



## **Australian Pipeline Trust**

# Non-capital cost benchmarking for the Roma-Brisbane pipeline

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## 1 Introduction

The Roma to Brisbane Pipeline (RBP) was originally built in 1969, and has been subject to additional compression and looping to increase its capacity since that time.

The RBP was included in Schedule A of the National Third Party Access Code For Natural Gas Pipeline Systems (the national Gas Code or the Code), which meant it was to be considered a Covered pipeline for the purposes of the Code.

In 1997 the Queensland Government was a signatory to the Natural Gas Pipelines Access Agreement – a COAG Intergovernmental Agreement to implement the National Third Party Access Code for Natural Gas Pipeline Systems. In accordance with this agreement, the Queensland Government passed the *Gas Pipelines Access Act (Queensland) 1998*, which came into effect on 19 May 2000.

The *Gas Pipelines Access Act (Queensland) 1998* applies the *Gas Pipelines Access Law* (comprising the National Gas Code and the legal framework for its operation) in Queensland, as well as regulations governing issues of specific relevance to Queensland such as the nomination of regulatory bodies.

In addition, the *Gas Pipelines Access Act (Queensland) 1998*, makes a number of amendments to the *Petroleum Act (Queensland) 1923* and the *Gas Act (Queensland) 1965* in an attempt to create a regulatory framework consistent with the National Gas Code.

The *Gas Pipelines Access Act (Queensland) 1998* established a number of derogations from the National Gas Code. In particular, section 58 of the *Act* provides that the Reference Tariffs for several transmission pipelines (notably the Roma to Brisbane pipeline) were to be approved and gazetted by the Queensland Minister for Mines and Energy rather than complying with the access pricing principles – and related regulatory process – in the National Gas Code. This means that the Reference Tariffs are non-reviewable for the term of the relevant derogation. For the RBP, this derogation expires in 2006.

This benchmarking exercise is conducted in the context of the Australian Pipeline Trust preparing its Proposed Access Arrangement under the National Gas Code to become effective on the expiry of the derogation.



## 1.1 Code requirements

Subsection 2.7 of the National Gas Code requires that:

2.7 The Access Arrangement Information may include any relevant information but must include at least the categories of information described in Attachment A.

Which then requires:

Attachment A - Information Disclosure by a Service Provider to Interested Parties

Pursuant to Section 2.7 the following categories of information must be included in the Access Arrangement Information. ...

Category 6: Information Regarding Key Performance Indicators  
Industry KPIs used by the Service Provider to justify "reasonably incurred" costs  
Service provider's KPIs for each pricing zone, service or category of asset

This analysis aims to develop the information required to address this reporting requirement.

## 1.2 Scope

The goal of this review is to conduct a relatively high level benchmarking analysis of key operational measures, consistent with that published by other relevant regulated pipelines.

## 1.3 Summary Findings

The forecast non-capital costs for the Roma-Brisbane Pipeline compare favourably with the regulator-approved levels of non-capital costs of other relevant Australian pipelines on the measures of:

- Non-capital costs per km; and
- Non-capital costs as a proportion of capital costs (ORC).



## **2 Approach**

In order to develop meaningful opex comparisons, it is necessary to identify both appropriate comparator pipelines and specific features of the Roma-Brisbane Pipeline - this allows identification of areas where information from comparator pipelines must be adjusted in order to be comparable to information applicable to the Roma-Brisbane Pipeline.

It is also necessary to identify the drivers of the costs being benchmarked, to ensure that the measures chosen are relevant and meaningful.

The levels of those measures, as adjusted in response to the differing operating characteristics identified, can then be assembled and a meaningful comparison made.

### **2.1 Comparator pipelines**

A list of Australian pipelines was compiled from the Australian Pipeline Industry Association 2005 Yearbook and directory. This directory identified Australia's pipelines by license, owner, product, length, diameter and construction date.

To this list, a series of filters were applied to reduce the pipeline sample to a manageable subset of relevant comparators.

#### **2.1.1 Criteria for identifying comparator pipelines**

The first set of filters applied in identifying comparator pipelines included:

- Onshore pipelines
  
- Pipelines over 100km in length
  
- Product

### **2.2 Benchmarking measures**

In conducting a meaningful benchmarking exercise, it is important to utilise meaningful metrics. To this end, it is important to ensure the benchmark measures

reflect the operational characteristics and cost drivers of the activity being benchmarked.

In the case of natural gas pipelines, costs are driven by a number of key activities:

- Pipeline operations (cathodic protection, SCADA, etc)
- Compressor operation (excluding fuel);
- Receipt and delivery point maintenance;
- Easement management (vegetation control, title management, etc);
- Internal inspection (pigging);
- Contract and capacity management;
- Administration and general expenses;
- Corporate management costs.

This in turn defines a number of key features which will drive the extent of activity in these key areas:

- The length of the pipeline;
- The number of stations (receipt points, offtakes, meters and compressors);
- The age and condition of the pipeline;
- The number of shippers on the pipeline;
- The terrain through which the pipeline operates, particularly the extent to which the pipeline traverses built-up or urban areas vs rural and remote areas.

In many of the benchmarks observed, a measure of the total capital investment is used as a proxy to accommodate the varying costs associated with pipeline size, difficulty of terrain along the pipeline route (including urban areas), number of compressors, etc. Optimised Replacement Cost is generally used as the measure of capital investment.

Importantly, the activities making up the total of non-capital costs do not tend to vary with the amount of gas transported through the pipeline. Excluding compressor fuel from the measure of non-capital costs also indicates that the extent of capacity utilisation does not have a significant bearing on costs. Also, the amount of available or contracted capacity is also not a driver of these costs.

Many Australian pipelines report non-capital costs against throughput or capacity as one of the key benchmarking measures provided. However, to the extent that the costs are not driven by throughput or capacity, such a measure will be dominated by the various pipelines' differences in throughput, capacity, and utilisation, rather than the efficiency of the non-capital costs being tested.



The review of comparator pipelines revealed a wide diversity in the available capacity, throughput and utilisation of pipelines around Australia. Particularly where competing pipelines have been constructed (notably the Eastern Gas Pipeline and the SEAGas pipeline), some comparator pipelines, notably the Moomba-Sydney Pipeline and the Moomba-Adelaide Pipeline, are operating with varying degrees of excess capacity.

Particularly as the total throughput and the extent of contracted capacity is not a driver of non-capital costs, it is not clear that throughput or capacity related measures are valid benchmark metrics. Moreover, as the Roma-Brisbane pipeline is operating at close to full capacity and throughput, there is a further question as to whether comparison along volumetric or capacity-related measures would be appropriate in any case.

In the end the analysis indicated that Australian regulated pipelines are the best comparators to use for benchmarking Australian regulated pipelines. This is particularly the case as Australian regulated pipelines report measures for benchmarking which are fit for purpose. Moreover, Australian regulators have reviewed and accepted those measures through the regulatory review process.

Relevant data used in the benchmarking analysis is included in Appendix A.

In summary, the requirement to use meaningful metrics in the benchmarking analysis finally restricted the analysis to two key benchmarks:

- Non-capital costs per km; and
- Non-capital costs as a proportion of capital costs.

## 3 Results

Results from the opex comparison study are presented below. In summary, the forecast non-capital costs of the Roma-Brisbane pipeline compare favourably with comparable regulator-approved levels of operating costs for similar pipelines.

### 3.1 Non capital costs per km

The ACCC has recognised that non-capital costs per km is a valid measure for comparison.<sup>1</sup> However, some care must be taken in measuring the relevant length of the pipeline in question.

The RBP is a looped pipeline with two different sizes of pipe running parallel to each other. No other major pipelines in Australia have this degree of looping.

Some operating cost items, such as vegetation and easement management, are significantly driven by both the length of the pipeline route and the nature of the environment through which the pipeline runs. The pipeline route of the RBP is approximately 440km for the Mainline and 121km for the Lateral. Approximately 10% of the Mainline passes through the built up area of Brisbane, resulting in an increased level of easement management and maintenance, compared to other pipelines crossing non-urban areas or open country.

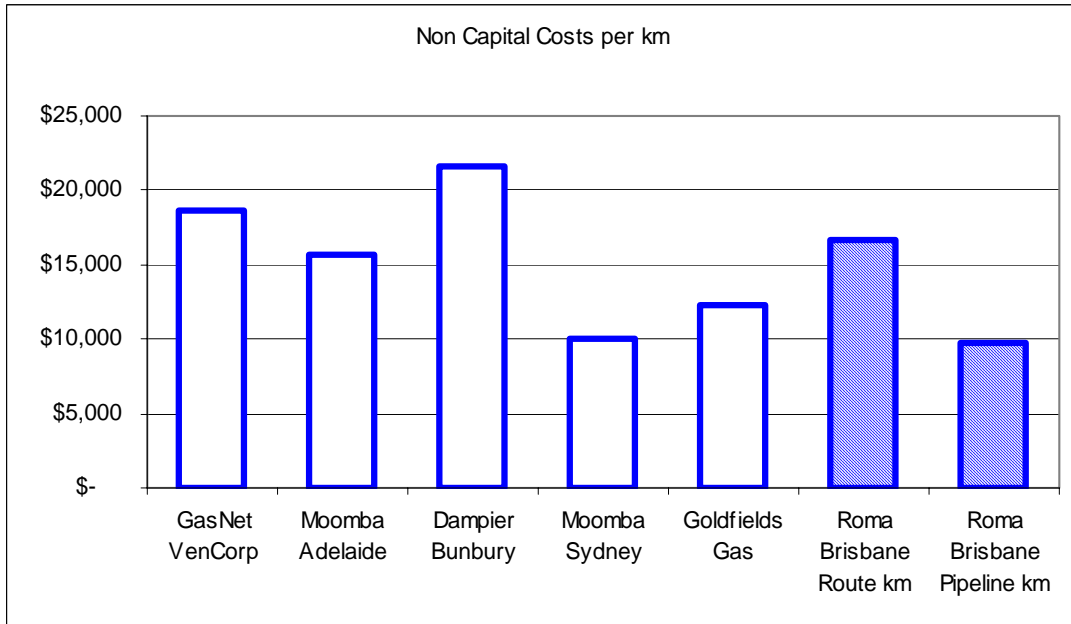
Some operating cost items, such as internal inspections (“pigging”) and cathodic protection, are driven by the actual length of the pipe. In the case of the RBP, the relevant length for such costs is approximately 965km, rather than the 560 km of the pipeline route.

The RBP distance-based benchmarks have therefore been presented as being measured both over route km and pipeline km. While neither of these measures will be accurate, due to the differing drivers of the non-capital costs, the two measures will present a range in which it would be reasonable to expect the composite measure to fall.

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<sup>1</sup> ACCC, [Final Decision](#) - Access Arrangement proposed by Epic Energy South Australia Pty Ltd for the Moomba to Adelaide Pipeline System, 12 September 2001. Page 57.





### 3.2 Non capital costs as a % of ORC

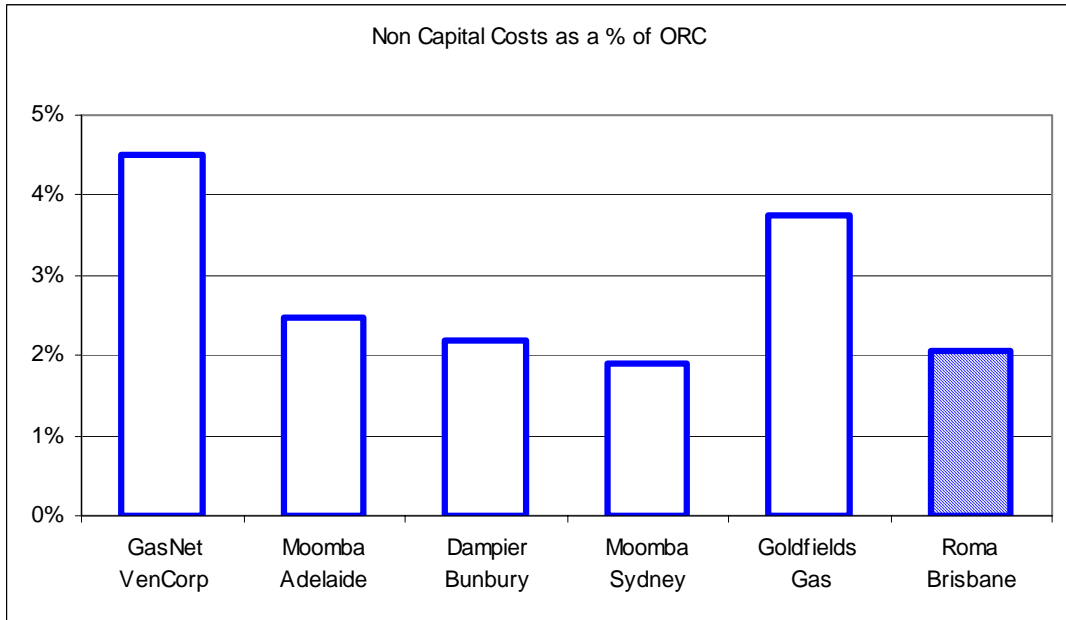
The ACCC has recognised non-capital costs as a ratio of Optimised Replacement Cost as being a valid measure of pipeline efficiency:

The Commission also assessed Epic’s forecast operating costs as a percentage of the overall capital assets employed. ([ACCC Footnote:] In the interests of comparison between pipeline systems, the ORC figure may be used as a measure of the value of the capital assets employed.) Typically, this ranges from 2 per cent for an uncompressed pipeline to 5 per cent for a fully compressed pipeline.<sup>2</sup>

This measure for the RBP, with six compressor stations, would be expected to fall closer to the upper end of the ACCC’s range than the bottom.

The forecast non-capital costs for the RPB, as a percentage of the Optimised Replacement Cost, are in the order of 2 percent, and compares favourably against other regulated Australian pipelines.

<sup>2</sup> ACCC, [Final Decision](#) - Access Arrangement proposed by Epic Energy South Australia Pty Ltd for the Moomba to Adelaide Pipeline System, 12 September 2001. Page 57.





## 4 Conclusions

In summary, this study has found:

- Regulated Australian pipelines tend to be the best benchmarking comparators for regulated Australian pipelines;
- For the regulated pipelines, significant differences in operating environment, capacity and utilisation necessarily restricts the depth to which benchmarking analysis can be informative;
- On the comparator measures:
  - Non-capital costs per km; and
  - Non capital costs as a percentage of Optimised Replacement Cost;

The level of non-capital costs proposed for the Roma to Brisbane pipeline compares favourably against the levels of regulator-approved non-capital costs for other regulated Australian pipelines.

## A Benchmarking data

### A.1 GasNet Australia

GasNet Australia operates the gas transmission system in Victoria. However, the management of capacity, etc is undertaken by VENCORP. In order to develop comparable benchmarking measures, the VENCORP operating costs have been added to those of GasNet in order to align to the costs of other pipelines which must manage their own capacity.

Source: [GasNet Access Arrangement Information](#)

Table 3-6: Components of Forecast Operating Costs 2003-2007 (nominal \$ million)

	2003	2004	2005	2006	2007
Total GasNet expenditure	18.3	19.8	19.4	21.1	21.5
VenCorp expenditure <sup>3</sup>		16.0	16.2	16.6	16.2
<b>Total</b>		<b>35.8</b>	<b>35.6</b>	<b>37.7</b>	<b>37.7</b>

Pipeline fuel is subtracted from the opex measurement to ensure consistency with the RBP opex information.

#### Schedule 1 - Description of Pipelines

Pipeline Licence	Location/Route	Length (km)	Pipe Diameter (mm)	MAOP (kPa)	mmkm
<b>Longford to Dandenong and Wollert System</b>					
Vic:68	Healesville-Koo-Wee-Rup Rd	1.2	80	2760	96
Vic:91	Anderson St, Warragul	4.8	100	2760	480
Vic:107	Pound Rd to Tuckers Rd	2	100	2760	200
Vic:50	Supply to Jeeralang	0.4	300	2760	120
Vic:50	Morwell to Dandenong	126.8	450	2760	57060
Vic:75	Longford to Dandenong	174.2	750	6890	130650
Vic:117	Rosedale to Tyers	34.3	750	7070	25725
Vic:120	Longford to Rosedale	30.5	750	7070	22875
Vic:135	Bunyip to Pakenham	18.7	750	7070	14025
Vic:141	Pakenham to Wollert	93.1	750	6890	69825
Vic:121	Tyers to Morwell	15.7	500	7070	7850
Vic:67	Maryvale	5.4	150	6890	810

<sup>3</sup> Source: [Vencorp proposed revisions to Access Arrangement](#)

Pipeline Licence	Location/Route	Length (km)	Pipe Diameter (mm)	MAOP (kPa)	mmkm
<b>Wollert to Wodonga/Echuca/ Bendigo System</b>					
Vic:101	Keon Park to Wollert	14.1	600	2760	8460
Vic:202	Keon Park East - Keon Park West	0.6	450	2760	270
Vic:101	Wollert to Wodonga	269.4	300	7400	80820
Vic:101	Euroa to Shepparton	34.5	200	7400	6900
Vic:132	Shepparton to Tatura	16.2	200	7390	3240
Vic:136	Tatura to Kyabram	21.3	200	7390	4260
Vic:152	Kyabram to Echuca	30.7	150	7390	4605
Vic:143	Wandong to Kyneton	59.5	300	7390	17850
Vic:128	Mt Franklin to Kyneton	24.5	300	7390	7350
Vic:131	Mt Franklin to Bendigo	50.8	300	7390	15240
Vic:78	Ballan to Bendigo	90.8	150	7390	13620
Vic:125	Guildford to Maryborough	31.4	150	7390	4710
Vic:238	Somerton Pipeline	3.4	250	2760	850
Vic:176	Chiltern Valley to Rutherglen	14.7	200	7400	2940
Vic:182	Rutherglen to Koonoomoo	88.8	200	7400	17760
Vic:178	Barnawartha to Murray River	5.5	450	10200	2475
NSW:24	Murray River to Culcairn	57	450	10200	25650
Brooklyn	to Ballarat System				
Vic:78	Brooklyn to Ballan	66.6	200	7390	13320
Vic:78	Ballan to Ballarat	22.7	150	7390	3405
Vic:134	Ballan to Ballarat	22.8	300	7390	6840
Vic:122	Derrimut to Sunbury	24	150	7390	3600
<b>Brooklyn to Geelong System</b>					
Vic:81	Brooklyn to Corio	50.7	350	7390	17745
Vic:162	Laverton to BHP	1.6	150	2760	240
<b>Dandenong to West Melbourne / Brooklyn System</b>					
Vic:36	Dandenong to West Melbourne	36.2	750	2760	27150
Vic:108	South Melbourne to Brooklyn	12.8	750	2760	9600
Vic:129	Princess Hwy to Henty St	0.2	500	2760	100
Vic:129	Dandenong to Princess Hwy	5	750	2760	3750
Vic:36	Princess Hwy to Regent St	0.8	200	2760	160
Vic:164	Supply to Bay St To Unichema	0.4	150	2760	60
Vic:124	Supply to Newport Power Station	1	450	2760	450
<b>Western Network</b>					
Vic:145	Paaratte to Allansford	33.3	150	7400	4995
Vic:155	Allansford to Portland	100.4	150	9890	15060
Vic:168	Curdievale to Cobden	27.7	150	9890	4155
Vic:171	Codrington to Hamilton	54.6	150	9890	8190



Pipeline Licence	Location/Route	Length (km)	Pipe Diameter (mm)	MAOP (kPa)	mmkm
<b>South West Pipeline</b>					
Vic:227	Iona to Paaratte	7.8	150	7400	1170
Vic:231	Iona to Lara	143.9	500	10200	71950
km, mmkm		1,932.8			738,656

ORC was calculated as \$800.8 million by adding ODRC (\$494.1m) and Accumulated depreciation (\$306.7m) from Tables 2.32 and 2.2 of GasNet Access Arrangement Information January 2003.

**Benchmark measures:**

Opex per ORC 4.27%  
 Opex per km \$ 17,701.78



## A.2 Moomba to Adelaide pipeline

Source: [Attachments to Revised Access Arrangement, January 2002](#)

It should be noted that Epic Energy, the owner of the Moomba-Adelaide Pipeline has sought, and received a recommendation from the NCC for, revocation of coverage of the MAPS under the National Gas Code.

TABLE 2 Information Regarding Operations and Maintenance

Year Ended 31 December ('000)	2001	2002	2003	2004	2005
TOTAL	15,367	15,093	15,596	16,794	16,292

ORC Information (direct replacement of the existing 558mm (22 inch) diameter pipeline and configuration)

	Unit	Diameter	Unit cost	\$	mmkm
	(km)	(inch)	\$/inchkm		
PIPELINE					
Main Line	781	22	22.00	378,004	436,423
Loop Line	42	20	22.00	18,480	21,336
Laterals	244.48	See AAI		46,326	41,944
Total	1067.48				499,703
Allowance for Native Title compensation				5,270	
COMPRESSOR STATIONS					
	KW		\$/kW		
Compressor Station #1	6000		3000	18,000	
Compressor Station #2	6000		3000	18,000	
Compressor Station #3	6000		3000	18,000	
Compressor Station #4	6000		3000	18,000	
Compressor Station #5	6000		3000	18,000	
Compressor Station #6	6000		3000	18,000	
Compressor Station #7	6000		3000	18,000	
Whyte Yarcowie Compressor Station	570		5000	2,850	
Meter and Reg Stations				16,400	
SCADA & Communications				7,000	
Line pack	502710	GJ	2.75	1,382	
Maintenance Depot				6,000	
Spares				3,500	
Head office /Gas Control				3,500	





### A.3 Dampier Bunbury pipeline

Source: [Proposed revised Access Arrangement Information June 2005](#):

Table 1: Asset Value By Asset Class

Asset	Percentage of total asset value	Asset value at 31 December 1999 (\$m)	Asset value at 31 December 2004 (\$m)
Pipeline	81.49	1,263.15	1,491.14
Compression	13.65	211.6	249.8
Metering	1.12	17.35	20.49
Depreciable	3.07	47.66	56.26
Non - depreciable (land and linepack)	0.66	10.24	12.09
<b>Total</b>	<b>100</b>	<b>1,550.00</b>	<b>1,829.77</b>

The asset value as at 31 December 2004 has been adopted as a proxy for DORC for the purpose of this exercise. Text from the decisions of the Economic Regulation Authority indicates that this value is not dissimilar to the ORC.

Table 4 - Main Line: Physical Characteristics

Section	Length	Nominal size	MAOP	
	(km)	(mm)	(kPa)	(mmkm)
Dampier To Kwinana Junction	1,311.20	660	8,480	865,392
	87.4	660	8,480	57,684
Kwinana Junction - Wlpg Plant - Kwinana Junction	6.4	660	8,480	4,224
Kwinana Junction To Main Line Valve 141	10.8	500	6,890	5,400
Main Line Valve 141 To Main Line Valve 150	73.5	500	6,890	36,750
Main Line Valve 150 To Main Line Valve 154	23.9	250	6,890	5,975
Main Line Valve 154 To Main Line Valve 157	16.9	200	6,890	3,380

Table 5 – Gas Transmission System Laterals

Section	Length	Nominal size	MAOP	
	(km)	(mm)	(kPa)	(mmkm)
Main Line Valve 150 To Main Line Valve 154 (Loopline)	24.3	450	8,280	10,935
Cs10 To Rockingham Lateral Pipeline (Rockingham Lateral Link)	0.18	600	6,890	108
Hamersley Iron	0.5	200	8,480	100
Carnarvon	163.7	150	8,480	24,555
	7.4	150	1,900	1,110
Mungarra	2.5	150	8,480	375
Pinjar	14.2	350	8,480	4,970
Russell Road	7.3	300	6,890	2,190



Kwinana West	2	500	6,890	1,000
	2.8	350	6,890	980
	1.5	200	6,890	300
Rockingham	3.2	300	6,890	960
KNC/BP (Part Of Rockingham Lateral Located Downstream Of Mason Road Delivery Station)	1.6	250	6,890	400
COGEN (Part Of Rockingham Lateral Located Downstream Of Cogen Delivery Station)	0.9	200	6,890	180
TIWEST COGENERATION LATERAL (Part Of Rockingham Lateral)	0.58	150	6,890	87
Alcoa Pinjarra	2.5	300	6,890	750
	2.9	300	6,890	870
Alcoa Wagerup	8	350	6,890	2,800
	1.5	350	6,890	525
Worsley	32.9	250	6,890	8,225
South West Cogeneration Lateral	32.9	250	8,280	8,225
<b>Totals</b>	<b>1,843</b>	<b>km</b>		<b>1,048,450</b>

Source: [Approved revised Access Arrangement Information December 2005:](#)

Table 12: Non Capital Costs (\$M at end of year)

Year ending 31 December	2005	2006	2007	2008	2009	2010
Total	61.05	60.34	83.87	84.85	84.35	87.43

Pipeline fuel gas cost is deducted from opex to ensure consistency with the RBP.

**Benchmark measures:**

Opex per ORC		2.18%
Opex per km	\$	21,677

## A.4 Moomba to Sydney pipeline

It should be noted that the coverage for part of the MSP was revoked while the assessment of its Proposed Access Arrangement was under way. The non-capital cost and pipeline characteristic measures shown here relate to the MSP in its entirety.

Source: EAPL Access Arrangement Information 5 May 1999

### 1.2 System Description

	Length (km)	Diameter (mm)
Mainline	1299	864
1. Young to Wagga Wagga	131	324
2. Dalton to Canberra	58	273
3. Young to Lithgow	269	168
4. Junee to Griffith	179	168
5. Wagga Wagga to Culcairn	88	457
<b>Total</b>	<b>2024</b>	<b>1,296,094 mmkm</b>

Source: ACCC, Final Decision - East Australian Pipeline Limited Access arrangement for the Moomba to Sydney Pipeline System, 2 October 2003 File No: C2002/1134

Table 2.7.8.2: Commission approved non capital costs (July 2003 \$ million)

Year ending 30 June	2004	2005	2006	2007	2008
Total non capital costs	18.57	18.62	18.76	18.91	19.05

Using the CPI for 2003 of 2.5% gives an ACCC-approved 2004 non capital cost of \$19.034m.

#### **Benchmark measures:**

Opex per ORC	1.80%
Opex per km	\$ 9,404

## A.5 Goldfields Gas pipeline

Source: Goldfields Gas Pipeline Approved Access Arrangement Information July 2005

Table 10 : Non Capital Costs (\$m, nominal)

	2004	2005	2006	2007	2008
Total	14.4	17.9	16.9	16.8	18.9

### Pipeline characteristics

Commissioned		June to October 1996
Pipeline licence	WA - PL 24	Expires 27 January 2016
Pipeline length		1378 km
Pipeline diameter:	Yarraloola to Newman	DN 400 mm (16 inch)
Pipeline diameter:	Newman to Kalgoorlie	DN 350 mm (14 inch)

A visual map review suggests that the distance from Yarraloola to Newman is approximately half the distance from Newman to Kalgoorlie. Assume therefore that the pipeline is approximately 1/3 (460 km) of 400mm pipe and 2/3 (918 km) of 350 mm pipe, for a total estimated mmkm of 505,300.

Source: Economic Regulation Authority, Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, 17 May 2005

In paragraph 160 of the Amended Draft Decision, the Authority gave attention under section 8.10(c) of the Code to Replacement Cost and Depreciated Replacement Cost valuations of \$450 million and \$425 million at 31 December 1999. There is considerable discussion in the Final Decision indicating that the ORC could be as high as \$500 million. This benchmarking analysis has assumed an ORC of \$450 million.

### Benchmark measures:

Opex per ORC	3.20%
Opex per km	\$ 10,450



## A.6 Roma to Brisbane pipeline

Roma - Brisbane Pipeline commissioning dates and lengths

	Commissioned	Length (km)	Diameter (mm)
Mainline (Wallumbilla to Bellbird Park)	March 1969	397	273
Metro Section (Bellbird Park to Gibson Island)	March 1969	42	300
Looping 1	July 1988	69.54	350
Looping 2	Sept 1989	70.95	350
Looping 3	February 1990	53.17	350
Looping 4	June 2000	61.72	350
Looping 5	December 2001	139.47	350
Looping 6	August 2002	11.00	350
Peat lateral	2001	121	250
<b>Total pipeline distance:</b>		<b>965.85</b>	
<b>Total route km</b>		<b>560</b>	
<b>Total mmkm</b>			<b>313,571</b>

Other relevant operating information

Opex - Forecast 2006	9,360.5
ORC per Venton report	456,145

### Benchmark measures:

Opex per ORC		2.05%
Opex per (route) km	\$	16,715
Opex per pipeline km	\$	9,691