



Final report to
Queensland Competition Authority

Demand forecasts for Envestra

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Table of Contents

	Page No.
EXECUTIVE SUMMARY	I
1 ECONOMIC OVERVIEW	1
1.1 Population and housing growth	1
1.2 Private and government consumption expenditure – impact on commercial Activity.....	2
1.3 Private investment – impact on manufacturing activity.....	3
1.4 Convention for “Years”.....	4
2 GAS DEMAND OVERVIEW	5
2.1 Queensland gas overview	5
2.2 Sources of cheaper gas	5
2.3 Contestability and regulation of network charges.....	6
3 HISTORICAL CONSUMPTION AND GROWTH RATES	8
3.1 Information sources.....	8
3.2 Envestra Usage and Growth Rates	8
3.3 Envestra Residential Gas Consumption	10
3.4 Envestra Small Commercial Gas Consumption	11
3.5 Envestra Small Industrial Gas Consumption.....	12
3.6 Contract loads and customers	13
4 FORECASTING OVERVIEW	15
4.1 Approach to forecasting.....	15
4.2 Demand drivers.....	15
4.3 Information sources.....	16
4.4 Years.....	17
4.5 Bypass.....	17
5 RESIDENTIAL	18
5.1 Assessment of data provided.....	18
5.2 Customer numbers.....	18

¹ Information provided on a commercial-in-confidence basis has been removed where necessary.

5.3	Combined residential.....	23
5.4	Comparison with Allgas forecasts and forecast by ABARE.....	23
6	COMMERCIAL.....	25
6.1	Assessment of data provided.....	25
6.2	AGA numbers.....	26
6.3	Commercial customer numbers	26
6.4	Commercial average usage.....	26
6.5	Commercial output forecasts.....	26
6.6	Small commercial forecast	27
6.7	Comparison with Allgas, ABARE forecasts	28
7	INDUSTRIAL.....	29
7.1	Assessment of data provided.....	29
7.2	AGA data.....	31
7.3	Customer numbers.....	31
7.4	Industrial output forecasts	31
7.5	Survey results.....	31
7.6	MMA forecasts.....	32
7.7	Comparison with Allgas and ABARE forecasts	32
7.8	Relationship between manufacturing activity and industrial gas consumption	33
7.9	Small industrial.....	34
8	PRICE IMPACT AND NEW USES.....	35
8.1	Price drivers	35
8.2	Indicative impact on customer prices.....	35
8.3	Price elasticities.....	36
8.4	Prices of other fuels.....	36
8.5	Assessed impact of price.....	37
8.6	Major new usages	37
9	COMBINED FORECASTS.....	39
9.1	Volume customers.....	39
9.2	Demand customers.....	40
9.3	MDQ	42
9.4	Materiality.....	42

EXECUTIVE SUMMARY

Background

Envestra has submitted to the Queensland Competition Authority (QCA) proposed Access Arrangements (AA) for its Brisbane (including north Brisbane and Ipswich), and Northern (Gladstone and Rockhampton) networks. The AA provides for two reference tariffs: for Volume customers (consuming less than 10 TJ pa) and Demand customers (consuming more than 10 TJ pa) separately for Brisbane (including Ipswich) and Northern networks.

Table 1 shows the division of Envestra's total gas demand for the Brisbane and Northern Networks in 1999/2000 between volume and demand customers and regions.

Table 1 Envestra load, 1999/2000, TJ

TJ, 1999/2000	Brisbane	Northern	Total
Volume customers	1540	172	1712
Demand customers	2503	42	2545
Total	4043	213	4257

Source: Envestra AAI

The Access Arrangement Information (AAI) supplied with the AAs include demand forecasts. According to the provisions of the Gas Pipelines Access (Queensland) Act 1998, which gives effect to the National Third Party Access Code for Natural Gas Pipeline Systems, QCA must be satisfied that such forecasts represent "... best estimates arrived at on a reasonable basis". To assist it in this regard, QCA has commissioned McLennan Magasanik Associates (MMA) to forecast demand for the Envestra network over the period 1999/2000 to 2009/2010.

Approach to forecasting

The information basis on which MMA has made its forecasts include:

- Envestra information from 1997/98 when Envestra took ownership of the network
- Earlier data from the incumbent retailer legacy billing system. Although Envestra has identified many problems with this data it is the only source of distribution history for the network prior to 1997/98
- Historical information supplied by the other major Queensland utility, Allgas
- Information and forecasts available in the public arena.
- Discussions with Envestra personnel
- A telephone survey of large customers in Brisbane.

Because of the lack of consistent historical information the MMA forecasts have been forced to rely more on information available in the public arena as well as comparison with Allgas than would normally be the case.

The approach taken by MMA for Envestra has been to:

- Consider historical growth in the Envestra gas market as a whole.
- Assess trends over recent history and, following discussions with the utility and examination of independent economic forecasting, changes to key drivers.
- Attempt to disaggregate demand into reasonably homogenous market categories, in this case residential, commercial and industrial or Volume (ie < 10 TJ pa) and Demand (ie > 10 TJ pa) consumers. Where this was not feasible from available Envestra information, estimates based on aggregates or derived from other sources have been used.
- Forecast separately for residential customer numbers and average usage, Volume commercial usage and the Volume industrial and Demand categories combined. Generally MMA attempts to determine key market drivers and assess customer numbers and average usage in the residential, commercial and industrial Volume categories. This has, however, not been possible for the Envestra forecasts because of the inconsistency of data available.
- Hold discussions with existing and prospective large customers.
- Superimpose the impact of expected price changes with the introduction of network regulation, customer contestability and “cheaper gas” options.
- Disaggregate into the Volume and Demand categories which form the basis of the Envestra Reference Tariffs for Brisbane and Northern regions.

MMA Forecast

Based on our approach, we have arrived at the forecast for Envestra provided in Table 2. The Table compares the Envestra gas demand forecast as provided in its Access Arrangements with the independent MMA demand forecast. We have provided the MMA demand forecast both before and after the expected impact of price changes as a result of regulation of network tariffs by QCA, the introduction of retail contestability and supply of “cheaper” PNG gas. These price impacts will need to be reviewed after the draft QCA determination.

Table 2 Aggregated Demand Forecast

Year ending 30 June	Volume Customer Sales (TJ)			Demand Customer Sales (TJ)			Total Sales (TJ)		
	Envestra forecast	MMA forecast (pre price impact)	MMA forecast (post price impact)	Envestra forecast	MMA forecast (pre price impact)	MMA forecast (post price impact)	Envestra forecast	MMA forecast (pre price impact)	MMA forecast (post price impact)
1999/2000 Actuals	1,712	1,712	1,712	2,544	2,544	2,544	4,257	4,257	4,257
2000/01	1,756	1,789	1,777	2,598	2,651	2,666	4,355	4,440	4,442
2001/02	1,803	1,868	1,843	2,654	2,762	2,793	4,457	4,631	4,636
2002/03	1,853	1,949	1,910	2,712	2,878	2,926	4,565	4,828	4,836
2003/04	1,906	2,032	1,979	2,772	2,999	3,065	4,678	5,031	5,044
2004/05	1,963	2,116	2,048	2,834	3,125	3,211	4,796	5,241	5,259
2005/06	2,019	2,193	2,130	2,898	3,235	3,348	4,917	5,428	5,477
2009/10		2,515	2,473		3,712	3,954		6,227	6,427

* Annual forecasts to 2009/10 are provided in the body of the report.

As can be seen from Table 2 and Figures 1 and 2 below, the forecast derived by MMA before taking into account price impacts differs from the Envestra forecast by some 1.6% pa for the Volume and 2% pa for the Demand markets. Thus in the year 2005/06 the MMA forecasts are greater than the Envestra forecasts in both markets by more than 8% in the volume market and over 11% in the demand market.

After taking into account expected price impacts based on the proposed Access Arrangements, the difference for the Volume market in the year 2005/06 narrows to some 5.5% while the difference in the Demand market increases to 15.5%. The narrowing between forecasts in the Volume market is due largely to the expectation that prices to residential customers will increase by some 15% in real terms because of regulation of distribution pricing. **This will need to be reviewed after the draft decision by QCA.**

Overall, MMA forecasts gas throughput to grow by about 4.2% pa between 1999/2000 and 2004/2005. This is a little slower than the 4.5% pa total load growth experienced by Envestra over the past two years and significantly slower than the total load growth understood to have taken place between 1995/96 and 1999/2000. Envestra has forecast an overall growth rate of 2.4% pa. Consequently, the MMA forecasts result in utility throughput some 10% to 11% higher by 2006 than that forecast by Envestra.

Figure 1 Comparison of Envestra and MMA Volume Consumption Forecast

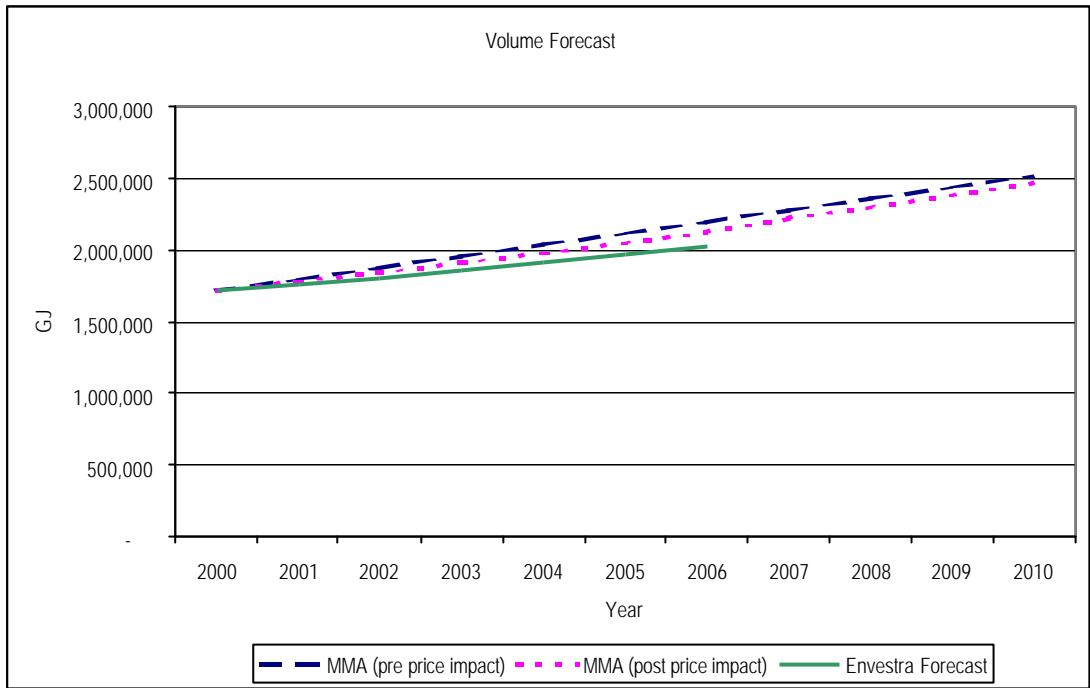
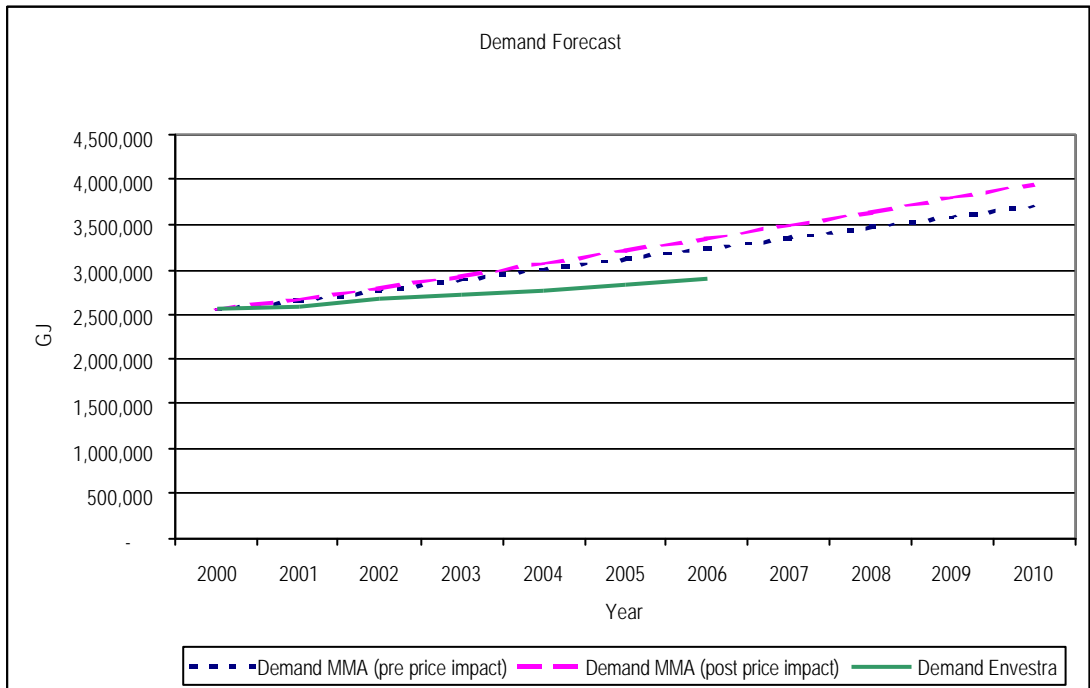


Figure 2 Comparison of Envestra and MMA Demand Consumption Forecast



Although we have not managed to correlate industrial output with gas usage for Envestra, a cyclical forecast which attempts to reflect the expected economic slowdown is provided in the

main body of the report. While retaining the same overall growth rate, growth has been phased into the later years of the period in line with expected economic activity.

Materiality

Our analysis also shows that each GJ of residential gas in the Brisbane region transported will earn Envestra over \$13 while each GJ of gas transported to large industrial customers will earn only \$1.50 or 11% of the residential amount.

Confidentiality

Commercially or otherwise confidential information has been removed from this version of the report. Where such information has been removed, it has been highlighted.

1 ECONOMIC OVERVIEW

In assessing general economic trends, MMA has utilised BIS Shrapnel economic forecasts contained within the report *'State Industry Prospects 1999 to 2014'* as well as forecasts of Manufacturing Activity for Queensland, Brisbane and Moreton commissioned specifically for this assignment. MMA has also utilised historical population and housing statistics from the Australian Bureau of Statistics (ABS).

From 2000 to 2005, the Queensland Gross State Product (GSP) is forecast by BIS Shrapnel to grow by 3.5% per annum compared to the Australian average of 3.2% pa. Private consumption is expected to growth by 4.2% pa, private investment by 3.4% pa, government consumption by 4.3% pa and public investment by 1.8% pa. While the Queensland economy is fairly broad based, a number of sectors are particularly important. These include the tourism, agriculture, mining and metals sectors. The state's manufacturing sector relies more heavily on commodity exports than the rest of Australia. The Queensland economy is thus relatively exposed to changes in the global economic environment.

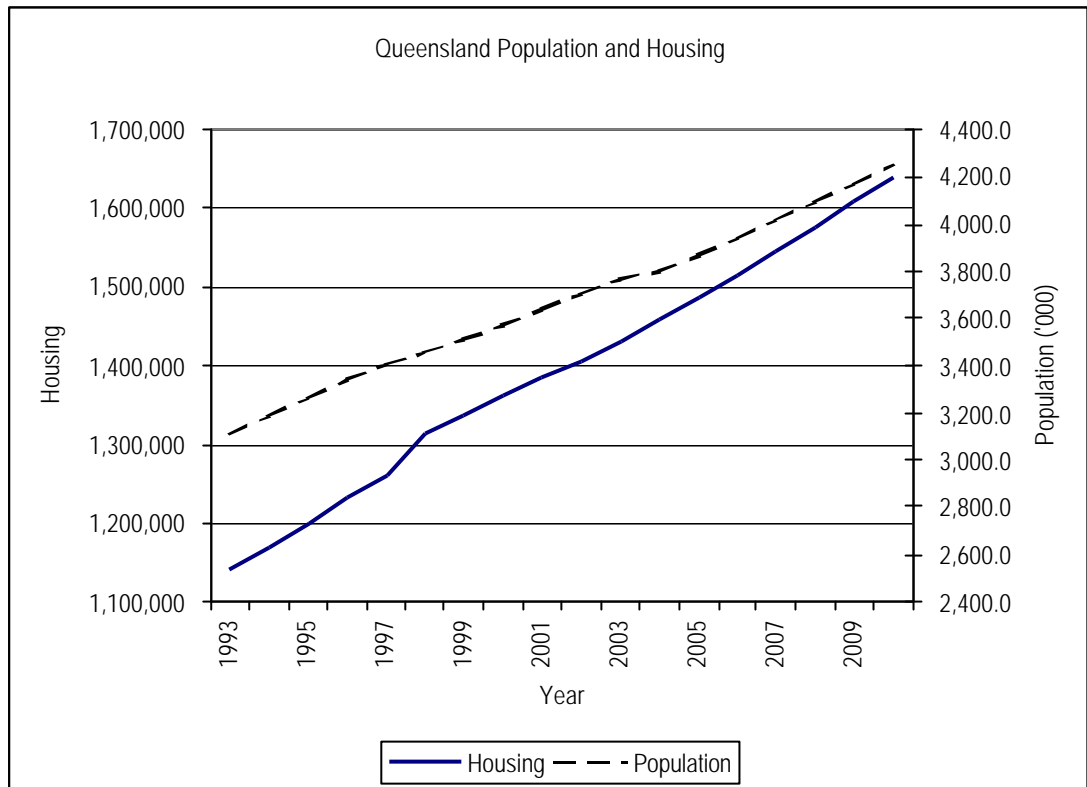
1.1 Population and housing growth

Population in Queensland has consistently grown faster than the rest of Australia over the last few decades drawing net migration from both interstate and internationally, although the population growth rate has been slowing since the mid 1990s. In March 2000, Queensland had an estimated resident population of 3,549,256, an increase of 1.6% over March 1999. While this growth rate was faster than the Australian average growth rate of 1.1% over the same period, it is below the level experienced in the early 1990s when growth of around 2.5% was realised.

The high proportion of working age migrants aged 20-34 has led to increased demand for housing and consumer goods and services. The Australian Bureau of Statistics reports that in June 1999 the estimated number of resident households was 1,338,442 in Queensland and 612,959 in Brisbane. BIS Shrapnel forecasts that spending on dwelling construction will grow at a compounded real annual growth rate of 3.7% between 1999 and 2004 before slowing to 1.9% pa between 2004 and 2009.

Historical population and housing data and forecasts are provided in Figure 1-1. The forecasts were derived from data contained within the BIS Shrapnel report. As has been the trend, housing is increasing at a faster rate than population.

Figure 1-1 Queensland Population and Housing - Actuals and Forecast



Source: Derived from ABS data (historical) and BIS Shrapnel

1.2 Private and government consumption expenditure – impact on commercial Activity

Commercial activity is largely driven by private consumption expenditure and government expenditure. Private consumption accounts for over 60% and government consumption accounts for 16% of the economic activity in Queensland. Consumption has shown strong growth over much of the 1990s. Consumption growth has been largely underpinned by Queensland’s high population growth rates which have offset the weak per capita consumption growth.

The slowing Australian economy is expected to be reflected in Queensland. This will result in a slowing of the rate of private consumption growth until about 2002/03. The expected recovery is then projected to lead to higher employment growth and with lower interest rates, private consumption and hence commercial activity should see a recovery to the end of 2005.

Queensland is in the best financial position of all the Australian states and enjoys a budget surplus, a AAA credit rating and no net debt. This position allows Queensland to have a relatively low tax regime and is expected to ensure continued growth of public expenditure up to 2002 before slowing to 2004 after which growth is expected to pick up again. Overall, public expenditure growth is expected to increase by an average of 3.7% pa over the next five years.

1.3 Private investment – impact on manufacturing activity

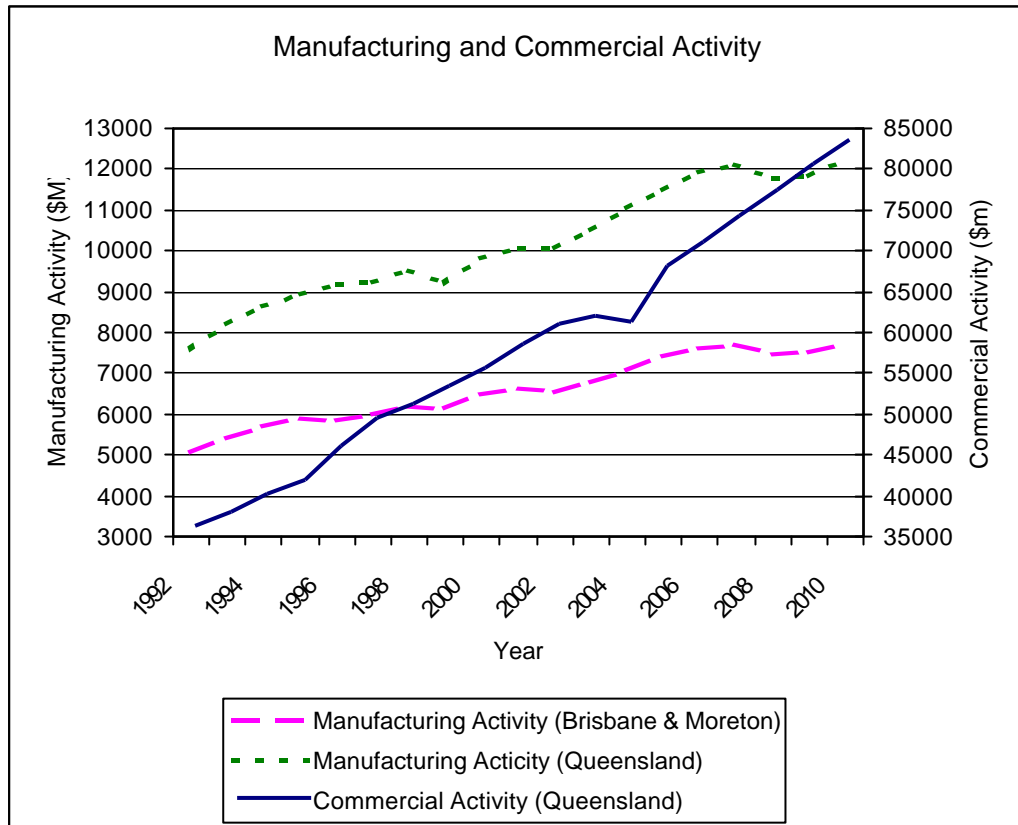
Private investment accounts for over 20% of Queensland's GSP. This sector comprises mainly Dwelling, Non-Dwelling and Equipment investments². The share due to Dwelling investments has been falling since the late 1980s when it accounted for up to 45% of private investments to 34% in the late 1990s. The share due to Non-Dwelling construction has fallen to a lesser extent from 23% in the late 1980s to 20% in 1999. Investment in equipment has risen significantly from the late 1980s when it accounted for only 28% of private investment to over 40%.

Over the next five years, these trends are expected to continue. Investment in plant and equipment is expected to increase its share of private investment to 43% while non-dwelling construction is expected to decline sharply to account for only 14% of private investment. Dwelling investments are expected to rise marginally to 36%. These changes reflect the current weakness of housing related activity in Queensland and the expected slow recovery of this sector. The expected reduction of energy cost in Queensland led by the expected increased supply of electricity and gas is expected to result in increased private investment in plant and equipment.

As seen in Figure 1-2, the above trends are expected by BIS Shrapnel to result in a slow down in commercial activity growth in Queensland over the next few years before a recovery from 2004/05 onwards. Manufacturing activity is expected to grow at 3.1% pa between 2000 and 2005 and 1.3% pa between 2005 and 2010 for Queensland and at 2.7% pa between 2000 and 2005 and 0.9% pa between 2005 and 2010 for Brisbane and Moreton.

² Intangible fixed assets (eg goodwill) account for the remainder of private investments.

Figure 1-2 Queensland Manufacturing and Commercial Activity – Actuals and Forecast



Source: BIS Shrapnel

1.4 Convention for “Years”

The MMA forecasts are for the period 1999/2000 to 2009/10. BIS Shrapnel historic and forecast data are also for financial years. Unless stated otherwise, years are Financial Years ending on June 30th. Thus, for example, 2002 would mean the financial year ending June 30th 2002 – or alternatively 2001/2002.

2 GAS DEMAND OVERVIEW

2.1 Queensland gas overview

Between 1990 and 1998, according to the Australian Bureau of Agricultural and Resource Economics (ABARE)³, Queensland's natural gas consumption including gas delivered directly from the transmission system grew by an average of over 6.5% per annum. With the introduction of PNG gas, ABARE expects the natural gas consumption growth will accelerate. Between 2000 and 2005, ABARE has forecast that natural gas consumption in Queensland will grow by over 19% pa, largely driven by the availability of gas from PNG. However, ABARE has assumed the availability of PNG gas from 2002/03. Latest indications are that PNG gas will not be supplied into Queensland before about 2005.

After the introduction of PNG gas, demand growth between 2005 and 2010 is expected by ABARE to fall to levels of about 7.2% pa similar to those experienced between 1990 and 1998.

However it must be recognised that total demand growth for the state may be very different to that experienced by the distributors – which is the subject of this report. According to the Australian Gas Association (AGA), gas consumption delivered through the Queensland distribution systems grew by only about 3% pa between 1990 and 1998. While total gas consumption may be significantly impacted by the availability of PNG gas, its incremental impact on the distribution systems is unlikely to be as significant as most of the gas from PNG is likely to be consumed by large industries, for example electricity generation, which is connected directly to the transmission system. In addition, distribution gas growth under consideration is also unlikely to accelerate at the levels expected for total gas consumption in Queensland due to the fact that gas is only distributed to a small part of the Queensland market. It is limited to parts of Brisbane, Toowoomba, Ipswich and the more recently reticulated areas of the South Coast and Gladstone/Rockhampton. Other newly reticulated areas like Hervey Bay, Maryborough and Bundaberg are not included in this analysis as the gas distribution network in these areas are not subject to the Access Arrangements under review.

2.2 Sources of cheaper gas

Gas for the utilities is sourced mainly from the South West Queensland Cooper Basin (SWQCB), with small quantities also being provided from conventional gas sources in the Surat Basin and Denison Trough and from coal seam methane (CSM) fields generally located around central Queensland.

³ Source: ABARE *Australian Energy, Market Developments and Projections to 2014-15*, detailed spreadsheets, 1999

The cost of SWQCB gas delivered at the Brisbane citygates for the utilities is relatively expensive compared to that in other eastern states. This is in part due to the need to transport the gas through two separately-owned transmission pipelines and partly because of the limited competition for gas supply into Queensland at the time contracts were being written.

Prospects exist for cheaper gas supply into Brisbane. Probably the best prospect is that of gas from Papua New Guinea which could reportedly be supplied to large, good load factor end-users at low delivered prices. However, the commencement date for PNG gas continues to be delayed, with first gas now only expected around 2005.

Gas from offshore the Northern Territory may also play a part in supplying cheaper gas for utilities. Again, however, the timing of such gas and the cost of its supply into Brisbane, are uncertain.

In the meantime, smaller quantities of "competitive" gas should be available from the Surat Basin and Denison Trough and increasingly from the development of CSM supply into Queensland. These latter sources of gas are expected to be important in reducing prices to larger utility customers when they become "contestable".

2.3 Contestability and regulation of network charges

Most large Queensland gas customers are already contestable – that is the customer can choose to take gas from competing producers, retailers or traders. However, customers offtaking from distribution mains are not yet contestable.

The Queensland Government has not announced its final timetable for full contestability. However, customers of size 100 TJ or more are scheduled to become contestable in July 2001 while other large customers (size 10 TJ or more) are expected to become contestable within a year or so of this time.

Contestability of the small customers (< 10 TJ) may be delayed beyond this time.

Contestability, together with regulated third party access to reticulation mains, will allow customers to benefit from competition for gas supply between producers (see above) and between retailers.

Regulation of network charging will ensure that end-users pay cost-reflectively for the assets and operating expenditures that are required to serve them. This will result in the elimination of network cross-subsidies, possibly over a transition period. While the outcome to individual customer classes is as yet to be determined, it can be expected that costs to large customers will reduce with contestability while those to small customers may stay approximately constant or possibly even increase.

We understand that many of the largest distribution customers (100 TJ or more) have already benefited from price reductions in anticipation of an earlier date for contestability. This means

that the major beneficiaries from contestability may well be the remaining large customers – those in the 10 to 100 TJ class.

There are also costs associated with full retail contestability (FRC) which are likely to be passed on to customers. While being minor for the larger customers (on a \$/GJ basis), this is not the case for the small residential customers.

3 HISTORICAL CONSUMPTION AND GROWTH RATES

3.1 Information sources

Envestra assumed ownership of the Queensland networks on 1 July 1997. Envestra data is thus limited to information for the 1997/98, 1998/99 and 1999/00 years. Data prior to this is available only from the legacy billing system of the incumbent retailer (Origin Energy). Envestra has identified many problems with the retailer billing system and does not place any reliance on it for the purposes of forecasting demand. Nevertheless, as the most likely source of distribution history for the company, Envestra was requested to provide as much historical detail as possible including information from the retailer billing system.

3.2 Envestra Usage and Growth Rates

Envestra has provided four years history of actual gas consumption – although it has expressed serious reservations about the quality of information supplied from the retailer billing system for the earlier years of the period. Data provided for total load growth in the Brisbane and Northern regions is given in Table 3-1 and illustrated in Figure 3-1.

Table 3-1 Load growth in the Envestra Queensland Network, 1995/96 to 1999/2000, GJ

	1996	1997	1998	1999	2000
Brisbane	[REDACTED]	[REDACTED]	3724766	3891804	4053201
Northern	[REDACTED]	[REDACTED]	174207	199155	213421
Total	[REDACTED]	[REDACTED]	3898973	4090959	4256622

Source: Information supplied by Envestra to QCA, information for FY ending June 30

According to the above numbers, the network as a whole has [REDACTED]
[REDACTED] This continues the strong growth reported over the previous decade, with network load growth for the decade to 1996 being 5.5% pa⁴.

This is the background against which Envestra load forecasts must be made. [REDACTED]
[REDACTED] This is similar to, but slightly faster than, the growth seen by Allgas over the same period.

Envestra has, in the AAI forecast a growth for the network as a whole between 1999/2000 and 2005/06 of less than 2.5% pa.

⁴ Envestra Prospectus "Investing in energy infrastructure", Joint lead managers and underwriters Macquarie Underwriting Limited and SBC Warburg Australia Limited, 1997 p 32

Envestra has stated that information about customer numbers and loads within market categories and sub-sectors and possibly even the totals for the early years of the period are unreliable.

The reasons given by Envestra for this are:

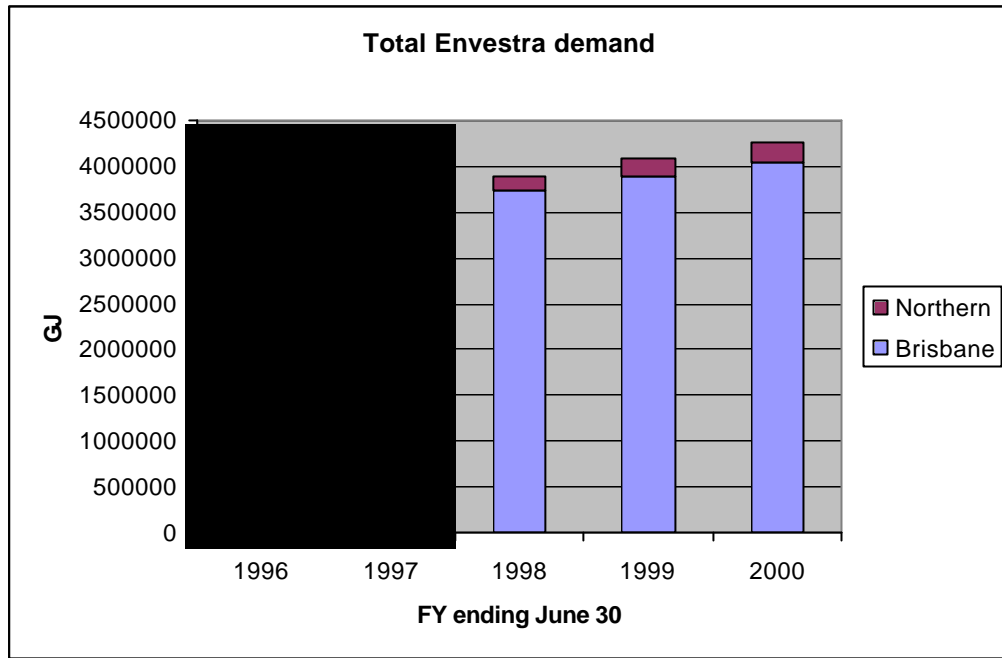
- Prior to 1998, billing data was kept in the retailer's LPG system. Data migration onto the current system began in 1997/98 but historical data was not transferred.
- Problems with data integrity and consistency have been identified since migration from the retailer's system.



- Retail reporting was based on different market segmentation criteria than those used by Envestra.
- Due to the relatively recent conversion from town gas, meters installed at smaller sites were still being changed over during the last three years. Due to differences in calorific value, meters designed for town gas may under-register when used in natural gas applications and at low flow-rates may not have recorded any consumption.

The inconsistency of information is further explored below. Nevertheless, it is important to bear in mind the over [redacted] pa apparent growth of the total network over the previous period and the average growth of 4.5% pa observed over the past two years based on data in which Envestra has greater confidence. .

Figure 3-1 Apparent Total Gas Consumption and Growth



Source: Information supplied to QCA by Envestra

3.3 Envestra Residential Gas Consumption

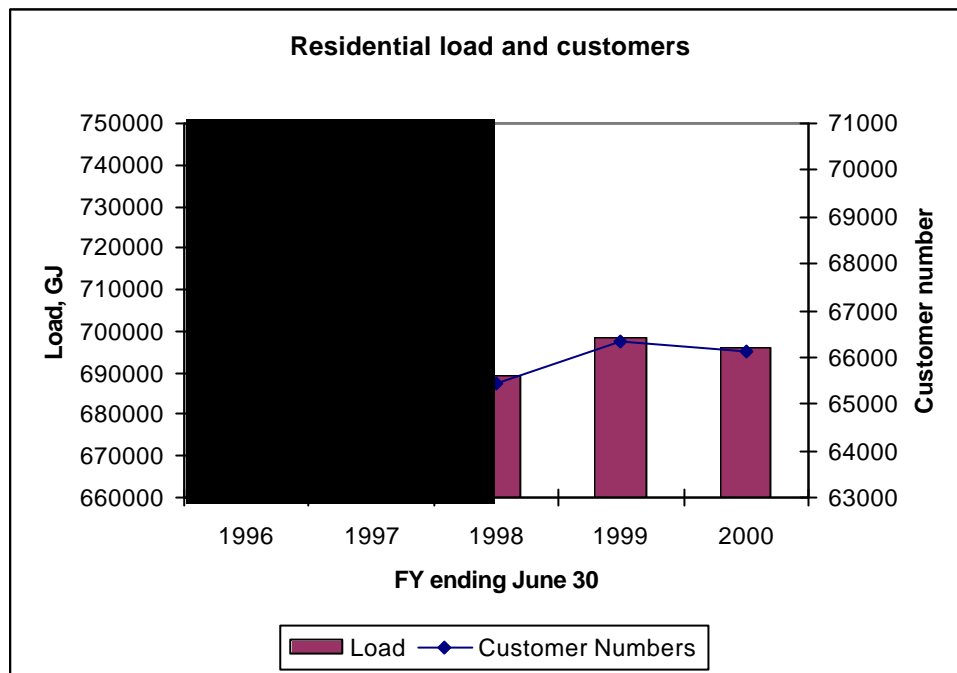
Envestra has provided residential gas consumption details for the Brisbane and Northern regions over the period 1996 to 2000. The residential load and customer numbers for the two regions combined are shown in Figure 3-2. The numbers shown appear inconsistent for both load and customer numbers across the regions combined, doubtless due at least in part to the different data bases used. While load movements in other states may often be explainable in terms of weather⁵, this is not the case for other numbers, for example, the large drop in customer numbers reported over the period.

Envestra has explained the inconsistency between 1997/98 and the earlier period as due to data base migration difficulties and differences in customer classifications between databases.

Envestra places greater reliance on the last three years of data – but even here trends are unclear.

⁵ Although Envestra has stated that weather is largely immaterial for the Queensland network.

Figure 3-2 Envestra Residential Gas Consumption and Numbers

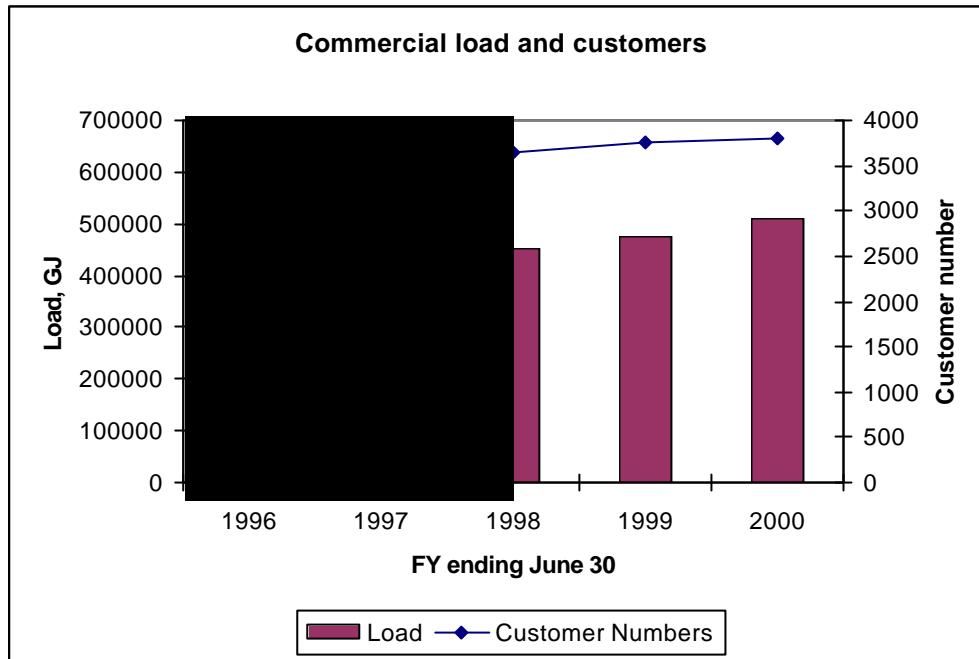


Source: Data supplied by Envestra to OCA

3.4 Envestra Small Commercial Gas Consumption

The data is also inconsistent for the commercial market across the 4-year period. As seen in Figure 3-3 while customer numbers seem to be increasing, the load has, conversely, decreased. Category switching (ie between demand and volume) may be an explanation for some of this apparent anomaly but most is likely to be due to the move to a different database in 1997/98.

Figure 3-3 Envestra Commercial Gas Consumption and Customers

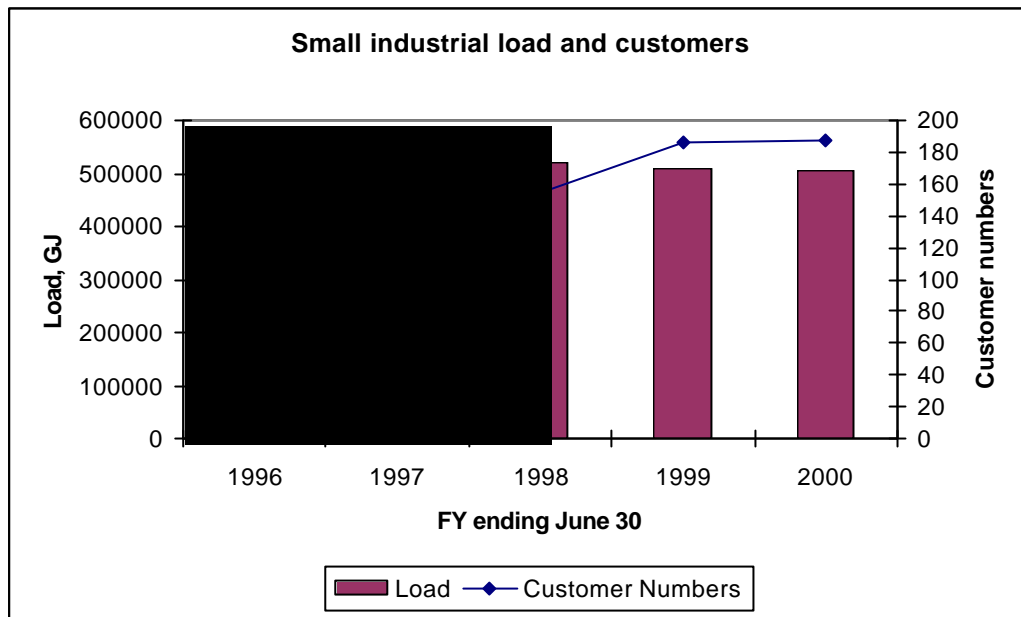


Source: Data supplied by Envestra to QCA

3.5 Envestra Small Industrial Gas Consumption

Again the trend is unclear for the small industrial customers for the regions combined, as seen in Figure 3.4. This is particularly obvious for the northern region where customer numbers change from [redacted] 9, 23 and 26 in succeeding years. We suspect classification changes are responsible for a significant proportion of the anomalies.

Figure 3-4 Envestra Small Industrial Gas Consumption and Customers

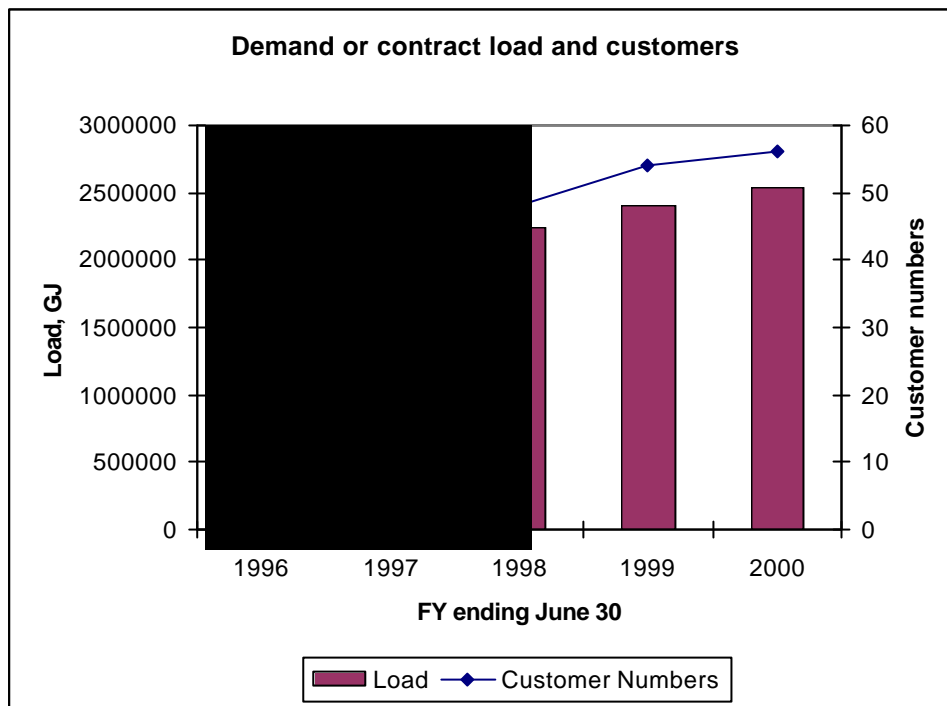


Source: Data supplied by Envestra to OCA

3.6 Contract loads and customers

As can be seen a strong growth trend does appear for the Contract or Demand customers – that is the 55 or so customers with demand greater than 10 TJ pa. According to the information supplied by Envestra, this segment of the market has been growing particularly strongly – [REDACTED] We suspect, however, that this growth may be over-estimated, again because of changes to customer categories.

Figure 3-5 Envestra Demand Load and Customers



Source: Data supplied by Envestra to OCA

4 FORECASTING OVERVIEW

4.1 Approach to forecasting

MMA has been asked to forecast gas demand for the utilities over the medium to long-term period 1999/2000 to 2009/10.

The MMA forecast of gas demand for the Envestra network has been based on an assessment of:

- Historical information for the period 1997/98 to 1999/2000 provided by Envestra from the Envestra database. Although Envestra has expressed confidence in this information, it covers too short a period to allow trends to be reasonably determined in isolation and there is evidence of movement between categories.
- Historical information for the period 1995/96 and 1996/97 from the retailer billing system database and supplied by Envestra has been used to supplement the previous information. Because of the concerns expressed by Envestra about inconsistencies between the two data sources, this information has been used cautiously and more in the aggregate than for particular customer classes.
- Information available in the public arena
- Changes to key growth drivers
- Economic indicators produced by an independent forecaster
- Discussions with major customers
- Consideration of data and forecasts for Allgas, the similar Queensland distributor

Each of the traditional sectors, residential, commercial and industrial have been assessed separately to the extent possible from data supplied by the reticulators to QCA or available in the public arena.

In general terms our approach has been to assume that growth over the medium term will be similar to that seen in the recent past, tempered by changes to key demand drivers. Demand has been built up from its components where possible after consideration of changes to key drivers.

4.2 Demand drivers

The key growth drivers for the smaller residential, commercial and industrial customers are:

- customer connections, which are in general related to new reticulations and growth in penetration on line of mains

- average usage per customer, which changes according to network connection policies, weather, and appliance penetration. The latter is, in turn, generally related to relative fuel and appliance pricing and, in the case of residential gas usage, household disposable income.

For the large customers (greater than 10 TJ pa), demand is more fundamentally related to changes in manufacturing output in the geographical area of concern and to penetration of gas into the sector.

The geographical coverage of the utilities is limited to south east and central Queensland. The demand assessments have thus concentrated on forecast economic growth in Brisbane and surrounding areas.

Increased gas penetration into the industrial and commercial sectors has been, and will continue to be, driven largely by price of competing fuels, but also increasingly takes into account environmental considerations – mainly emissions to air including greenhouse gases. Both price and environmental considerations are expected to result in improved penetration prospects for gas over the forecast period.

4.3 Information sources

In our forecasting we have been largely dependent upon information supplied by the reticulators, as well as information available in the public arena and a limited telephone survey of existing and prospective customers.

4.3.1 Information from the distributors

Envestra has supplied, on a confidential basis, the following information:

- A history of customer loads and customer numbers for the residential, commercial, small industrial and contract categories for 1997/98 to 1999/2000 from the Envestra data base
- A history of customer loads and customer numbers for the residential, commercial, small industrial and contract categories for 1995/96 to 1997/98 from the previous retail data base
- Forecasts for the residential, commercial and industrial categories
- A breakdown and 4-year history of large (> 10 TJ pa) customers and loads by region
- Available details about new reticulation expectations and impact of weather
- Envestra has supplied only very limited details about end-usage categories in the demand market and MDQ assumptions.

MMA has also had access to information supplied to QCA by Allgas for demand forecasting purposes.

4.3.2 *Economic forecasting data*

For this assignment BIS Shrapnel has been commissioned to provide historical and forecast manufacturing product information by 2-Digit ANZSIC code, for Queensland and separately for Brisbane and Moreton.

MMA has also used the BIS Shrapnel report entitled "*State Industry Prospects 1999 to 2014*" and Australian Demographic Statistics for Queensland and Brisbane from the Australian Bureau of Statistics (ABS).

4.3.3 *Survey of customers*

For this assignment MMA has held telephone discussions with some 17 existing or prospective distribution customers who, between them make up some 30% of the total Queensland distribution market large customer load.

The questions asked of these customers have been related to current and expected usage of gas over the forecast period.

4.4 **Years**

The MMA forecasts are for the period 1999/2000 to 2009/10. Forecasting has been in financial years. Unless stated otherwise, years are Financial Years ending on June 30th. Thus, for example, 2002 would mean the financial year ending June 30th 2002 – or alternatively 2001/2002.

4.5 **Bypass**

Bypass of distribution mains has the potential to result in a distributor losing significant loads. Distributors have presumably framed their proposed Access Arrangements (AAs) in such a way as to minimise the possibility of bypass. We have assumed in our forecasts that there is no such bypass.

5 RESIDENTIAL

5.1 Assessment of data provided

Envestra has provided residential consumption and customers numbers for 1999/2000 and the previous 4 years.

Table 5-1: Residential customer numbers and consumption

Customers	████	████	1998	1999	2000
Brisbane	████	████	62900	63455	63270
Northern	████	████	2521	2870	2847
Total	████	████	65421	66325	66117
Load, GJ	████	████	1998	1999	2000
Brisbane	████	████	666002	671803	669822
Northern	████	████	23437	26588	26403
Total	████	████	689439	698391	696225

Source: Information supplied by Envestra to OCA

The Envestra residential market in 1999/2000 consumed some 696 TJ, a █████ decrease from the previous year █████

████████████████████ As commented by Envestra, this suggests data problems rather than a real demand fall-off.

The separate customer connections and derived average usage show similar problems to the total load numbers in the residential market. For example, according to the data, average usage per customer reduced from █████ GJ per customer in 1995/96 to █████ in the next year and then remained approximately constant. Barring a significant weather impact (see Exhibit 5.1), this appears unlikely.

Thus the retailer data provided for 1996 and 1997 are clearly inconsistent with the later data and we are also uncertain about the consistency of the information supplied for the more recent period.

5.2 Customer numbers

The history of customer numbers over the past two years supplied by Envestra suggests that there are virtually no net new residential customers in Brisbane, while in the Northern region customer growth has averaged 6.3% pa over the past two years. Overall, according to Envestra over the past two years there has been customer growth of about 0.5% pa.

Historical customer growth over the longer term is hard to determine from the numbers supplied by Envestra because of the different data base definitions and apparent movement between customer groupings.

However, two numbers which may compare customers on a more consistent basis are available from the Envestra prospectus from mid 1997⁶ and the operational information posted on the Envestra website⁷ for June 2000.

These provide total Envestra Queensland customer numbers as 71,645 in 1997 and 78,276 in 2000. These show customer number growth to be about 3% pa, or about 2000 customers pa. If we subtract from this number the industrial and commercial customers in the Wide Bay area understood to be connected at the end of 2000, the customer number growth rate for the period in question is still well over 2.5% pa⁸.

About 97% of total customers were residential in 1997. According to Envestra numbers provided for this assignment, the residential proportion is now only 94%. If this proportion has really changed to that extent then it would mean an annual increase in residential numbers of about 1% pa but very high growth in non-residential customer numbers (26% pa).

We expect that the residential proportion has stayed about the same as previously and that the growth rate in residential numbers probably approached 3% pa.

The Allgas growth in customer numbers was about 2% pa over the same period. Allgas has (according to the AAI) both less mains-kms and fewer customers than Envestra. However, on a proportional basis we would expect the percentage growth to be similar.

Envestra has provided information that shows new main reticulation growth between 16 and 46 km/year over the previous few years. However, Envestra plans to grow reticulation mains at an average rate of 50.4 km over the next 6 years.

Allgas has been growing its network at 55 ± 12 km/year.

According to Envestra, on average each km equals about 34 customers, say 30 of which are residential. If 50 new km is reticulated annually then eventually the customer numbers attributable to this should average some 1500 new customers. Indeed, possibly significantly more as penetration in new areas is said to be much higher than in existing areas.

⁶ Envestra Prospectus "Investing in energy infrastructure", Joint lead managers and underwriters Macquarie Underwriting Limited and SBC Warburg Australia Limited, 1997

⁷ www.envestra.com.au/operations/page0017.asp

⁸ Customer connections in the Wide Bay area fall outside the scope of the Access Arrangement and this review.

Envestra's new marketing efforts to increase customers on Line of Mains (LOM) must also be scrutinised against recent history and the disconnections history and average reconsidered. Envestra has forecast that new connections on LOM, will result in an increase of LOM customers. But no history is provided and Envestra has also utilised the highest disconnection number rather than an average from the past three years.

It may be that Envestra has spent very little effort or money on connecting new customers. For example, the reticulation only increased by 16 km in 1998. However, reticulations have more recently been significantly higher and the customer numbers growth should reflect this.

Envestra has forecast a customer growth rate of 2% pa over the period 1999/2000 to 2005/06, however has back-ended the growth.

5.2.1 AGA comparisons

AGA annually surveys the utilities and collects information on distribution numbers, usages, costs etc. It then publishes this information in the annual Gas Statistics publication. The Queensland gas distribution is dominated by the Allgas and Envestra utilities⁹.

We have analysed the historical data contained in the AGA statistics by subtracting the Allgas residential numbers (supplied for the Allgas demand forecasts) from the total to derive estimated Envestra growth in residential numbers. This provided a set of data that exhibited greater consistency than that provided by Envestra. This set of data produces an estimated Envestra residential connection growth rate of about 2% pa between 1995/96 and 1998/99.

5.2.2 Growth in population and housing

Population in Queensland has consistently grown faster than the rest of Australia over the last few decades drawing net migration from both interstate and internationally, although the population growth rate has been slowing since the mid 1990s. In March 2000, Queensland had an estimated resident population of 3,549,256, an increase of 1.6% over March 1999. While this growth rate was faster in Queensland than the Australian average growth rate of 1.1% over the same period, it is below the level experienced in the early 1990s when growth of around 2.5% was realised.

Historical population and housing data and forecasts have been provided earlier in Figure 1-1. The forecasts were derived from information contained within the BIS Shrapnel report. As has been the trend, housing is increasing at a faster rate than population. Over the periods 2000 to 2005 and 2005 to 2010 we project the following growth rates for Queensland population and housing.

⁹ The Roma and Dalby utilities are very small by comparison and disregarded here.

Table 5-2: Recent and projected Queensland population and housing growth, % pa

	Population	Housing
1995/1996 – 1999/2000	1.8%	2.5%
1999/2000 to 2004/2005	1.6%	1.8%
2004/2005 to 2009/2010	1.9%	2.0%

Source: Based on ABS data and forecasts derived from BIS Shrapnel report

5.2.3 Forecast

Despite the lack of consistent historical information there is evidence that the residential customer growth rate has been some 2-3% over the previous period. Both housing and population growth are expected to slow somewhat over the next period. However, Envestra is also intending to commit significant resources to network marketing.

We expect residential customer growth over the period 2000 to 2010 to lie between 1.5% and 3% pa. We assume a 2% growth rate for Brisbane and 3% (in light of recent high 6% recorded growth) for the Northern region between 2000 and 2005, falling to 1.5% pa growth for Brisbane and 2.5% pa for the Northern region between 2005 and 2010. Over the period this is approximately in line with Envestra's forecasts.

Average usage of gas by the residential market is dependent on appliances connected and weather.

Average usage by residential users would be expected to increase over time because of:

- increased appliance numbers over time
- policy to connect only “economic” customers which will tend to discourage cooker only connections (with average usage of about 3 GJ pa)
- increasing penetration of gas into hot water (average usage some 10 - 15 GJ pa)
- increased penetration of gas into the heater market and for pool heating
- replacement of meters which read low for natural gas¹⁰

Opposing this are the trends to decreased household size over time, improving appliance efficiencies, the eventual saturation of water heater appliance penetration within the market and limited opportunities for expansion in space heating applications.

As stated previously, the average usage per consumer information generated from the historical numbers is particularly inconclusive. The average has come down from an apparent 11 GJ/customer in 1995/1996 to 10.5 GJ/customer in 1999/2000.

¹⁰ According to Envestra, almost 20% of the residential meters were designed for town gas and read low since the conversion to natural gas. Average metered usage is expected to increase as these are replaced over the next 10 years.

We can see no reason for the reduction in average usage per customer and conclude that it is either weather related or, more likely, an artefact of the inconsistent data. Indeed, Envestra has stated that it also expects average usage to increase over time.

5.2.4 Comparison with average usage in the Allgas network

Allgas has a significantly higher residential average usage than Envestra – some 14 GJ per customer pa versus 10.5 GJ for Envestra. Allgas has provided a history of average usage by the residential market from 1992 to 2000. Over this period there has been an upward trend in average usage per customer, however, this is masked somewhat by apparently anomalous movements likely to result from the impact of weather.

Our forecasts for Allgas have estimated a linear growth rate in average usage of 0.11 GJ/year.

We have no reason to believe that the Envestra average should not also be growing. Despite Envestra's view that weather plays no material part, warm weather over recent years may have masked an increase in average usage.

Exhibit 5.1: Impact of weather for Brisbane utilities

In the southern states of Australia, weather plays a significant role in consumption for the residential and small commercial markets. Allgas has stated that weather is of importance only for its Toowoomba market – but that this does result in the residential market as a whole being significantly impacted by weather. We believe that the variation in weather over recent years does go some of the way to explaining the apparently anomalous average customer usage data found by Allgas over recent years.

Envestra has stated that it considers weather to be largely immaterial to utility loads. However, it does reticulate Ipswich which we understand to have a temperature colder than Brisbane's. Indeed, Envestra analysis of yearly residential data shows an approximate 50% increase in winter residential gas usage over residential summer gas usage.

However, despite this and Envestra providing weather data for Brisbane we have been unable to adequately correlate weather with average residential usage for either Envestra or Allgas.

The average is expected to increase for two main reasons:

- New customers are added who have at least gas hot water - ie a usage of say 13-15 GJ pa as well as possibly cooking and some space/pool heating
- Customers who currently are low users – which according to Envestra¹¹ is a high proportion - add gas hot water and possibly other uses. This is likely to be the main contributor to the increase in average usage and the most economical for Envestra to pursue¹².

¹¹ KPMG report p 10.

¹² For example, if 5% of current gas cooking only customers convert to gas cooker and hot water each year then the average is expected to increase by about 0.25 GJ pa.

Because of Envestra's low residential average usage starting point, with everything else being equal, its averages are likely to increase at a percentage rate faster than Allgas. However, we understand Allgas to have a higher space heating load in Toowoomba and Envestra also has slightly higher gas prices than Allgas, which would tend to reduce switching from electricity.

We have decided, therefore, to assume for Envestra in Brisbane the same growth in average residential usage rate as for Allgas – 0.11 GJ pa. The Northern increase is, however, likely to be less because it is a newer network for which connections may have already required hot water and the heating load is likely to be even less than Brisbane's. We assume 0.05 GJ pa increase for the Northern Region.

5.3 Combined residential

We forecast residential usage to grow at about 3% pa between 2000 and 2005 and slow somewhat to 2.5% pa over the following 5 years.

As a point of comparison, the Envestra prospectus in 1997 forecast residential load growth to be 3.6% pa to 2001/02 and then 2.6% pa.

Table 5-3 Envestra forecast residential gas consumption and growth

	Brisbane	Northern	Combined
2000	669,822	26,403	696,225
2001	690,317	27,342	717,659
2002	711,365	28,313	739,678
2003	732,978	29,318	762,295
2004	755,170	30,358	785,528
2005	777,958	31,433	809,391
2006	797,427	32,388	829,815
2007	817,304	33,371	850,676
2008	837,599	34,383	871,983
2009	858,319	35,425	893,744
2010	879,471	36,498	915,969
Compounded annual growth rate			
2000-2005	3.04%	3.55%	3.06%
2005-2010	2.48%	3.03%	2.50%

5.4 Comparison with Allgas forecasts and forecast by ABARE

ABARE has published its Queensland residential gas consumption forecast. ABARE expects that this sector will grow at around 2.5% between 2000 and 2005 and 2.3% between 2005 and 2010.

MMA has forecast residential usage growth rates of 3% pa between 2000 and 2005 and 2.5% pa between 2005 and 2010. By comparison, Envestra has for its AA projected residential gas consumption to increase by an average of about 2.2% pa between 2000 and 2006¹³.

Allgas, in information provided to QCA in its Access Arrangement application has forecast that its residential gas consumption will grow at 2.5% between 2000 and 2005. This is somewhat lower than the 2.9% pa growth rate forecast by MMA for the Allgas residential sector before taking into account any price impact. This however, may not be directly comparable with Envestra's forecast growth rate since Allgas includes Serviced Hot Water gas consumption in their residential sector while Envestra excludes it from this sector. A more comparable Allgas forecast what MMA terms the Allgas domestic gas consumption which does not include the SHW component of gas consumption. MMA has forecast that the Allgas domestic gas consumption would grow at 2.6% between 2000 and 2005.

¹³ MMA has derived this estimate forecast by adding Envestra's forecast growth in customer numbers (new customers plus line of mains) to the number of residential customers in 2000 and multiplying this by the difference in average usage forecast over the period.

6 COMMERCIAL

6.1 Assessment of data provided

Envestra has provided commercial consumption and customers numbers for 1999/2000 and the previous 2 years and information from the retailer databases for the two years prior to this. Again, Envestra has significant reservations about the use of information prior to 1997/98. Envestra now defines the commercial class as that consuming up to 1 TJ pa, but it is not clear that this was the definition used prior to 1997/98 or that there has not been some re-classifications since then.

Table 6-1: Commercial customer numbers and consumption

Customers	████	████	1998	1999	2000
Brisbane	████	████	3380	3477	3533
Northern	████	████	272	269	267
Total	████	████	3652	3746	3800
Load, GJ	████	████	1998	1999	2000
Brisbane	████	████	388626	415757	452659
Northern	████	████	65270	60213	58811
Total	████	████	453896	475970	511470

Source: Information supplied by Envestra to QCA

Over the two most recent years, for which Envestra has more confidence in the data, customer numbers have increased at an average 2% pa, and average usage at 4% pa, resulting in a total load increase of 6% pa.



Much of this is likely to be due to movement between customer categories and thus an overall assessment is likely to be of most value. However, Envestra has stated that it does not have information available on movement of commercial customers.

6.2 AGA numbers

AGA utility numbers from 1992 to 1997 separate out commercial from industrial customers. These show an overall growth rate of 6% pa in customer numbers and 9.6% pa increase in loads for Queensland as a whole.

We have estimated Envestra growth in numbers by subtracting Allgas numbers supplied for the demand study from the combined AGA information. The resulting derived Envestra numbers show customer growth over the same period of 7.5% pa and total usage increases of 7.9% pa. These are higher than the numbers for Allgas.

6.3 Commercial customer numbers

Envestra has over the past two years estimated customer number growth at about 2% pa and has forecast a growth in commercial connections between 2000 and 2006 of about 2.8% pa.

For Allgas we have forecast a commercial customer growth rate of 3.5% pa for the period 2000 to 2005 slowing to 3% pa from 2005 to 2010.

In the absence of consistent Envestra data, we have decided to not forecast customer numbers separately for Envestra. For the sake of input into Reference Tariff calculations, however, we have assumed that commercial numbers will increase at the same rate as Allgas. This takes into account the faster growth rates shown by Envestra in the period to 1997 but also the fact that the South Coast has been and continues to be the source of significant growth for Allgas.

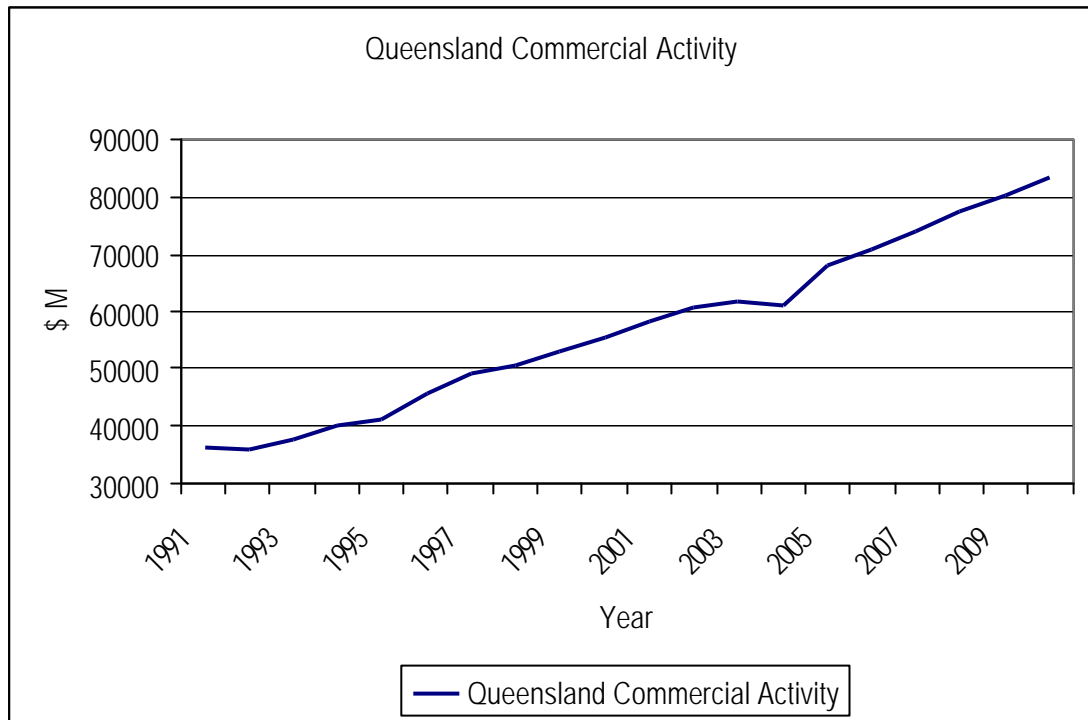
6.4 Commercial average usage

According to the last two years' history, average usage has been growing at about 4% pa. This is likely to be due to either larger new commercial loads or category shifting (from the contract or demand customers to the tariff or volume customers). As the market matures and most large customers are connected, we would expect that the average rate would decrease over time as generally smaller customers are connected to the mains.

6.5 Commercial output forecasts

Historical and forecast Queensland commercial output in real \$ terms is illustrated in Figure 6-1. Commercial output grew at about 5.6% pa over the period 1992 to 2000, slowing somewhat to 4.8% pa over the latter years of the period. BIS Shrapnel has forecast output growth of just over 4% pa over the period 2000 to 2010.

Figure 6-1 Queensland Commercial Output, \$M real, historical and forecast



Source: BIS Shrapnel, *State Industry Prospects, 1999 to 2014*

The reduction in commercial output growth rates suggests some slowing of the recent strong gas growth. However, commercial output is still expected to grow at over 4% pa over the period 2000 to 2010.

6.6 Small commercial forecast

From AGA data we assess that over the period 1992 to 1997 the commercial category (which includes large as well as small customers) grew at around 8% pa. According to the recent Envestra numbers, the small commercial category load grew at around 6% pa over the past two years.

However, this number is reduced somewhat by the negative growth rate in the Northern Region where load fell by 6 TJ over the same period. We consider this likely to be due to the re-classification of one or more customers from the Commercial to Industrial category or the Volume to Demand category¹⁴. If we assume that 10 TJ was lost in 1999 and 15 TJ in 2000 from such migration then the growth rate for customers starting in this category is about 7.7% overall, consistent with the growth estimated from AGA over the period 1992 to 1997.

After reviewing the data provided by Envestra and analysed the information publicly available from the AGA, adjusted by subtracting the Allgas data to provide a reference estimate for the Envestra growth rate, MMA has decided to utilise Envestra's 1998, 1999 and 2000 data for

¹⁴ There were 3 new demand customers listed in 1998.

forecasting purposes. Loads of 10TJ and 15TJ were added to Envestra's 1999 and 2000 data respectively to take into account an assumed level of usage migrated from the commercial to the contract categories in the data Envestra provided. The resulting 1998 to 2000 data showed an average growth of approximately 36.3TJ pa or 7.7% annual growth which is consistent with the 1992 to 1997 Envestra growth of 7.9% pa estimated from the analysis of the AGA data. MMA applied a linear growth of 36.3TJ to Envestra's 2000 commercial consumption level to derive the forecast to 2010. This results in a compounded annual growth rate of 6% between 2000 and 2005 and 4.7% between 2005 and 2010.

We assume the same growth rates across both regions.

This also assumes that there is no net migration from Commercial to Industrial or Volume to Demand in the future.

6.7 Comparison with Allgas, ABARE forecasts

ABARE forecasts that Queensland's commercial gas consumption will grow very rapidly at 21.8% pa between 2000 and 2005 slowing down to 7.4% pa between 2005 and 2010.

Allgas forecast growth at 6.3% pa between 2000 and 2005.

MMA has forecast Allgas commercial gas consumption growing at a rate of 7% pa between 2000 and 2005 and 6% pa between 2005 and 2010, which is not significantly different from that forecast by Allgas.

For Envestra, we have forecast a growth rate of 6% pa between 2000 to 2005 and 4.7% pa between 2005 to 2010. This compares with Envestra's forecast growth rate of 3.9% pa to 2006.

7 INDUSTRIAL

7.1 Assessment of data provided

The historical data provided by Envestra is separated into small industrial and contract. This is provided in Table 7-1 and Table 7-2 and combined in Table 7-3. Again, the numbers from 1997/98 are derived from the Envestra database while those prior to this are from the retailer database.

Table 7-1: Small industrial customer numbers and consumption

Customers			1998	1999	2000
Brisbane			146	163	162
Northern			9	23	26
Total			155	186	188
Load, GJ			1998	1999	2000
Brisbane			433895	442825	417988
Northern			85500	68299	86673
Total			519395	511124	504661

Source: Information supplied by Envestra to OCA

Table 7-2: Contract customer numbers and consumption

Customers			1998	1999	2000
Brisbane			48	51	53
Northern			0	3	3
Total			48	54	56
Load, GJ			1998	1999	2000
Brisbane			2236243	2361419	2502732
Northern			0	44055	41534
Total			2236243	2405474	2544266

Source: Information supplied by Envestra to OCA

Table 7-3: Contract plus small industrial customer numbers and consumption

Customers			1998	1999	2000
			194	214	215
Northern			9	26	29
Total			203	240	244
Load, GJ			1998	1999	2000
Brisbane			2670138	2804244	2920720
Northern			85500	112354	128207
Total			2755638	2916598	3048927

Source: Information supplied by Envestra to QCA

The growth in combined small industrial and contract load over the period 1996 to 2000 averaged 11% pa. For the period 1998 to 2000 in which Envestra has expressed greater confidence in the data, the average growth rate was 5% pa.

The small industrial category shows significant swings in both customer numbers, loads and average usage. We suspect that much of this is due to category switching and this tends to be confirmed by the variations in average load.

To reduce the fluctuation due to category switching we have assessed the small industrial market together with the contract market as a whole. While some contract commercial customers are included within the overall contract market we expect that they will not significantly impact on the analysis. We have, however, factored in some compensation for category shifting of commercial customers¹⁵. MMA utilised the industrial, 10TJ – 100TJ contract load and 100TJ+ contract load data provided by Envestra for 1998, 1999 and 2000 as the base for the forecast. The loads from these three market segments were aggregated to determine an overall industrial load.

The resulting 1998 to 2000 data shows that the Envestra industrial load grew by an average of 5% pa.

¹⁵ To be consistent with the previous section we have reduced Contract Loads by 10 TJ in 1999 and 15 TJ in 2000.

7.2 AGA data

AGA numbers from 1992 to 1997 separate out commercial from industrial customers. These show an overall growth rate of 3.7% pa in industrial customer numbers and 3.9% pa increase in industrial loads for Queensland as a whole.

We have estimated growth in Envestra numbers by subtracting Allgas numbers supplied for the demand forecast from the combined AGA information. The resulting derived Envestra numbers suggest customer growth over the same period of 4.1% pa and total usage increases of 6.5% pa. These are again higher than the numbers for Allgas.

7.3 Customer numbers

Combined small industrial and contract customer numbers show a customer growth rate of [REDACTED] and 9.6% between 1998 and 2000. While fluctuations occur on an annual basis, the trend suggests that for the industrial and contract market categories combined, Envestra is experiencing significant customer growth of between 7% pa to 10% pa. These do, however, appear high compared to the derived estimates based on AGA numbers. The difference could arise in part from switching between the commercial and industrial categories.

7.4 Industrial output forecasts

MMA commissioned BIS Shrapnel to develop a manufacturing output forecast for Queensland, Brisbane and Moreton. Over the past 8 years, manufacturing in Brisbane and Moreton have been growing at about 3% pa, slightly slower than Queensland as a whole. BIS Shrapnel is forecasting that manufacturing in Queensland will experience growth at 3.1% pa between 2000 and 2005, falling to 1.3% pa between 2005 and 2010. A fall in manufacturing output is expected in 2008. For Brisbane and Moreton, manufacturing output growth rates are expected to be slightly lower than for Queensland as a whole. Between 2000 and 2005, manufacturing output in Brisbane and Moreton is expected to grow at 2.7%, slowing to 1.2% between 2005 and 2010. Actual reductions in manufacturing output are expected in 2002 as well as in 2008 in Brisbane and Moreton.

This means that trends relying on increased outputs are expected to slow slightly in 2000 and 2005 and more significantly in 2005 to 2010.

7.5 Survey results

We have talked independently to some 17 current and potential customers of the networks in Brisbane and surrounding areas. Together, these represent some 30% of current industrial usage on the networks.

The survey asked questions about current and expected usage of gas over time.

As would be expected, most customers contacted suggested little change from current operations, although some existing customers suggested expanded gas usage, a couple decreased gas usage and several prospective Envestra end-users were identified.

Although certainly not exhaustive, the survey suggests that growth rates over the next few years may reduce slightly compared to the previous five years.

7.6 MMA forecasts

We have undertaken a trend analysis of the contract plus small industrial load growth experienced between 1996 and 2000. [REDACTED] consider this high growth rate to be in part due to the inconsistency of data between 1997 and 1998. [REDACTED]

Over the period 1998 to 2000, for which Envestra has most confidence in the data, the average increase was some 140 TJ pa. We have assumed a growth rate of 4.2% pa over the next 5 years reducing to 3.5% for the next 5 years, consistent with a linear growth rate of 140 TJ pa. While this is less than the 5% experienced over the past few years and certainly significantly less than the 11% suggested by the numbers from 1996 to 2000, it is more in line with the industrial slowdown suggested by the BIS Shrapnel industrial output forecasts and our survey. However, growth in this segment is likely to be lumpy as large industrial customers connect to the network.

Over the last two years between 1998 and 2000, the growth rates experienced in the Brisbane and the Northern region parts of the Envestra network have been very different. Brisbane grew at 4.6% pa while the Northern region grew at over 15%. We do not believe that the rate of growth achieved between 1998 and 2000 in the Northern region is sustainable. Indeed, it is likely to be due in part to category switching.

Given these difficulties in estimating growth in the Northern region with a relatively low load base, we have decided to apply the same growth rates across the two regions.

7.7 Comparison with Allgas and ABARE forecasts

ABARE forecasts that Queensland's industrial gas consumption will grow at 15.8% pa between 2000 and 2005 before slowing to 2.4% pa between 2005 and 2010. However, included in this forecast is a large expansion in usage due to the arrival of PNG gas. This is now expected to

[REDACTED]

arrive significantly later than expected by ABARE and will affect the distribution growth rates to a much lesser extent than for very large non-distribution users.

For the Allgas forecasts we have managed to reasonably correlate industrial output with gas usage. This was not possible for Envestra due to the poor historical data quality.

For Allgas, MMA has forecast a growth rate related largely to industrial output growth of 3.7% pa between 2000 and 2005 and 1.2% pa between 2005 and 2010 while Allgas has forecast growth at a rate of 3.1% pa between 2000 and 2005.

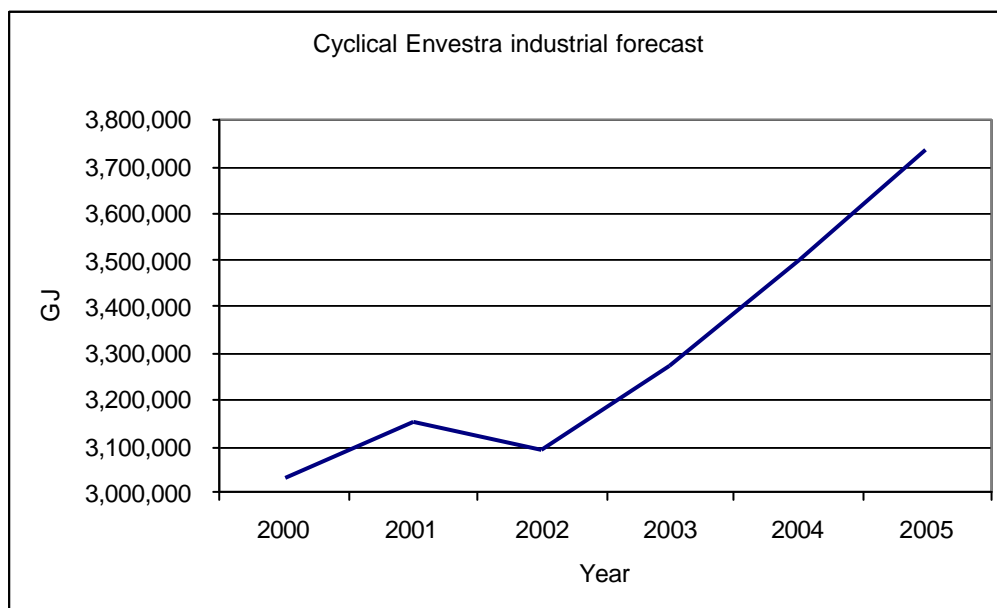
For Envestra, MMA forecasts a growth rate of 4.2% between 2000 and 2005 and 3.5% between 2005 and 2010. While this may be slower than the demand growth experience between 1998 and 2000, it is significantly faster than the Envestra annual forecast growth rate of around 2.2% pa between 2001 and 2006.

7.8 Relationship between manufacturing activity and industrial gas consumption

MMA was unable to find any reasonable relationship between the level of manufacturing activity and Envestra's industrial gas consumption. This may be due to the inconsistent data available rather than an actual lack of a correlation. In our analysis of the Allgas industrial consumption, we did find a strong correlation between industrial gas consumption and manufacturing activity and we were thus able to develop a forecast based on this relationship.

Because of the economic downturn expected during the early years of the forecast period, MMA has developed an alternative, "cyclical" forecast which more closely reflects the economic cycle. While retaining the same growth rate as that forecast above over the period 2000 to 2005, we have applied the growth shape developed for Allgas there to the Envestra industrial gas consumption. This cyclical forecast from 2000 to 2005 is provided in Figure 7-1.

Figure 7-1 Cyclical Envestra Industrial Gas Consumption Forecast



Envestra has, however, commented that although a cyclical forecast may be appropriate for the larger, more diverse Allgas load, it does not appear appropriate for the Envestra load.

It should be noted that KPMG Consulting, who prepared the document entitled "Envestra Limited, Demand Forecast, Queensland Natural Gas Distribution System" on which the Envestra forecasts rely, did undertake a "macroeconomic variable analysis" of the Demand and Volume markets. This analysis of the demand market suggested an annual growth rate of between 5 and 6% pa. KPMG did, however, advise caution in the interpretation of these results and chose instead to use microeconomic forecasts.

7.9 Small industrial

We have utilised the same growth rate for small industrial as for the industrial category as a whole. In terms of customer numbers for Reference Tariff calculation purposes, we project numbers increasing by 2 each year in the Brisbane region and 1 each year in the Northern region.

Envestra has projected a growth rate of 2.4% pa for the small industrial sector.

8 PRICE IMPACT AND NEW USES

8.1 Price drivers

Over the past few years we understand prices to:

- have remained stable in nominal terms for residential and small business customers for a few years before a recent increase of around 4% and then an almost 10% price increase for GST
- have remained relatively unchanged in real terms for customers greater than 10 TJ but less than 100 TJ
- have dropped in real terms to large customers over 100 TJ in size in anticipation of both contestability and reduction of cross-subsidy through regulation of distribution networks

The price drop for the latter has undoubtedly contributed to the growth in the industrial category. This is especially true in the light of increased LPG and liquid fuel prices over the past year or so.

Over the next few years we anticipate three significant pricing impacts:

1. Regulation of distribution costs and elimination of cross-subsidies

We have based our assessment of the impact of this on the proposed Access Arrangements.

2. Retail contestability for the gas market over the next 5 years
 - contestability for the largest customers (>100 TJ) in July 2001
 - contestability for the remaining > 10 TJ customers within a year of this
 - contestability for the small business customers and the residential segment probably between 2002 and 2007
3. Availability of PNG gas or increased volumes of CSM

We anticipate that PNG gas will become available into Brisbane from about 2005. This would act to substantially reduce the city gate price of gas into Brisbane, possibly by some one-third. This will, in turn, tend to further reduce the price of gas to all customers. As an alternative, increased quantities of CSM should become available for supply to utility markets.

8.2 Indicative impact on customer prices

In total, based on the current proposed AA tariffs and our understanding of current delivered prices we indicatively assess that these changes could result in:

- prices to residential customers increasing by approximately 15% in real terms over the next 5 years – say 3% pa and then remaining constant in real terms thereafter

- prices to other small business customers (mainly commercial) reducing by about 15% in real terms over the next five years and then reducing by 1% pa in real terms thereafter
- prices to 10 TJ to 100 TJ customers reducing in real terms by 10% pa over the period 2000 to 2005 and then by a further 2% pa thereafter
- prices to 100 TJ + customers reducing in real terms by 1% pa over the period 2000 to 2005 and then by a further 4% pa thereafter

These may need to be reviewed after the draft determination by QCA.

8.3 Price elasticities

In September 1996 the Australian Gas Association (AGA) published a report entitled "Price Elasticities of Australian Energy Demand". This publication assessed the own price elasticities of demand for gas to be:

	Short run	Long run
Industrial	-0.29	-0.30
Residential	-0.78	-0.78
Commercial	-0.09	-0.10

Source: AGA Research Paper No 3, page 22

The own price elasticities of demand were found to be inelastic, in other words a one percent fall in real gas prices results in a less than one percent rise in volumes demanded.

In a previous report to the Office of the Regulator General, Victoria, MMA commented that the residential own price elasticities appeared high for the relatively mature Victorian market. In the absence of other information pertinent to the less mature Queensland market, we have, however, utilised the AGA numbers.

8.4 Prices of other fuels

We have not assessed the impact of the prices of other fuels relative to gas. In general terms, however, the main competitors to reticulated gas in Queensland are electricity and LPG for the residential, commercial and industrial markets and coal for large customers.

With increasing competition and contestability in the electricity market we would expect electricity prices to fall for larger customers and remain approximately stable for small customers who we understand are currently benefiting from cross-subsidies.

Wholesale prices of LPG and liquid fuels have increased significantly over the past two years approximately in line with crude oil prices. These are expected to reduce over time, however, gas is expected to continue to make inroads into the LPG market.

8.5 Assessed impact of price

The indicative price changes and volume impact are provided in Table 8-1 below.

Table 8-1: Indicative price movements and impact on demand

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cumulative price changes, % real										
Residential	3%	6%	9%	12%	15%	15%	15%	15%	15%	15%
Commercial	-3%	-6%	-9%	-12%	-15%	-16%	-17%	-18%	-19%	-20%
Industrial	-2%	-4%	-5%	-7%	-9%	-12%	-14%	-17%	-19%	-22%
Cumulative volume changes, % real										
Residential	-2%	-5%	-7%	-9%	-12%	-12%	-12%	-12%	-12%	-12%
Commercial	0%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Industrial	1%	1%	2%	2%	3%	3%	4%	5%	6%	7%

-ve sign means a decrease in price or demand

These volume changes are multiplied by the volumes forecast to estimate the impact of the assumed real price changes.

8.6 Major new usages

Major new sources of growth in Queensland are likely to be:

- Gas for electricity generation and cogeneration. Such usage is forecast to expand dramatically over the next generation. However, these are likely to off-take from the transmission, rather than distribution mains and are therefore excluded from consideration here.
- Natural Gas for Vehicles (NGV). Although this is routinely forecast to show strong growth, results to date have been poor. This sub-sector is likely to be included within the commercial or industrial segment.
- Dispersed generation. Small-scale electricity generation from micro-turbines or fuel cells has the potential to be a major end-use of natural gas around the world. It is, however, too early to say when this will take off in Queensland. We have not included any growth from this source in our forecasts.
- Gas cooling. As for NGV, gas for cooling has long been touted as a potential source of increased gas demand, especially in warm climates such as Brisbane. While we consider that cooling in the commercial market may eventually result in significant growth in that

segment, there are no indications as yet of significant penetration for this end-use. We have not included any growth from this source in our forecasts.

9 COMBINED FORECASTS

9.1 Volume customers

The MMA demand forecasts for the Envestra Volume (< 10 TJ pa) market are provided in Table 9-1. The Table provides the forecast volume with (post) and without (pre) the price impacts discussed in Chapter 8 factored in.

Table 9-1: MMA pre- and post- price impact forecasts and Envestra forecast, TJ

Volume market			
	MMA (pre-price)	MMA (post-price)	Envestra Forecast
2000	1,712	1,712	1,712
2001	1,789	1,777	1,756
2002	1,868	1,843	1,803
2003	1,949	1,910	1,853
2004	2,032	1,979	1,906
2005	2,116	2,048	1,963
2006	2,193	2,130	2,019
2007	2,272	2,213	-
2008	2,351	2,298	-
2009	2,433	2,385	-
2010	2,515	2,473	-

The effect of the price increases expected for domestic customers resulting from the proposed AA is to dampen growth in the residential market. Nevertheless, the MMA forecasts are still significantly greater than the Envestra forecasts over the period. By 2006 the MMA forecast is for a Volume demand some 7 to 11% greater than that forecast by Envestra.

The forecast break-up of demand between the Brisbane and Northern regions for the pre-price impact assessment is provided in Table 9-2. The information supplied by Envestra has not allowed great confidence about the forecast split of demand between regions.

Table 9-2: MMA pre-price impact forecast split into regions, TJ

Volume Market			
	Brisbane	Northern	Total
2000	1,540	172	1,712
2001	1,609	180	1,789
2002	1,679	189	1,868
2003	1,751	198	1,949
2004	1,824	207	2,032
2005	1,899	217	2,116
2006	1,968	226	2,193
2007	2,037	234	2,272
2008	2,108	244	2,351
2009	2,180	253	2,433
2010	2,253	262	2,515

In Table 9-3, we provide our forecast for volume customer numbers in the Envestra network.

Table 9-3: MMA volume customer numbers forecast

	Residential	Commercial	Industrial	Total
2000	66,117	3,800	188	70,105
2001	67,468	3,933	191	71,592
2002	68,846	4,071	194	73,111
2003	70,254	4,213	197	74,664
2004	71,690	4,361	200	76,250
2005	73,156	4,513	203	77,872
2006	74,286	4,649	206	79,141
2007	75,434	4,788	209	80,431
2008	76,600	4,932	212	81,744
2009	77,785	5,080	215	83,079
2010	78,988	5,232	218	84,438

9.2 Demand customers

The MMA demand forecasts for the Envestra Demand (> 10 TJ pa) market are provided in Table 9-4. The Table provides the forecast volume with (post) and without (pre) the price impacts discussed in Chapter 8 factored in.

Table 9-4: MMA pre- and post- price impact forecasts and Envestra forecast, TJ

Demand market			
	MMA (pre-price)	MMA (post-price)	Envestra Forecast
2000	2,544	2,544	2,544
2001	2,651	2,666	2,598
2002	2,762	2,793	2,654
2003	2,878	2,926	2,712
2004	2,999	3,065	2,772
2005	3,125	3,211	2,834
2006	3,235	3,348	2,898
2007	3,348	3,490	
2008	3,465	3,639	
2009	3,586	3,793	
2010	3,712	3,954	

By the year 2006 the MMA forecast pre-price impact is for demand some 12% higher than that forecast by Envestra. The effect of the price reductions expected for commercial and industrial customers resulting from the proposed AA and contestability is to enhance growth in the industrial market. This results in even greater disparity between the Envestra and MMA forecasts.

The forecast break-up of demand between the Brisbane and Northern regions for the pre-price impact assessment is provided in Table 9-5. Again, the information supplied by Envestra has not allowed great confidence about forecasting the regional division of large customer demand.

Table 9-5: MMA pre-price impact forecast split into regions, TJ

Demand Market			
	Brisbane	Northern	Total
2000	2,503	42	2,544
2001	2,608	43	2,651
2002	2,717	45	2,762
2003	2,832	47	2,878
2004	2,950	49	2,999
2005	3,074	51	3,125
2006	3,182	53	3,236
2007	3,293	55	3,348
2008	3,409	57	3,465
2009	3,528	59	3,586
2010	3,651	61	3,712

9.3 MDQ

Envestra intends to charge Demand customers on the basis of MDQ but has provided only very limited information about MDQ in 1999/2000 and how it has forecast MDQ. Envestra has assumed an MDQ of 7.2 TJ/day for the 10 – 100 TJ contract customers and 4.16 TJ/day for the 100 TJ + contract customers.

This assumes average load factors of 57% for the 10 – 100 TJ contract customers and 70% for the 100 TJ + contract customers. These load factors appear reasonable, possibly somewhat low.

It is unclear how these load factors were assessed, for example whether they are contracted or measured and, if measured, how.

As for Allgas, we would expect that the growth in MDQ would not be directly proportional to the growth in annual usage because of the interest of customers in reducing MDQ after it becomes a charging parameter.

However, many of the customers concerned will not be daily metered and will, according to the AA, therefore be assumed to have a monthly MDQ of 1.3 times the average daily quantity for the month. We would not expect these customers to be able to moderate their MDQ payment. Consequently these customers would have no incentive to modify their behaviour and reduce MDQ.

We assume for Envestra that the MDQ stays proportional to load for most of the load.

9.4 Materiality

As can be seen from Table 9.6 based on the AA pricing, each GJ of residential gas transported will earn Envestra almost \$13 while each GJ of gas transported to large industrial customers will earn only some 11% of this.

This means that every 1% increase in volume in the residential market or approximately 7 TJ pa, would provide the distributor with an additional \$90,000 pa. A difference in residential volumes of 5% from forecast over the longer term will change expected revenue by over \$0.46 million.

In the small commercial sector, a 1% change in volume in gas consumed will result in Envestra earning approximately \$34,000 pa extra. Over the longer term, should there be a 5% difference between forecast and actual volumes then the revenue difference would be approximately \$170,000 annually. The small industrial sector results in an impact of \$27,000 for a 1% change and \$135,000 for a 5% change.

In the medium contract industrial sector (10 to 100 TJ), assuming an MDQ load factor of 65%, a 1% increase in the volume of gas consumed will result in the revenue that Envestra receives

increasing by approximately \$55,000 pa or by almost \$280,000 pa should there be a 5% difference between forecast and actual in the Brisbane region.

If the customer is even larger (> 100 TJ, but still assuming a load factor of 65%) the impact will be \$15,000 for a 1% change and \$75,000 for a 5 percent difference.

Table 9.6 Impact of Volume Changes on Envestra Revenue (excluding GST)

	Ave Revenue	\$ Impact of forecast differences	
	\$/GJ	1%	5%
Residential	\$ 13.26	\$92,319	\$461,597
Commercial	\$ 6.67	\$34,115	\$170,575
Small Industrial - Volume	\$ 5.40	\$27,252	\$136,258
Medium Industrial - Demand	\$ 3.73	\$55,431	\$277,153
Large Industrial - Demand	\$ 1.46	\$15,450	\$77,248