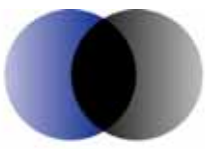
Market Outlook for the Roma (Wallumbilla) to Brisbane Gas Pipeline

Comparison of APA Forecasts with ACIL Tasman's independent market assessment

Prepared for Australian Pipeline Trust

2 December 2005



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Boxes, charts, figures and tables

Executive summary

This report provides an independent review of forecasts prepared by Australian Pipeline Trust (APA) of gas throughput on the Roma (Wallumbilla) to Brisbane Pipeline (RBP). The APA forecasts have been prepared in the context of a regulatory review of access arrangements for the RBP scheduled in 2006.

In order to form an opinion as to the reasonableness of the APA forecasts, ACIL Tasman has undertaken a comparison with its own independently developed forecasts for gas demand in the markets serviced by the RBP. The report provides a comparison of the forecasts together with commentary on the similarities and differences between the forecasts.

On the basis of this analysis we consider the APA forecast of gas throughput on the RBP to be reasonable. While there are some differences in the assumptions relating to new entrant gas-fired power generation, and to the long-term future of [Confidential], we consider the APA positions in relation to these components of the market are within the bounds of reasonable probability. In any case, these differences do not result in any significant divergence in the forecasts until after 2011. With the exception of these specific differences, there is a close correlation between APA's forecast and ACIL Tasman's independently developed view of gas demand in the region serviced by the RBP.

1 Introduction

Australian Pipeline Trust (APA) has engaged ACIL Tasman Pty Ltd (ACIL Tasman) to provide an independent review and critique of APA's forecasts for gas throughput on the Roma (Wallumbilla) to Brisbane Pipeline (RBP). The RBP is a 440km gas pipeline that transports gas from Wallumbilla (approx 40km east of Roma to Gibson Island (east of Brisbane city).

The APA forecasts have been prepared in the context of a regulatory review of access arrangements for the RBP scheduled in 2006.

ACIL Tasman has compared the APA forecasts with its own independently developed forecasts for gas demand in the markets serviced by the RBP. This report provides a comparison of the forecasts, commentary on the similarities and differences between the forecasts, and an opinion as to the reasonableness of the forecasts prepared by APA.

2 The market for services on RBP

The main market serviced by the RBP is the South East Queensland region, comprising Brisbane, Toowoomba and the Gold Coast.

The RBP also services mid-line loads (both existing and under development) at Oakey (existing Oakey power station) and Dalby region (town reticulation plus Braemer power station under construction).

This report focuses on the annual gas throughputs associated with supply of gas to these loads, rather than on the pipeline capacity required to meet these loads (taking into account diurnal and seasonal load swings) or the various forms of transport service that may be sought by different customers.

3 APA Forecast

The APA forecasts were presented to ACIL Tasman in the form of an Excel® file containing aggregate throughput forecasts for the RBP for the period 2006 to 2025. Five years of historical actual data (2001 to 2005) was also provided.

These forecasts were prepared in July 2005, prior to the release of:

- NEMMCO 2005 Statement of Opportunities (October 2005)
- Allgas and Envestra Queensland gas networks Access Arrangements (October 2005)

3.1 Summary of APA forecast

The APA forecast of throughput on RBP is summarised in Figure 1.

Figure 1 **APA Forecast of RBP throughput volume**

[Confidential]

Data source: APA

The historical data shows throughput rising from 30PJ in 2001 to 48PJ in 2005. [Confidential]

3.2 APA commentary on forecast

3.2.1 General Methodology

The APA forecasts were derived via the following steps:

1. Modelling current contracted capacity
2. Modelling a continuation of current contracted capacity beyond the term of the contract where appropriate
3. Modelling organic growth in current capacity, such as expansion of an existing power station, organic growth of residential loads etc
4. Modelling expansion loads (largely power generation)

3.2.2 General Assumptions

The APA forecasts are based on the following strategic assumptions:

- no new alternative pipelines directly supply the Brisbane market (that is, no bypass)
- any gas supply to SE Queensland from the proposed PNG pipe will flow through the RBP and replace gas from current sources
- sufficient gas exists to meet demand
- the RBP capacity is expanded to meet new loads in a timely manner
- the RBP is not extended to any new geographical markets

3.3 Market Overview and Forecast

3.3.1 Residential and Commercial

APA notes that growth in demand for gas transportation for residential and commercial markets has historically been driven by organic growth in the retail gas market, which continues to grow at approximately 3% p.a.

It is noted that the gas distribution network operators (Energex, Origin) have forecast lower load growth (1.5%- 2%) in their Access Arrangement submissions released in October 2005. In regard to these submissions APA notes that:

- these submissions are not final and may be subject to review by the regulator
- customer numbers are growing at 3.25% to 4%
- gas market FRC is planned for 2007 which may increase market choices and reduce prices resulting in some growth

3.3.2 Industrial Market

The major industrial gas user (non-power station) in the south-east Queensland market is the fertiliser plant at Gibson Island. [Confidential]

3.3.3 Power Generation Market

In recent years step changes in growth have occurred in the power generation market. This growth has been influenced by

- the availability of competitively priced gas from Coal Seam Methane (CSM) fields and
- changes in within the electricity market including:
  - Queensland Energy Policy – 13% Gas Scheme. In 2000 the Queensland Government released an energy policy that included a requirement for

Queensland electricity retailers to source 13% of their electricity from gas-fired generation by 1 January 2005.

- Electricity Transmission Interconnection and the National Market. The development of a national market and transmission infrastructure supports the ability of power generated in south-east Queensland to be sold into interstate markets.
- General Electricity Supply and Demand Growth. Electricity demand in Queensland is growing at 3% to 4% per year. Additional generation, particularly peak and intermediate power stations will be required in the short to medium term.

APA expects these factors to continue to positively influence the development of gas usage for power generation in the south-east Queensland region. Using modelling based on the 2004 NEMMCO Statement of Opportunities, APA conclude that 2 or 3 additional power generation plants (not already planned and committed) will be needed in Queensland by 2011/12. [Confidential]

Power station loads assumed in the APA forecast include:

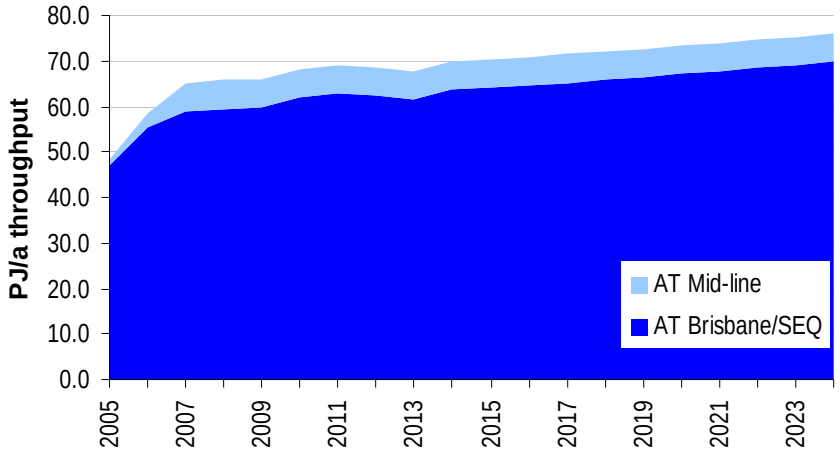
- Braemar Power Project in 2006-7

[Confidential]

4 ACIL Tasman forecast and comparison

ACIL Tasman's independent forecast of gas demand in the regions serviced by the RBP has been derived from a current (mid-2005) scenario drawn from our proprietary *GasMark*® model of the Eastern Australian gas market. This scenario represents a current "base case" view of gas supply (existing and new sources) and gas demand throughout the major gas consuming regions in Eastern Australia. The scenario has not been modified in any way for this particular assignment: it represents the generic assumption set that we currently use as the starting point for analysis in client assignments.

Figure 2 **ACIL Tasman *GasMark* forecast of gas demand in markets serviced by RBP**



Data source: ACIL Tasman *GasMark* database

4.1 Assumptions in the ACIL Tasman forecast

4.1.1 General Methodology

The AT forecasts have been derived as follows:

1. Retail (commercial, residential and small industrial) demand has been estimated on the basis of historical demand levels as revealed in public sources such as distribution system access arrangements and industry publications, with annual growth assumptions based on historical trends and economic and demographic forecasts for the region.
2. Major industrial load demand (eg Incitec Pivot, BP Bulwer Island cogeneration) is based on ACIL Tasman's understanding of the current gas

requirements for the sites in question, taking into account relevant public information on current and anticipated requirements, including any announced plans for expansion, refurbishment etc.

3. Gas demand for existing and new entrant gas-fired power generation capacity has been determined by calculation based on ACIL Tasman's modelling of the dispatch of individual power stations operating in the National Electricity Market. This modelling has been undertaken using our proprietary electricity market model *PowerMark* which emulates the operation of the NEM and allows the total annual dispatch of power plant (and therefore the corresponding fuel requirements) to be calculated.

4.1.2 General Assumptions

The AT forecasts are based on the following general assumptions:

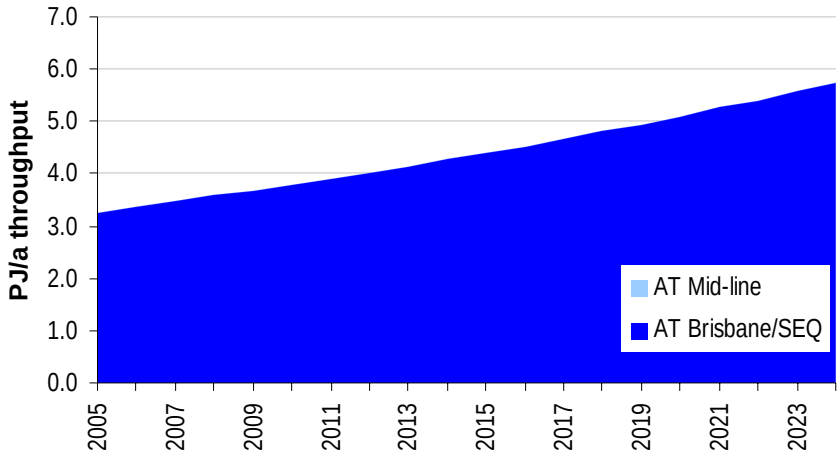
- no new alternative pipelines directly supply the Brisbane market (that is, no bypass of RBP); RBP expanded as necessary to accommodate market volumes
- new sources of supply (expanded coal seam gas, PNG) become available to supplement existing sources

4.2 Market Overview and Forecast

4.2.1 Residential and Commercial

Forecast residential and commercial loads served by the RBP are shown in Figure 3.

Figure 3 **ACIL Tasman forecast residential/commercial loads serviced by RBP**



Data source: GasMark database

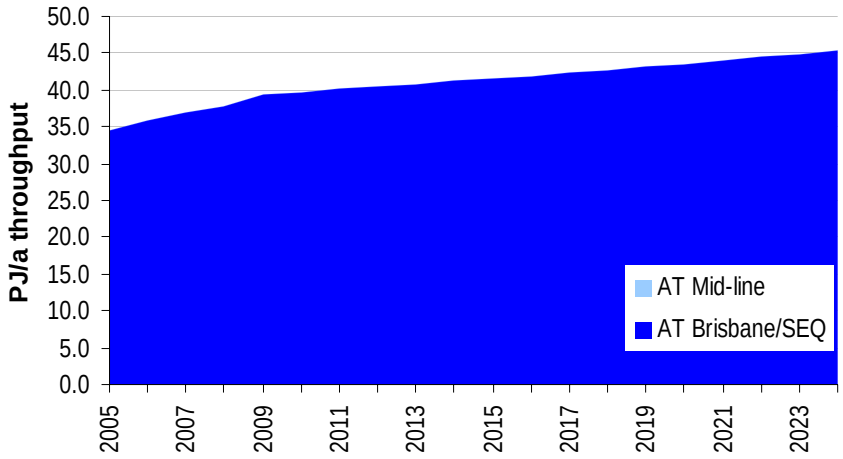
The residential commercial market in South East Queensland is very small compared to southern States, mainly because of the mild climate (which means that there is very little if any gas-fired space heating load). Reticulated natural gas is not as widely available as in the southern states, and because of the low average demand volumes per customer costs of service are high, so that gas is relatively expensive compared to retail electricity.

Residential and commercial loads are forecast to grow at about 3% per year, from about 3.3PJ/a at present to 5.7PJ/a by 2024.

4.2.2 Industrial Market

Forecast industrial loads (including co-generation) served by the RBP are shown in Figure 4.

Figure 4 **ACIL Tasman forecast industrial loads serviced by RBP**



Data source: GasMark database

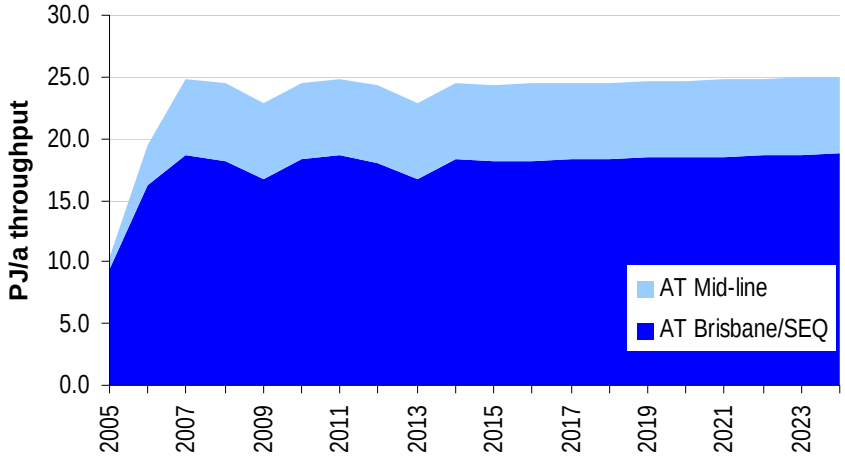
The industrial load comprises major facilities including Incitec Pivot Gibson Island plant and BP Bulwer Island co-generation, as well as smaller retail industrial customers that account for about 11.8PJ/a at present, growing at an average 2.5% per year.

Both the BP Bulwer Island and Incitec Pivot Gibson Island fertiliser plant are assumed to remain in operation throughout the modelling period.

4.2.3 Power Generation Market

Forecast electricity loads (CCGT intermediate service plant and open-cycle gas turbine peaking plant) served by the RBP are shown in Figure 5.

Figure 5 **ACIL Tasman forecast power generation loads serviced by RBP**



Data source: GasMark database

Gas consumption grows rapidly to 2007 with increased dispatch of the Swanbank E power station in response to implementation of the Queensland Government 13% gas scheme, and the commissioning of the Braemer (Wambo) power station with an announced gas demand of 6PJ/a. *Note that the Braemer power station was not included in ACIL Tasman's electricity base case in early 2005, and the gas requirements for this station are therefore based on announced plans rather than modelled performance in the NEM.*

The results are derived from the Base Case scenario developed by ACIL Tasman in early 2005 for our multi-client electricity market outlook report. The Base Case electricity scenario includes existing and new entrant plant required to meet forecast average and peak energy demand which in turn has been estimated by ACIL Tasman taking the 2004 NEMMCO Statement of Opportunities as a starting point.

In determining regional gas requirements for power generation, key assumptions relate to the location and fuel source for new entrant power plant. We have assumed that new base to intermediate load generating capacity includes a mix of coal-fired and gas-fired plant. The assumptions included in ACIL Tasman's 2005 electricity base case regarding new entrant plant, plant retirements (highlighted in red text) and plant capacity upgrades (highlighted in blue) in Queensland are summarised in Figure 6.

New entrant base load plant includes Kogan Creek (coal-fired) from November 2007, and two additional 450MW units of coal-fired plant in 2011. **No gas-fired new entrant base load plant is assumed.**

A gas-fired peaking plant is assumed to be commissioned in Queensland in January 2012. This peaking plant is assumed to be located in Brisbane/SEQ

(and so uses gas delivered by the RBP) but because of its low capacity factor uses little gas: around 0.1 – 0.2PJ/a

Figure 6 **ACIL Tasman electricity base case—Queensland new entrant generators and plant retirements**

Portfolio	Generator	From Date	To Date	Unit Size
CS Energy	Kogan Creek	1/11/2007	30/06/2025	750
CS Energy	Swanbank B Power Station	1/07/1968	31/10/2007	120
CS Energy	Swanbank B Power Station	1/07/1968	30/06/2011	120
CS Energy	Swanbank B Power Station	1/07/1968	30/06/2011	120
CS Energy	Swanbank B Power Station	1/07/1968	30/06/2011	120
CS Energy	Swanbank E Gas Turbine	1/08/2002	31/12/2004	385
CS Energy	Swanbank E Gas Turbine	1/01/2005	31/12/2005	385
Enertrade	Mt Stuart Gas Turbine	1/01/1999	30/09/2013	152
Enertrade	Mt Stuart Gas Turbine	1/01/2014	30/06/2025	227
Enertrade	Mt Stuart Gas Turbine	1/01/1999	30/09/2013	152
Enertrade	Mt Stuart Gas Turbine	1/01/2014	30/06/2025	227
Enertrade	Townsville Power Station	1/01/1999	30/09/2004	165
Enertrade	Townsville Power Station	1/03/2005	30/06/2025	226
Qld NE2	Qld NE2 Coal1	1/07/2011	30/06/2025	450
Qld NE2	Qld NE2 Coal1	1/12/2011	30/06/2025	450
Qld NE4	Qld NE4 Peaker1	1/01/2012	30/06/2025	150

Data source: ACIL Tasman PowerMark 2005 base case

4.3 Comparison of APA and ACIL Tasman forecasts

Figure 7 compares the APA and ACIL Tasman forecasts of throughput on the RBP.

Figure 7 **Comparison of APA and ACIL Tasman forecasts**

[Confidential]

Data source: APA, ACIL Tasman GasMark database

The major points of difference in the forecasts are:

[Confidential]

4.3.1 Comment on the power generation assumptions

In addition to the already-committed investment in 700MW of new coal-fired capacity at Kogan Creek, ACIL Tasman's current electricity base case assumes a further 900MW of base load coal-fired plant is commissioned in Queensland in 2011. We also assume an additional 150MW of capacity at Mount Stuart, with conversion from peaking to intermediate/base load dispatch from 2014.

This level of investment in new base load plant is, in our view, sufficient to meet forecast demand growth.

The differences in the APA and ACIL Tasman forecasts for power generation can therefore be attributed to different assumptions regarding the future fuel choices for new generating plant, and possibly the location of that plant.

While we have assumed that the new plant entering 2011 is coal-fired, it is quite conceivable that some of this plant could be gas-fired—and located in South East Queensland where it could be supplied with gas via RBP.

[Confidential]

4.3.2 Comment on the [Confidential]

4.3.3 [Confidential] Comparison of adjusted APA and ACIL Tasman forecasts

In order to examine the extent of similarity in the underlying market forecasts of APA and ACIL Tasman, excluding the influences of the assumptions relating to new entrant power generation assumptions and [Confidential], we have compared the ACIL Tasman forecast throughput on RBP with the APA forecast adjusted by:

[Confidential]

Note that this has been done merely to allow a comparison of the forecasts on a like-with-like basis—not because we consider there is strong reason to adopt the ACIL Tasman assumptions over the APA assumptions.

The results, summarised in Figure 8, show that the underlying market assumptions adopted by APA are very similar to ACIL Tasman's forecast, with annual aggregate volumes generally within 5%.

Figure 8 **Comparison of APA and ACIL Tasman adjusted forecasts**

[Confidential]

Data source: APA, ACIL Tasman GasMark database

4.4 Conclusions regarding APA forecast

On the basis of this analysis ACIL Tasman considers the APA forecast of gas throughput on the RBP to be reasonable. We have adopted different positions in relation to new entrant gas-fired power generation, and to the long-term future of the [Confidential], but we consider the APA positions in relation to these components of the market are within the bounds of reasonable probability. In any case, these differences do not result in any significant divergence in the forecasts until after 2011. Except for these differences, there is a close correlation between APA's forecast and ACIL Tasman's independently developed view.