ActewAGL Gas Network Performance Benchmark Study

FY2000 – FY2008

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1. Executive Summary

This Study reviews the operational performance of the ActewAGL gas networks, benchmarked against published reports for gas distributors by Australian regulators. The Introduction provides high level information regarding the gas industry in Australia. The following section contains more detailed information about the individual gas distributors in each state. The main section covering KPI benchmarks is divided into the two standard categories: Reliability of Supply, and Network Integrity. Finally, the Appendix contains a complete set of data sheets used to generate all the charts in this Study.

The Australian Energy Regulator (AER) became the economic regulator for covered natural gas distribution pipelines in all states and territories (except WA) on 1 July 2008. Prior to this each had its own regulator which published annual performance reports. This Study utilises data published within the following regulators' annual reports and internal information for ActewAGL and JGN:

- The ACT and Queanbeyan, through the Independent Competition and Regulatory Commission (ICRC)
- NSW through the Department of Water and Energy (DWE)
- Victoria, through information reported by the Essential Services Commission (ESC) and the Office of Gas Safety (OGS)
- Queensland, through the Queensland Competition Authority (QCA)
- Western Australia, through the Economic Regulation Authority (ERA)
- South Australia, through information reported by the Office of the Technical Regulator (OTR)
- Review of all states via the Australian Energy Regulator (AER)

Benchmark KPI for gas networks are broadly divided into two categories: **Reliability** and **Integrity**. Reliability of supply is about the availability of gas to customers, measured in terms of the average frequency and duration of supply interruptions and also the speed of emergency response. Network Integrity is taken to relate to gas leakage and mechanical damage to mains, and also the level of Unaccounted For Gas.

ActewAGL performs better than all the other utilities in every benchmark KPI.

- The number of outages is lower than any other Australian gas utility.
- Outages per customer is also lower than other utilities and half that of JGN. Indeed, on past history an average ActewAGL customer could expect an unplanned gas network outage only once every 800 years!
- Emergency response has always been 100% within 60 minutes for the last 6 years, substantially better than any other utility.
- 0.3 leaks per km mains is half that of JGN and is much lower than other utilities except WAGN which only publishes publicly reported leaks.
- 0.07 hits pa per km mains is lower than all others.
- UAFG of 1.6% is also lower than all other utilities.

2. Introduction

2.1 Gas Distribution Networks Benchmarked

The total length of Australia's gas distribution networks expanded from around 67,000 kilometres in 1997 to over 81,000 kilometres in 2007. The networks deliver over 300 petajoules of gas a year and have a combined valuation of over $7 billion.

This report deals with the performance of the following gas distribution networks, based on availability of data:

- ActewAGL (ACT, Greater Queanbeyan)
- JGN (NSW)
- Envestra (Vic)
- Multinet (Vic)
- SP AusNet (Vic)
- Envestra (Qld)
- Allgas Energy (Qld)
- WA Gas Networks (formerly AlintaGas Networks)
- Envestra (SA).

To date, performance reporting has not included Tasmanian figures due to the fact that the gas industry there has been in its infancy. AER will consider including Powerco in the future, along with revisions to the Gas Distribution Code.

2.2 Ownership of Gas Distribution Networks

The major gas distribution networks in Australia are privately owned. South Australia, Victoria, Western Australia and Queensland privatised their state-owned networks in 1993, 1997, 2000 and 2006, respectively. The principal NSW network has always been in private hands. Over time, structural reform and capital market drivers have led to specialist network businesses acquiring most assets in the sector.

ActewAGL was Australia's first multi-utility to offer electricity, natural gas, water and wastewater services under one roof. ActewAGL was set up in October 2000 when the Australian Gas Light Company (AGL), and ACTEW Corporation, an ACT Government owned enterprise, entered into Australia's first utility joint venture. Following business dealings between AGL and Alinta in October 2006, ownership of ActewAGL's retail arm was shared equally between AGL Energy and ACTEW Corporation, and ownership of ActewAGL's distribution arm was shared equally between Alinta and ACTEW Corporation. Further changes to the distribution partnership occurred when a consortium including Singapore Power purchased Alinta in 2007. The distribution partnership is now owned equally by Singapore Power and ACTEW Corporation.

AGL and **Alinta** merged in October 2006 and subsequently de-merged in that AGL sold its infrastructure and asset management business to Alinta. AGLGN changed its name to Alinta GN and Agility to Alinta Asset Management (AAM). In September 2007, Alinta was taken over by a consortium comprising Singapore Power International (SPI), Babcock & Brown Infrastructure (BBI) and Babcock & Brown Power (BBP). Subsequently Alinta was split into three businesses. As part of the acquisition of Alinta by SPI, APA entered into an agreement to

transfer the operating and maintenance services provided by Alinta for APA's key gas transmission pipelines (NSW, Queensland, Northern Territory and Western Australia) to APA.

Rebranding to **Jemena** occurred in August 2008 due to legal name obligations. The newly established business called Jemena contains both Alinta GN, now called Jemena Gas Networks (JGN), and the asset management service provider now renamed Jemena Asset Management (JAM). In May 2009 Jemena acquired the remaining 51% of Alinta Asset Management (AAM) thereby taking full control of the workforce and assets away from BBI.

Another significant ownership change in 2006 was the privatisation of Queensland's Allgas network, which was sold to the APA Group. Figure 1 shows key ownership changes since 1994.

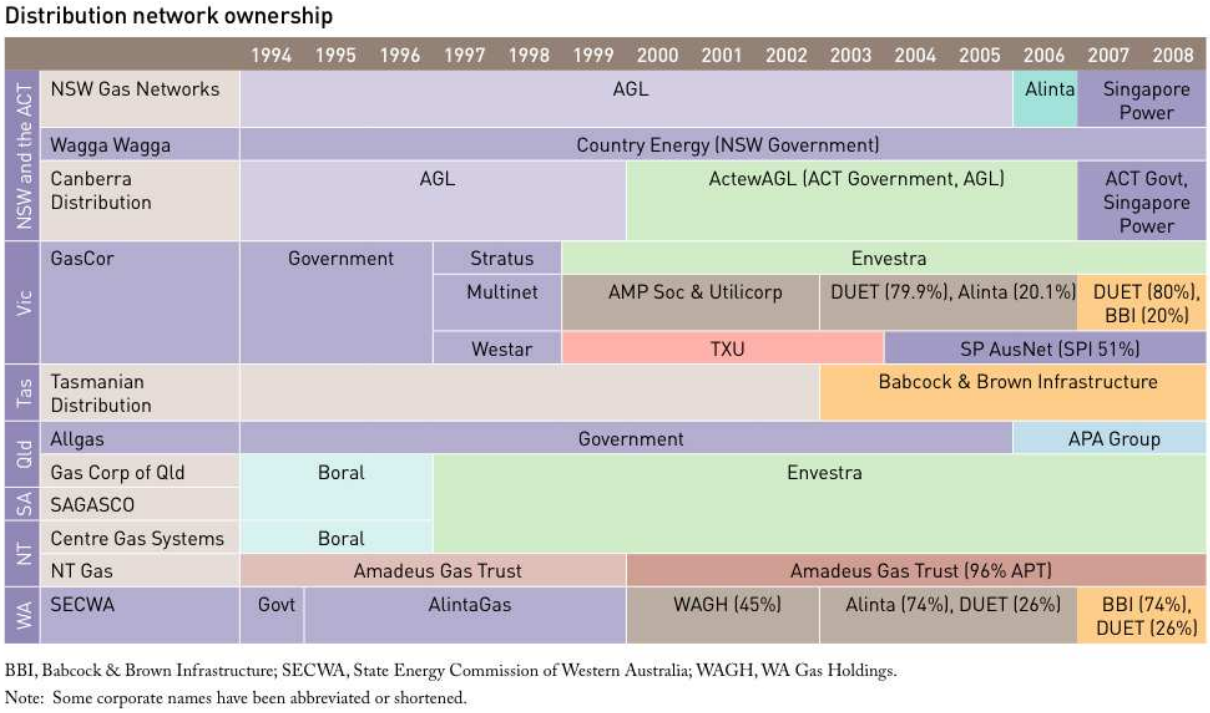

Figure 1. Gas distribution network ownership

In summary, ownership consolidation had reduced the number of principal players in the gas distribution sector to six:

- **Singapore Power International** owns the principal NSW gas distribution network (JGN). It has a 51% share in the Victorian network (SP AusNet) and a 50% share of the Australian Capital Territory (ACT) network (ActewAGL). In August 2008, Singapore Power International rebranded its gas distribution entities as Jemena.
- **Envestra**, a public company in which the APA Group and Cheung Kong Infrastructure each have a 17% shareholding, owns networks in Victoria, South Australia and Queensland, as well as a small Northern Territory network.
- **Babcock & Brown Infrastructure** owns the Tasmanian distribution network (Powerco) and is the 74% owner of the Western Australian network. It owns 20% of Multinet. It has just divested 58% of its holding in PowerCo NZ to QIC.
- The **APA Group** owns the Allgas network in Queensland, and has a 17% stake in Envestra.

- **DUET Group** is a Macquarie Group and AMP Capital Investors branded externally managed investment vehicle. It is the 80% owner of Victoria's Multinet network and a minority owner of the Western Australian network. DUET Group contracts out the operation of its networks; Jemena East is the contract manager for Multinet in Victoria..
- **Cheung Kong Infrastructure** owns a 17% interest in Envestra.

There are increasing ownership linkages between gas distribution and other energy networks. In particular, Singapore Power International, Babcock & Brown Infrastructure and the APA Group own and operate both gas transmission and distribution infrastructure. In addition, Singapore Power International, the APA Group, Cheung Kong Infrastructure and DUET Group all have ownership interests — in some cases, substantial interests — in the electricity network sector.

2.3 Regulatory Framework

The regulation of covered distribution networks was transferred from state and territory regulators to the Australian Energy Regulator (AER) on 1 July 2008. In Western Australia, the local regulator — the Economic Regulation Authority — will continue to regulate covered networks. The only major unregulated network is the Tasmanian distribution network, which is currently being rolled out. In addition, a number of small regional networks are not covered

JURISDICTION	REPORTING ARRANGEMENTS
New South Wales	Distribution businesses report annually to the Department of Water and Energy on network integrity and safety information, network reliability and consumer-related matters. As of 1 March 2008, the most recent published data was for 2001–02.
Victoria	The Essential Services Commission publishes annual performance reports for the three gas distribution businesses, covering financial performance, reliability of supply, network integrity, and customer service.
Queensland	The Queensland Competition Authority publishes annual performance reports for the two distribution businesses, covering unaccounted-for gas, reliability of supply and customer service.
South Australia	The Essential Services Commission of South Australia publishes annual performance reports, covering financial performance, reliability of supply, network integrity and customer service.
Western Australia	The Economic Regulation Authority published its first compliance report for gas distribution in 2007, covering reliability of supply and network integrity. New licensing arrangements will widen the range of published data over time, including performance indicators based on the Victorian model.
Tasmania	The Office of the Tasmanian Energy Regulator publishes annual performance reports, covering reliability of supply, network integrity, and customer service.
ACT	The Independent Competition and Regulatory Commission publishes annual performance reports, covering network performance and consumer protection. As of 1 March 2008, the most recent published data was for 2004–05.

Figure 2. Regulation of Gas utilities in Australia

Note that the above Figure (published by the AER) refers to the lack of data for NSW and the ACT. In fact of course this Study has access to a wealth of internal data for JGN and ActewAGL.

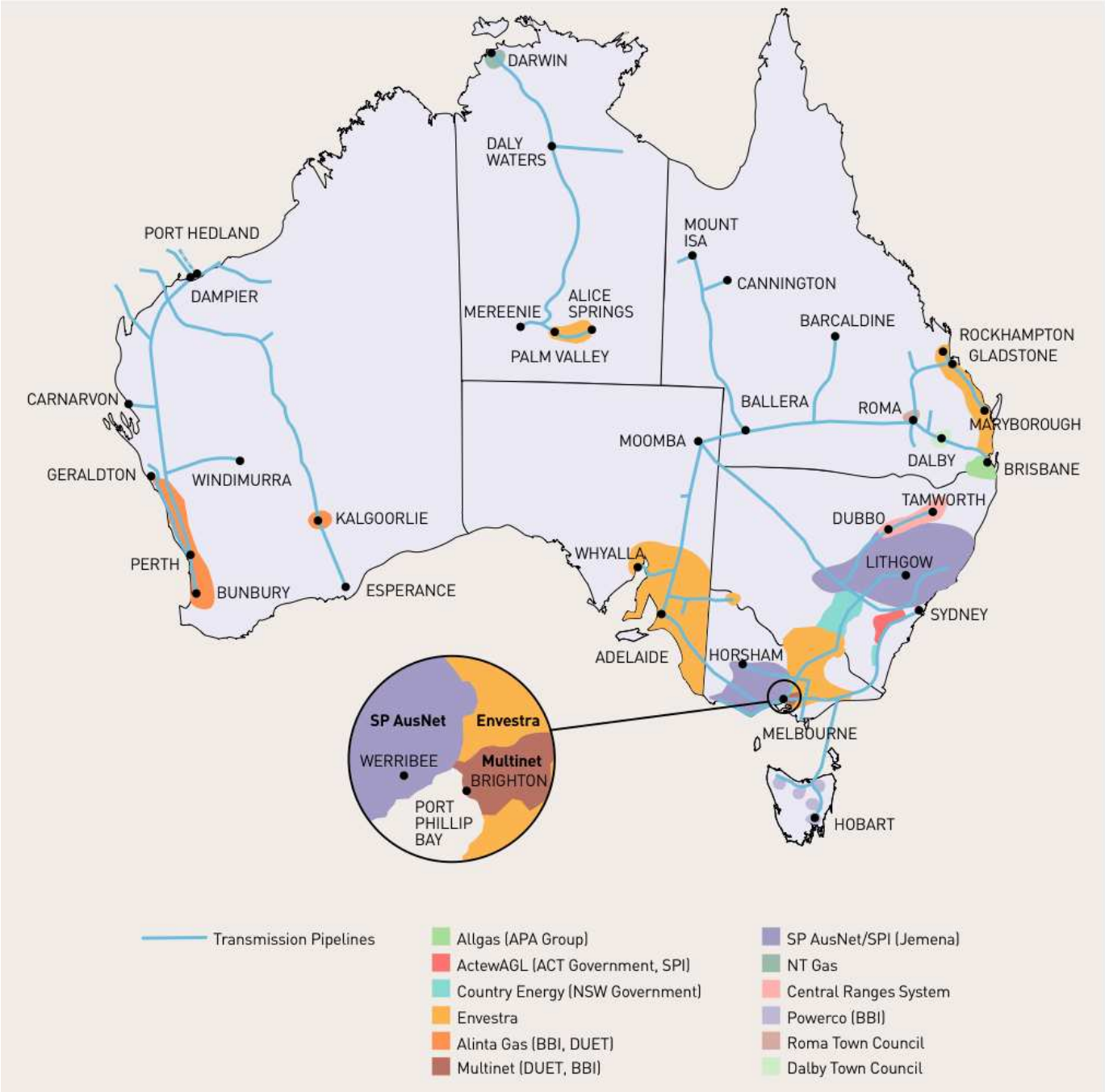

Figure 3. Gas distribution networks in Australia

2.4 Summary of Gas Utilities in Australia

DISTRIBUTION NETWORK	LOCATION	LENGTH OF MAINS (KM)	ASSET BASE ($ MILLION 2007)	INVESTMENT —CURRENT REGULATORY PERIOD ($ MILLION 2007)	CURRENT REGULATORY PERIOD	OWNER
NEW SOUTH WALES AND ACT						
NSW Gas Networks (Alinta AGN)	Sydney, Newcastle/ Central Coast and Wollongong	23 800	2088	518	1 July 2005– 30 June 2010	Jemena (Singapore Power International (Australia))
Central Ranges System	Dubbo to Tamworth region	250	n/a	n/a	2006–2019	APA Group
Wagga Wagga distribution	Wagga Wagga and surrounding areas	622	47	8	1 July 2005– 30 June 2010	Country Energy (NSW Govt)
ActewAGL Distribution (Canberra network)	ACT and Queanbeyan	3 621	247	49	1 July 2004– 30 June 2010	ACTEW Corporation (ACT Govt) 50%; Jemena (Singapore Power International (Australia)) 50%
VICTORIA						
Multinet	Melbourne's eastern and south-eastern suburbs	9 513	888	251	1 Jan 2008– 31 Dec 2012	DUET Group 79.9%; BBI 20.1%
Envestra (Stratus)	Melbourne, north-east and central Victoria, and Albury —Wodonga region	9 350	859	394	1 Jan 2008– 31 Dec 2012	Envestra (Cheung Kong Infrastructure 17%, APA Group 17%)
SP AusNet (Westar)	Western Victoria	9 140	955	343	1 Jan 2008– 31 Dec 2012	SP AusNet (listed company: Singapore Power International 51%)
QUEENSLAND						
Allgas	South of the Brisbane River	2 515	307	155	1 July 2006– 30 June 2011	APA Group
Envestra	Brisbane, Gladstone and Rockhampton	2 261	235	100	1 July 2006– 30 June 2011	Envestra (Cheung Kong Infrastructure 17%, APA Group 17%)
SOUTH AUSTRALIA						
South Australian distribution	Adelaide and surrounds	7 377	851	204	1 July 2006– 30 June 2011	Envestra (Cheung Kong Infrastructure 17%, APA Group 17%)
WESTERN AUSTRALIA						
Alinta Gas Networks	Mid-west and south-west regions	12 157	708	157	1 Jan 2005– 31 Dec 2009	BBI 74.1%, DUET Group 25.9%. Operated by WestNet Energy (owned by BBI)
TASMANIA						
Tasmanian Gas Network	Hobart, Launceston and other towns	683	100	n/a	Not covered	Powerco (BBI)
National totals		81 289	7285	2179		

BBI, Babcock & Brown Infrastructure; n/a, not available.

Notes:

1. For Tasmania, the asset value is an estimated construction cost. For other networks, the asset value is the opening regulated asset base for the current regulatory period, adjusted to June 2007 dollars.
2. Investment data are forecasts for the current asset arrangement period, adjusted to June 2007 dollars.
3. Some corporate names have been abbreviated or shortened.

Sources: Access arrangements for covered pipelines; company websites.

Figure 4. Summary of Australian Gas Utilities

2.5 Financial Indicators

While this Study deals specifically with benchmarking operational performance, it is instructive to observe some basic financial indicators for the various gas distributors.

2.5.1 Investment

Investment in gas distribution typically involves capital works to upgrade and expand the capacity of existing networks and extend the networks into new residential and commercial developments, regional centres and towns. While most major centres already have a distribution network in place, there are also recent examples of new networks being constructed — for example, the Central Ranges in NSW and the Tasmanian networks. Mostly, however, distribution investment relates to discrete development and upgrade projects that are relatively small compared to capital projects in gas transmission. This tends to result in distribution investment recording relatively stable trends over time, compared to the 'lumpy' investment cycles often seen for gas transmission.

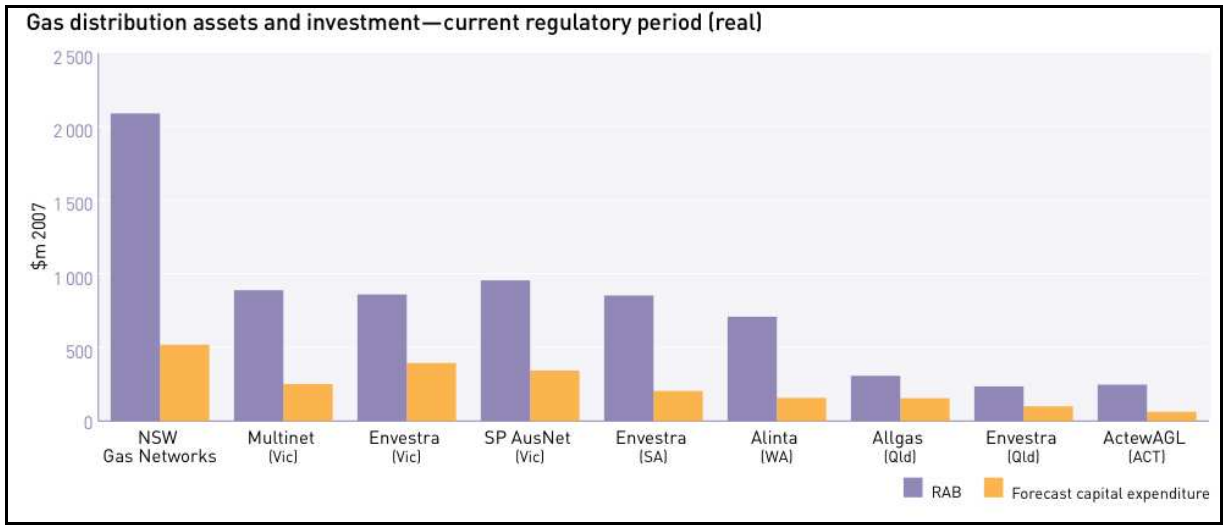

Figure 5. RAB and forecast investment over the current AA

Figure 5 shows the opening regulated asset bases (RAB) and forecast investment over the current regulatory period (typically five years) for the major networks. The regulated asset base estimates the depreciated optimised replacement cost of an asset.

Investment over the current regulatory cycle of 5 years is running at around 25% of the underlying asset base in most networks, but around 35% for SP AusNet (Victoria) and 40 – 50% for Envestra (Victoria) and the Queensland networks. The Victorian networks attract significantly higher investment than NSW, in part reflecting the penetration of natural gas as a major heating source in Victoria.

2.5.2 O&M Expenditure

Figure 6 compares forecast operating and maintenance expenditure for the networks on a per kilometre basis. Most networks have expenses ranging from about $4000 to $7000 per kilometre of network line length. Differences may arise for a number of reasons, including the age and condition of the networks and geographical factors. Normalising on a per kilometre basis may bias against high-density urban networks with relatively short line lengths. Envestra, which has been expanding its Queensland network, recorded higher per kilometre costs than the other networks.

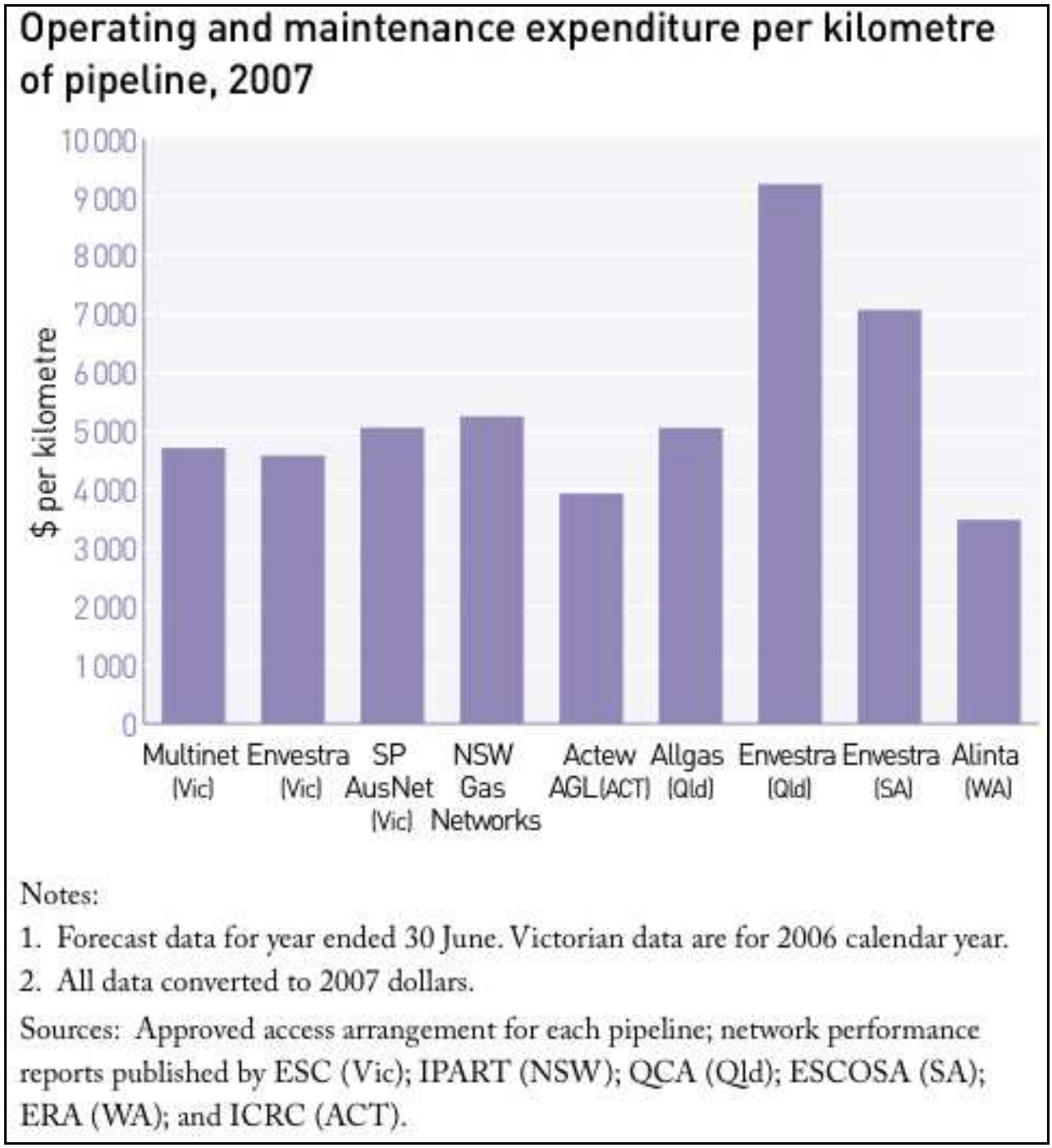

Figure 6. O&M expenditure per km pipeline 2007

3. The Gas Utilities' Distribution Systems

3.1 ActewAGL

ActewAGL also supplies Greater Queanbeyan, Bungendore and Nowra as well as the ACT. .However Nowra is not included in this report as it is not within the purview of the next Access Arrangement.

ActewAGL owns 3,500 kilometres of natural gas distribution system, delivering approximately 7.4 petajoules of natural gas to approximately 110,000 homes and businesses. There are two high pressure transmission pipelines supplying natural gas to ActwAGL's distribution system in the ACT and Queanbeyan: the Licence 29 spur from the Moomba-Sydney Pipeline through the northern Watson TRS and the Eastern Gas Pipeline from Longford in Victoria through the eastern Hoskintown TRS. The EGP also supplies Nowra.

ActewAGL distributes 7% of the total natural gas delivered in NSW and owns 1.3% of the total NSW network pipe length. ActewAGL also owns the Hoskinstown to ACT pipeline.

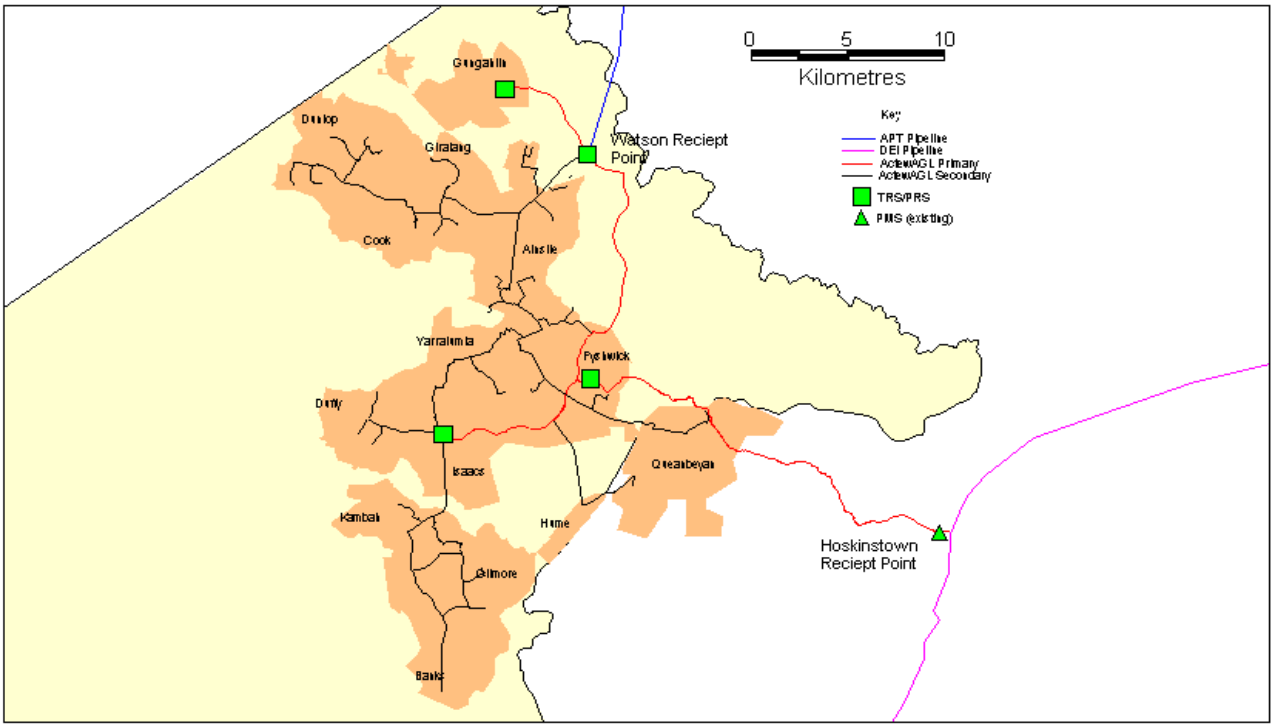

Figure 7. ActewAGL Distribution Networks

3.2 Jemena Gas Networks

The principal authorised reticulator of natural gas in NSW is Jemena Gas Networks operated by Jemena Asset Management, a wholly owned subsidiary of Jemena. Jemena Gas Networks distributes 94% of the total natural gas delivered in NSW and owns 92% of the total NSW network pipe length.

Jemena Gas Networks (NSW) Ltd owns 24,000 kilometres of natural gas distribution system, delivering approximately 100 petajoules of natural gas to approximately one million homes and businesses across NSW. There are two main high pressure transmission pipelines supplying natural gas to Jemena's distribution systems. The Moomba-Sydney Pipeline, owned by the APA Group, transports natural gas from the gas fields in South Australia across regional NSW to Sydney. The Eastern Gas Pipeline supplies gas from Longford in Victoria, up the east coast to Sydney. It is owned by Jemena.

Jemena's NSW natural gas network extends to the Greater Sydney region and over 45 regional areas across NSW including coastal centres between Newcastle and the Hunter Region north of Sydney and Wollongong and Shellharbour south of Sydney. The network also extends to the Riverina, Blue Mountains and the major centres of the Central Tablelands.

Figure 8 below outlines the geographical areas serviced by each NSW and ACT gas distribution business including JGN and ActewAGL.

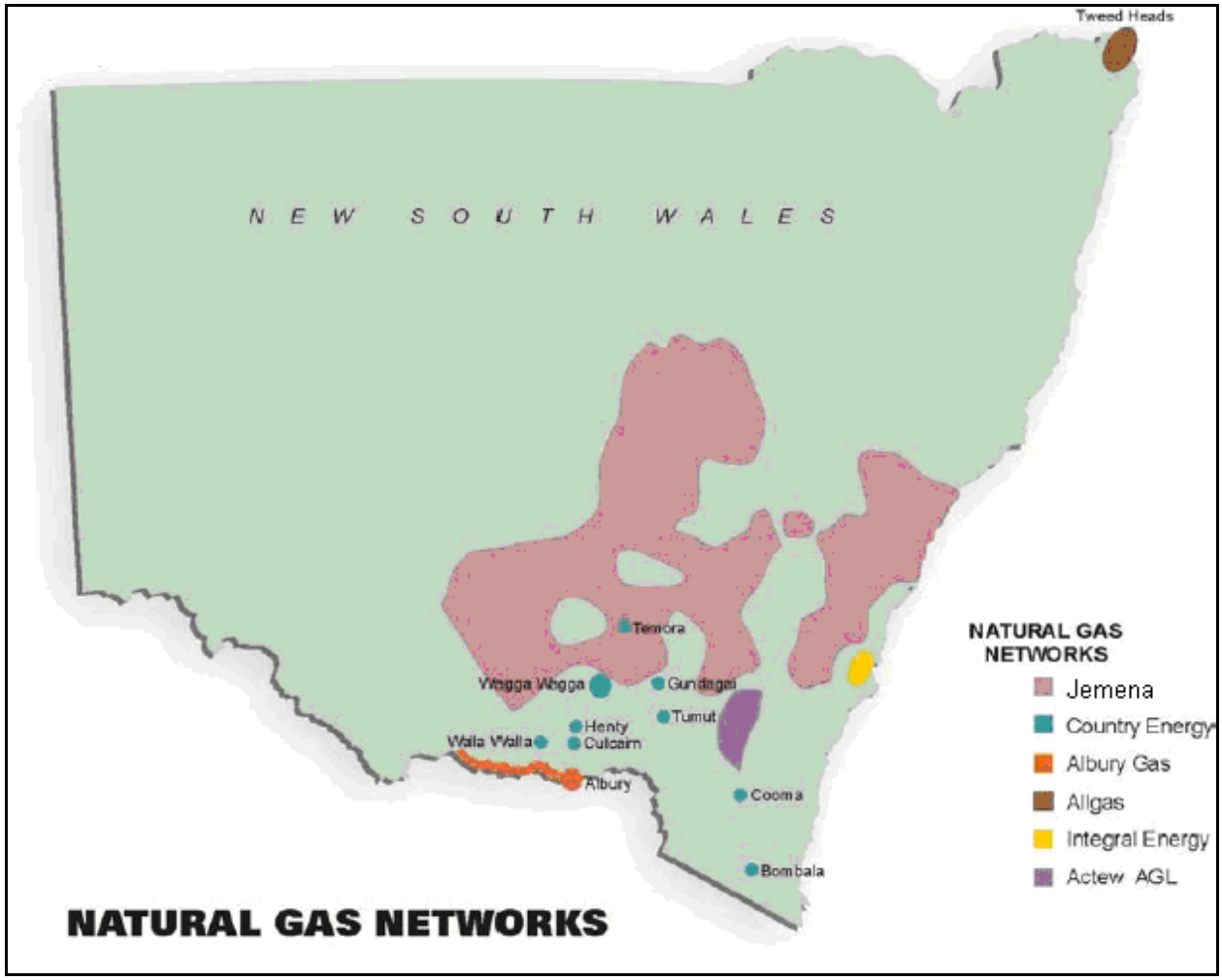

Figure 8. NSW/ACT Gas Distribution Networks

3.3 Victorian Gas Distributors

Three distributors transport gas to end-users in Victoria: Multinet, Envestra and SP AusNet.

Envestra owns Australia-wide about 21,000 kilometres of natural gas distribution networks and 1,000 kilometres of transmission pipelines, serving over one million consumers in South Australia, Victoria, Queensland, NSW and the Northern Territory. Envestra (Victoria) supplies nearly 50 PJpa of gas to about 522,000 customers in both urban and rural areas. This includes the northern, outer eastern and southern areas of Melbourne and Mornington Peninsula, and rural communities in northern Victoria through 9300 km of distribution pipelines

Multinet Gas is the largest distributor of natural gas in Victoria. Multinet Gas is managed and operated by Jemena East, responsible for the day-to-day management of the network. Jemena East is a division of Alinta Asset Management, which is now 100% owned by Jemena. Jemena East is also the project manager responsible for the construction, operation and maintenance of the Multinet Gas extension programs in the Yarra Ranges and South Gippsland. The distribution network transports gas from the high-pressure transmission network operated by GasNet Australia Trust to the premises of residential, commercial and industrial gas users. The 9,600 km gas distribution network covers an area of 1,600 km^2. Multinet delivers about 57 PJpa to 646,000 customers in Melbourne's inner and outer eastern and SE suburbs.

SP AusNet utilises SPI Management Services, a wholly-owned subsidiary of Singapore Power, for core management services through a Management Services Agreement. SP Ausnet supplies 70 PJpa of gas to approximately 535,000 customers in Melbourne's western suburbs and nineteen country centres in western Victoria, including Geelong, Ballarat, Bendigo and Warrnambool. Additionally SP AusNet also distributes gas to a significant proportion of Victoria's large industrial customers.

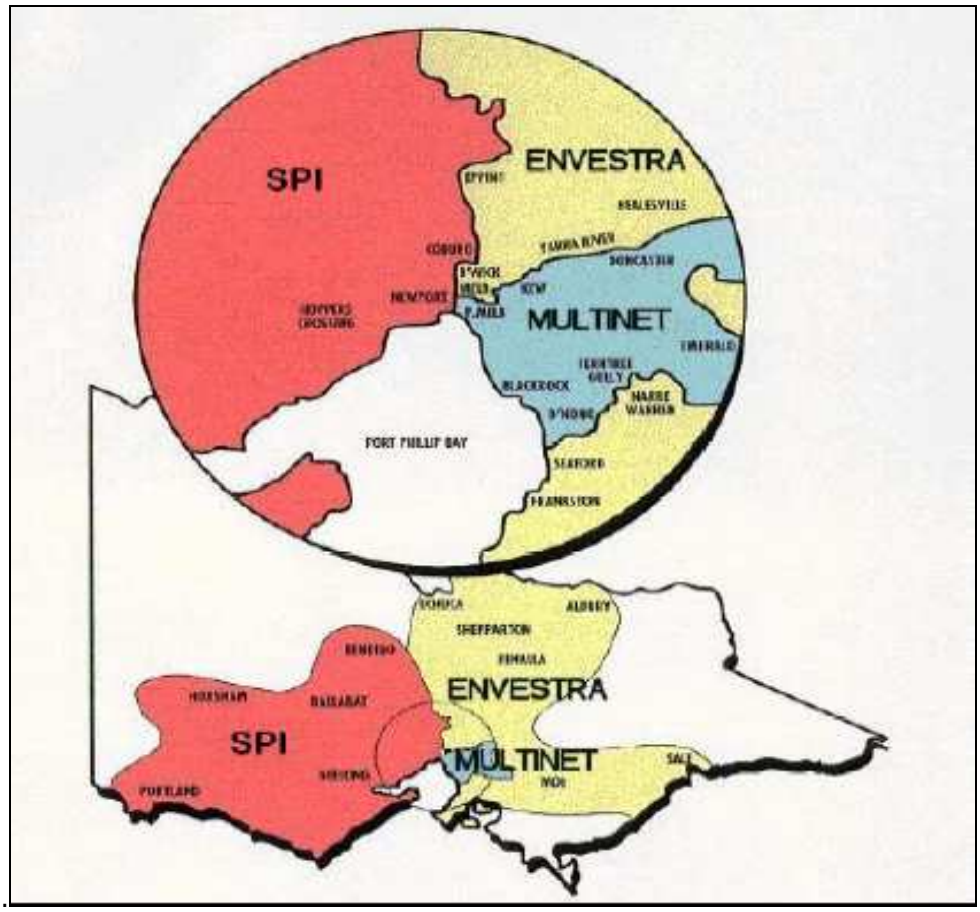

Figure 9. Victorian Gas Distribution Areas

3.4 Queensland Gas Distributors

The Queensland gas market consumes about 10% of Australia's natural gas output. Not all of **Envestra's** Queensland network is covered by their access arrangement. This Study deals only with the major parts of the network whose details are published by the QCA: the Brisbane Region and the Northern Region, as shown in the Figure below. This part of the Envestra network comprises approximately 2,260 kilometres of low, medium, high and transmission pressure mains servicing north Brisbane, Gladstone, Ipswich and Rockhampton. During 2006/07, Envestra distributed gas to a total of 77,200 tariff customers (up 2.1% on the previous year) who consumed approximately 1.8 petajoules of gas. Envestra's 67 contract customers accounted for 3.2 petajoules of gas.

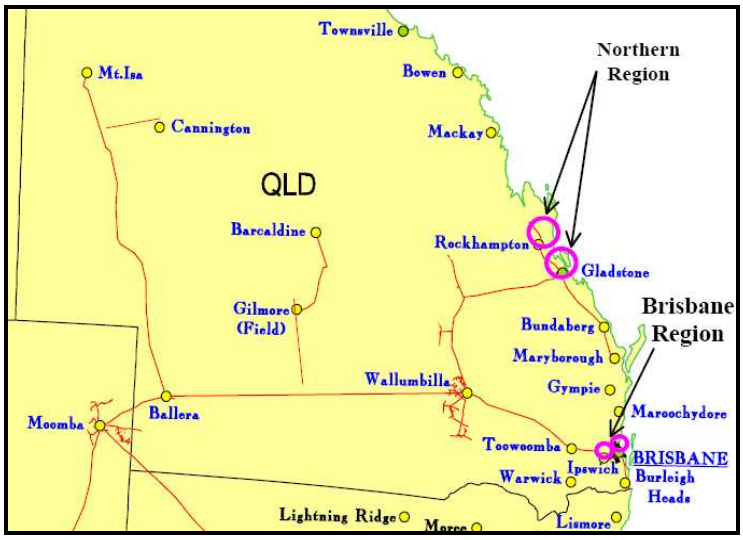

Figure 10. Envestra Queensland Gas Pipelines and Networks

APT Allgas Energy supplies natural gas through a network of 2515 km of distribution mains to over 68,000 customers who consumed 10.3 PJ in 2006/07. Its 108 contract customers consumed 7.5 PJ of this gas. Its supply area is made up of Brisbane (south of the Brisbane River), the Gold Coast (including small parts of northern NSW), Oakey and Toowoomba. A 3-year, $17 million expansion of the APA Gas Network has been completed in the Gold Coast area, to extend the distribution network to service up to 9,000 new homes in the upper Coomera - Pimpama area.

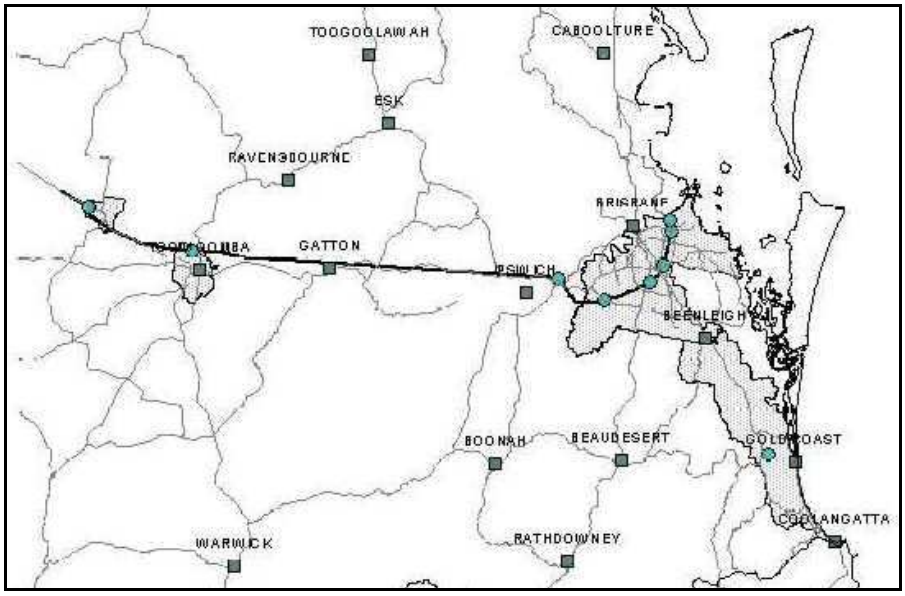

Figure 11. Allgas Energy Distribution Area

3.5 Western Australia Gas Distributors

There are three gas distributors in Western Australia: WA Gas Networks, Esperance Power Station and Wesfarmers Kleenheat Gas.

WA Gas Networks (WAGN), formerly AlintaGas Networks**,** holds a licence to operate NG distribution systems in the Coastal and Goldfields-Esperance supply areas and an LPG system in the Great Southern supply area in Albany. The Coastal supply area includes the Perth metropolitan area and the coastal strip from Busselton to Geraldton. WAGN also operates a single distribution system in Kalgoorlie-Boulder area.

Esperance Power Station operates a single natural gas system in the Goldfields-Esperance supply area of Esperance. Wesfarmers Kleenheat Gas holds a licence to operate distribution systems in the Goldfields-Esperance and Coastal supply areas. Wesfarmers operates two small LPG systems in Leinster and Margaret River.

WAGN accounts for 99.86% of all residential gas connections (over 542,000) and 99.85% of all gas sold to small-use customers (10.8 PJpa out of a total 31 PJpa). The WAGN gas mains in the Coastal operating area (11,985km) accounts for 98.6% of the total. Therefore this Study deals only with the WAGN Coastal supply area.

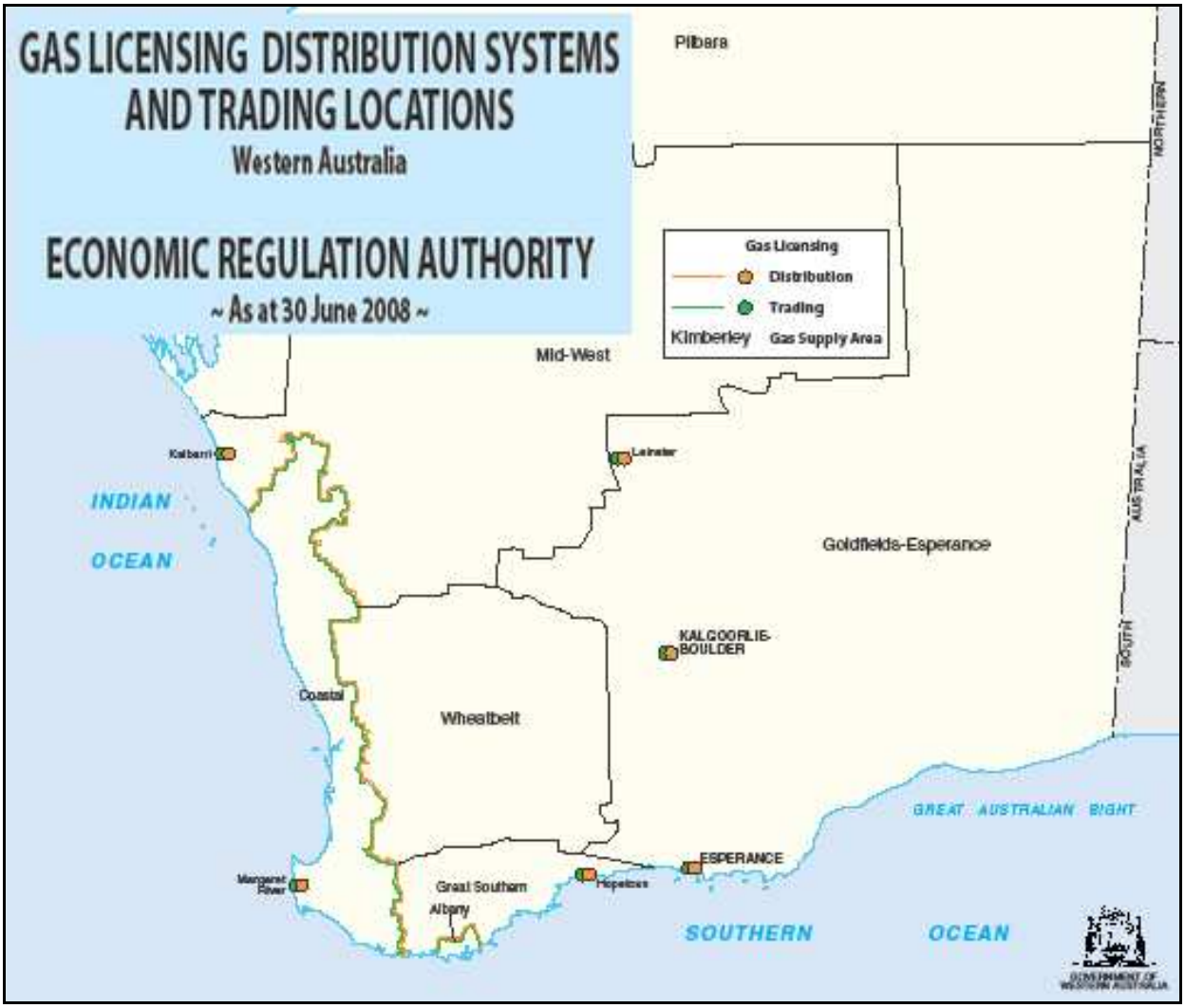

Figure 12. Gas distribution networks in WA

3.6 South Australian Gas Distributor

Envestra is the only owner of gas distribution networks in South Australia. Envestra uses Origin Energy Asset Management (OEAM), a division of Origin Energy Ltd, as its principal contractor for carrying out its planning, construction, repair and operational activities. The networks are located in Adelaide, Whyalla, Port Pirie, Mt Gambier, Peterborough, Riverland Area (Berri) and Murray Bridge.

South Australia's principal source of natural gas is the Cooper Basin. Gas from the Santos processing plant at Moomba is transported via Epic Energy's Moomba-to-Adelaide transmission pipeline (MAP) to the metropolitan and major regional areas. The capacity of the MAP was increased during 2008 to meet contractual obligations for the supply of gas to the new Pelican Point power station. Epic Energy also owns the transmission pipeline supplying natural gas to Mount Gambier from the Katnook gas field developed by Origin Energy Resources. Envestra owns the Riverland transmission pipeline from Angaston to Berri (which continues to Mildura in Victoria) with a spur-line to Murray Bridge.

Around 60% of the natural gas supplied to the metropolitan area is used for electricity generation at the Torrens Island power station, Pelican Point power station and a cogeneration power station at Osborne. The remainder is distributed through a network owned by Envestra and sold to households and businesses by Origin Energy which is a licensed retailer. A small amount of gas is sold by AGL to individual industrial customers. Terra Gas Trader is another licensed retailer which supplies gas to power stations.

Envestra SA owns nearly 7500 km of gas distribution system, delivering approximately 36 PJpa of natural gas to approximately 380,000 customers across SA.

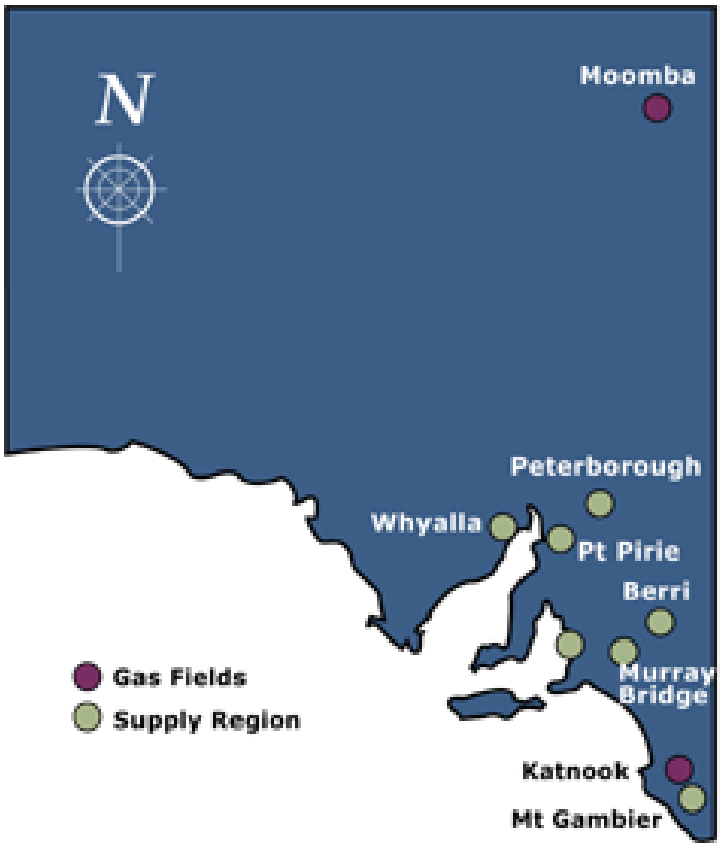

Figure 13. Gas distribution in SA

4. Distribution Network Statistics

Figure 14 provides a direct comparison of the basic characteristics of the gas utilities in 2007.

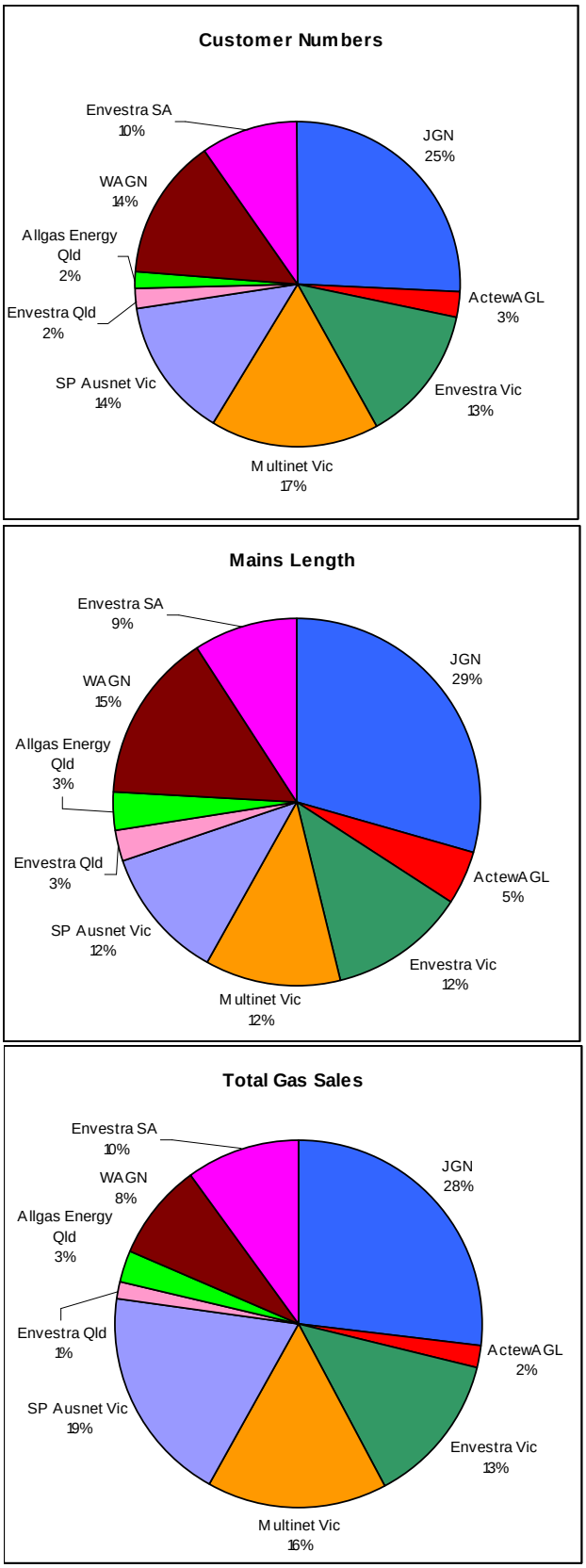

Figure 14. Basic characteristics of Australian gas distributors

4.1 Customer Numbers

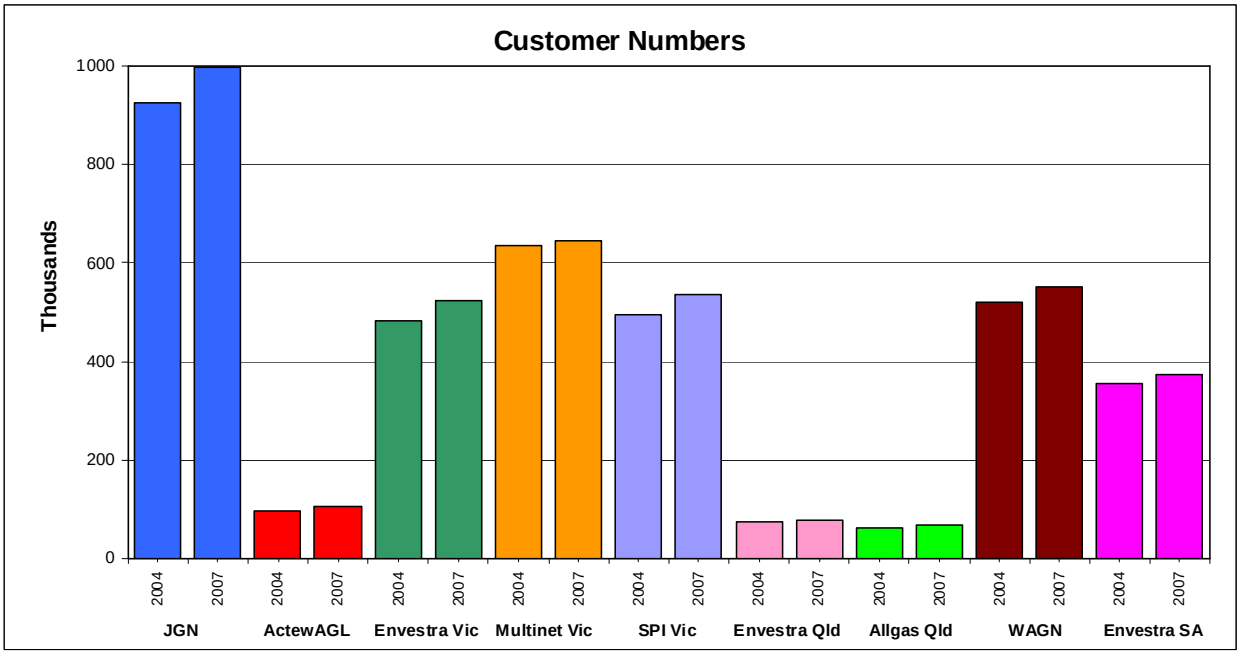

Figure 15. Comparison of customer numbers: 2004 – 2007

4.2 Distribution Mains Length

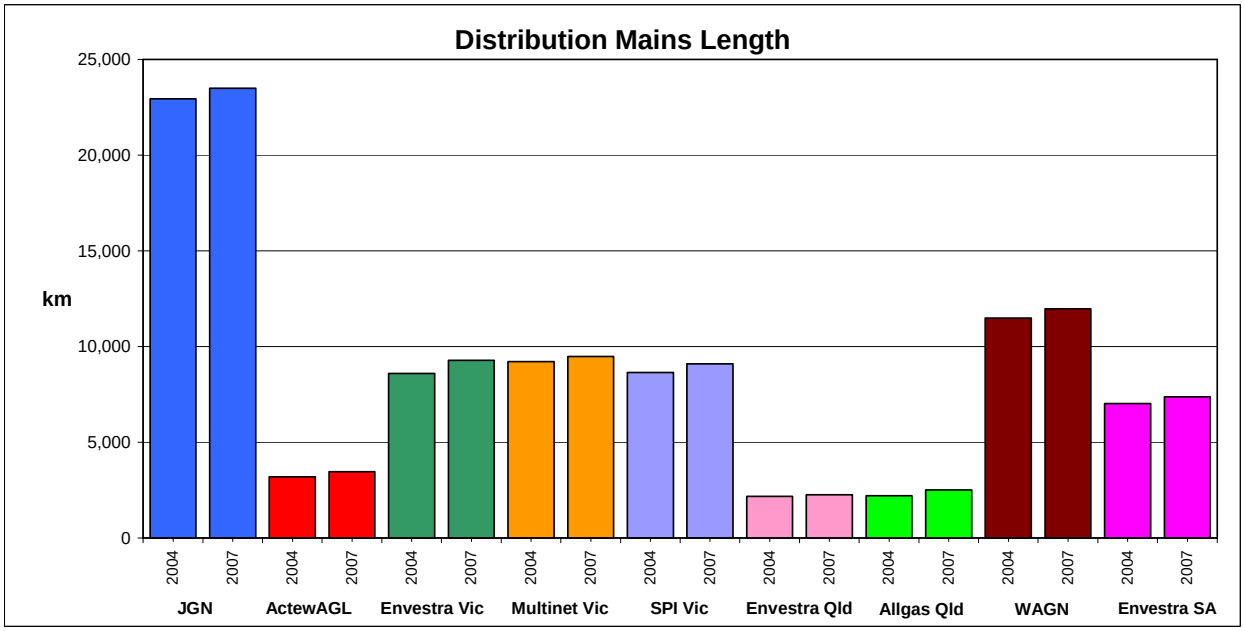

Figure 16. Comparison of distribution mains length: 2004 – 2007

4.3 Energy Density

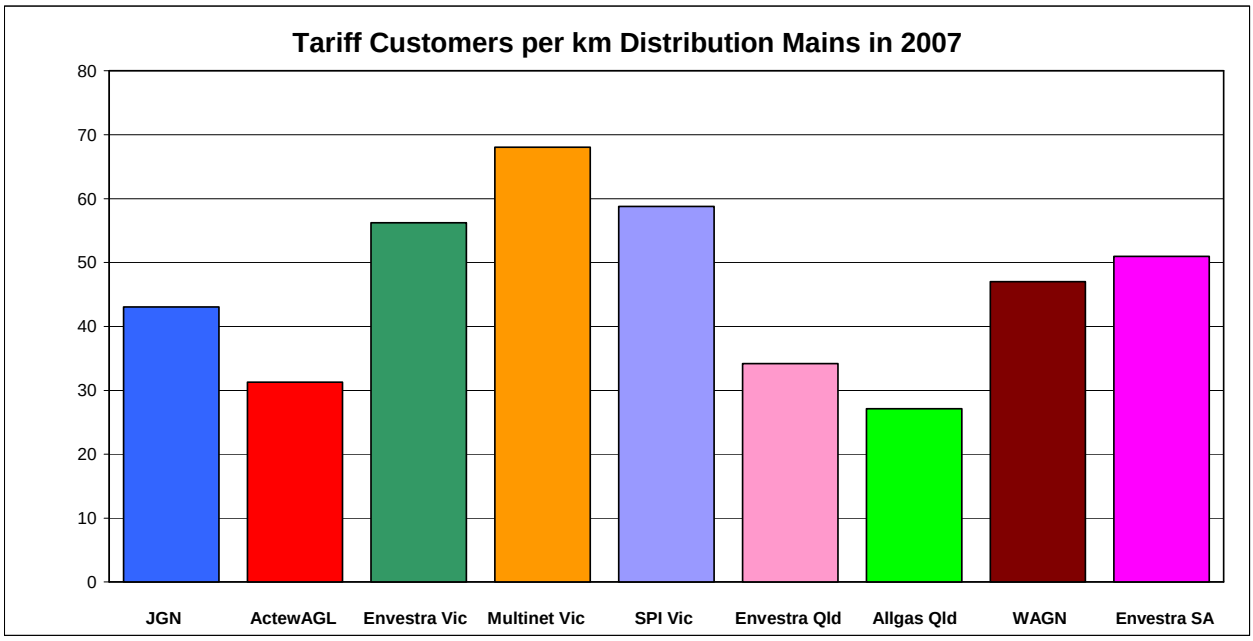

Figure 17. Tariff customers per km distribution mains: 2007

As with other network industries, gas distribution networks exhibit economies of customer density. Economies of density arise because once a gas distributor has incurred the costs of installing a gas main down a street, the marginal cost of connecting another house or building to the gas main is lower. As the network serves more customers, the large fixed costs are spread across more customers.

ActewAGL has over 3700 km of mains excluding Nowra, similar to the Queensland networks. JGN has some 24,000 km of mains in NSW, similar to the total 28,500 km of mains in Victoria. However, the total number of customers serviced by the three Victorian utilities is over 1.7 million, significantly higher than JGN's 1 million in NSW. This reflects the higher line-of-main penetration of gas supply in Victoria due mainly to the colder climate.

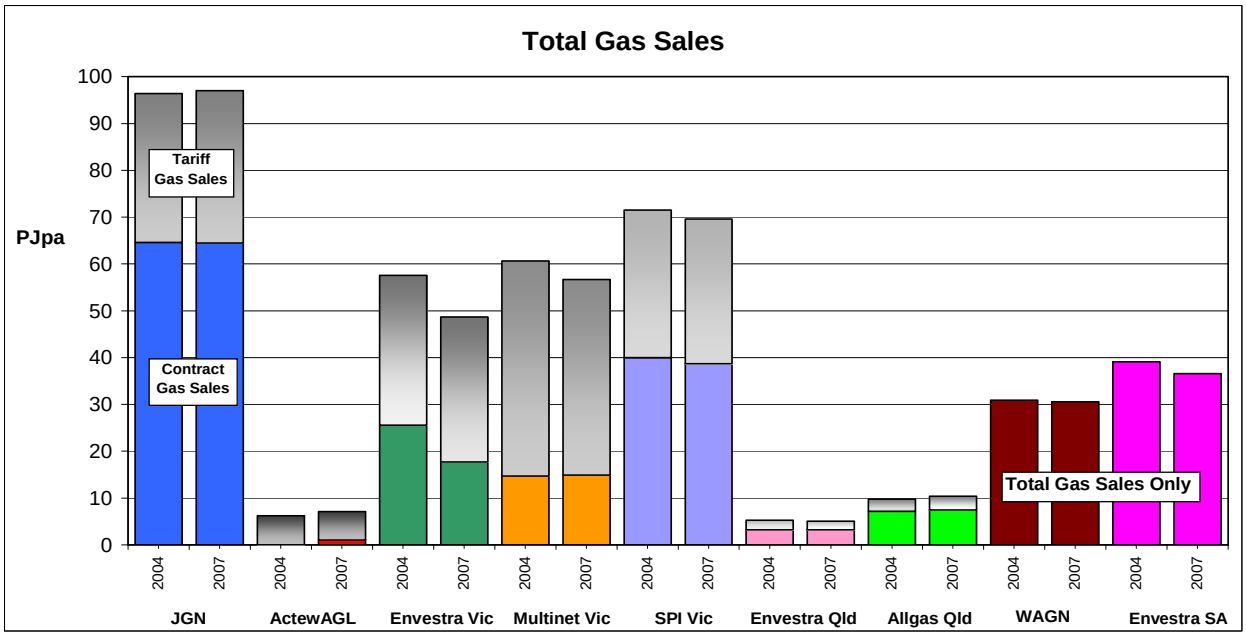

Figure 18. Comparison of gas sales: tariff and contract

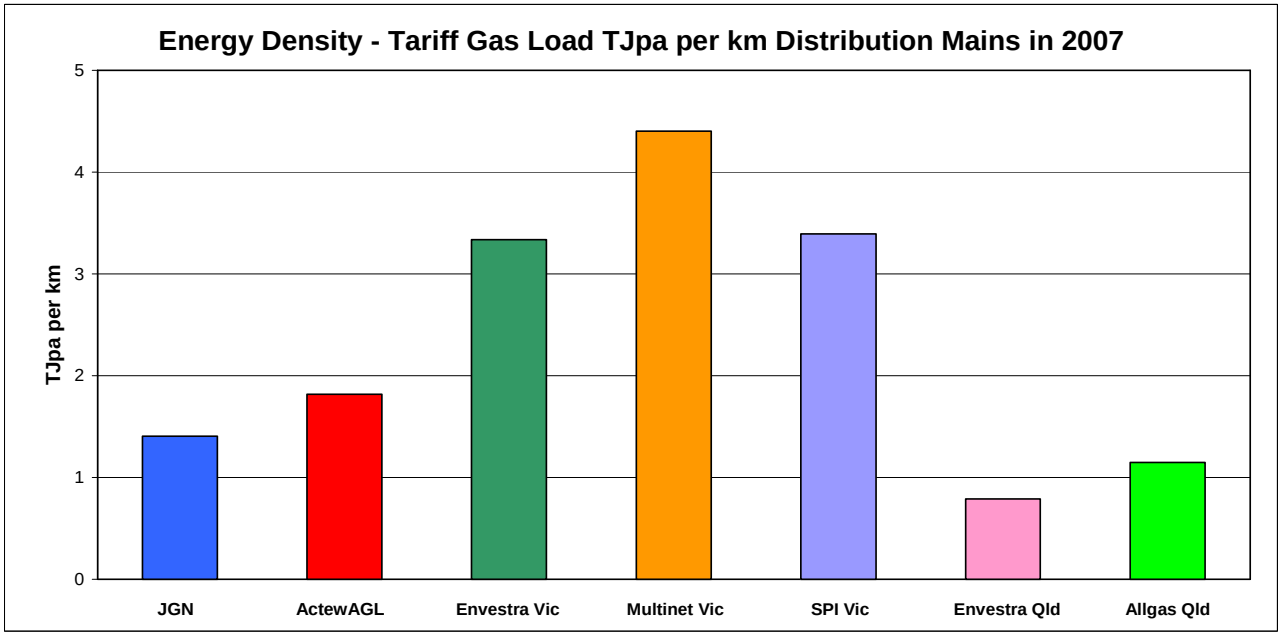

Figure 19. Energy density per km distribution mains in 2007

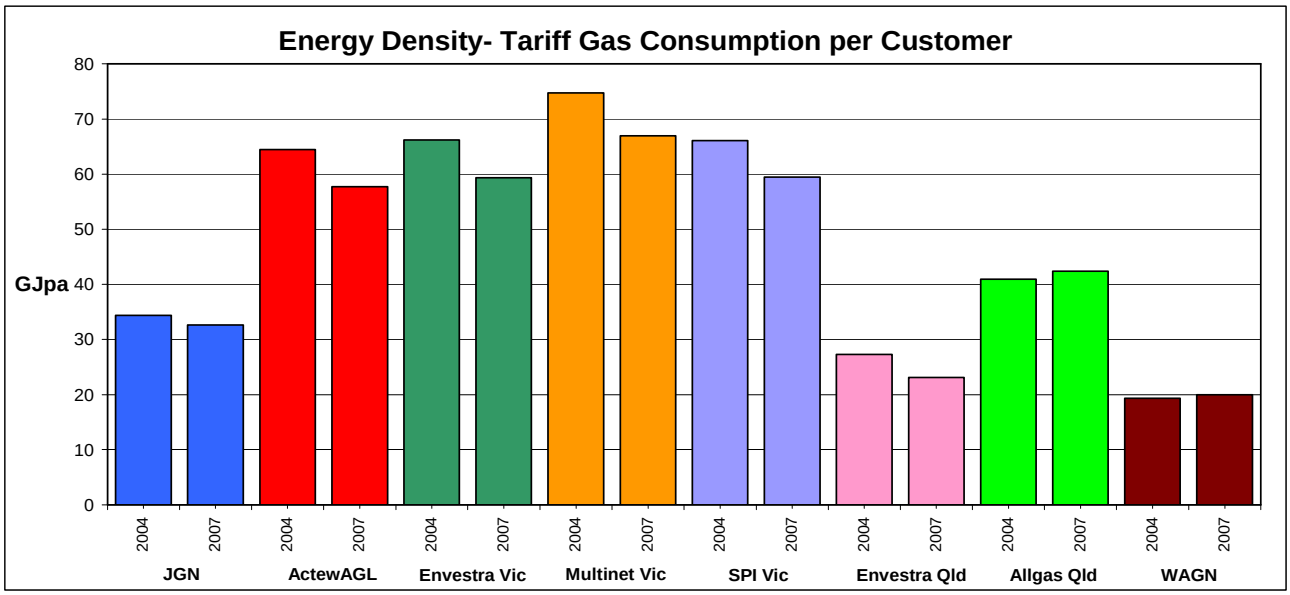

Figure 20. 2007 Tariff gas consumption comparison: 2004 and 2007

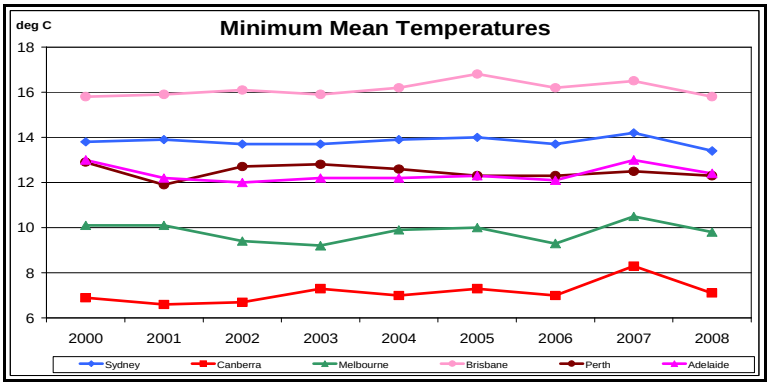

Figure 21. Minimum mean temperature in capital cities

A distribution network also exhibits economies of customer consumption, because its operating costs are lower relative to its fixed costs. As the capacity usage increases, fixed costs are spread over more gas volume and average costs decline. Average tariff gas load per km in Victoria is nearly three times that for JGN even taking into account the colder country areas in NSW. Tariff gas consumption of 32 GJpa is only half that in Victoria and in Canberra. This is quite sensitive to seasonal temperature particularly in colder climates with large heating loads. The significant reduction between 2004 and 2007 in Figure 20 is largely due to the warmer

winter minimum mean temperature in 2007 in the eastern states as shown in Figure 21 above. The nearly constant temperatures in WA corresponds to little change in tariff consumption.

4.4 Gas Distribution Network Pipe Materials

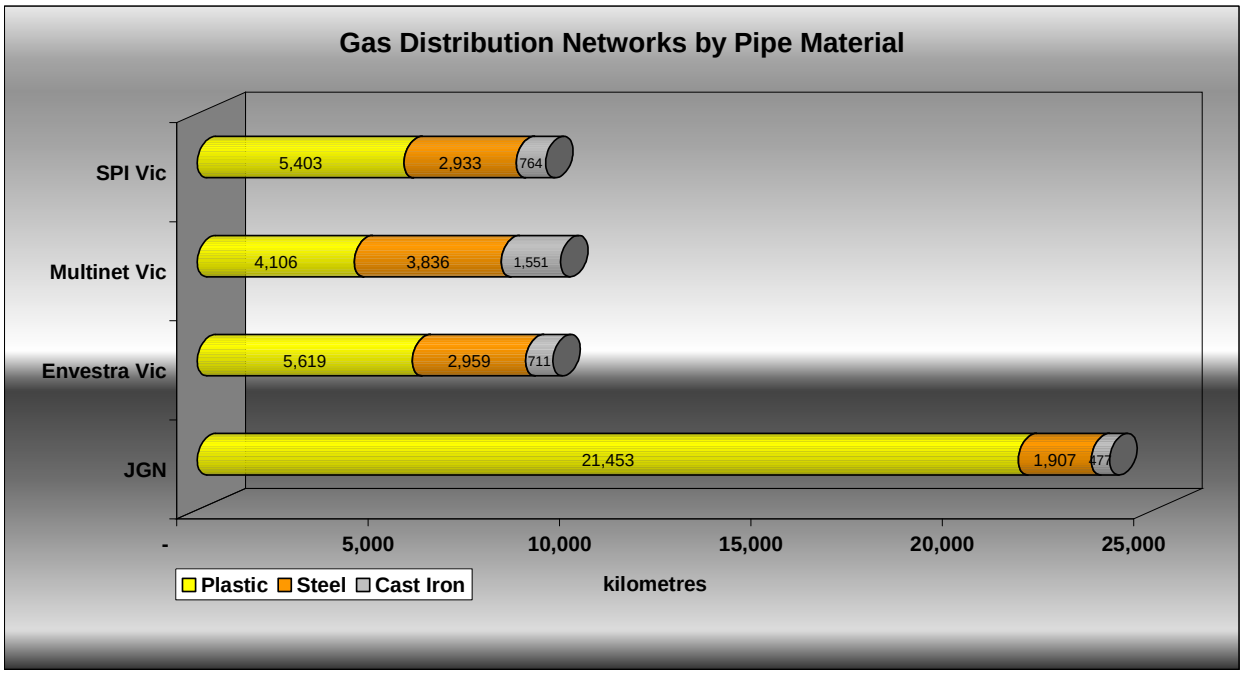

Figure 22. Pipe materials in gas networks

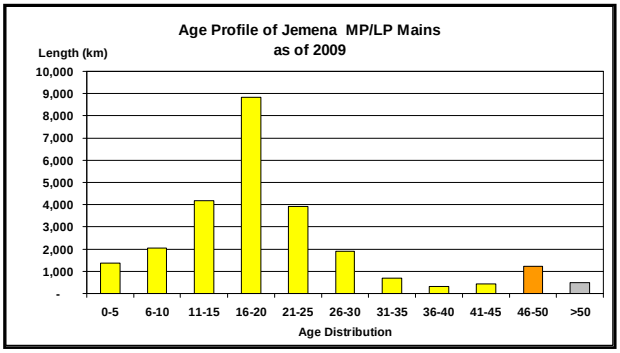

Figure 23. Age profile of JGN MP/LP mains

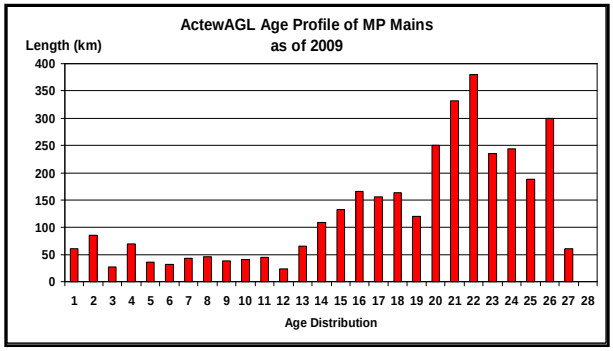

Figure 24. Age profile of ActewAGL MP/LP mains

There are very little data published on the pipe materials comprising Australian gas distribution networks. The ESC in Victoria does provide such information and Figure 22 above shows this compared to indirect information available for JGN[1]. The age profile for ActewAGL shows that most of the mains were laid in the 1980s so that most of the MP network would be plastic. Given the age profile above for JGN, it was assumed that mains older than 50 years would be cast iron (2%). Mains younger than 36 years would be plastic (90%). All other mains would be steel (8%).

Victorian LP/MP mains have a much higher proportion of steel and old cast iron mains which points to a higher UAFG due to leakage (see 5.2.3 Unaccounted for Gas (UAFG).

[1] JGN mains composition data from "Asset Ages Master 2009 consolidated graphs v2.xls"

5. Key Performance Indicators (KPI)

There is limited and quite disparate information available in the Australian gas distribution sector on best practice performance and how to measure it. Benchmarks are required to define acceptable levels for KPI against which actual performance can be measured. It is anticipated that industry-wide benchmarks will be developed over time, though progress is slow. Jemena has been proactive in liaising with DWE in developing suitable gas network KPI for annual reporting. The advent of the new AER regulator should facilitate a common set of benchmark KPI.

Consequently it is not always possible to derive common benchmark KPI for all gas utilities. This will be evident from the following charts where different selections of gas utilities appear, depending on the KPI and the format of data published by the various regulatory jurisdictions (see Figure 2. Regulation of Gas utilities in Australia).

In this Study, the Victorian figures are reported for calendar years, whilst all other utilities' data are for financial years: ie the Victorian year 2007 will be compared to the financial year 2006/07. The data for ActewAGL includes the ACT, Greater Queanbeyan and Bungendore. It specifically excludes Nowra since this is outside the jurisdiction of the ICRC.

All data used in this Study can be found in the Appendix 8.2 Data Sheets. These tables and the related charts are linked to the Excel spreadsheet:

JGN Performance Benchmarking Data 2003_08.xls.

All files relating to this Study can be found on the attached CD.

5.1 Reliability of Supply

The reliability of supply is about the availability of gas to customers. This section describes the measures used and covers the assessment of supply reliability over the last few years and the individual performances of the distributors in their supply areas. Reliability is primarily measured in terms of the number, average frequency and duration of supply interruptions. Unplanned outages are often caused by third parties damaging pipes and water entering low-pressure pipes. They can also be caused by those leaks or damaged pipes which require immediate repair. Emergency Response is measured by the percentage of instances when the arrival of the emergency team at the incident was within 60 minutes of notification being received.

5.1.1 Gas Supply Outages

A gas supply outage (or interruption) is an event causing a loss of gas supply to customers. One gas supply outage event will generally cause multiple customer interruptions. For example, an event that causes 50 customers to lose supply is one gas supply outage, and 50 customer-interruptions. If the supply outage lasted one hour this would equal 50 **C**onsumer **H**ours **O**ff **S**upply (CHOS). Only DWE, ICRC and QCA require CHOS to be included in annual reporting.

The number of outages is seen as a measure of frequency, providing a picture as to the condition of the assets in question. CHOS is seen more as a measure of overall reliability, the focus being how well the needs of consumers are met. At the individual incident level, a number of factors including time of day, number of consumers affected, and availability of back feeds impact this figure.

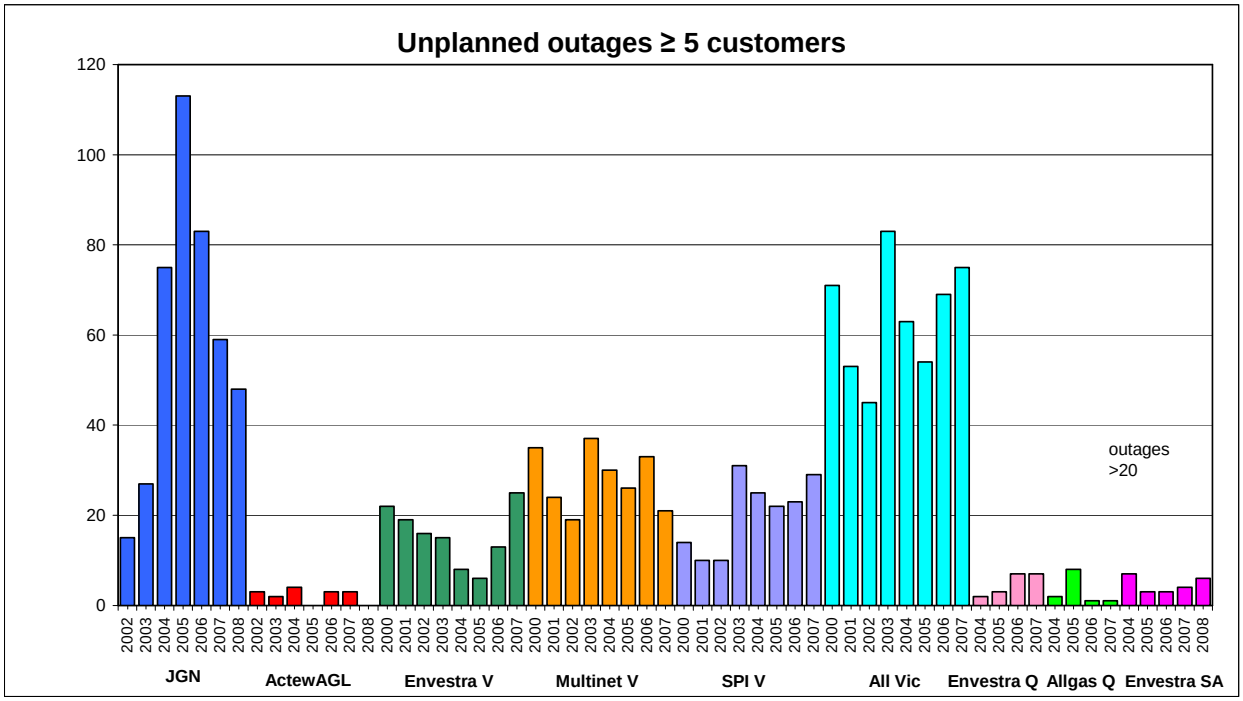

Figure 25. Unplanned outages ≥ 5 customers

All utilities except WAGN provide the number of interruptions involving 5 or more customers (Envestra SA quotes ≥ 20 customers). ActewAGL's interruptions are remarkably low. JGN's level of significant interruptions is comparable to Victoria overall. Indeed the number has dropped dramatically over the last few years. This KPI is dependent on the size of each network.

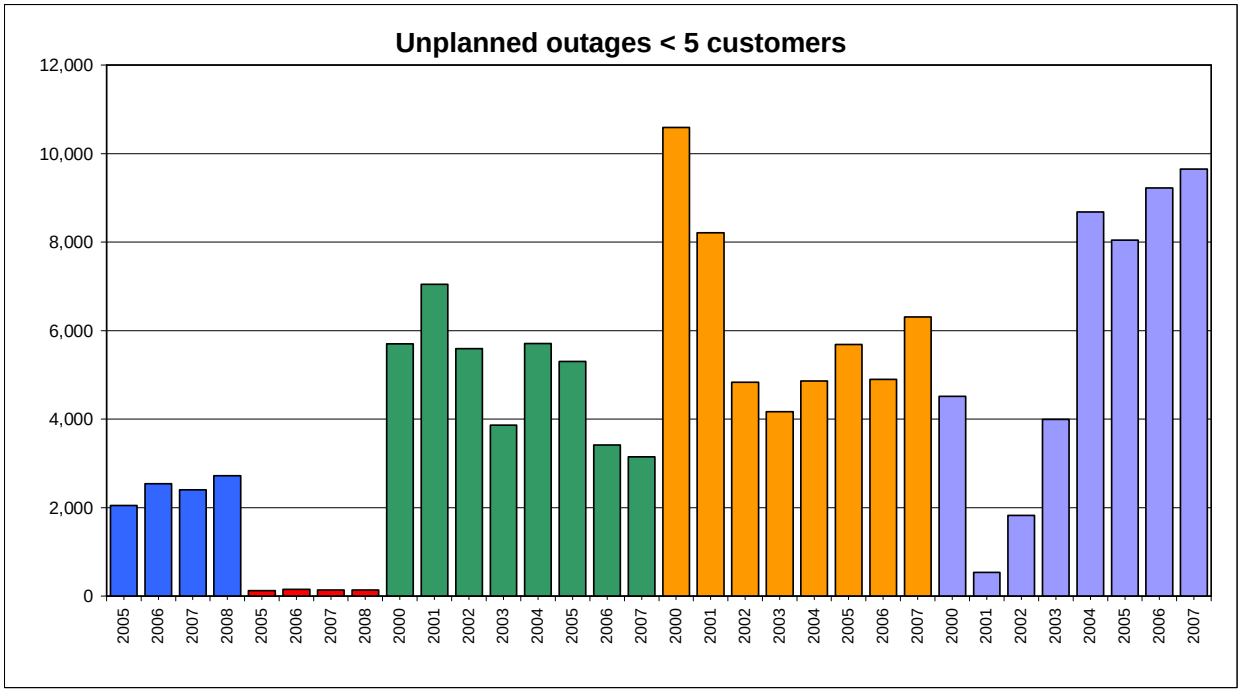

Figure 26. Unplanned outages < 5 customers

There is some difficulty is comparing KPI for outages involving fewer than five customers. While JGN and ActewAGL rigorously capture data on the large outages, the number of smaller outages can only be calculated by judicious use of appropriate workcodes. The business rule

for this can be found in the Appendix. However there is no information available as to how other utilities capture this information. The comparison in Figure 26 above does seem unduly favourable to JGN. This should be born in mind when comparing other KPI involving this parameter.

However it is quite clear that ActewAGL's performance in this respect is outstanding.

5.1.2 Minutes-off-Supply (SAIDI)

SAIDI (**S**ystem **A**verage **I**nterruption **D**uration **I**ndex) is a measure of how long each customer is without supply for the year when averaged over all customers in the network.

$$\text{SAIDI} = \frac{\text{Total customer hours interrupted x 60}}{\text{Total number of customers}}$$

The ESC in Victoria uses the SAIDI, SAIFI and CAIDI concepts, as used in the electricity industry, divided into the total number of planned and unplanned outages. However planned outages are not useful for benchmarking due to inconsistent reporting across the utilities.

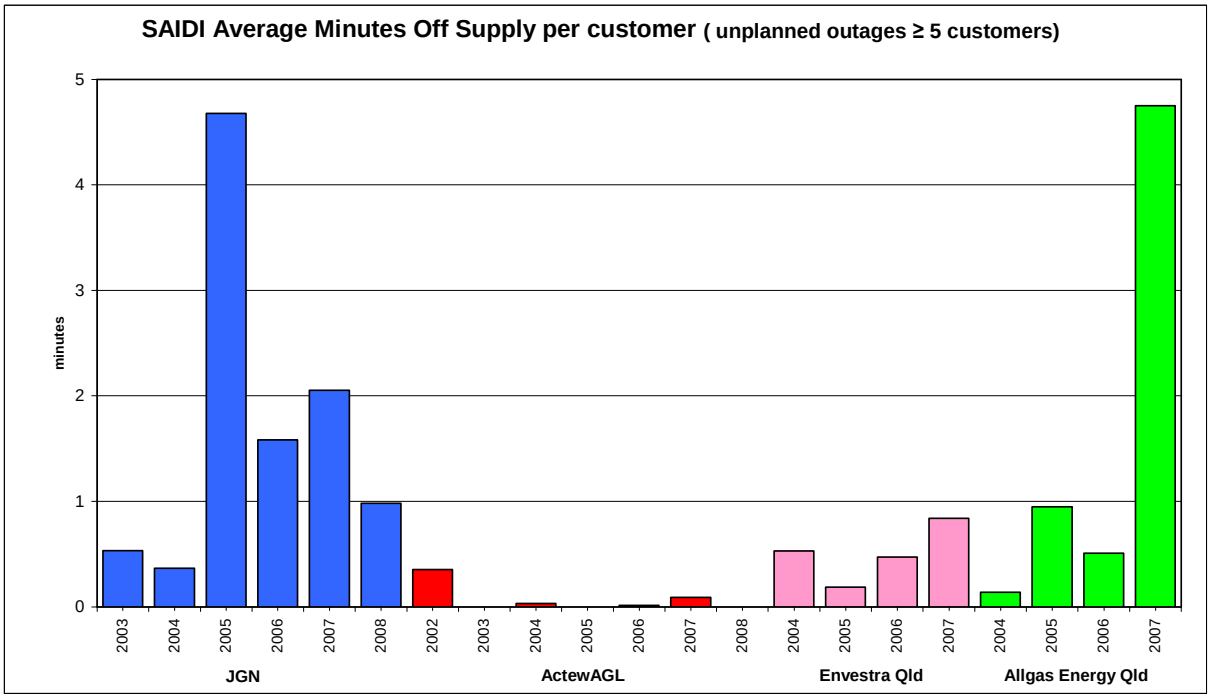

Figure 27. SAIDI unplanned outages for ≥ 5 customers

Figure 27shows the unplanned SAIDI calculated for each of the utilities. Durations are only available for the larger outages involving 5 or more customers for JGN, ActewAGL and the Queensland utilities. The high figure for Allgas Energy in 2006/07 was occasioned by a single outage involving 600 customers for 9 hours due to a third party hit.

The CHOS for JGN and ActewAGL is based on the time between 'gas off' and 'gas on', excluding any relight time. The high SAIDI for JGN in 2004/05 was largely due to two major outages caused by Agility contractors, precipitating a comprehensive training and supervision campaign which dramatically improved results in subsequent years.

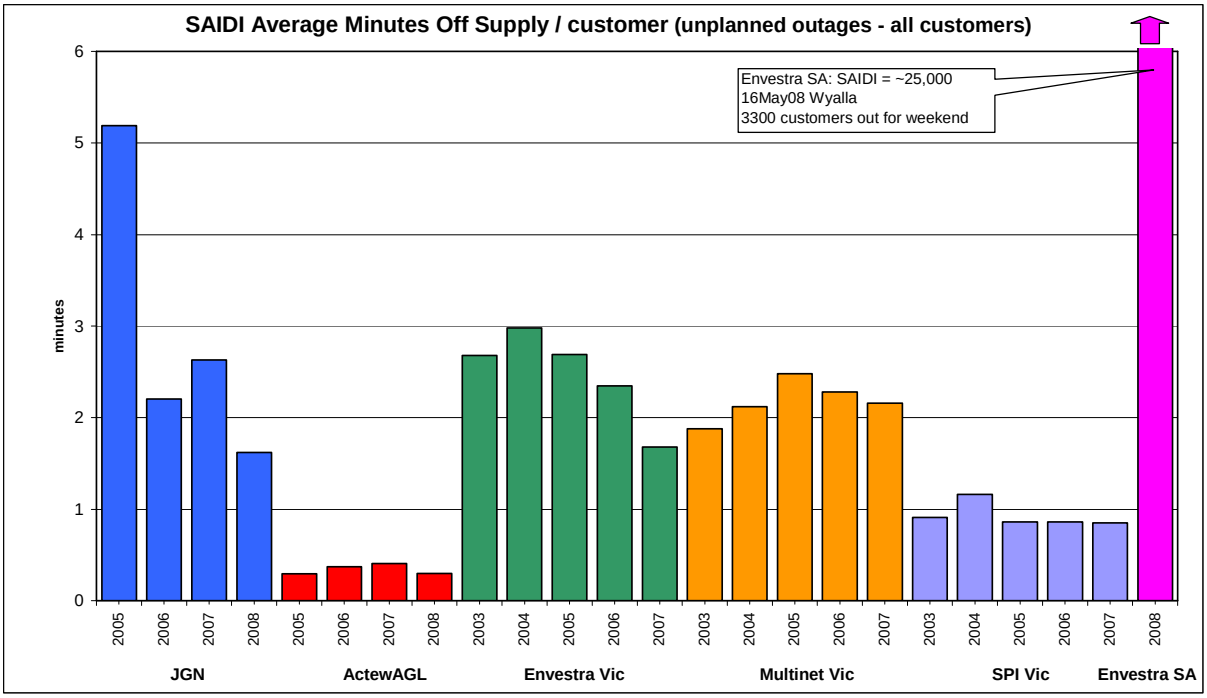

Figure 28. SAIDI unplanned outages for all customers

ActewAGL performs remarkably well on this SAIDI KPI. JGN also performs well on this benchmark, bearing in mind the uncertainty in the criteria for determining the number of small outages. It is worth noting the great sensitivity of this KPI to single serious incidents. Envestra SA experienced a major outage in May 2008 in which gas supply was lost to Whyalla, involving 3300 customers for an entire weekend. This resulted in a SAIDI of 25,000!

5.1.3 Interruption Frequency (SAIFI)

SAIFI (**S**ystem **A**verage **I**nterruption **F**requency **I**ndex) is a measure of the number of supply interruptions each customer experiences for the year when averaged over all customers on the network. The KPI as shown here is per 1000 customers in order to avoid a large number of decimal points.

$$\text{SAIFI} = \frac{\text{Total number of interruption events x 1000}}{\text{Total number of customers}}$$

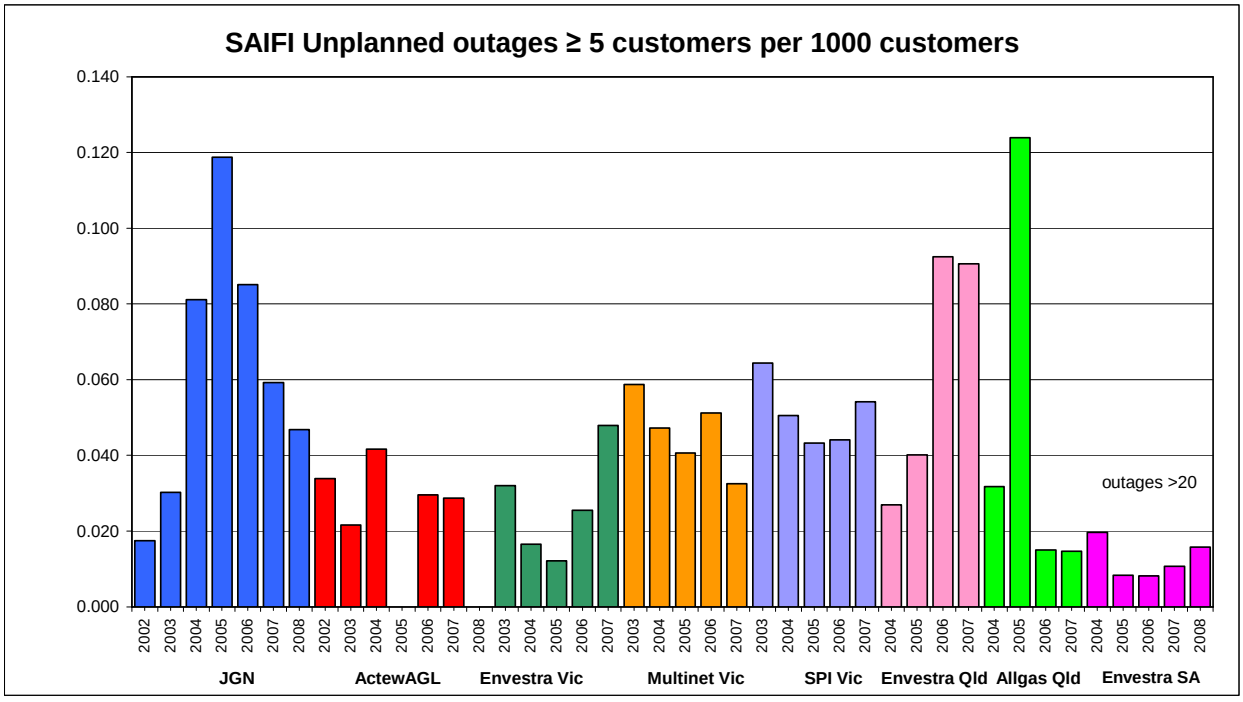

Figure 29. Unplanned outages ≥5 customers per 1000 customers

ActewAGL had no serious outages in 2004/05 and 2007/08. JGN has shown a marked reduction in both the number and CHOS of significant outages over the last few years, as mentioned previously, to a level that is now comparable to most other utilities. Envestra's Queensland network, which recorded a higher rate of interruptions than other networks, received a significant increase in investment allowances in the current regulatory period. This may improve the network's reliability performance over time.

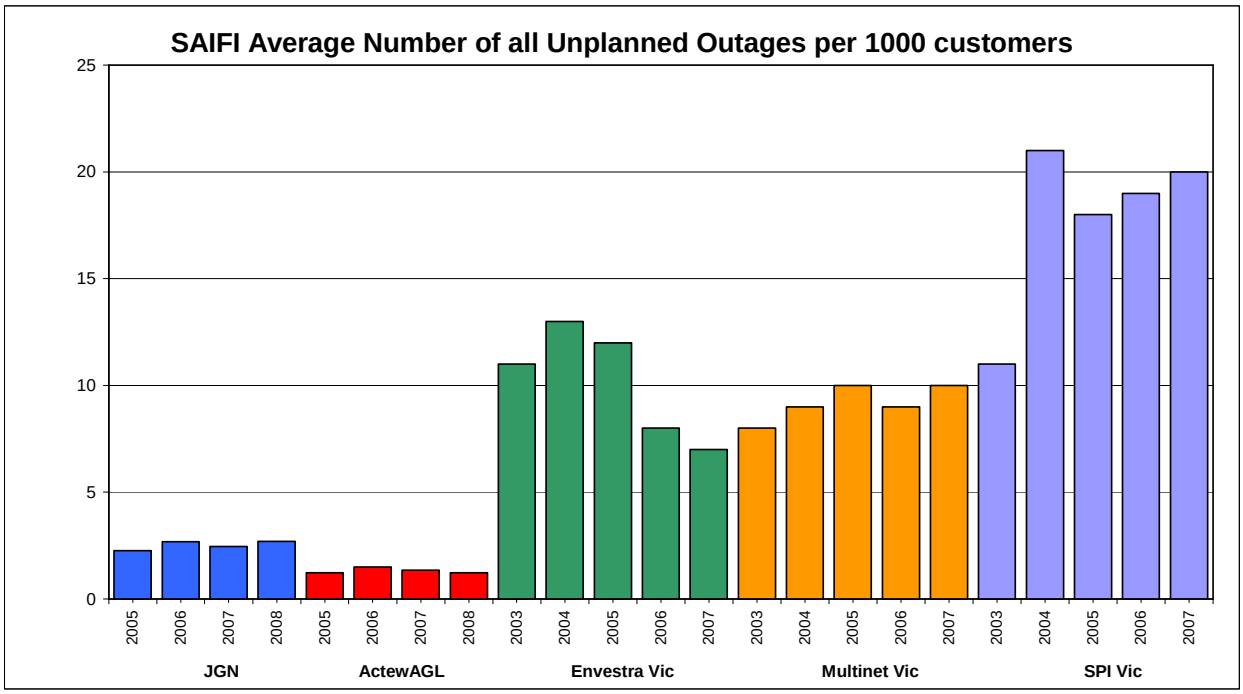

Figure 30. SAIFI Average number of interruptions per customer

The SAIFI charts indicate that the rate of interruptions is low for all gas networks. The ESC reported in 2007 that the average Victorian customer may expect to lose supply due to planned and unplanned events about once every 43 years. In part, these outcomes reflect the inherently reliable nature of gas distribution networks. Unlike electricity supply which has a much higher number of relatively brief interruptions, gas distribution inherently has a fewer number of interruptions inevitably of longer duration. Indeed, on past history an average ActewAGL customer could expect an unplanned gas network outage only once every 800 years!

5.1.4 Interruption Duration CAIDI

CAIDI (**C**ustomer **A**verage **I**nterruption **D**uration **I**ndex) is calculated as SAIDI divided by SAIFI. It measures the duration of an interruption event averaged over the year. It is calculated as the sum of the duration of each customer interruption (in minutes), divided by the total number of customer interruptions.

$$\text{CAIDI} = \frac{\text{Total customer hours interrupted x 60}}{\text{Total number of interruption events}}$$

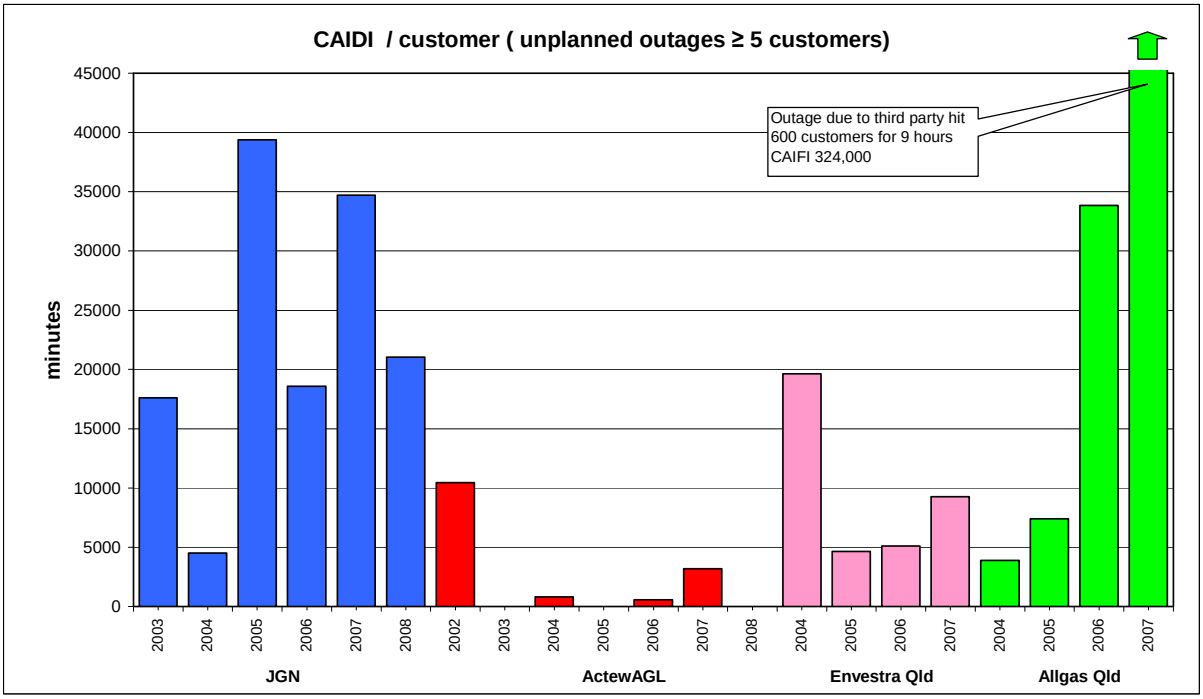

Figure 31. CAIDI unplanned outages for ≥ 5 customers

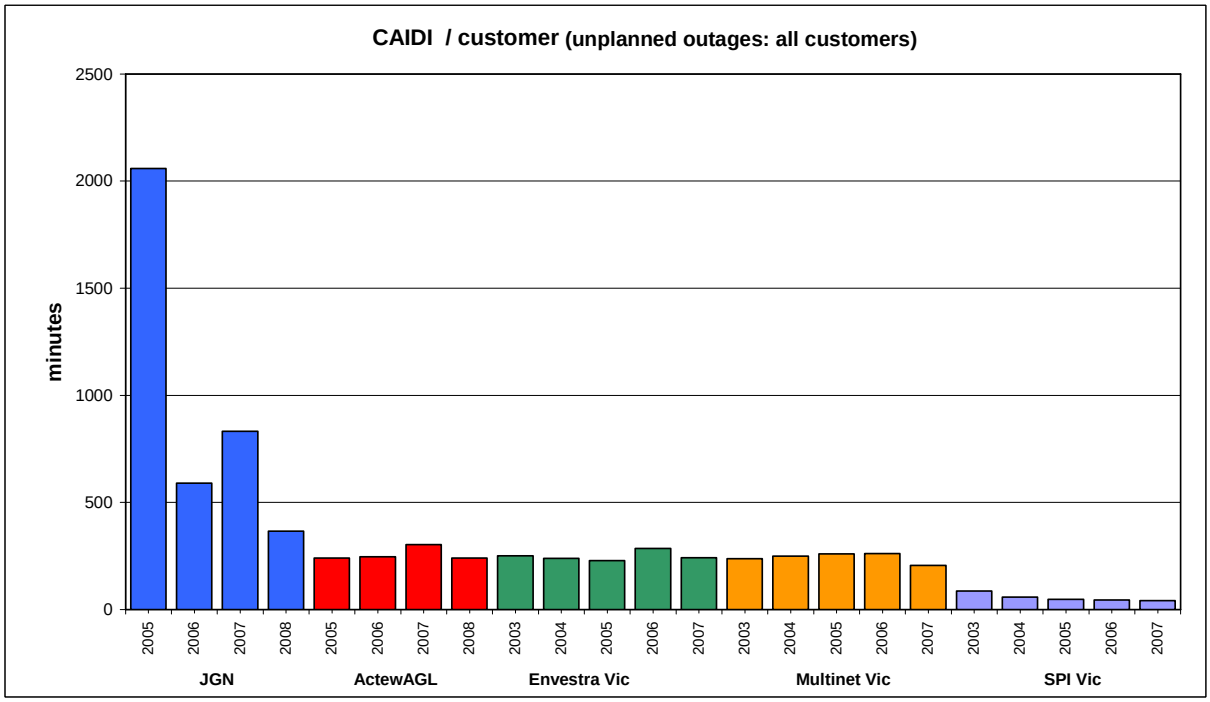

Figure 32. CAIDI unplanned outages for all customers

CAIDI for all customer interruptions is not particularly useful as a benchmark KPI because of the different ways in which the duration for small interruptions is determined. Only SP AusNet is capable of accurately measuring these durations. Envestra and Multinet use an average duration of four hours for a single premise interruption. JGN and ActewAGL do not record reliable durations for small outages either; for this comparison, four hours is also assumed. The extraordinary CAIDI for Allgas Energy in 2006/07 was due to a major outage involving 600 customers for 9 hours due to a third party hit.

5.1.5 Reliability / Density Correlation

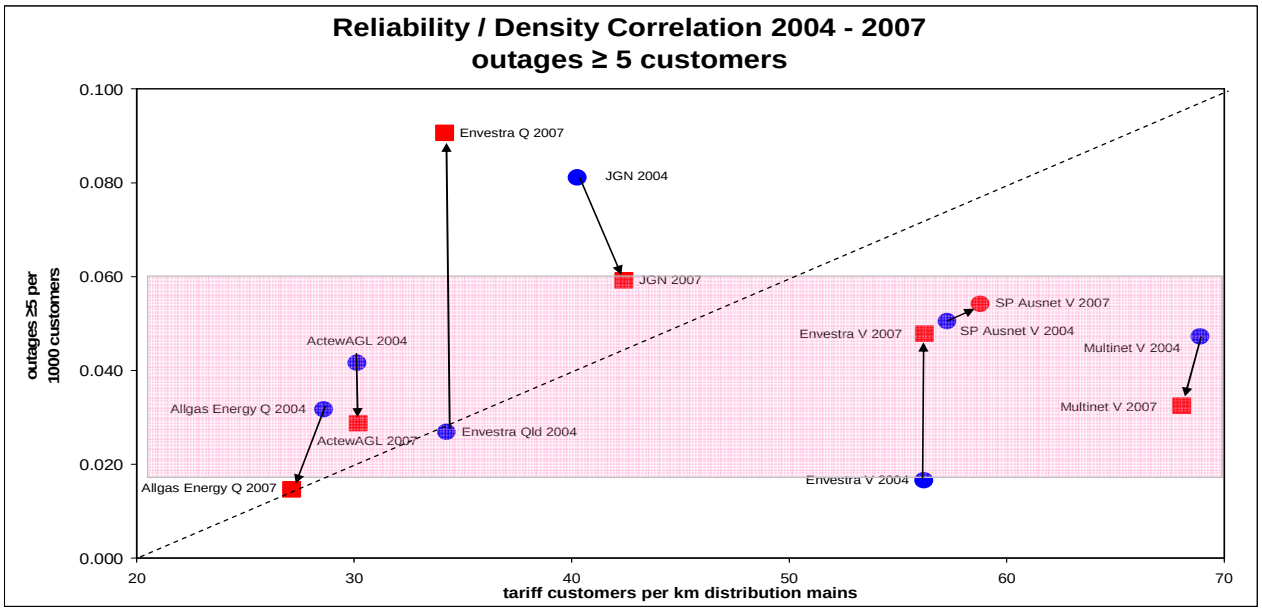

Figure 33. Reliability / density correlation: outages ≥ 5 customers

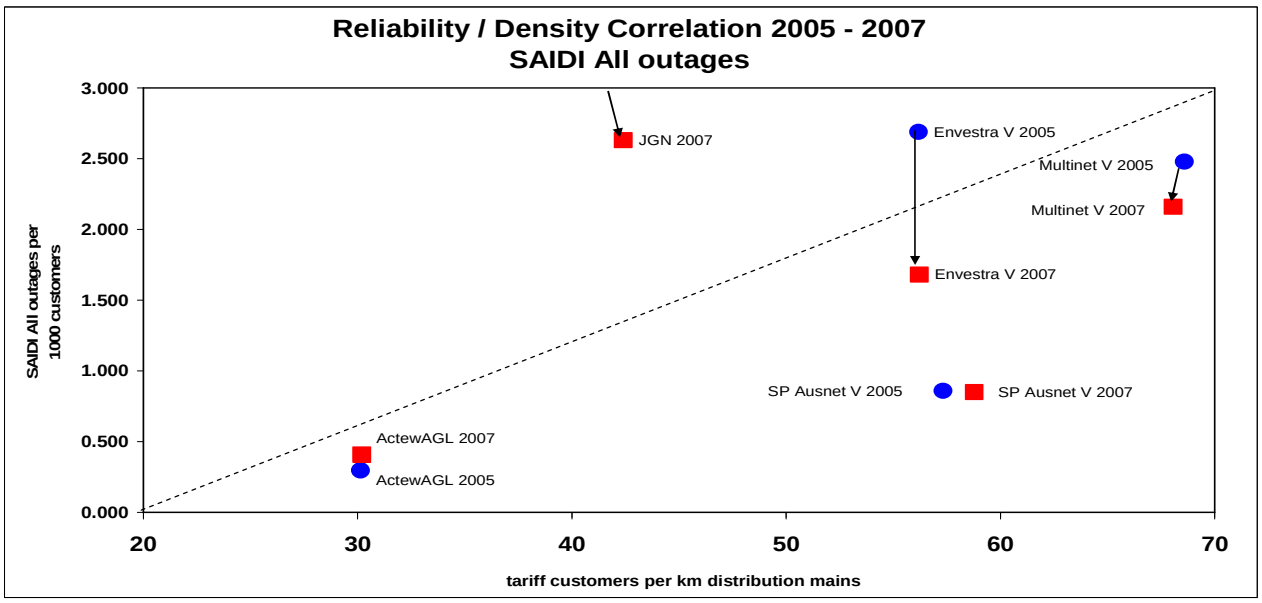

Figure 34. Reliability / density correlation: SAIDI all outages

The figures above indicate possible relationships between customer density and the occurrence of serious outages. It might be expected that the higher the customer density, the greater the incidence of serious outages because more customers are within the affected area. That is, points would cluster along a diagonal. However, Figure 33 shows that most utilities fall within a band between 0.02 and 0.06 outages per 1000 customers regardless of customer density. We could take this to mean that the number of serious outages is largely unrelated to line-of-main penetration, particularly in view of the considerable changes from year to year. Figure 34 does show a stronger correlation between SAIDI and customer density since it involves a measure of the number of customers involved.

5.1.6 Emergency Response

Distributors report on their response times to customer calls about serious incidents. The response time is defined as the time elapsed from when a report classified as a Class 1 gas leak incident (GASS Priority 00 service order) is received by the business, to the time taken for a business representative to arrive on site.

The following targets have been established in Victoria:

- metropolitan business hours (7 am to 7 pm weekdays)— 95% within 60 minutes
- metropolitan after hours— 90% within 60 minutes
- country all hours— 90% within 60 minutes.

ERA in Western Australia requires 100% response within 60 minutes for a mains break, within 3 hours for a service pipe break and within 2 hours for a publicly reported gas leak. Jemena, and Multinet use an internal target of 95% for all areas at all times. The graph below compares the response performance of the JGN networks with the Victorian, WA and ACT distributors.

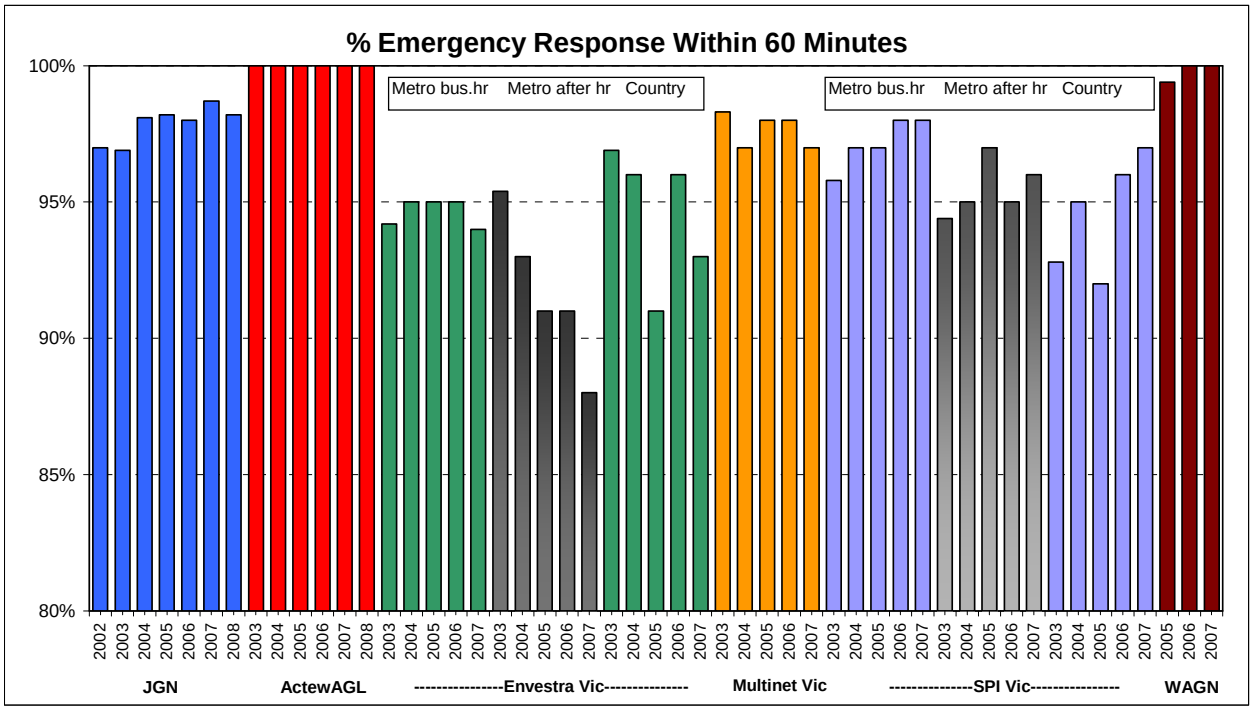

Figure 35. Emergency response within 60 minutes

ActewAGL consistently achieves 100% within 60 minutes. JGN is above target and compares well with the Victorian distributors, particularly as it includes both metro and country areas. ActewAGL Emergency Response performance is reported to the ICRC as % response within 6 hours. However,

Envestra's performance has been below its performance targets on several occasions and its after-hours response is getting steadily worse. Envestra advised ESC that the performance measure was quite sensitive to being only a few minutes late in responding to calls. It considered that its overall performance had been satisfactory since no incidents had been caused by late response.

5.2 Network Integrity

A critical aspect of gas supply safety is network integrity, which can be measured in terms of loss of containment (leakages), third party damage and Unaccounted For Gas. All regulators except Queensland publish data on gas leaks, but the indicators differ between jurisdictions. Victoria and the ACT publish annual data on the number of gas leaks per kilometre of pipe. The Victorian networks typically record around 1.3 gas leaks per kilometre each year. In 2007, Western Australia began publishing data on the number of reported gas leaks occurring in public areas.

5.2.1 Publicly Reported Gas Leaks

Gas leaks are identified both through public reports of gas smell and leakage surveys by the distributors. An important part of the gas distribution business is the response to gas leaks reported by the public. This is affected by a number of factors, including the effectiveness of distributors' renewal strategies, the condition and composition of assets, the level of odorant, the extent and effectiveness of leakage surveys and seasonal / environmental factors. JGN classifies such reports as an immediately hazardous Class 1 leak, unless it can be firmly established verbally that a lower classification is warranted. Site investigation may subsequently determine that the leak can be reclassified.

For the purpose of benchmarking against other Australian utilities, since the number of publicly reported leaks can be related to the length of distribution mains, an important measure of the effectiveness of distributors' network integrity and maintenance strategies is the number of gas leaks per kilometre of main. However, direct comparison between the States is difficult because of differences in the KPI used. In Victoria, the ESC publish only the total number of leaks repaired per km of pipe and the average number of unrepaired leaks per month per km of pipe. The publicly reported leaks and those discovered on leakage survey are not separated. The SA Technical Regulator publishes Envestra's annual number of publicly reported leaks and the length of distribution mains. However, for leakage survey, only the ratio, leaks per km of mains surveyed, is quoted.

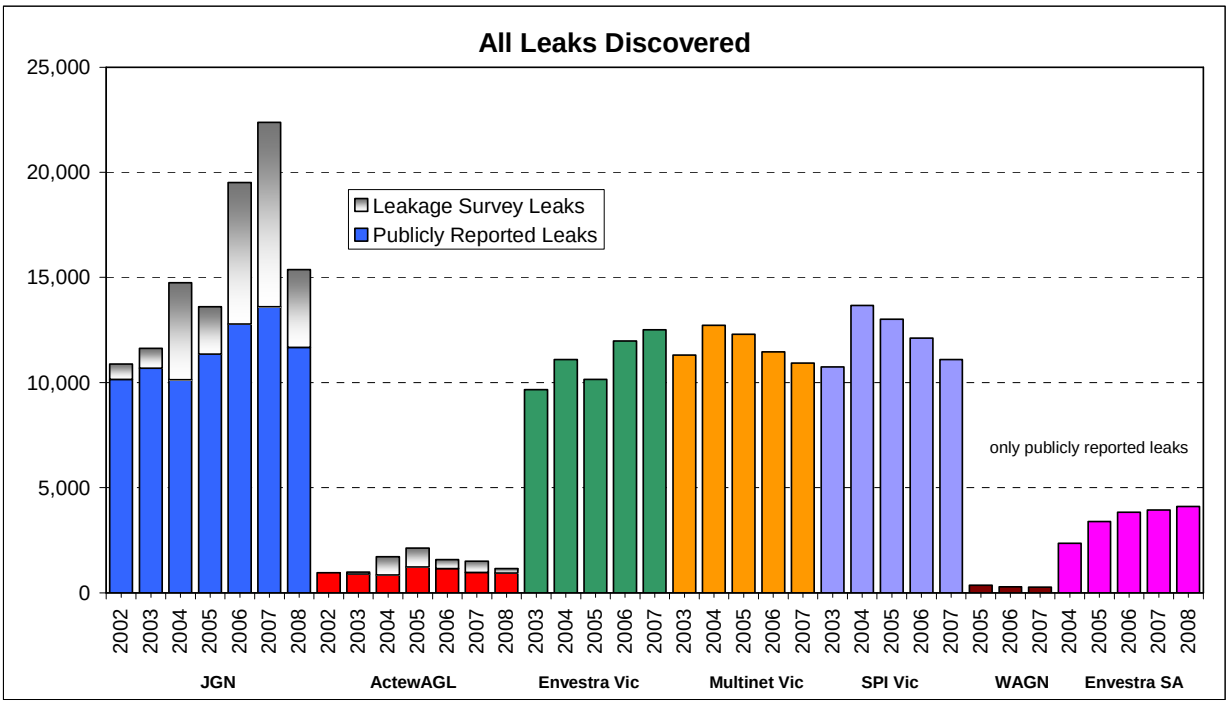

Figure 36. All leaks discovered

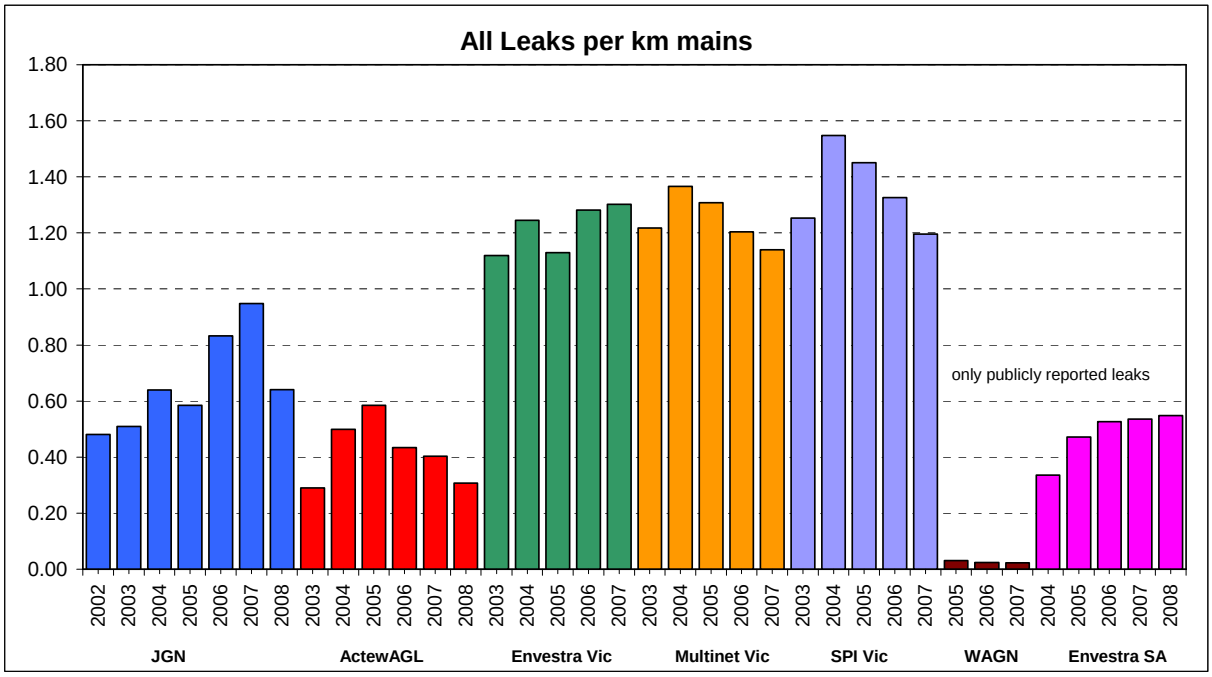

Figure 37. All leaks per km mains

Thus for the purposes of benchmarking, Figure 37 provides the best comparison across the utilities as a measure of network integrity. Overall, ActewAGL shows the best result. JGN's leakage 'intensity' is significantly less than that in Victoria. WAGN shows a remarkably low level of publicly reported leaks. This coupled with a low 1.8% UAFG indicates good system integrity.

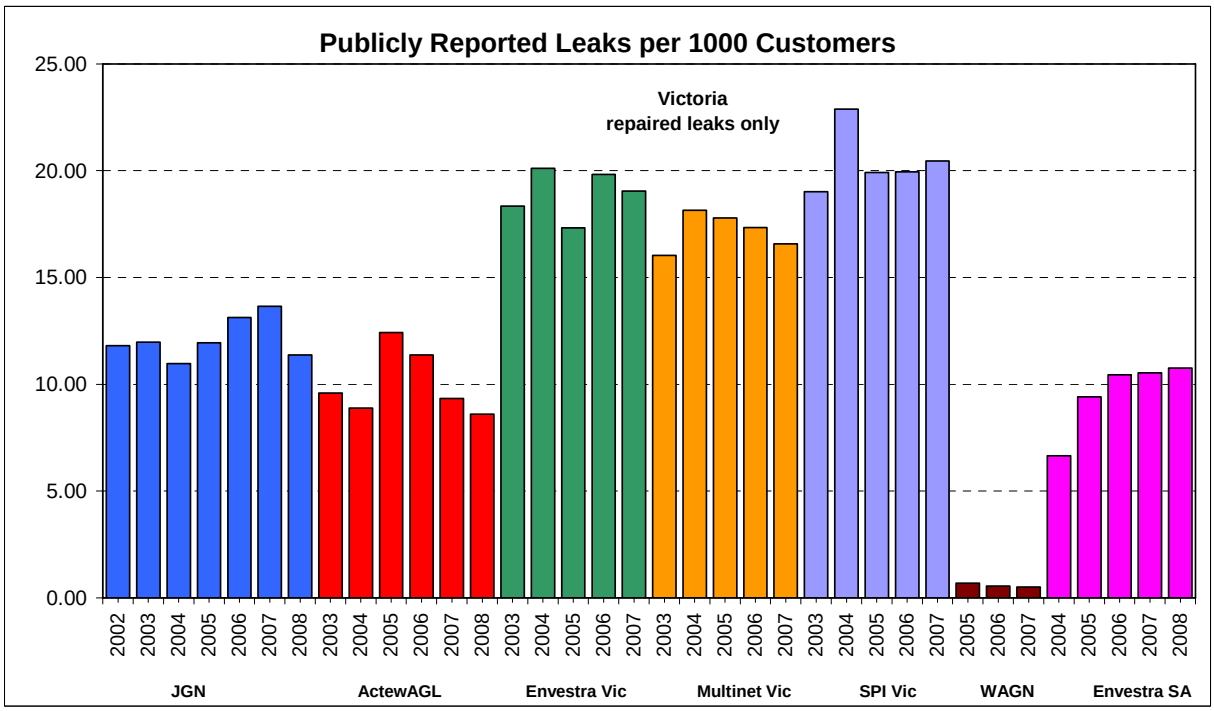

Figure 38. Publicly reported leaks per 1000 customers

Publicly reported leaks per 1000 consumers puts the number of reports in the context of a consumer. Standardising this statistic to measure the number of reports per 1,000 consumers enables each network to be considered from the basis of the consumer. A high number of reports per 1000 consumers would imply that a significant proportion of the network's consumers is affected by leaks and may raise questions about network safety.

While the ESC does not separate publicly reported leaks from leakage survey leaks, the Victorian Office of Gas Safety (OGS) did provide this information for the year 2000 only. OGS reported that "the Victorian frequency of publicly reported escapes was twice that of SA. The reason for this is unclear but factors to be considered would be the age and condition difference of the distribution systems, environment considerations, etc."

5.2.2 Mechanical Third Party Damage (Hits)

External damage to networks is a significant cause of gas escapes and customer supply interruptions. This is a serious safety issue because damage to gas mains may lead to injury and even death. This is not an indicator of the performance of the network operator per se, but is however an indication of the effectiveness of the network operator's communication campaigns, such as "Dial Before You Dig", or signage targeted at third parties that may potentially cause mechanical damage such as other utilities' maintenance workers.

It is logical to normalise the benchmark KPI by correlating the number of mains hits with the length of mains, and the number of hits on services with the number of customers. Unfortunately, the definitions of hits on mains and on services appear to be quite different between Jemena and the ESC and the ERA in WA, as can be seen in Figure 39 and Figure 40. Envestra SA only publishes the total number of hits.

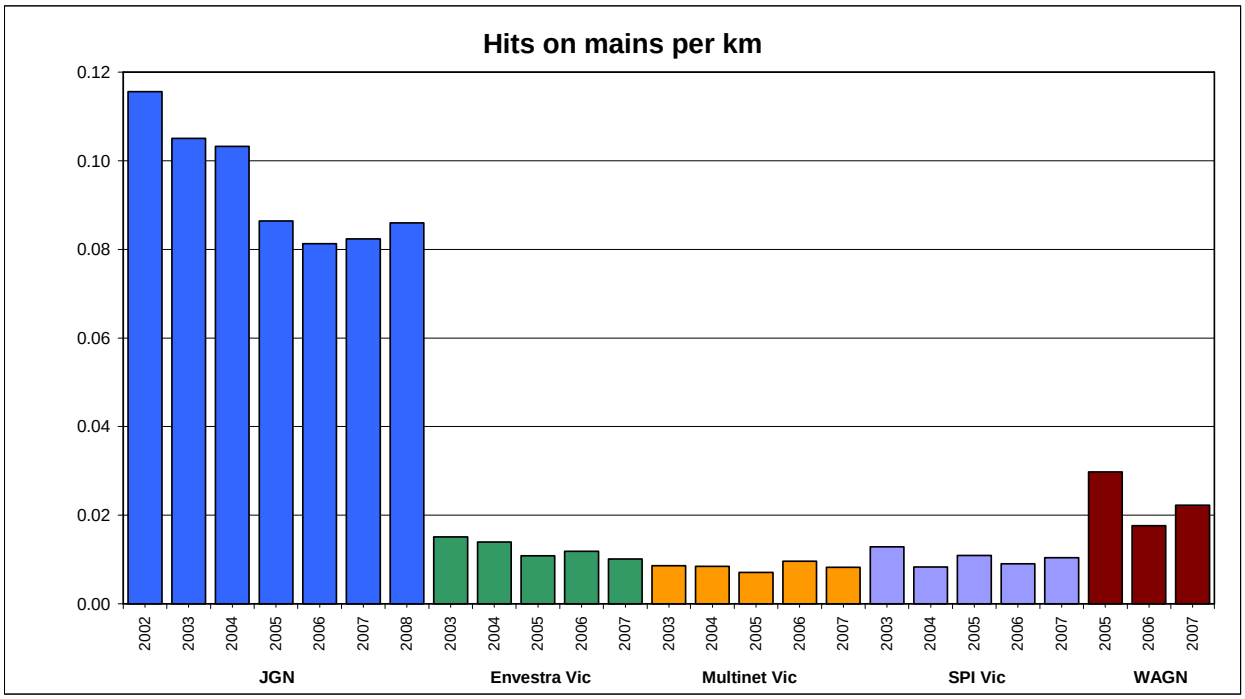

Figure 39. Hits on mains per km

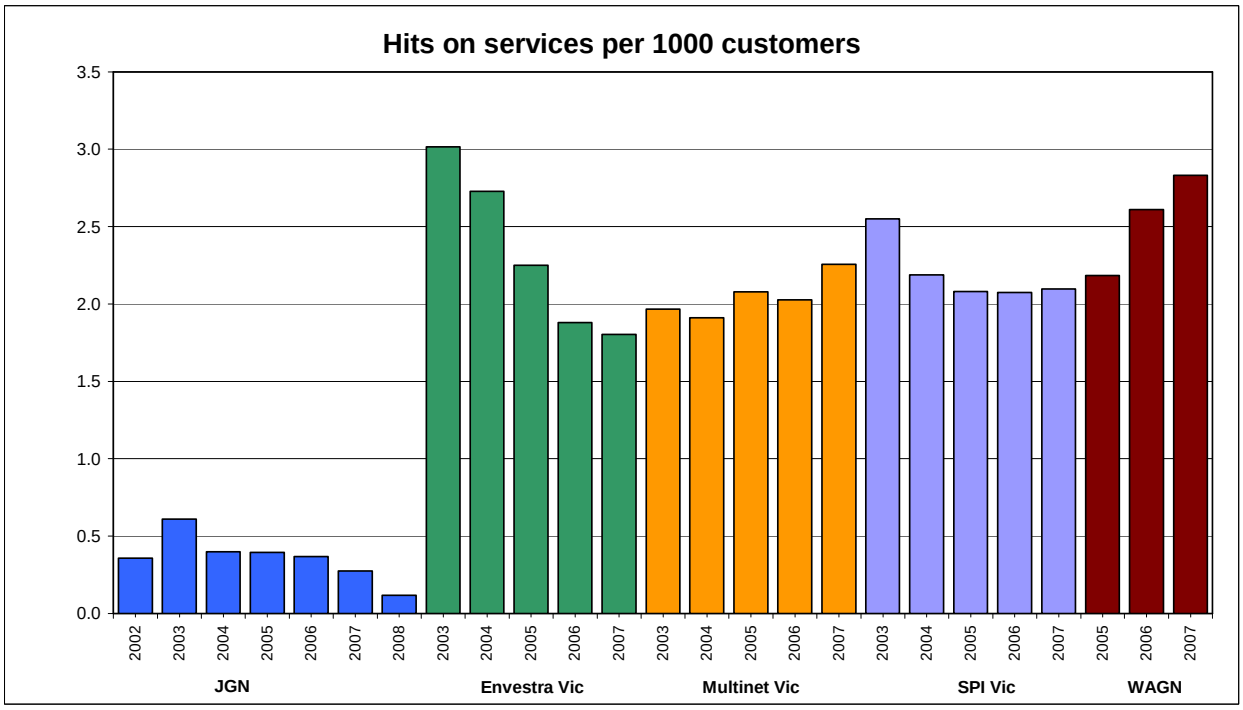

Figure 40. Hits on services per 1000 customers

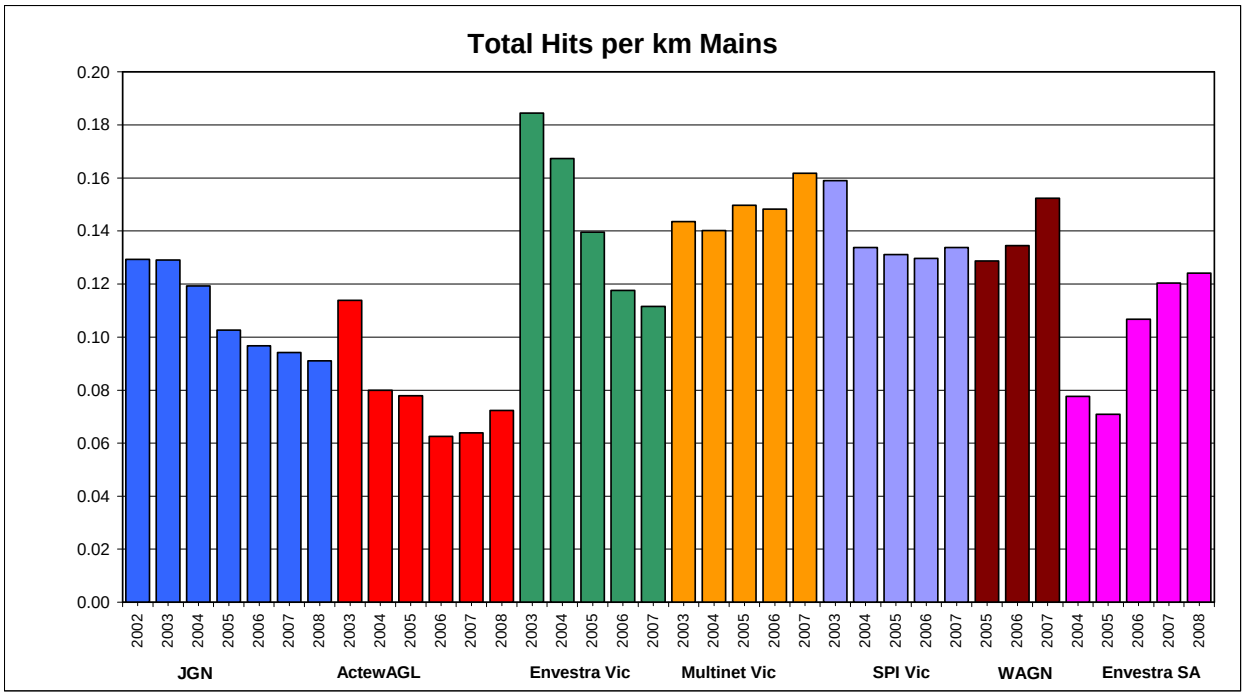

Figure 41. Total hits per km mains

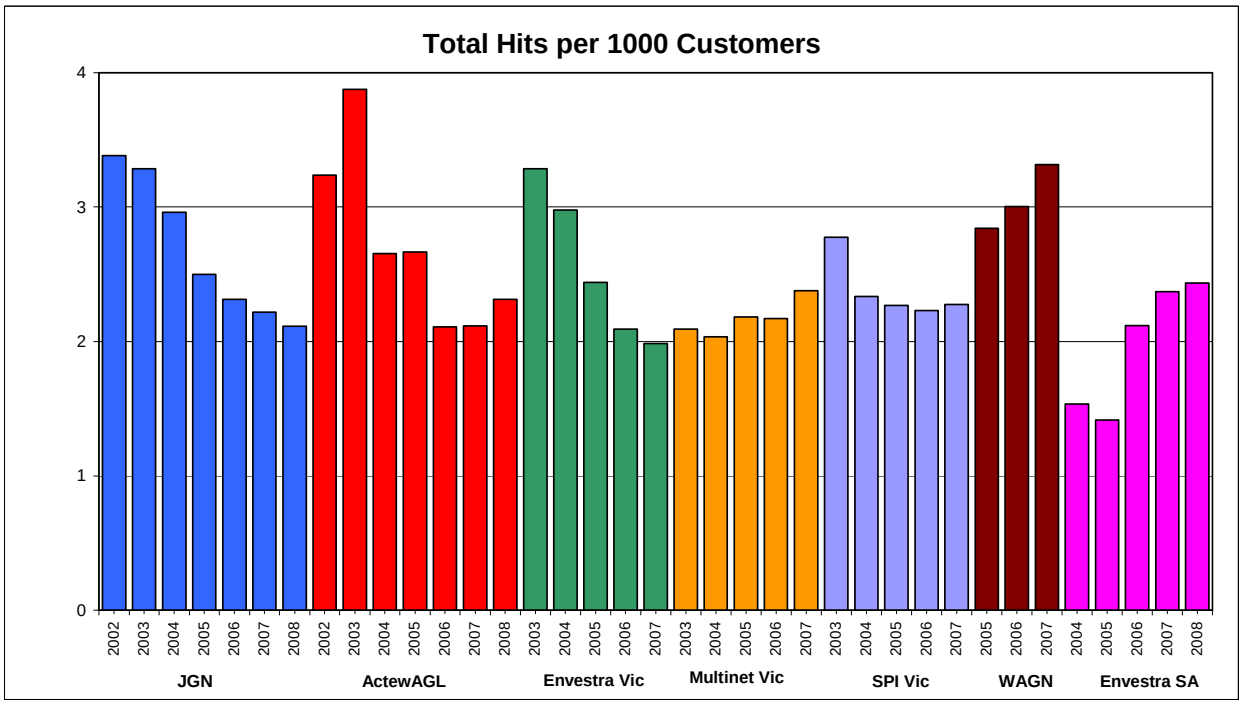

Figure 42. Total hits per 1000 customers

Obviously the Victorian and WA methodologies allocate far more hits to services than does Jemena. However, the total number of hits does provide a basis for comparison. Victorian and WA utilities experience more hits per km. Envestra SA has shown a significant increase over the last three years. JGN shows a pleasing and ongoing reduction in hits per km perhaps due to increased use of One Call and increased vigilance in pipeline patrols and standbys. ActewAGL again shows the best performance.

On a hits per customer basis, most utilities show a current level of around 2 hits pa per 1000 customers except for WAGN which has an increasing trend of 3 hits pa.

5.2.3 Unaccounted for Gas (UAFG)

UAFG is defined as the difference between the gas entering the system and the amount delivered, as a proportion of the gas entering expressed as a percentage. It is a measure of how much of the gas injected into the network is lost in transit. UAFG can be a complex issue, resulting from system leaks, theft, inaccurate meters, differences in times meters are read, accounting error, pressure, gas compressibility factor, temperature or Heating Value discrepancies, line pack differences and losses in commissioning of new or replacement pipes.

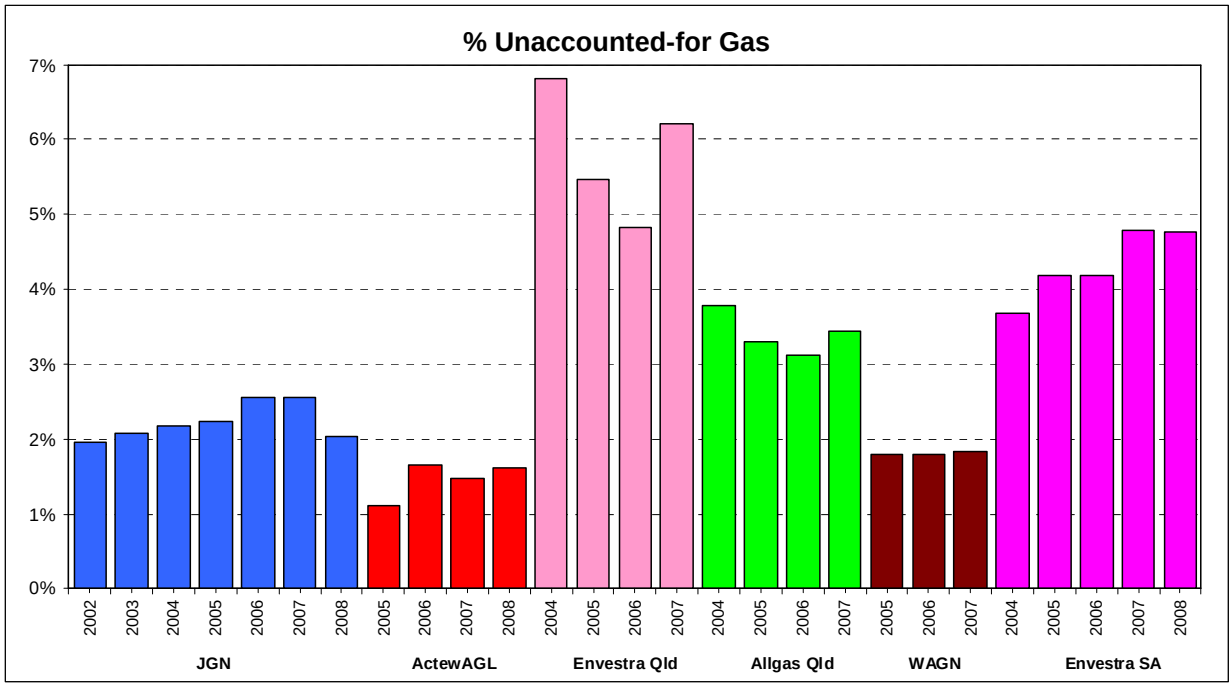

Figure 43 Comparison of Unaccounted for Gas

Taking into consideration the size of the distribution network, JGN and ActewAGL have been performing well compared to the network operators in South Australia and Queensland. Note that UAFG for ActewAGL excludes Nowra.

Envestra Qld experienced a significant increase in UAFG in 2006/07. It was unable to account for the increase and hoped that its mains replacement program would continue a downward trend in the future.

The ESC of South Australia noted in its 2006 – 2007 performance report that unaccounted-for gas had almost doubled in the Envestra network since 2002 – 03. The issue may be linked to the existence of older cast iron pipelines in parts of the network. Envestra is undertaking a capital works program to replace around 100 kilometres of cast iron pipes a year.

UAFG for the Victorian gas utilities is not published by the ESC. However, as an indication of the upper level of UAFG in Victoria, the Gas Distribution System Code (GDSC) currently sets out UAFG benchmarks for each Victorian distributor. The benchmarks express UAFG as a percentage of gas deliveries, with separate benchmarks applying in respect of volumes delivered from the high and low pressure systems. The GDSC requires distributors to use reasonable endeavours to ensure that the quantity of UAFG in their systems is less than the prescribed benchmark[2].

As can be seen from the following table taken from the ESC **Gas Access Arrangement Review 2008-2012 Final Decision,** it appears that UAFG in Victoria could be generally higher than that of JGN and ActewAGL. (Class B benchmarks refer to gas loads <250,000 GJ/pa and Class A benchmarks >= 250,000 GJ/pa.)

Table 1.8 **Final decision – UAFG benchmarks 2008 – 2012**

UAFG percentage of total injections

	Class B benchmarks					*Class A benchmarks 2008 – 2012*
	2008	*2009*	*2010*	*2011*	*2012*	
Envestra (Victoria)	2.8	2.8	2.7	2.7	2.6	0.3
Envestra (Albury)	3.0	3.0	3.0	3.0	3.0	0.1
Multinet	3.2	3.2	3.2	3.1	3.1	0.3
SP AusNet	5.1	5.1	5.0	5.0	4.9	0.3

[2] Under the Victorian UAFG model, retailers are required to purchase sufficient gas from producers to cover UAFG; distributors are not funded for UAFG in their revenue requirement. Consequently, retailers initially bear the cost of all UAFG. However, if actual UAFG is greater than the benchmark, then the distributor pays an amount to the relevant retailer(s) equal to the cost of the additional gas lost. Where UAFG is lower than the benchmark, the relevant retailer(s) pay the distributor an amount equal to the cost of the gas that would have been required to meet the benchmark. The reconciliation between retailers and distributors is performed annually by VENCorp.

6. Terminology

AAM	Alinta Asset Management
ACT	Australian Capital Territory
AER	Australian Energy Authority
AGL	Australian Gaslight Company
BBI	Babcock & Brown Infrastructure
BBP	Babcock & Brown Power
CAIDI	Customer Average Interruption Duration Index - The sum of the duration of each customer interruption (in minutes), divided by the total number of customer interruptions (SAIDI divided by SAIFI).
CAPEX	Capital Expenditure
CHOS	Consumer Hours Off Supply
DEUS	Department of Energy, Utilities and Sustainability (NSW)
DWE	Department of Water and Energy
ERA	Economic Regulation Authority of Western Australia
ESC	Essential Services Commission (Vic)
ESCOSA	Essential Services Commission of South Australia
GASS	JGN billing and maintenance planning system
GDSC	Victorian Gas Distribution System Code
HRA	High Risk Area
ICRC	The Independent Competition and Regulatory Commission (ACT)
JAM	Jemena Asset Management
JGN	Jemena Gas Networks
KPI	Key Performance Indicator
MAP	Moomba-to-Adelaide transmission pipeline
OEAM	Origin Energy Asset Management
OGS	Office of Gas Safety (Vic)
OPEX	Operating Expenditure
OTR	Office of the Technical Regulator (SA) - a section within the Minerals and Energy Division of the Department for Primary Industries and Resources SA (PIRSA).
PJpa	petajoules per annum (10^{15} joules/y)
QCA	Queensland Competition Authority
RAB	The regulated asset base estimates the depreciated optimised replacement cost of an asset
SAIDI	System Average Interruption Duration Index - The sum of the duration of each customer interruption (in minutes), divided by the total number of connected customers averaged over the year.
SAIFI	System Average Interruption Frequency Index - The total number of customer interruptions, divided by the total number of connected customers averaged over the year.
SPI	Singapore Power International
TJ	terajoule (10^{12} joules)
UAFG	Unaccounted For Gas
WAGN	WA Gas Networks

7. Attribution of Data

This table lists the various sources of data gathered for this Benchmarking Study. Specific data references can be found in the Attribution column of the data sheets in the Appendix 8.2.

1	JGN and ActewAGL Distribution Network Annual Reports submitted to Department of Water and Energy DWE (previously DEUS)
2	ActewAGL Licensed Annual Reporting: Gas Distribution submitted to Independent Competition and Regulatory Commission ICRC
3	Essential Services Commission ESC: Comparative Performance Annual Reports - Gas Distribution Businesses
4	Queensland Competition Authority QCA: Gas Distribution- Service Quality Performance Annual Reports
5	Economic Regulation Authority of Western Australia ERA: Gas Distribution and Trading Licences Annual Performance Reports
6	Office of the Technical Regulator of South Australia OTR: Annual Reports of the OTR: Gas
7	JAM Customer Growth Business-As-Usual Forecast for JGN from Bharat Mana, Works Program Management
8	JAM Customer Growth Business-As-Usual Forecast for ActewAGL from Bharat Mana, Works Program Management
9	JAM System Upgrade CAPEX Forecast for JGN from Veronica Wieckowski, Capacity Planning
10	JAM System Upgrade CAPEX Forecast for ActewAGL from Veronica Wieckowski, Capacity Planning
11	JGN Asset Management Plan 2009
12	ActewAGL Asset Management Plan 2009
13	JGN mains composition data from "Asset Ages Master 2009 consolidated graphs v2.xls"
14	Outages < 5 customers, each of 4 hr, based on wc201,202 extracted by BrioQuery from GASS by Sonny Dang, Capacity Management – Business Rule in 8.1
15	Major Outages Register for JGN and ActewAGL maintained by Sonny Dang, Capacity Management
16	JAM internal quarterly ActewAGL Distribution and Transmission Reports
17	Access Arrangement internal Historic UAFG Report for ActewAGL 2009: JAM data
18	Australian Bureau of Meteorology website Capital City Min.Mean Temperature Data .xls
19	Allgas Energy, Access Arrangement for the Queensland Network 7Jun06
20	AER State of the Energy Market 2008
21	Asset Register Gas Networks 30Jun04.xls

8. APPENDICES

8.1 Business Rule: Outages < 5 Customers: No or Poor Supply

KPI Outages < 5 Customers: No or Poor Supply

Indicator Outline
This KPI identifies gas customer supply problems involving no more than 4 customers, due to problems related to the network, service regulators or meters.

Purpose
This KPI highlights trends in network supply problems by aggregating report-in workcodes specifically related to no supply or poor supply for use in benchmarking comparisons with other Australian gas utilities.

Report Period	**Data Source**
Financial year update of Benchmarking Study	ASKS: Service Order Details table

Rules

By Network

2003 Area failure – no supply to contract customer

2010 No Supply – inlet service rectified
2011 No Supply - inlet service referred

2020 Poor Supply - inlet service rectified
2021 Poor Supply - inlet service referred

2030 Poor Supply Peak Period – work performed
2031 Poor Supply Peak Period - referred

Sample Population

All Service Orders with Finalised Workcodes within the financial year Period.

Selection Criteria

Include only the above issued workcodes at the 4-digit level.

8.2 Data Sheets

The following are data sheets for each gas utility surveyed in this Study, directly linked to the accompanying Excel spreadsheet, ***JGN Performance Benchmarking Data 2003_08.xls***. This spreadsheet also contains the original charts which are linked to the charts displayed in this document. Any changes in the spreadsheet can be updated in this document by loading the spreadsheet and then highlighting the relevant linked chart or data table and pressing F9.

Jemena Gas Networks	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	
JGN DATA	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**Attribution**
Residential customers	727698	763,385	801,879	835,394	868,680	898,236	923,566	945,257	965,653	995,074	
I & C Tariff customers	23963	24,429	24,803	24,660	23,775	25,843	27,535	29,293	30,683	30,869	
Tariff Customers	**751,661**	**787,814**	**826,682**	**860,054**	**892,455**	**924,079**	**951,101**	**974,550**	**996,336**	**1,025,943**	
Contract customers		544	511	510	491	488	490	483	444	430	
TOTAL Customers		**788,358**	**827,193**	**860,564**	**892,946**	**924,567**	**951,591**	**975,033**	**996,780**	**1,026,373**	**7**
Cast Iron Pipe km								477		477	
Steel Pipe km								2,769		1,907	
Plastic Pipe km								20,100		21,453	**13**
Transmission (Primary) Mains km			108	113	113	113	113	113	113	143	
Distribution Mains km			22,286	22,527	22,724	22,956	23,162	23,347	23,497	23,837	
TOTAL Mains km			**22,394**	**22,640**	**22,837**	**23,069**	**23,275**	**23,460**	**23,610**	**23,980**	**1**
Tariff customers per km distribution mains			37.1	38.2	39.3	40.3	41.1	41.7	42.4	43.0	
# outages < 5 (wc201,202)							2,047	2,536	2,399	2,717	**14**
# outages >= 5				15	27	75	113	83	59	48	**1**
# customers in outages >= 5					2,822	4,574	10,096	5,119	3,782	3,153	**15**
Total hours in outages >= 5 (CHOS)					7,929	5,648	74,150	25,705	34,113	16,827	**1**
SAIDI per customer (all outages)							5.19	2.21	2.63	1.62	**4h/cust.**
SAIDI per customer (outages >= 5)					0.533	0.367	4.675	1.582	2.053	0.984	
SAIFI per 1000 customers (all outages)							2.27	2.69	2.47	2.69	
CAIDI (all outages)							2060	589	833	365	
CAIDI (outages >= 5)					17,620	4,518	39,372	18,582	34,691	21,034	
# outages >= 5 per 1000 customers				0.017	0.030	0.081	0.119	0.085	0.059	0.047	
Publicly Reported Leaks				10,154	10,687	10,134	11,358	12,793	13,606	11,669	**1**
Leakage Survey Leaks				730	947	4,619	2,260	6,730	8,765	3,697	**1**
Leaks Repaired											
Av. Leaks Unrepaired											
Leakage Survey km				5,880	7,743	8,458	5,427	7,681	4,960	4,958	**1**
TOTAL Leaks				**10,884**	**11,634**	**14,753**	**13,618**	**19,523**	**22,371**	**15,366**	
All leaks per km mains				0.48	0.51	0.64	0.59	0.83	0.95	0.64	
Publicly Reported Leaks per 1000 customers				11.8	12.0	11.0	11.9	13.1	13.6	11.4	
Leaks per km mains surveyed				0.12	0.12	0.55	0.42	0.88	1.77	0.75	
Hits on Mains				2,604	2387	2,369	2,002	1,897	1,936	2,049	**1**
Hits on Services				308	545	368	375	359	275	120	**1**
TOTAL Hits				**2,912**	**2,932**	**2,737**	**2,377**	**2,256**	**2,211**	**2,169**	
Hits on mains per km				0.12	0.11	0.10	0.09	0.08	0.08	0.09	
Hits on services per 1000 customers				0.36	0.61	0.40	0.39	0.37	0.28	0.12	
Total hits per km				0.13	0.13	0.12	0.10	0.10	0.09	0.09	
Total hits per 1000 customers				3.38	3.28	2.96	2.50	2.31	2.22	2.11	
Emergency Response within 60'				97.0%	96.9%	98.1%	98.2%	98.0%	98.7%	98.2%	**1**
ER < 60' Metro. Business Hours											
ER < 60' After Business Hours											
ER < 60' Country											
Gas Input TJ				99,135	99,146	98,581	97,934	97,773	99,546	100,183	**1**
UAFG TJ				1,935	2,048	2,150	2,185	2,503	2,542	2,040	**1**
Total Gas Sales TJ				97,200	97,098	96,431	95,749	95,270	97,004	98,143	**1**
Tariff Gas Sales TJ		28,345	29,533	30,004	30,764	31,789	31,665	31,800	32,492	33,537	**7**
Contract Gas Sales TJ				67,196	66,334	64,642	64,084	63,470	64,512	64,606	
Tariff gas sales per km distribution mains			1.33	1.33	1.35	1.38	1.37	1.36	1.38	1.41	
Gas consumption per tariff customer GJpa		36.0	35.7	34.9	34.5	34.4	33.3	32.6	32.6	32.7	
UAFG %		2.50%		1.95%	2.07%	2.18%	2.23%	2.56%	2.55%	2.04%	
Minimum Mean Temperature (deg C) Sydney		13.8	13.9	13.7	13.7	13.9	14	13.7	14.2	13.4	**18**

ActewAGL (excluding Nowra)	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	
ActewAGL	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**Attribution**
Domestic Customers	74207	78,542	82,643	86,598	90,497	93,913	96,472	99,249	101,839	106,917	
I & C Tariff customers	1936	1,993	2,033	2,075	2,121	2,160	2,182	2,211	2,656	2,874	
Tariff Customers	**76,143**	**80,535**	**84,676**	**88,673**	**92,618**	**96,073**	**98,654**	**101,460**	**104,495**	**109,791**	
Contract Customers											
TOTAL Customers	**76143**	**80,535**	**84,676**	**88,673**	**92,618**	**96,073**	**98,654**	**101,460**	**104,495**	**109,791**	**7**
Cast Iron Pipe km											
Steel Pipe km											
Plastic Pipe km											
Transmission (Primary) Mains km					261	265	245	233	248	249	
Distribution Mains km					3,155	3,188	3,376	3,420	3,461	3,510	
TOTAL Mains km					**3,416**	**3,453**	**3,621**	**3,653**	**3,709**	**3,759**	**2**
Customers per km mains					29.4	30.1	29.2	29.7	30.2	31.3	
# outages < 5 (wc201,202)							122	150	138	136	**14**
# outages >= 5				3	2	4	0	3	3	0	**15**
# customers in outages >= 5				100	147	61	0	54	209	0	**15**
Total hours in outages >= 5 (CHOS)				523	214	54	0	28	159	0	**15**
SAIDI per customer (all outages)							0.30	0.37	0.41	0.30	**4h/cust.**
SAIDI per customer (outages >= 5)				0.35		0.034	0.000	0.017	0.091	0.000	
SAIFI per 1000 customers (all outages)							1.24	1.51	1.35	1.24	
CAIDI (all outages)							240	246	303	240	
CAIDI (outages >= 5)				10,460	0	810		560	3,180		
# outages >= 5 per 1000 customers				0.034	0.022	0.042	0.000	0.030	0.029	0.000	
Publicly Reported Leaks				949	888	853	1,225	1,154	974	943	**2**
Leakage Survey Leaks				0	101	868	894	431	521	211	**2**
Leaks Repaired					1,750	2,154	1,633				
Av. Leaks Unrepaired											
Leakage Survey km				0	378	0	322	82	397	609	**12**
TOTAL Leaks				**949**	**989**	**1,721**	**2,119**	**1,585**	**1,495**	**1,154**	
All leaks per km mains					0.29	0.50	0.59	0.43	0.40	0.31	
Publicly Reported Leaks per 1000 customers					9.6	8.9	12.4	11.4	9.3	8.6	
Leaks per km mains surveyed					0.27	0.00	2.78	5.26	1.31	0.35	
Hits on Mains											
Hits on Services											
TOTAL Hits				**287**	**359**	**255**	**263**	**214**	**221**	**254**	**2**
Hits on mains per km											
Hits on services per 1000 customers											
Total hits per km					0.11	0.08	0.08	0.06	0.06	0.07	
Total hits per 1000 customers				3.24	3.88	2.65	2.67	2.11	2.11	2.31	
Emergency Response within 60'					100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	**16**
ER < 60' Metro. Business Hours											
ER < 60' After Business Hours											
ER < 60' Country											
Gas Input TJ (ACT,Q,Nowra)				6,688	7,013	7,677	7,199	7,447	7,174	7,521	**2, 17**
UAFG TJ							80	123	106	121	**17**
Total Gas Sales TJ	5019	5,118	5,548	5,582	5,686	6,195	7,120	7,324	7,068	7,400	**8**
Tariff Gas Sales TJ	5019	5,118	5,548	5,582	5,686	6,195	6,102	6,242	6,030	6,380	**8**
Contract Gas Sales TJ	0	0	0	0	0	0	1,018	1,082	1,038	1,020	**8**
Tariff gas sales per km distribution mains					1.80	1.94	1.81	1.83	1.74	1.82	
Gas consumption per tariff customer GJpa	65.9	63.6	65.5	63.0	61.4	64.5	61.8	61.5	57.7	58.1	**8**
UAFG %							1.11%	1.66%	1.47%	1.61%	**17**
Minimum Mean Temperature (deg C) Canberra		6.9	6.6	6.7	7.3	7	7.3	7	8.3	7.1	**18**

Envestra Vic.

Envestra Vic.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Attribution
Residential customers					450,426	461,874	474,025	486,040	499,046		All data
I & C Tariff customers					17,830	21,456	22,009	22,551	23,135		3
Tariff Customers					**468,256**	**483,330**	**496,034**	**508,591**	**522,181**		
Contract customers											
TOTAL Customers					**468,256**	**483,330**	**496,034**	**508,591**	**522,181**		
Cast Iron Pipe km								711	711		
Steel Pipe km								2,730	2,959		
Plastic Pipe km								5,600	5,619		
Transmission (Primary) Mains km					310	310	310	310	314		
Distribution Mains km					8,335	8,600	8,673	9,040	9,289		
TOTAL Mains km					**8,645**	**8,910**	**8,983**	**9,350**	**9,603**		
Customers per km mains					56.2	56.2	57.2	56.3	56.2		
outages < 5		5,702	7,048	5,589	3,861	5,712	5,300	3,413	3,149		
# outages >= 5		22	19	16	15	8	6	13	25		
# customers in outages >= 5											
Total hours in outages >= 5 (CHOS)											
SAIDI per customer (all outages)					2.68	2.98	2.69	2.35	1.68		
SAIDI per customer (outages >= 5)											
SAIFI per 1000 customers (all outages)					11.00	13.00	12.00	8.00	7.00		
CAIDI (all outages)					251	238	228	285	241		
CAIDI (outages >= 5)											
# outages >= 5 per 1000 customers					0.032	0.017	0.012	0.026	0.048		
Publicly Reported Leaks		7,667									
Leakage Survey Leaks											
Leaks Repaired					8,585	9,718	8,586	10,080	9,950		
Av. Leaks Unrepaired					1,084	1,376	1,561	1,900	2,555		
Leakage Survey km											
TOTAL Leaks					**9,669**	**11,094**	**10,147**	**11,980**	**12,505**		
All leaks per km mains					1.12	1.25	1.13	1.28	1.30		
Repaired Leaks per 1000 customers					18.3	20.1	17.3	19.8	19.1		
Leaks per km mains surveyed											
Hits on Mains					126	120	94	107	94		
Hits on Services					1412	1,319	1,116	956	942		
TOTAL Hits					**1,538**	**1,439**	**1,210**	**1,063**	**1,036**		
Hits on mains per km					0.02	0.01	0.01	0.01	0.01		
Hits on services per 1000 customers					3.02	2.73	2.25	1.88	1.80		
Total hits per km					0.18	0.17	0.14	0.12	0.11		
Total hits per 1000 customers					3.28	2.98	2.44	2.09	1.98		
Emergency Response within 60'											
ER < 60' Metro. Business Hours					94.2%	95.0%	95.0%	95.0%	94.0%		
ER < 60' After Business Hours					95.4%	93.0%	91.0%	91.0%	88.0%		
ER < 60' Country					96.9%	96.0%	91.0%	96.0%	93.0%		
Gas Input TJ											
UAFG TJ											
Total Gas Sales TJ						57,600	54,800	57,000	48,700		
Tariff Gas Sales TJ						32,000	30,100	33,400	31,000		
Contract Gas Sales TJ						25,600	24,700	23,600	17,700		
Tariff gas sales per km distribution mains						3.72	3.47	3.69	3.34		
Gas consumption per tariff customer GJpa						66.2	60.7	65.7	59.4		
UAFG %											
Minimum Mean Temperature (deg C) Melbourne		10.1	10.1	9.4	9.2	9.9	10	9.3	10.5	9.8	18

Multinet Vic.

Multinet Vic. DATA	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Attribution
Residential customers					608,238	614,420	618,000	622,000	624,400		All data
I & C Tariff customers					22,147	20,735	21,000	22,000	21,700		3
Tariff Customers					**630,385**	**635,155**	**639,000**	**644,000**	**646,100**		
Contract customers											
TOTAL Customers					**630,385**	**635,155**	**639,000**	**644,000**	**646,100**		
Cast Iron Pipe km								1,551	1,551		
Steel Pipe km								3,800	3,836		
Plastic Pipe km								4,070	4,106		
Transmission (Primary) Mains km					96	96	91	91	92		
Distribution Mains km					9,191	9,220	9,312	9,422	9,493		
TOTAL Mains km					**9,287**	**9,316**	**9,403**	**9,513**	**9,585**		
Customers per km mains					68.6	68.9	68.6	68.4	68.1		
outages < 5		10,590	8,213	4,828	4,163	4,858	5,684	4,899	6,310		
# outages >= 5		35	24	19	37	30	26	33	21		
# customers in outages >= 5											
Total hours in outages >= 5 (CHOS)											
SAIDI per customer (all outages)					1.88	2.12	2.48	2.28	2.16		
SAIDI per customer (outages >= 5)											
SAIFI per 1000 customers (all outages)					8.00	9.00	10.00	9.00	10.00		
CAIDI (all outages)					237	249	260	262	206		
CAIDI (outages >= 5)											
# outages >= 5 per 1000 customers					0.059	0.047	0.041	0.051	0.033		
Publicly Reported Leaks		12,447									
Leakage Survey Leaks											
Leaks Repaired					10,110	11,525	11,361	11,165	10,710		
Av. Leaks Unrepaired					1,195	1,199	931	285	220		
Leakage Survey km											
TOTAL Leaks					**11,305**	**12,724**	**12,292**	**11,450**	**10,930**		
All leaks per km mains					1.22	1.37	1.31	1.20	1.14		
Repaired Leaks per 1000 customers					16.0	18.1	17.8	17.3	16.6		
Leaks per km mains surveyed											
Hits on Mains					79	78	66	91	78		
Hits on Services					1240	1,214	1,328	1,306	1,458		
TOTAL Hits					**1,319**	**1,292**	**1,394**	**1,397**	**1,536**		
Hits on mains per km					0.01	0.01	0.01	0.01	0.01		
Hits on services per 1000 customers					1.97	1.91	2.08	2.03	2.26		
Total hits per km					0.14	0.14	0.15	0.15	0.16		
Total hits per 1000 customers					2.09	2.03	2.18	2.17	2.38		
Emergency Response within 60'					98.3%	97.0%	98.0%	98.0%	97.0%		
ER < 60' Metro. Business Hours											
ER < 60' After Business Hours											
ER < 60' Country											
Gas Input TJ											
UAFG TJ											
Total Gas Sales TJ						60,600	56,400	61,504	56,700		
Tariff Gas Sales TJ						45,900	42,500	47,300	41,800		
Contract Gas Sales TJ						14,700	13,900	14,204	14,900		
Tariff gas sales per km distribution mains						4.98	4.56	5.02	4.40		
Gas consumption per tariff customer GJpa						74.7	68.8	76.0	66.9		
UAFG %											
Minimum Mean Temperature (deg C) Melbourne		10.1	10.1	9.4	9.2	9.9	10	9.3	10.5	9.8	18

SP AusNet Vic.

SPI Vic.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Attribution
Residential customers					463,446	476,862	489,936	505,585	519,386		All data
I & C Tariff customers					17,861	18,233	18,427	15,355	15,498		3
Tariff Customers					**481,307**	**495,095**	**508,363**	**520,940**	**534,884**		
Contract customers											
TOTAL Customers					**481,307**	**495,095**	**508,363**	**520,940**	**534,884**		
Cast Iron Pipe km								764	764		
Steel Pipe km								2,800	2,933		
Plastic Pipe km								5,400	5,403		
Transmission (Primary) Mains km					183	183	183	183	184		
Distribution Mains km					8,397	8,647	8,800	8,957	9,100		
TOTAL Mains km					**8,580**	**8,830**	**8,983**	**9,140**	**9,284**		
Customers per km mains					57.3	57.3	57.8	58.2	58.8		
outages < 5		4,515	532	1,823	3,991	8,677	8,049	9,225	9,649		
# outages >= 5		14	10	10	31	25	22	23	29		
# customers in outages >= 5											
Total hours in outages >= 5 (CHOS)											
SAIDI per customer (all outages)					0.91	1.16	0.86	0.86	0.85		
SAIDI per customer (outages >= 5)											
SAIFI per 1000 customers (all outages)					11.00	21.00	18.00	19.00	20.00		
CAIDI (all outages)					87	57	48	44	42		
CAIDI (outages >= 5)											
# outages >= 5 per 1000 customers					0.064	0.050	0.043	0.044	0.054		
Publicly Reported Leaks		10,956									
Leakage Survey Leaks											
Leaks Repaired					9,153	11,328	10,120	10,390	10,940		
Av. Leaks Unrepaired					1,595	2,335	2,904	1,720	155		
Leakage Survey km											
TOTAL Leaks					**10,748**	**13,663**	**13,024**	**12,110**	**11,095**		
All leaks per km mains					1.25	1.55	1.45	1.32	1.20		
Repaired Leaks per 1000 customers					19.0	22.9	19.9	19.9	20.5		
Leaks per km mains surveyed											
Hits on Mains					108	72	96	81	95		
Hits on Services					1227	1,084	1,057	1,081	1,122		
TOTAL Hits					**1,335**	**1,156**	**1,153**	**1,162**	**1,217**		
Hits on mains per km					0.01	0.01	0.01	0.01	0.01		
Hits on services per 1000 customers					2.55	2.19	2.08	2.08	2.10		
Total hits per km					0.16	0.13	0.13	0.13	0.13		
Total hits per 1000 customers					2.77	2.33	2.27	2.23	2.28		
Emergency Response within 60'											
ER < 60' Metro. Business Hours					95.8%	97.0%	97.0%	98.0%	98.0%		
ER < 60' After Business Hours					94.4%	95.0%	97.0%	95.0%	96.0%		
ER < 60' Country					92.8%	95.0%	92.0%	96.0%	97.0%		
Gas Input TJ											
UAFG TJ											
Total Gas Sales TJ						71,500	67,100	71,300	69,600		
Tariff Gas Sales TJ						31,500	29,200	33,300	30,900		
Contract Gas Sales TJ						40,000	37,900	38,000	38,700		
Tariff gas sales per km distribution mains						3.64	3.32	3.72	3.40		
Gas consumption per tariff customer GJpa						66.1	59.6	65.9	59.5		
UAFG %											
Minimum Mean Temperature (deg C) Melbourne		10.1	10.1	9.4	9.2	9.9	10	9.3	10.5	9.8	18

Envestra Queensland (AA region)

N.Brisbane,Ipswitch,Gladstone,Rocky	1999	2000	2000/01 2001	2001/02 2002	2002/03 2003	2003/04 2004	2004/05 2005	2005/06 2006	2006/07 2007	2007/08 2008	Attribution
Residential customers											All data
I & C Tariff customers											4
Tariff Customers						**74,297**	**74,641**	**75,603**	**77,169**		
Contract customers						67	65	67	67		
TOTAL Customers						**74,364**	**74,706**	**75,670**	**77,236**		
Cast Iron Pipe km									2.1%		
Steel Pipe km											
Plastic Pipe km											
Transmission (Primary) Mains km											
Distribution Mains km											
TOTAL Mains km						**2,172**	**2,172**	**2,227**	**2,261**		
Customers per km mains						34.2	34.4	34.0	34.2		
outages < 5											
# outages >= 5						2	3	7	7		
# customers in outages >= 5						73	51	166	300		
Total hours in outages >= 5 (CHOS)						655	233	598	1,080		
SAIDI per customer (all outages)											
SAIDI per customer (outages >= 5)						0.528	0.187	0.474	0.839		
SAIFI per 1000 customers (all outages)											
CAIDI (all outages)											
CAIDI (outages >= 5)						19,650	4,650	5,122	9,257		
# outages >= 5 per 1000 customers						0.027	0.040	0.093	0.091		
Publicly Reported Leaks											
Leakage Survey Leaks											
Leaks Repaired											
Av. Leaks Unrepaired											
Leakage Survey km											
TOTAL Leaks											
All leaks per km mains											
Publicly Reported Leaks per 1000 customers											
Leaks per km mains surveyed											
Hits on Mains											
Hits on Services											
TOTAL Hits											
Hits on mains per km											
Hits on services per 1000 customers											
Total hits per km											
Total hits per 1000 customers											
Emergency Response within 60'											
ER < 60' Metro. Business Hours											
ER < 60' After Business Hours											
ER < 60' Country											
Gas Input TJ							5,459	5,392	5,361		
UAFG TJ (ex. Linepack)							298	260	333		
Total Gas Sales TJ							5,161	5,082	5,028		
Tariff Gas Sales TJ						2,027	1,919	1,776	1,784		
Contract Gas Sales TJ							3,242	3,306	3,244		
Tariff gas sales per km distribution mains						0.93	0.88	0.80	0.79		
Gas consumption per tariff customer GJpa						27.3	24.8	23.5	23.1		
UAFG %						6.80%	5.46%	4.82%	6.21%		
Minimum Mean Temperature (deg C) Brisbane		15.8	15.9	16.1	15.9	16.2	16.8	16.2	16.5	15.8	**18**

Allgas Energy Queensland

S.Brisbane,Gold Coast,Oakey,Toowoomba	1999	2000	2000/01 2001	2001/02 2002	2002/03 2003	2003/04 2004	2004/05 2005	2005/06 2006	2006/07 2007	2007/08 2008	Attribution
Residential customers											**All data**
I & C Tariff customers											**4**
Tariff Customers						**62,917**	**64,413**	**66,435**	**68,104**		
Contract customers						114	111	112	108		
TOTAL Customers						**63,031**	**64,524**	**66,547**	**68,212**		
Cast Iron Pipe km											
Steel Pipe km											
Plastic Pipe km											
Transmission (Primary) Mains km											
Distribution Mains km						2,204	2,304	2,408	2,515		
TOTAL Mains km						**2,204**	**2,304**	**2,408**	**2,515**		
Customers per km mains						28.6	28.0	27.6	27.1		
outages < 5											
# outages >= 5						2	8	1	1		
# customers in outages >= 5						107	428	94	600		
Total hours in outages >= 5 (CHOS)						130	986	564	5,400		
SAIDI per customer (all outages)											
SAIDI per customer (outages >= 5)						0.124	0.917	0.509	4.750		
SAIFI per 1000 customers (all outages)											
CAIDI (all outages)											
CAIDI (outages >= 5)						3,900	7,395	33,840	324,000		
# outages >= 5 per 1000 customers						0.032	0.124	0.015	0.015		
Publicly Reported Leaks											
Leakage Survey Leaks											
Leaks Repaired											
Av. Leaks Unrepaired											
Leakage Survey km											
TOTAL Leaks											
All leaks per km mains											
Publicly Reported Leaks per 1000 customers											
Leaks per km mains surveyed											
Hits on Mains											
Hits on Services											
TOTAL Hits											
Hits on mains per km											
Hits on services per 1000 customers											
Total hits per km											
Total hits per 1000 customers											
Emergency Response within 60'											
ER < 60' Metro. Business Hours											
ER < 60' After Business Hours											
ER < 60' Country											
Gas Input TJ						10,144	10,357	10,109	10,705		
UAFG TJ (ex. Linepack)						383	341	316	369		
Total Gas Sales TJ			**9,559**	**9,350**	**9,660**	9,761	10,016	9,793	10,336		**4,19**
Tariff Gas Sales TJ			**2,312**	**2,406**	**2,647**	2,578	2,737	2,639	2,884		**4,19**
Contract Gas Sales TJ			**7,247**	**6,944**	**7,013**	7,183	7,279	7,154	7,452		**4,19**
Tariff gas sales per km distribution mains						1.17	1.19	1.10	1.15		
Gas consumption per tariff customer GJpa						41.0	42.5	39.7	42.3		
UAFG %						3.78%	3.29%	3.13%	3.45%		
Minimum Mean Temperature (deg C) Brisbane		15.8	15.9	16.1	15.9	16.2	16.8	16.2	16.5	15.8	**18**

WA Gas Networks	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	
Perth to Busselton	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**Attribution**
Residential customers							512,297	516,038	542,539		**All data**
I & C Tariff customers							8,224	9,958	8,147		**5**
Tariff Customers							**520,521**	**525,996**	**550,686**		
Contract customers											
TOTAL Customers							**520,521**	**525,996**	**550,686**		
Cast Iron Pipe km											
Steel Pipe km											
Plastic Pipe km											
Transmission (Primary) Mains km											
Distribution Mains km											
TOTAL Mains km							**11,491**	**11,745**	**11,985**		
Customers per km mains							45.4	46.2	47.0		
outages < 5											
# outages >= 5											
# customers in outages >= 5											
Total hours in outages >= 5 (CHOS)											
SAIDI per customer (all outages)											
SAIDI per customer (outages >= 5)											
SAIFI per 1000 customers (all outages)											
CAIDI (all outages)											
CAIDI (outages >= 5)											
# outages >= 5 per 1000 customers											
Publicly Reported Leaks							354	292	273		
Leakage Survey Leaks											
Leaks Repaired											
Av. Leaks Unrepaired											
Leakage Survey km											
TOTAL Leaks							**354**	**292**	**273**		
All leaks per km mains							0.03	0.02	0.02		
Publicly Reported Leaks per 1000 customers							0.68	0.56	0.50		
Leaks per km mains surveyed											
Hits on Mains							342	207	267		
Hits on Services							1,137	1,373	1,559		
TOTAL Hits							**1,479**	**1,580**	**1,826**		
Hits on mains per km							0.03	0.02	0.02		
Hits on services per 1000 customers							2.18	2.61	2.83		
Total hits per km							0.13	0.13	0.15		
Total hits per 1000 customers							2.84	3.00	3.32		
Emergency Response within 60'							99.4%	100.0%	100.0%		
ER < 60' Metro. Business Hours											
ER < 60' After Business Hours											
ER < 60' Country											
Gas Input TJ							31,482	32,781	31,130		
UAFG TJ (ex. Linepack)							567	590	574		
Total Gas Sales TJ							30,915	32,191	30,556		
Residential Gas Sales TJ							9,887	10,734	10,851		
Contract Gas Sales TJ											
Tariff gas sales per km distribution mains											
Gas consumption per residential customer GJpa							19.3	20.8	20.0		
UAFG %							1.80%	1.80%	1.84%		
Minimum Mean Temperature (deg C) Perth		12.9	11.9	12.7	12.8	12.6	12.3	12.3	12.5	12.3	**18**

Envestra SA	1998/99	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08		
JGN DATA	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Attribution	
Residential customers											All data	
I & C Tariff customers											6	
Tariff Customers												
Contract customers												
TOTAL Customers						**355,250**	**360,734**	**367,515**	**374,411**	**381,274**		
Cast Iron Pipe km												
Steel Pipe km												
Plastic Pipe km												
Transmission (Primary) Mains km												
Distribution Mains km						7,023	7,203	7,289	7,377	7,477		
TOTAL Mains km						**7,023**	**7,203**	**7,289**	**7,377**	**7,477**		
Customers per km mains						50.6	50.1	50.4	50.8	51.0		
# outages < 5 (wc201,202)												
# outages > 20						7	3	3	4	6		
# customers in outages > 20										3,400		
Total hours in outages > 20 (CHOS)										158,400		
SAIDI per customer (all outages)										24926.96		
SAIDI per customer (outages > 20)												
SAIFI per 1000 customers (all outages)												
CAIDI (all outages)												
CAIDI (outages >= 20)												
# outages > 20 per 1000 customers						0.020	0.008	0.008	0.011	0.016		
Publicly Reported Leaks						2,359	3,392	3,834	3,945	4,101		
Leakage Survey Leaks												
Leaks Repaired												
Av. Leaks Unrepaired												
Leakage Survey km												
TOTAL Leaks						**2,359**	**3,392**	**3,834**	**3,945**	**4,101**		
All leaks per km mains						0.34	0.47	0.53	0.53	0.55		
Publicly Reported Leaks per 1000 customers						6.6	9.4	10.4	10.5	10.8		
Leaks per km mains surveyed						0.93	0.56	0.52	0.85	0.55		
Hits on Mains												
Hits on Services												
TOTAL Hits						**545**	**511**	**778**	**888**	**928**		
Hits on mains per km												
Hits on services per 1000 customers												
Total hits per km						0.08	0.07	0.11	0.12	0.12		
Total hits per 1000 customers						1.53	1.42	2.12	2.37	2.43		
Emergency Response within 60'												
ER < 60' Metro. Business Hours												
ER < 60' After Business Hours												
ER < 60' Country												
Gas Input TJ				43,554	42,930	40,564	37,983	38,917	38,412	37,720		
UAFG TJ				1,182	1,022	1,493	1,592	1,630	1,834	1,799		
Total Gas Sales TJ						39,071	36,391	37,287	36,578	35,921		
Tariff Gas Sales TJ												
Contract Gas Sales TJ												
Tariff gas sales per km distribution mains												
Gas consumption per tariff customer GJpa												
UAFG %				2.71%	2.38%	3.68%	4.19%	4.19%	4.77%	4.77%		
Minimum Mean Temperature (deg C) Adelaide		13	12.2	12	12.2	12.2	12.3	12.1	13	12.4	18	