APT Allgas Energy Pty Limited

Load Forecast

Effective
01 July 2011 – 30 June 2016

Attachment 3.1
1 November 2010
20100928 Load forecast.doc

Contents

Executive Summary

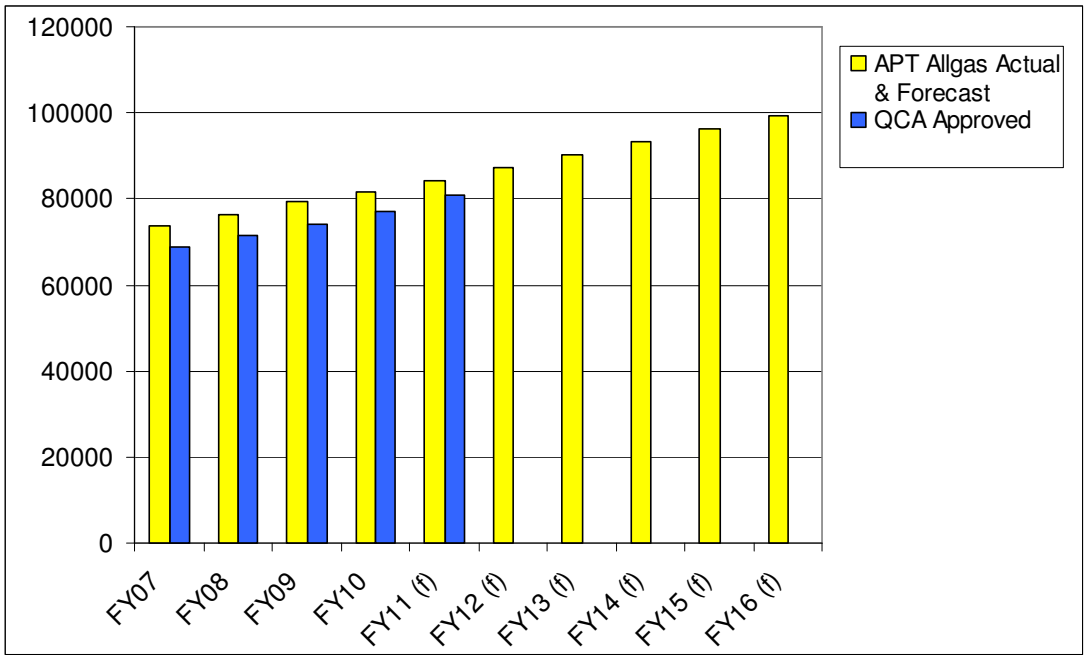
During the current Access Arrangement (AA) period, customer numbers in the Volume Class were consistently above the QCA forecast levels approved in the current AA, with actual connections at the end of FY11 forecast at 84,290 against a QCA forecast of 80,962. However, this has been offset by consumption levels that were consistently below the QCA forecast levels approved in the current AA, with total Volume class consumption for the current AA period forecast at 14,371 TJ against the approved QCA forecast of 16,100 TJ. Demand Class customer numbers have also been below the QCA forecast levels approved in the current AA and while consumption has been up and down, total consumption for the Demand Class of 37,020 TJ has been slightly below the QCA approved total of 37,020 TJ for the AA period.

Demand forecasts for the Volume and Demand Classes have been developed by analysing historical and current data to identify trends and applying current relevant market data and industry forecasts.

Over the upcoming AA period connections are forecast to increase to 99,546 (3.4% pa) and total throughput forecast to decrease slightly from 51,390 TJ to 50,390 TJ, primarily due to the loss of two large Demand Class End Users from the network.

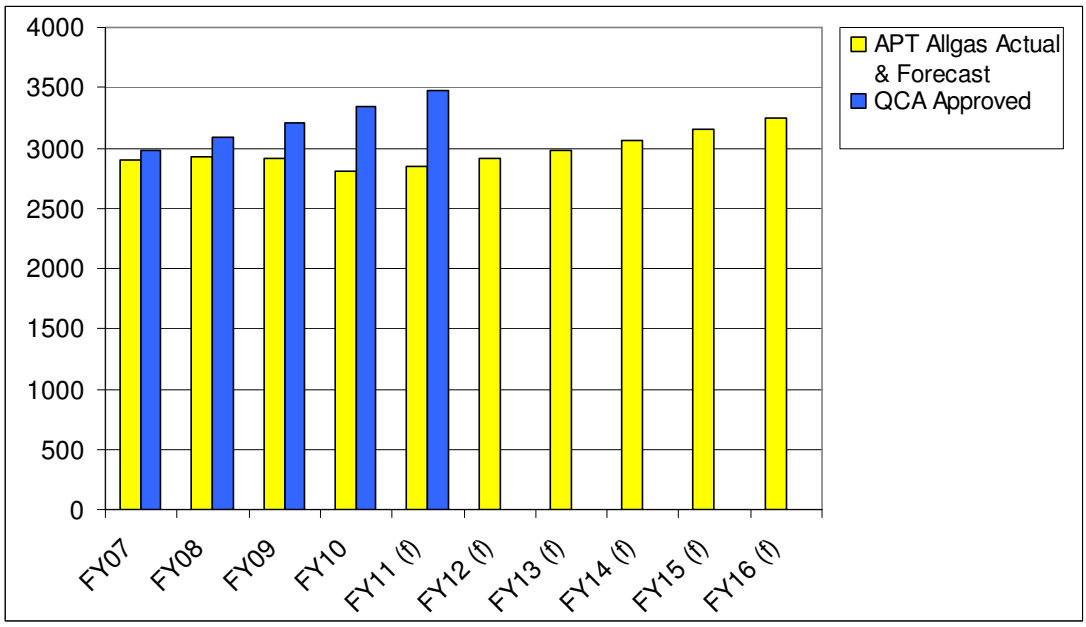
The following graphs show both past performance and forecast performance for the APT Allgas network, for both the Volume Class and the Demand Class.

Figure ES-1: Volume Class customer numbers



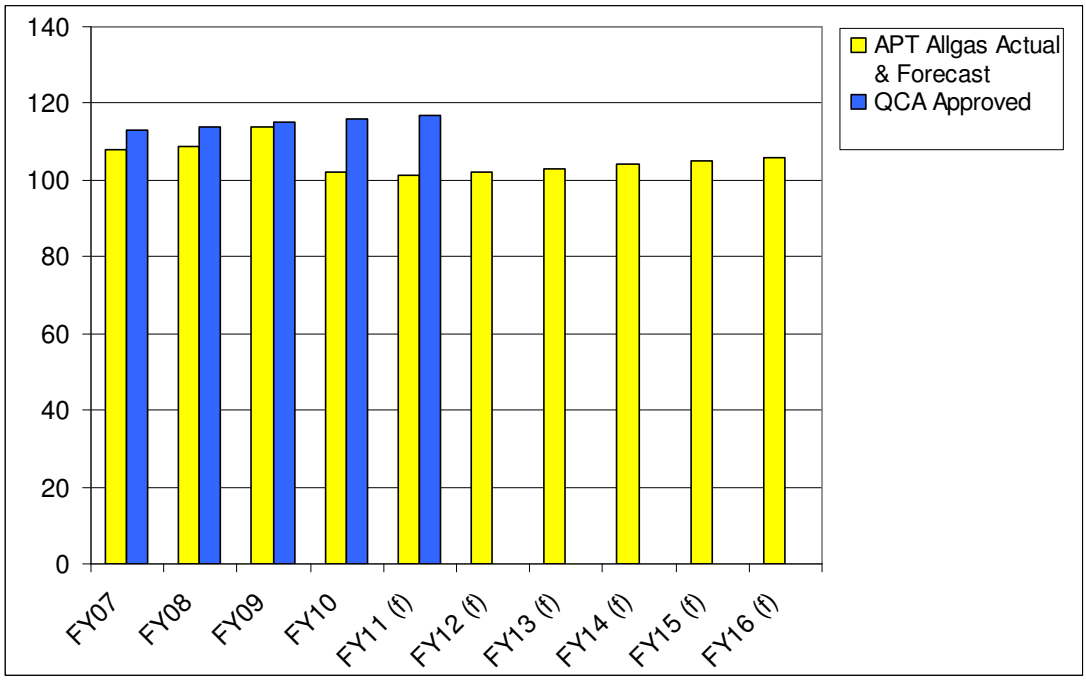
Please see section 2.4 for details on these figures.

Figure ES-2: Volume Class consumption



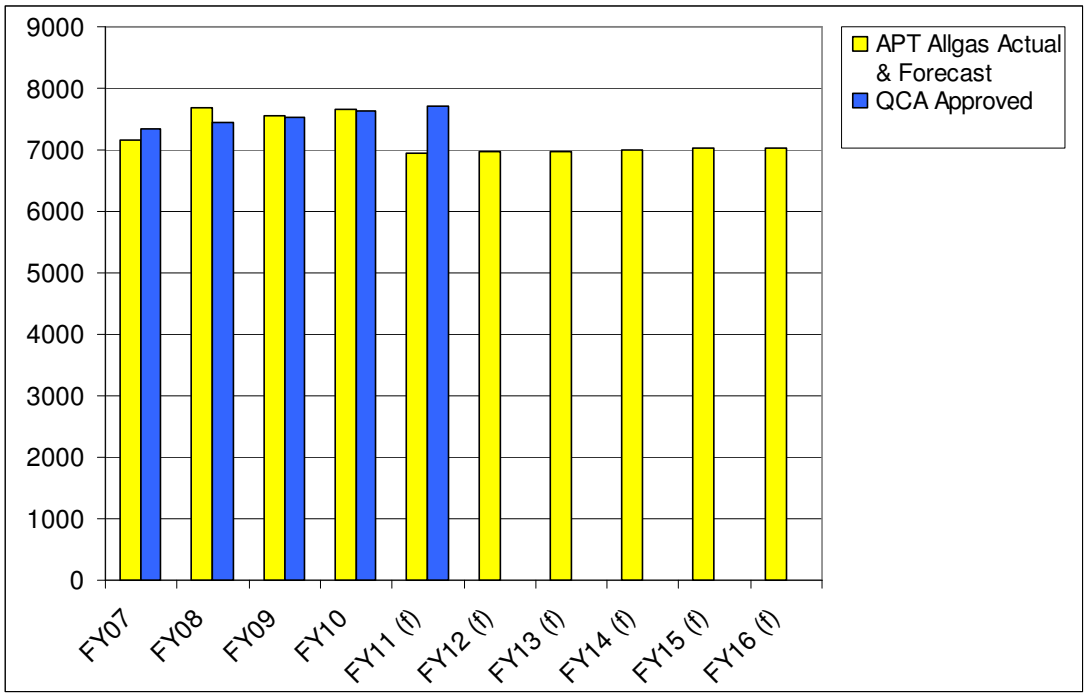
Please see section 2.5 for details on these figures.

Figure ES-3: Demand Class customer numbers



Please see section 3.3 for details on these figures.

Figure ES-4: Demand Class consumption



Please see section 3.6 for details on these figures.

Table ES-1: Summary of forecast customer numbers and consumption (rounded figures)

Year	FY12 (f)	FY13 (f)	FY14 (f)	FY15 (f)	FY16 (f)	AA Total
Demand class customer number	102	103	104	105	106	
Volume class customer number	87,169	90,119	93,143	96,243	99,441	
Total customer number	**87,271**	**90,222**	**93,247**	**96,348**	**99,547**	
Demand class customer volume (TJ)	6,970	6,985	7,000	7,015	7,030	35,000
Volume class customer volume (TJ)	2,908	2,984	3,062	3,154	3,249	15,357
Total customer volume (TJ)	**9,878**	**9,969**	**10,062**	**10,169**	**10,278**	**50,356**

1 Introduction

1.1 Rule requirements

Section	Rule	Where addressed
Division 2. 72. (1) (a)	Access Arrangement information relevant to price and revenue regulation: Specific requirements for access arrangement information relevant to price and revenue regulation: The access arrangement information for a full access arrangement proposal (other than an access arrangement variation proposal) must include the following: if the access arrangement period commences at the end of an earlier access arrangement period: usage of the pipeline over the earlier access arrangement period showing:	
Division 2. 72. (1) (a) (iii) (A)	for a distribution pipeline, minimum, maximum and average demand and, for a transmission pipeline, minimum, maximum and average demand for each receipt or delivery point; and	Section 4
(a) (iii) (B)	for a distribution pipeline, customer numbers in total and by tariff class and, for a transmission pipeline, user numbers for each receipt or delivery point;	Sections 2.4 and 3.3

1.2 Regulatory Information Notice

The Regulatory Information Notice (RIN) provided by the Australian Energy Regulator requires specific information be provided in this section of the Access Arrangement submission.[1] Details on where such information can be found in this document are set out in Table 1-1 below.

[1] Australian Energy Regulator, 25/03/2010, *Preliminary RIN Notice Template*

Table 1-1 Satisfaction of RIN requirements

RIN Reference	RIN Requirement	RIN Proforma	Where addressed
Section 2.2.2 (c)	Customer numbers by tariff class and service: Volume Class Actual and forecast for the earlier AA period	Proforma 10	Section 2.1
Section 2.2.2 (c)	Customer numbers by tariff class and service: Volume Class Forecast for the upcoming AA period	Proforma 10	Section 2.4
Section 2.2.2 (c)	Customer numbers by tariff class and service: Demand Class Actual and forecast for the earlier AA period	Proforma 10	Section 3.1
Section 2.2.2 (c)	Customer numbers by tariff class and service: Demand Class Forecast for the upcoming AA period	Proforma 10	Section 3.3
Section 2.2.2 (a)	Minimum, maximum and average demand Actual and forecast for the earlier AA period	Proforma 11	Section 4
Section 2.2.2 (a)	Minimum, maximum and average demand Forecast for the upcoming AA period	Proforma 11	Section 4
Section 2.2.2 (b)	Volume by tariff class and service: Volume Class Actual and forecast for the earlier AA period	Proforma 12	Section 2.5
Section 2.2.2 (b)	Volume by tariff class and service: Volume Class Forecast for the upcoming AA period	Proforma 12	Section 2.5
Section 2.2.2 (b)	Volume by tariff class and service: Demand Class	Proforma 12	Section 3.4

	Actual and forecast for the earlier AA period		
Section 2.2.2 (b)	Volume by tariff class and service: Demand Class Forecast for the upcoming AA period	Proforma 12	Section 3.6

1.3 *Load and demand forecast*

The load and demand forecast underpins two distinct aspects of the Access Arrangement:

- The capital expenditure plan
  - Customer Requested capital expenditure required to cover services, metering, main extensions, etc for new customers.
  - Augmentation capital requirements to upgrade gate station and high pressure mains etc to meet network growth.
- The derivation of tariffs to ensure recovery of the revenue requirement.

1.4 *Definition of APT Allgas network Customer Classes*

Volume Class

Volume Class customers generally consume less than 10TJ pa and include both Residential customers and Business customers.

Residential customers are identified as customers with installed meter capacity of 10 cubic metres per hour or less, and include both houses and unit dwellings. All other Volume Class customers are classified as Business customers, and typically have an installed meter capacity of greater than 10 cubic metres per hour.

New customers for the Volume Class (past performance) have further been split into Residential New Homes, Residential New Units, Residential Existing Homes and Business customers. This split enables an analysis of individual market segment past performance, industry trends and forecasts. Conclusions from investigation into each market segment are useful in that they combine to give the total forecast of APT Allgas network demand for the coming AA period.

Customers and consumption are also split by geographic regions (as per Table 2-2). The 'Central Region' includes the Brisbane network, the 'Western Region' includes the Toowoomba and Oakey networks, and the 'Southern Region' includes the Gold Coast to Tweed Heads network (including neighbouring regions such as Yatala).

Demand Class

Demand Class customers consume 10TJ pa or more and are typically large industrial customers.

2 Volume Class

2.1 Customer numbers during the earlier Access Arrangement period

This section gives historical information regarding total customer numbers for the Volume Class for the current AA period, compared with the approved QCA numbers. Analysis of this historical information has been important in forecasting network performance for the upcoming AA period.

Table 2-1 below shows actual historical data for total Volume Class customers connected to the APT Allgas network in each year of the current AA period, and the QCA approved customer numbers for each year of the period.

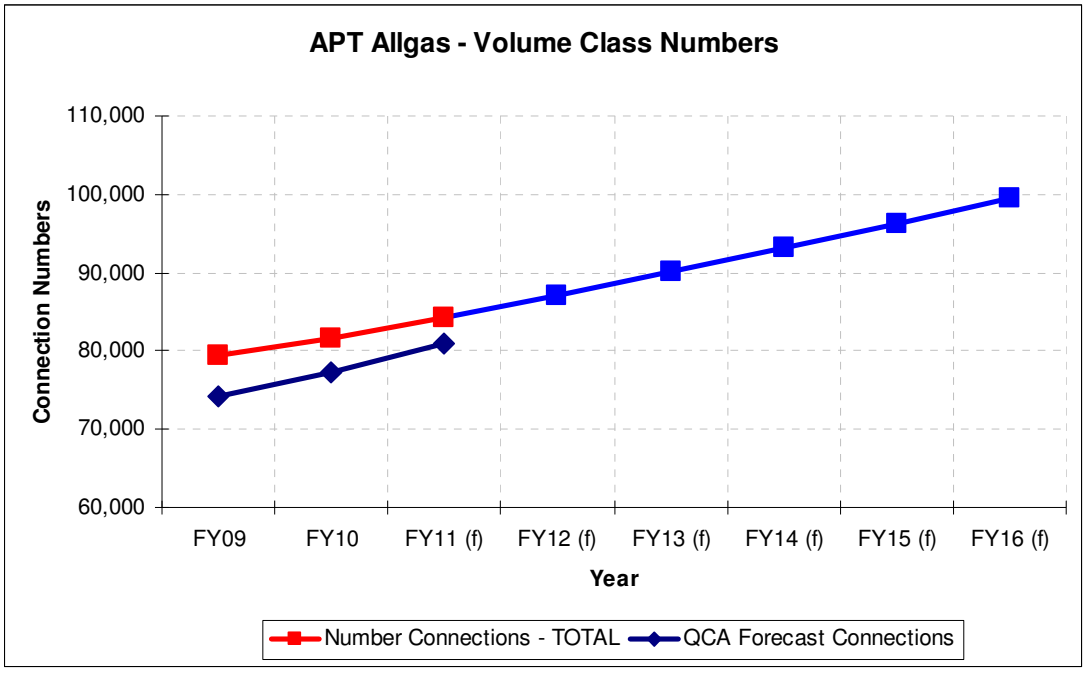
Customer connections are forecast to be 84,290 at the end of the current AA period against a target of 80,962.

Table 2-1 Volume Class customer numbers

Year	FY07	FY08	FY09	FY10	FY11 (f)
QCA Approved	68,910	71,434	74,197	77,283	80,962
APT Allgas network Actual	73,656	76,522	79,483	81,722	84,290

Figure 2-1 below shows customer numbers from FY07, compared with the approved QCA numbers.

Figure 2-1 Volume Class customer numbers from FY07



In 2007, APA Group purchased the Allgas natural gas network (changing the name to APT Allgas Energy Pty Limited) and in the same year, Full Retail Contestability (FRC) was introduced, effectively separating distribution networks from gas retailers. Independent systems were installed and DUOS was charged based on active MIRNs.

The FY10 figures for new Volume Class network connections, by customer segment, are detailed in Table 2-2 below. These figures are for new connections only, whereas the total customer numbers in Table 2-1 reflect both new connections and attrition caused by disconnections. These figures and customer segmentation are used as the base year for forecasting the coming AA period.

Table 2-2 FY10 full year figures by Volume Class customer segment

Region	New Homes	New Units	Existing Homes	Total Residential	Business	**Total**
Central Region	828	355	420	1,603	94	**1,697**
Western Region	135	58	45	238	4	**242**
Southern Region	727	311	138	1176	63	**1,239**
Total	**1,690**	**724**	**603**	**3,017**	**161**	**3,178**

2.2 *Customer numbers forecast methodology – Residential*

The FY10 actual new network connections have been used as the foundation for the upcoming AA period customer number forecast for Residential customers in the Volume Class.

Total customer connections were split into customer segments (New Homes, New Units, Existing Homes, Business) to enable analyses of each individual customer market. These investigations have been used to forecast APT Allgas network demand for the coming AA period for each customer segment, combining to give the total.

The Hanson Utilities Billing system (HUB) historically used for the APT Allgas network does not separate Residential connections into new home, new unit and existing home market segments. Residential connections were split between new dwellings and existing dwellings using historical network existing home connection numbers. New dwellings were split into new homes and new units using the Housing Institute of Australia (HIA) dwelling start forecasts.[2] It is reasonable to assume that new dwelling start trends in natural gas reticulated areas will follow new dwelling start trends for the entire market.

The HIA produce Quarterly Outlooks which include dwelling starts. The HIA uses macroeconomic analysis to forecast the impact of market factors on housing starts, including Government policy, employment rates, GDP, consumer confidence and inflation – both on a national and state level; as well as economic and industry indicators specifically relevant to the housing market, such as home lending, residential investment and building approval numbers.[3] Further details on this methodology can be found in Attachment 3.1.1, HIA Queensland State Outlook

[2] HIA Economics Group, 15/10/2010, *Long term dwelling start forecast* (see Appendix A)

[3] HIA Economics Group, 28/6/2010, *HIA Queensland State Outlook March 2010*

March 2010. Factors and results from the Quarterly Outlook are extrapolated to give the long term forecast.

This FY11 forecast was used as the basis for the upcoming AA period forecast, with further development using analysis of the market context for Residential customer segments, as detailed below in Sections 2.2.1 to 2.2.10.

2.2.1 Residential customers – New dwellings

The HIA Long Term Outlook[4] forecasts the number of new dwelling starts over the AA period (as detailed in Table 2-3 below). As the number of new dwelling starts is equal to the size of the opportunity for new fuel selection in the Residential new dwelling market, this forms the basis of the forecast increase in new home and new unit connections for the APT Allgas network.

Table 2-3 HIA Long Term Forecast – Dwelling Starts

Qld	Building Starts ('000)		Total ('000)	*Houses/Total*
	Houses	Multi-units		
2010/11	23.48	10.06	33.55	0.700
2011/12	27.54	10.71	38.25	0.720
2012/13	27.08	11.89	38.97	0.695
2013/14	27.58	12.11	39.69	0.695
2018/19	30.67	14.10	44.77	0.685

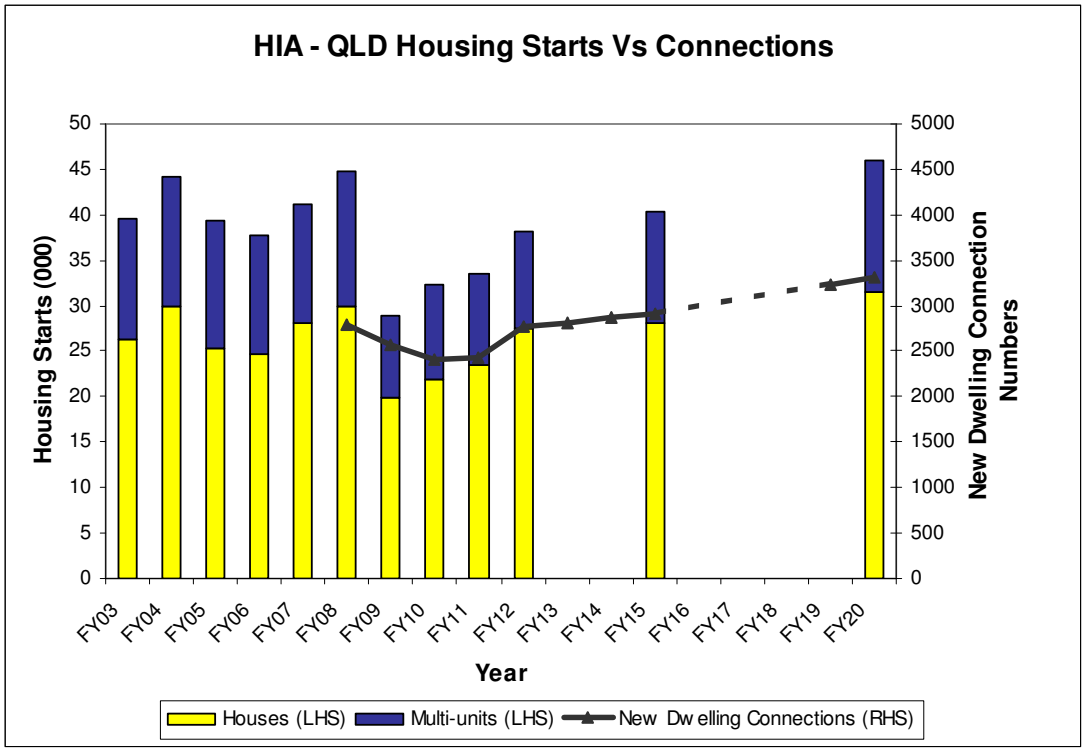
Historical new connection data for the Residential market is detailed in Figure 2-2 below, charted against the HIA historical dwelling starts.

In March 2006, the Queensland Government Sustainable Housing Code[5] came into effect, banning installation of electric hot water systems in new dwellings and effectively removing a major competitor in this market segment (electric resistance hot water). This contributed to an increase of natural gas appliance penetration in new dwellings from approximately 60% to approximately 90% in new estates where natural gas reticulation has been installed. New connection numbers follows the trend of new dwelling starts from FY06 onwards. Although new connection performance did not reflect the magnitude of the decline in new dwelling starts in FY09, new connections did experience a noticeable shift from increase to decline in the years following the dip in new dwelling starts.

[4] HIA Economics Group, 15/10/2010

[5] Department of Infrastructure & Planning Qld, 23/3/2010, www.dip.qld.gov.au/sustainable-housing/electric-hot-water-system-replacement

Figure 2-2 HIA dwelling starts vs new Residential network connections



2.2.2 Economic activity impacting the construction industry

As new dwellings account for 80% of new Residential network connections (FY10, see Table 2-2) customer number performance in the Volume Class is heavily reliant on the state of the construction industry.

The HIA forecasts a recovery in new housing starts (see Figure 2-2 above),[6] but from the low point of FY09.

2.2.3 Residential customers – Existing dwellings business as usual growth

Existing home new connections have been forecast to increase by 5% per year, in line with historical trends in this market segment. Further analysis of factors influencing the Residential market are provided in Section 2.2.4 to 2.2.8:

- Appliance selection

[6] HIA Economics Group, 15/10/2009, *Long term dwelling start forecast* (see Appendix A)

- Competition from electricity for cooking appliance selection
- Competition from electricity for space heating appliance selection
- Competition from other fuels for hot water system appliance selection
- Impact of gas marketing

2.2.4 Appliance selection

Natural gas in the Residential market is not purchased on the merits of the fuel itself. Rather, appliance selection drives the penetration of natural gas into this market. Factors affecting appliance selection differ between appliances. For example, drivers in the selection of hot water system include Government policy, cost and lead times for installation,[15] whereas the selection of a cooking appliance is more likely to be a lifestyle choice, driven by personal preference.

Therefore, natural gas customer numbers are dependent upon factors that influence the selection of natural gas hot water systems, cooking appliances, space heaters outdoor heaters, pool and spa heaters, and clothes dryers over appliances powered by electricity, solar or heat pump technologies.

2.2.5 Competition from electricity for cooking appliance selection

Electricity is essential to support current standards of living, and is automatically connected to every new home. Electricity is able to be used for all of the appliances listed above and therefore stymies the growth of new opportunities for natural gas appliance selection, as natural gas market share is impacted by home owners choosing not to replace their existing electric appliances, with appliances utilising another fuel.

The selection of gas for cooking is a lifestyle choice for home owners – with electricity connected to every home, natural gas is not essential for cooking. Further to this, the development of more responsive electric induction cooktops present increased competition with regards to natural gas' primary benefit over electric technologies for cooking – responsive, controllable heat.

2.2.6 Competition from electricity for space heating appliance selection

As discussed in Section 2.2.5 above, electricity is already connected to every home, and as such, natural gas is not essential for the purpose of home heating. Whilst heating demand on the APT Allgas network is small, an identifiable heating market exists in the Toowoomba region.

Moreover, the high penetration of reverse cycle air conditioning (as discussed in Section 2.6.5) means that consumers do not need to purchase an additional

appliance to meet their home heating needs. Reverse cycle air conditioners also offer operating cost advantages over conventional heating due to the increased coefficient of performance of these units (1 kw of electric input produces up to 4 kw of heating output). This makes operating costs of these units competitive with gas.

2.2.7 Competition from other fuels for hot water system appliance selection

Natural gas hot water systems are the largest gas consuming appliances used in Queensland domestic installations, consuming approximately 10 GJ/a compared with only 2 GJ/a for cooking appliances and 3 GJ/a for indoor heating appliances.

Electric hot water systems

Natural gas hot water systems face very real competition from electric hot water systems, particularly with the availability of off-peak electricity contracts for water heating. In 2008, Queensland recorded the highest level of off-peak electricity use for hot water systems, at 49%.[7] Figure 2-3 below shows the penetration of electric hot water systems in the Queensland Residential market.

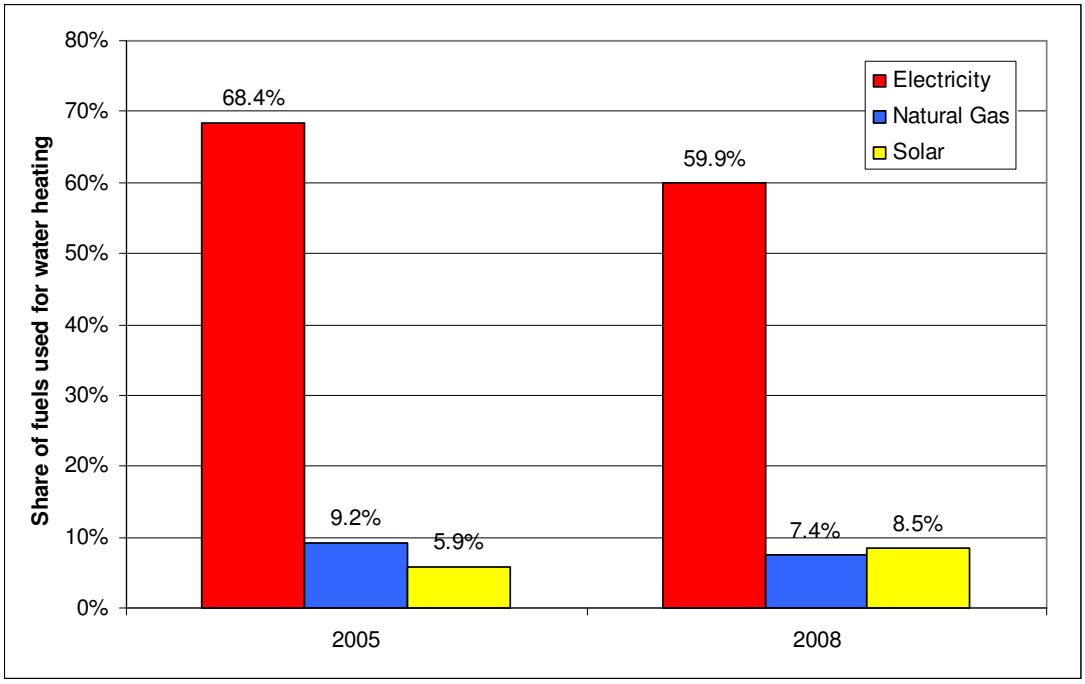
Hot water systems are the largest gas consuming appliances available for Queensland residential use and as such, the penetration of natural gas into the hot water market, relative to other fuels, is particularly important.

Solar hot water systems

Historical trends show a decline in use of electricity for water heating in Queensland. However, while gas was the clear 2nd preference earlier this decade,[8] solar has overtaken natural gas in recent years, as seen in Figure 2-3 below.[9]

[7] Australian Bureau of Statistics, March 2008, *Environmental Issues: Energy Use and Conservation*
[8] Australian Bureau of Statistics, March 2008, *Environmental Issues: Energy Use and Conservation*
[9] Australian Bureau of Statistics, March 2008, *Environmental Issues: Energy Use and Conservation*, p53.

Figure 2-3 Fuel used for water heating in Qld[7]



The percentages noted in Figure 2-3 do not total 100%. Other categories recorded in the ABS study but not shown in Figure 2-3 were wood, LPG and "Did not know".

While gas models (natural gas and LPG) currently enjoy a minor share of existing hot water systems nationally (15%), national sales figures in recent times show a clear shift towards renewable technologies such as solar and heat pump - 27% of new sales, more than 3 times that of gas models.[10] This statistic indicates that both natural gas and LPG market share is being significantly eroded, relative to the growth of solar hot water. It is also worth noting that the use of gas for water heating in Queensland, as seen in Figure 2-3 above, proportionate to other fuels, is lower than these national figures.

Solar hot water systems enjoy high awareness and well established 'sustainable/green' market positioning, due to Government financial support and combined extensive advertising and promotion by a well-resourced sales and manufacturer sector.

[10] Wilkenfeld and Associates, 2009, *Regulation Impact Statement: for Consultation. Phasing Out Greenhouse-Intensive Water Heaters in Australian Homes*, p21. Gas hot water market share (natural gas & LPG) was approximately 15% of existing stock in 2008, compared to 8% for solar. Gas hot water market share of new sales was 8% in 2008, compared to 27% for solar and heat pump.

The comparatively high cost to purchase and install a solar hot water system is mitigated by specific Government incentives and communications that reduce the initial capital cost of solar options to a more affordable range. There are no rebates or financial incentives available for choosing natural gas hot water.

Specific rebates and financial incentives for solar hot water purchase and installation include:

- RECs created by solar hot water lower the cost of purchase by up to $1,222.[11]
- The Federal Hot Water Rebate reduces the cost of purchase by $1,000 for solar hot water.[12]
- The Queensland Government Solar Hot Water Rebate offers a rebate of $600 (or $1000 for pensioners and low income earners) for installation of a solar hot water system.[13]

Heat pump hot water systems

Heat pump hot water systems are also eligible for the Government rebates and financial incentives listed above, including the Queensland Government Solar Hot Water Rebate, although amounts for some rebates and incentives differ.

Further to this, heat pump hot water systems are quick and easy to install, as they can be connected to the existing electricity supply. Similar to reverse cycle air conditioners, heat pump hot water systems also offer operating cost advantages over conventional storage systems due to the coefficient of performance associated with these units (1 kw electrical input produces 3-4 kw of heating).

As discussed in Appendix A, this is particularly important when an existing electric storage unit fails and the dwelling is not already connected to the natural gas network. A heat pump can be connected on the same day, whereas natural gas hot water selection imposes a time lag while natural gas is connected to the dwelling. This connection lead time can be up to 15 working days, during which time hot water is not available to the household.

[11] Dux, *www.hotwaterrebate.com.au*, viewed 15/9/10. Range based on Dux models – solar electric boosted 250L to solar gas boosted 400L. Heat pump RECs price fell in between the range. Actual RECS values may be higher, as the manufacturer does not necessarily pass the full value on to the customer.

[12] Federal Government Renewable Energy Bonus, *www.climatechange.gov.au/government-programs-and-rebates/solar-hot-water*

[13] Queensland Government, September 2008, *Queensland Renewable Energy Plan Solar Hot Water Rebate fact sheet*

2.2.8 Impact of gas marketing

Natural gas marketing activities are undertaken by APA Group in order to maximise the number of new connections to the network. The strategy focuses on specific appliance messages and targets specific market segments in order to achieve the maximum possible gas consumption per connection. Full details of marketing strategy and activities for the upcoming AA period can be found in the Network Development Plan attached.

Natural gas marketing seeks to overcome the inherent competitive disadvantages faced by natural gas in comparison with other fuel selections:

- Limitations in natural gas availability.
- Environmental impact (lower than coal-fired electricity, but higher than solar).
- Ineligibility for Renewable Energy Certificates and other Government rebates.
- More difficult and less timely installation, given the requirement to connect to infrastructure before installing appliances.
- Key influencers such as builders and plumbers being predisposed to specifying solar or heat pump hot water, due to ease of installation and the fact that gas appliance installation requires the employment of an additional tradesperson (gasfitter).

Natural gas marketing includes strategies for targeting messages to decision makers in homes and businesses, education of key influencers such as builders, plumbers and gasfitters, engagement of commercial and residential land developers, and specific promotions aimed at reducing the cost barrier to home connection, and incentivising key influencers. The benefits and impacts of natural gas marketing are discussed further in the APT Allgas Network Development Plan.

2.2.9 Residential customers – Existing dwellings: impact of new Sustainable Housing Laws on replacement of failed electric hot water systems

Queensland Government Sustainable Housing Laws are part of the Queensland's Climate Change Strategy, which include the Sustainable Housing Code 2006.[5] These new laws came into effect on January 1 2010, and extend the ban on installation of electric hot water system in new homes to apply to some existing homes. The installation of electric resistance hot water systems is banned in existing Class 1 buildings (houses and townhouses), where a natural gas network connection and meter can be installed at the property boundary at no cost to the home owner from the natural gas distributor. In such cases, when an electric resistance hot water system is replaced, it must be replaced with a "greenhouse efficient" hot water system. These include 5-star natural gas, 5-star LPG, solar and heat pump hot water systems.

The Emergency Hot Water Replacement File Note[14] details the analysis into the impact of new legislation on connections arising from replacement of failed electric hot water systems.

The report forecasts a 0% share of this market for the following reasons:

George Wilkenfeld & Associates, contend that the most influential factors in selecting a replacement hot water system when an existing unit fails are initial capital cost and speed of replacement.[15]

Speed of replacement is an area in which natural gas hot water systems are severely disadvantaged. Lead times for a new natural gas service and meter installation (10 to 15 working days) are a disincentive for home owners to select a natural gas hot water system, as the household would be without hot water during this period.

A preference for lowest initial capital cost at purchase will favour natural gas hot water in many cases. However, this is mitigated by specific Government incentives and communications that reduce the initial capital cost of solar and heat pump options to a more affordable range.

Natural gas selection is also disadvantaged by a lack of qualified installers. While 61% of home owners will make a plumber or hot water specialist their first point of contact in the case of hot water failure[16], only approximately 14% of plumbers listed in the Queensland Yellow Pages work with gas[17]. The remaining 72% have a clear disincentive to recommend a hot water unit that they are not qualified to install.

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[14] APA Group, 16/3/2010, *Emergency Hot Water Replacement File Note*

[15] Wilkenfeld and Associates, 2009, *Regulation Impact Statement: for Consultation. Phasing Out Greenhouse-Intensive Water Heaters in Australian Homes*, pp7, 41, 114:

- Running costs are less a factor than initial capital cost (purchase and installation) (p41), and that "…the cheapest capital option is often preferred" (p7).
- "Speed of replacement has historically been a factor reinforcing the tendency to replace electric with electric" (p114). It is logical to assume that speed of replacement will continue to be a factor when choosing an alternative to electric hot water.

[16] Wilkenfeld and Associates, 2009, *Regulation Impact Statement: for Consultation. Phasing Out Greenhouse-Intensive Water Heaters in Australian Homes*, p22. 61% of home owners call a plumber or hot water specialist for an emergency hot water replacement, and 20% of home owners defer to the recommendation of an external influencer when choosing a water heater.

[17] Sensis, www.yellowpages.com.au, viewed 15/9/10. Search for "Plumbers" in Queensland yielded 3240 results, search results refined by "gas system" yielded 436 results.

2.2.10 Residential customers – Existing dwellings: Impact of new Sustainable Housing Laws on voluntary replacement of electric hot water systems

APA Group has developed a multi-tiered campaign to encourage early (voluntary) replacement of electric hot water systems, leveraging the opportunity presented by the new Sustainable Housing Laws. This campaign has been active in the latter half of FY10 and includes an incentive based program and details of these marketing activities can be found in the Network Development Plan attached.

The Queensland Government has also engaged in marketing activities promoting awareness of the new laws.[18]

As at 30 June 2010, 19 new connections to existing homes have been recorded as a result of queries regarding the new legislation from owners of those properties. These new connections contribute to the 5% forecast growth per year (175 connections over the upcoming AA period) in existing homes.

2.2.11 Queensland Government Residential Gas Installation Rebate Scheme

During the previous AA period, the Queensland Government implemented the Residential Gas Installation Rebate Scheme, offering a $200-$500 rebate to home owners that replaced existing electric appliances with gas appliances. This Scheme ended on 31/8/2009.[19] The rebate did not generate a significant increase in new network connections. The removal of this incentive is therefore not expected to generate a significant decrease in new residential connections for the coming AA period, and has not been factored into the forecast methodology.

2.3 Customer numbers forecast methodology – Business

Volume Class new connection numbers for the Business market in FY11 have been forecast using FY10 numbers as the base with projections based on the increase in residential connections as described previously. This assumes that business connections will be in line with residential activity (given that the HIA Long Term Forecast, which is the basis of the APT Allgas residential connection forecast, uses a range of broader economic indicators) and is in line with APA Group's Marketing

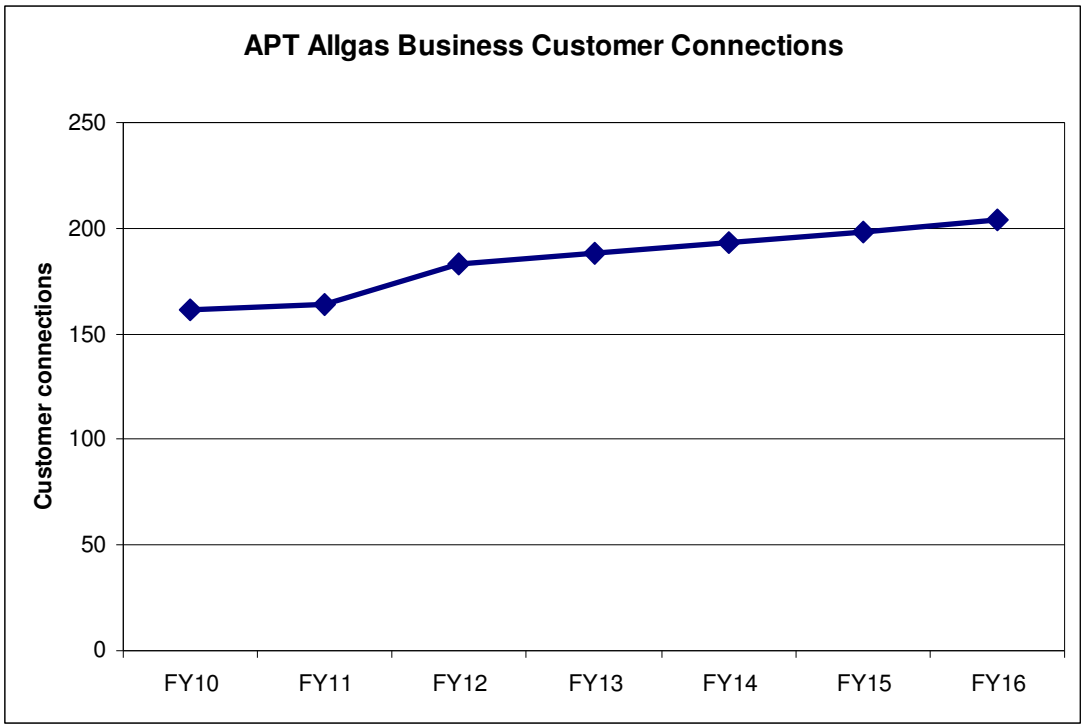
[18] The Department of Infrastructure & Planning engaged in generic newspaper advertising to promote their "ClimateSmart" initiative. A postcard regarding electric hot water replacement was also delivered via letterbox drop to affected suburbs in March 2010. This postcard, and a Fact Sheet regarding electric hot water replacement requirements are available on *www.dip.qld.gov.au/sustainable-living/electric-hot-water-system-replacement*

[19] Department of Mines & Energy Qld, 11/02/08, *Residential Gas Installation rebate Scheme Guidelines for Applicants, version 1*

Representative's forecasts of new Business connections based on previous experience and industry knowledge.

A graph of historical and forecast Business connections is shown in Figure 2-4 below:

Figure 2-4 Business customer historical and forecast new connections



2.4 Customer numbers forecast

Table 2-4 below shows the forecast total customer numbers for Volume Class for each year of the upcoming AA period.

Table 2-4 Volume Class historical figures and forecast

	FY07	FY08	FY09	FY10	FY11 (f)	FY12 (f)	FY13 (f)	FY14 (f)	FY15 (f)	FY16 (f)	AA Total
Number New Connections - Residential	N/A	N/A	3174	3,017	3,057	3,428	3,512	3,600	3,690	3,807	27,285
Number New Connections - Business	N/A	N/A	129	161	164	183	188	193	198	204	1,420
Number Disconnections - TOTAL	N/A	N/A	367	939	653	732	750	769	788	813	5,811
Number Connections - TOTAL at EOY	**73,656**	**76,522**	**79,483**	**81,722**	**84,290**	**87,169**	**90,119**	**93,143**	**96,243**	**99,441**	**N/A**
QCA Forecast Connections	**68,910**	**71,434**	**74,197**	**77,283**	**80,962**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

2.5 *Consumption during the earlier Access Arrangement period*

This section provides historical information regarding total consumption and average customer consumption for Volume Class customers for the current AA period, compared with the approved QCA volumes. Analysis of this historical information has been important in forecasting network performance for the upcoming AA period.

Table 2-5 below shows actual historical data for the total volume of gas consumed by Volume Class customers in each year of the current AA period, and the QCA approved consumption for each year of the period.

Volume Class consumption for the current AA period FY07-FY11 is forecast at 14,371 TJ compared to the QCA approved target of 16,100 TJ (-10.7%).

At the end of FY10, the average consumption was 10.2 GJ/a for residential connections with installed meter capacity of 10 cubic metres per hour or less against an assumed average of 13.6 GJ/a, which the regulator used in development of the current AA forecast.

Consumption of natural gas by residential households typically ranges from 0 GJ to 25 GJ per annum. Natural gas utilisation of 0 GJ to 3 GJs reflects gas consumption for cooking only. The maximum consumption of 25 GJ for residential customers reflects gas consumption that includes cooking, water heating, outdoor connections for BBQs, and space heating need, which is largely confined to the Western Region (Toowoomba) given climatic conditions.

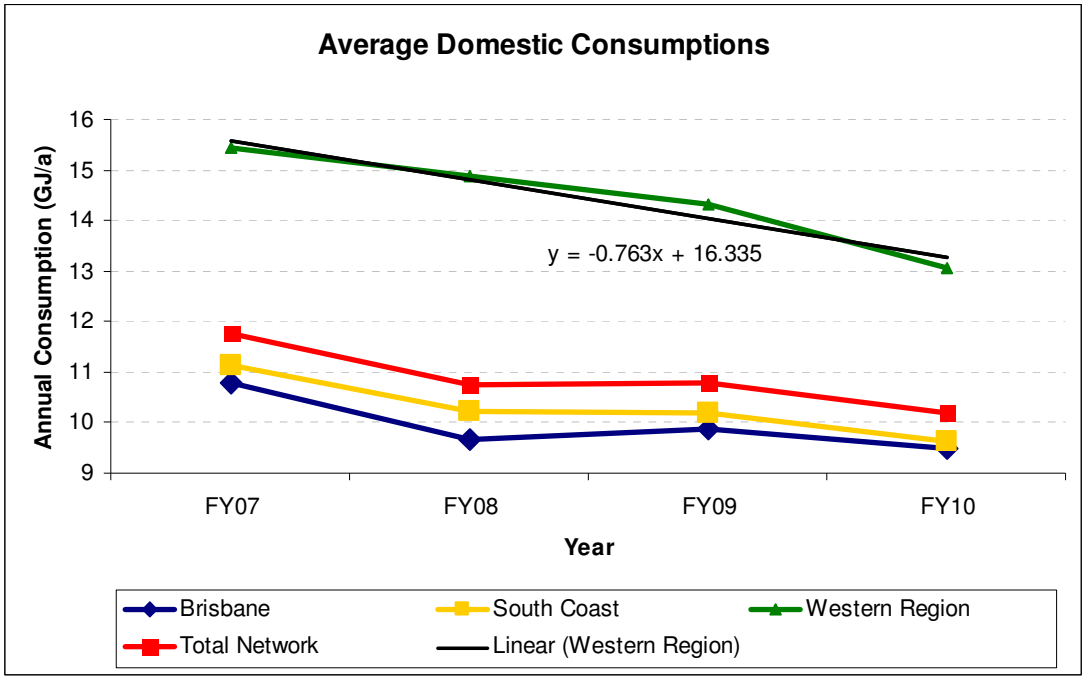
Table 2-5: Volume Class customer volume (in TJ)

Year	FY07	FY08	FY09	FY10	FY11 (f)	AA Total
QCA Approved	2,983	3,091	3,211	3,339	3,476	16,100
APT Allgas network Actual	2,896	2,920	2,912	2,800	2,844	14,371

Variances between the approved QCA customer volumes and APT Allgas network actual volumes are due to a decline in average consumption.

Figure 2-5 below shows average Residential consumption (defined as having a meter capacity of 10 cubic metres per hour or less) by region for the last three years.

Figure 2-5 Volume Class average customer volume, residential segment



Average consumption in the Western region has been affected by a variety of factors, including:

- Loss of heating load due to the emergence of reverse cycle air conditioning as an alternative to traditional gas fired heating appliances in Queensland.
- The ongoing water shortage in the Western Region, and associated usage restrictions.

Average consumption in Brisbane and the South Coast has also been affected by the introduction of water efficiency measures to combat the drought as evidenced by the step decrease in consumption from FY07 to FY08. These water efficiency measures have been shown to result in continued reduced average consumptions post the drought breaking in FY09 due to the continued behavioural and physical measures taken to reduce consumption during the drought period.

The ongoing effect of improvements in appliance efficiency, in particular the change from gas storage hot water systems to instantaneous systems, is forecast to provide ongoing reductions in overall consumption from the residential sector.

2.6 Consumption forecast methodology

For the purposes of forecasting the load from the Volume class residential customer group, the following actual consumption figures for FY10 were adopted as a base:

- 9.49 GJ per annum for residential consumers in the Central region; and
- 9.64 GJ per annum for residential consumers in the Southern region; and
- 13.07 GJ per annum for residential consumers in the Western region

Volume class residential average consumption has been forecast to decline in the Western region at the rate displayed over the last four years and consumption in all regions is forecast to reduce due to appliance upgrades. These appliance upgrades have been estimated to reduce the overall residential consumption by 5128 GJ per annum for the next ten years. This equates to the conversion of approximately 4,000 storage hot water systems per annum resulting in an average consumption reduction from 10 GJ/a for storage to 8.7GJ/a for instantaneous per unit and has been applied evenly over all regions based on the number of connections.

For Volume class business customers the average consumption for the three years FY08 to FY10 was adopted as a base and forecast to continue at these rates for the next AA period;

- 382.39 GJ per annum for business consumers in the Central region; and
- 553.12 GJ per annum for business consumers in the Southern region; and
- 322.76 GJ per annum for residential consumers in the Western region.

Disconnections have been projected to continue at historical rates over the next AA period with the proportion of business and residential disconnections based on the ratio of new connections for each year. Volume for disconnections has been assumed at the respective average for residential and business customers for each year with spread of disconnections assumed to occur evenly over the year.

Figure 2-6: Volume Class total gas consumption

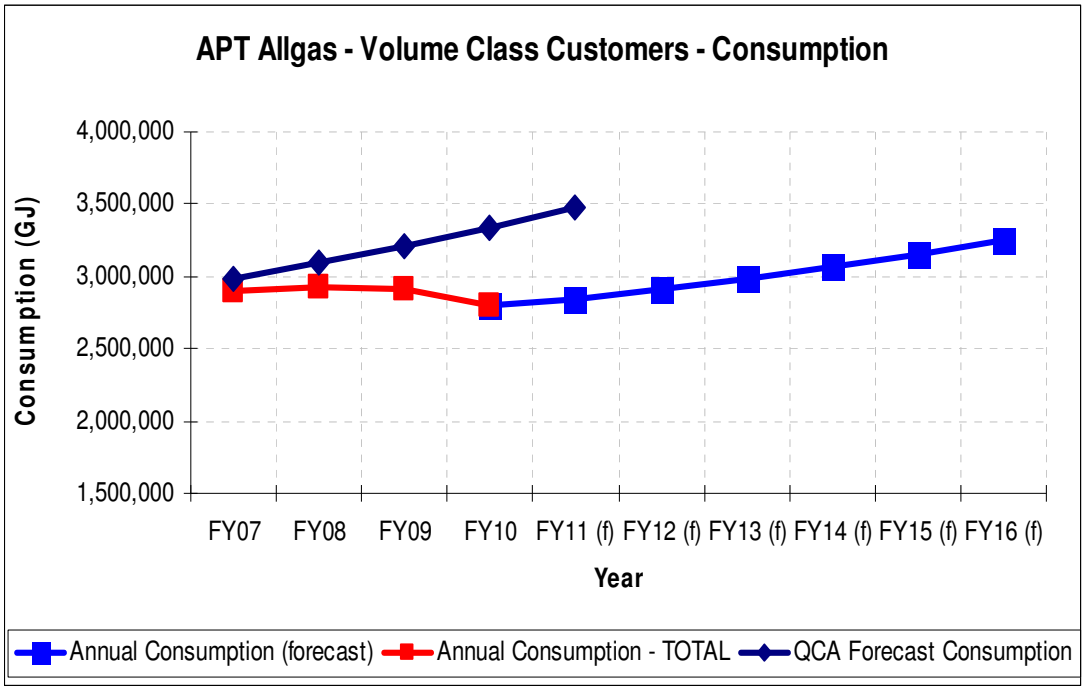


Figure 2-6 shows that historical consumption during the current AA period has consistently been below QCA forecast levels approved in the current AA. This reflects in the lower average per customer consumption, as per Figure 2-5.

2.6.1 Summary of factors influencing decline in average consumption

The decline in consumption for FY07 to FY08 is due primarily to the effect of drought on hot water usage and in turn gas consumption through water restrictions and the implementation of water efficient devices such as shower heads and washing machines.

Whilst water restrictions have been relaxed slightly, consumption trends remain low and the effects of changes to water efficient devices will result in lower levels continuing into the future.

Consumption in the Western region has also been affected by the loss of market share in the home heating market to reverse cycle air conditioners. Also water restrictions in Toowoomba and Oakey remain at high levels as these areas still have extremely low dam levels.

2.6.2 Selection of energy efficient appliances

MEPS and appliance energy ratings

Gas appliances carry energy efficiency labelling, showing star ratings up to a maximum of 6. Gas appliance labelling is a tool that allows consumers to select higher efficiency rated products, which reduce the consumption of gas for that household.

Minimum Energy Performance Standards for gas appliances have been proposed by the Equipment Energy Efficiency (E3) Committee (consisting of Government representatives at a Federal and State level) as a replacement for the current energy efficiency labelling system and have been a point of discussion in the industry for some years.

In light of higher expectations for appliance energy efficiency, several equipment manufacturers voluntarily manufacture natural gas hot water systems to higher energy efficiency levels.

This results in lower gas consumption for households equipped with an energy efficient natural gas hot water system. For example, a 5-star natural gas hot water system will use approximately 4040 MJ/a less gas than a 3-star natural gas hot water system.[20]

Further to this, Queensland Government legislation such as the Sustainable Housing Code for new homes (March 2006) and the new Sustainable Housing Laws for existing homes (January 2010) have set the minimum requirement for natural gas hot water systems being installed at a 5-star energy rating level.

6-star gas hot water

In line with this trend towards greater appliance energy efficiency, hot water system manufacturers are introducing 6-star natural gas hot water systems into the market.

A 6-star natural gas hot water system uses approximately 2020MJ less gas per annum than a 5-star natural gas hot water system.[21]

The availability of these appliances contributes to the decline of average gas consumption for residential users and will continue to do so as 6-star gas hot water models become more widely available.

[20] Department of Environment, Water, Heritage and the Arts, 2008, *Report: Water Efficiency Labelling for Instantaneous Gas Water Heaters*, p7, Table 3

[21] Department of Environment, Water, Heritage and the Arts, 2008, *Report: Water Efficiency Labelling for Instantaneous Gas Water Heaters*, p7, Table 3

Penetration of gas boosted solar hot water systems

While a customer installing a gas boosted solar hot water system contributes to network connections, the low gas usage of this appliance means that uptake of these appliances contributes to a lower average residential customer consumption.

Data available for new connections during Q4 FY10 on the APT Allgas network shows that gas boosted solar hot water systems amounted to 1% of newly installed hot water systems that use natural gas (95% are natural gas instantaneous models and 4% are natural gas storage models). Anecdotally, gas boosted solar hot water systems have stabilised at approximately 5% of the total hot water market.

2.6.3 Hot water conservation

Natural gas hot water systems are key to maintaining the average gas consumption in the residential market, consuming approximately 10 GJ/a compared with only 2 GJ/a for cooking appliances and 3 GJ/a for indoor heating appliances.

The impact of hot water conservation has been so significant as to require a revision of the approximate consumption for a natural gas hot water system for modelling purposes. Commencing FY11, APA Group has revised the GJ/a assumption for a natural gas hot water system from 10 GJ/a to 9 GJ/a.

Hot water conservation has a significant impact on average household gas consumption figures, and is affected by both water and energy saving practices.

For example, 74% of Australian households use cold rather than hot water in their washing machines, up from 61% in 1994.[22] However, hot water conservation is also affected by overall water conservation.

Drought awareness

Upon launching its "Target 140" Campaign in March 2007, the Qld Water Commission reported that water consumption in Queensland reduced by from 300L per person per day to 180L per day. Water consumption remains at low levels despite the relaxing of water restrictions, hovering around 150L per person per day during the snapshot period 6/8/2010 to 9/9/2010.[23]

For example and specifically with regards to use of hot water, in 2007 43% of Queenslanders reported taking shorter showers or showering less often.[24]

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[22] Australian Bureau of Statistics, March 2008, *Environmental Issues: Energy Use and Conservation*

[23] Queensland Water Commission website, viewed 15/9/2010, *www.qwc.qld.gov.au*

[24] Australian Bureau of Statistics, November 2008, *Environmental Issues: People's Views and Practices*, p53, fig 4.11

Water saving appliances and devices

By 2007, almost 60% of Queensland households had low flow shower heads installed, compared with approx 36% in 2001 and less than 24% in 1994.[25]

The Queensland Government encourages use of low flow shower heads, offering a 'ClimateSmart Home Service' for $50 that includes the replacement of one existing shower head (Brisbane City Council offer a $50 ClimateSmart Home Service rebate to residents, making this service free for Brisbane residents).

In a 2008 ABS (Australia-wide) study, water efficiency was ranked as the most important factor when purchasing a washing machine (49%).[26]

This change in the appliance mix represents a structural change in the marketplace. While many customers have opted to install water efficient devices in response to the incentives, APT Allgas considers it unlikely that customers will revert to high usage fixtures and appliances, even if water restrictions are completely removed. In short, this reduction in usage per customer is likely to be a permanent reduction, not one which is expected to recover.

2.6.4 Government policies and initiatives

5 & 6 star housing standards in Queensland

From 1 May, 2010, all new houses and townhouses built in Queensland are required to satisfy a minimum 6-star energy rating.[27] Qualifications for the rating include the use of passive design principles, insulation and building materials used, as well as credits for solar photovoltaic panels and use of outdoor living areas.

While the new standards are designed to reduce residential energy consumption, they present some opportunities for natural gas as a low carbon emission fuel, and the recognition of outdoor living spaces presents some opportunities for small increases in gas consumption per household via barbecues and outdoor heating (albeit these appliances, individually, use almost no gas per annum).

[25] Australian Bureau of Statistics, 2007, *Environmental Issues: People's Views and Practices 2007*, p47, fig 4.4

[26] Australian Bureau of Statistics, November 2008, *Environmental Issues: Energy Use and Conservation*, p69

[27] Department of Infrastructure & Planning Qld, May 2010, 6-*star energy equivalence rating for houses and townhouses* Fact Sheet

'Switch on Gas'

Switch on Gas is the Ministerial Council for Energy's 10 year strategy (2005-2015) to improve energy efficiency of gas appliances and equipment, via regulation of energy efficiency standards.

The strategy aims to reduce the consumption of gas by more than 5% over this period, by increasing appliance and equipment efficiency.[28]

While the strategy will not affect forecast connections to the network, it is reflected in the declining average consumption per customer.

The strategy aimed to implement MEPS for gas appliances during the period 2012-2015, which coincides with the upcoming AA period.

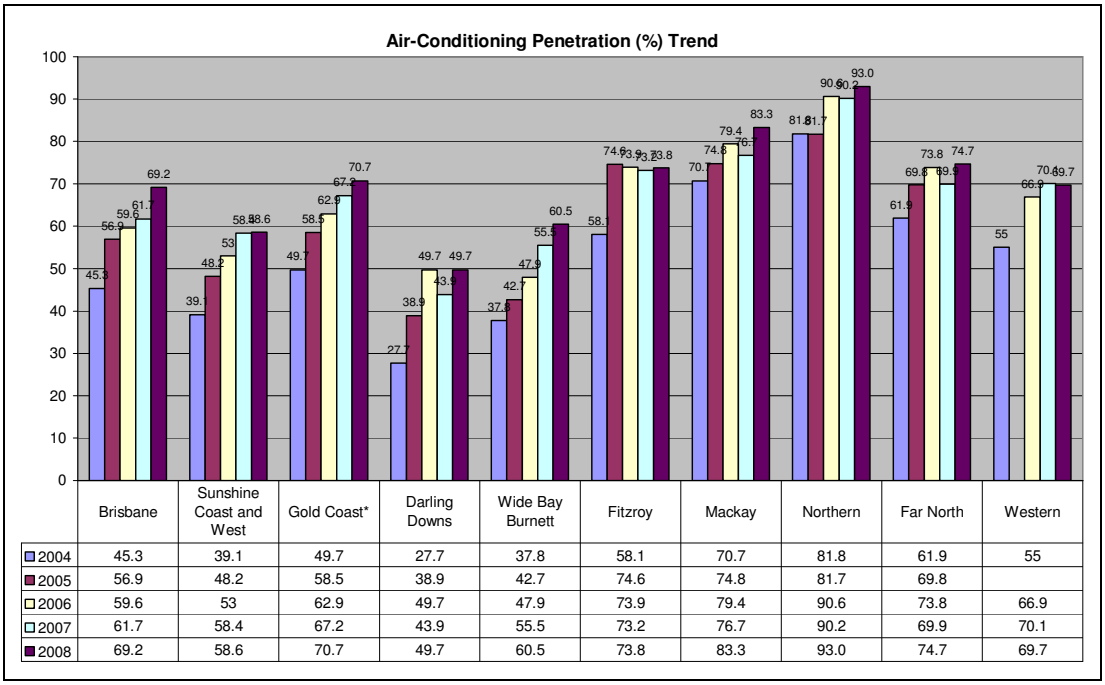
2.6.5 Reverse cycle air conditioners

The growth of reverse cycle air conditioning in the heating and cooling appliance market is shown in Figure 2-7.[29] This is significant, as a reverse cycle air conditioner can meet all the home heating needs of a typical Queensland household without a requirement for the customer to invest in a separate (gas consuming) space heating appliance.

[28] Office of the Government Statistician, Department of Mines & Energy , May 2008, *Air-Conditioning Penetration Trend, Queensland Household Survey*

[29] Energy Efficient Strategies, 2006, *Status of Air Conditioners in Australia*, pp42-43

Figure 2-7 Reverse Cycle Air Conditioning share of all cooling types in Qld



	Brisbane	Sunshine Coast and West	Gold Coast*	Darling Downs	Wide Bay Burnett	Fitzroy	Mackay	Northern	Far North	Western
2004	45.3	39.1	49.7	27.7	37.8	58.1	70.7	81.8	61.9	55
2005	56.9	48.2	58.5	38.9	42.7	74.6	74.8	81.7	69.8	
2006	59.6	53	62.9	49.7	47.9	73.9	79.4	90.6	73.8	66.9
2007	61.7	58.4	67.2	43.9	55.5	73.2	76.7	90.2	69.9	70.1
2008	69.2	58.6	70.7	49.7	60.5	73.8	83.3	93.0	74.7	69.7

2.6.6 New technologies

In order to address erosion of consumption in the Residential market by reverse cycle air conditioning and other technologies, APA Group proposes to create a new activity to coordinate the development and deployment of new gas technologies. The purpose and scope of this role is detailed in Appendix B Development and Deployment of New Technology. If the proposal is accepted, the impact of new technology projects will most likely be seen in the AA period FY17 to FY21. A full discussion on the benefits of the proposed role can be found in the APT Allgas Network Development Plan.

2.7 Consumption forecast

Table 2-6 below shows the forecast consumption for Volume Class customers for each year of the upcoming AA period.

This table forecasts a 1 GJ/a decline in average residential consumption from FY09 until the end of the upcoming AA period, FY16 (approximately 1%). This forecast is based on recent historical decline, factoring in market trends and public policy, as

detailed in Section 2.6 above, and includes a stabilisation of average residential consumption from FY14 onwards.

Table 2-6: Volume Class historical figures and forecast

	FY07	FY08	FY09	FY10	FY11 (f)	FY12 (f)	FY13 (f)	FY14 (f)	FY15 (f)	FY16 (f)	AA Total
Av Consumption Residential (GJ/a)	11.8	10.8	10.8	10.2	9.8	9.6	9.4	9.2	9.2	9.1	N/A
Number of residential customers	68,076	71,242	74,624	76,983	79,420	82,153	84,953	87,824	90,766	93,801	N/A
Residential customer consumption (GJ)	801,155	766,404	804,525	785,010	780,651	789,260	799,124	809,133	831,254	853,978	N/A
Av Consumption Business: (GJ/a)	375.33	407.86	433.50	425.15	423.73	422.38	422.96	423.52	424.08	424.59	N/A
Number of business customers	5580	5280	4860	4739	4870	5016	5166	5319	5477	5640	N/A
Business customer consumption (GJ)	2,094,358	2,153,500	2,107,047	2,014,749	2,063,454	2,118,504	2,184,805	2,252,901	2,322,795	2,394,641	N/A
Volume Class Total Consumption (GJ)	**2,895,513**	**2,919,904**	**2,911,572**	**2,799,759**	**2,844,104**	**2,907,763**	**2,983,929**	**3,062,033**	**3,154,049**	**3,248,618**	**27,727,245**
QCA Forecast Consumption (GJ)	**2,983,000**	**3,091,000**	**3,211,000**	**3,339,000**	**3,476,000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

3 Demand Class

3.1 Customer numbers during the earlier Access Arrangement period

This section provides historical information regarding total customer numbers for Demand Class customers for the current AA period, compared with the approved QCA numbers and volumes. Analysis of this historical information has been important in forecasting network performance for the upcoming AA period.

Table 3-1 below shows actual historical data for total Demand Class customers connected to the APT Allgas network in each year of the current AA period, and the QCA approved customer numbers for each year of the period.

Table 3-1: Demand Class customer numbers

Year	FY07	FY08	FY09	FY10	FY11 (f)
QCA Approved	113	114	115	116	117
APT Allgas network Actual	108	109	114	102	101

Actual figures have been consistently below the forecast figures approved by the QCA for the current AA period. Demand Class customer numbers are particularly sensitive to economic conditions:

- Customer number growth is affected by economic drivers as the decision to replace existing equipment is subject to cost and Return on Investment (ROI) assessment.
- Economic conditions impact business start ups and closures.

3.2 Customer numbers forecast methodology – Demand customers

Demand customer numbers have been forecast to increase over the upcoming AA period from a forecast 100 in FY11 to 105 in FY16. Demand Class customers are generally large commercial and industrial operations that are heavily dependent on a number of external factors that are not influenced by APT Allgas. The forecast assumes that connection rates will continue in line with historical averages and that the existing customer base will remain unchanged. These assumptions have been derived from analysis of historical information and discussions with large end users

and retailers operating in this market. The drop off in customer numbers between FY10 and FY11 represents known losses of loads including the transfer of one large end user from supply off the APT Allgas network to direct supply off the Roma to Brisbane pipeline and a number of Demand Class to Volume Class downgrades.

3.3 Customer numbers forecast

Table 3-2 below shows the forecast total customer numbers for Demand Class for each year of the upcoming AA period.

Table 3-2: Demand Class historical figures and forecast

Year	FY07	FY08	FY09	FY10	FY11(f)	FY12(f)	FY13(f)	FY14(f)	FY15(f)	FY16(f)
Zone 1	26	26	30	27	27	27	28	28	28	28
Zone 2	23	24	25	22	21	22	22	22	22	23
Zone 3	19	18	19	18	19	19	19	19	20	20
Zone 4	7	7	8	9	9	9	9	10	10	10
Zone 5	6	6	6	5	5	5	5	5	5	5
Zone 6	10	10	10	8	8	8	8	8	8	8
Zone 7	5	5	4	5	4	4	4	4	4	4
Zone 8	9	10	9	5	5	5	5	5	5	5
Zone 9	2	2	2	2	2	2	2	2	2	2
Zone 10	1	1	1	1	1	1	1	1	1	1
Total Connections	**108**	**109**	**114**	**102**	**101**	**102**	**103**	**104**	**105**	**106**
QCA Forecast Connections	**113**	**114**	**115**	**116**	**117**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

3.4 Consumption during the earlier Access Arrangement period

Table 3-3 below shows actual historical data for the total volume of gas consumed by Demand Class customers in each year of the current AA period, and the QCA approved consumption for each year of the period.

Total volume for the current AA period FY07-FY11 is forecast at 51,411 TJ against the approved target of 53,768TJ (-4.4%), with Demand Class consumption forecast at 37,020 TJ against target of 37,668TJ (-1.7%).

At the end of June 2010 Demand Class customer volume was 7,666 TJ/a and at the start of the next regulatory period is forecast to be 6,970 TJ/a increasing over the period to 7,030 TJ/a (note: step decrease of a large end user coming off-line at the end of FY10). See Appendix C MDQ & MDH Forecasts for upcoming AA period.

Table 3-3: Demand Class customer volume (in TJ)

Year	FY07	FY08	FY09	FY10	FY11 (f)	AA Total
QCA Approved	7,355	7,443	7,533	7,623	7,714	37,668
APT Allgas network Actual	7,154	7,679	7,565	7,666	6,955	37,020

Interval Meter Roll Out

The interval meter roll out program has increased the number of customer sites with interval metering equipment installed from the top 33 to all Demand Class customers nominally consuming >10 TJ/a. Prior to this Demand Class customers with basic meters installed had their MDQ estimated by applying a load factor of 1.1 to the average daily consumption derived from monthly manual meter reads. Generally MDQ were set based either on historical peaks or in the case of new customers assumed load profiles. In some circumstances these assumptions have either underestimated or overestimated the site MDQ.

With interval metering, more accurate and timely data has raised the awareness of MDQ nominations and a large number of resets have been occuring. It is anticipated that the number of resets will diminish going forward and that a more accurate MDQ profile will emerge.

3.5 Consumption forecast methodology

Demand Class forecasts for the next AA period have been developed through the following process:

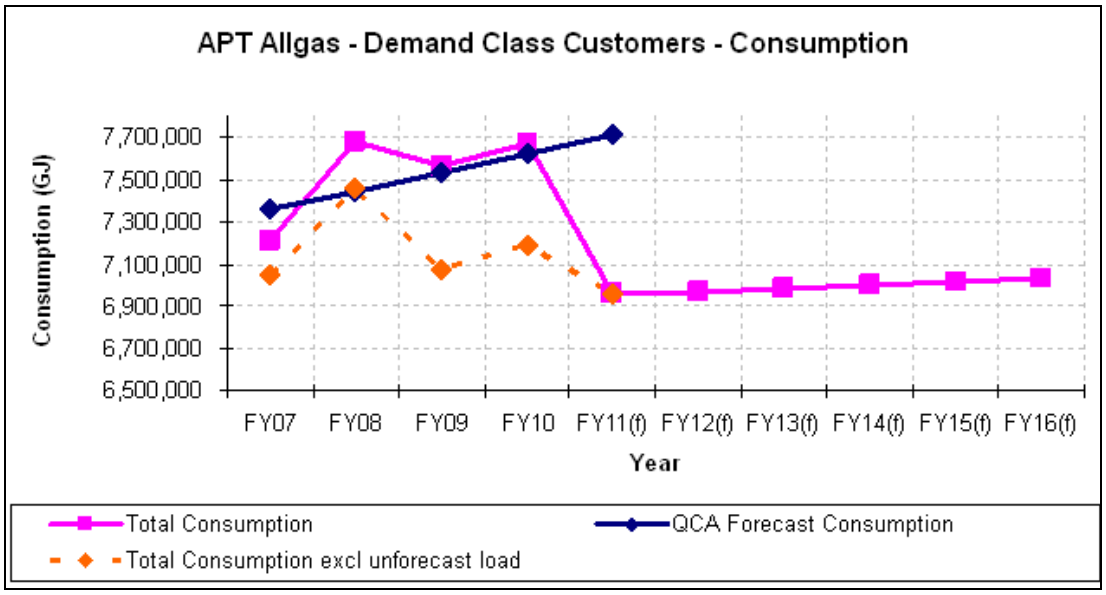
- Review of historical demand
- Holding discussions with largest users
- Analysis of industry group trends

The roll out of interval metering to all Demand Class customers is providing more detailed usage information and is altering some assumptions previously made about MDQ for basic metered sites. This is expected to settle down over the remainder of FY10 with the roll out program completed at the end of FY09. In particular this affected end users with relatively poor load factors.

A review of end users in December 2008 saw a number of larger end users upgrade from Volume Class to Demand Class and some smaller end users downgrade.

Figure 3-1 below shows the historical consumption trend since FY07 against QCA approved consumption forecasts and actual consumption with the unforecast load removed.

Figure 3-1: Demand Class Consumption historical trends



As shown, demand volumes have increased from FY07 to FY10 primarily due to the effect of the unforecast load which came on line in FY07 and is contracted to switch to direct supply off the Roma to Brisbane Pipeline at the start of FY11.

This trend of slight growth in demand volume is forecast to continue over the next regulatory period. Detailed forecast of volume, MDQ and MHQ are shown in Appendix A.

3.5.1 Existing customer survey

A survey of 25 of the top Demand Class customers was conducted either directly with the customer or with the responsible retailer.

In general the indication of future loads was 'business as usual' with mainly slight increases forecast. No significant issues were identified through this process and as such future projections based on recent historical trends was considered prudent.

As these discussions necessarily involved commercially confidential information related to each customer, no detail is provided in this document. Discussion notes will be provided confidentially to the AER on request.

3.5.2 Organic Growth

Historical trends over the last three years indicate steady consumption over the current AA period and this is assumed to continue with small incremental growth from increases in customer numbers which are assumed to be spread over Demand zones 1 to 4. These zones have traditionally been the largest growth zones for new demand loads. Each new connection is assumed to have an MHQ of 10 GJ/h, MDQ of 100 GJ/d and consume 15,000 GJ/a.

3.5.3 Carbon Pollution Reduction Scheme (CPRS), or similar

Given the uncertainty surrounding the format and timing of a Government CPRS initiative, the impacts of a potential CPRS are difficult to gauge and have therefore not been factored into APT Allgas forecast figures for the coming AA period.

3.6 Consumption forecast

Table 3-4 below shows the forecast consumption for Demand Class customers for each year of the upcoming AA period.

Table 3-4: Demand Class historical figures and forecast (rounded to the nearest TJ)

Year	FY07	FY08	FY09	FY10(f)	FY11(f)	FY12(f)	FY13(f)	FY14(f)	FY15(f)	FY16(f)	AA Total
Vol Zone 1	2,156	2,128	1,863	2,059	2,047	2,047	2,062	2,062	2,062	2,062	
Vol Zone 2	1,207	1,370	1,591	1,617	1,123	1,138	1,138	1,138	1,138	1,153	
Vol Zone 3	2,316	2,369	2,243	2,327	2,342	2,342	2,342	2,342	2,357	2,357	
Vol Zone 4	363	396	426	423	423	423	423	438	438	438	
Vol Zone 5	144	138	129	116	116	116	116	116	116	116	
Vol Zone 6	236	275	298	257	257	257	257	257	257	257	
Vol Zone 7	315	515	501	362	142	142	142	142	142	142	
Vol Zone 8	190	223	233	234	234	234	234	234	234	234	
Vol Zone 9	94	87	91	72	72	72	72	72	72	72	
Vol Zone 10	188	177	191	198	198	198	198	198	198	198	
Total Consumption	**7,208**	**7,679**	**7,565**	**7,666**	**6,955**	**6,970**	**6,985**	**7,000**	**7,015**	**7,030**	**34,999**
QCA Forecast Consumption	**7,355**	**7,443**	**7,533**	**7,623**	**7,714**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

4 Minimum, maximum and average demand by tariff class and service

Table 4-1 below shows the aggregated network total daily Demand for each year of the current and upcoming AA period. These figures have been derived from aggregating daily injection data from all network gate station supply points into the network and forecast end user demand and network UAG.

Table 4-1: Network Demand historical figures and forecast

Year	FY06	FY07	FY08	FY09	FY10	FY11(f)	FY12(f)	FY13(f)	FY14(f)	FY15(f)	FY16(f)
Minimum Demand (TJ/d)	11.83	12.28	12.77	14.38	13.24	12.14					
Maximum Demand (TJ/d)	36.52	42.29	42.15	41.72	40.15	38.52	38.66	39.06	39.37	39.75	40.02
Average Demand (TJ/d)	27.48	29.60	30.22	29.87	30.12	27.99	28.09	28.38	28.61	28.88	29.08

A HIA Long Term Dwelling Forecast

Housing Starts, by type			
	Building starts ('000)		
Qld	**Houses**	**Multi-units**	**Total**
2002/03 (a)	26.38	13.23	39.61
2003/04 (a)	29.83	14.41	44.23
2004/05 (a)	25.25	14.11	39.36
2005/06 (a)	24.71	13.03	37.74
2006/07 (a)	28.21	12.96	41.17
2007/08	29.95	14.81	44.76
2008/09	19.96	8.86	28.82
2009/10	21.91	10.33	32.24
2010/11	24.48	10.06	33.55
2014/15	28.08	12.32	40.41
2019/20	31.44	14.46	45.90

(a) = actual

B Development and Deployment of New Technology

Gas is currently utilised for limited residential applications, primarily water heating, cooking, and space heating. This Business Case argues for the employment of additional dedicated resources, whose sole objective is to investigate new technological improvements to gas fuelled equipment and to facilitate the introduction of these appliances into the Queensland market.

Potential new applications include gas-fired air-conditioning, gas-fired combined absorption chilling/heating/hot water, natural gas for vehicles, embedded generation, small scale cogeneration, micro-cogeneration, and fuel cells.

This additional expenditure would be required for the upcoming AA period. Given the long-term outlook of this function, increases in revenue would not be expected until the AA period commencing FY17.

A full discussion of this proposed expenditure can be found in the Network Development Plan.

C MDQ & MDH Forecasts for upcoming AA period

	FY07	FY08	FY09	FY10(f)	FY11(f)	FY12(f)	FY13(f)	FY14(f)	FY15(f)	FY16(f)
MDQ Zone 1	10,153	10,128	11,878	11,247	11,247	11,247	11,347	11,347	11,347	11,347
MDQ Zone 2	6,938	7,385	7,546	7,778	5,895	5,995	5,995	5,995	5,995	6,095
MDQ Zone 3	8,972	8,800	8,550	8,871	8,971	8,971	8,971	8,971	9,071	9,071
MDQ Zone 4	1,975	1,997	2,454	2,569	3,044	3,044	3,044	3,144	3,144	3,144
MDQ Zone 5	706	746	749	633	633	633	633	633	633	633
MDQ Zone 6	1,099	1,185	1,250	1,330	1,330	1,330	1,330	1,330	1,330	1,330
MDQ Zone 7	2,272	2,272	2,234	2,120	956	956	956	956	956	956
MDQ Zone 8	1,031	1,249	1,296	1,308	1,308	1,308	1,308	1,308	1,308	1,308
MDQ Zone 9	438	438	438	552	552	552	552	552	552	552
MDQ Zone 10	887	887	887	912	912	912	912	912	912	912
MDQ – Billed (GJ/d)	**34,473**	**35,087**	**37,282**	**37,319**	**34,847**	**34,947**	**35,047**	**35,147**	**35,247**	**35,347**
QCA Forecast MDQ	**30,345**	**30,628**	**31,022**	**31,418**	**31,817**					

	FY07	FY08	FY09	FY10(f)	FY11(f)	FY12(f)	FY13(f)	FY14(f)	FY15(f)	FY16(f)
MHQ Zone 1	693	693	959	911	911	911	921	921	921	921
MHQ Zone 2	499	531	568	535	457	467	467	467	467	477
MHQ Zone 3	607	589	606	599	609	609	609	609	619	619
MHQ Zone 4	177	177	252	262	262	262	262	272	272	272
MHQ Zone 5	74	74	74	62	62	62	62	62	62	62
MHQ Zone 6	116	116	116	99	99	99	99	99	99	99
MHQ Zone 7	186	186	178	186	111	111	111	111	111	111
MHQ Zone 8	144	144	139	95	95	95	95	95	95	95
MHQ Zone 9	52	52	52	52	52	52	52	52	52	52
MHQ Zone 10	44	44	44	44	44	44	44	44	44	44
MHQ - Billed (GJ/h)	**2,592**	**2,606**	**2,988**	**2,846**	**2,703**	**2,713**	**2,723**	**2,733**	**2,743**	**2,753**
QCA Forecast MHQ	**2,337**	**2,337**	**2,337**	**2,337**	**2,337**	**2,337**				