

Access arrangement information for the access arrangement

JGN's NSW gas distribution networks

1 July 2010 – 30 June 2015

Amended by order of the Australian
Competition Tribunal, 30 June 2011

Further amended with regard to mine
subsidence expenditure, 26 September
2011

June 2010

Table of contents

1	Introduction	3
1.1	Purpose of the access arrangement.....	3
1.2	Purpose of this access arrangement information	3
1.3	Access arrangement periods	3
2	Jemena Gas Networks	4
2.1	Description of the Jemena Gas Networks	4
2.1.1	<i>Background</i>	4
2.1.2	<i>Current configuration and operation</i>	4
3	Forecast demand	7
3.1	Forecast demand	7
3.1.1	<i>Total forecast</i>	8
3.2	Forecast pipeline capacity	9
3.3	Demand, consumption and customer numbers in the earlier AA period	9
4	Forecast operating expenditure	10
4.1	Forecast operating expenditure	10
4.2	Forecast non-O&M costs	10
4.3	Key performance indicators for the AA period	11
4.4	Operating expenditure in the earlier AA period.....	11
5	Forecast capital expenditure	12
5.1	Forecast capital expenditure	12
6	Capital base	13
6.1	Summary.....	13
6.2	Opening capital base for the earlier AA period	13
6.3	Opening capital base	14
6.4	Projected capital base in the AA period.....	16
6.5	Capital contributions	18
6.6	Capital expenditure in the earlier AA period	18
7	Cost of capital	19
7.1	Summary.....	19
7.2	Treatment of tax.....	19
7.3	Weighted average cost of capital model	20
7.3.1	<i>Cost of equity</i>	20
7.3.2	<i>Cost of debt</i>	21

7.4	Weighted average cost of capital parameters.....	21
7.4.1	<i>Inflation forecast</i>	21
7.4.2	<i>Gearing</i>	21
7.4.3	<i>Nominal risk-free rate</i>	21
7.4.4	<i>Market risk premium</i>	21
7.4.5	<i>Equity beta</i>	21
7.4.6	<i>Debt risk premium and credit rating</i>	22
7.4.7	<i>Dividend imputation</i>	22
8	Depreciation	23
8.1	Summary.....	23
8.2	Assumptions on economic life of assets for regulatory depreciation.....	23
8.3	Depreciation and accumulated depreciation.....	24
9	Revenue requirement	26
10	Services	27
10.1	Summary.....	27
10.2	Cost allocation overview	27
10.3	Price path	27
11	Reference tariffs	29
11.1	Volume and demand tariff classes.....	29
11.1.1	<i>Volume tariff classes</i>	29
11.1.2	<i>Demand tariff classes</i>	29
11.1.3	<i>Transaction costs</i>	31
11.1.4	<i>Ability to respond to price signals</i>	31
11.2	Efficient pricing.....	31
11.2.1	<i>Tariff efficiency</i>	31
12	Price control formulae	32
12.1	Summary.....	32
12.2	Haulage reference service	32
12.2.1	<i>Tariff variation mechanism</i>	32
12.2.2	<i>Tariff variation process</i>	33
12.3	Other reference services.....	33
12.3.1	<i>Tariff variation mechanism</i>	33
12.3.2	<i>Tariff variation process</i>	33
12.4	Cost pass through tariff variation mechanism.....	33
	Glossary	34

1 Introduction

Jemena Gas Networks (NSW) Ltd ACN 003 004 322 (**JGN**) is the owner, controller and operator of gas distribution networks in NSW (**JGN network**).

Chapter 1 describes the form and structure of the access arrangement (**AA**) and this Access Arrangement Information (**AAI**) for the period 1 July 2010 to 30 June 2015 (**AA period**), and the regulatory arrangements that inform the content of these documents.

1.1 Purpose of the access arrangement

The AA for the AA period details the commercial and technical terms upon which JGN offers reference services to users and prospective users by means of four covered pipelines:

- the New South Wales (NSW) distribution system
- the Central West distribution system
- Wilton to Newcastle distribution pipeline
- Wilton to Wollongong distribution pipeline.

On 9 June 2009, the Australian Energy Regulator (**AER**) directed JGN to consolidate the terms of access for these four covered pipelines into one AA.

The AA is the fourth one for JGN.

1.2 Purpose of this access arrangement information

This AAI contains information that enables users and prospective users to understand the derivation of the elements of the AA for the AA period.

1.3 Access arrangement periods

This document refers to two different AA periods. These are both defined below and in the glossary:

- **earlier AA period** – the period 1 July 2005 to 30 June 2010
- **AA period** – the period 1 July 2010 to 30 June 2015.

2 Jemena Gas Networks

As an aid to understanding the AA for the AA period, this chapter describes the physical operation of the JGN gas distribution network and the services JGN offers.

2.1 Description of the Jemena Gas Networks

This section provides an overview of the physical JGN network, the services provided, its users, and end users of gas (**customers**). It explains characteristics and emerging trends and opportunities that affect reference services and tariffs in the AA for the AA period.

2.1.1 *Background*

JGN provides natural gas transportation and associated services to users of the JGN network.

The JGN network has its origins in 1837 when the Australian Gas Light Company (**AGL**) was formed to light the streets of Sydney. The network has grown through a combination of extensions, new developments and acquisitions. It now provides gas to more than 1 050 000 of its users' customers across Sydney, Newcastle, the Central Coast, and Wollongong, and over 20 country centres including those within the Central Tablelands, Central West, Southern Tablelands and Riverina districts.

2.1.2 *Current configuration and operation*

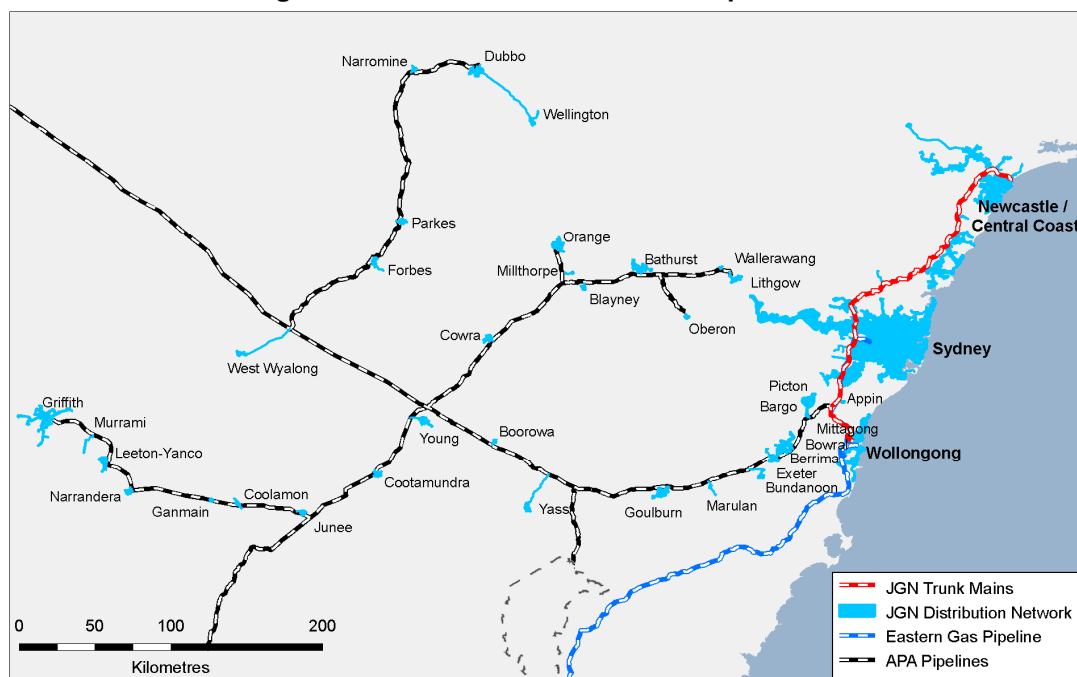
At present the section of the JGN network that serves Sydney, Newcastle and Wollongong has four receipt points through which it accepts gas from three principal sources:

- the Moomba to Sydney Pipeline (**MSP**), owned by the Australian Pipeline Trust and APT Investment Trust (**APA Group**), which principally transports gas produced in the Cooper basin to JGN's Wilton receipt point
- the Jemena-owned Eastern Gas Pipeline (**EGP**), which principally transports gas produced in Bass Straight from the Longford plant in Victoria to:
 - the JGN's Horsley Park receipt point
 - the JGN's Port Kembla receipt point
- the Sydney Gas Company¹ (**SGC**), which injects local coal seam methane at the Rosalind Park receipt point near Campbelltown.

¹ On 1 April, 2009, AGL Energy Limited announced that it had completed the compulsory acquisition of remaining shares in SGL (<http://imagesignal.comsec.com.au/asxdata/20090401/pdf/00941156.pdf>).

There are separate country receipt points (32 in all) for each of the country centres served by the JGN network. All of those centres are connected to the MSP or the Central West Pipeline, both owned by the APA Group.

Figure 2-1: JGN network overview map



At each of these network receipt points, natural gas is physically transferred from the transmission pipeline/facility owner to JGN and commercially transferred from the shipper of gas on the transmission pipeline to the user who contracts with JGN for reticulation of the gas to customers or itself. Custody transfer quality meters are located at each of the JGN network’s receipt points to measure the transfer of gas from the transmission pipeline/facility into the network.

The JGN network currently consists of approximately 267 km of trunk mains, 143 km of primary mains, 1428 km of secondary mains, 22 596 km of medium and low pressure mains, 36 network receipt points, 27 trunk receiving stations, 14 primary regulating stations, and 575 district regulator sets.

The section of the JGN network that serves Sydney, Newcastle and Wollongong is balanced as a single network as are each of the network sections that serve country centres. ‘Balancing’ refers to arrangements that ensure that users in aggregate inject into the JGN network each day similar amounts of gas as they withdraw. This ensures that operating gas pressure in all parts of the reticulation network stay within technically acceptable limits. Under these arrangements, each user of a network section is responsible for the injection of enough gas to meet the demands of its customers on a daily basis. Balancing ensures that the balance of supply/demand to the network is managed and that there are commercially and

technically feasible arrangements in place to supply operational balancing gas on each day.

3 Forecast demand

Refer to chapter 11 of the AER's final decision, Jemena Gas Networks, Access arrangement proposal for the NSW gas networks, 1 July 2010–30 June 2015, June 2010 (**final decision**) for further information.

3.1 Forecast demand

Table 3-1, Table 3-2 and Table 3-3 set out the forecast customer numbers, minimum and maximum demand, and volume over the AA period respectively.

Table 3-1: Forecast customer numbers by type and tariff class for AA period

	2010-11	2011-12	2012-13	2013-14	2014-15
Residential	1 082 658	1 115 918	1 148 907	1 189 233	1 233 758
Small business	30 496	30 961	31 082	30 911	31 045
Total small customers	1 113 154	1 146 879	1 179 989	1 220 144	1 264 802
Large customers	412	412	410	409	409
Total customers	1 113 566 ^a	1 147 291	1 180 399	1 220 553	1 265 211

a: In Table 4-1 of the revised access arrangement information, this amount is 1 113 567. However, this is a typographical error because the total of the individual line items for 2010-11 in that table is 1 113 566.

Table 3-2: Average daily load small and large customers for the AA period and maximum daily quantity (MDQ) large customers (TJ) per year

	2010-11	2011-12	2012-13	2013-14	2014-15
Small customers	95.1	95.1	97.1	96.4	96.4
Large customers ^a	213.9	217.9	213.6	207.7	208.8
Total average load	275.7	279.1	276.6	270.8	270.8
MDQ large customers	326	331	325	318	318

a: Large customers operate on average less than 365 days a year.

Table 3-3: Load by customer type and tariff for the AA period (TJ)

Service	2010-11	2011-12	2012-13	2013-14	2014-15
Residential	22 553	22 336	22 747	22 793	22 934
Small business	12 148	12 359	12 682	12 378	12 237
Total load small customers	34 701	34 695	35 429	35 171	35 171

Service	2010-11	2011-12	2012-13	2013-14	2014-15
Large customers	65 936	67 183	65 529	63 685	63 685
Total load all customers	100 637	101 878	100 959	98 856	98 856

3.1.1 Total forecast

The resulting total forecast is shown in Table 3-4 (weather normalised).

Table 3-4: Total gas forecast 2008-09 to 2014-15

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Total load (TJ)							
Residential	21 310	22 518	22 553	22 336	22 747	22 793	22 934
Small Business	11 753	12 039	12 148	12 359	12 682	12 378	12 237
Total small customers	33 063	34 557	34 701	34 695	35 429	35 171	35 171
Large customers	64 675	64 643	65 936	67 183	65 529	63 685	63 685
Total load	97 738	99 200	100 637	101 878	100 959	98 856	98 856
Customer numbers							
Residential	1 022 084	1 052 085	1 082 658	1 115 918	1 148 907	1 189 233	1 233 758
Small business	29 750	30 210	30 496	30 961	31 082	30 911	31 045
Total small customers	1 051 834	1 082 295	1 113 154	1 146 879	1 179 989	1 220 144	1 264 802
Large customers	414	411	412	412	410	409	409
New network connections							
New estates and high rise	18 197	22 945	24 306	26 067	26 016	33 554	37 956
Electricity to gas	6332	7056	6267	7193	6973	6772	6568
Total new residential	24 529	30 001	30 573	33 260	32 989	40 326	44 524
Small business	888	975	1075	1175	1251	1335	1410
Large customers	6	3	3	3	3	3	3

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
HDD index standard							
HDD index	496	490	484	479	473	468	462
Average residential load per year (GJ)							
Existing customers	20.4	21.5	20.9	20.1	19.9	19.3	18.7
New estates and high rise	18.1	17.0	16.7	16.1	15.8	15.2	14.6
Electricity to gas	14.6	14.6	15.7	14.8	14.5	14.0	13.6
Average load all residential	20.8	21.3	20.7	19.7	19.8	19.2	18.6
MDQ large customers							
MDQ large customers	331	318	326	331	325	318	318

3.2 Forecast pipeline capacity

Capacity and utilisation information for a distribution network is not available or meaningful for a distribution pipeline. The JGN network is a meshed network made up of interconnected pipes and there are a number of practical considerations governing why the calculation of utilisation is not straightforward and therefore may not be practicable².

3.3 Demand, consumption and customer numbers in the earlier AA period

Information about the demand, consumption and customer numbers in the earlier AA period can be found in Table 3-1, Table 3-2 and Table 3-3 in the revised access arrangement information.

² AER, Draft decision, *Jemena, Access arrangement proposal for the NSW gas networks, 1 July 2010 –30 June 2015*, February 2010, p. 250.

4 Forecast operating expenditure

This chapter sets out the forecast operating expenditure (**opex**) and key performance indicators (**KPIs**) for the AA period.

Refer to chapter 9 of the final decision for further information regarding the basis on which the forecast opex has been derived.

4.1 Forecast operating expenditure

Forecast opex over the AA period is shown in Table 4-1.

Table 4-1: Forecast opex (\$m, real, 2009–10)

	2008-09 (adjusted base year)	2009-10	AA period				
			2010-11	2011-12	2012-13	2013-14	2014-15
Non-O&M	40.2	41.8	43.2 42.9	43.6 43.3	44.1 43.8	44.7 44.4	45.5 45.1
O&M	83.4	82.4	89.3 90.4	93.2 90.6	97.1 101.8	99.8	102.1
Total operating expenditure	123.6	124.2	132.5 133.3	136.9 133.9	141.3 145.6	144.5 144.2	147.6 147.3

4.2 Forecast non-O&M costs

Table 4-2 summarises forecast opex excluding operating and maintenance expenditure (**O&M**) activities.

Table 4-2: Forecast non-O&M expenditure (\$m, real, 2009–10)

	2008-09 (adjusted base year)	2009- 10	AA period				
			2010- 11	2011- 12	2012- 13	2013- 14	2014- 15
Administration and overhead							
Base cost	19.7	18.3	18.5	18.9	19.5	20.3	21.0

	AA period						
	2008-09 (adjusted base year)	2009- 10	2010- 11	2011- 12	2012- 13	2013- 14	2014- 15
One-off events	-1.7						
Step changes	0.0	0.0	0.3 0.0	0.3 0.0	0.3 0.0	0.3 0.0	0.3 0.0
Government levies	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Marketing	6.2	6.7	6.7	6.7	6.7	6.7	6.7
UAG ^a	12.9	13.8	13.4	13.4	13.3	13.0	13.1
Carbon costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Self insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt raising	0.0	0.0	1.3	1.3	1.3	1.4	1.4
Total non-O&M expenditure	40.2	41.8	43.2 42.9	43.6 43.3	44.2 43.8	44.7 44.4	45.5 45.1

a: The UAG target for the AA period is 2.34 per cent.

4.3 Key performance indicators for the AA period

Table 4-3 sets out KPIs for the AA period.

Table 4-3: KPIs: operating cost per metre and cost per customer site (\$, real, 2009–10)

	2010-11	2011-12	2012-13	2013-14	2014-15
Operating cost per metre	4.5	4.8 4.6	5.0 5.2	5.3	5.5
Operating cost per customer site	99.6 100.6	103.1 100.7	107.0 111.2	109.3	110.9

4.4 Operating expenditure in the earlier AA period

Information about the operating expenditure in the earlier AA period can be found in Table 3-4 in the revised access arrangement information.

5 Forecast capital expenditure

5.1 Forecast capital expenditure

Table 5-1 summarises the forecast capital expenditure (**capex**) which complies with the National Gas Rules (**NGR**).

Table 5-1: Forecast capex for the AA period (\$m, real, 2009–10)

Capex	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Market expansion	57.4	66.7	68.5	80.0	87.5	360.1
System reinforcement, renewal, replacement	70.5 67.9	61.9 61.4	56.2 51.4	48.8	54.2	291.6 283.7
Non-system assets	22.2	16.6	15.2	30.6	31.5	116.1
Total	150.1 147.5	145.2 144.7	139.9 135.1	159.4	173.2	767.8 759.9

Refer to chapter 3 of the final decision for further information and the basis and reasoning for the forecast capex.

6 Capital base

6.1 Summary

The combined total of the capital base at 1 July 2010 is ~~\$2312.7 million~~ ~~\$2307.4 million~~ (\$, nominal) and is forecast to be ~~\$2943.2 million~~ ~~\$2936.9 million~~ at 30 June 2015 (\$, nominal), as shown in Table 6-1.

Table 6-1: Forecast capital base as at 30 June 2015 (\$m, nominal)

Asset class	Closing capital base at 30 June 2015
Wilton-Wollongong trunk	8.5 11.0
Wilton-Newcastle trunk	134.0 131.5
NSW distribution network	2800.7 2794.4
Combined total	2943.2 2936.9

In 2005 the Independent Pricing and Regulatory Tribunal of New South Wales (IPART) approved the treatment of the four pipelines that comprised its NSW network as a single covered pipeline for the purposes of the gas code and AA for the earlier AA period. In its decision on the AA for the earlier AA period, IPART required JGN to maintain separate capital bases for each of the Wilton to Newcastle and Wilton to Wollongong transmission pipelines and the distribution system, in addition to the aggregated capital base. The AER has required similar terms in its AA consolidation direction.³ The roll forward of the capital base is prepared using these three capital bases.

6.2 Opening capital base for the earlier AA period

Table 6-2: Estimated capital base as at 30 June 2005 (\$m, nominal)

Asset class	Closing capital base 30 June 2005
Wilton-Wollongong trunk	10.6
Wilton-Newcastle trunk	123.9 124.2
NSW distribution network	1829.1 1828.2

³ AER, Decision and statement of reasons, 9 June 2009.

Asset class	Closing capital base 30 June 2005
Combined total	1963.6 1963.0

The closing asset base for the Wilton-Wollongong Trunk is before the removal of \$2.1 million (nominal) in redundant assets, which reduces the opening capital base for this asset to \$8.5 million.

6.3 Opening capital base

The capital base is adjusted in accordance with rule 77(2) of the NGR.

Table 6-3: Increase in consumer price index (CPI) (%)

Financial Year	Annual increase in the consumer price index
2006 actual	2.80
2007 actual	3.25
2008 actual	2.96
2009 actual	3.69
2010 forecast	2.11

Notes: Values are year on year CPI inflation for the year to December for 8 capital cities as published by the Australian Bureau of Statistics.

Source: Australian Bureau of Statistics.

The closing capital base for the earlier AA period is set out in Table 6-4, Table 6-5, Table 6-6 and Table 6-7.

Table 6-4: Capital base for the earlier AA period (\$m, nominal)

	2005-06	2006-07	2007-08	2008-09	2009-10
Opening capital base ⁴	1961.5 1956.9	2024.6 2019.8	2128.9 2124.0	2203.0 2198.0	2286.8 2281.6
Net capital expenditure	74.4	110.5	90.2	84.7	94.2
Depreciation	67.2	73.8	80.3	83.6	85.1
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	55.9 55.8	67.6 67.5	64.3 64.1	82.7 82.5	49.2 49.1

⁴ In this and following roll forward tables opening balances and the first half of the capital expenditure are in year end \$nominal of the preceding year.

	2005-06	2006-07	2007-08	2008-09	2009-10
Closing capital base	2024.6 2019.8	2128.9 2124.0	2203.0 2198.0	2286.8 2281.6	2345.1 2339.8
Adjustment for difference between estimated and actual capital expenditure in 2004-05					-32.4

Note: Values for 2009-10 are forecast.

Table 6-5: Capital base for the Wilton to Wollongong trunk pipeline for the earlier AA period (\$m, nominal)

	2005-06	2006-07	2007-08	2008-09	2009-10
Opening capital base	10.6	8.6 10.7	8.7 10.9	8.7 11.0	8.8 11.3
Asset redundancies	-2.1	0	0	0	0
Net capital expenditure	0.0	0.0	0.0	0.0	0.0
Depreciation	0.2	0.2	0.2	0.2	0.2
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	0.2 0.3	0.3	0.3	0.3 0.4	0.2
Closing capital base	8.6 10.7	8.7 10.9	8.7 11.0	8.8 11.3	8.8 11.3
Adjustment for difference between estimated and actual capital expenditure in 2004-05					-0.4

Note: Values for 2009-10 are forecast.

Table 6-6: Capital base for the Wilton to Newcastle trunk pipeline for the earlier AA period (\$m, nominal)

	2005-06	2006-07	2007-08	2008-09	2009-10
Opening capital base	123.9 121.8	125.0 122.8	126.6 124.4	127.8 125.5	129.8 127.5
Net capital expenditure	0.0	0.0	0.0	0.0	2.2
Depreciation	2.4	2.5	2.6 2.5	2.6	2.7
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	3.5 3.4	4.1 4.0	3.7	4.7 4.6	2.8 2.7
Closing capital base	125.0 122.8	126.6 124.4	127.8 125.5	129.8 127.5	132.1 129.7
Adjustment for difference between estimated and actual capital expenditure in 2004-05					-2.7

Note: Values for 2009-10 are forecast.

Table 6-7: Capital base for the NSW distribution system capital base for the earlier AA period (\$m, nominal)

	2005-06	2006-07	2007-08	2008-09	2009-10
Opening capital base	1829.1 1824.5	1891.0 1886.3	1993.6 1988.7	2066.5 2061.5	2148.2 2142.9
Net capital expenditure	74.4	110.5	90.2	84.7	92.0
Depreciation	64.7	71.1	77.6	80.8	82.2
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	52.2 52.1	63.3 63.1	60.3 60.1	77.7 77.5	46.3 46.1
Closing capital base	1891.0 1886.3	1993.6 1988.7	2066.5 2061.5	2148.2 2142.9	2204.2 2198.8
Adjustment for difference between estimated and actual capital expenditure in 2004-05					-29.3

Note: Values for 2009-10 are forecast.

The closing balance values for 2009-10 constitute the opening capital base for the AA period.

6.4 Projected capital base in the AA period

The projected capital base in the AA period is set out in Table 6-8, Table 6-9, Table 6-10 and Table 6-11.

Table 6-8: Projected capital base for the AA period (\$m, nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening capital base ⁵	2312.7 2307.4	2448.6 2444.2	2564.5 2563.4	2676.0 2669.8	2804.3 2797.9
Net capital expenditure	147.9 148.8	142.3 145.7	144.3 139.2	168.9	188.4
Depreciation	74.0 73.9	91.9 91.8	101.3 101.2	112.4 112.3	124.8 124.7
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	62.0 61.9	65.5 65.4	68.5 68.4	71.7 71.6	75.3 75.2
Closing capital base	2448.6 2444.2	2564.5 2563.4	2676.0 2669.8	2804.3 2797.9	2943.2 2936.9

Table 6-9: Projected capital base for the Wilton to Wollongong trunk pipeline for the AA period (\$m, nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening capital base	8.4	8.5	8.5	8.5	8.5

⁵ In this and following roll forward tables opening balances and the first half of the capital expenditure are in year end \$nominal of the preceding year.

	2010-11	2011-12	2012-13	2013-14	2014-15
	10.9	10.9	10.9	11.0	11.0
Net capital expenditure	0.0	0.0	0.0	0.0	0.0
Depreciation	0.2 0.3	0.2 0.3	0.2 0.3	0.2 0.3	0.2 0.3
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	0.2 0.3	0.2 0.3	0.2 0.3	0.2 0.3	0.2 0.3
Closing capital base	8.5 10.9	8.5 10.9	8.5 11.0	8.5 11.0	8.5 11.0

Table 6-10: Projected capital base for the Wilton to Newcastle trunk pipeline for the AA period (\$m, nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening capital base	129.5 127.0	130.6 128.4	131.1 128.7	131.7 129.1	132.5 130.0
Net capital expenditure	0.5	0.0	0.0	0.4	1.2
Depreciation	2.8 2.7	2.8	2.9	3.0 2.9	3.1 3.0
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	3.4 3.3	3.4 3.3	3.4 3.3	3.4	3.4
Closing capital base	130.6 128.4	131.1 128.7	131.7 129.1	132.5 130.0	134.0 131.5

Table 6-11: Projected capital base for the NSW distribution system for the AA period (\$m, nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening capital base	2174.8 2169.5	2309.6 2305.4	2424.9 2423.8	2535.9 2529.7	2663.3 2657.0
Net capital expenditure	147.4 148.3	142.3 145.7	144.3 139.2	168.5	187.2 187.3
Depreciation	71.1 71.0	88.8	98.2 98.1	109.2 109.1	121.5 121.4
Reused redundant assets (end year)	0.0	0.0	0.0	0.0	0.0
Adjustment for inflation	58.4 58.3	61.9 61.8	64.9 64.8	68.1 67.9	71.7 71.5
Closing capital base	2309.6 2305.4	2424.9 2423.8	2535.9 2529.7	2663.3 2657.0	2800.7 2794.4

6.5 Capital contributions

Table 6-12: Capital contributions over the earlier AA period (\$m, nominal unless otherwise stated)

Details	2005-06	2006-07	2007-08	2008-09	2009-10
Total Contributions Received	7.91 7.83	5.00 5.04	8.66 8.55	6.81 6.87	4.30 4.28
Less Tax Cost Compensation	0.88 0.87	0.26	0.40 0.39	0.33	0.51 0.50
Contribution to Assets	7.02 6.96	4.73 4.74	8.26 8.16	6.48 6.54	3.79 3.78
Number of Contributions Received (No.)	886	724	772	857	1024

Notes: Values for 2009-10 are forecast. JGN has derived historical values from the capital contributions database that it has maintained in accordance with section 9.2 of its AA for the earlier AA period.

6.6 Capital expenditure in the earlier AA period

Information about the capital expenditure in the earlier AA period can be found in Table 3-5 in the revised access arrangement information.

7 Cost of capital

7.1 Summary

Table 7-1 sets out JGN's cost of capital for the AA for the AA period.

The details of how the weighted average cost of capital (**WACC**) parameters have been estimated are set out in the rate of return chapter 5 of the final decision.

**Table 7-1: WACC parameters adopted for the AA
for the AA period (units as stated)**

Parameter	
Nominal risk-free rate (%)	5.85
Inflation rate (%)	2.60
Real risk-free rate (%)	3.17
Equity beta	0.80
Market risk premium (%)	6.5
Debt risk premium (%)	4.17 2.93
Debt to total assets (gearing) (%)	60
Nominal return on equity (%)	11.05
Nominal return on debt (%)	10.02 8.78
Nominal vanilla WACC (%)	10.43 9.69

7.2 Treatment of tax

The final decision estimates the revenue requirements on a post-tax basis.

The post-tax approach involves incorporating a separate taxation building block—the estimated cost of corporate income tax (ETC)—which is estimated for each year as:

$$\text{ETC} = (\text{ETI} \times r) \times (1 - \gamma)$$

where:

ETI is the estimate of taxable income for that year

r is the tax rate; and

γ is the assumed utilisation of imputation credits.

Refer to chapter 6 of the final decision for further information.

7.3 Weighted average cost of capital model

The final decision estimates a nominal vanilla WACC as follows:

$$WACC = R_d \times \frac{D}{V} + R_e \times \frac{E}{V}$$

where:

R_d is the nominal return on debt

R_e is the nominal return on equity

D is total debt

E is total equity

V is $(D + E)$, i.e. total debt plus total equity.

7.3.1 Cost of equity

The final decision estimates the cost of equity using the Sharpe–Lintner capital asset pricing model (**CAPM**) as follows:

$$R_e = R_f + MRP \times \beta_e$$

where:

R_e is the nominal return on equity

R_f is the nominal risk-free rate

MRP is the market risk premium, i.e. $(R_m - R_f)$ where R_m is the return on the market portfolio

β_e is the equity beta of the benchmark business.

Refer to section 5.3 of the final decision for further information.

7.3.2 *Cost of debt*

The final decision estimates the cost of debt as follows:

$$R_d = R_f + DRP$$

where:

R_d is the nominal return on debt

R_f is the nominal risk-free rate

DRP is the nominal debt risk premium.

7.4 **Weighted average cost of capital parameters**

7.4.1 *Inflation forecast*

The final decision approves a forecast inflation rate of 2.60 per cent per annum.

Refer to section 5.6 of the final decision for further information.

7.4.2 *Gearing*

The final decision approves a gearing ratio of 60 per cent.

Refer to section 5.5 of the final decision for further information.

7.4.3 *Nominal risk-free rate*

The final decision approves a nominal risk-free rate of 5.85 per cent.

Refer to section 5.4 of the final decision for further information.

7.4.4 *Market risk premium*

The final decision approves a market risk premium of 6.5 per cent.

Refer to section 5.3 of the final decision for further information.

7.4.5 *Equity beta*

The final decision approves an equity beta of 0.8.

Refer to section 5.3 of the final decision for further information.

7.4.6 *Debt risk premium and credit rating*

The final decision approves a benchmark debt risk premium of ~~4.17-2.93~~ per cent based on a BBB+ credit rating.

Refer to section 5.5 of the final decision for further information.

7.4.7 *Dividend imputation*

The final decision approves a gamma (assumed utilisation of imputation credits) value of ~~0.25 0.65~~.

Refer to chapter 6 of the final decision for further information.

8 Depreciation

Refer to chapter 4 of the final decision for further information.

8.1 Summary

Table 8-1 summaries the forecast depreciation over the AA period by applying the real straight-line depreciation method.

Table 8-1: Forecast depreciation for the AA period (\$, nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Depreciation	74.0	91.9	101.3	112.4	124.7	504.3
	73.9	91.8	101.2	112.3		504.0

8.2 Assumptions on economic life of assets for regulatory depreciation

Table 8-2: Economic lives of JGN assets

Asset Class	Economic Asset Life (Years)
System Assets	
Trunk Wilton-Sydney	80
Trunk Sydney-Newcastle	80
Trunk Wilton-Wollongong	80
Contract Meters	20
Fixed Plant – Distribution	50
HP Mains	80
HP Services	50
MP Mains	50
MP Services	50
Meter Reading Devices	20
Country POTS	50
Tariff Meters	20
Building	48
Computers	5
Software	5
Fixed Plant	10

Asset Class	Economic Asset Life (Years)
Furniture	10
Land	0
Leasehold Improvements	10
Low value assets	10
Mobile Plant	10
Vehicles	4
Stock	1
All assets (including equity raising costs)	54

8.3 Depreciation and accumulated depreciation

Remaining asset lives for the capital base at 30 June 2010 are set out in Table 8-3.

Table 8-3: Remaining asset lives as at 30 June 2010

	Remaining Asset Life
Trunk pipeline (Wilton-Newcastle)	48.45 48.32
Trunk pipeline (Wilton-Wollongong)	42.90 43.87
Distribution system:	
Country POTS	36.66
Contract meters	10.20
Tariff meters	11.42
Meter reading devices	16.60
Fixed plant	0
HP mains	66.01 66.16
MP mains	29.68
HP services	27.04
MP services	38.15

Forecast regulatory depreciation for the AA period is provided in Table 8-4.

Table 8-4: Forecast depreciation for the AA period (\$m, nominal)

	2010-11	2011-12	2012-13	2013-14	2014-15	Total

	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Wilton-Wollongong	0.2 0.3	0.2 0.3	0.2 0.3	0.2 0.3	0.2 0.3	1.1 1.3
Wilton-Newcastle	2.8 2.7	2.8	2.9	3.0 2.9	3.1 3.0	14.5 14.3
Distribution network	71.1 71.0	88.8	98.2 98.1	109.2 109.1	121.5 121.4	488.7 488.3
Total	74.0 73.9	91.9 91.8	101.3 101.2	112.4 112.3	124.7	504.3 504.0

Forecast depreciation for the AA period (adjusted for the difference between forecast and actual CPI) will be used in rolling forward the asset base to the beginning of the AA period beginning on 1 July 2015 (rule 90(2) of the NGR).

9 Revenue requirement

The total revenue requirement is determined using the building block approach (in accordance with rule 76 of the NGR). This chapter sets out the total revenue requirement.

Refer to chapter 10 of the final decision for further information.

The total required revenues for each year of the AA period are set out in the following table.

Table 9-1: Total revenue requirement (\$m, real, 2009–10, unless otherwise stated)

	2010-11	2011-12	2012-13	2013-14	2014-15
Return on capital	242.6 242.0 224.8	249.6 249.1 231.6	254.6 254.0 236.1	259.8 258.9 240.7	265.8 265.0 246.3
Depreciation	11.7	25.0 25.1	30.3 30.4	36.7 36.8	43.5
Operating and maintenance	132.5 133.6	136.9 134.2	141.3 145.9	144.5	147.6
Corporate income taxation	12.9 12.5 5.0	17.7 16.7 6.7	19.2 7.8	22.2 9.0	25.3 25.4 10.2
Incentive mechanism payments	na	na	na	na	na
Total	399.6 399.8 375.2	429.3 425.0 397.6	445.3 449.5 420.1	463.2 462.5 431.0	482.2 481.6 447.7
X factor tariff revenue^a					
Haulage reference services (%)	-5.31 ^b	-1.96	-8.39 -8.33 -1.96	-8.39 -8.33 -1.96	-8.39 -8.33 -1.96
Meter data service (%)	-29.69 ^b	0.00	-0.80 -0.71 0.00	-0.80 -0.71 0.00	-0.80 -0.71 0.00

na: Not applicable.

a: Negative values for X indicate real price increases under the CPI-X formula.

b: The 2010-11 X factor is the initial real change in tariffs (P0 adjustment).

10 Services

10.1 Summary

The reference services⁶ for the AA period are:

- *haulage service* - a service for transportation of gas by JGN through its network to a single eligible delivery point for the use of a single customer
- *meter data service* - a service for the provision of meter reading and on-site data and communication equipment to a delivery point.

Ancillary reference services and charges are provided as part of the reference haulage service or meter data service, unless a contrary intention is clear.

JGN also provides non-reference negotiated services.

Refer to chapter 2 of the final decision for further information.

10.2 Cost allocation overview

The final decision approves the allocation of total revenue to reference services.

Refer to chapter 12 of the final decision for further information.

10.3 Price path

This section sets out the proposed prices that will allow JGN to recover its required revenue as presented in chapter 10.

The comparison of total revenue to total cost of service is shown in Table 10-1.

Table 10-1: Revenue and cost alignment (\$m, real, 2009-10)

	2010-11	2011-12	2012-13	2013-14	2014-15	NPV
Total cost of service	399.6	429.3	445.3	463.2	482.2	1741.7
	399.8	425.0	449.5	462.5	481.6	1741.4
	375.2	397.6	420.1	431.0	447.7	1679.4
Total revenue	389.7	400.3	441.3	477.9	521.5	1741.7
	389.6		441.4	477.4	520.7	1741.4
			416.0	424.6	436.6	1679.0

Note: The net present value (NPV) of the total cost of service and total revenue is estimated using a real pre-tax WACC which reflects the approved nominal vanilla WACC.

⁶ The reference services are defined in schedule 1 of the AA.

Based on the cost allocation to the haulage reference service discussed above, the price path aligns the net present value (**NPV**) of the five year cost of service with the NPV of the forecast revenues.

11 Reference tariffs

There are 36 tariff classes in the AA period which are distinguished between two different customer categories:

- *volume (or small) customers* who include residential and small industrial and commercial customers
- *demand (or large) customers* who are larger commercial and industrial gas consumers.

Volume and demand customers are called ‘tariff market’ and ‘contract market’ customers in the AA for the earlier AA period, respectively.

The distinction between volume and demand customers is based on the likelihood of their consumption being more or less than 10 TJ of gas per year.

Refer to chapter 12 of the final decision for further information.

11.1 Volume and demand tariff classes

11.1.1 *Volume tariff classes*

The AA for the earlier AA period assigns all volume customers to a single reference tariff class for the purpose of trunk network services and local network services.

There are two tariff classes for volume customers in the AA period:

- *V-Coastal tariff* – Applicable to volume customer delivery points located in the Wilton network section, which is supplied from the JGN northern and southern trunks
- *V-Country tariff* – Applicable to volume customer delivery points located in country network sections that do not utilise JGN trunk mains.

The V-coastal tariff includes an implicit trunk charge. The V-country tariff does not include a trunk charge.

11.1.2 *Demand tariff classes*

The AA for the earlier AA period charges for services to demand customer delivery points (denoted as contract customers in the AA for the earlier AA period) on a zonal basis. These zones reflect the customer’s location within the local network. Retaining this approach gives rise to the 12 location-based demand tariff classes.

Similarly, JGN has retained the option for throughput pricing for large customers as a separate tariff class (also for customers that are currently capped)

In addition to the 13 tariff classes outlined above (12 location and 1 throughput tariff class) the following tariff classes are offered:

- an additional 11 tariff classes (one for each of the 11 coastal zones) based on a capacity charge tariff for very large customers who agree to participate as “first response” respondents in network load shedding events, and
- for Sydney locations, an additional 5 tariff classes (one for each of the 5 Sydney zones) for major end customer throughput tariffs, and
- for Sydney locations an additional 5 tariff classes (one for each of the 5 Sydney zones) for major end customer throughput tariffs for very large customers who agree to participate as “first response” respondents in network load shedding events.

In total there are 34 demand tariff classes in the AA for the AA period.

Demand customers will continue to be assigned to multiple reference tariff classes which reflect their location within the local network, and the manner in which they are billed for usage.

Tariff categories

The 34 demand tariff classes can be grouped into 5 categories:

- *capacity* – This is the default category for demand customers. However, customers can select the other two available demand tariff categories at their option, subject to assignment procedures and criteria.
- *capacity first response* – This is a new discounted tariff for large customers who are willing and eligible to participate in network load shedding on a “first response” basis. Assignment to these tariffs will be on user request where assignment criteria are satisfied. Customers assigned to this tariff category receive a discounted tariff in return for a commitment to shed load under an agreed curtailment plan. These customers must meet certain operational criteria relating to their usage and ability to shed load.
- *throughput* – Assignment to this tariff is currently made on user request. This tariff category replaces the capping and throughput service in the AA for the earlier AA period.
- *major end-customer throughput* – Assignment to this tariff is to be made on user request where assignment criteria are satisfied. This tariff is only available in the 5 Sydney zones.

- *major end-customer throughput first response* – This is a new discounted tariff for large customers located in one of the Sydney zones who are willing and eligible to participate in network load shedding on a “first-response” basis. Assignment to these tariffs will be on user request where assignment criteria are satisfied. Customers assigned to this category receive a discounted demand major end-customer throughput (**DMT**) tariff in return for a commitment to shed load under an agreed curtailment plan. These customers must meet certain operational criteria relating to their usage and ability to shed load. This tariff category is intended to encourage more efficient and transparent load shedding.

11.1.3 *Transaction costs*

The final decision considers that the revised access arrangement proposal⁷ takes into account transaction costs when determining tariffs, charging parameters and tariff classes.

Refer to chapter 12 of the final decision for further information.

11.1.4 *Ability to respond to price signals*

Refer to chapters 12 and 13 of the final decision for further information.

11.2 **Efficient pricing**

11.2.1 *Tariff efficiency*

Refer to chapters 12 and 13 of the final decision for further information.

⁷ JGN, *Access arrangement (revision in response to AER draft decision)*, March 2010.

12 Price control formulae

12.1 Summary

A tariff basket form of price control is used for the haulage reference service. A tariff rebalancing constraint is applied that limits annual real movements in revenues from any given tariff to no more than 10 per cent adjusted for the value of X_t .

A fixed tariff schedule approach is retained for the meter data reference service.

12.2 Haulage reference service

12.2.1 Tariff variation mechanism

A tariff basket annual tariff variation mechanism in the form of a weighted average price cap (**WAPC**) formula applies to the haulage reference service. The WAPC uses the CPI-X price control in the AA period.

The weighted average price element of the tariff basket formula is given effect through the following parameters that comprise the right hand side of the WAPC:

$$\frac{\sum_{x=1}^n \sum_{y=1}^m p_t^{xy} q_{t-2}^{xy}}{\sum_{x=1}^n \sum_{y=1}^m p_{t-1}^{xy} q_{t-2}^{xy}}$$

These parameters determine the weighted average of notional revenues in the current year compared to the year in which the proposed tariffs are to apply. This notional revenue relies upon historical quantities from two years prior.

The price cap element of the WAPC is given effect through the following formula which comprises the left hand side of the WAPC:

$$(1 + CPI_t)(1 - X_t)$$

The X_t parameter is:

- 1.96% in 2011–12;
- 8.39% ~~-8.33%~~ -1.96% in 2012–13;
- 8.39% ~~-8.33%~~ -1.96% in 2013–14; and
- 8.39% ~~-8.33%~~ -1.96% in 2014–15.

The CPI_t parameter allows JGN's haulage reference tariffs to be adjusted annually for inflation.

12.2.2 Tariff variation process

JGN is required to submit an annual reference tariff proposal to the AER for approval approximately 50 business days prior to the relevant financial year in which the proposed tariffs are to apply. The annual reference tariff proposal will include a pricing model that demonstrates JGN's compliance with the tariff variation mechanism.

The AER will review this proposal for compliance with the tariff variation mechanism and approve or reject the proposal consistent with the terms of the AA for the AA period.

12.3 Other reference services

The meter data reference service is maintained constantly over the AA period in real terms.

12.3.1 Tariff variation mechanism

A tariff schedule approach will be used for meter data reference services. This approach involves JGN publishing in its AA a list of real prices for each year of the AA period and then adjusting this each year for inflation.

12.3.2 Tariff variation process

The tariff variation process follows JGN's haulage reference tariff variation process. JGN submits its annual tariff proposal including a pricing model that demonstrates how JGN has escalated the real tariffs published in its AA for the AA period for inflation. The AER approval will be based on its confirmation that JGN has correctly applied the inflation adjustment to its tariffs.

12.4 Cost pass through tariff variation mechanism

A cost pass through mechanism will operate in the AA period to vary tariffs.

Refer to chapter 13 of the final decision and section 3 of the AA for further information.

Glossary

AA	access arrangement
AA period	the access arrangement period: 1 July 2010 to 30 June 2015
AAI	access arrangement information
AER	Australian Energy Regulator
AGL	Australian Gas Light Company
APA Group	Australian Pipeline Trust and APT Investment Trust
capex	capital expenditure
CAPM	capital asset pricing model
CPI	consumer price index
customer	an end user of gas
DMT	demand major end-customer throughput
earlier AA period	the access arrangement period: 1 July 2005 to 30 June 2010
EGP	Eastern Gas Pipeline
final decision	AER, Final decision, Jemena Gas Networks, Access arrangement proposal for the NSW gas networks, <i>1 July 2010–30 June 2015</i> , June 2010
GJ	gigajoule
HDD	heating degree days
IPART	Independent Pricing and Regulatory Tribunal of New South Wales
JAM	Jemena Asset Management Pty Ltd ACN 086 013 461
JGN	Jemena Gas Networks (NSW) Ltd ACN 003 004 322
JGN network	the gas distribution networks in NSW controlled and operated by JGN
KPIs	key performance indicators
MDQ	maximum daily quantity
MSP	Moomba to Sydney pipeline
NGR	National Gas Rules
NPV	net present value
NSW	New South Wales
O&M	operating and maintenance expenditure
opex	operating expenditure
POTS	packaged off-take station

revised access arrangement information	Jemena Gas Networks (NSW) Ltd, <i>Revised access arrangement information</i> , March 2010
revised access arrangement proposal	Jemena Gas Networks (NSW) Ltd, <i>Access arrangement (revision in response to AER draft decision)</i> , March 2010
SGC	Sydney Gas Company
TJ	terajoule (10^{12} joules)
UAG	unaccounted for gas
user	a party who contracts with JGN for its use of JGN's pipeline services
WAPC	weighted average price cap
WACC	weighted average cost of capital