



Review of application of New Capital Expenditure Criteria to the WA Gas Networks Gas Distribution Systems

**A REPORT PREPARED FOR THE ECONOMIC REGULATION
AUTHORITY**

March 2011

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1 Introduction

1.1 Scope of this report

Frontier Economics (Frontier) has prepared this Final Report for the Economic Regulation Authority (the Authority) in relation to proposed revisions to the WA Gas Networks Gas Distribution Systems (WAGN GDS) Access Arrangement submitted by the operators of the WAGN GDS, WA Gas Networks Pty Ltd (WAGN).

This Report provides Frontier's final views on WAGN's proposed Access Arrangement revision in respect of the application of Rule 79(2)(a), (b) and (d) of the National Gas Rules (Rules). This Rule applies to both:

- Actual capital expenditure on the WAGN GDS over the period of the previous access arrangement, from 1 January 2005 to 31 December 2009.
- Forecast capital expenditure on the WAGN GDS over the period of the new access arrangement, from 1 January 2010 to 30 June 2014.

1.2 Structure of this report

This report is structured as follows:

- Section 2 outlines the relevant requirements of the National Gas Rules.
- Section 3 describes the information provided by WAGN in relation to relevant investment before and after the Authority's Draft Decision.
- Section 4 provides our assessment of WAGN's submissions before and after the Authority's Draft Decision.
- Section 5 sets out our final conclusions.
- Detailed discussion of project-specific information provided by WAGN before the Authority's Draft Decision is discussed in the Appendix.

2 Requirements of the National Gas Rules

Rule 79(2) of the National Gas Rules sets out the criteria for ‘conforming capital expenditure’ under the Rules. Conforming capital expenditure can be added to a service provider’s capital base, allowing the service provider to earn a regulated return on that expenditure through tariffs to network users.

The grounds under which capital expenditure is justifiable under Rule 79(2) are as follows:

- (a) the overall economic value of the expenditure is positive; or
- (b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or
- (c) the capital expenditure is necessary:
 - (i) to maintain and improve the safety of services; or
 - (ii) to maintain the integrity of services; or
 - (iii) to comply with a regulatory obligation or requirement; or
 - (iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or
- (d) the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).

Further, Rule 79(3) provides that:

In deciding whether the overall economic value of capital expenditure is positive, consideration is to be given only to economic value directly accruing to the service provider, gas producers, users and end users.

Finally, Rule 79(4) provides that:

In determining the present value of expected incremental revenue:

- (a) a tariff will be assumed for incremental services based on (or extrapolated from) prevailing reference tariffs or an estimate of the reference tariffs that would have been set for comparable services if those services had been reference services; and
- (b) incremental revenue will be taken to be the gross revenue to be derived from the incremental services less incremental operating expenditure for the incremental services; and
- (c) a discount rate is to be used equal to the rate of return implicit in the reference tariff.

Frontier has not been asked to assess capital expenditure justified on the basis that it is necessary for the purposes set out in Rule 79(2)(c).

3 Information provided by WAGN GDS

3.1 Initial information (January 2010)

Frontier initially received the following information from WAGN (through the Authority) relevant to our assessment of capital expenditure under Rule 79(2):

- *Access Arrangement for the Mid-West and South-West Gas Distribution Systems, Final*, 29 January 2010 (plus Annexure C, Template Haulage Contract, Final, 29 January 2010) (Access Arrangement).
- *Access Arrangement Information for the WA Gas Networks Gas Distribution Systems, Final*, 29 January 2010 (Access Arrangement Information).
- *Proposed Revisions to the Access Arrangement for the WA Gas Networks Gas Distribution Systems, Submission, Confidential*, 29 January 2010 (plus Attachments 1-11) (WAGN GDS Submission).
- Confidential ERA Excel spreadsheet model.
- Public format Excel spreadsheet model.
- WAGN Covering Letter to the Authority dated 29 January 2010.
- WAGN Representation Letter to Deloitte Touche Tohmatsu dated 29 January 2010.
- WA Gas Networks Special Purpose Financial Report for the four year period ended 31 December 2008.

The WAGN GDS Submission contended that certain elements of both its actual¹ and forecast² capital expenditure satisfied the requirements for conforming capital expenditure under the ‘incremental net revenue test’ in Rule 79(2)(b).

3.2 Additional information (April 2010)

Following a request from Frontier for further information about how WAGN’s actual and forecast capital expenditures satisfied the criteria in Rule 79(2)(b), WAGN provided (again through the Authority) the following additional information:

- WAGN Letter to the Authority (Data Request 5 – Confidential Response) dated 25 April 2010.

¹ WAGN GDS Submission, p.76.

² WAGN GDS Submission, p.92.

- Marsden Jacob Associates, *Applying the new capital expenditure criteria to extensions and reinforcement of the WAGN GDS, a report prepared for WA Gas Networks*, April 2010 (Marsden Jacob report).
- Excel spreadsheet filename: WAGN Rule 79_2_b test (3) data request Frontier Economics (Original Rule 79(2)(b) spreadsheet).

3.3 Updated information (October 2010)

Following the publication of the Authority's Draft Decision, Frontier received the following information from WAGN through the Authority:

- WAGN Covering Letter to the Authority dated 8 October 2010.
- *Access Arrangement for the Mid-West and South-West Gas Distribution Systems, Final*, 8 October 2010 (Final Access Arrangement).
- *Amended Access Arrangement Information for the WA Gas Networks Gas Distribution Systems*, 8 October 2010 (Amended Access Arrangement Information).
- *Proposed Revisions to the Access Arrangement for the WA Gas Networks Gas Distribution Systems, Submission: Response to Draft Decision, Confidential*, 8 October 2010 (WAGN Response to the DD).
- WAGN Letter to the Authority entitled, "ESD Report – Request for Further Information" dated 25 September 2010 (Annexure 1 to the WAGN Response to the DD).
- SFG Consulting, *The required return on equity commensurate with current conditions in the market for funds, Report prepared for WA Gas Networks*, 1 September 2010 (Annexure 2 to the WAGN Response to the DD).
- *Commercial and regulatory risks involved in delivering reference services using the WAGN GDS, Confidential*, 1 October 2010 (Annexure 3 to the WAGN Response to the DD).
- Excel spreadsheet filename: Model to ERA 8 Oct 2010 FINAL.

3.4 Additional updated information (November 2010)

Following a request from Frontier for an updated version of the original Rule 79(2)(b) spreadsheet, WAGN provided the following through the Authority:

- WAGN Letter to the Authority entitled, "Information Request #3 – Relevant to Assessment of Forecast Conforming Capital Expenditure Under NGR 79(2)(b) dated 18 November 2010.
- Excel spreadsheet filename: WAGN_ERA FD Information Request #3 Rule 79_2_b test (Updated Rule 79(2)(b) spreadsheet).

4 Review of WAGN material

4.1 Initial WAGN information and data

Sections 4 and 5 of the WAGN GDS Access Arrangement Information provide data for conforming capital expenditure for the previous and current access arrangement periods, respectively. More detailed project-specific information is contained in section 4 of the WAGN GDS Submission. Data for actual and forecast capital expenditure is also set out in the public and confidential Excel spreadsheets provided to the Authority.

4.2 Additional WAGN information and reports

After reviewing WAGN's initial information and data, Frontier raised several questions with the Authority related to the information and statements contained in the WAGN GDS Submission. In particular, Frontier sought substantiation of the net incremental revenue figures in the Submission to support WAGN's claims that both actual³ and forecast⁴ demand and user-initiated capital expenditures satisfied the net incremental revenue test in Rule 79(2)(b).

In response, WAGN acknowledged⁵ the lack of substantiation and provided the additional information set out in section 3.2 above. In particular, the Marsden Jacob report sought to show that:

- \$152 million of actual capital expenditure, which includes 25% of actual expenditures on the Mandurah lateral and associated Dampier to Bunbury Natural Gas Pipeline gate station⁶
- \$149.4 million of forecast capital expenditure, which includes 25% of forecast expenditures on the Mandurah lateral and associated Dampier to Bunbury Natural Gas Pipeline gate station⁷

is justifiable with reference to the criterion in Rule 79(2)(b).⁸

³ Section 4.5.1, p.76.

⁴ Section 4.5.2, p.92. Also see section 4.8, pp.95-96.

⁵ WAGN Letter to the Authority (Data Request 5 – Confidential Response) 25 April 2010, p.1.

⁶ Marsden Jacob report, Table 3, p.12.

⁷ Marsden Jacob report, Table 4, p.13.

⁸ Marsden Jacob report, section 4, pp.14-17.

4.3 Analysis of original WAGN submission and additional information

In our draft report for the Authority, Frontier analysed the original material provided by WAGN up to the end of April 2010. This section reproduces that analysis.

The most relevant components of this original information to the assessment of WAGN's actual and forecast capital expenditure are from the WAGN GDS Submission, the Marsden Jacob report and the original Rule 79(2)(b) spreadsheet. These documents raise a number of issues, as discussed below. Detailed discussion of project-specific information is contained in the Appendix.

Appropriate threshold for individual project justification

Tables 27-29 and 31-33 of the WAGN GDS Submission contain detailed project-by-project information on actual and forecast capital expenditure, respectively. The information contained in the Tables includes:

- The nature of each project (eg pipeline extension, corrosion protection, replacement of particular assets).
- The type of assets commissioned from the expenditure (eg high pressure mains, medium/low pressure mains, IT).
- The rationale or driver for the expenditure – the options being demand-driven, asset replacement, performance enhancement and customer initiated.
- Quantum of expenditure (in \$ millions) by year(s) of expenditure (calendar years for 2005-2009 and financial years for 2010-2014).
- Regulatory justification for the expenditure under Rule 79(2) (ie whether the expenditure is justified under Rule 79(2)(a), (b) and/or (c)).

We note that the tables do not demonstrate how each individual investment satisfies the relevant conforming capital expenditure criteria under Rule 79(2) and no evidence of each project's satisfaction of the criteria is contained in the remainder of the WAGN GDS Submission. In addition, neither the Marsden Jacob report nor the original Rule 79(2)(b) spreadsheet show how each project described in the relevant tables of the WAGN GDS Submission satisfies the Rule 79(2)(b) criterion. However, these documents do show how the sum of the relevant actual and forecast project capital expenditures justified under Rule 79(2)(b) satisfy the net incremental revenue test.

In our view, it would be open to the Authority to require WAGN to demonstrate how each individual project expenditure in the relevant Submission tables met the incremental revenue test and was therefore justified under Rule 79(2)(b). Alternatively, the Authority could adopt a threshold below which project expenditures could be bundled but above which they would need to be

individually justified. Based on the types of project expenditures set out in the tables, we suggest that a reasonable threshold may be \$2 million across an access arrangement period. The Authority may alternatively elect to consider whether the project expenditure in aggregate satisfies Rule 79(2)(b).

Appropriate timeframe for assessment

Putting the issue of the appropriate expenditure threshold for individual justification to one side, the Marsden Jacob report seeks to show that both actual and forecast capital expenditure justified under Rule 79(2)(b) meets the net incremental revenue test. The assumptions applied in the Marsden Jacob report seem to be broadly appropriate (or even conservative) given the requirements of the Rules and the constraints of the analysis. For example, the report:

- Includes 25% of the Mandurah costs in the pool of expenditure justified under Rule 79(2)(b) in accordance with the WAGN Letter to the Authority of 25 April 2010.
- Calculates expected incremental revenues based on reference tariffs that fall by 2% pa due to depreciation of the GDS assets developed by the end of the current access arrangement period.
- Calculates the present value of expected incremental revenues and costs based on a discount rate of 6.78% (pre-tax real) in line with WAGN GDS's WACC as required under Rule 79(4)(c).

According to the Marsden Jacob report and the original Rule 79(2)(b) spreadsheet, the test is satisfied (ie incremental revenue exceeds incremental costs):

- For actual 2005-2009 expenditures: From 2016, being 11 years after the first actual expenditures were made in this period.
- For forecast 2010-2013/14 expenditures: From 2030, being 20 years after the first forecast expenditures are made in this period.

We note that the while there is an 11 year period for the net incremental revenues from actual expenditures over 2005-2009 to exceed net incremental costs, the period for net incremental revenues from forecast expenditures to exceed net incremental costs is 20 years. Whether this period is excessive is a matter for the Authority. In this regard, the Authority may have regard to the life of the assets involved.

4.4 Analysis of updated WAGN information

Following the publication of the Authority's Draft Decision, WAGN provided the Authority with the updated and additional information described in sections 3.3 and 3.4 above.

The WAGN letter to the Authority of 18 November 2010 explains that the updated Rule 79(2)(b) spreadsheet reflects more up to date data on new customer connections – and hence more up to date information on incremental revenues – than the original Rule 79(b)(2) spreadsheet.

As a result, the updated Rule 79(2)(b) spreadsheet shows that the net incremental revenue test is satisfied (ie incremental revenue exceeds incremental costs):

- For actual 2005-2009 expenditures: From 2017, being 12 years after the first actual expenditures were made in this period (compared to 2016 in the original Rule 79(2)(b) spreadsheet).
- For forecast 2010-2013/14 expenditures: From 2026, being 16 years after the first forecast expenditures are made in this period.

In light of other elements of the updated information from WAGN, we had some concerns over the integrity of these results. Specifically, our concerns arose from the data for gas volumes per customer in both the original and updated Rule 79(2)(b) spreadsheet. Forecast gas volumes per customer in both the spreadsheets are effectively calculated as an average of per customer volumes for the relevant tariff class over 2005-2009. Therefore, per customer gas volumes until the end of the analysis period (2040) are assumed to be the same as they were over 2005-2009.

However, the WAGN Response to the DD highlights that gas volumes per customer for most tariff classes (A2, B1, B2 and B3) are in sustained decline. This implies that forecast incremental revenue in both the original and updated Rule 79(2)(b) spreadsheets have been overstated. We sought to derive an estimate of the extent of overstatement by comparing the implied per customer volumes for the 2005-2009 period in the updated Rule 79(2)(b) spreadsheet for tariff class B customers (only) against the volume forecasts for 2010/11 – 2013/14 put forward by WAGN in its Response to the DD. This revealed an approximate overstatement in the updated Rule 79(2)(b) spreadsheet of:

- 13% for tariff class B1 customers
- 12% for tariff class B2 customers and
- 8% for tariff class B3 customers.

To adjust for this overstatement of per customer volumes, we adjusted the per customer volumes for all tariff class B customers in the updated Rule 79(2)(b) spreadsheet downwards by 10%. The effect of this adjustment was to postpone by four years the date at which forecast capital expenditure satisfies the net incremental revenue test, from 2026 to 2030 (which is also the date the test was passed in the original spreadsheet). The adjustment also halved the surplus of the present value of the net incremental revenue over the present value of the capital costs. Nevertheless, the forecast capital expenditure continued to satisfy the test within the timescale of the analysis.

In addition, in our analysis of the original WAGN information, we made several other comments in relation to the application of Rule 79(2)(b) to WAGN's actual and forecast capital expenditures. These comments concerned the appropriate threshold for individual project justification and the appropriate timeframe for assessment. The updated information provided by WAGN in response to the Authority's Draft Decision does not cause us to alter those comments.

5 Conclusion

This Report provides Frontier's final views on WAGN's proposed Access Arrangement revision in respect of the application of Rule 79(2)(a), (b) and (d) of the National Gas Rules. We have reviewed all the original and updated information provided by WAGN in coming to our views.

We found that WAGN's actual and forecast capital expenditure meets the requirements of the net incremental revenue test in the Rules assuming that:

- The test applies to aggregate actual expenditure and aggregate forecast expenditure rather than on a project-by-project basis
- The test can be satisfied over a 20 year-plus timeframe.

In our view, it is open to the Authority to:

- Require WAGN to demonstrate how each of its individual project expenditures meets the net incremental revenue test or set a threshold above which they would need to be individually justified (say, \$2 million across an access arrangement period).
- Require WAGN's forecast capital expenditure to meet the net incremental revenue test over a shorter timeframe than 20-plus years, taking account of the life of the assets involved.

Appendix A – Detailed comments on individual project expenditures

As noted in the body of the report, tables 27-29 and 31-33 of the WAGN GDS Submission set out project-by-project information on actual and forecast capital expenditures over the 2005 to 2009 and 2010 to 2013/14 access arrangement periods, respectively.

However, the stated justification for each project in the tables sometimes appears to contain some anomalous classifications.

There are some cases where it is not clear how certain expenditures facilitate new connections, even though these projects have been justified on the basis of Rule 79(2)(b). There are other cases where projects have been justified on the basis of Rule 79(2)(c) even though it appears they should be justified on the basis of Rule 79(2)(b).

Where it appears that the projects should be assessed under Rule 79(2)(c) we suggest that the assessment be undertaken accordingly. The individual project actual and forecast expenditures falling in this category are set out in Table 1 to Table 3 below.

Actual project expenditures (Table 27)

Table 1: Actual project expenditures justified under Rule 79(2)(b) but appear to belong under Rule 79(2)(c)

No	Project	Submission page no	Additional comments
1	Upgrade corrosion protection on high pressure pipeline (Pipeline 9)	61	Expenditure appears necessary for maintenance of existing services and hence belongs under Rule 79(2)(c) justification Many other corrosion protection expenditures are justified under Rule 79(2)(c)
2	Corrosion protection upgrade: investigate interference issues and restore corrosion protection system on High Pressure Pipeline 63/64 (O'Connor)	61	As above
3	Direct current voltage gradient surveys of steel pipelines	61	-
4	Upgrade corrosion protection system remediation on Pipeline 76	62	Expenditure appears necessary for maintenance of existing services and hence belongs under Rule 79(2)(c) justification Many other corrosion protection expenditures are justified under Rule 79(2)(c)
5	Upgrade corrosion protection: replacement of impressed current transformer units of inadequate capacity	63	As above
6	Modifications to (steel) Pipeline 4, Mounts Bay Road and Kings Park	63	-

7	Transformer/rectifier unit for cathodic protection on steel pipeline (Pipeline 5) East Perth	63	-
8	Installation of pressure monitoring devices: installation of additional pressure monitoring devices within expanding network to provide the data for system modelling which identifies over-pressure (safety) and under-pressure (capacity maintenance) problems	63	Expenditure appears necessary for safety and service integrity and hence belong under Rule 79(2)(c) justification
9	Improvements in the earthing of steel pipelines identified in annual corrosion protection system reviews to reduce induced AC voltages to acceptable levels	63	As above
10	Modifications to high pressure pipeline: Wambro Sound Roundabout	63	Other pipeline modifications projects are justified under Rule 79(2)(c)
11	Main relocation: Southern River	65	Many other relocation projects are justified under Rule 79(2)(c)
12	Installation of isolation valves, Lambeth Circuit, Wellard	66	-
13	Collie River: replacement Collie River crossing with PE DN16 pipeline	66	Similar project on p69 is justified under Rule 79(2)(c)
14	Relocation of 120mm x 80mm PVC main to allow work by City of Gosnells	67	Expenditure appears better suited to Rule 79(2)(c) justification Many other relocation projects are justified under Rule 79(2)(c)
15	Main relocation: Foreshore Drive, Geraldton	67	Many other relocation projects are justified under Rule 79(2)(c)

5BAppendix A – Detailed comments on individual project expenditures

16	Modifications to corrosion protection system, Flynn Drive Neerabup, affected by induced currents from new Western Power lines	67	Expenditure appears necessary for maintenance of existing services and hence belongs under Rule 79(2)(c) justification Many other corrosion protection expenditures are justified under Rule 79(2)(c)
17	Corrosion protection upgrade to maintain the integrity of steel pipelines in medium pressure parts of the network	70	As above
18	Service pipes: Rome Road, Melville	70	-
19	Overlength services	70	-
20	(Steel) Pipeline 84 condition assessment and upgrading of cathodic protection	70	-
21	Upgrade regulator pit OS73	70	-

Forecast project expenditures (Tables 31 and 32)

Table 2: Forecast project expenditures justified under Rule 79(2)(b) but appear to belong under Rule 79(2)(c)

No	Project	Submission page no	Additional comments
1	Pinjarra extension: extend 7.2km x 150mm Class150 pipeline from Pinjarra Gate Station to regulator set HS017 to allow operating pressure to be increased from 600 kPa to 900 kPa ensuring continuity of supply during winter conditions	80	Expenditure appears necessary for maintenance of existing services and hence belongs under Rule 79(2)(c) justification
2	Canningvale main extension: extension of 135m x 110PE along Amherst Road across Warton Road to Holmes Street: short main extension required to compensate for pressure drop identified in system modelling studies	80	As above
3	Beresford Main Extension: extend 300m x 110PE along Chapman Rd and 1660m x 160PE SDR17.6 PE80B along North West Coastal Hwy to connect to 160PE on Flores Rd short main extension required to compensate for pressure drop identified in system modelling studies	81	As above
4	High pressure regulator set capacity upgrades: upgrading of high pressure regulator sets at network locations at which system modelling has identified a significant pressure reduction and a requirement for additional capacity	83	As above
5	Medium pressure regulator set capacity upgrades: upgrading of high pressure regulator sets at network locations at which system modelling has identified a significant pressure reduction and a requirement for additional capacity	83	As above

6	SN2 New Service Appl.Inst.Estd.Dom	88	Expenditure appears for necessary established customers and hence belongs under Rule 79(2)(c) justification
7	SN5 New Service Appl.Inst.Estd.Com	88	As above
8	SNH New Service Cluster.Estd.unit		As above
9	SND Gas Mains Relay	88	-
10	SNR Re-lay Service	88	-
11	SPS Upgrade Meter – Com/Ind (AG)	88	-
12	SPU Upgrade Meter – Dom (AG)	88	-
13	SN7 Commission Meter Appl.Inst. Meter Only	88	-
14	Upgrade Meter – Com/Ind (Retail)	88	-

Projects justified under Rule 79(2)(c) but not clear why they are not justified under Rule 79(2)(b)

Actual project expenditures (Table 27)

Table 3: Actual project expenditures justified under Rule 79(2)(c) but not clear why they are not justified under Rule 79(2)(b)

No	Project	Submission page no	Additional comments
1	Relocation of pressure regulating station PRS011 to facilitate Eastern Perth development	68	Expenditure appears necessary for facilitating new connections and hence belongs under Rule 79(2)(b) justification
2	Medium pressure regulator set upgrades: upgrading of existing medium pressure regulator sets to accommodate increase in number of connections	72	As above

We note that the value of these two projects is less than the value of the projects in Table 1. This means that the inclusion of these projects in the assessment under Rule 79(2)(b) instead of the projects in Table 1 does not prevent actual aggregate capital expenditure from satisfying the net incremental revenue test.

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