Jemena Gas Networks (NSW) Ltd

2015-20 Access Arrangement Information

Revised in response to the draft decision

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ABBREVIATIONS

AA	Access Arrangement
AAI	Access Arrangement Information
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AGLUI	AGL Upstream Investments
CPI	Consumer Price Index
ECM	Efficiency Carryover Mechanism
EDD	Effective Degree Days
EGP	Eastern Gas Pipeline
HP	High Pressure
JGN	Jemena Gas Networks (NSW) Ltd
LRMC	Long Run Marginal Costs
MP	Medium Pressure
MSP	Moomba to Sydney Pipeline
Network Users	users of the JGN network
NGR	National Gas Rules
RAB	Regulatory asset base
RY	Regulatory Year
STTM	Short Term Trading Market
TAB	Tax Asset Base
UAG	Unaccounted for Gas
WACC	Weighted Average Cost of Capital
WAPC	Weighted Average Price Cap

1. INTRODUCTION

1.1 PURPOSE

1. This revised Access Arrangement Information (**revised AAI**) has been prepared by Jemena Gas Networks (NSW) Ltd (ACN 003 004 322) (**JGN**). It provides supporting information to the amended access arrangement (**AA**) revisions proposal applicable to the NSW natural gas distribution network owned, controlled and operated by JGN for the period 1 July 2015 to 30 June 2020 (**revised AA proposal**). It is prepared in accordance with the requirements of rule 72 of the National Gas Rules (**NGR**).

2. JGN has also prepared a separate response document (**response to the draft decision**) which:

   a) addresses the Australian Energy Regulator's (**AER**) draft decision on the initial access arrangement revision proposal submitted by JGN on 30 June 2014 (**the initial AA proposal**)

   b) provides further background to this revised AAI and the revised AA proposal.

3. This revised AAI, the revised 2015 AA proposal, and the response to the draft decision, are collectively referred to as JGN's **revised AA submission**.

1.2 NETWORK OVERVIEW

4. JGN provides natural gas transportation and associated services to users of the JGN network (**Network Users**).

5. 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 1.2 million customers in Sydney, Newcastle, Wollongong and the Central Coast, and over 20 country centres including those within the Central Tablelands, Central West, Southern Tablelands and Riverina regions of NSW.

1.2.1 CURRENT CONFIGURATION AND OPERATION

6. The majority of gas consumed in NSW is sourced from other states.

7. At present, gas is injected into the JGN Wilton network section (which provides gas to customers across Sydney, Newcastle, Wollongong and the Central Coast) at five receipt points with a sixth currently under construction. Gas is sourced at these receipt points from:

   • the Moomba to Sydney Pipeline (**MSP**), owned by APA Group, which principally transports gas produced in the Cooper Basin in South Australia to JGN's Wilton receipt point

   • the Eastern Gas Pipeline (**EGP**), owned by Jemena, which transports gas produced in the Gippsland Basin in Victoria to JGN's Albion Park, Port Kembla, and Horsley Park receipt points

   • the Rosalind Park Gas Plant, owned by the AGL Upstream Investments (**AGLUI**), which injects local coal seam methane into JGN's Rosalind Park receipt point

   • a gas storage facility and pipeline now being built by AGL at Tomago which will interconnect with the network at a new JGN receipt point at Hexham.

8. 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 of which are owned by APA Group.

Figure 1–1: JGN network overview map
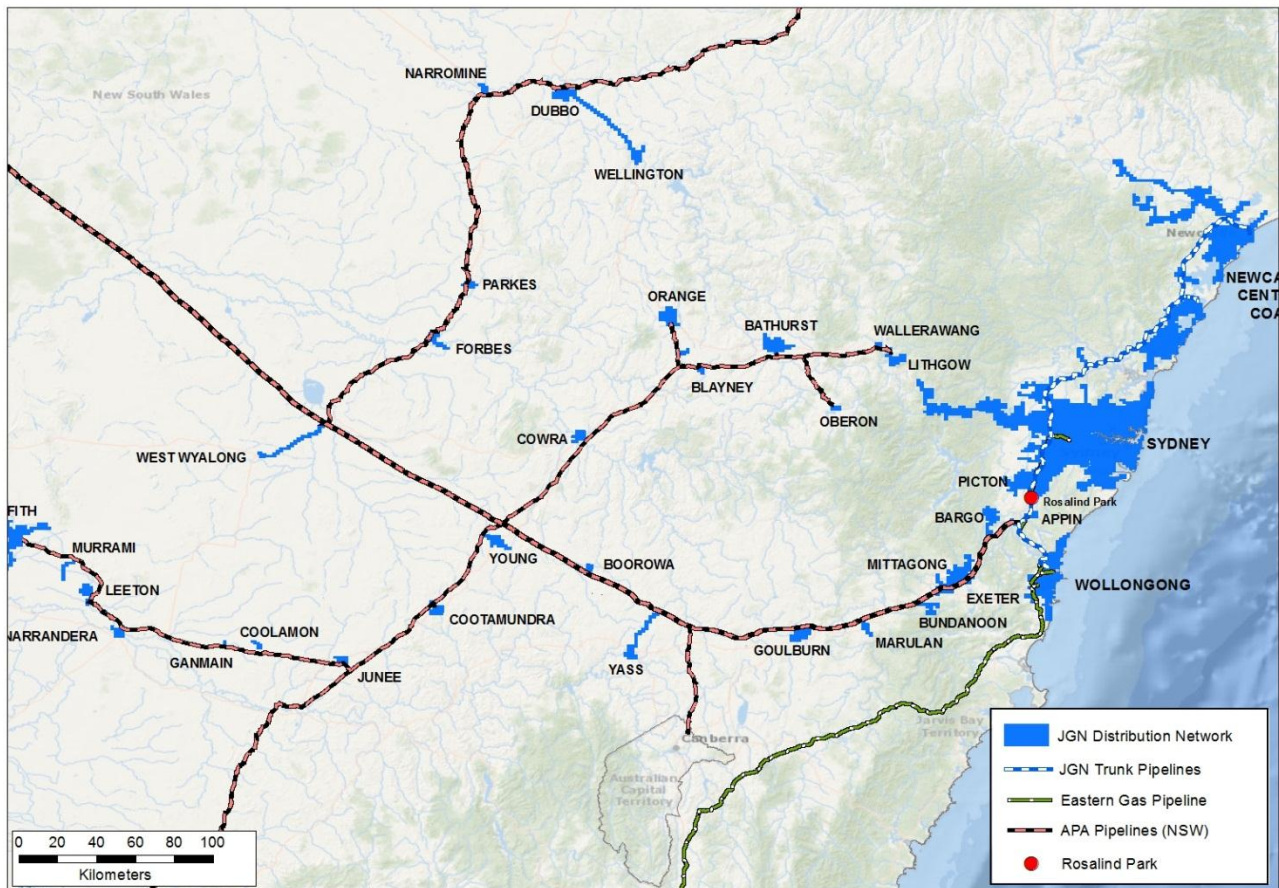
9. Network Users are responsible for injecting natural gas from a transmission pipeline (MSP or EGP) or facility owner (AGLUI) into JGN's network through JGN's receipt points. Once injected into the network, JGN has contractual obligations with Network Users to transport that gas through the network to the Network Users' customers' premises. Custody transfer quality meters are located near each receipt point to measure the quantity of gas injected into the network.

10. The JGN network currently consists of approximately 267 km of trunk mains, 147 km of primary mains, 1,493 km of secondary mains and 23,470 km of medium and low pressure mains, as well as 55 trunk receiving stations and packaged off-take stations, 17 primary regulating stations, 619 district regulator sets and 2 bulk metering stations.

11. The JGN Wilton network section which serves the Sydney, Newcastle and Wollongong areas is the Short Term Trading Market (**STTM**) distribution system for the STTM Sydney Hub and gas delivered to receipt points in this network section is governed by STTM rules and procedures. The STTM is a market-based wholesale gas balancing mechanism established at defined gas hubs such as the STTM Sydney Hub and allows Network Users to buy gas directly from the STTM rather than through a shipper or producer. The Australian Energy Market Operator (**AEMO**) operates the STTM. While the STTM Sydney Hub is governed by the STTM, JGN's country network sections operate solely under a contractual supply chain framework. This means that Network

Users still need to procure gas from a shipper or producer and arrange for that gas to be transported to receipt points for those network sections.

12. As the JGN network has limited gas storage capacity, to maintain operational gas pressure throughout each network section and ensure the safe and reliable operation of the network, there are contractual obligations on Network Users to ensure the total quantity of gas injected and withdrawn from each network section on a day is equal—or balanced. There are also obligations on Network Users to ensure that the gas that is injected into JGN's network meets a defined gas specification and is injected within the minimum and maximum gas pressure range for the relevant receipt point. For the STTM Sydney Hub, the expectation is that the STTM will manage gas balancing behaviours through financial incentives and penalties. JGN deems each country network section to be in balance.

1.3   INTERPRETATION

13. This AAI and the draft decision response adopt the following drafting conventions:

- monetary values are reported in real 2014-15 Australian dollars, unless indicated otherwise

- annual values are reported on a 1 July to 30 June regulatory year (**RY**) basis, unless indicated otherwise

- numerical values in tables may not tally due to arithmetic rounding

- reference to a "rule" is a reference to a rule from the NGR

- the document "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 mines subsidence expenditure, 26 September 2011, June 2010" is referred to in this 2015 AA submission as the **2010 AA**

- the document "Access arrangement information for the access arrangement, JGN's NSW gas distribution networks 1 July 2010 – 1 July 2015, amended by the order of the Australian Competition Tribunal, 30 June 2011, further amended with regard to mine subsidence expenditure, 26 September 2011, June 2010" is referred to in this 2015 AA submission as the **2010 AAI**

- references to the '2010-15 AA period' or 'earlier AA period' refer to the period commencing 1 July 2010 and ending 30 June 2015

- references to the '2015-20 AA period' or 'AA period' refer to the period commencing 1 July 2015 and ending 30 June 2020.

14. An abbreviations list is also provided in this revised AAI.

2. CURRENT PERIOD OUTCOMES

2.1 CAPITAL EXPENDITURE BY ASSET CLASS

15. Table 2–1 sets out capital expenditure by asset class for the 2010-15 AA period. Values for RY11-RY14 are actuals, while RY15 values are estimates.

Table 2–1: Capital expenditure by asset class ($2015, $millions)

Asset Class	Actual 2010-11	Actual 2011-12	Actual 2012-13	Actual 2013-14	Estimate 2014-15	Total
Trunk Wilton-Sydney	-	-	-	-	-	-
Trunk Sydney-Newcastle	(0.00)	-	0.00	1.79	-	1.79
Trunk Wilton-Wollongong	-	-	-	-	-	-
Contract Meters	0.25	0.48	0.54	1.17	0.67	3.11
Fixed Plant - Distribution	22.56	20.93	6.78	3.02	16.99	70.26
HP Mains	17.70	22.12	11.43	9.27	9.51	70.04
HP Services	-	-	2.54	5.52	1.28	9.33
MP Mains	26.35	25.04	22.78	24.22	31.03	129.42
MP Services	35.62	45.66	44.60	51.45	57.34	234.67
Meter Reading Devices	3.88	4.74	4.79	5.99	7.86	27.27
Country POTS	3.31	8.74	0.83	0.24	1.45	14.57
Tariff Meters	24.85	27.16	28.16	31.90	42.86	154.93
Building	-	0.01	1.59	3.88	12.42	17.90
Computers	-	-	-	0.24	-	0.24
Software	42.14	27.67	12.59	8.99	43.12	134.51
Fixed Plant	0.32	0.45	1.24	0.32	1.10	3.42
Furniture	0.02	0.02	-	-	0.03	0.06
Land	-	-	0.92	0.94	1.99	3.85
Leasehold Improvements	-	0.61	0.04	-	24.17	24.82
Low value assets	-	-	-	-	-	-
Mobile Plant	0.12	0.23	0.50	0.76	0.91	2.52
Vehicles	3.75	2.90	2.11	6.26	2.50	17.52
Stock	-	-	-	-	-	-
Equity Raising Costs	-	-	-	-	-	-
Access Arrangement Costs	2.31	0.00	0.04	4.83	1.10	8.28
Total	**183.17**	**186.76**	**141.47**	**160.78**	**256.34**	**928.52**

2.2   OPERATING EXPENDITURE

16.   Table 2–2 sets out operating expenditure by category for the 2010-15 AA period. Values for RY11-RY14 are actuals, while RY15 values are estimates.

Table 2–2: Operating expenditure by asset class ($2015, $millions)

Category	Actual 2010-11	Actual 2011-12	Actual 2012-13	Actual 2013-14	Estimate 2014-15	Total
Operating and maintenance	102.93	100.29	103.05	114.36	110.46	531.10
Administration and overheads	24.67	26.83	29.72	17.30	14.59	113.11
Marketing	6.45	6.34	5.66	7.65	7.46	33.57
Government levies	3.10	5.29	3.32	3.98	3.98	19.66
UAG	13.14	16.44	14.51	13.74	16.36	74.20
Carbon	-	-	9.25	7.17	0.04	16.45
Debt raising costs	-	-	-	-	-	-
Total	**150.29**	**155.20**	**165.52**	**164.20**	**152.89**	**788.10**

2.3   PIPELINE USAGE

17.   Table 2–3 provides pipeline usage for the 2010-15 AA period. Values for RY11-RY14 are actuals, while RY15 values are estimates.

Table 2–3: Pipeline daily demand (TJ)

	Actual 2010-11	Actual 2011-12	Actual 2012-13	Actual 2013-14	Estimate 2014-15
Minimum demand	156.08	124.79	157.23	157.08	157.84
Maximum demand	416.20	382.78	385.62	372.18	356.89
Average demand	**274.44**	**248.30**	**258.49**	**248.28**	**231.39**

18. Table 2–4 provides customer numbers by tariff class for the 2010–15 AA period. Values for RY11-RY14 are actuals, while RY15 values are estimates.

Table 2–4: Customer numbers by tariff class (number)

Tariff class	Actual	Actual	Actual	Actual	Estimate	Total
	2010-11	2011-12	2012-13	2013-14	2014-15	
Residential	1,096,101	1,124,125	1,158,188	1,194,557	1,230,962	5,803,933
Small business	14,064	15,188	15,933	16,827	17,183	79,195
Total volume customers	**1,110,165**	**1,139,313**	**1,174,121**	**1,211,384**	**1,248,145**	**5,883,128**
Demand customers	401	398	401	409	409	2,018
Total customers	**1,110,566**	**1,139,711**	**1,174,522**	**1,211,793**	**1,248,554**	**5,885,146**

3. CAPITAL BASE

3.1 OPENING CAPITAL BASE FOR THE EARLIER AA PERIOD

19. The opening regulatory asset base (**RAB**) as at 1 July 2010 is the closing RAB as at 30 June 2010 of $2,312.7M (total) from the 2010 AAI. That amount includes estimated net capex of $94.2M for 2009-10. Actual net capex for 2009-10 was $96.9M. The difference ($2.7M), uplifted at the weighted average cost of capital (**WACC**) for 5 years, is included as an adjustment of $4.4M in 2015. Details of the adjustment are shown in Table 3–1.

Table 3–1: Adjustment for difference between estimated and actual net capex in 2009-10 ($nominal, $millions)

Asset class	Closing RAB	Difference between estimated and actual net capex for 2009-10			WACC uplift	Adjustment in 2014-15
	30-Jun-10	Estimate	Actual	Difference		
Wilton-Wollongong trunk	8.44	-	-	-	-	-
Wilton-Newcastle trunk	129.47	2.21	0.05	(2.17)	(1.37)	(3.54)
NSW distribution network	2,174.80	91.95	96.83	4.88	3.09	7.97
Combined total	**2,312.71**	**94.17**	**96.88**	**2.71**	**1.72**	**4.43**

(1) Net capex is capex after accounting for capital contributions and disposals.

3.2 CLOSING CAPITAL BASE FOR THE EARLIER AA PERIOD

20. JGN accounts for inflation by indexing the capital base. This is consistent with the approach taken in past revisions of JGN's AA, with the NGR, and with the precedent set in the majority of Australian regulatory decisions. Therefore, JGN has adjusted its capital base as follows:

> *capital base = opening capital base + indexation at CPI + conforming capital expenditure – depreciation + conforming assets from speculative investment account – redundant assets + re-used redundant assets – asset disposals.*[1]

21. The following projections of the capital base are based on actual data for capex, capital contributions and asset disposals for the years 2010-11, 2011-12, 2012-13 and 2013-14. In addition:

- consumer price index (**CPI**) values are as set out in Table 3–2

- economic and remaining asset lives are as presented in section 3.4.2.

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[1] Rule 77.

Table 3–2: Increase in CPI (per cent)

Year	Annual increase in the CPI (per cent)
2010-11	2.65
2011-12	3.10
2012-13	2.20
2013-14	2.75
2014-15	1.72

(1) Source: Australian Bureau of Statistics.

(2) Values are year on year CPI inflation for the year to December for the eight capital cities as published by the Australian Bureau of Statistics.

22. In rolling forward the capital base to 2015, JGN has not included any conforming assets from a speculative investment account, classified any assets as redundant assets, or re-used any assets previously classified as redundant.

23. JGN has deducted forecast depreciation in rolling forward its capital base from 2010-11 to 2014-15 in accordance with clause 3.1(c) of its 2010 AA.

24. Table 3–3 to Table 3–6 set out JGN's roll forward of the combined total capital base and for each of the Wilton to Wollongong and Wilton to Newcastle trunk pipelines and the NSW distribution system (including the Central West distribution system) respectively over the earlier AA period.

Table 3–3: Roll forward of combined total capital base over earlier AA period ($nominal, $millions)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening balance	2,312.71	2,456.60	2,611.22	2,697.06	2,801.51
Add net capex at start of year[2]	76.25	82.80	63.46	69.67	121.92
Add indexation of assets[3]	63.42	78.81	58.96	75.95	50.21
Add net capex at end of year[2]	78.27	85.37	64.86	71.58	124.01
Less depreciation[4]	(74.06)	(92.35)	(101.44)	(112.74)	(124.05)
Adjustment	-	-	-	-	4.43
Closing balance	**2,456.60**	**2,611.22**	**2,697.06**	**2,801.51**	**2,978.04**

(1) Values for 2014-15 are estimates based on JGN's current outlook.

(2) Net capex = gross capex (including equity raising costs) less capital contributions less asset disposals.

(3) Indexation of assets = (opening balance + net capex at start of year) x CPI for the year.

(4) Depreciation is forecast depreciation as approved by the AER.

(5) These notes also apply to the other RAB roll forward tables in chapter 3.

Table 3–4: Roll forward of Wilton to Wollongong trunk pipeline capital base over earlier AA period ($nominal, $millions)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening balance	8.44	8.46	8.51	8.49	8.50
Add net capex at start of year	-	-	-	-	-
Add indexation of assets	0.22	0.26	0.19	0.23	0.15
Add net capex at end of year	-	-	-	-	-
Less depreciation	(0.20)	(0.21)	(0.21)	(0.22)	(0.22)
Adjustment	-	-	-	-	-
Closing balance	**8.46**	**8.51**	**8.49**	**8.50**	**8.42**

Table 3–5: Roll forward of Wilton to Newcastle trunk pipeline capital base over earlier AA period ($nominal, $millions)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening balance	129.47	130.15	131.34	131.33	133.73
Add net capex at start of year	(0.00)	-	0.00	0.87	-
Add indexation of assets	3.44	4.04	2.90	3.63	2.30
Add net capex at end of year	(0.00)	-	0.00	0.89	-
Less depreciation	(2.76)	(2.85)	(2.91)	(2.99)	(3.05)
Adjustment	-	-	-	-	(3.54)
Closing balance	**130.15**	**131.34**	**131.33**	**133.73**	**129.43**

Table 3–6: Roll forward of NSW distribution system capital base over earlier AA period ($nominal, $millions)

	2010-11	2011-12	2012-13	2013-14	2014-15
Opening balance	2,174.80	2,317.99	2,471.37	2,557.25	2,659.28
Add net capex at start of year	76.25	82.80	63.46	68.80	121.92
Add indexation of assets	59.76	74.51	55.88	72.09	47.77
Add net capex at end of year	78.27	85.37	64.86	70.68	124.01
Less depreciation	(71.10)	(89.30)	(98.32)	(109.53)	(120.77)
Adjustment	-	-	-	-	7.97
Closing balance	**2,317.99**	**2,471.37**	**2,557.25**	**2,659.28**	**2,840.18**

25. The closing balance values for 2014-15 constitute the opening capital base for the 2015-20 AA period.

3 — CAPITAL BASE

3.3   PROJECTED CAPITAL BASE IN THE AA PERIOD

26. The projected capital base in the AA period is set out in Table 3–7, Table 3–8, Table 3–9 and Table 3–10.

Table 3–7: Roll forward of combined total capital base over the AA period ($nominal, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening balance	2,978.04	3,153.40	3,311.10	3,473.06	3,608.32
Add net capex at start of year	119.61	117.16	126.01	118.36	105.65
Add indexation of assets	78.93	83.34	87.58	91.51	94.64
Add net capex at end of year	122.66	120.15	129.22	121.38	108.34
Less depreciation	(145.84)	(162.95)	(180.85)	(195.99)	(184.66)
Adjustment	-	-	-	-	-
Closing balance	**3,153.40**	**3,311.10**	**3,473.06**	**3,608.32**	**3,732.29**

Table 3–8: Roll forward of Wilton to Wollongong capital base over the AA period ($nominal, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening balance	8.42	8.41	8.39	8.37	8.33
Add net capex at start of year	-	-	-	-	-
Add indexation of assets	0.21	0.21	0.21	0.21	0.21
Add net capex at end of year	-	-	-	-	-
Less depreciation	(0.23)	(0.23)	(0.24)	(0.25)	(0.25)
Adjustment	-	-	-	-	-
Closing balance	**8.41**	**8.39**	**8.37**	**8.33**	**8.29**

Table 3–9: Roll forward of Wilton to Newcastle trunk pipeline capital base over the AA period ($nominal, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening balance	129.43	129.61	129.71	129.73	129.67
Add net capex at start of year	-	-	-	-	-
Add indexation of assets	3.30	3.30	3.31	3.31	3.30
Add net capex at end of year	-	-	-	-	-
Less depreciation	(3.12)	(3.20)	(3.28)	(3.37)	(3.45)
Adjustment	-	-	-	-	-
Closing balance	**129.61**	**129.71**	**129.73**	**129.67**	**129.52**

Table 3–10: Roll forward of NSW distribution system capital base over the AA period ($nominal, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening balance	2,840.18	3,015.38	3,173.00	3,334.97	3,470.32
Add net capex at start of year	119.61	117.16	126.01	118.36	105.65
Add indexation of assets	75.42	79.82	84.06	87.99	91.12
Add net capex at end of year	122.66	120.15	129.22	121.38	108.34
Less depreciation	(142.49)	(159.51)	(177.33)	(192.38)	(180.96)
Adjustment	-	-	-	-	-
Closing balance	**3,015.38**	**3,173.00**	**3,334.97**	**3,470.32**	**3,594.47**

3.4   DEPRECIATION

3.4.1   SUMMARY

27. JGN has established a depreciation schedule that reflects the economic lives and cash flow needs of the business consistent with the NGR requirements.

28. Table 3–11 summaries JGN's forecast deprecation over the 2015-20 AA period, determined by applying the real straight-line depreciation method.

Table 3–11: Forecast depreciation over the AA period ($nominal, $millions)

Depreciation	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Total	145.84	162.95	180.85	195.99	184.66	870.30

3.4.2   ASSUMPTIONS ON ECONOMIC LIFE OF ASSETS FOR REGULATORY DEPRECIATION

29. The economic lives that JGN has adopted for its assets are set out in Table 3–12.

Table 3–12: Economic lives of JGN assets (years)

Asset Class	Economic Asset Life (years)
Trunk Wilton-Sydney	80
Trunk Sydney-Newcastle	80
Trunk Wilton-Wollongong	80
Contract Meters	20
Fixed Plant - Distribution	50
High Pressure (**HP**) Mains	80
HP Services	50
Medium Pressure (**MP**) Mains	50

Asset Class	Economic Asset Life (years)
MP Services	50
Meter Reading Devices	20
Country POTS	50
Tariff Meters	20
Buildings	48
Computers	5
Software	5
Fixed Plant	10
Furniture	10
Land	n/a
Leasehold Improvements	10
Low value assets	10
Mobile Plant	10
Vehicles	6

3.4.3   REMAINING ASSET LIVES

30. Remaining asset lives for the capital base at 30 June 2015 are set out in Table 3–13.

Table 3–13: Remaining asset lives as at 30 June 2015 (years)

Asset Class	Remaining life (years)
Trunk Wilton-Sydney	38.1
Trunk Sydney-Newcastle	46.2
Trunk Wilton-Wollongong	37.9
Contract Meters	7.2
Fixed Plant - Distribution	50.0
HP Mains	58.5
HP Services	50.0
MP Mains	26.2
MP Services	36.9
Meter Reading Devices	20.0
Country POTS	31.6
Tariff Meters	9.2
Building	48.0
Computers	5.0
Software	4.0

Asset Class	Remaining life (years)
Fixed Plant	8.6
Furniture	10.0
Land	-
Leasehold Improvements	10.0
Low value assets	10.0
Mobile Plant	8.4
Vehicles	3.2
Stock	1.0
Equity Raising Costs	49.9
Weighted average remaining asset life	**32.8**

3.4.4   FORECAST DEPRECIATION

31. The amount of regulatory depreciation for each asset class is determined for each year of the AA period by applying the real straight-line depreciation method to the opening regulatory value of each asset class for each year. Real straight-line depreciation (as distinct from historical cost straight-line) involves deducting the same real amount of depreciation in each year of an asset's life.

32. Forecast regulatory depreciation for the AA period is provided in Table 3–14. A demonstration of how the forecast is derived is included in appendix 10.1 of our response to the draft decision.

Table 3–14: Forecast depreciation over AA period ($nominal, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Wilton-Wollongong trunk	0.23	0.23	0.24	0.25	0.25	1.20
Wilton-Newcastle trunk	3.12	3.20	3.28	3.37	3.45	16.43
NSW distribution network	142.49	159.51	177.33	192.38	180.96	852.67
Total	**145.84**	**162.95**	**180.85**	**195.99**	**184.66**	**870.30**

33. Forecast depreciation for the AA period, adjusted for the difference between forecast and actual CPI, will be used in rolling forward the capital base to the beginning of the AA period beginning on 1 July 2020 (rule 90(2) of the NGR).

3 — CAPITAL BASE

3.5   CAPITAL CONTRIBUTIONS

34.   Table 3–15 and Table 3–16 set out JGN's capital contributions over the 2010-15 and 2015-20 AA periods, respectively.

Table 3–15: Capital contributions over the earlier AA period ($nominal, $millions)

	2010-11	2011-12	2012-13	2013-14	2014-15 estimate	Total
Total contributions received[2]	7.49	3.71	5.34	14.48	10.32	**41.34**

(1)   The value or 2014-15 is an estimate based on JGN's current outlook.

(2)   Capital contributions are assumed to be received 50 per cent at the start of the year, and 50 per cent at the end of the year, and are converted to year-end dollars.

Table 3–16: Capital contributions over the AA period ($nominal, $millions)

Details	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Total contributions received[1]	5.84	5.40	5.25	5.41	5.56	**27.46**

(1)   Capital contributions are assumed to be received 50 per cent at the start of the year, and 50 per cent at the end of the year, and are converted to year-end dollars.

3.6   CONFORMING CAPITAL EXPENDITURE

35.   Table 3–17 and Table 3–18 set out JGN's conforming capital expenditure over the 2010-15 and 2015-20 AA periods, respectively.

Table 3–17: Conforming capital expenditure over the earlier AA period ($nominal, $millions)

Details	2010-11	2011-12	2012-13	2013-14	2014-15 estimate	Total
Market expansion	57.63	65.36	76.20	92.85	101.23	393.27
System reinforcement, replacement and renewal	64.52	79.63	40.96	39.45	69.74	294.30
Non-system assets	44.18	29.86	18.20	25.77	85.36	203.36
Gross capital expenditure	166.33	174.85	135.37	158.06	256.34	890.94
Less capital contributions	(7.49)	(3.71)	(5.34)	(14.48)	(10.32)	(41.34)
Conforming capital expenditure	**158.83**	**171.13**	**130.03**	**143.58**	**246.02**	**849.60**

(1)   Values for 2014-15 are estimates based on JGN's current outlook.

(2)   Capex is assumed to be spent 50 per cent at the start of the year, and 50 per cent at the end of the year, and converted to year-end dollars.

Table 3–18: Conforming capital expenditure over the AA period ($nominal, $millions)

Details	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Market expansion	95.08	97.55	98.12	99.32	99.10	489.17
System reinforcement, replacement and renewal	103.80	109.77	122.77	118.19	105.01	559.53
Non-system assets	52.41	38.48	42.95	31.00	18.33	183.17
Gross capital expenditure	251.29	245.80	263.84	248.50	222.43	1,231.87
Less capital contributions	(5.84)	(5.40)	(5.25)	(5.41)	(5.56)	(27.46)
Conforming capital expenditure	**245.45**	**240.40**	**258.59**	**243.09**	**216.87**	**1,204.41**

(1) Capex is assumed to be spent 50 per cent at the start of the year, and 50 per cent at the end of the year, and converted to year-end dollars.

3.7 DISPOSALS

36. Table 3–19 and Table 3–20 set out JGN's asset disposals over the 2010-15 and 2015-20 AA periods respectively.

Table 3–19: Asset disposals over the 2015-20 AA period ($nominal, $millions)

	2010-11	2011-12	2012-13	2013-14	2014-15 estimate	Total
Total asset disposals[1]	6.48	2.98	1.71	2.35	0.09	**13.62**

(1) The value for 2014-15 is an estimate based on JGN's current outlook.
(2) Asset disposals are assumed to occur 50 per cent at the start of the year, and 50 per cent at the end of the year, and are converted to year-end dollars.

Table 3–20: Asset disposals over the 2015-20 AA period ($nominal, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Total asset disposals[1]	0.13	0.11	0.15	0.34	0.19	**0.91**

(1) Asset disposals are assumed to occur 50 per cent at the start of the year, and 50 per cent at the end of the year, and are converted to year-end dollars.

4. DEMAND

4.1 JGN'S DEMAND FORECASTING APPROACH

37. JGN engaged Core Energy to prepare the demand forecasts for the AA period. The demand forecasting approach for the broadly involved forecasting customer numbers and the average consumption per connection to provide total forecast demand.[2]

4.1.1 APPROACH TO FORECASTING CUSTOMER NUMBERS

38. The approach to forecasting customer connections involved:

• using regression analysis to determine the historical trend in new connections to derive a suitable forecast for each year

• analysing the historical trend in the rate of disconnections to derive a suitable forecast for each year

• adjusting connection forecasts for factors which are not present in the historical trend, including forecast changes in the relative prices of gas and electricity.

4.1.2 APPROACH TO FORECASTING DEMAND PER CONNECTION

39. The approach to forecasting demand per connection involved:

• normalise total demand per annum for the effects of weather

• divide total demand by number of connections to determine consumption per connection

• determine the historical trend in consumption per connection to establish a base for projection

• adjust consumption per connection forecasts for factors which are not present in the historical trend, including the impact of rising wholesale gas prices and increasing appliance substitution.

4.1.2.1 Weather normalisation

40. JGN weather normalised the historical gas consumption data using Effective Degree Days (**EDD**), where cooler temperatures (below a given threshold), result in higher gas use for heating purposes. This approach is based on AEMO guidelines.[3] Core Energy's approach is summarised in Box 4–1.

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[2] Rule 72(1)(d) provides that the AAI must include to the extent practicable a forecast of pipeline capacity over the 2015-20 AA period and the basis upon which the forecast has been derived. Capacity information for a distribution network is not available or meaningful for a distribution pipeline. The JGN network is a geographically dispersed network made up of interconnected pipes and there are a number of practical considerations governing why the calculation of capacity is not practicable.

[3] AEMO, *2012 review of the weather standards for gas forecasting,* April 2012.

Box 4–1 Core Energy forecasting method

Core Energy's process of weather normalising demand using EDD involves:

- specifying the EDD index for calculating EDD. This involves using regression analysis to determine the coefficients providing the best fit between demand and weather for JGN's NSW network

- using historical temperature data at the Sydney Airport weather station, determine the trend in historical EDD

- determining an appropriate 'normalised' EDD figure for each year (either a trending series or, if no trend in EDD is apparent, the average yearly EDD) which represents normal weather conditions. In the case of Sydney Airport no long-term trend in EDD was evident, thus an average EDD was used

- comparing the actual EDD recorded each year to the normalised EDD figure for that year to obtain the 'abnormal' EDD

- using regression analysis to determine the sensitivity of demand to EDD in each year for each customer class, multiplying this factor by the abnormal EDD figure to arrive at the total abnormal gas demand due to weather for each year

- subtracting abnormal demand from actual demand to arrive at weather normalised demand for each customer class.

4.1.2.2 Price elasticity

41. Projected retail gas and electricity prices impact on forecast gas consumption.

42. Over time, higher gas prices result in customers using less gas. We captured this relationship through a long-term own price elasticity of -0.3 for residential customers, and -0.35 for non-residential customers, consistent with the AER's decision for Envestra (Victoria).

43. Over time, decreases in retail electricity prices relative to gas prices will also result in customers using less gas. Core Energy captured this relationship through a long-term cross price elasticity of -0.1 for residential customers and non-residential customers. While the AER has not considered this effect previously, Core Energy considers material relative increases in retail gas prices and increasing fuel choice will impact customers' decisions in the:

- *short term*—particularly given the high penetration of reverse cycle air-conditioning in NSW that provides customers with heating choice

- *longer term*—as customers make appliance replacement decisions, such as the choice of hot water supply.

44. Core Energy projected retail gas and electricity prices using a range of publicly available regulatory decisions and market evidence.

4.2   DEMAND FORECASTS

45. Tables 4–1 to 4–3 set out JGN's forecast customer numbers, average consumption and total consumption over the AA period respectively.

Table 4–1: Forecast customer numbers by customer type

	2015-16	2016-17	2017-18	2018-19	2019-20
Total Volume Market	1,284,008	1,317,392	1,348,273	1,376,669	1,402,603
Total Demand Market	443	441	441	441	441
Total customers	**1,284,451**	**1,317,833**	**1,348,714**	**1,377,110**	**1,403,044**

Table 4–2: Forecast average daily consumption by customer type and MDQ (TJ)

	2015-16	2016-17	2017-18	2018-19	2019-20
Volume market	94.84	95.19	94.76	94.30	93.86
Demand market	132.42	130.49	128.62	126.81	124.69
Total average load	**227.26**	**225.68**	**223.39**	**221.11**	**218.55**
Demand market MDQ/CD	276.78	272.29	269.31	266.93	266.93

Table 4–3: Forecast consumption by customer type (TJ): 2016-20

	2015-16	2016-17	2017-18	2018-19	2019-20
Total volume market	34,710	34,746	34,589	34,419	34,352
Total demand market	48,466	47,627	46,948	46,285	45,638
Total consumption	**83,176**	**82,373**	**81,537**	**80,703**	**79,990**

46. Forecast average residential consumption is set out in Table 4–4.

Table 4–4: Actual and forecast average consumption by volume market type (GJ)

Demand per Connection	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Existing residential	20.08	19.30	18.69	18.35	17.97	17.66	17.38
Electricity to gas **(E to G)**	11.83	11.34	10.99	10.78	10.56	10.38	10.22
New estates	18.05	17.31	16.76	16.45	16.11	15.83	15.59
New medium density	16.46	15.78	15.29	15.00	14.69	14.44	14.21
Small business	246.36	204.53	193.50	186.24	177.85	168.87	161.73
I&C	455.88	466.65	411.75	403.49	392.08	378.69	369.15

5. OPERATING EXPENDITURE

5.1 FORECASTING BASIS

47. JGN has employed two methods for forecasting opex over the 2015-20 AA period:

   • *base, step and trend approach*—applied to the adjusted base year opex amount, which excludes opex cost categories that are subject to specific annual forecasts over the 2015-20 AA period

   • *specific year-by-year forecasts*—for items where base year costs are not representative of the future.

48. JGN has adjusted the base year by subtracting costs relating to non-recurrent events and circumstances that are not expected to endure. JGN has then trended its adjusted base year costs forward, escalating or de-escalating the forecast by applying a rate of change.

49. Step changes are then added to the trended adjusted base year. Step changes involve increases or decreases in costs due to new regulatory obligations, changes in good industry practice and JGN's operating environment. These costs reflect forecast prudent and efficient opex not captured by the base year expenditure or trend escalation.

5.2 OPERATING EXPENDITURE FORECAST

50. Table 5–1 summarises JGN's forecast opex for the AA period.

Table 5–1: JGN forecast O&M costs over the AA period ($2015, $millions)

Level 1 category	Level 2 category	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
O&M	Maintenance	28.37	27.43	27.77	28.56	28.01	28.16	28.30
	Emergency response	4.50	4.39	4.41	4.44	4.48	4.50	4.53
	Management - O&M	12.66	12.35	12.43	12.50	12.62	12.68	12.75
	Network planning	6.52	6.37	6.40	6.44	6.50	6.53	6.57
	Network control and operational switching	7.05	6.88	6.92	6.96	7.02	7.06	7.10
	Project governance and related functions	5.08	4.96	4.99	5.02	5.06	5.09	5.12
	Quality and standard functions	3.51	3.43	3.45	3.47	3.50	3.52	3.54
	Other	13.56	13.80	15.43	14.48	14.82	14.71	14.84
	Information technology (IT)	14.32	13.97	15.55	17.14	16.77	16.34	16.41

	Corporate overheads - O&M	17.31	16.89	16.99	17.09	17.25	17.34	17.43
	Pigging/Integrity digs, adhoc mains renewal	1.49	-	-	-	-	-	-
Non-O&M (A&O)	Corporate overheads - A&O	9.36	9.22	9.34	9.39	9.48	9.53	9.54
	Management - A&O	2.41	2.35	2.37	2.38	2.40	2.41	2.43
	Other directs	5.53	3.02	3.03	3.05	3.12	7.56	6.40
Non-O&M (Other)	Government levies	3.98	3.98	3.98	3.98	3.98	3.98	3.98
	Marketing	7.65	7.46	8.81	8.85	8.92	8.96	9.00
	Unaccounted for gas (UAG)	13.74	16.36	15.85	15.86	15.79	15.71	15.68
	Carbon costs	7.17	0.04	0.04	0.04	0.04	0.04	0.04
	Debt raising costs	-	-	3.23	3.32	3.40	3.47	3.50
Consolidated	**Total JGN opex**	**164.20**	**152.89**	**160.96**	**162.99**	**163.18**	**167.60**	**167.14**

6. RATE OF RETURN

6.1 RATE OF RETURN

51. The allowed rate of return (specified as a nominal vanilla WACC) is 7.15 per cent per annum as set out in Table 6–1. This WACC is updated annually for the trailing average return on debt, using the methods specified in the AA.

Table 6–1: JGN's WACC

Parameters	JGN proposal (per cent)
Return on equity	9.87
Return on debt	5.33
Inflation	2.55
Leverage	60.00
Gamma	25.00
Corporate tax rate	30.00
Nominal vanilla WACC	**7.15**

(1) Return on debt, return on equity, and nominal WACC are estimated using data from the sample averaging period of the 20 business days to 30 January 2015 (inclusive).
(2) Gamma is discussed in chapter 10 and appendix 10.1.
(3) Values may not add due to rounding.

6.2 DEPARTURES FROM THE GUIDELINE

52. JGN has departed from the AER's rate of return guideline to the extent that we do not consider that the guideline best achieves the allowed rate of return objective. The departures from the rate of return guideline are:

- JGN has adopted a different methodology for estimating the return on equity

- JGN has adopted a different credit rating assumption for the purposes of estimating the return on debt

- JGN has adopted a different method for transitioning to the trailing average portfolio approach to estimating the return on debt

- JGN has adopted a different method for selection of future averaging periods, for the purposes of estimating the prevailing return on debt in each year of the AA period

- JGN has adopted a different estimate of the value of imputation credits (gamma).

53. In each case the reason for the departure is that we do not consider that the guideline best achieves the allowed rate of return objective. The reasons for these departures are explained in detail in chapter 7 of JGN's response to the draft decision, and associated appendices.[4]

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[4]   JGN, *JGN 2015-20 access arrangement - response to the draft decision*, 27 February 2015.

6.3 FORMULA APPLIED UNDER RULE 87(12)

54. JGN applies a four step process for updating the return on debt each year over the AA period:

- **steps 1 and 2**: estimate a 'spot rate' return on debt for the relevant year, where:

  - the averaging period for the spot rate is nominated by JGN and either accepted or rejected by the AER in advance of that period and, if rejected, an alternative period is set by the AER (**step 1**)

  - the spot rate is estimated using the average of available independent third party data sources, or where the estimates from these sources diverge by more than 60 basis points, the independent third party data source that best fits the traded bond data over that averaging period, where the fit is measured statistically (**step 2**).

  JGN gives effect to this step using a process that automatically selects the best fitting independent third party estimate. This process is codified in clause 5 of our AA. The process is specified in as much detail as possible, so that it can be applied automatically and within a relatively short timeframe.

  The estimate produced by step 2 is not the return on debt that will be used to update total revenue and tariffs for the relevant year—rather, it is one parameter in the calculation of the updated return on debt (see step 3 below).

- **step 3**: update the trailing average to derive the updated return on debt figure to apply for the relevant year. This is the return on debt used to update total revenue and tariffs. The updated trailing average return on debt is a function of the 'spot rate' estimated in step 2 for that year, the spot rates for previous years, and a transitional value.

  - The return on debt is updated using an automatic application of a weighted average formula. The weighted average formula is set out in clause 5 of the AA.

- **step 4**: update total revenue and tariffs entering the return on debt figure from step 3 into JGN's revenue forecast model (draft decision response appendix 10.1) and resolving for the relevant X factors in years three to four of the AA period. As required by the NGR, the change in total revenue resulting from any update to the return on debt is given effect by automatic application of a formula that is set out in JGN's revised revenue forecast model (draft decision response appendix 10.1). Once the updated return on debt is entered, this model updates forecast revenues and X factors automatically using the formulae embedded within it.

55. This process is specified in JGN's AA.

7.   CORPORATE INCOME TAX

7.1   VALUE OF IMPUTATION CREDITS

56. The value of imputation credits is 0.25.

7.2   COST OF CORPORATE INCOME TAX

57. Table 7–1 shows how JGN's tax asset base (**TAB**) rolls forward over the AA period and provides details of the cost of tax calculation for that period.

Table 7–1: Cost of corporate income tax for the AA period ($nominal, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20
Opening TAB	980.24	1,093.97	1,189.44	1,292.82	1,373.53
Plus capex	248.04	242.64	260.42	245.08	219.48
Less depreciation	(134.31)	(147.17)	(157.04)	(164.38)	(165.46)
Closing TAB	1,093.97	1,189.44	1,292.82	1,373.53	1,427.55
Revenue requirement (post tax)[1]	453.43	484.84	514.96	546.58	545.10
Plus capital contributions	5.84	5.40	5.25	5.41	5.56
Less opex[2]	(165.06)	(171.41)	(175.97)	(185.34)	(189.55)
Less interest expense	(99.13)	(104.66)	(109.99)	(114.93)	(118.85)
Less tax depreciation	(134.31)	(147.17)	(157.04)	(164.38)	(165.46)
Taxable income	60.77	67.00	77.21	87.34	76.80
Tax loss carried forward	-	-	-	-	-
Tax rate (per cent)[3]	0.39	0.39	0.39	0.39	0.39
Tax payable	23.52	25.94	29.89	33.81	29.73
Value of imputation credits	(5.88)	(6.48)	(7.47)	(8.45)	(7.43)
Net cost of corporate tax	**17.64**	**19.45**	**22.42**	**25.36**	**22.30**

(1) Revenue requirement = building block revenue (excluding tax wedge).

(2) Opex includes debt raising costs.

(3) Tax rate is the grossed up tax rate equal to rt / (1 – (1 – γ) * rt). Grossing up recognises that, for purposes of the building block calculation, the net cost of corporate tax forms part of JGN's pre-tax revenue requirement and is itself subject to tax.

8. INCENTIVE MECHANISMS

8.1 2010-15 AA PERIOD

58. JGN's 2010 AA includes an incentive mechanism relating to the rate of unaccounted for gas (**UAG**). JGN is provided a fixed allowance for a quantity of UAG based on a target percentage rate of total network receipts. In the 2010-15 AA period this rate is 2.34 per cent of receipts. If the actual UAG rate is below (above) this rate, JGN over (under) recovers its actual UAG costs.

59. The 2010 AA stipulates a one year lag for the pass through of the recoverable amount (which captures the penalty or reward).[5] The pass through amounts for RY11-RY14 have been recovered through JGN's reference tariffs for RY12-RY15.

60. In accordance with the annual reference tariff variation mechanism the penalty or reward for RY15 UAG performance will be reflected in reference tariffs for 2016-17.

8.2 2015-20 AA PERIOD

8.2.1 UNACCOUNTED FOR GAS

61. To provide a continuous incentive to manage network leakages, a UAG incentive mechanism applies in the AA period as follows:

- the current UAG incentive scheme applies based on an efficient annual target rate of UAG

- JGN is compensated for variation in total market volumes and costs of purchasing UAG (which remain outside JGN's control) through an automatic annual adjustment

- the efficient level of UAG is represented as two different UAG target rates – one applied to daily metered customer withdrawals and the other to gas received to supply non-daily metered customers

- a two year lag is applied to cost recovery, removing reliance on forecast gas receipts and allowing JGN to submit its annual TVN as early as 15 March each year.

62. The mechanism is specified in section 2 of schedule 3 to AA.

8.2.2 OPERATING EXPENDITURE

63. JGN applies an efficiency carryover mechanism (**ECM**) to 2015-20 AA period opex. This provides JGN a continuous incentive to seek opex efficiencies over the AA period.

64. The operation of the ECM is expressed in a fixed principle set out in clause 12 of the AA. The primary features of the ECM are:

- JGN will keep the benefit (or will incur the cost) of delivering actual opex lower (higher) than forecast opex in each year of an AA period

- the ECM carries forward JGN's incremental efficiency gains for the length of the carryover period

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[5] A time value of money (WACC) adjustment is applied to account for this lag.

- this carryover period length is five years

- the carryover amounts is an additional 'building block' when setting JGN's reference service revenue for the AA period commencing 1 July 2020.

9. REFERENCE TARIFFS

9.1 PRICING PRINCIPLES AND BASIS OF REFERENCE TARIFFS

65. JGN has considered the following pricing principles and objectives when constructing its current tariff classes and charge components for the 2015-20 AA period:

- *recover our efficient costs of operation*—we need to recover our allowed revenue to continue to provide safe and reliable natural gas services into the future

- *keep gas competitive*—maintain and enhance the attractiveness and position of natural gas as a value for money fuel of choice in NSW

- *price efficiently and equitably*—ensure that similar customers are grouped together and that these customers pay for gas in a way that encourages efficient use of the network

- *provide stability in our network tariffs and end-retail prices*—where possible minimise any sharp change in end customer bills

- *provide simplicity and transparency in our tariffs*—consider customer preferences, the transaction costs of providing customised tariffs and ensuring customers and stakeholders can make sense of our charges.

66. To support these objectives, JGN splits its tariff classes between two different customer categories:

- volume customers, who include residential and small industrial and commercial end customers

- demand customers, who are larger commercial and industrial end customers.

67. Within the volume and demand categories, individual customers are primarily distinguished based on their location, the characteristics of the end customer, and likelihood of their consumption being more or less than 10 TJ of gas per year. In most cases volume customers have consumption below 10 TJ per annum and demand customers have consumption above 10 TJ per annum—which is a common delineation across jurisdictions.

68. To accommodate intermediaries, there may be limited instances where it is not appropriate for JGN to apply the 10 TJ delineation and provides necessary changes to the assignment criteria.

69. The volume tariff classes for the haulage reference service are set out in Table 9–1.

Table 9–1: JGN's volume reference tariff classes

Tariff category	Number of tariff classes	Tariff classes	Types of customers	Why included
Volume individual metered	2	VI-Coastal VI-Country (previously V-Coastal and V-Country)	• Most of our 1.2 million existing customers, including residential and small and medium businesses consuming up to 10 TJ per annum • New customers consuming up to 10 TJ per annum with individual metering by JGN.	Maintains existing tariff classes for most of JGN's existing and new customers.
Volume boundary metered (new)	2	VB-Coastal VB-Country	Residential end customers in higher-density residential developments and small business customers in commercial developments supplied energy by an energy intermediary that sits between the boundary meters and the end customers.	Increasing demand for boundary metered supply to higher-density developments where energy intermediaries then on-sell energy to residential or business end customers. We want to encourage innovative, efficient and customer focused energy services.
Residential distributed generation technology (new)	4	VRT-03, VRT-04, VRT-06, VRT-10	Residential end customers supplied energy by an intermediary using a large-scale generation unit in a residential precinct (consuming more than 50 TJ per annum).	Recent technological, market and policy developments mean residential customers in large precincts may be supplied electricity, heating or cooling from a gas fired plant (cogeneration or trigeneration). We want to encourage innovative, efficient and customer focused energy services, and promote gas usage to lower average prices for all customers.

70. The demand tariff classes for the haulage reference service are set out in Table 9–2. The numbers associated with the tariff classes are 'identifiers'. These identifiers relate to groups of postcodes and are set out within the AA. JGN ranks the cost relativities of supplying demand customers in different postcodes using a system of cost-reflective drivers.

Table 9–2: JGN demand reference tariff classes

Tariff category	Number of tariff classes	Tariff class names	Types of customers	Why included
Capacity country	1	DC Country	Most of our large industrial customers	Maintains existing tariff classes
Capacity coastal	11	DC1 to DC11		
Throughput	1	DT		

Tariff category	Number of tariff classes	Tariff class names	Types of customers	Why included
Major end-user (throughput)	5	DMT1 to DMT5		
First response	2	DCFR-06 & DMTFR-03	Several large industrial customers with flexibility in operations to reduce demand as a first priority response	Grandfathered tariff classes to maintain existing benefit these customers provide

9.2   COST ALLOCATION METHOD

71.   JGN offers a single reference service—the haulage reference service—to meet customer preferences.   The NGR require JGN to allocate its total revenues to reference and non-reference services.

72.   JGN's cost allocation method involves taking the required cost of service (building blocks), deducting revenues associated with non-reference services (including negotiated revenues) and from non-pipeline services and then allocating the residual costs to the haulage reference service.

73.   JGN calculates the revenue for other non-reference services based on the forecast level of activity for those services and their prices.   Revenue not related to pipeline services includes third party hits income, rental income, property enquiry income and doubtful debts recovered income. JGN does not allocate this revenue to a reference service as the underlying costs are excluded from JGN's building block revenues. Deducting these revenues from the building block revenues ensures costs are not duplicated by allocations to reference services.

9.3   RELATIONSHIP BETWEEN COSTS AND TARIFFS

JGN demonstrates that its tariffs support allocative efficiency and reflect the costs of its different customer bases via:

•   demonstration of efficient prices including JGN's estimates of:

   −   stand-alone and avoidable costs

   −   long run marginal costs (**LRMC**)

•   JGN's consideration of transaction costs

•   JGN's consideration of customer's ability to respond to price signals

•   a description of how ancillary charges are efficient.

9.3.1   STAND-ALONE AND AVOIDABLE COSTS

74.   The expected revenue recovered for each tariff class should lie on or between the stand-alone cost of providing the reference service and the avoidable cost of not providing the reference service.

75. JGN's stand-alone and avoidable cost estimates for each tariff class, and the approach to calculating these, are set out in the initial proposal.[6] This demonstrated that JGN's expected revenue for each tariff class lies between the two efficiency measures.

9.3.2   LONG RUN MARGINAL COST

76. JGN has taken into account LRMC in setting its tariffs.

77. JGN has calculated LRMC for each of its volume tariff classes using the average incremental approach. JGN's model has produced LRMC values of zero for the demand market as there is no growth in this market during the forecast horizon. That is, JGN does not expect the demand market to drive incremental growth-related investment on JGN's network. This is consistent with the incremental cost to the shared network being specific to individual demand customers' characteristics.

78. Table 9–3 details LRMC for JGN's volume tariff classes.

Table 9–3: LRMC for JGN tariff classes ($nominal/GJ)

Tariff Class	LRMC
VI-Coastal	14.93
VI-Country	17.19
VB-Coastal	12.35
VB-Country	12.20
VRT-03	12.63
VRT-04	12.16
VRT-06	12.00
VRT-10	12.00

79. Table 9–4 details our estimated LRMC values for our tariff components in the volume market.

Table 9–4: LRMC for each tariff class by tariff component

Tariff Class	Tariff Component		
	Fixed $/annum	Variable $/GJ chargeable demand	Variable $/GJ
VI-Coastal	43.56	-	13.03
VI-Country	93.71	-	13.11
VB-Coastal	6.21	-	12.08
VB-Country	6.21	-	11.93
VRT-03	15.12	11.97	-
VRT-04	5.81	11.90	-
VRT-06	5.81	11.75	-

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6   JGN, *JGN 2015-20 access arrangement information*, Appendix 13.1, 30 June 2014.

Tariff Class	Tariff Component		
	Fixed $/annum	Variable $/GJ chargeable demand	Variable $/GJ
VRT-10	5.81	11.75	-

(1) Note that the values are calculated per end customer. That is, for the boundary metered tariffs, $6.21 is the LRMC for supplying each end customer behind the meter and not the LRMC of each boundary metered customer.

Taking LRMC into account

80. Factors applicable to the consideration of LRMC for gas network pricing, and which explain why LRMC estimates are not equivalent to JGN's tariff levels, are:

- the NGR permit JGN to recover its building block cost of services, which includes a return on sunk costs (i.e. our RAB) and fixed opex and can therefore be expected to exceed LRMC—this point is acknowledged by rule 94(5)

- at an aggregate network level, JGN's capacity requirements are not driven so much by load peaks as by volume market expansion (i.e. new customers)

- customers told us they prefer variable volume-based charges as they see fixed charges as a barrier to gas connection

- LRMC estimates can be subjective and rely on assumptions and quality of input information

- ensuring natural gas, as a discretionary fuel, remains competitive—recovering some costs via usage rather than fixed charges empowers customers to be able to control their bills and increases the attractiveness for new customers to connect

- seeking stability in end-retail prices—LRMC estimates can be volatile when re-made over time. JGN has considered the relativities between the LRMC estimates between the tariff classes.

81. Gas networks are very different from electricity distribution businesses, which must also take account of LRMC when setting tariffs. Gas, and in particular in the JGN network, has lower penetration and utilisation than electricity and faces competition from other fuel sources. In addition, climate is a significant determinant of the customer mix and utilisation of the network. These factors affect the application of LRMC to signal the impact of incremental consumption because JGN seeks to increase the efficient utilisation of its network. While the rules provide that tariffs are to take into account LRMC, since the building blocks revenue is greater than LRMC, not every tariff class and tariff parameter can be set at LRMC.

82. JGN notes that, although volume customers are largely driving incremental demand, we do not experience capacity constraints to the extent that electricity networks do. For this reason, JGN is not subject to the same incentives to price throughput at LRMC. JGN also takes into account customer preferences for low usage-based charges to encourage energy efficiency.

83. Demand customers have large loads and are considered on an individual basis when they connect to JGN's network. Consistent with rule 79(2)(b), these considerations examine the incremental revenues from the customer relative to the incremental costs. Where the expected costs exceed the revenues, JGN charges a capital contribution to the connecting customer. The fact that these users pay a contribution for any capacity development costs not covered by JGN's existing charges means JGN's net LRMC can be expected to trend towards its prices for these customers.

84. Finally, marginal costs are essentially forward-looking since they reflect the expected change in costs that arise from changes in demand. Because they are forward looking, invariably the estimates are subjective, reliant on the assumptions made and quality of the input information. JGN has kept this in mind when taking into account its LRMC estimates.

9.3.3   TRANSACTION COSTS

85. JGN has considered transaction costs such as metering charges and administrative costs when determining its tariffs and tariff classes. This includes how to establish an appropriate balance of transaction costs that supports JGN's pricing objectives noted in section 9.1.

86. JGN considers its decision to retain a structure for charges based on customer size (volume versus demand) is economically efficient for a number of reasons. For example, it would be inefficient to charge individually metered volume customers consuming less than 10 TJ a year on capacity as that would require more sophisticated daily metering and data handling. Such metering costs are avoided by charging these customers on throughput using basic metering equipment.

87. Similarly, postage stamping[7] tariffs for coastal and country areas avoids transaction costs for VI and VB customers. 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. JGN considers the minor additional administrative burden to offer tariff classes for intermediaries is justifiable to ensure greater cost reflectivity for these volume tariffs and reflect the demand for these boundary metered tariffs.

88. In comparison to the VI and VB customers, JGN charges demand customers on capacity as they have the necessary metering equipment for daily reads. In addition, unlike VI and VB, demand and VRT customers are charged based on location. This is because:

• the size of the customers' usage and associated impact 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 as it does not have an exclusive franchise area.

89. JGN introduced the existing tariff classes for demand customers in 2010, reducing transaction costs for retailers and customers at that time. The proposed closure of the first response tariffs to new customers will further reduce transaction costs as JGN and retailers will not need to maintain those tariff classes for which there has been no first response uptake.

90. In addition, JGN's simplified reference services will also avoid transaction costs associated with having multiple fixed charge components for each tariff class. This will improve customer understanding of our charges and improve participation in energy markets, including reducing the administrative costs and complexity of retail comparator websites.

91. JGN considers that its tariffs and tariff classes for the 2015-20 AA period provide the correct balance between minimising transaction costs and ensuring that customers have incentives to respond to pricing signals.

9.3.4   RESPONSE TO PRICE SIGNALS

92. JGN considers that it has structured its tariffs and charging components to allow customers and end customers to respond to price signals. It is for this reason that JGN applies a declining block structure and minimises the fixed charge to empower customers to control their bills.

93. The use of a declining block structure means customers face reduced costs for additional gas usage. JGN considers that this is an appropriate price signal for customers where the marginal costs of supplying additional units is materially lower than the average costs, encouraging increased network utilisation.

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7   'Postage stamping' refers to the practice of applying the same price or set of prices within a specified location. Note that JGN still differentiates prices within the coastal or country areas depending on customer or end customer characteristics.

9.3.5   ANCILLARY CHARGES

94. JGN ancillary charges seek to recover the cost of user-initiated activities. The user-requested ancillary activities, which attract an ancillary charge, are set out in the JGN's reference tariff schedule (see schedule 2 or our revised AA). Ancillary charge levels are also included in the reference tariff schedule.

95. The ancillary charges are set to recover JGN's costs of providing the relevant activities to volume and demand customers and ensure other customers are not required to inefficiently cross-subsidise the costs of these user-initiated activities. They have been determined based on JGN's incremental costs and are consistent with benchmarks from other jurisdictions.

10. ANNUAL REFERENCE TARIFF VARIATION

10.1 HAULAGE REFERENCE SERVICES

96. For its haulage reference service, JGN maintains 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 for the 2015-20 AA period.

97. JGN implements this WAPC using the CPI-X price control formula and annual tariff variation mechanism. The specification is set out in the AA. The mechanism also includes an automatic adjustment factor to true-up forecast and actual costs for certain uncontrollable cost categories, and a cost pass through adjustment factor to allow tariffs to vary for pass through amounts approved in accordance with clause 3 of the AA.

98. A WAPC constrains the overall movement in reference tariffs within the AA period. It provides JGN incentives, consistent with the long-term interests of customers, to:

- increase volumes and network utilisation as it does not constrain the revenue that JGN might recover, supporting productive and allocative efficiency

- price at marginal cost to help ensure that customers susceptible to bypassing the network are retained, again supporting allocative efficiency.

99. The tariff basket approach is consistent with customers' long-term interests by always balancing to the weighted average price. A tariff basket approach allows JGN to respond to market changes and maintain efficient tariff structures consistent with rule 97(3)(a). Further, a WAPC means JGN, and not its customers, bears the risk where actual demand is different from the AER allowance. This places the risk with JGN as the party best placed to manage it. It also motivates JGN to:

- encourage growth, therefore increasing asset utilisation to the benefit of its customers

- price according to the incidence of its costs.

10.2 ANCILLARY CHARGES

100. JGN maintains its charges for user-requested ancillary activities in real terms over the 2015-20 AA period unless the underlying costs materially change. This seeks to promote price-stability for these activities.

11. TOTAL REVENUE AND KPIS

11.1 TOTAL REVENUE REQUIREMENT

101. JGN's total required revenues for each year of the AA period are set out in Table 11–1. The smoothed and unsmoothed revenues and X-factors are set out in Table 11–2. The set of X-factors provides JGN's price path. Table 11–3 provides the average annual price changes.

Table 11–1: JGN total revenue ($2015, $millions)

Building block	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Return on capital	215.95	222.34	227.86	232.17	234.13	1,132.45
Return of capital (depreciation)	65.25	75.71	86.49	94.48	79.38	401.30
Opex	160.96	162.99	163.18	167.60	167.14	821.87
Tax	17.20	18.50	20.79	22.93	19.66	99.08
Total revenue	**459.37**	**479.54**	**498.31**	**517.17**	**500.32**	**2,454.70**

(1) There are no increments or decrements for any year resulting from the operation of an incentive mechanism to encourage gains in efficiency

Table 11–2: Revenues and X-factors ($real, $millions)

	2015-16	2016-17	2017-18	2018-19	2019-20	NPV
Total building block revenue - unsmoothed	459.37	479.54	498.31	517.17	500.32	2,115.04
Total building block revenue – smoothed	564.81	518.42	473.74	433.60	441.54	2,115.04
X-factor[8]	6.50%	8.24%	8.24%	8.24%	(1.84%)	N/A

(1) Total price change (C) for any year equals (1 - A) x (1+ B) – 1

(2) Years are from July to June.

Table 11–3: Average annual price changes (per cent)

	2015-16	2016-17	2017-18	2018-19	2019-20	Cumulative % total
Real price change	(6.50%)	(8.24%)	(8.24%)	(8.24%)	1.84%	(29.38%)
Inflation forecast	2.55%	2.55%	2.55%	2.55%	2.55%	12.74%
Nominal price change	**(4.11%)**	**(5.90%)**	**(5.90%)**	**(5.90%)**	**4.43%**	**(17.39%)**

(1) Years are from July to June.

(2) Nominal price change is calculated as (1+ real price change) x (1 + inflation forecast)-1.

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[8]   Under the CPI-X form of control (represented by the formula (1-X)*(1+CPI)), a positive X-factor is a decrease in average prices.

11.2   KEY PERFORMANCE INDICATORS

102.   JGN retains the existing opex KPIs. Table 11–4 sets out JGN's opex KPIs, based on JGN's demand and opex forecasts.

Table 11–4: KPIs: Operating cost per metre and cost per customer site ($2015)

	2015-16	2016-17	2017-18	2018-19	2019-20
Operating cost per metre	6.09	6.09	6.03	6.13	6.05
Operating cost per customer site	125.32	123.68	120.99	121.70	119.13

12.   COMPLIANCE CHECKLIST

Table 12–1: Compliance checklist – revised AAI

Provision	Requirement	Reference
National Gas Rules		
72(1)(a)	The access arrangement information must include: (i) capital expenditure (by asset class) over the earlier access arrangement period; and (ii) operating expenditure (by category) over the earlier access arrangement period; and (iii) usage of the pipeline over the earlier access arrangement period showing: (A) for a distribution pipeline, minimum, maximum and average demand...; and (B) for a distribution pipeline, customer numbers in total and by tariff class...	(i) section 2.1 (ii) section 2.2 (iii) section 2.3
72(1)(b)	The access arrangement information must include how the capital base is arrived at and, if the access arrangement period commences at the end of an earlier access arrangement period, a demonstration of how the capital base increased or diminished over the previous access arrangement period.	Chapter 3
72(1)(c)	The access arrangement information must include the projected capital base over the access arrangement period, including: (i) a forecast of conforming capital expenditure for the period and the basis for the forecast; and (ii) a forecast of depreciation for the period including a demonstration of how the forecast is derived on the basis of the proposed depreciation method.	Section 3.3 and (i) section 3.6 (ii) section 3.4
72(1)(d)	The access arrangement information must include to the extent it is practicable to forecast pipeline capacity and utilisation of pipeline capacity over the access arrangement period, a forecast of pipeline capacity and utilisation of pipeline capacity over that period and the basis on which the forecast has been derived	Chapter 4
72(1)(e)	The access arrangement information must include a forecast of operating expenditure over the access arrangement period and the basis on which the forecast has been derived	Chapter 5
72(1)(f)	The access arrangement information must include the key performance indicators to be used by the service provider to support expenditure to be incurred over the access arrangement period	Section 11.2
72(1)(g)	The access arrangement information must include: the proposed return on equity the return on debt the allowed rate of return ...for each regulatory year of the access arrangement period, in accordance with rule 87, including any departure from the methodologies set out in the rate of return guidelines and the reasons for that departure.	Sections 6.1 and 6.2.
72(1)(ga)	The access arrangement information must include the proposed formula (if any) that is to be applied in accordance with rule 87(12).	Section 6.3
72(h)	The access arrangement information must include the estimated cost of corporate income tax calculated in accordance with rule 87A, including the proposed value of imputation credits referred to in that rule.	Chapter 7

72(1)(i)	The access arrangement information must include, if an incentive mechanism operated for the previous access arrangement period - the proposed carry-over of increments for efficiency gains or decrements for efficiency losses in the previous access arrangement period and a demonstration of how allowance is to be made for any such increments or decrements.	Section 8.1
72(1)(j)	The access arrangement information must include the proposed approach to the setting of tariffs including: (i) the suggested basis of reference tariffs, including the method used to allocate costs and a demonstration of the relationship between costs and tariffs; and (ii) a description of any pricing principles employed but not otherwise disclosed under this Rule.	(i) chapter 9 (ii) section 9.1
72(1)(k)	The access arrangement information must include the service provider's rationale for any proposed reference tariff variation mechanisms.	Chapter 10
72(1)(l)	The access arrangement information must include the service provider's rationale for any proposed incentive mechanism.	Section 8.2
72(1)(m)	The access arrangement information must include the total revenue to be derived from pipeline services for each regulatory year of the access arrangement period.	Section 11.1