

ATTACHMENT 6
RESPONSE TO E40: DEMAND FORECAST
Envestra Submission

The QCA selected McLennan Magasanik Associates ('MMA') to formulate alternative forecasts of demand for the regulated Queensland gas distribution businesses. The forecasts for Envestra are contained in the document *MMA Demand Forecasts for Envestra*, dated 16 February 2001 ('MMA Demand Forecasts'). Envestra engaged KPMG to prepare an independent demand forecast for its Queensland covered networks which is contained in the report *Demand Forecasts, Queensland Natural Gas Distribution System, November 2000* ('KPMG Demand Forecasts'). MMA's forecasts over the period 2000/01 to 2005/06 for Envestra are significantly higher than those developed by KPMG.

The QCA has determined that the MMA post price impact demand forecasts should be adopted by Envestra for the calculation of Reference Tariffs. Envestra cannot accept the QCA's position on demand forecasts due to the inappropriate forecasting methodology used by MMA. This has resulted in biased forecasts that overstate expected demand for Envestra's covered network. As detailed in the following sections, the MMA demand forecasts do not conform to section 8.1(a) and 8.2(e) of the Code and cannot therefore be used in the Access Arrangement.

1. Code Requirements

Section 8 of the Code provides guidance on how forecasts of demand are to be derived. The key Code requirements to be taken into account include:

- providing the Service Provider with the opportunity to earn a stream of revenue that recovers the efficient costs of delivering the Reference Service over the expected life of the assets used in delivering that Service (8.1(a));
- any forecasts required in setting the Reference Tariff represent best estimates arrived at on a reasonable basis (8.2(e)).

2. Criteria for Assessing MMA Forecasts

To assess whether the MMA Demand Forecasts satisfy the Code requirements for forecasts of demand the following criteria have been considered:

- i) Logic of the forecasting methodology;
- ii) Whether the forecasts are unbiased;
- iii) Whether the forecasts are appropriate for the specific network.

These criteria are similar to those that were used by MMA and Marsden Jacob Associates on behalf of the Office of the Regulator-General to review the Victorian Government's Energy Projects Division forecasts of demand over the 1998-2002 period for the Victorian gas distribution businesses¹.

Logical, appropriate and unbiased forecasts will provide the best and most reasonable forecasts of demand and allow the Service Provider to earn a revenue stream that covers the efficient cost of those services.

3. Assessment of MMA Demand Forecasts

3.1 MMA Method Not Logical

The MMA Demand Forecasts have been generated using a 'plain vanilla' macroeconomic forecasting methodology, utilising trends in macroeconomic variables and historical growth

¹ Office of the Regulator General, *Review of Gas Demand Forecasts*, 29 May 1998

rates. The macroeconomic methodology used by MMA has resulted in significantly higher volume forecasts than are expected by Envestra (11% higher in 2005/06).

This standard macroeconomic approach taken by MMA is applicable to large distributors with close to 100% market share in a 'steady state' market. In this type of market regional variances are averaged out across the entire system and macroeconomic correlations and historical growth rates provide appropriate proxies on which to base future growth estimates.

The macroeconomic approach is not suitable for Envestra's Queensland network where the distribution business is small, services a minor portion of the overall gas market in Queensland and has quite distinctive regional demand and operating characteristics, as shown in the following table.

Network Comparisons (1999/00)	Envestra	Allgas	Difference
Average Domestic consumption (GJ pa)	10.5	12.0	-1.5
Number of consumers	70,161	58,979	11,182
Length of mains (km)	2,026	1,900	126
Volume delivered to <10 TJ pa Consumers (TJ)	1,712	2,210	-498
Volume delivered to >10 TJ pa Consumers (TJ)	2,545	7,014	-4,469
Total Gas Delivered (TJ)	4,257	9,224	-4,967

The differences between Envestra and Allgas are underscored by the regional differences in domestic and industrial consumption. Allgas reports an overall average domestic consumption of 12 GJ pa and Envestra 10.5 GJ pa. However, within the Allgas average is the consumption of Toowoomba domestic consumers at 20 GJ pa².

Envestra and Allgas Access Arrangements also cover a small proportion of the total natural gas market in Queensland. According to the Australian Gas Association *Gas Statistics Australia 2000*, 1998/99, natural gas production in Queensland was 125.1 PJ, with 16.1 PJ sold to Allgas and Origin Energy, of which 1.6 PJ was sold to domestic consumers and 14.5 PJ to commercial and industrial consumers. Of the remaining 109 PJ, 16.1 PJ was sold to interstate markets, 13.6 PJ sold for public electricity generation and 79.3 PJ for industrial processes. The largest market in Queensland for natural gas is the industrial market where producer direct sales predominate. In 1999/00 Allgas had over twice the total demand of Envestra and supplied over 2.75 times the industrial (> 10TJ/a) volume. As is evident from the statistics in the table there are significantly different demand drivers for each of the networks and for Queensland as a whole.

The MMA methodology also failed to take into account that natural gas is not available in every suburb of Brisbane. The location of domestic dwelling growth (i.e. whether it is located within an economic distance from a gas main) is critical when assessing domestic demand growth prospects.

In conclusion, a macroeconomic demand forecasting methodology is inappropriate where regional microeconomic factors are the major drivers of demand. The inappropriateness of MMA's method is supported by their own analysis where they state that they were "... *unable to find any reasonable relationship between the level of manufacturing activity and Envestra's industrial gas consumption.*"³. MMA assert that the lack of correlation is due to poor data quality. However, when the microeconomic fundamentals are examined, the lack of a correlation is due to:

² Allgas Energy Ltd, *Access Arrangement Information for Queensland Network*, 17 October 2000, pp48

³ McLennan Magasanik Associates, *Demand Forecasts for Envestra*, dated 16 February 2001

- (a) the route of the Roma to Brisbane transmission pipeline (i.e. through the area covered by the Allgas network); and
- (b) the relationship between the transmission pipeline, energy transportation costs and the incentive for industrial consumers to minimise energy costs by locating close to the transmission pipeline.

This has resulted in an uneven dispersion of industrial gas consumption between Allgas (73% of the market) and Envestra (27% of the market), not to mention the substantial volumes supplied directly from the transmission pipeline. One would therefore expect a better correlation between industrial gas consumption and manufacturing activity in Brisbane for Allgas.

3.2 Excluded Consumer Demand Forecasts

Not only is the Envestra's covered pipeline system in Queensland a small sub-section of the overall Queensland natural gas market, it is also only a portion of Envestra's Queensland business. This was not taken into account in developing MMA's forecasts.

The following table shows demand forecasts for Envestra's Excluded Consumers. If the load due to these consumers is included, Envestra's growth forecasts for its Queensland business are comparable to those derived by MMA, with total demand in both cases growing by around 1.2 PJ over the Access Arrangement Period.

Demand Growth (TJ)	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
KPMG Forecast Demand	4,257	4,355	4,457	4,565	4,678	4,796	4,917
Excluded Consumers	438	488	673	866	892	950	986
Total Envestra Queensland	4,695	4,843	5,130	5,431	5,570	5,746	5,903
Cumulative Access Arrangement Period Growth	-	148	435	736	875	1,051	1,208
MMA Demand (post-price impact)	4257	4442	4636	4836	5044	5259	5477
Cumulative Access Arrangement Period Growth	-	185	379	579	787	1,002	1,220

The table demonstrates that forecasts of demand growth will vary depending on the definition of the network for which the forecasts are being developed. The macroeconomic approach taken by MMA does not differentiate between Envestra's network and the total Queensland market. It is therefore clearly inappropriate to apply growth factors estimated by MMA to Envestra's Access Arrangement forecasts.

3.3 Unsuitable Data

MMA has used data from ABARE, AGA, BIS Schrapnel, Allgas and Envestra to formulate their forecasts of demand for Envestra.

MMA have placed considerable weight on pre-1997/98 data provided by Envestra. As outlined in previous submissions to the QCA, the pre-1997/98 Envestra data is unsuitable for demand forecasting purposes. Forecasts that are justified (even partially) using the pre-1997/98 data will result in illogical, unreliable and unreasonable demand forecasts.

MMA have argued that they have used independent data from ABARE and the AGA to improve the rigour of their analysis. However,

- i) the pre-1997/98 AGA data originated from the same source as that provided by Envestra (i.e. the retail database) and therefore has all of the problems associated with the Envestra pre-1997/98 data;
- ii) the AGA data is for the State in aggregate. It includes Allgas consumers and regions of Envestra's business not covered under the Access Arrangement. Extrapolation of consumption trends in regions not covered under the Access Arrangement will provide misleading forecasts (see section 3.1);
- iii) Envestra has changed the treatment of Bulk Hot Water facilities for the purposes of the Access Arrangement to more accurately reflect the costs associated with providing that service. Previously, consumer numbers for Bulk Hot Water facilities were counted as the number of domestic consumers connected to the Bulk Hot Water facility. The Access Arrangement counts the Bulk Hot Water facility as one consumer. Historical data will not reflect this change and overstate the number of consumers (the KPMG Demand Forecasts used an estimate of 10 domestic type consumers per Bulk Hot Water connection).
- iv) ABARE data is aggregate whole of State data and therefore not suitable for forecasting regional demand. ABARE forecasts will reflect large producer direct industrial and power generation consumption expectations that are irrelevant for Envestra's Access Arrangement.

Consequently, forecasts based on the above data will not provide the best and most reasonable forecasts for Envestra's Access Arrangement.

3.4 MMA Forecasts For Envestra are Biased

For the purpose of forecasting natural gas demand "bias" is defined in the Macquarie Dictionary as "*a particular tendency or inclination, especially one which prevents unprejudiced consideration of a question; to influence unfairly, prejudice or warp.*" The MMA Demand Forecasts for Envestra are biased because:

1. Macroeconomic Trends Unfairly Influence Forecasts

It was demonstrated above that the use of macroeconomic correlations between population, private consumption expenditure, manufacturing activity, commercial activity, housing and gas demand does not reflect the regional subtleties of Envestra's small Queensland covered network. Forecasts based on these macroeconomic correlations will therefore be biased towards macroeconomic (rather than regional) trends.

This conclusion is supported by the Brown & Root who stated that "*population and gas demand growth for Queensland may be very different to growth experienced by the distributors*" (pp 2-2). Using regional microeconomic data, Brown & Root forecast that population growth in residential locations serviced by Envestra will be slower between 2001 and 2006 than it was from 1996 to 2001⁴.

2. Domestic Demand Forecast Prejudiced by Allgas

The consumption growth rate for Envestra's Brisbane region domestic consumers was assumed by MMA to be the same as that for Allgas, ie growth of 0.11 GJ per annum over the Access Arrangement Period. Given the regional and consumer composition

⁴ Brown & Root Services Asia Pacific Pty Ltd, *Review Of The Forecast Capital Expenditure For The Envestra Natural Gas Distribution Networks*, Confidential Report Prepared for the Queensland Competition Authority, 20 April 2001, pp 3-3.

differences between the two distribution networks (as discussed in section 3.1) there is no logical or justifiable reason why domestic consumption will increase by the same rate over the Access Arrangement Period for both Allgas and Envestra.

Furthermore, given the lower average consumption of Envestra's domestic consumers compared to Allgas', MMA has arbitrarily determined that Envestra's consumers will increase consumption at a faster rate (in percentage terms) than those on the Allgas system. The forecasts for Envestra's domestic consumers are therefore biased towards the Allgas forecast with MMA giving little, if any, consideration to the Envestra specific drivers of demand.

3. Energy Efficiency

MMA have failed to recognise the fact that the increasing efficiency of natural gas appliances is negatively affecting the demand for natural gas. Growth in consumption per consumer is reduced by the increase in appliance efficiency and energy conservation measures. Failure to incorporate this as a key demand driver produces forecasts that are biased upwards that do not satisfy the requirements of section 8.2(e) of the Code.

4. The MMA Forecasts Are Inappropriate

4.1 Appropriateness of MMA Demand Forecasts

MMA's forecasts of demand increase at an increasing rate relative to those derived by KPMG. The annual volume differential between the KPMG and MMA demand forecasts are presented below. MMA's demand forecasts result in a large differential (>0.5 PJ pa) in forecast demand by the end of the Access Arrangement Period.

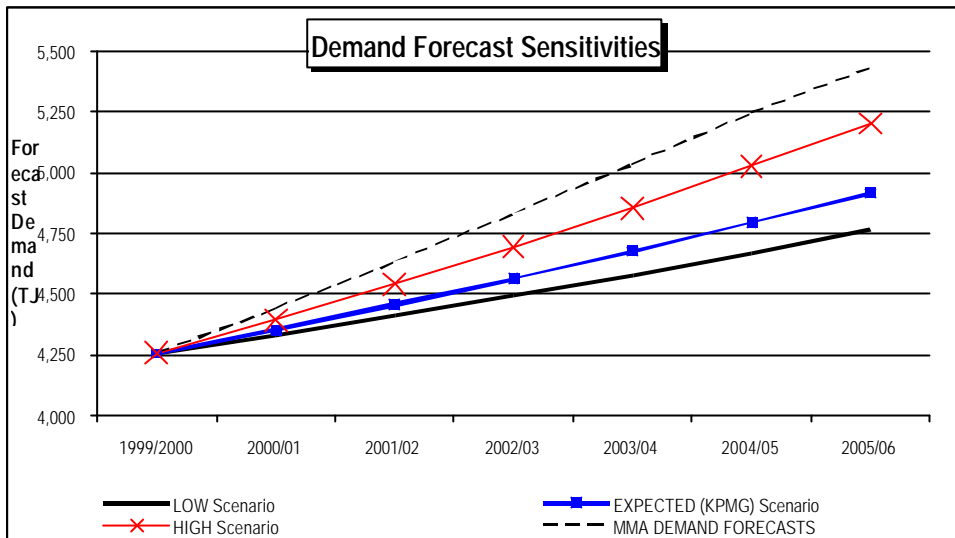
Demand Forecasts (TJ)	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
MMA	4,442	4,634	4,832	5,037	5,248	5,436
KPMG	4,355	4,457	4,565	4,678	4,796	4,917
Difference (TJ)	88	177	267	359	452	518
Difference (%)	2%	4%	6%	8%	9%	11%

To the extent that the MMA Demand Forecasts are too high and actual demand is lower than forecast, Envestra will be unable to recover the revenue approved by QCA. If Envestra's demand forecasts are correct and the QCA use the MMA Demand Forecasts to calculate Reference Tariffs, revenue to Envestra would be reduced over the period 2001/02 to 2005/06 by \$8.5 million or 5.6% of total revenue (see Appendix A). This would be inconsistent with section 8.1(a) of the Code.

5. Best & Reasonable Forecasts Of Demand For Envestra

Envestra believes that the KPMG Demand Forecasts satisfy the Code requirements and the assessment criteria detailed in section 2, whereas the MMA Demand Forecasts do not. This view is supported by Brown and Root who concluded that the number of new connections forecast in the KPMG Demand Forecasts was reasonable.

The KPMG Demand Forecasts were formulated in consultation with Envestra. A microeconomic forecasting methodology was selected by KPMG as Envestra's covered Queensland network represents a small segment of the overall Queensland natural gas market (approximately 4%) and because regional drivers are the main determinants of demand.



The KPMG Demand Forecasts represent expected demand within a range of high and low forecasts. Given the imprecise nature of forecasting natural gas demand it is prudent to generate sensitivities of high, low and expected demand. These sensitivities are presented in the graph below:

The forecasting methodology is logical, unbiased and appropriate for a small distribution network such as Envestra's Queensland covered network. As such the HIGH, LOW and EXPECTED forecasts presented above satisfy the Code requirements and the assessment criteria outlined in section 2.

6. Recommendation

The QCA should adopt a microeconomic demand forecasting methodology, such as that utilised in the KPMG Demand Forecasts, because it:

- i) accounts for network specific drivers of demand;
- ii) represents the best and most reasonable forecasts of demand for Envestra's Queensland network; and
- iii) provides a reasonable basis to expect that the efficient costs of delivering Reference Services will be recovered over the life of the assets.

APPENDIX A – Revenue Impact of MMA Demand Forecasts

2001/02	KPMG Forecast (PJ)	MMA Forecast (PJ)	Draft Decision CRR (\$m)	KPMG Forecast \$ per GJ	MMA Forecast \$ per GJ	Price Impact (\$m)	Volume Impact (\$m)	Total Revenue Impact (\$m)
>10 TJ pa Market	2.7	2.8	\$7.3	\$2.75	\$2.61	\$0.02	\$0.36	\$0.38
<10 TJ pa Market	1.8	1.8	\$21.7	\$12.03	\$11.77	\$0.01	\$0.47	\$0.48
			\$29.0					\$0.86

% of Total Revenue	3.0%
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2002/03	KPMG Forecast (PJ)	MMA Forecast (PJ)	Draft Decision CRR (\$m)	KPMG Forecast \$ per GJ	MMA Forecast \$ per GJ	Price Impact (\$m)	Volume Impact (\$m)	Total Revenue Impact (\$m)
>10 TJ pa Market	2.7	2.9	\$7.6	\$2.80	\$2.60	\$0.04	\$0.56	\$0.60
<10 TJ pa Market	1.9	1.9	\$22.0	\$11.87	\$11.52	\$0.02	\$0.65	\$0.67
			\$29.6					\$1.28

% of Total Revenue	4.3%
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2003/04	KPMG Forecast (PJ)	MMA Forecast (PJ)	Draft Decision CRR (\$m)	KPMG Forecast \$ per GJ	MMA Forecast \$ per GJ	Price Impact (\$m)	Volume Impact (\$m)	Total Revenue Impact (\$m)
>10 TJ pa Market	2.8	3.1	\$7.9	\$2.85	\$2.58	\$0.08	\$0.76	\$0.84
<10 TJ pa Market	1.9	2.0	\$22.3	\$11.70	\$11.27	\$0.03	\$0.82	\$0.85
			\$30.2					\$1.69

% of Total Revenue	5.6%
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2004/05	KPMG Forecast (PJ)	MMA Forecast (PJ)	Draft Decision CRR (\$m)	KPMG Forecast \$ per GJ	MMA Forecast \$ per GJ	Price Impact (\$m)	Volume Impact (\$m)	Total Revenue Impact (\$m)
>10 TJ pa Market	2.8	3.2	\$8.1	\$2.86	\$2.52	\$0.13	\$0.95	\$1.08
<10 TJ pa Market	2.0	2.0	\$22.6	\$11.51	\$11.03	\$0.04	\$0.95	\$0.99
			\$30.7					\$2.07

% of Total Revenue	6.7%
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2005/06	KPMG Forecast (PJ)	MMA Forecast (PJ)	Draft Decision CRR (\$m)	KPMG Forecast \$ per GJ	MMA Forecast \$ per GJ	Price Impact (\$m)	Volume Impact (\$m)	Total Revenue Impact (\$m)
>10 TJ pa Market	2.9	3.3	\$8.4	\$2.90	\$2.51	\$0.17	\$1.13	\$1.30
<10 TJ pa Market	2.0	2.1	\$23.1	\$11.44	\$10.85	\$0.07	\$1.20	\$1.26
			\$31.5					\$2.57

% of Total Revenue	8.1%
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Revenue Impact Summary (excluding Cost of Tax implications)

Total Revenue Determined by QCA 2001/02 to 2005/06 (\$m)	\$151.0
Estimated revenue under-recovery from MMA Demand Forecasts (\$m)	\$8.5
Estimated revenue under-recovery from MMA Demand Forecasts (%)	5.6%