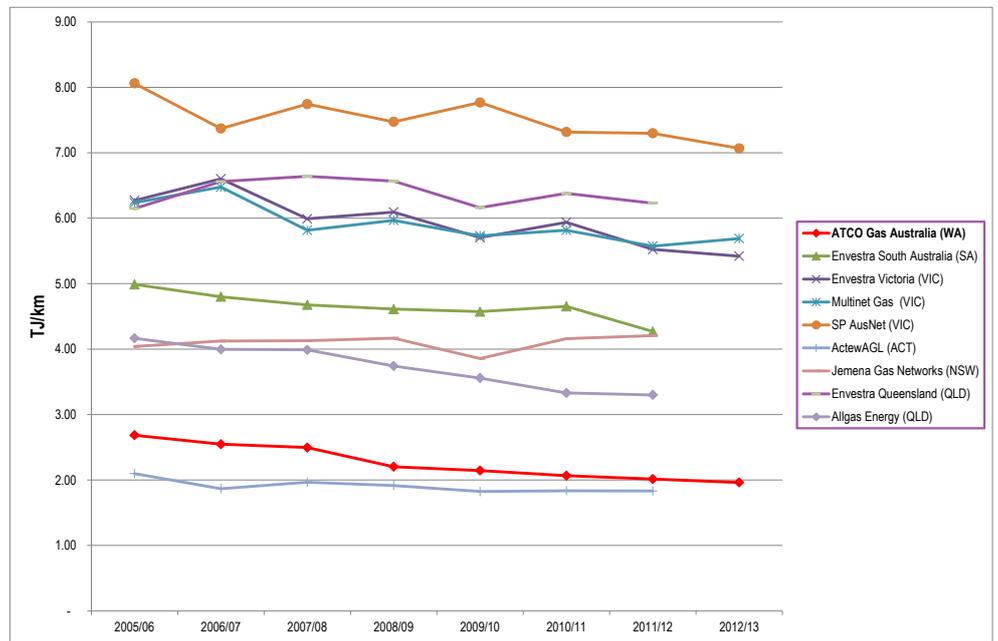
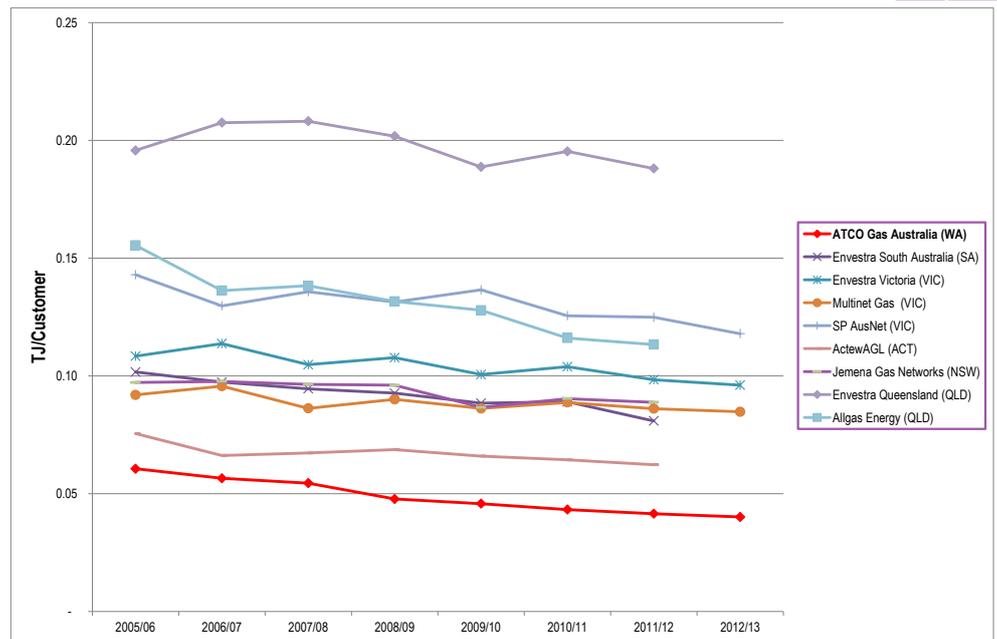


Figure 3 Energy density (TJ per customer)



ATCO Gas has among the lowest energy density of the gas distributors in the sample and its energy density has been declining over the study period. The gas distribution network provides good coverage in terms of providing commercial and residential customers with access to reticulated gas supply. However, the milder climate in Western Australia means that household gas consumption for space heating is low relative to colder climate regions and is used more for hot water. Even so, ATCO's energy density is well below that of the Queensland gas distributors. This could also reflect a different customer mix.

The WA Economics and Industry Standing Committee Inquiry into Domestic Gas Prices (2011) provided comment on declining household consumption which was attributed to customers switching to reverse cycle air-conditioning for heating and from gas hot water storage to solar hot water. ATCO's delivered gas has fallen by 17 per cent over the study period.

Declining energy density is common across all of the gas distributors in the study and reflects the findings of previous studies that have observed a long term trend of declining average gas usage.

Depending on the extent to which low energy density drives costs, the very low energy density for ATCO relative to the other businesses means that even it were equally efficient as other firms, its costs would be higher and hence it would not appear to be as efficient.

ATCO Gas is in the mid-range of customer density as measured by customers per km of network and customer density has risen over the study period. Hence, ATCO's customer density profile may not be as important as its energy density profile in terms of explaining potential cost differentials.

5.2 Opex indicators

Four operating cost (opex) partial indicators are provided below:

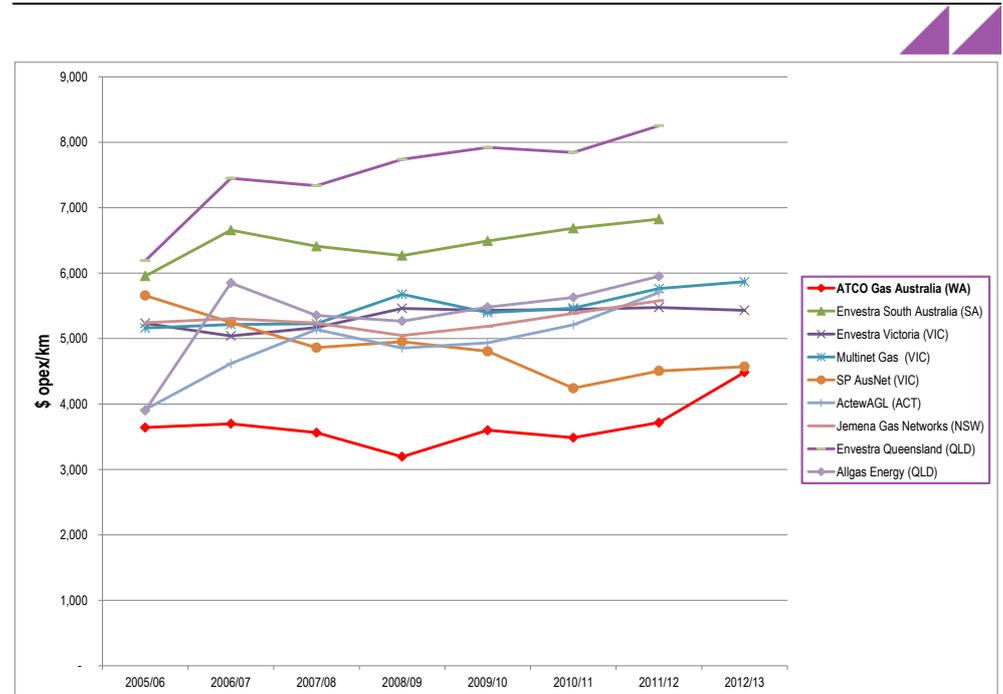
— Opex per kilometre of mains

- Opex per customer
- Opex per TJ
- Opex as a percentage of the Regulatory Asset Base (RAB).

Opex for all of the businesses is expressed in December 2013 constant dollars.

The partial performance indicators provide a unit cost measure. A lower unit cost indicates efficient costs relative to the sample.

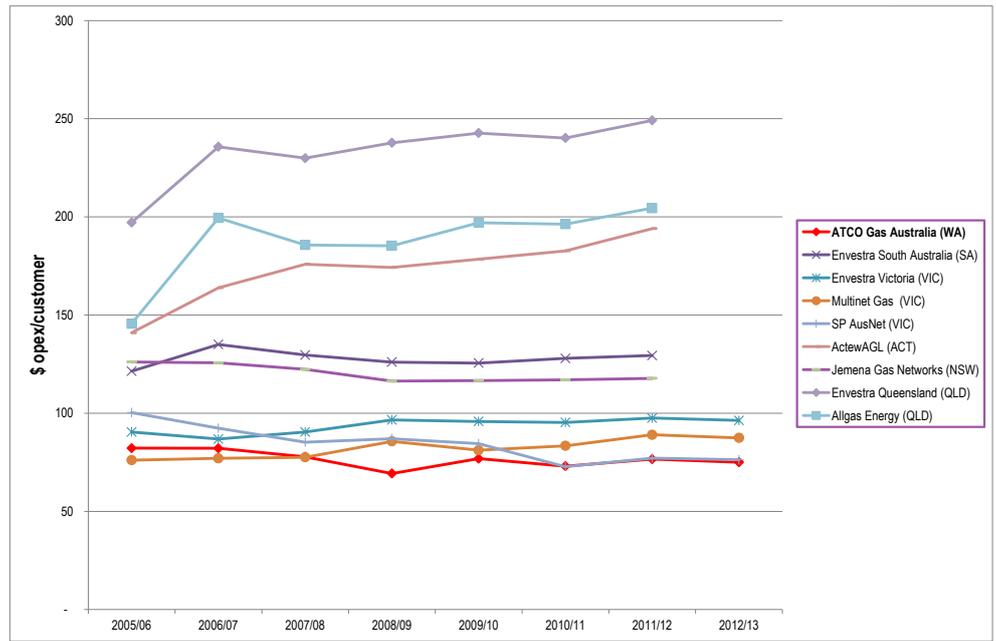
Figure 4 Opex per km



Note: Opex in \$Dec 2013

ATCO Gas has the lowest opex per km of the nine gas distributors over the entire study period, ranging from \$3,641 in 2005-06 to \$4,485 in 2012-13. Opex per km has increased since 2010-11 but still remains the lowest among the benchmarked firms. In 2005-06 ATCO Gas’s opex per km was 41 per cent lower than the highest cost gas distributor in the sample (Envestra Queensland) and 55 per cent lower in 2011-12. When compared against the average across the distribution firms, ATCO Gas’s opex per km was 27 per cent below the average in 2005-06 and 35 per cent below the average in 2011-12.

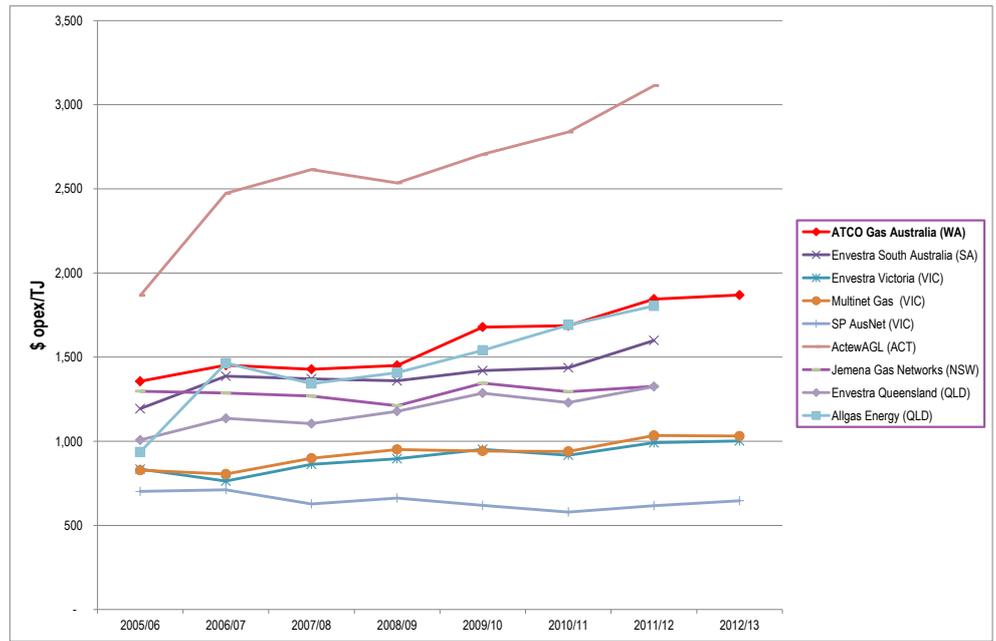
Figure 5 Opex per customer



Note: Opex in \$Dec 2013

ATCO Gas consistently has the lowest or second lowest opex per customer, ranging from \$82 in 2005-06 to \$75 in 2012-13. Opex on a per customer basis has fallen by nine per cent over the study period. In 2005-06 ATCO Gas’s opex cost per customer was 58 per cent lower than the highest cost gas distributor in the sample (Envestra Queensland) and 69 per cent lower in 2011-12. When compared against the average across the distribution firms, ATCO Gas’s opex per customer was 32 per cent below the average in 2005-06 and 44 per cent below the average in 2011-12.

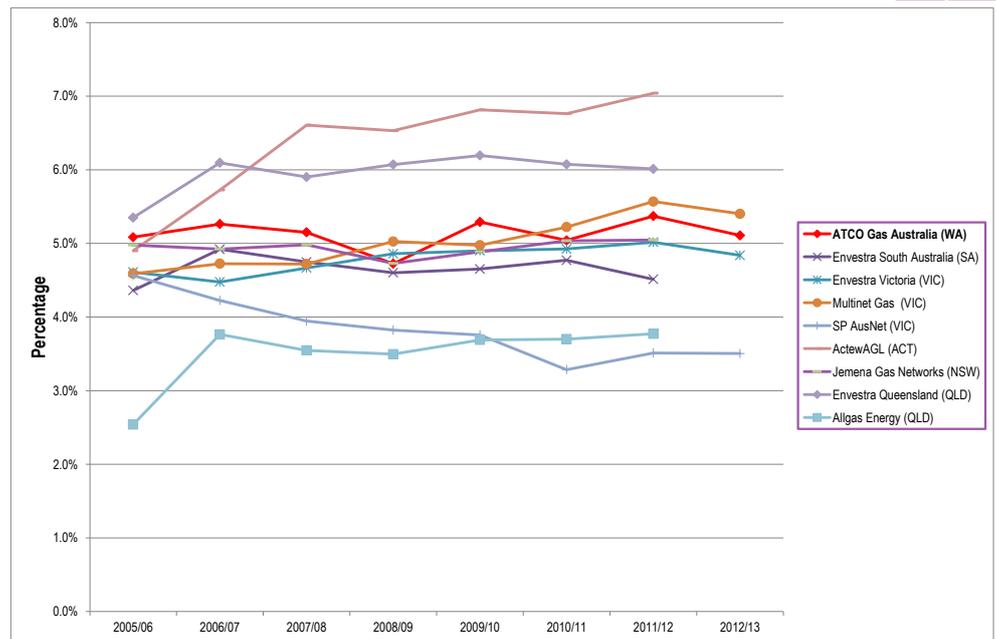
Figure 6 Opex per TJ



Note: Opex in \$Dec 2013

Opex per TJ is relatively high for ATCO Gas at \$1,357 in 2005-06 and increasing to \$1,869 in 2012-13. The relative position of ATCO Gas at the higher end of the sample based on this cost measure is related to the low energy density of ATCO Gas’s customer base relative to the other gas distributors (as shown in Figure 2 and Figure 3 above). Given its low energy density relative to the other businesses, its per TJ opex is higher. When compared against the average across the distribution firms, ATCO Gas’s opex per TJ was 22 per cent higher than the average in 2005-06 and 2011-12.

Figure 7 Opex as a percentage of RAB



Note: Opex in \$Dec 2013

The final opex performance indicator is opex as a percentage of RAB. As explained in the WorleyParsons (2007) report:

Expressing expenditure as a proportion of the Regulated Asset Base (RAB) is a commonly used tool to normalise data between distributors, on the basis that the more assets there are in the network (and hence higher RAB), the greater the need for both Opex and Capex.

The only qualification that would be made to this statement is that the RAB, due to different valuation approaches, may not always provide an accurate measure of the relative size of the asset base between firms. A more stable measure is likely to be provided by normalising costs relative to the physical network size (in km) as shown in Figure 4 above.

Opex as a percentage of RAB for ATCO Gas, as shown in Figure 7, is in the mid to higher range of the sample, ranging between 5.09 per cent in 2005-06 to 5.11 per cent in 2012-13.

On balance, the analysis of the opex performance cost indicators would suggest that ATCO Gas is cost efficient in relation to its operating cost relative to the sample of firms. When compared on a per km and per customer basis, ATCO Gas has some of the lowest unit opex in the sample over the 2005-06 to 2012-13 period. ATCO Gas has achieved low opex per customer outcomes even though it does not have particularly high customer density (it is in the mid-range of the sample), indicating opex cost efficiency relative to the sample based on this partial measure.

Unit operating costs appear higher when compared on a per TJ basis. This in part reflects ATCO Gas's low energy density relative to the sample.

However, the consistently low unit opex costs for ATCO Gas relative to the other gas distributors could warrant further investigation to understand whether there are factors in addition to cost efficiency that are driving this outcome. As identified in Section 2.1, this could include differences in quality of service, age of assets, levels of investment or other unexplained operating environment factors.

5.3 Capex indicators

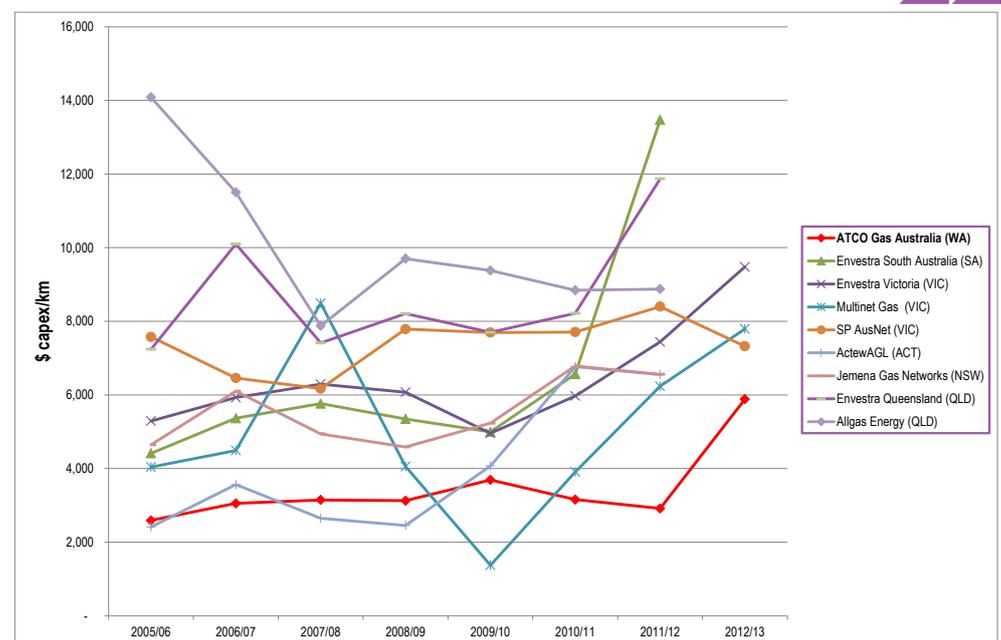
Four capital expenditure (capex) partial indicators are provided below:

- Capex per kilometre of mains
- Capex per customer
- Capex per TJ
- Capex as a percentage of the Regulatory Asset Base (RAB).

Capex for all of the businesses is expressed in December 2013 constant dollars.

The partial performance indicators provide a unit cost measure. A lower unit cost indicates efficient costs relative to the sample.

Figure 8 Capex per km



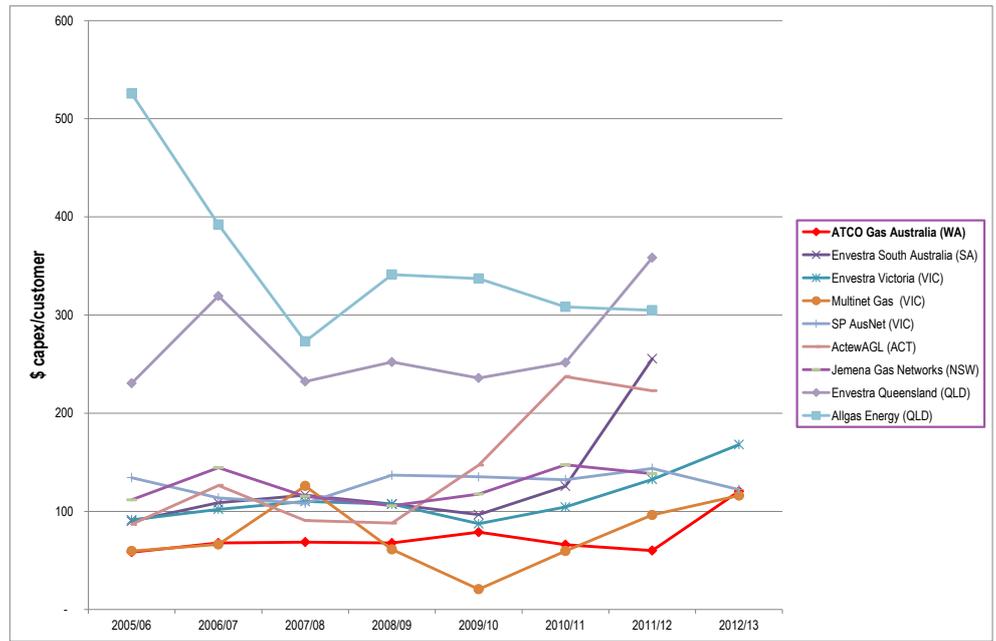
Note: Capex in \$Dec 2013

ATCO Gas has among the lowest capex per km of the nine gas distributors over the study period, ranging from \$2,591 in 2005-06 to \$5,883 in 2012-13. ATCO Gas's capex per km has been relatively stable over the period before increasing in 2012-13, which according to ATCO is due to necessary expenditure on safety performance improvements such as asset replacement and leak reduction. The capex per km of many of the other gas distributors has also increased significantly in recent years.

The actual reported capex for some gas distributors (such as Multinet Gas) has varied sharply over the study period, providing significant volatility in this and the other capex performance indicators on a year-on-year basis.

In 2005-06 ATCO Gas's capex cost per km was 82 per cent lower than the highest cost gas distributor in the sample (Allgas Energy) and 78 per cent lower (than Envestra SA) in 2011-12. When compared against the average across the distribution firms, ATCO Gas's capex per km was 55 per cent below the average in 2005-06 and 64 per cent below the average in 2011-12.

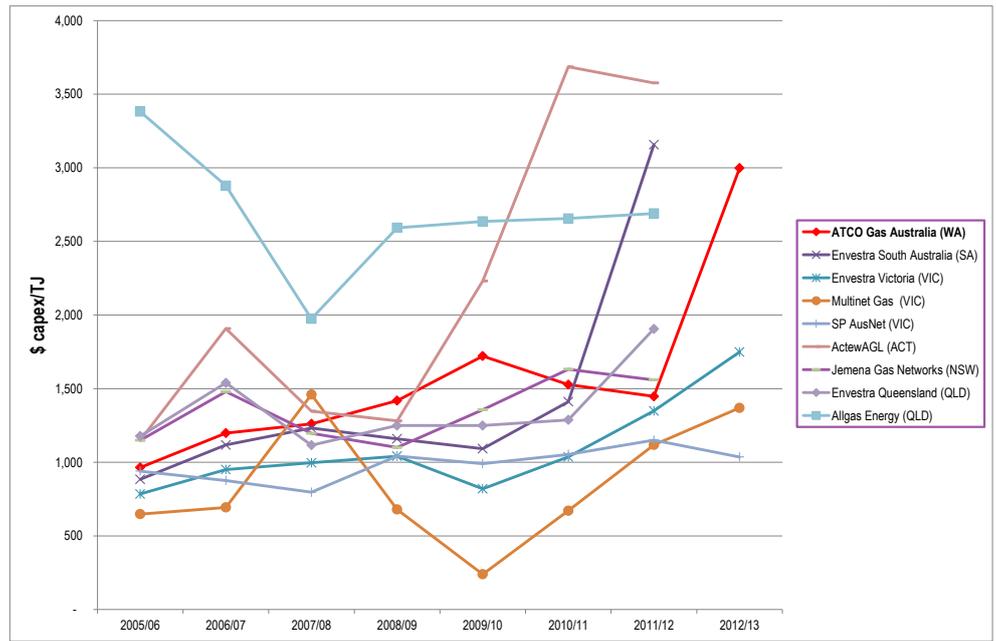
Figure 9 Capex per customer



Note: Capex in \$Dec 2013

ATCO Gas consistently has the lowest or second lowest capex per customer, ranging from \$89 in 2005-06 to \$120 in 2012-13. In 2005-06 ATCO Gas’s capex cost per customer was 89 per cent lower than the highest cost gas distributor in the sample (Allgas Energy) and 83 per cent lower (than Envestra Queensland) in 2011-12. When compared against the average across the distribution firms, ATCO Gas’s capex per customer was 62 per cent below the average in 2005-06 and 68 per cent below the average in 2011-12.

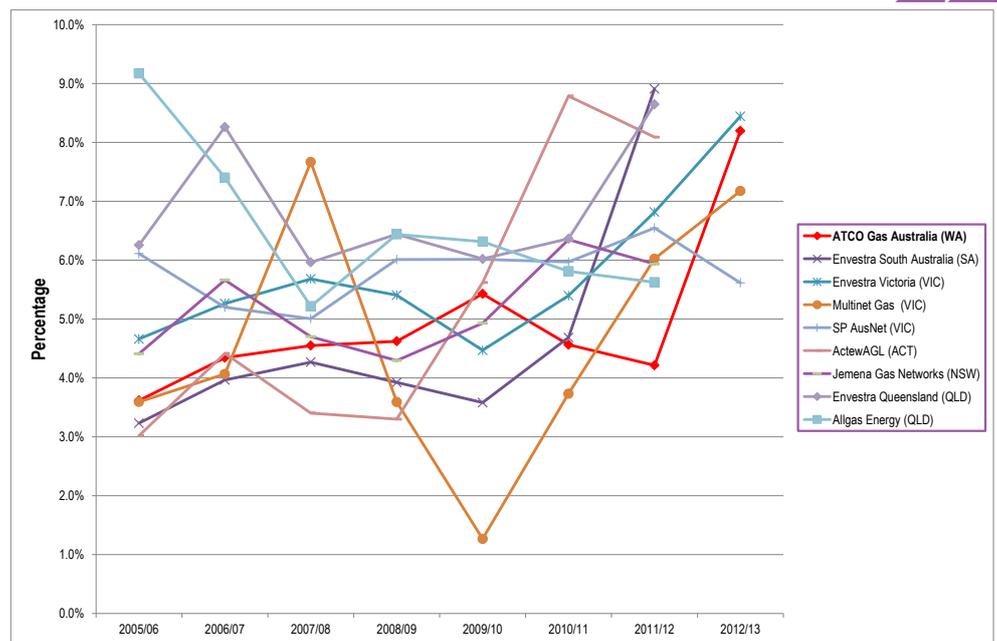
Figure 10 Capex per TJ



Note: Capex in \$Dec 2013

Capex per TJ is relatively high for ATCO Gas at \$965 in 2005-06 and increasing to \$2,998 in 2012-13. The relative position of ATCO Gas at the higher end of the sample based on this cost measure is related to the low energy density of ATCO Gas’s customer base relative to the other gas distributors. Given its low energy density relative to the other businesses, its per TJ capex is relatively higher. However, ATCO’s capex per TJ is lower than the sample average, 22 per cent lower in 2005-06 and 27 per cent lower in 2011-12.

Figure 11 Capex as a percentage of RAB



Note: Capex in \$Dec 2013

Capex as a percentage of RAB for ATCO Gas is in the lower to mid-range of the sample for much of the study period (excluding 2012-13), ranging between 3.62 per cent in 2005-06 to 4.21 per cent in 2011-12. This is between 26 per cent and 38 per cent below the sample average, respectively in 2005-06 and 2011-12.

Overall, the analysis of the capex performance indicators would suggest that ATCO Gas has efficient capital expenditure costs in relation to the sample of firms. Across all of the capex indicators ATCO is below the sample average and on a per km and per customer basis it is consistently among the lowest in the sample. However, this means that the caution sounded in relation to the opex efficiency measures would again apply. That is, the consistently low unit capex costs relative to the other gas distributors could warrant further investigation to understand whether there are factors in addition to cost efficiency that are driving this outcome.

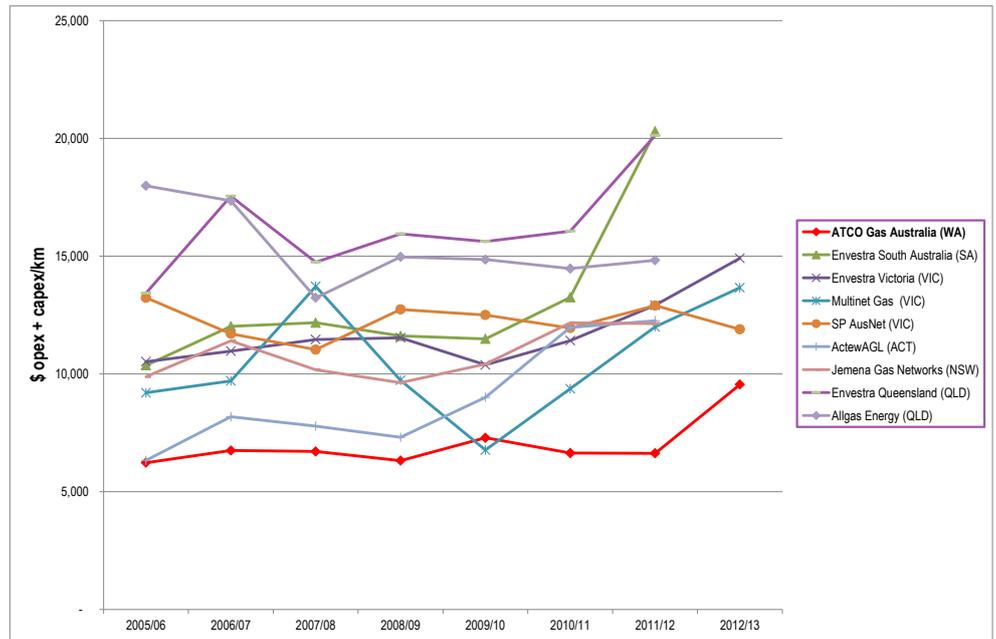
5.4 Total expenditure indicators

In accordance with the Marksman Report, two total expenditure (opex + capex) partial indicators are provided below:

- Total expenditure (opex + capex) per kilometre of mains
- Total expenditure (opex + capex) as a percentage of the Regulatory Asset Base (RAB).

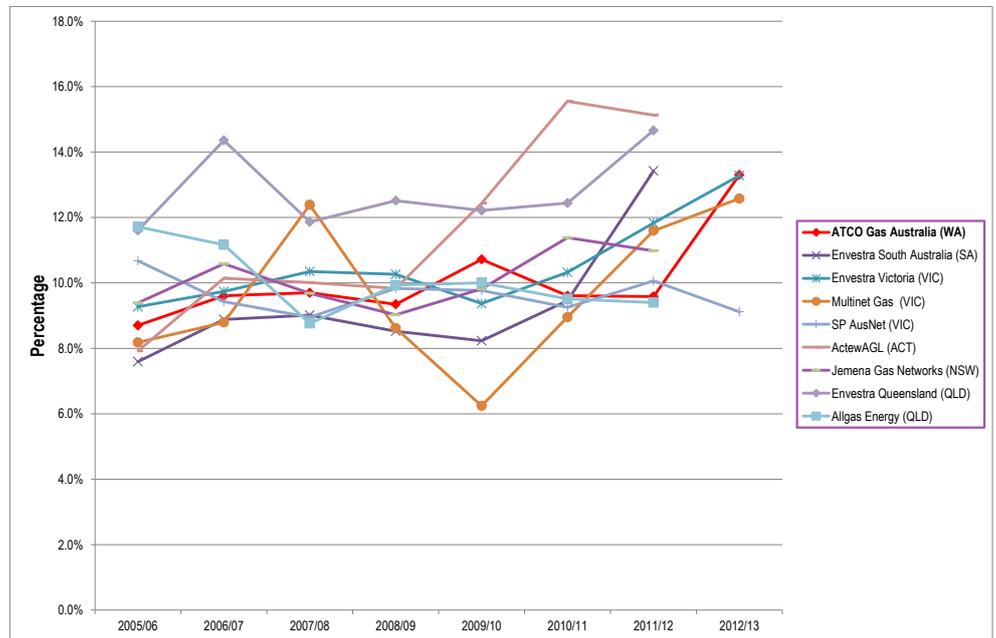
These are alternative measures of total costs relative to the asset base. As explained above, the cost per mains km measure is considered a more stable measure of cost performance.

Figure 12 Opex + capex per km



Note: Expenditure in \$Dec 2013

Figure 13 Opex + capex as a percentage of RAB



Note: Expenditure in \$Dec 2013

As would be expected, these measures follow the same trend as has been observed for the opex and capex partial indicators.

ATCO Gas has the lowest opex + capex per km of the nine gas distribution businesses in all years except 2009-10, ranging from \$6,232 in 2005-06 to \$9,551 in 2012-13. In 2005-06 ATCO Gas's opex + capex per km was 65 per cent lower than the highest cost gas distributor in the sample (Allgas Energy) and 67 per cent lower (than Envestra SA) in 2011-

12. When compared against the average across the distribution firms, ATCO Gas's opex + capex per km was 42 per cent below the average in 2005-06 and 52 per cent below the average in 2011-12.

5.5 Conclusions

The efficiency analysis undertaken within this study is by its nature partial as individual cost categories are assessed relative to single outputs. In addition, the measures do not account for potential explanators of cost differences between the firms in the sample such as the differing quality of service provided or operating environment differences.

This means that the efficiency measures do not provide a comprehensive picture of overall efficiency performance and the performance of individual firms may appear better or worse than they would if the measures accounted for these other explanators.

However, strengthening the insights from the analysis, a significant proportion of the gas distributors' costs are measured and compared, the costs have been normalised against a range of relevant output measures and assessed in conjunction with the key operating environment indicators of customer and energy density.

Based on the results of the analysis, the opex and capex performance indicators for ATCO Gas would suggest that they have efficient costs over the study period and relative to the sample of Australian gas distributors.

Capex unit costs were below the sample average across all of the output measures. Opex unit cost were below the sample average on a per mains km and per customer basis. Opex unit cost are above the sample average on a per TJ basis. This in part reflects ATCO Gas's low energy density relative to the sample.

However, the consistently low unit costs for ATCO Gas relative to the other gas distributors could warrant further investigation to understand whether there are factors in addition to cost efficiency that are driving this outcome. As identified in Section 2.1, these factors could include differences in quality of service, age of assets, historical levels of investment or other unexplained operating environment factors.

Appendix A Benchmarks

Table A1 Customers per mains km

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	44.29	45.02	45.80	46.11	46.83	47.75	48.49	48.87
Envestra South Australia (SA)	49.05	49.29	49.46	49.74	51.71	52.26	52.75	
Envestra Victoria (VIC)	57.86	58.05	57.15	56.54	56.69	57.14	56.13	56.39
Multinet Gas (VIC)	67.82	67.70	67.41	66.26	66.47	65.55	64.74	67.10
SP AusNet (VIC)	56.38	56.81	57.06	56.90	56.90	58.28	58.43	59.93
ActewAGL (ACT)	27.78	28.18	29.22	27.87	27.66	28.51	29.40	
Jemena Gas Networks (NSW)	41.56	42.22	42.80	43.38	44.48	46.03	47.37	
Envestra Queensland (QLD)	31.41	31.61	31.91	32.55	32.65	32.66	33.13	
Allgas Energy (QLD)	26.80	29.33	28.84	28.43	27.81	28.68	29.11	

Table A2 TJ per mains km

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	2.68	2.55	2.50	2.20	2.14	2.07	2.01	1.96
Envestra South Australia (SA)	4.99	4.80	4.68	4.61	4.57	4.65	4.27	
Envestra Victoria (VIC)	6.27	6.60	5.99	6.09	5.70	5.94	5.52	5.42
Multinet Gas (VIC)	6.24	6.48	5.81	5.97	5.73	5.82	5.57	5.69
SP AusNet (VIC)	8.06	7.37	7.74	7.47	7.77	7.32	7.30	7.07
ActewAGL (ACT)	2.10	1.87	1.97	1.92	1.82	1.84	1.83	
Jemena Gas Networks (NSW)	4.04	4.12	4.13	4.17	3.86	4.16	4.21	
Envestra Queensland (QLD)	6.15	6.56	6.64	6.57	6.16	6.38	6.23	
Allgas Energy (QLD)	4.17	4.00	3.99	3.74	3.56	3.33	3.30	

Table A3 TJ per customer

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04
Envestra South Australia (SA)	0.10	0.10	0.09	0.09	0.09	0.09	0.08	
Envestra Victoria (VIC)	0.11	0.11	0.10	0.11	0.10	0.10	0.10	0.10
Multinet Gas (VIC)	0.09	0.10	0.09	0.09	0.09	0.09	0.09	0.08
SP AusNet (VIC)	0.14	0.13	0.14	0.13	0.14	0.13	0.12	0.12
ActewAGL (ACT)	0.08	0.07	0.07	0.07	0.07	0.06	0.06	
Jemena Gas Networks (NSW)	0.10	0.10	0.10	0.10	0.09	0.09	0.09	
Envestra Queensland (QLD)	0.20	0.21	0.21	0.20	0.19	0.20	0.19	
Allgas Energy (QLD)	0.16	0.14	0.14	0.13	0.13	0.12	0.11	

Table A4 Operating expenditure per mains km

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	3,641	3,698	3,563	3,195	3,599	3,486	3,716	4,485
Envestra South Australia (SA)	5,955	6,656	6,411	6,269	6,492	6,686	6,825	
Envestra Victoria (VIC)	5,232	5,041	5,169	5,462	5,431	5,446	5,476	5,432
Multinet Gas (VIC)	5,161	5,216	5,227	5,676	5,396	5,466	5,764	5,868
SP AusNet (VIC)	5,658	5,247	4,862	4,952	4,806	4,241	4,506	4,572
ActewAGL (ACT)	3,917	4,619	5,139	4,856	4,936	5,209	5,704	
Jemena Gas Networks (NSW)	5,241	5,305	5,237	5,047	5,187	5,385	5,578	
Envestra Queensland (QLD)	6,191	7,451	7,336	7,739	7,923	7,845	8,253	
Allgas Energy (QLD)	3,901	5,850	5,354	5,267	5,480	5,630	5,951	

Table A5 Operating expenditure per customer

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	82	82	78	69	77	73	77	75
Envestra South Australia (SA)	121	135	130	126	126	128	129	
Envestra Victoria (VIC)	90	87	90	97	96	95	98	96
Multinet Gas (VIC)	76	77	78	86	81	83	89	87
SP AusNet (VIC)	100	92	85	87	84	73	77	76
ActewAGL (ACT)	141	164	176	174	178	183	194	
Jemena Gas Networks (NSW)	126	126	122	116	117	117	118	
Envestra Queensland (QLD)	197	236	230	238	243	240	249	
Allgas Energy (QLD)	146	199	186	185	197	196	204	

Table A6 Operating expenditure per TJ

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	1,357	1,452	1,428	1,450	1,678	1,687	1,845	1,869
Envestra South Australia (SA)	1,194	1,387	1,371	1,359	1,420	1,437	1,599	
Envestra Victoria (VIC)	834	764	863	896	952	917	991	1,002
Multinet Gas (VIC)	828	805	899	951	942	940	1,034	1,031
SP AusNet (VIC)	702	712	628	663	619	580	617	647
ActewAGL (ACT)	1,867	2,473	2,614	2,535	2,705	2,837	3,113	
Jemena Gas Networks (NSW)	1,297	1,287	1,269	1,211	1,345	1,295	1,326	
Envestra Queensland (QLD)	1,007	1,136	1,105	1,178	1,286	1,230	1,325	
Allgas Energy (QLD)	937	1,464	1,343	1,408	1,540	1,691	1,804	

Table A7 Operating expenditure as a percentage of RAB

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	5.09%	5.26%	5.15%	4.72%	5.29%	5.04%	5.37%	5.11%
Envestra South Australia (SA)	4.36%	4.92%	4.75%	4.60%	4.65%	4.77%	4.51%	
Envestra Victoria (VIC)	4.61%	4.48%	4.67%	4.86%	4.90%	4.92%	5.02%	4.84%
Multinet Gas (VIC)	4.59%	4.72%	4.72%	5.03%	4.98%	5.22%	5.57%	5.40%
SP AusNet (VIC)	4.56%	4.23%	3.95%	3.82%	3.76%	3.29%	3.51%	3.51%
ActewAGL (ACT)	4.90%	5.73%	6.61%	6.53%	6.81%	6.76%	7.04%	
Jemena Gas Networks (NSW)	4.98%	4.92%	4.98%	4.73%	4.89%	5.04%	5.05%	
Envestra Queensland (QLD)	5.35%	6.10%	5.90%	6.07%	6.19%	6.08%	6.01%	
Allgas Energy (QLD)	2.54%	3.76%	3.55%	3.50%	3.69%	3.70%	3.77%	

Table A8 Capital expenditure per mains km

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	2,591	3,052	3,147	3,126	3,692	3,156	2,916	5,883
Envestra South Australia (SA)	4,413	5,365	5,764	5,346	4,997	6,567	13,474	
Envestra Victoria (VIC)	5,290	5,928	6,293	6,074	4,955	5,969	7,441	9,478
Multinet Gas (VIC)	4,041	4,491	8,490	4,056	1,375	3,906	6,235	7,793
SP AusNet (VIC)	7,576	6,458	6,170	7,787	7,695	7,707	8,398	7,323
ActewAGL (ACT)	2,414	3,563	2,648	2,454	4,071	6,767	6,553	
Jemena Gas Networks (NSW)	4,644	6,102	4,941	4,585	5,233	6,787	6,558	
Envestra Queensland (QLD)	7,240	10,098	7,411	8,209	7,700	8,218	11,872	
Allgas Energy (QLD)	14,085	11,503	7,877	9,701	9,377	8,842	8,874	

Table A9 Capital expenditure per customer

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	58	68	69	68	79	66	60	120
Envestra South Australia (SA)	90	109	117	107	97	126	255	
Envestra Victoria (VIC)	91	102	110	107	87	104	133	168
Multinet Gas (VIC)	60	66	126	61	21	60	96	116
SP AusNet (VIC)	134	114	108	137	135	132	144	122
ActewAGL (ACT)	87	126	91	88	147	237	223	
Jemena Gas Networks (NSW)	112	145	115	106	118	147	138	
Envestra Queensland (QLD)	231	319	232	252	236	252	358	
Allgas Energy (QLD)	526	392	273	341	337	308	305	

Table A10 Capital expenditure per TJ

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	965	1,199	1,261	1,419	1,721	1,528	1,447	2,998
Envestra South Australia (SA)	885	1,118	1,233	1,159	1,093	1,411	3,157	
Envestra Victoria (VIC)	785	951	997	1,042	820	1,037	1,349	1,749
Multinet Gas (VIC)	648	693	1,460	680	240	672	1,119	1,370
SP AusNet (VIC)	940	876	797	1,042	991	1,053	1,151	1,036
ActewAGL (ACT)	1,150	1,908	1,347	1,281	2,231	3,686	3,576	
Jemena Gas Networks (NSW)	1,149	1,480	1,197	1,100	1,357	1,632	1,559	
Envestra Queensland (QLD)	1,178	1,539	1,116	1,250	1,250	1,288	1,906	
Allgas Energy (QLD)	3,382	2,879	1,975	2,593	2,636	2,656	2,690	

Table A11 Capital expenditure as a percentage of RAB

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	3.62%	4.34%	4.55%	4.62%	5.43%	4.56%	4.21%	8.20%
Envestra South Australia (SA)	3.23%	3.97%	4.27%	3.92%	3.58%	4.69%	8.91%	
Envestra Victoria (VIC)	4.66%	5.26%	5.68%	5.40%	4.47%	5.40%	6.82%	8.44%
Multinet Gas (VIC)	3.59%	4.07%	7.67%	3.59%	1.27%	3.73%	6.02%	7.18%
SP AusNet (VIC)	6.11%	5.20%	5.01%	6.01%	6.01%	5.97%	6.55%	5.61%
ActewAGL (ACT)	3.02%	4.42%	3.40%	3.30%	5.62%	8.79%	8.09%	
Jemena Gas Networks (NSW)	4.41%	5.66%	4.70%	4.30%	4.93%	6.35%	5.93%	
Envestra Queensland (QLD)	6.26%	8.26%	5.96%	6.44%	6.02%	6.36%	8.65%	
Allgas Energy (QLD)	9.17%	7.40%	5.22%	6.44%	6.31%	5.81%	5.63%	

Table A12 Operating + Capital expenditure per mains km

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	6,232	6,751	6,710	6,321	7,291	6,642	6,632	9,551
Envestra South Australia (SA)	10,368	12,022	12,175	11,615	11,489	13,252	20,299	
Envestra Victoria (VIC)	10,522	10,969	11,462	11,536	10,386	11,415	12,917	14,910
Multinet Gas (VIC)	9,202	9,706	13,717	9,733	6,771	9,372	11,999	13,662
SP AusNet (VIC)	13,235	11,705	11,032	12,739	12,501	11,949	12,905	11,895
ActewAGL (ACT)	6,331	8,182	7,788	7,310	9,007	11,976	12,257	
Jemena Gas Networks (NSW)	9,886	11,407	10,178	9,633	10,420	12,172	12,136	
Envestra Queensland (QLD)	13,431	17,549	14,746	15,948	15,623	16,063	20,125	
Allgas Energy (QLD)	17,986	17,353	13,231	14,968	14,857	14,472	14,826	

Table A13 Operating + Capital expenditure as a percentage of RAB

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
ATCO Gas Australia (WA)	8.7%	9.6%	9.7%	9.3%	10.7%	10%	10%	13%
Envestra South Australia (SA)	7.6%	8.9%	9.0%	8.5%	8.2%	9.5%	13.4%	
Envestra Victoria (VIC)	9.3%	9.7%	10.3%	10.3%	9.4%	10.3%	11.8%	13.3%
Multinet Gas (VIC)	8.2%	8.8%	12.4%	8.6%	6.2%	9.0%	11.6%	12.6%
SP AusNet (VIC)	10.7%	9.4%	9.0%	9.8%	9.8%	9.3%	10.1%	9.1%
ActewAGL (ACT)	7.9%	10.1%	10.0%	9.8%	12.4%	15.5%	15.1%	
Jemena Gas Networks (NSW)	9.4%	10.6%	9.7%	9.0%	9.8%	11.4%	11.0%	
Envestra Queensland (QLD)	11.6%	14.4%	11.9%	12.5%	12.2%	12.4%	14.7%	
Allgas Energy (QLD)	11.7%	11.2%	8.8%	9.9%	10.0%	9.5%	9.4%	

Appendix B Terms of reference

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6 February 2014

Ms Deirdre Rose
Principal
Acil Allen Consulting Pty Ltd
Level 9
60 Collins Street
MELBOURNE VIC 3000

Dear Ms Rose

ATCO Gas Australia Pty Ltd - ERA Price Determination

We act for ATCO Gas Australia Pty Ltd (**ATCO Gas**) in relation to the Economic Regulation Authority's (**ERA**) review of the Gas Access Arrangement for ATCO Gas under the National Gas Law and Rules.

ATCO Gas owns and operates the Mid West and South West Gas Distribution System in Western Australia. ATCO Gas wishes to engage you to prepare an expert report in connection with the ERA's review of the access arrangement for the period 2015-2020.

This letter sets out the matters which ATCO Gas wishes you to address in your report and the requirements with which the report must comply.

Terms of Reference

Legal Framework

The terms and conditions upon which ATCO Gas provides access to its gas network are subject to five yearly reviews by the ERA. The ERA undertakes that review by considering the terms and conditions proposed against criteria set out in the National Gas Law and National Gas Rules.

A fundamental aspect of that review is assessing the efficiency of proposed expenditure.

In this context the following provisions of the National Gas Rules are of note:

Under Rule 79 to be Conforming Capital Expenditure, capital expenditure must, amongst other things,:

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“be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services;”

Rule 91(1) provides:

“Operating expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services.”

Rule 74 provides:

- “(1) Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.*
- (2) A forecast or estimate:*
- (a) must be arrived at on a reasonable basis; and*
 - (b) must represent the best forecast or estimate possible in the circumstances.”*

Rule 75 provides:

“Information in the nature of an extrapolation or inference must be supported by the primary information on which the extrapolation or inference is based.”

Capital expenditure is defined as:

“costs and expenditure of a capital nature incurred to provide, or in providing, pipeline services.”

Operating expenditure is defined as:

“operating, maintenance and other costs and expenditure of a non-capital nature incurred in providing pipeline services and includes expenditure incurred in increasing long-term demand for pipeline services and otherwise developing the market for pipeline services.”

Opinion

Your report is prepared in the context of assessing whether ATCO Gas is an efficient operator.

In September 2010 as part of its Queensland and South Australian Access Arrangement review Envestra Limited submitted a report to the Australian Energy Regulator titled *“Gas Distributor Benchmarking Report Envestra South Australia and Queensland”* by Marksman Consulting Services. This report compared the performance of various Australian distributors (including ATCO Gas) using various opex, capex and total expenditure benchmarks.

ATCO Gas wishes to engage you to prepare an expert report updating the analysis in the Marksman Consulting Report to reflect performance over the period 2005 to 2011 (or 2012 if appropriate data is available).

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ATCO Gas also requests you address the following in your report:

- (a) the basis on which data was sourced and the extent to which that data can be considered robust and appropriate to use for the benchmarking analysis;
- (b) the methodology used to ensure comparability of data between the analysed businesses;
- (c) the uses which can be made of a benchmarking analysis and any strengths and weaknesses of that analysis;
- (d) your view, as an expert, as to whether benchmarking is a useful mechanism for assessing the efficiency of a business.

It is intended that your report will be submitted by ATCO Gas to the ERA with its Access Arrangement proposal. The report may be provided by the ERA to its own advisers. The report must be expressed so that it may be relied upon both by ATCO Gas and by the ERA.

The ERA may ask queries in respect of the report and you will be required to assist in answering these queries. The ERA may choose to interview you and if so, you will be required to participate in any such interviews.

The report will be reviewed by ATCO Gas' legal advisers and will be used by them to provide legal advice as to its respective rights and obligations under the National Gas Law and National Gas Rules.

If ATCO Gas was to challenge any decision ultimately made by the ERA, that appeal will be made to the Australian Competition Tribunal and your report will be considered by the Tribunal. ATCO Gas may also seek review by a court and the report would be subject to consideration by such court. You should therefore be conscious that the report may be used in the resolution of a dispute between the ERA and ATCO Gas. Due to this, the report will need to comply with the Federal Court requirements for expert reports, which are outlined below.

Timeframe

ATCO Gas's Access Arrangement proposal must be submitted by **16 March 2014**. Your report will need to be finalised by 24 February 2014.

Compliance with the Code of Conduct for Expert Witnesses

Attached is a copy of the Federal Court's Practice Note CM 7, entitled "*Expert Witnesses in Proceedings in the Federal Court of Australia*", which comprises the guidelines for expert witnesses in the Federal Court of Australia (**Expert Witness Guidelines**).

Please read and familiarise yourself with the Expert Witness Guidelines and comply with them at all times in the course of your engagement by ATCO Gas.

In particular, your report should contain a statement at the beginning of the report to the effect that the author of the report has read, understood and complied with the Expert Witness Guidelines.

Your report must also:

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- 1 contain particulars of the training, study or experience by which the expert has acquired specialised knowledge;
- 2 identify the questions that the expert has been asked to address;
- 3 set out separately each of the factual findings or assumptions on which the expert's opinion is based;
- 4 set out each of the expert's opinions separately from the factual findings or assumptions;
- 5 set out the reasons for each of the expert's opinions; and
- 6 otherwise comply with the Expert Witness Guidelines.

The expert is also required to state that each of the expert's opinions is wholly or substantially based on the expert's specialised knowledge.

It is also a requirement that the report be signed by the expert and include a declaration that "[the expert] has made all the inquiries that [the expert] believes are desirable and appropriate and that no matters of significance that [the expert] regards as relevant have, to [the expert's] knowledge, been withheld from the report".

Please also attach a copy of these terms of reference to the report.

Terms of Engagement

Your contract for the provision of the report will be directly with ATCO Gas. You should forward ATCO Gas any terms you propose govern that contract as well as your fee proposal.

Please sign a counterpart of this letter and return it to us to confirm your acceptance of the engagement.

Yours faithfully

Johnson Winter & Slattery

Enc: Federal Court of Australia Practice Note CM 7, "Expert Witnesses in Proceedings in the Federal Court of Australia"

Deirdre Rose
.....

Signed and acknowledged by Deirdre Rose

Date *10/2/2014*
.....

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Appendix C CV Deirdre Rose

Deirdre is a Principal at ACIL Allen in Melbourne with over 16 years of economic consulting experience at leading consulting firms including her own practice Ilex Consulting, Ernst & Young, Frontier Economics and London Economics.

Deirdre has undertaken productivity and efficiency benchmarking of a range of industries and government services over a period of close to 20 years, including benchmarking of electricity distribution businesses and water supply businesses. Deirdre was initially trained while a research economist at NSW Treasury by leading international academics in economic performance benchmarking techniques (including Total Factor Productivity (index number) and Data Envelopment Analysis).

Deirdre brings a strong background in applied micro-economics and modelling skills such as in electricity market modelling, cost benefit analysis and business case development.

Deirdre has also provided wide-ranging analytical and advisory support to regulated firms across a range of industries. This has been in the context of regulatory determinations advising on elements of the building blocks and broader support relevant to the operations and investments of the regulated firms. Deirdre has also advised governments and regulators on economic regulatory frameworks.

Deirdre has a degree in administration and economics from Griffith University.

Economic benchmarking experience

- *Victorian dairy sector*: While the Chief Economist of the Victorian Department of Primary Industries oversighted a study to measure the productivity and efficiency of the Victorian dairy industry. (2012)
- *Victorian water business*: Led a TFP study for a large metropolitan Victorian water business to assess their productivity over time using index number techniques. (2008)
- *Review of Energy Reform Implementation Group (ERIG) analysis of electricity network performance*: Provided an electricity network business with a critique of the productivity measures included in the ERIG discussion papers on energy market reforms released in November 2006. (2006)
- *Sydney Water*: Assisted in undertaking a TFP study for Sydney Water to assess their productivity over time using index number techniques. This was done in the context of their periodic price review process with IPART. This analysis was able to change the negative view of the businesses' productivity performance to a more positive stance, with an understanding that significant investments had increased costs but had commensurately significantly improved Sydney Water's required quality of service particularly in terms of wastewater quality. (2005)
- *Victorian distribution pricing review*: Regulatory advice to TXU Networks during the 2001 Victorian electricity distribution pricing review on benchmarking analysis. (2000)
- *NSW electricity distribution*: Led the team (including Professor Tim Coelli) that undertook a detailed benchmarking study for the Independent Pricing and Regulatory Tribunal (IPART). The study used a range of economic benchmarking techniques including partial indicators, Data Envelopment Analysis, Stochastic Frontier Analysis and index number techniques. The results of the study were used to help determine the regulated price paths of the NSW electricity distributors for the five-year period from July 1999. (1998, 1999)

- *Queensland electricity supply industry*: Supervised and undertook benchmarking studies of the generation, retail and network businesses in Queensland. The network sector studies were used to establish appropriate X factors as part of the revenue caps for the transmission and distribution businesses in Queensland. The retail sector study was used in setting allowed revenues in relation to non-contestable customers. (1998)
- *West Australia electricity supply industry*: Benchmarked the economic performance of the West Australian firms in the generation, transmission and distribution sector against international firms using DEA. This was done as part of a broader study of options for reforming the electricity supply industry in Western Australia. (1998)
- *Water and Sewerage Companies, England and Wales*: Member of advisory teams to water companies subject to take over bids which were referred to the Monopolies and Mergers Commission (MMC) during 1996. Worked on projects to assess the relative efficiency of firms in the UK water sector (using DEA and Total Factor Productivity (TFP) analysis), to examine the structure of the water sector, and to provide general advice on likely economic and regulatory consequences of further mergers in the UK water sector. Appeared before hearings of the MMC to report on the results of the efficiency studies. During this six month period in the UK, I presented to a number of water companies on economic benchmarking techniques. (1996)
- *Government owned businesses and budget sector agencies*: At NSW Treasury applied efficiency measurement tools to measure and assess the performance of government owned businesses and budget sector agencies (including electricity distributors, correctional centres, rail and ferry services). Developed considerable expertise in using TFP or index number techniques and Data Envelopment Analysis (DEA) to measure and benchmark public sector performance. Received training in the use of economic benchmarking techniques from leading academics including Knox Lovell, Hal Fried, Tim Coelli and Suthathip Yaisawarng. (1994, 1995)

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