Jemena Gas Networks (NSW) Ltd

Revised Access Arrangement Information

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1 Introduction

This Access Arrangement Information (**AAI**) has been prepared by Jemena Gas Networks (NSW) Ltd (**JGN**) (ACN 003 004 322), which is a public company registered in New South Wales (**NSW**). JGN is the owner, controller and operator of gas distribution networks in NSW (**JGN network**).

Chapter 1 describes the form and structure of JGN's access arrangement (**AA**) and AAI, and the regulatory arrangements that inform the content of these documents.

1.1 Purpose of JGN's access arrangement

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

- the NSW distribution system
- the Central West distribution system
- Wilton to Newcastle distribution pipeline
- Wilton to Wollongong distribution pipeline.

On 5 June 2009, the AER directed JGN to consolidate the terms of access for these four covered pipelines into one AA.

JGN's AA will apply from 1 July 2010 to 30 June 2015 which is the next access arrangement period (**next AA period**) and the fourth one for JGN.

1.2 Purpose of this access arrangement information

This revised AAI contains information that enables users and prospective users to understand the derivation of the elements of JGN's AA. It is updated from the original AAI that was submitted to the AER by JGN on 25 August 2009. It should be read in conjunction with JGN's access arrangement submission and JGN's initial response to the draft decision.

All monetary amounts presented in this AAI are expressed in real 2010 dollars, are in millions of dollars and apply to 1 July to 30 June regulatory years unless otherwise stated.

1.3 Access arrangement periods

This document refers to several different access arrangement periods. These are both defined below and in the glossary:

- **previous AA period** – the period 1 July 2000 to 30 June 2005
- **current AA period** – the period 1 July 2005 to 30 June 2010
- **next AA period** – the period 1 July 2010 to 30 June 2015
- **subsequent AA period** – the period 1 July 2015 to 30 June 2020.

This naming convention matches that JGN used in its August 2009 proposal.

2 Jemena Gas Networks

As an aid to understanding the AA, 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 customers. It explains characteristics and emerging trends and opportunities that affect reference services and tariffs proposed in the AA.

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 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

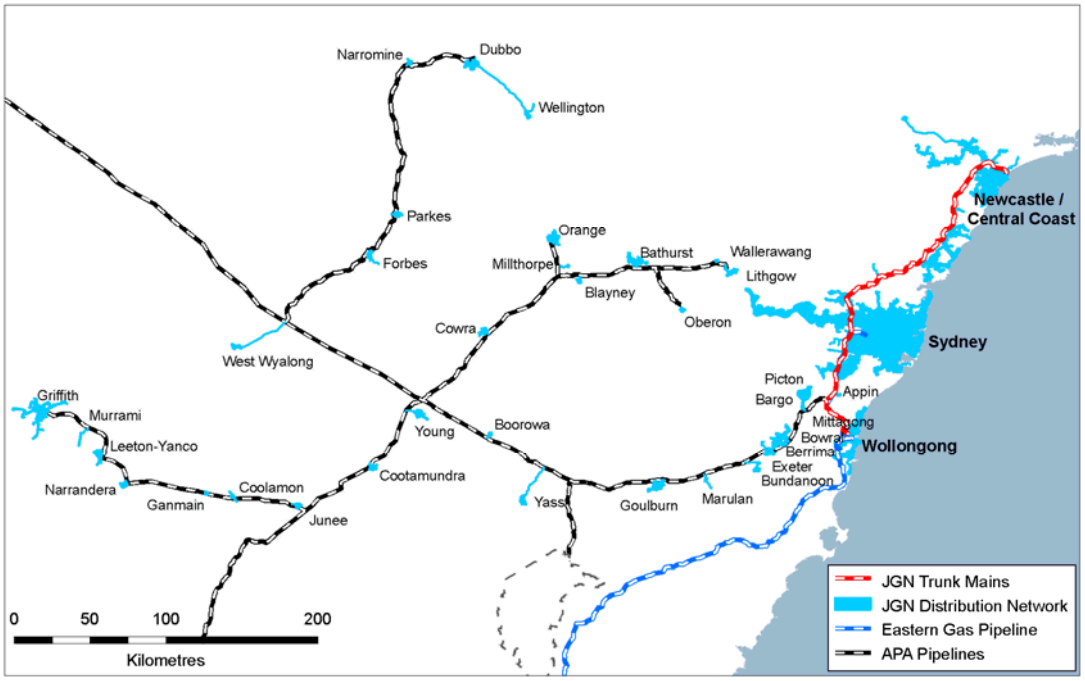
At present the section of the JGN network that serves Sydney, Newcastle and Wollongong has four receipt points through which it accepts gas from three principal sources:

- 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 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 Company[1] (**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, 1,428 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 Current performance

This chapter examines JGN's performance during the current AA period in the areas of:

- demand, energy consumption and customer numbers
- opex
- capex.

3.1 Customer numbers, demand and volume

Table 3-1 to Table 3-3 provide a series of JGN's outcomes over the current AA period in relation to customer numbers, maximum, minimum and average demand, and total gas load (volume). Maximum daily quantity (**MDQ**) for large customers is also shown.

Table 3-1: Customer numbers during the current AA period

Customer numbers by type	2005-06 actual	2006-07 actual	2007-08 actual	2008-09 actual	2009-10 forecast
Residential	945,257	965,653	995,074	1,022,084	1,052,085
Small business	29,293	30,683	30,869	29,750	30,210
Total volume customers	974,550	996,336	1,025,943	1,051,834	1,082,295
Demand customers	483	444	430	414	411
Total customers	975,033	996,780	1,026,373	1,052,248	1,082,706

Table 3-2: Minimum, maximum and average daily load total JGN network 2005-06 to 2008-09 (TJ)

	2005-06 actual	2006-07 actual	2007-08 actual	2008-09 actual
Minimum load	130.20	149.40	132.80	131.70
Maximum load	391.50	399.20	415.80	411.80
Average daily load	259.70	266.70	271.20	275.60

Note: JGN does not have available forecasts of maximum and minimum total system wide demand, which is why the above table provides historical data.

Table 3-3: Gas load by customer type and tariff for current AA period (TJ)

Service	2005-06 actual	2006-07 actual	2007-08 actual	2008-09 actual	2009-10 estimated
Residential	20,010	20,649	21,327	23,041	22,518
Small business	11,790	11,843	12,210	11,945	12,039
Total volume customers	31,800	32,492	33,537	34,986	34,557
Total demand customers	62,988	64,857	65,452	65,569	64,643
Total load all customers	94,788	97,349	98,989	100,555	99,200

Note: Gas loads up to and including 2008-09 are actual, not weather normalised.

3.2 Operating expenditure

Table 3-4 shows the opex forecast that IPART allowed for JGN (AGLGN) in the 2005 final decision, in the categories that IPART specified. At a total opex level, JGN expects to incur operating expenditure over the current period of $648.7 million, which is $38.4 million (or 5.6 per cent) below that allowed.

Table 3-4: Allowed non-capital costs compared with actuals and JGN's currently estimated and forecast outcomes

Cost category		2005-06	2006-07	2007-08	2008-09	2009-10
Operating and maintenance	Allowed	80.2	81.3	81.9	82.5	83.1
	Incurred	86.3	87.6	85.8	85.1	82.2
Administration and overheads	Allowed	21.3	21.6	21.8	22.0	22.2
	Incurred	18.5	20.4	20.9	22.5	27.6
Marketing	Allowed	19.3	19.6	19.7	19.9	20.1
	Incurred	4.4	2.8	4.6	6.2	6.7

Cost category		2005-06	2006-07	2007-08	2008-09	2009-10
Government levies	Allowed	3.7	3.7	3.7	3.7	3.7
	Incurred	3.8	4.3	4.0	3.1	3.1
UAG	Allowed	10.5	10.3	10.4	10.4	10.5
	Incurred	15.8	14.2	12.1	13.0	13.8
Total non-capital costs	Allowed	135.1	136.5	137.5	138.5	139.6
	Incurred	128.7	129.3	127.4	129.9	133.4
Efficiencies achieved (per cent)		*6.4*	*7.2*	*10.1*	*8.6*	*6.2*

Notes: Amounts allowed are adapted from IPART Final Decision, *Revised Access Arrangement for AGL Gas Networks*, April 2005, Table 5.1.

Amounts incurred are JGN's actuals to 2008-09 and its forecast for 2009-10.

O&M costs include retail contestability and market operations.

The O&M costs that JGN incurred from 2005-06 to 2008-09 reflect the agreed fee that JGN paid to JAM under its previous outsourcing arrangements. The O&M costs that JGN expects to incur in 2009-10 are based on JGN's new outsourcing agreement with JAM.

3.3 Capital expenditure

As shown in Table 3-5, JGN expects to incur capex over the current AA period of $535.0 million, which is $31.1 million (5.5 per cent) below that allowed by IPART in 2005.

Table 3-5: Allowed capital costs compared with actuals and JGN's currently estimated and forecast outcomes

Cost category		2005-06	2006-07	2007-08	2008-09	2009-10	Total
Market expansion	Allowed	63.5	62.4	61.1	61.4	61.9	310.3
	Incurred	49.9	40.6	42.1	49.7	48.8	231.1
System reinforcement / renewal / replacement	Allowed	69.4	46.6	43.4	26.9	19.8	206.1
	Incurred	48.0	91.1	46.9	37.1	44.6	267.8
Non-system assets	Allowed	9.3	9.3	9.3	10.7	11.2	49.7
	Incurred	2.2	0.7	19.8	6.9	6.5	36.0
Total capital costs	Allowed	142.2	118.2	113.7	99.0	93.0	566.1
	Incurred	100.1	132.3	108.9	93.7	100.0	535.0
Variance (per cent)		**-29.6**	**11.9**	**-4.3**	**-5.4**	**7.6**	**-5.5**

Notes: Amounts allowed are adapted from IPART Final Decision, *Revised Access Arrangement for AGL Gas Networks*, April 2005, Table 7.7.

Amounts incurred are JGN's actuals to 2007-08, estimates for 2008-09, and forecast for 2009-10.

4 Forecast demand

4.1 JGN's forecast demand

Table 4-1, Table 4-2 and Table 4-3 set out JGN's forecast customer numbers, minimum and maximum demand, and volume over the next AA period respectively.

Table 4-1: Forecast customer numbers by type and tariff class for next AA period

	2010-11 Forecast	2011-12 Forecast	2012-13 Forecast	2013-14 Forecast	2014-15 Forecast
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	1,113,567	1,147,291	1,180,399	1,220,553	1,265,211

Table 4-2: Average load volume and demand customers next AA period and MDQ demand customers (TJ)

	2010-11 Forecast	2011-12 Forecast	2012-13 Forecast	2013-14 Forecast	2014-15 Forecast
Volume customers	95.1	95.1	94.1	93.5	94.4
Demand customers	213.9	217.9	211.1	205.3	199.9
Total average load	275.7	279.1	271.6	265.9	261.5
MDQ demand customers	326.2	331.3	322.3	315.7	308.4

Table 4-3: Load by customer type and tariff for next AA period (TJ)

Service	2010-11 Forecast	2011-12 Forecast	2012-13 Forecast	2013-14 Forecast	2014-15 Forecast
Residential	22,553	22,335	22,055	22,105	22,474
Small business	12,148	12,359	12,296	12,004	11,992
Total load volume customers	34,700	34,694	34,351	34,110	34,466
Demand customers	65,936	67,183	64,765	62,942	60,969

Service	2010-11 Forecast	2011-12 Forecast	2012-13 Forecast	2013-14 Forecast	2014-15 Forecast
Total load all customers	100,637	101,878	99,116	97,052	95,436

4.1.1 JGN total forecast

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

Table 4-4: JGN total gas forecast 2008-09 to 2014-15

June years	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Total load (TJ)							
Residential	21,310	22,518	22,553	22,335	22,055	22,105	22,474
Business	11,753	12,039	12,148	12,359	12,296	12,004	11,992
Total volume customers	33,063	34,557	34,700	34,694	34,351	34,110	34,466
Demand customers	64,675	64,643	65,936	67,183	64,765	62,942	60,969
Total load	97,738	99,200	100,637	101,878	99,116	97,052	95,436
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 volume customers	1,051,834	1,082,295	1,113,154	1,146,879	1,179,989	1,220,144	1,264,802
Demand 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	6,332	7,056	6,267	7,193	6,973	6,772	6,568
Total new residential	24,529	30,001	30,573	33,260	32,989	40,326	44,524
Small	888	975	1,075	1,175	1,251	1,335	1,410

June years	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
business							
Demand customers	6	3	3	3	3	3	3
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	19.2	18.5	18.2
New estates and high rise	18.1	17.0	16.7	16.1	15.3	14.7	14.3
Electricity to gas	14.6	14.6	15.7	14.8	14.1	13.6	13.3
Average load all residential	20.8	21.3	20.7	19.7	18.8	18.1	17.7
Maximum daily quantity demand customers (MDQ)							
MDQ demand customers	331	318	326	331	322	316	308

4.2 Forecast pipeline capacity

Capacity and utilisation information for a distribution network is not available or meaningful for a distribution pipeline. As noted in the draft decision, 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 do therefore may not be practicable[2].

[2] Draft decision, p250

5 Forecast operating expenditure

5.1 JGN's forecast opex

JGN's forecast opex over the next AA period is shown in Table 5-1.

Table 5-1: JGN forecast opex

			Next AA period				
	2008-09 (adjusted base year)	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Non-O&M	47.24	51.27	52.86	53.48	53.99	54.88	55.70
O&M	83.42	82.15	85.30	87.42	91.54	94.08	97.94
Total forecast opex	**130.66**	**133.42**	**138.17**	**140.89**	**145.53**	**148.96**	**153.64**

5.2 JGN forecast non-O&M costs

Table 5-2 summarises JGN's forecast opex excluding O&M activities.

Table 5-2: JGN forecast operating costs excluding O&M over next AA period

			Next AA period				
Category	**2008-09 (adjusted base year)**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Administration and overhead							
Base cost	26.57	25.21	25.51	26.00	26.88	27.96	28.89
One-off events	-1.68	0.00	0.00	0.00	0.00	0.00	0.00
Step changes	0.00	0.00	0.44	0.44	0.46	0.48	0.49
Government levies	3.08	3.08	3.08	3.08	3.08	3.08	3.08
Marketing	6.22	6.75	6.75	6.75	6.75	6.75	6.75
Unaccounted for gas	13.04	13.81	13.36	13.43	13.01	12.77	12.60

			Next AA period				
Category	**2008-09 (adjusted base year)**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Carbon costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Self insurance	0.00	2.42	2.42	2.42	2.42	2.42	2.42
Debt raising	0.00	0.00	1.31	1.35	1.39	1.43	1.47
Total JGN non-O&M opex	**47.24**	**51.27**	**52.86**	**53.48**	**53.99**	**54.88**	**55.70**

Note: JGN proposes to capitalise equity raising costs to its RAB rather than include it in its forecast cost of service and cash flows.

This forecast is therefore subject to change if JGN's capex, cost of service or cash flow assumptions are varied.

5.3 JGN's operating and maintenance costs

Table 5-3 summarises JGN's forecast opex including O&M activities.

Table 5-3: JGN forecast O&M costs over next AA period

			Next AA period				
Category	**2008-09 (adjusted base year)**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
JAM asset management services							
Base cost	79.52	75.76	76.53	78.56	81.99	84.66	87.90
One-off events	-2.58	0.00	0.00	0.00	0.00	0.00	0.00
Step changes	0.30	0.30	2.46	2.38	2.77	2.45	2.78
Site remediation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Margin	6.18	6.09	6.32	6.48	6.78	6.97	7.25
Total JGN O&M opex	**83.42**	**82.15**	**85.30**	**87.42**	**91.54**	**94.08**	**97.94**

5.4 Key performance indicators for the next AA period

JGN proposes to retain its existing distribution KPIs to reflect the reclassification of its trunk pipelines as distribution pipelines. Table 5-4 sets out JGN's proposed KPIs.

Table 5-4: Proposed KPIs: Operating cost per metre and cost per customer site ($)

	2010-11	2011-12	2012-13	2013-14	2014-15
Operating cost per metre	4.61	4.67	4.82	4.93	5.05
Operating cost per customer site	102.07	101.35	102.75	102.36	102.54

6 Forecast capital expenditure

6.1 JGN's forecast capex

Table 6-1 summarises JGN's forecast capex which complies with the NGR.

Table 6-1: Forecast capex over the next AA period

Capex	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Market expansion	61.2	73.1	75.0	88.3	96.7	394.5
System reinforcement/ renewal / replacement	80.6	78.4	73.8	65.5	70.1	368.5
Non-system assets	24.4	18.2	16.7	33.9	34.9	128.1
Total	166.2	169.8	165.5	187.7	201.8	891.0

Sources: JAM, 2009, Jemena Asset Management Plan for the Jemena JGN (NSW) Gas Network 2009-10 – 2014-15.

JAM, 2009, Jemena Asset Management: 2010-11 – 2014-15 Information Technology Strategy and Asset Management Plan for Jemena Gas Networks (NSW).

6.2 Basis of capital expenditure forecast

6.2.1 Distribution forecast methodology

JAM has adopted a fit-for-purpose forecasting methodology. This employs different forecasting methods for different categories of capex that reflect the nature of capex projects or activities within those categories. It reflects the prudent capital works gating processes JGN and JAM follow.

JAM initially forecast all capex costs in 2008-09 dollars, and then adjusted them for the real input cost escalators and for forecast CPI inflation, in accordance with instructions from JGN.

Network capital expenditure

Table 6-2 summarises JGN's methods for forecasting network capex and the rules upon which it has relied for capex justification.

Table 6-2: Forecast methods for network capex

Program	Rule 79(2) justification	Methodology and key assumptions
Market Expansion	79(2)(b)	Market expansion activities are considered high volume routine activities. Capex is forecasted on the basis of forecasted volumes of new connections and unit rates. NIEIR forecasts the annual volumes of new connections for all market types following historical trends. Forecast unit rates are based on historical actual rates from the current AA period, and the forecasted 2009-10 rates.
Growth capacity development	79(2)(c)(ii) and (iv)	Projects for capacity development are identified for inclusion in the AMP and capex forecasts through various planning, monitoring, validating and risk assessment activities. JGN forecasts the capital costs of these projects using three methods: Desktop estimate based on average units rates from comparable recent projects Feasibility estimate that updates the desktop estimate using identified features of the project, the JAM Pricing Model and information from site visits, including estimates from external quantity surveyors Committed estimates that include information from contractors and tenders. JGN also includes an annual budget allocation for a number of small projects identified after the approval of the AMP each year. Overall, external quantity surveyors estimate the costs for about 90 per cent of projects using the JPM, while the average unit rates are used for the remaining 10 per cent. Committed estimates are developed for projects prior to final approval/release of funds.

Program	Rule 79(2) justification	Methodology and key assumptions
Mains and services renewal	79(2)(c)(i) and (ii)	Mains and renewal capex includes budget allocations for renewal activities as well as projects identified for larger areas. Budget allocations include: Ad-hoc renewal of mains and services; localised renewal of sections of main and associated services that pose unacceptable risk or have reached the end of their economic life (specific projects are identified each year) Ad-hoc renewal of individual services that pose unacceptable risk or have reached the end of their economic life. Forecasts for budget allocations are based on levels of historic renewal activities and current policies and procedures. Based on this information, JGN considers renewal activities will rise in the future. Forecasts for larger projects are based on historic proposals and average unit rates from comparable recent projects. Committed estimates are developed for projects prior to final approval / release of funds.
Mines subsidence	79(2)(c)(i) and (ii)	Forecast capex is based on the current scope of proposed activities as at April 2009 and includes current estimates from JAM. Committed estimates are developed for projects prior to final approval / release of funds.

Program	Rule 79(2) justification	Methodology and key assumptions
Stay in business facilities and SCADA	79(2)(c)(ii) and (iv)	JGN undertakes stay in business capex to maintain the integrity of services, and maintain capacity to meet demand from existing customers. Projects are identified for inclusion in the AMP and capex forecast through various planning, monitoring, risk and engineering assessment activities. JGN forecasts the capital costs of these projects using three methods: Desktop estimate based on average units rates from comparable recent projects Feasibility estimate that updates the desktop estimate using identified features of the project, the JAM Pricing Model and information from site visits, including estimates from external quantity surveyors Committed estimates that include information from contractors and tenders. JGN also includes an annual budget allocation for a number of small projects identified after the approval of the AMP each year. Committed estimates are developed for projects prior to final approval/release of funds.
Meter renewal and upgrade	79(2)(c)(ii) and (iii)	Like market expansion activities, planned meter renewals and upgrades are considered high volume routine activities and estimated based on forecast volumes and unit rates. Forecast volumes are based on the life expectancy of various meter types, based on data extracted from GASS for current assets in service. Forecast unit rates are based on historic actual rates from the current AA period and the current 2009-10 rates.
Government authority work	79(2)(c)(iii)	JGN is often required by government authorities to move its mains. JGN forecasts these costs based on the historical trend. Committed estimates are developed for projects prior to final approval / release of funds.

Source: JAM.

Non-network forecast methodology

Table 6-3 summarises JGN's methods for forecasting non-network capex and the rules upon which it has relied for capex justification.

Table 6-3: Forecast methods of non-network capex

Program	Rule 79(2) justification	Methodology and key assumptions
Motor vehicles	79(2)(c)(iv)	JGN has an aging fleet of motor vehicles. Its forecast capex assumes: • rolling replacement of fleet based on a combination of vehicle age and actual/expected km • replacement occurs on the registration renewal date • budget costs by vehicle type. The forecast is based on individual vehicles summarised for vehicle categories (e.g. trucks, trailers and passenger vehicles) on an annual basis.
Leasehold improvements, buildings and land	79(2)(c)(iv)	Forecast capex assumes leasehold improvements including relocation of North Parramatta Control Centre to the Sydney Olympic Park site
IT and communications	Various as set out In Appendix 7.2 including 79(2)(a) and (c)	JAM has forecast IT capex on a project specific basis for the following key IT projects: • Jemena transition projects • corporate, financial & office systems • business intelligence and management reporting • document and records management - electronic content management • geographic information system (GIS) • supervisory control and data acquisition (SCADA) • distribution network and load management systems • market services and risk management • gas network services delivery • customer service, billing and metering GASS replacement • IT infrastructure
Planned fixed and mobile plant and equipment	79(2)(c)(iv)	JAM has forecast this capex based on recent unit rates and recent expenditure for: gas leak surveyor units, pipe locators, pipeline current mappers, CP fault finding tools, oscilloscopes, druck gauges, pressure pot sand blasting cabinets, high pressure purge burners, hydraulic squeezers, motor drive pump for high pressure hot tapping drill, plidco clamps and seals, air compressors,

Program	Rule 79(2) justification	Methodology and key assumptions
		tippers, excavators and trailers.

7 Regulatory asset base

7.1 Summary

JGN has determined that the combined total of its RAB at 1 July 2010 is $2,996million ($nominal) and is forecast to be $3,038 million at 30 June 2015 ($nominal), as shown in Table 7-1.

Table 7-1: Forecast value of RAB at 30 June 2015 ($nominal)

Asset class	Closing RAB at 30 June 2015
Wilton-Wollongong trunk	12.74
Wilton-Newcastle trunk	146.56
NSW distribution network	2,910.07
Combined total	**3,069.38**

In 2005 IPART agreed to JGN's proposal to treat the four pipelines that comprised its NSW network as a single covered pipeline for the purposes of the gas code and AA. In its decision on the 2005 AA, 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.[3] The AER has imposed similar terms in its AA consolidation direction. JGN has prepared its RAB roll forward by these three capital bases.

7.2 Opening capital base for the current AA period

Table 7-2: JGN's closing RAB as at 30 June 2005 ($nominal)

Asset class	Closing RAB 30 June 2005
Wilton-Wollongong trunk	10.6
Wilton-Newcastle trunk	124.0
NSW distribution network	1,832.8
Combined total	**1,967.4**

Notes: Closing RAB for Wilton-Wollongong trunk is before 20 per cent reduction require by IPART.

7.3 Closing capital base for the current AA period

JGN has adjusted its capital base as follows:

[3] AER letter to JGN dated 5 June 2009.

capital base = opening capital base + indexation at CPI + conforming capital expenditure – depreciation – capital contributions + conforming assets from speculative investment account – redundant assets + re-used redundant assets – asset disposals[4]

Table 7-3: Increase in consumer price index

Financial Year	Annual increase in the consumer price index (per cent)
2006 actual	3.98%
2007 actual	2.07%
2008 actual	4.51%
2009 actual	1.46%
2010 forecast	3.00%

Notes: Values up to 2009 are year on year CPI inflation for the year to June for 8 capital cities as published by the Australian Bureau of Statistics. The value for 2010 is as forecast by the Reserve Bank of Australia in its May 09 *Monetary Policy Statement*.

Source: Australian Bureau of Statistics and Reserve Bank of Australia.

The closing capital base for the current AA period is set out in Table 7-4, Table 7-5, Notes: Opening RAB for Wilton-Wollongong trunk is after 20 per cent reduction require by IPART.

Table 7-6 and Table 7-7.

Table 7-4: Roll forward of combined total capital base over current AA period ($nominal)

Details	2005-06	2006-07	2007-08	2008-09	2009-10
Opening balance (before revaluation) [5]	1,965.3	2,051.4	2,131.8	2,238.7	2,273.7
Add capex (before revaluation)	86.3	118.7	99.7	93.7	100.0
Add revaluation of assets	79.6	43.7	98.1	33.3	69.6
Less depreciation	67.9	73.7	81.4	82.9	83.9
Less capital contributions	6.2	4.3	7.8	8.6	3.8
Less disposals	5.7	3.9	1.7	0.3	2.0
Add reused redundant	0.0	0.0	0.0	0.0	3.5

[4] NGR rule 77.

[5] In this and following roll forward tables Opening Balances and half of the real equivalent of capex are in year end $nominal of the preceding year.

Details	2005-06	2006-07	2007-08	2008-09	2009-10
assets (end year)					
Closing balance	**2,051.4**	**2,131.8**	**2,238.7**	**2,273.7**	**2,357.0**

Notes: Values for 2009-10 are forecast. JGN has derived historical amounts from the regulatory asset register that it has maintained in accordance with section 9.1 of its current AA. These notes apply to the following three tables also.

Table 7-5: Roll forward of Wilton to Wollongong trunk pipeline capital base over current AA period ($nominal)

Details	2005-06	2006-07	2007-08	2008-09	2009-10
Opening balance (before revaluation)	8.5	8.7	8.7	8.9	8.8
Add capex (before revaluation)	0.0	0.0	0.0	0.0	0.0
Add revaluation of assets	0.3	0.2	0.4	0.1	0.3
Less depreciation	0.2	0.2	0.2	0.2	0.2
Less capital contributions	0.0	0.0	0.0	0.0	0.0
Less disposals	0.0	0.0	0.0	0.0	0.0
Add reused redundant assets (year end)	0.0	0.0	0.0	0.0	3.5
Closing balance	**8.7**	**8.7**	**8.9**	**8.8**	**12.3**

Notes: Opening RAB for Wilton-Wollongong trunk is after 20 per cent reduction require by IPART.

Table 7-6: Roll forward of Wilton to Newcastle trunk pipeline capital base over current AA period ($nominal)

Details	2005-06	2006-07	2007-08	2008-09	2009-10
Opening balance (before revaluation)	124.0	126.5	126.7	129.8	129.1
Add capex (before revaluation)	0.0	0.0	0.0	0.0	2.2
Add revaluation of assets	4.9	2.6	5.7	1.9	3.9
Less depreciation	2.4	2.5	2.6	2.6	2.7
Less capital contributions	0.0	0.0	0.0	0.0	0.0
Less disposals	0.0	0.0	0.0	0.0	0.0
Add reused redundant	0.0	0.0	0.0	0.0	0.0

Details	2005-06	2006-07	2007-08	2008-09	2009-10
assets (year end)					
Closing balance	**126.5**	**126.7**	**129.8**	**129.1**	**132.5**

Table 7-7: Roll forward of NSW distribution system capital base over current AA period ($nominal)

Details	2005-06	2006-07	2007-08	2008-09	2009-10
Opening balance (before revaluation)	1,832.8	1,916.2	1,996.4	2,100.0	2,135.8
Add capex (before revaluation)	86.3	118.7	99.7	93.7	97.8
Add revaluation of assets	74.3	40.9	92.0	31.2	65.5
Less depreciation	65.4	71.1	78.7	80.1	81.0
Less capital contributions	6.2	4.3	7.8	8.6	3.8
Less disposals	5.7	3.9	1.7	0.3	2.0
Add reused redundant assets	0.0	0.0	0.0	0.0	0.0
Closing balance	**1,916.2**	**1,996.4**	**2,100.0**	**2,135.8**	**2,212.2**

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

7.4 Projected capital base in the next AA period

The projected capital base in the next AA period is set out in Table 7-8, Table 7-9, Table 7-10 and Table 7-11.

Table 7-8: Roll forward of combined total capital base over next AA period ($nominal)

Details	2010-11	2011-12	2012-13	2013-14	2014-15
Opening Balance (before revaluation) [6]	2,357.0	2,495.9	2,629.7	2,760.1	2,909.8
Add Capex (before revaluation)	171.7	176.2	176.2	204.9	225.8
Add Revaluation Of Assets	61.6	65.1	68.5	72.1	76.2

[6] In this and following roll forward tables Opening Balances and half of the real equivalent of capex are in year end $nominal of the preceding year.

Details	2010-11	2011-12	2012-13	2013-14	2014-15
Less Depreciation	88.1	98.8	109.3	121.7	136.2
Less Capital Contributions	3.9	6.9	3.1	3.6	4.0
Less Disposals	2.5	1.8	1.9	2.0	2.1
Add Reused redundant assets	0.0	0.0	0.0	0.0	0.0
Closing Balance	**2,495.9**	**2,629.7**	**2,760.1**	**2,909.8**	**3,069.4**

Table 7-9: Roll forward of Wilton to Wollongong capital base over next AA period ($nominal)

Details	2010-11	2011-12	2012-13	2013-14	2014-15
Opening Balance (before revelation)	12.3	12.4	12.5	12.6	12.7
Add Capex (before revelation)	0.1	0.2	0.2	0.2	0.2
Add Revaluation Of Assets	0.3	0.3	0.3	0.3	0.3
Less Depreciation	0.4	0.4	0.4	0.4	0.4
Less Capital Contributions	0.0	0.0	0.0	0.0	0.0
Less Disposals	0.0	0.0	0.0	0.0	0.0
Add Reused redundant assets	0.0	0.0	0.0	0.0	0.0
Closing Balance	**12.4**	**12.5**	**12.6**	**12.7**	**12.7**

Table 7-10: Roll forward of Wilton to Newcastle trunk pipeline capital base over next AA period ($nominal)

Details	2010-11	2011-12	2012-13	2013-14	2014-15
Opening Balance (before revelation)	132.5	134.6	137.2	140.0	143.1
Add Capex (before revelation)	1.5	2.1	2.2	2.6	3.0
Add Revaluation Of Assets	3.4	3.4	3.5	3.6	3.6
Less Depreciation	2.8	2.9	3.0	3.1	3.2
Less Capital Contributions	0.0	0.0	0.0	0.0	0.0

Details	2010-11	2011-12	2012-13	2013-14	2014-15
Less Disposals	0.0	0.0	0.0	0.0	0.0
Add Reused redundant assets	0.0	0.0	0.0	0.0	0.0
Closing Balance	**134.6**	**137.2**	**140.0**	**143.1**	**146.6**

Table 7-11: Roll forward of NSW distribution system capital base over next AA period ($nominal)

Details	2010-11	2011-12	2012-13	2013-14	2014-15
Opening Balance (before revelation)	2,212.2	2,348.9	2,480.0	2,607.5	2,754.1
Add Capex (before revelation)	170.0	174.0	173.8	202.1	222.5
Add Revaluation Of Assets	170.0	174.0	173.8	202.1	222.5
Less Depreciation	57.9	61.3	64.7	68.3	72.2
Less Capital Contributions	84.9	95.5	105.9	118.2	132.6
Less Disposals	3.9	6.9	3.1	3.6	4.0
Add Reused redundant assets	2.5	1.8	1.9	2.0	2.1
Closing Balance	**2,348.9**	**2,480.0**	**2,607.5**	**2,754.1**	**2,910.1**

7.5 Capital contributions

Table 7-12: Capital contributions over the current AA period ($nominal)

Details	2005-06	2006-07	2007-08	2008-09	2009-10
Total Contributions Received	7.83	5.01	8.55	6.87	4.28
Less Tax Cost Compensation	0.87	0.26	0.39	0.33	0.50
Contribution to Assets	6.96	4.74	8.16	6.54	3.78
Number of Contributions Received	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.

8 Cost of capital

8.1 Summary

JGN has set its cost of capital using the domestic version of the Fama-French three-factor model **(FF model**) to estimate the cost of equity component of its WACC. JGN uses a nominal vanilla WACC of 10.86 per cent.

Table 8-1 summarises JGN's WACC parameters as well as resulting WACC variants.

Table 8-1: JGN's proposed WACC Parameters

Parameters	JGN Proposal
Inflation (i)	2.52%
Nominal risk free rate (R_f^n)	5.58%
Real risk free rate	2.98%
Debt margin (D^n)	4.48%
Nominal pre-tax cost of debt	10.06%
Real pre-tax cost of debt	7.36%
Market risk premium (MRP^n)	6.50%
Growth risk premium (HML^n)	6.24%
Size risk premium (SMB^n)	-1.23%
Equity beta (β_e)	Na
Market beta (β_m)	0.59
Growth beta (β_{HML})	0.48
Size beta (β_{SMB})	0.30
Post-tax nominal return on equity	12.04%
Gearing (D/V)	60%
Dividend imputation (γ)	0.20
Tax rate on equity (T_e)	22.46%

Parameters	JGN Proposal
Corporate tax rate (T_c)	30%
Pre-tax real WACC ($WACC^r$)	9.16%
Pre-tax nominal WACC ($WACC^n$)	11.91%
Nominal vanilla WACC	**10.86%**
Real vanilla WACC	8.13%

Notes: Real costs of debt and equity and the risk free rate are calculated from the nominal equivalents using the Fisher equation and forecast inflation.

Debt margin is based on an efficient gas business with a BBB credit rating.

JGN does not rely on a debt or asset beta to estimate its proposed WACC.

8.2 Treatment of tax

JGN calculate its revenue requirement 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 calculated for each year as:

ETC = (ETI x r)*(1 – γ)

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, which is the product of the payout ratio and the utilisation rate (θ).

8.3 Weighted average cost of capital model

JGN uses a nominal vanilla WACC incorporating:

- the Fama-French three-factor model to estimate the cost of equity
- observed domestic corporate bond performance to estimate the cost of debt.

8.3.1 WACC proposal

JGN proposes using a nominal vanilla WACC as follows:

$$WACC^n = R_e^n \frac{E}{V} + R_d^n \frac{D}{V},$$

where:

- R_e^n is the nominal return on equity
- R_d^n is the nominal return on debt
- $\frac{E}{V}$ is the level of equity
- $\frac{D}{V}$ is the level of gearing.

8.3.2 Cost of equity proposal

Summary

Nominal cost of equity is estimated using the FF model as follows:

$$R_e^n = R_f + MRP^n \times \beta_m + SMB^n \times \beta_{SMB} + HML^n \times \beta_{HML},$$

where:

- R_f^n is the nominal risk free rate
- MRP^n is the nominal market risk premium
- HML^n is the risk premium for high book-to-market firms compared to low book-to-market firms.
- SMB^n is the risk premium for small firms compared to big firms
- β_m is the market beta
- β_{HML} is the beta on the high minus low firm factor
- β_{SMB} is the beta on the small minus big firm factor.

Table 8-2 sets out the FF model parameters that JGN relies upon for its proposed cost of equity.

Table 8-2: Domestic Fama-French three-factor model

Parameters	Market	HML	SMB
Risk Premium	6.50%	6.24%	-1.23%
Beta	0.59	0.48	0.30

Note. Estimated using data sampled up to the end of May 2009.

Applying these parameters to a domestic version of the FF model leads to a return on equity that is 6.46 percentage points above the risk-free rate. A risk-free rate of 5.58 per cent was observed over the 20 days up to and including the 12 February 2010, which results in an estimated cost of equity of 12.04 per cent for a gas distributor.

8.3.3 Cost of debt proposal

Nominal cost of debt:

$$R_d^n = R_f^n + D^n ,$$

where:

- R_f^n is the nominal risk free rate
- D^n is the nominal debt margin.

JGN uses a debt margin of 4.48 per cent. This margin is added to the nominal risk free rate of 5.60 per cent to give JGN's proposed cost of debt of 10.06 per cent.

8.4 Weighted average cost of capital parameters

Based on the above, JGN calculates a pre tax WACC of 12.63 per cent in accordance with the NGR.

Table 8-3 provides a summary of the parameter values that JGN proposes for its WACC calculation and resulting WACC estimates.

Table 8-3: JGN's proposed WACC parameters for the next AA period

Parameters	Current AA period	Next AA period
Inflation (i)	2.80%	2.52%
Nominal risk free rate (R_f^n)	5.70%	5.58%
Real risk free rate	2.82%	2.98%
Debt margin (D^n)	1.13%–1.22%	4.48%
Normal pre-tax cost of debt	6.83%–6.92%	10.06%

Parameters	Current AA period	Next AA period
Real pre-tax cost of debt	3.92%–4.01%	7.36%
Market risk premium (MRP^n)	5.5%–6.5%	6.50%
Growth risk premium (HML^n)	Na	6.24%
Size risk premium (SMB^n)	Na	-1.23%
Equity beta (β_e)	0.8–1.0	Na
Market beta (β_m)	Na	59.00%
Growth beta (β_{HML})	Na	48.00%
Size beta (β_{SMB})	Na	30.00%
Post-tax nominal return on equity	10.10%–12.20%	12.04%
Gearing (D/V)	60.00%	60.00%
Dividend imputation (γ)	0.5–0.3	20.00%
Tax rate on equity (T_e)	30.00%	22.46%
Corporate tax rate	30.00%	30.00%
Pre-tax real WACC ($WACC^r$)	5.9–7.3%	9.16%
Selected Pre-tax WACC ($WACC^r$)	7.00%	9.16%
Pre-tax nominal WACC ($WACC^n$)	10.00%	11.91%
Nominal vanilla WACC	**8.14%–9.03%**	**10.86%**
Real vanilla WACC	5.19%–6.06%	8.13%

Source: Current AA period parameters from Table 8.6 of IPART (2005). [7]

[7] IPART, *Final Decision*, *Revised Access Arrangement for AGL Gas Networks*, April 2005, p. 104.

8.4.1 Inflation

JGN proposes an inflation forecast of 2.52 per cent. Here, forecast inflation is the geometric average of the forecast annual inflation for each of the ten years from 2010 to 2019 as follows:

Table 8-4: Forecast Inflation

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Inflation Forecast	2.50%	2.75%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Geometric Average										2.52%

Note: Inflation forecasts are for the year to June.
Source: Reserve Bank of Australia, *Statement on Monetary Policy*, 4 February 2010.

8.4.2 Gearing

JGN uses a gearing ratio of 60 per cent, consistent with the assumed efficient level of debt chosen by the AER in its final WACC decision and in the current IPART decision.

8.4.3 Nominal risk free rate

The nominal risk free rate is 5.58 per cent, based on the 20-day historical average of the annualised yield on 10 year Commonwealth Government Securities (**CGS**) to 12 February 2010 using the indicative mid rates published by the RBA.

JGN estimates the yield on a 10 year CGS maturing at the 20 business days to 12 February 2020 by interpolating on a straight-line basis the yields on the CGS bonds maturing at 15 March 2019 and 15 April 2020.

8.4.4 Market risk premium

JGN uses a market risk premium (**MRP**) of 6.5 per cent, based on the AER's final WACC decision.

8.4.5 Fama-French factors and betas

JGN relies upon NERA's report for the parameters of the FF model. Appendix 5.1 provides NERA's full computations, which are summarised in Table 8-2 above.

8.4.6 Debt margin

JGN proposes a debt margin of 4.48 per cent. This margin is added to the nominal risk free rate of 5.58 per cent to give JGN's proposed cost of debt of 10.06 per cent as set out in section 8.3.3.

8.4.7 *Dividend imputation*

JGN uses a value of imputation credits (or gamma) of 0.2 as the best estimate in the circumstances

9 Depreciation

9.1 Summary

Table 9-1 summaries JGN's forecast deprecation over the next AA period by applying the real straight-line depreciation method.

Table 9-1: Forecast depreciation over next AA period ($nominal)

Deprecation	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Total	3.87	6.91	3.06	3.64	4.05	21.52

9.2 Assumptions on economic life of assets for regulatory depreciation

Table 9-2: 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
Furniture	10
Land	0

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

9.3 Depreciation and accumulated depreciation

Remaining asset lives for the capital base at 30 June 2010 are set out in Table 9-3.

Table 9-3: Remaining asset lives as at 30 June 2010

	Remaining Asset Life
Trunk pipeline (Wilton-Newcastle)	45.71
Trunk pipeline (Wilton-Wollongong)	34.25
Distribution system:	
Country POTS	35.04
Contract meters	9.61
Tariff meters	10.14
Meter reading devices	19.35
Fixed plant	7.08
HP mains	58.51
MP mains	28.97
HP services	26.23
MP services	35.86

Notes: Values based on:

1. actual capex and disposals to June 2009 and forecasts for 2009-10
2. depreciation for the period to June 2010 as set out in IPART's 2005 Final Decision adjusted for actual inflation over the period
3. forecast depreciation for the year ended June 2005.

Forecast regulatory depreciation for the next AA period is provided in Table 9-4.

Table 9-4: Forecast depreciation over next AA period ($nominal)

Asset category	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Wilton/Wollongong	0.37	0.38	0.39	0.40	0.42	1.96
Wilton/ Newcastle	2.78	2.87	2.97	3.08	3.19	14.89
Distribution network	0.72	3.65	-0.31	0.15	0.44	4.66
Total	3.87	6.91	3.06	3.64	4.05	21.52

JGN intends to use forecast depreciation for the next AA period (adjusted for the difference between forecast and actual CPI) in rolling forward the asset base to the beginning of the next AA period beginning on 1 July 2015 (rule 90(2)).

10 Incentive mechanisms

There are presently some 600,000 homes and businesses within JGN's distribution area that have no reticulated gas supply. JGN proposes one incentive mechanism for the next AA period—a market expansion mechanism (**MEM**)—that will significantly increase the likelihood of gas being made available to a proportion of those homes and businesses over time.

10.1 Proposed incentive mechanisms

For some types of investment, such as discretionary market expansion, the return provided by the WACC is insufficient for JGN to attract the necessary capital. JGN's proposed MEM would provide it with a modest additional return to enable it to justify investment in discretionary expansion projects that are:

- additional to business as usual short mains extensions which have been included in the JGN capex forecast and
- currently marginally uncommercial even though they have potential to provide many new customers in established areas with the benefits of gas supply.

The MEM has at its core the promotion of the efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas. JGN considers that this incentive mechanism is consistent with the gas market objective and with the pricing principles set out in NGL ss. 24(3), (5) and (6).

Consumers in the MEM areas who choose to connect to gas will benefit immediately from that choice through reduced energy costs and access to a wider variety of green options, and consumers generally will benefit through lower tariffs as conforming capital from the MEM areas is rolled into the capital base..

10.2 Incentive mechanisms operating in the current AA period

JGN's current AA[8] identifies two incentive mechanisms:

- *unaccounted for gas* – JGN receives compensation for UAG up to a target rate of 2.1 per cent. JGN benefits by keeping this compensation where it achieves UAG less than 2.1 per cent but bears additional unfunded costs where UAG is greater than 2.1 per cent. Over the past three years, JGN's

[8] AGL Gas Networks, *Access Arrangement for NSW Network*, June 2005.

UAG forecasts as reported to IPART have averaged 2.4 per cent, resulting in JGN sustaining financial losses

- *price cap* – JGN's approved tariffs apply throughout the current AA period regardless of whether the forecasts on which the tariffs were determined are realised. JGN benefits from: 1) additional revenue if demand exceeds forecast; or 2) higher profits if costs are less than forecast. JGN also bears losses if: 1) demand is less than forecast; or 2) costs are greater than forecast. In the current period, JGN's demand was less than IPART had approved. JGN has consequently foregone approximately [5] per cent of its revenues over the three years to June 2008 relative to the cost of service determined by IPART.

JGN proposes to retain the effect of these mechanisms which the current AA identifies as incentive mechanisms. However, JGN is of the view that under the new NGR, these mechanisms are better characterised as elements of the annual tariff variation mechanism as set out in section 14.2.1. JGN considers that this treatment is more in keeping with the intent of the relevant incentive mechanism and tariff variation rules and that it improves consistency with how these mechanisms are treated in other networks AAs.

11 Revenue requirement

JGN has determined its total revenue requirement using the building block approach (in accordance with section 76 of the NGR). This chapter sets out JGN's total revenue requirement.

JGN's total required revenues for each year of the next AA period are set out in the following table.

Table 11-1: JGN revenue requirement

Building block	2010-11	2011-12	2012-13	2013-14	2014-15
Return on capital	258.22	266.31	273.42	280.87	289.26
Return of capital (depreciation)	25.88	32.05	37.86	44.87	53.00
Opex	138.17	140.89	145.53	148.96	153.64
Tax	21.81	24.43	26.01	29.46	33.39
Revenue requirement	**444.07**	**463.69**	**482.83**	**504.15**	**529.29**

12 Services

12.1 Summary

JGN's proposed reference services in for its revised AA 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 activities and charges are provided as part of JGN's reference haulage service or meter data service.

JGN also proposes to provide non-reference negotiated services.

12.2 Cost allocation overview

JGN's cost allocation model takes the required cost of service (**COS**), deducts revenues associated with negotiated, and then allocates the residual costs to the haulage reference service and meter data reference service.

JGN calculates the revenue for other non-reference services, ancillary and negotiated, based on the level of activity for those services and their prices.

For the reference services, JGN divides the residual COS into its building block categories: return on asset, return of asset and operating costs. The model then splits these into operating cost allocations and capital cost allocations.

12.2.1 Capital allocations

The capital allocations consist of the return on assets and return of assets costs from the COS. JGN allocates these based on the share of the regulatory asset base attributable to each reference service.[9] This means JGN has used its asset categories as 'allocation keys'.

The haulage service comprises all regulatory asset classes except for the demand customer remote meter reading and communication devices which are allocated to the meter data service. This is because the costs of the network and meter provision are associated with the haulage service. The meter data service relates only to the provision of meter reading (an operating cost) and on-site data and

[9] Note this share is a fully distributed cost allocation rather than the stand alone and avoidable cost allocations relied upon for assessing the efficient pricing bound of reference tariff classes in section 13.2.1.

communication equipment. Such equipment is only installed for large customer delivery points.

JGN considers small customer meter data loggers to be an integrated part of its network and has included this asset class in the haulage reference service allocation. This is because JGN would require these data loggers to operate its network even when meter data services are provided by another third party.

The model allocates the return on assets and return of asset costs to the asset classes using the written down value of the RAB and the depreciation by asset class. JGN considers these costs to all be direct costs associated with the identified asset categories.

12.2.2 Operating cost allocations

JGN allocates its opex costs to the haulage reference service and the meter data reference service differently for direct versus indirect costs.

JAM collects the direct operating and maintenance costs by activity. These are called work breakdown structure (**WBS)**. JGN's cost allocation model uses these JAM WBS cost collectors as allocation keys to allocate operating and maintenance costs to the haulage service and the meter data service based on the direct attribution of particular activities to each reference service. For WBS collectors which collect the costs of managers and other employees who work across multiple activities, these costs have been prorated across the haulage and meter data services using the weights from the directly attributable WBS collectors.

JGN allocates the following direct costs to the haulage reference service:

- UAG costs including carbon permits for deemed fugitive emissions under the proposed CPRS
- mains tax
- marketing.

This is because these costs relate to the network and network usage rather than the provision of meter reading services.

For JGN's indirect costs, JGN makes a specific allocation to the meter data service, with the remaining costs allocated to the haulage service. JGN calculates the overhead allocation to the meter data service as follows:

- corporate overheads are allocated based on a benchmark rate
- JGN then applies a commercial margin to the overheads calculated in step-1.

The residual indirect costs (including overheads and administration costs) are allocated to the haulage service.

12.3 Price path

This section sets out the proposed prices that will allow JGN to recover its required revenue as presented in chapter 11. Prices are determined in real 2010 dollars.

The comparison of total revenue to total cost of service is shown in Table 12-1.

Table 12-1: Revenue and cost alignment

	2010-11	2011-12	2012-13	2013-14	2014-15	NPV
Total cost of service	444.07	463.69	482.83	504.15	529.29	1863.69
Total revenue	474.81	479.15	480.00	482.85	492.16	1863.69

Note: The net present value (**NPV**) of JGN's total cost of service and total revenue is estimated using JGN's proposed pre-tax real WACC of 9.16 per cent.

Based on the cost allocation to the haulage reference service discussed above, JGN has solved for a price path that aligns the net present value (**NPV**) of its five year cost of service with the NPV of its forecast revenues. The resulting price path is set out in Table 12-2.

Table 12-2: Price path

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Total revenue	400.20	474.81	479.15	480.00	482.85	492.16
Total demand (PJ)	99.20	100.64	101.88	99.12	97.05	95.44
Real average price ($/GJ)	4.03	4.72	4.70	4.84	4.98	5.16
Real price change		16.95%	-0.32%	2.97%	2.73%	3.65%

13 Reference tariffs

JGN has established a suite of reference tariffs to recover the costs it has allocated to its reference services.

JGN proposes 36 tariff classes and distinguishes 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 current AA, 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. The 10 TJ threshold is used now by JGN, and is common in other jurisdictions. Larger customers must have a reasonable MHQ and MDQ specified per delivery point as they have a larger individual impact on the network than small customers.

13.1.1 Volume tariff classes

JGN's current AA assigns all volume customers to a single reference tariff class for the purpose of trunk network services and local network services.

JGN's proposed AA establishes two tariff classes for volume customers:

- *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.

This delineation is necessary to group country volume customers separately from volume customers located in the Wilton network section which includes the trunk mains. The delineation enables JGN to combine trunk charges with other network charges without affecting the tariffs that apply to country customer delivery points.

13.1.2 Demand tariff classes

JGN's current AA charges for services to demand customer delivery points (denoted as contract customers in JGN's current AA) 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)

JGN is also proposing:

- an additional sets of location-based capacity charge tariffs for very large customers who agree to participate as "first response" respondents in network load shedding events, and
- for Sydney locations, an additional set of location based major end customer throughput tariffs, and
- for Sydney locations an additional set of major end customer throughput tariffs for very large customers who agree to participate as "first response" respondents in network load shedding events

In total JGN proposes 34 demand tariff classes in the next AA.

This proposal means JGN's demand customers will continue to be assigned to multiple reference tariff classes established by JGN to reflect their location within the local network, and the manner in which they are billed for usage.

Tariff categories

JGN demand tariff classes are grouped together by tariff category. There are three different categories for demand classes:

- *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 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. This tariff category is intended to encourage more efficient and transparent load shedding
- *throughput* – Assignment to this tariff is currently made on user request. This tariff category replaces the capping and throughput service in the current AA and sets a ceiling for cost of network transportation that allows the price of gas to remain competitive with alternate fuels.

- *major end-customer throughput* – Assignment to this tariff is to be made on user request where assignment criteria are satisfied. Tariff is only available in tariff locations 1 through 5 with fixed and variable components.

- *major end-customer throughput first response* – This is a new discounted tariff for large customers who are willing 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 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.

13.1.3 Transaction costs

JGN has considered transaction costs such as transportation costs, metering charges and administrative costs when determining its tariffs and tariff classes. JGN considers its decision to structure charges based on customer size (volume versus demand) is economically efficient for a number of reasons. For example, it would be inefficient for volume customers consuming less than 10 TJ a year to be charged on capacity as that would require more sophisticated daily metering. Such metering costs are avoided by charging these customers on throughput using basic metering equipment.

Similarly, transaction costs for volume customers are avoided by postage stamping their tariffs. It would be considerably more costly to charge these customers based on zonal location for limited benefit in terms of network savings arising from any demand response.

In comparison to the above, demand customers are charged on capacity as they have the necessary metering equipment for daily reads. In addition, unlike volume customers, demand customers are charged based on location. This is because:

- the size of the customers' usage and associated affects on the network warrant the additional costs of targeted price signalling (i.e. to manage capacity demands and network location decisions)

- this addresses the bypass risk that JGN may otherwise face because it does not have an exclusive franchise area.

The adoption of tariff classes for demand customers is an integrated and complementary component of a number of changes affecting services for large customers. Together, these result in greatly reduced transaction costs for retailers and customers. Transaction costs associated with complicated contract

management and capacity booking management are also avoided through JGN's simplified reference services.

JGN considers that its tariffs and tariff classes provide the correct balance between minimising transaction costs and ensuring that customers have incentives to respond to pricing signals. Moreover, JGN considers that implementing of a tariff basket price control will better enable it to maintain this balance during the AA period.

13.1.4 Ability to respond to price signals

JGN's tariffs have been formulated with regard to how customers may respond to price signals. While volume customers are on postage stamped tariffs, demand customers' tariffs are dependent on location. This gives demand customers a clear signal that the location within the network of their premises will affect their payable tariff.

JGN has introduced the major end-customer throughput tariff class and its first response equivalent after having specific regard to major Sydney demand customers' ability to respond to the price signals arising from tariff restructuring required to accommodate the STTM.

Minimum demand bill

JGN has also introduced a minimum bill charge for demand customers to provide a smooth transition in price between the volume and demand tariff classes.

JGN's 2005-06 to 2009-10 AA inadvertently established a perverse pricing incentive whereby some customers who moved from the volume to the demand market initially experienced a significant price reduction despite the increase in their capacity requirements.

JGN's proposed minimum demand bill addresses this incentive by ensuring customers shifting from the volume to the demand tariff class continue to face prices that reflect the costs these customers impose on the JGN network.

First response tariff

During emergency supply events which require network demand curtailment, the largest customers on the network inevitably bear the largest burden of the curtailment response. A new tariff is proposed for very large customers who are prepared to participate materially in load shedding at the first tier of load reductions, and to establish a formal plan with JGN for communication and target load reductions during an emergency event. A significant discount of 50 per cent is proposed for customers willing and able to react to a load shedding event as part of a "first response" tranche of reductions. This tariff is available for both the

capacity first response and major end-customer throughput first response tariff classes.

JGN considers that the transaction costs associated with this targeted tariff offering are warranted by the significant demand response that JGN can incentivise through this tariff.

13.2 Efficient pricing

13.2.1 Tariff efficiency

Stand alone costs

Table 13-1: Stand alone costs compared to expected revenue ($000)

Tariff class	Stand alone estimate	Expected revenue
Haulage demand market segment		
Sydney 1	37,580	3,385
Sydney 2	42,790	6,042
Sydney 3	45,637	9,040
Sydney 4	42,758	6,345
Sydney 5	35,406	1,805
Newcastle 1	45,191	3,102
Newcastle 2	50,836	2,615
Newcastle 3	32,103	577
Wollongong 2	22,976	788
Haulage volume market segment		
Coast	661,113	385,676
Country	81,296	43,471
Meter data service		
Volume	14,677	5,248
Demand	454,424	866

Avoidable costs

Table 13-2: Avoidable costs compared to expected revenue ($000)

Tariff class	Avoidable estimate	Expected revenue
Haulage demand market segment		
Sydney 1	287	3,385
Sydney 2	640	6,042
Sydney 3	765	9,040
Sydney 4	316	6,345
Sydney 5	81	1,805
Newcastle 1	213	3,102
Newcastle 2	177	2,615
Newcastle 3	29	577
Wollongong 2	7	788
Haulage volume market segment		
Coast	229,753	385,676
Country	18,300	43,471
Meter data service		
Volume	3,353	4,696
Demand	856	890

13.2.2 Long run marginal cost

JGN has used the average incremental cost (AIC) approach for estimating LRMC.

JGN relied on forecasts for the capacity development capital programme, Jemena Asset Management's (JAM) direct operating and maintenance costs and the NIEIR forecast. This resulted in an estimate of LRMC for the volume tariff classes of $4.66/GJ for country customers and $7.00/GJ for coastal customers when estimated based on the forecast period 2009-10 to 2029-30.

These estimates compare to JGN's proposed haulage throughput tariffs (declining block tariffs) of approximately $4.46/GJ to $12.90/GJ for volume country customers, with a consumption weighted average of approximately $8.71/GJ, and $4.71/GJ to $13.15/GJ for volume coastal customers, with a consumption weighted average of approximately $8.96/GJ.

Consistent with NGR rule 94(6) JGN has sought to recover the residual of its costs in a manner that least distorts demand. This has involved JGN retaining standing charges for each customer.

14 Price control formulae

14.1 Summary

JGN earns its revenue and provides for adjustments in its current AA through a schedule of prices which it varies each year for inflation and UAG.

For the next AA period, JGN will adopt a tariff basket form of price control for its haulage reference service. JGN will also apply a tariff rebalancing constraint that limits annual movements in revenues from any given tariff to no more than 10 per cent.

JGN proposes to retain a fixed tariff schedule approach for its meter data reference service that does not relate to haulage.

14.2 Haulage reference service

14.2.1 Tariff variation mechanism

For its haulage service, JGN proposes a tariff basket annual tariff variation mechanism as permitted under rule 97(2)(b) in the form of a weighted average price cap (**WAPC**) formula. JGN will implement this WAPC using the CPI-X price control formula and Annual Tariff Variation Mechanism specified in clause 3.5 of the AA.

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 historic 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:

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

The X_t parameter is set at zero per cent.

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

The V_t parameter is the annual variation factor required to give effect to the annual tariff variations of UAG, licence fee adjustments and weather correction set out for those years in which pass through events occur. This parameter is required to transpose the required nominal value of tariff adjustments into a percentage variation factor for use in the left hand side of the WAPC.

This tariff basket combines both annual price path variation with pass through variation consistent with rule 97(1)(d). It will apply to all JGN's haulage reference tariffs for all tariff classes.

14.2.2 Tariff variation process

JGN will submit its annual reference tariff proposal to the AER for approval 30 business days prior to the relevant financial year in which the proposed tariffs are to apply. JGN's 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 AA terms.

14.3 Other reference services

JGN proposes to maintain its prices for meter data reference services in real terms over the 2010-11 to 2014-15 AA period.

14.3.1 Tariff variation mechanism

JGN will retain a tariff schedule approach for its meter data reference services. This approach involves JGN publishing a list of real prices for each year of the 2010-11 to 2014-15 period in its AA and then adjusting this each year for inflation.

14.3.2 Tariff variation process

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

Glossary

AA	access arrangement
AAI	access arrangement information
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
AEMA	Australian Energy Market Agreement
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AGL	Australian Gas Light Company
AGLGN	AGL Gas Networks Limited
AIC	average incremental cost
AMA	asset management agreement between JGN and JAM
AMP	asset management plan
APA	APA Group: the Australian Pipeline Trust and APT Investment Trust
A&O	administration and overheads
BASIX	Building Sustainability Index
BB	gas market bulletin board
BOM	Bureau of Meteorology
CEG	Competition Economists Group
capex	capital expenditure
CAPM	capital asset pricing model
CGS	Commonwealth government securities
CHOS	customer hours off supply
CLM Act	NSW Contaminated Land Management Act
COAG	Council of Australian Governments
CPI	consumer price index
CPRS	carbon pollution reduction scheme
COS	cost of service
current AA period	current access arrangement period: 1 July 2005 to 30 June 2010
customer	an end user of gas
DC	demand capacity
DCFR	demand capacity first response

DECC	Department of Environment and Climate Change
DMS	Data and Measurement Solutions
DMT	demand major end-customer throughput
DMTFR	demand major end-customer throughput first response
EBA	enterprise bargaining agreements
EBIT	earnings before interest and tax
EBS	Enterprise Business Services
EEH	energy efficient homes
EGP	Eastern Gas Pipeline
ENA	Energy Networks Association
ESF	enterprise support functions
E to G	electricity to gas hot water conversion
EUCS	energy use and conservation survey
FF	Fama-French three-factor model
Gas Supply Act	Gas Supply Act 1996 (NSW)
GCSS	guaranteed customer service level standards
GGAS	NSW Greenhouse Gas Reduction Scheme
GIS	geographic information system
GJ	gigajoule
GMC	Gas Market Company
GRMO	Queensland Gas Retail Market Operator
GSOO	Gas Market Statement of Opportunities
GSP	gross state product
HDD	heating degree days
ICB	initial capital base
IPART	Independent Pricing and Regulatory Tribunal of New South Wales
ISC	Implementation Steering Committee
IT	Information technology
ITP	IT Plan
JAM	Jemena Asset Management Pty Ltd (ACN 086 013 461)
JGN	Jemena Gas Networks (NSW) Limited, ACN 003 004 322
JGN network	controller and operator of gas distribution networks in NSW
KPI	key performance indicator
LFS	Labour Force Survey

LGA	local government area
LRMC	long run marginal cost
MAOP	maximum allowable operating pressure
MCE	Ministerial Council on Energy
MCE/SCO	Standing Committee of Officials that support the MCE
MDQ	maximum daily quantity
MEM	market expansion mechanism
MEPS	mandatory energy performance standards
MMA	McLennan Magasanik Associates
MRC	Marsh Risk Consulting
MRET	mandatory renewable energy target
MRP	market risk premium
MSP	Moomba to Sydney pipeline
NCC	National Competition Council
NECF	national energy customer framework
NEET	NSW Energy Efficiency Target scheme
NEMMCO	National Electricity Market Management Company Limited
NERL	National Energy Retail Law, proposed
NERR	National Energy Retail Rules, proposed
next AA period	next access arrangement period: 1 July 2010 to 30 June 2015
NGCF	national gas connections framework
NGER	national greenhouse and energy reporting
NGERAC	National Gas Emergency Response Advisory Committee
NGL	National Gas Law, schedule of the National Gas (South Australia) Act 2008
NGO	national gas objective
NGR	National Gas Rules
NIEIR	National Institute of Economic and Industry Research
NPV	net present value
NPWG	Network Policy Working Group
NSW	New South Wales
O&M	operating and maintenance expenditure
opex	operating expenditure
ORC	optimised replacement cost

PB	Parsons Brinckerhoff
Pipelines Act	Pipelines Act 1967 (NSW)
Pipelines Regulation	Pipelines Regulation 2005 (NSW)
previous AA period	previous access arrangement period: 1 July 2000 to 30 June 2005
PJ	petajoule (10^{15} joules)
POTS	packaged off-take station
PRS	primary receiving station
PTRM	post tax revenue model
PV	photovoltaic
PwC	PriceWaterhouseCoopers
RAB	regulatory asset base
RBA	Reserve Bank of Australia
RBSM	risk and benefit sharing mechanism
REC	renewable energy certificate
REMCo	South Australian Retail Energy Market Company
RET	renewable energy target
RFP	request for proposal
RIN	regulatory information notice under national gas rule 48(1)
RIS	Regulatory Impact Statement
ROLR	retailer of last resort
RPWG	Retail Policy Working Group
RSA	Reference Service Agreement
RSC	retail support clause
SAIDI	system average interruption duration index
SGC	Sydney Gas Company
SMP	Service Model Project
SPIAA	SPI (Australia) Assets Pty Ltd
SPM	service performance measure
STTM	short term trading market
subsequent AA period	subsequent access arrangement period: 1 July 2015 to 30 June 2020
t CO2e	tonnes of equivalent carbon dioxide
TJ	terajoule (10^{12} joules)
UAG	unaccounted for gas

user	a party who contracts with JGN for its use of JGN's pipeline services
VENCorp	Victorian Energy Networks Corporation
WAPC	weighted average price cap
WACC	weighted average cost of capital
WBS	work breakdown structure
WELS	water efficiency labelling and standards
WOBCA	whole of business cost allocation