Australian Energy Regulator

Review of Expenditure of ACT & NSW Gas Distributors

Jemena Gas Networks (NSW) Ltd

December 2009

Wilson Cook & Co
Engineering and Management Consultants
Advisers and Valuers

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Reply to: Auckland Office
Our ref: 0901 J
Email: info@wilsoncook.co.nz

3 February 2010

Mr Mike Buckley
General Manager, Network Regulation North Branch
The Australian Energy Regulator
Marcus Clarke Street
CANBERRA ACT 2601

Dear Mr Buckley

RE: REVIEW OF EXPENDITURE OF ACT & NSW GAS DNSPs: JEMENA GAS NETWORKS (NSW) LTD

In response to your instructions, we have reviewed the gas access arrangement proposal submitted by Jemena Gas Networks (NSW) Ltd to the AER in August 2009 in relation to capital and operating expenditure in the present access arrangement period, FY 2006 to FY 2010, and in the next period, FY 2011 to FY 2015, and have pleasure in submitting our report.

The main conclusions to come out of the review are as follows.

(a) We have recommended that the base-year level of operating expenditure be set at a reduced level and that adjustments be made to reduce the requested level of technical step changes.
(b) We conclude in relation to Jemena's actual and forecast capital expenditure in the present period that its efficiency is not adequately demonstrated by Jemena and thus we are able to recommend only that the incurred level of expenditure be accepted as reasonable in terms of scope. Various adjustments are proposed.
(c) Likewise, we conclude in relation to Jemena's forecast capital expenditure in the next period that its prospective efficiency is not adequately demonstrated by Jemena and thus we are able to recommend only that the forecast level of expenditure be accepted as reasonable in terms of scope, subject to various adjustments that we propose.
(d) We consider that a reasonable level of unaccounted-for gas to allow in the decision would be 2.34% of gas receipts.

Particular Considerations

A common theme in the majority of the expenditure categories reviewed was the lack of information available on which to verify the scope, necessity, timing and optimality of the expenditure incurred or forecast. This was combined with related party transactions that made it impossible, in the absence a reconciliation of the costs incurred by Jemena and the various related parties, to identify or confirm as reasonable the direct and indirect cost allocations or "margins" that have been incorporated in the expenditure.

At best, we have been able to conclude (sometimes by giving Jemena the reasonable benefit of doubt) that the work undertaken was reasonable in scope or appeared so.

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However, in no case have we been able to attest to the cost efficiency of the expenditure because of the lack of information on the details, volumes and costs of completed work.

Wherever possible, we have indicated the type of additional information that we believe would be required to address these issues.

Conclusion

In conclusion, we acknowledge with thanks the assistance of Jemena's staff and of the AER in carrying out this work.

Yours faithfully,

Wilson Cook & Co Limited

Encl.

Review of Expenditure of ACT & NSW Gas Distributors

Jemena Gas Networks (NSW) Ltd

Prepared for the Australian Energy Regulator

By Wilson Cook & Co Limited

Enquiries to Mr J W Wilson

Our reference 0901 J

December 2009

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Disclosure

Wilson Cook & Co Limited has prepared this report in accordance with the instructions of its client on the basis that all data and information that may affect its conclusions have been made available to us. No responsibility is accepted if full disclosure has not been made. We do not accept responsibility for any consequential error or defect in our conclusions resulting from any error, omission or inaccuracy in the data or information supplied.

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1 Introduction

1.1 Appointment

In June 2009, the Australian Energy Regulator (AER) appointed Wilson Cook & Co Ltd, Engineering and Management Consultants, Advisers and Valuers, of Auckland to assist it with a review of certain matters in the gas access arrangement proposals submitted by the ACT and NSW gas distributors [1] to the AER in the period June to August 2009 in relation to capital and operating expenditure in the present access arrangement period (FY 2006 to FY 2010) and in the next period (FY 2011 to FY 2015). The terms of reference for the work are set out below.

This report deals with Jemena Gas Networks (NSW) Ltd (Jemena). [2]

1.2 Scope of Review

The scope of the review in relation to Jemena was as follows.

(a) Review the capital expenditure in the present period taking into account the deferral, addition or change in scope of projects and indicate the grounds on which the expenditure is considered justified. [3]

(b) Review the capital expenditure forecast for the next period and indicate the grounds on which the expenditure is considered justified.

(c) Review the controllable operating expenditure [4] forecast for the next period, including projects or programmes undertaken by Jemena Asset Management (JAM) for or on behalf of Jemena. In particular, consider whether: (a) the proposed programmes or projects are required; (b) whether the extent or scope of each programme or project is appropriate; (c) whether the unit rates and costs applied are appropriate and reasonable; (d) whether due consideration has been given to potential efficiency improvements; and (e) whether there is any overlap of the operating expenditure programme with the proposed capital expenditure programme. In relation to item (e), attention was drawn to the step changes proposed in appendix 6.3 of the Access Arrangement Information (AAI).

(d) Review the proposed level of unaccounted-for gas (UAG) in the network for reasonableness.

This scope of work was to be undertaken, as far as applicable, within the context of the original, general terms of reference for the review, which included the following requirements.

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1 ActewAGL Distribution, Country Energy Gas and Jemena Gas Networks (NSW) Ltd.

2 Throughout the report, references to the AER are generally to the management unless the sense requires reference to the Board itself; references to periods are to regulatory (access arrangement) periods unless the context requires otherwise; references to Jemena or to 'the business' are to Jemena Gas Networks (NSW) Ltd or to its related parties where the sense requires; and references to 'the network' are to Jemena's network. Where needed to avoid confusion with other businesses in the Jemena Group, Jemena Gas Networks (NSW) Ltd is referred to more precisely as JGN.

3 The regulatory decision for Jemena covering the present period was delivered by the Independent Pricing and Regulatory Tribunal (IPART).

4 Excludes consideration of carbon costs, site remediation expenditure, debt-raising costs, self-insurance costs, marketing costs.

Capital Expenditure

Capital expenditure in the present period was to be assessed under rule 79 of the Rules and where appropriate the criteria in sections 8.16 and 8.17 of the *Gas Code* [5] and capital expenditure in the next period is to be assessed in accordance with rule 79 of the Rules. [6]

We were to consider whether the past and future levels of capital expenditure were reasonable and represented the best levels or forecasts, given the operating context of the business and having regard to the capital expenditure criteria in the Rules.

In that context, in relation to capital expenditure, we were to assess past capital expenditure in relation to accepted good industry practice to achieve the lowest sustainable cost of providing the services and in relation to the relevant conditions in which the business operates; and we were to assess forecast capital expenditure in relation to the capital expenditure that would be incurred by a prudent service provider acting efficiently in accordance with accepted good industry practice to achieve the lowest sustainable cost of providing services and in relation to the arguments advanced by the business in support of it.

We were to distinguish between capital expenditure for replacement on the one hand and capital expenditure for augmentation or expansion on the other. In distinguishing the drivers of capital expenditure, we were to have regard to the appropriateness of the capital expenditure for augmentation in terms of forecast demand and the appropriateness of capital expenditure for replacement in terms of the general condition and age of the network.

In summary, we were to advise on the value and/or nature of capital expenditure that should be included or should not be included in the present and next periods.

Operating Expenditure

We were to assess the business's proposal in relation to forecast operating expenditure with reference to operating expenditure that would be incurred by a prudent service provider acting efficiently in accordance with accepted good industry practice to achieve the lowest sustainable cost of providing services.

In circumstances where operating expenditure in the present period was used as the basis for determining the proposed level of operating expenditure in the next period, we were to assess the reasonableness of the base year's level of operating expenditure for this purpose and the reasonableness of the escalation factors applied to it to calculate the future levels of operating expenditure.

In summary, we were to advise on the value and/or nature of operating expenditure that should be or should not be included in the present and next periods.

Definitions

We were to outline the definitions of 'prudence', 'efficiency' and 'lowest sustainable cost' assumed in our assessment.

Expenditure Proposals Considered Unsuitable

If we considered that the proposed expenditure did not meet the relevant criteria of the *Gas Code* or the Rules, whichever was applicable, we were to provide an alternative estimate for

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5 '*National third party access code for natural gas pipeline systems*', including amending agreements.

6 A précis of the requirements of the Rules in relation to capital expenditure was set out in the background information provided to us by the AER. Both the *Gas Code* and the Rules consider the compliance of expenditure in terms of whether it is needed for maintenance of the safety, integrity or capacity of the services or words to that effect. However, they also list other grounds on which expenditure could be considered compliant – e.g. in relation to revenue exceeding cost or suchlike.

the expenditure or propose an alternative that would ensure the continued quality, safety, reliability and security of supply.

Other Matters

We were to liaise with the business during the course of our review including, if necessary, requesting through the AER any additional information and documentation needed and meeting with the business as required.

We were to present our draft report to the AER by the end of October 2009 (later extended to December) and we consulted the AER before the work began to clarify what was practical to achieve in the limited time available for the review. The scope of this report reflects the conclusions so reached and outlined at the beginning of this section of the report.

1.3 Relevant Material and Consultation

For the purpose of the review, we received and considered the business's proposal and its supporting documents, particularly the AAI, including supporting appendices and documents such as internal policies and procedures, technical reports and data and the report of the relevant jurisdictional regulator for the present period. We sought and received clarifications and additional information from the business in written responses and at our meeting with its staff in Sydney on 16 October 2009 and in subsequent correspondence. [7]

We acknowledge with thanks the cooperation of the business's staff in this regard.

1.4 Matters Not Reported On

The review was limited to the context of our instructions – specifically, the particular scope of work set out at the commencement of section 1 above.

The following matters were excluded from consideration in our work or were not undertaken:

- review of forecast demand, as that was not within our terms of reference;
- review of the business's policies for the capitalisation of expenditure;
- review or re-calculation of detailed network analyses;
- review of the cost-of-materials or cost-of-labour escalators applied by the business;
- review of expenditure other than that associated with the business's network business unit;
- review of capital contributions; [8]
- physical inspection of the assets;
- recalculation of expenditure if we had reason to consider the projections inappropriate, other than in respect of proposing adjustments for the AER's consideration;
- consideration of the possible effects of the following factors that can only be conjectured:
  - requirements for capex related to future safety issues, new statutory requirements, new Government policies or initiatives, or environmental requirements except to the extent that they have been identified by the business;

[7] The business's proposal and supporting documents were received by us on 27 August, 2009 and responses to our requests for additional information, sent through the AER, were still being received at the time of concluding this report (18 December, 2009).

[8] Our assessments relate to gross capital expenditure, not net.

  - possible adjustments in capex stemming from the application of demand management policies other than those already reflected in the business's estimates;
  - any changes from current network planning or design practice;
- review of financial models;
- any matters outside our field of expertise; and
- any other matters identified elsewhere in the report as having been excluded from our work.

We did not attempt to verify the accuracy of the data provided to us, or of the statements and representations made by the business. Nor did we carry out an audit of the business's accounts, asset register, data, expenditure, processes or any item or activity or take any action that might be considered to have constituted an audit. We relied solely on the submissions received from the business and the representations made in response to our enquiries.

1.5 Independence and Probity

Wilson Cook & Co Limited and its reviewers are all independent of Jemena and the AER, other than in the context of providing the AER with professional advice on expenditure matters from time to time.

Whilst the AER's staff provided guidance in respect of our terms of reference and assisted us with our work and whilst we considered their advice and requests, we are satisfied that none influenced our report or its conclusions inappropriately.

2 Definitions and Network

2.1 Definitions

Prudence and Efficiency

The terms of reference do not define prudence or efficiency for the purpose of the review. Therefore, without attempting to interpret the Rules (and except in the case of our assessment of prudence of the business's capex in the current period – see below), we adopted the following approach.

We first noted that the objective of the review was in essence to assess the business's expenditure proposals and to report to the AER on whether in our opinion the forecast expenditure reasonably reflected the efficient costs of a prudent distribution network service provider (DNSP) working in the circumstances of the business concerned.

We noted that to ensure adequacy or effectiveness, a prudent operator might undertake more work than otherwise considered necessary but to ensure efficiency it might undertake less and thus a balance between the two is required.

We noted that *prudence* has connotations of exercising sound judgement especially concerning one's own interests, being careful to avoid undesired consequences, being cautious or circumspect in one's conduct, managing carefully and with economy. Prudence is often best judged by the absence of evidence suggesting a lack of it. In the case of gas networks, imprudence might be most discernible if there was evidence of failure to invest adequately, accompanied by identified adverse consequences, and is thus best assessed retrospectively.

Where we considered that there was an appropriate balance between these factors, prudence and efficiency, we have said in the text that we consider the expenditure "reasonable".

Where we identified instances of imprudent expenditure, an imprudent failure to make expenditure or of what appeared to be inadequate provision for future expenditure, we have described them.

We considered *efficiency* in terms of the nature or timing of expenditure and looked for evidence that as far as practicable the expenditure reflected optimal planning and design and competitive costs taking account of local factors, 'good gas industry practice' and the defined security of supply and service standards of the business concerned.

Good Gas Industry Practice

We interpreted *good gas industry practice* to be the exercise of that degree of skill, diligence, prudence and foresight reasonably to be expected of a distribution business working under the prevailing conditions consistent with applicable regulatory, service, safety and environmental objectives.

Lowest Sustainable Cost

Both the Code and the Rules refer at various places to the "lowest sustainable cost" of providing pipeline services or words to that effect but neither defines these terms. For the purpose of our report, we have interpreted "lowest cost" to mean the cost to the business (and thence to the customer) of implementing the least-cost option of delivering the required

services, constructing the facilities necessary to deliver the services, carrying out operational or maintenance activities necessary to deliver the services, maintaining the required level of safety, integrity or capacity of the services or, in short, meeting the applicable statutory and regulatory obligations and requirements as the case may be.

We note in that context that the regulatory requirements encapsulate performance measures such as customer service measures, which in turn are one of the requirements to be met. Their incorporation avoids the need for us to go into those matters in our technical review.

After determining the scope of a project or expenditure programme on the basis of demand and other factors, and having identified, quantified, and valued the costs and benefits of the project alternatives, the next step in project assessment is to identify the least-cost or most cost-effective alternative to achieve the purpose of the project. A comparative analysis of the scale, location, technology and timing of alternative project options or designs is often required. Such an analysis will take into account the costs to the business (and thus indirectly the costs to its customers) in testing for least-cost or productive efficiency. Alternatively, if the effect or outcome of a project can be quantified but not valued, the average incremental cost can be estimated with the aim of establishing the project alternative with the lowest per-unit cost. [9]

The costs and benefits considered should be "life-cycle" costs – *viz.* the costs and benefits over the expected life of the project or programme concerned. This ensures that a long-term view is taken of investment requirements.

In this way, the "sustainability" of delivery of the pipeline services (which we interpret to mean sustainable at the required level over time) is inherent in the concept of the least-cost option in that a long-term view is taken when identifying the project requirements (in terms of service capability, capacity or the like), the costs and the benefits of the options available to meet the identified need and the resulting solution.

As can be seen from the preceding text, the concept of least-cost options inherently incorporates the selection of modern designs and technologies and such other features as are in accordance with good industry practice.

2.2 Network

The network originated in or around 1837 on the formation of the Australian Gas Light Company to light the streets of Sydney. It has grown through a combination of extension and acquisition and now serves around 1,053,000 customers in Sydney, Newcastle, the Central Coast, Wollongong and around 20 country centres, including those in the Central Tablelands, Central West, Southern Tablelands and Riverina districts. [10] It transports around 66 PJ of gas p.a. to 414 large customers who each consume more than 10 TJ p.a. and 35 PJ of gas p.a. to the remaining customers, as summarised in Table 2.1.

Table 2.1: Customers and Load by Region in FY 2009

Region	Customers ≥ 10 TJ p.a.		Customers < 10 TJ p.a.	
	Number	Load (TJ)	Number	Load (TJ)
Sydney	294	36, 597	823,061	27,275
Newcastle	60	18,884	89,480	2,378

[9] The use of edited text based on World Bank guidelines is acknowledged.

[10] A map showing the coverage of the network is given on p. 11 of the AAI.

Wollongong	13	5,976	55,479	1,377
Country	47	4,161	84,590	3,957
Total	414	65,618	1,052,610	34,987

Source: AAI, p. 13, table 2.1.

Residential gas usage is principally for home heating, water heating and cooking.

Key network statistics are as follows:

- 267 km of trunk mains, 143 km of primary mains and 1,428 km of secondary mains, all operating at high pressure;
- 22,596 km of medium- and low-pressure mains, of which 90% operate at medium pressure;
- 36 network receipt points,[11] 27 "trunk" receiving stations, 14 primary regulating stations and 575 district regulator sets.

In terms of the type of material used, 3,616 km of pipe are of steel construction, 20,315 km are plastic and 349 km are cast iron, the latter operating only at low pressure.

Although the origins of the network go back to the 19th century, the network has largely been rehabilitated, as is evident in the low level of UAG being experienced – see section 7 in this report.

[11] The network that serves Sydney, Newcastle and Wollongong has four receipt points for gas: Wilton (from the Moomba-Sydney pipeline), Horsley Park and Port Kembla (from the Eastern Gas Pipeline) and Campbelltown (from the Sydney Gas Company's production facility at Rosalind Park.

3 Operating Expenditure in Present Period

3.1 Review

We were not required to make an assessment of Jemena's operating expenditure in the present period other than to consider the reasonableness of the level of expenditure in the "base year", *viz.* FY 2009, the year proposed by Jemena as the basis for determining the level of operating expenditure in the next period, which matter we discuss in section 4 of this report.

However, we considered it necessary to review the operating expenditure in the present period briefly to ensure that we were familiar with the business's operations in the present period when considering its expenditure projections for the next. The expenditure is summarised in Table 3.1.

Table 3.1: Operating Expenditure in Present Period ($2010 m)

		FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	**Total**
Operating & Maintenance	Allowed	79.8	80.9	81.5	82.1	82.7	**407.0**
	Incurred	85.9	87.2	85.4	77.9	79.4	**415.8**
	Variance	6.1	6.3	3.9	(4.2)	(3.3)	**8.8**
Administration & Overheads	Allowed	21.2	21.5	21.7	21.9	22.1	**108.4**
	Incurred	18.4	20.3	20.8	24.0	24.5	**108.0**
	Variance	(2.8)	(1.2)	(.9)	2.1	2.4	**(.4)**
Marketing	Allowed	19.2	19.5	19.6	19.8	20.0	**98.1**
	Incurred	4.3	2.8	4.6	6.5	7.5	**25.7**
	Variance	(14.9)	(16.7)	(15.0)	(13.3)	(12.5)	**(72.4)**
Government levies	Allowed	3.7	3.7	3.7	3.7	3.7	**18.5**
	Incurred	3.8	4.3	4.0	3.1	3.1	**18.3**
	Variance	.1	.6	.3	(.6)	(.6)	**(.2)**
UAG	Allowed	10.5	10.3	10.4	10.4	10.5	**52.1**
	Incurred	15.7	14.1	12.0	12.5	11.6	**65.9**
	Variance	5.2	3.8	1.6	2.1	1.1	**13.8**
Total	**Allowed**	**134.4**	**135.8**	**136.9**	**137.8**	**138.9**	**683.8**
	Incurred	**128.1**	**128.6**	**126.8**	**124.0**	**126.2**	**633.7**
	Variance	**(6.3)**	**(7.2)**	**(10.1)**	**(13.8)**	**(12.7)**	**(50.1)**
	Variance (%)	**-5%**	**-5%**	**-7%**	**-10%**	**-9%**	**-7%**
Total excluding marketing and UAG	Allowed	104.7	106.0	106.9	107.6	108.4	**533.6**
	Incurred	108.1	111.7	110.2	105.0	107.1	**542.1**
	Variance	3.4	5.7	3.3	(2.6)	(1.3)	**8.5**
	Variance (%)	3%	5%	3%	-2%	-1%	**2%**

Source: AAI, p. 47, Table 4.7. Figures may not add due to rounding.
Note the error in the source table in the AAI: the bottom line of that table reports variances (referred to there as "efficiencies") as percentages but they are actually dollars as shown above.

3.2 Variances

A significant variance occurred in marketing to promote gas sales, where the approved level of expenditure was underrun substantially. This underrun more than accounted for higher-

than-approved O & M expenditure – it overran in the first three years of the period and underran in the last two – and expenditure on UAG.

A point to be noted is that the underrun in expenditure of $50.1 m in total has been categorised by Jemena in the AAI Table 4.7 and elsewhere as “efficiencies achieved”. An underrun in expenditure is not a measure of efficiency unless it is accompanied by a relevant measure of work done or output that is as planned or increased. Neither was the case, in this instance, as the underrun was attributable to greatly reduced marketing expenditure.

The variances in the other expenditure categories were small by comparison. Administration and overheads underran in the first three years and overran in the last two but the variances are small. The variances in government levies are immaterial and the variances in UAG show a declining overrun, reflecting the declining trend in the quantity of UAG over the period FY 2006 to FY 2008 shown in the graph on p. 8 of appendix 6.8 to the AAI. [12]

[12] The variance in UAG is likely to have arisen from a combination of variances in actual gas costs and in gas quantity. We understand that the variance is subject to the tariff variation mechanism described on page 141 of IPART’s final report in 2005 but we did not examine that aspect, looking only at implicit gas quantities when making this observation.

4 Operating Expenditure in Next Period

4.1 Summary of Proposed Expenditure

Operating expenditure in the next period is projected to be $741.4 m compared with the forecast $633.7 m in the present period, an increase of 17%. [13] Excluding carbon costs (which did not occur in the present period and might not occur in the next), the forecast increase from the present period is 10.7%. A summary of the forecast expenditure is shown in Table 4.1. Additional costs sought as part of Jemena's correspondence of 18 December 2009 are not considered in our assessment.

Table 4.1: Operating Expenditure in Next Period ($2010 m)

FY ->	FY 2009 (Base Year)	FY 2009 with costs allocated	2010	2011	2012	2013	2014	2015	Total for next period
Direct JAM costs			No data provided by Jemena						
Engineering	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Operational support	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Market, billing and metering	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Repairs and maintenance	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
IT costs	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Other direct JAM costs	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Indirect JAM costs	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Jemena ESF costs (via JAM)	c-i-c	c-i-c		c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Base O & M a/	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Step changes	3.7	c-i-c	c-i-c	3.8	3.9	4.0	4.1	4.2	20.1
Site remediation	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Margin	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Total O & M	81.9	81.9	79.4	84.6	84.2	87.2	89.9	93.3	439.2
Admin & o/hd: base cost b/	24.3	24.3	22.8	23.3	23.9	24.8	25.9	26.8	124.7
Admin & o/hd: one-off events	(1.6)	(1.6)	.0	.0	.0	.0	.0	.0	.0
Admin & o/hd: step changes	.4	.4	.4	.4	.5	.5	.5	.5	2.3
Government levies	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	15.7
Marketing	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	41.0
UAG	12.6	12.6	11.6	11.4	11.4	11.3	11.4	11.6	57.0
Carbon costs	.0	.0	.0	.0	4.0	11.0	11.9	12.9	39.8
Self insurance	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	12.3
Debt raising	.0	.0	.0	1.8	1.9	1.9	2.0	2.0	9.5
Total non- O & M	49.4	49.4	48.6	50.7	55.4	63.2	65.4	67.5	302.2
Total	**131.3**	**131.3**	**128.0**	**135.3**	**139.6**	**150.4**	**155.3**	**160.8**	**741.4**

Sources: AAI, p. 75, Table 6.1; p. 84 table 6.6; and p. 93 table 6.12 and responses to questions. Figures may not add due to rounding. There is a minor discrepancy between the total reported for FY 2010 in the sources for this table and that reported in the sources for table 4. There are also differences in the figures quoted for FY 2009 but that is due to adjustments made to the base year (FY 2009) by Jemena when forecasting its expenditure in the next period.
a/ The "Base O & M" total for FY 2009 includes a deduction of $2.77 m for "one-off events" per table 6.12 in the AAI.
b/ The "Admin & o/hd: base cost" figures have been amended as advised by Jemena on 27 November.

[13] There is some doubt about all FY 2010 data and related percentages, as there appears to be a minor discrepancy in the data supplied by Jemena for that year. See the notes to the table.

Basis of the Forecast

Jemena proposes a level of operating expenditure in the next period that is based mainly on the level in the base year with non-recurrent items removed, step changes added and escalation applied for O & M growth (using a proxy for it), forecast real changes in input costs – *viz.* materials, labour and overheads – and escalation.

Jemena states in its AAI that it used two methodologies for forecasting its operating expenditure costs in the next period. It used a "base-year roll-forward approach for the majority of its recurrent opex including its administration and overhead costs and for "most of the fee that [Jemena] will pay to JAM for asset management services under the new asset management agreement, which is the principal component of its O & M costs". It used specific year-by-year forecasts for a small number of particular costs that will be incurred and in respect of which it does not consider base-year costs to be representative of the future; specifically, government levies, marketing costs, self-insurance costs, site remediation costs and the cost of UAG. [14]

The base year chosen is FY 2009. The base-year data relies on forecasts for the last three months of direct costs and for the last four months of indirect costs.

Growth

Jemena states that "the volume-driven elements of [the] O & M expenditure forecasts have been informed by the market expansion capex as well as the NIEIR customer numbers set out in Table 5-10 of the AAI" (see the AAI, p. 70) and that "this has included assessment of customer-driven work orders and the incremental operating costs arising from the market expansion capex program". It also states that it has "relied upon the NIEIR demand forecast to establish its UAG forecast as set out in section 6.5.4 [of the AAI]".

External Factors

Jemena states that two external factors are affecting its operations and associated costs or are expected to affect them and that they have been taken into account in its expenditure proposals. The external factors cited are government policy measures in response to climate change – the Government has stated an intention to implement carbon pricing and trading and other new policies such as renewable energy targets and national hot water schemes – and developments in the energy market. The relevant developments in the energy market include a national energy customer framework, a national gas connections framework, a short-term trading market for gas and the commencement of operation of the Australian Energy Market Operator from 1 July 2009. We understand that greenhouse gas emission reporting requirements have already been introduced.

Variances from Present Level

The year-to-year increases (decreases) in the total expenditure are 3.2% from FY 2009 to FY 2010 in the present period and 5.7% from FY 2010 to FY 2011, 3.2% from FY 2011 to FY 2012, 7.7% from FY 2012 to FY 2013, 3.2% from FY 2013 to 2014 and 3.5% from FY 2014 to FY 2015 in the next period. Excluding carbon costs, the percentages are 3.2%, 5.7%, 0.2%, 2.8%, 2.8% and 3.2% respectively. [15]

Of particular note, the forecast increase in the O & M component over the present period is only 5.6% whereas the increase in the non-O & M component (which comprises

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[14] AAI, p. 75 onwards.

[15] The percentage increase from FY 2009 to FY 2010 is based on the unadjusted actual expenditure reported in Table 3.1 for FY 2009. However, there is some doubt about all FY 2010 data and related percentages, as there appears to be a minor discrepancy in the data supplied by Jemena for that year.

administration and overheads, government levies, marketing costs, carbon costs, self-insurance costs, debt raising costs and the cost of UAG) is 38.7%. If carbon costs are removed from the calculation, the increase in the non-O & M component is 20.4%, still notably higher than the increase in the O & M component. [16]

Furthermore, the percentage increase (decrease) from the present period in administration and overhead expenditure (the largest part of the non-O & M component) is projected to be 37.8%; the decrease in government levies is 15%, the increase in marketing is 60% and the decrease in forecast expenditure on UAG is 14%.

Significant increases are thus evident in the non-"O & M" component, particularly in administration and overheads, with material but less significant increases in the "O & M" component.

4.2 Principal Issues Arising

We were asked to review Jemena's proposed controllable operating expenditure [17] forecast for the next period, including projects or programmes undertaken by JAM for or on behalf of Jemena. In particular, we were asked to consider whether: (a) the proposed programmes or projects are required; (b) whether the extent or scope of each programme or project is appropriate; (c) whether the unit rates and costs applied are appropriate and reasonable; (d) whether due consideration has been given to potential efficiency improvements; and (e) whether there is any overlap of the operating expenditure programme with the proposed capital expenditure programme. In relation to item (e), our attention was drawn to the step changes proposed in appendix 6.3 of the AAI.

Before proceeding to our review of these items, however, we would like to note several matters that have influenced the work we have been able to carry out.

Structure of Jemena's O & M Costs and Lack of Reconciliation

JGN [18] out-sources delivery of its operating and maintenance activities and capital works programme to Jemena Asset Management (JAM), a related party, and directly or indirectly to other related parties. [19]

No reconciliation was provided of the costs incurred by Jemena and its various related parties to enable the direct and indirect cost allocations or "margins" that have been incorporated in the expenditure to be identified with certainty or confirmed as reasonable.

Lack of Detailed Information on Projects, Programmes, Costs and Volumes

Initially, in spite of requests for the information, almost no details of the composition of the O & M component of the forecast operating expenditure were provided, despite that component accounting for around 60% of the total forecast operating expenditure in the next

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16 The terminology used is Jemena's but a distinction needs to be drawn between operating expenditure as a whole (including maintenance expenditure) and its O & M and non-O & M components. Generally, we have referred to the **components** as O & M or non-O & M. References to the expenditure as a whole are generally to operating expenditure written in full.

17 Controllable operating expenditure excludes carbon costs, site remediation expenditure, debt-raising costs, self-insurance costs, marketing costs.

18 See footnote 2.

19 It states that prior to the current arrangements, this out-sourcing was undertaken under arrangements in place under AGL's ownership. Alinta took ownership of the AGL's New South Wales gas network in 2006. A year later, a consortium of Babcock & Brown and Singapore Power International bought Alinta. Subsequently, SPI gained ownership of several former Alinta assets. The largest of these included Jemena Gas Networks (NSW), Jemena Electricity Networks (Vic), Jemena Pipelines, and Jemena Asset Management. Source: AAI, p. xvi.

period. [20] Later, totals were provided for the first eight lines in Table 4.1 but still no significant details were provided of expenditure on individual O & M projects or programmes or on the volumes of work foreseen in each, notwithstanding Jemena's acknowledgement (AAI p. 75) that "Opex is a major component of network expenditure accounting for approximately 36 per cent of JGN's total cost of service".

Jemena states in its AAI (p. 77) that it "has separately forecast its opex costs for each material category of costs and in accordance with the cost categories determined by IPART". [21] We noted that the requirements in the regulatory information notice (RIN) were defined only at a high level and that particular operating expenditure categories were not specified. However, we also noted the general requirement under the Rules for businesses to provide the basis of their forecasts, including the assumptions on which the forecasts were made. Without attempting to interpret the requirements of the RIN, we considered that the general provisions in the RIN, combined with the requirements under the Rules, required a reasonable level of disclosure by the business in its access arrangement proposal and information to avoid a situation in which the regulator is asked to accept a forecast of expenditure at face value.

The combination of this lack of detailed costing information and work volumes, combined with the various related party transactions involved, made it difficult for us to determine the **efficiency** of the expenditure reported in respect of the present period or planned in respect of the next, as opposed to the reasonableness of its scope and timing. We discuss these and related issues in the remainder of this section (section 3) of the report in relation to operating expenditure and in the following sections in relation to capital expenditure.

Basis of Operating Expenditure Estimate in Next Period

In the present period, JAM appears to have managed the operating services for the sum that was provided in the last decision. It also appears that, other than in minor instances, the basis of estimation of operating expenditure in the next period is the escalation of the sum in the present period, plus the identified step changes, rather than the estimation of future requirements.

Several studies have been relied upon to claim that the cost of the services is efficient and we discuss them later in this report although evidence of comparative positions (made in the studies) does not establish efficiency *per se;* and such studies ought to be only an accompaniment to a detailed "bottom-up analysis" of the expenditure. No such analysis was made available for our review.

To enable the questions asked of us to be addressed the business would need to have provided detailed analyses of JAM's costs to deliver the services. [22]

Given that the management costs of the various entities involved are likely to be highly integrated, we consider it might be very difficult to break them down in a way that would support an assessment of efficiency of service delivery without a detailed "bottom-up" analysis of the costs being available.

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[20] The asset management plan (AMP) sets out the main O & M expenditure streams (and capital development plans) and we have no reservations about the adequacy of the AMP in a general sense, other than to observe that there is very little information on cost in it. There is **no** connection made between it and the O & M expenditure estimates presented by Jemena. (In the case of capital expenditure in the next period, the AMP is accompanied by an appendix to the AAI in which the forecast expenditure on each project and programme is stated for each year of the next period, although no other breakdown of those costs is given.)

[21] It says that the categories required by section 2.3.5.2 (b) (ii) of the RIN are aligned with the cost categories set out in Table 6-6 in the AAI for non-O & M costs and Table 6-12 for O & M costs.

[22] JAM, in this instance, should include all other related parties in the chain.

Conclusion in Relation to Scope of Our Assessment

For these reasons, we did not consider it possible to carry out a complete assessment of the forecast expenditure in terms of its **efficiency**.

We raised these points with the AER and, in consultation with the AER, it was decided that we would examine the following matters under this part of the review.

(a) Consider the base-year costs, particularly from the standpoint of whether (i) they appear representative of the costs in the other years in the present period and (ii) they did or did not include non-recurrent items.
(b) Consider the various "benchmarking" reports and their implications as far as the efficiency of the base-year costs is concerned, noting that a bottom-up analysis of costs has not been provided.
(c) Consider, to the extent that details are disclosed, the identified projects and programmes in the next period in terms of necessity, scope and timing;
(d) Consider, to the extent that they are disclosed, whether the unit rates and costs applied are appropriate and reasonable.
(e) Consider the reasonableness of the methods of escalation applied to escalate the base-year costs.
(f) Consider whether the proposed step changes related to technical matters were justifiable as additions to the level of operating expenditure derived from the escalation of expenditure in the present period.
(g) Consider whether due consideration has been given to potential efficiency improvements.
(h) Consider whether there is any overlap of the operating expenditure programme with the proposed capital expenditure programme.
(i) Identify those areas where our conclusions were constrained by a lack of information.

We discuss the forecast expenditure accordingly in the remainder of this section of the report.

4.3 Expenditure in Base Year

Jemena's actual expenditure in the base year was $124.0 m, as shown in Table 3.1 on p. 8 of this report. With deductions totalling $4.41 m for "one-off" events and the addition of a total of $11.70 m of other adjustments that we discuss below, the adjusted expenditure proposed by Jemena as the basis of its forecast for the next period is $131.3 m, as shown in Table 4.2 in summary and in Table 4.1 in more detail.

Table 4.2: Expenditure in Base Year ($ FY 2010)

	Allowed	Incurred	Jemena's proposal
O&M base costs	82.1	77.9	c-i-c
O&M step changes	-	-	c-i-c
Margin	-	-	c-i-c
A&O base costs	21.9	24.0	24.3
A&O "one-off" events	-	-	(1.6)
A&O step changes	-	-	.4
Marketing	19.8	6.5	8.2
Government levies	3.7	3.1	3.1
UAG	10.4	12.5	12.6
Carbon costs	-	-	.0
Self insurance	-	-	2.5
Debt raising	-	-	.0
	137.9	124.0	131.3

A breakdown of O & M costs is given in Table 4.1.

Jemena has proposed that its forecast expenditure on government levies, UAG and certain other items ought to be based on year-by-year forecasts and we agree with that approach. Setting those items aside, the remaining expenditure categories are O & M expenditure (including step changes and a margin), administration and overhead (A & O) expenditure and marketing expenditure. The allowed and incurred expenditure and variances in each category in the base year are summarised in Table 4.3.

Table 4.3: Summary of Variances in Base-Year Expenditure ($2010 m)

Category		$ m
Operating & Maintenance	Allowed	82.1
	Incurred	77.9
	Variance	(4.2)
Administration & Overheads	Allowed	21.9
	Incurred	24.0
	Variance	2.1
Marketing	Allowed	19.8
	Incurred	6.5
	Variance	(13.3)

The table shows that A & O expenditure exceeded the level allowed by IPART in its decision by $2.1 m [23] and O & M expenditure underran the level allowed by $4.2 m. Marketing costs underran the approved level by $13.3 m.

The base year costs, subject to certain adjustments, are considered by Jemena to be representative despite the inability to obtain underlying costs for the previous three years to enable trends to be examined. [24] Because of Jemena's corporate structure and the new asset management agreement (AMA), adjustments have been proposed for the reclassification of costs related to the commercial and regulatory teams and JAM's occupancy and communications costs (see the AAI, p. 79) and for new outsourcing arrangements (see the AAI p. 80). These adjustments are reflected in the figures above.

[23] This figure has not been adjusted to account for UAG costs recouped via the tariff variation mechanism in the current access arrangement period.

[24] See the AAI, p. 79.

"Base" O & M Costs

Forecast "base" O & M expenditure includes direct JAM costs related to engineering services, operational support services, marketing billing and metering services, repairs and maintenance, non-capitalised IT costs, other direct JAM costs plus indirect JAM costs and Jemena's "enterprise service function" (ESF) costs (the latter including costs incurred by SPI (Australia) Assets Pty Limited and other entities in the Jemena Group). Together, these items are referred to in Jemena's tables as the "base" O & M costs, as shown in Table 4.1.

Forecast expenditure details were not provided in the AAI for the component costs in O & M but information received on 7 December in response to our request provided the total expenditure under each sub-category in each year in the next period but no other details. We infer that the base-year level of O & M, not "bottom-up" estimates by expenditure category, forms the basis of the expenditure proposed for the next period. This inference is further supported by statements in relation to the AMA that, in each of the future years, the level of O & M expenditure is likely to be based on expenditure in prior years.

Margin

A margin applies to the base O & M, not the A & O, and is included as a separate item in the base-year level of expenditure. Jemena advised on 18 December that it is "**[c-i-c]**% of the total JAM costs attributable to Jemena in the base year". We discuss this further in section 4.6 ("Cost Efficiency" and the AMA), recommending its removal unless Jemena is able to demonstrate through reconciliation of its costs or by other means that the item is required to recover identifiable costs and does not incorporate a profit element.

A & O Costs

A & O costs in three categories (a base cost, "one-off" events and step changes) are added to the O & M costs.

Cost Allocation Methodology

A cost allocation methodology (whole-of-business cost allocation – WOBCA) has been used to allocate all costs including the ESF costs referred to above that are not directly attributable to particular assets or asset groups – in essence, JGN's and a share of JAM's corporate overheads. [25]

Changes are also said to be required since the historical costs in the base year reflect the nature of JGN's outsourcing at the time and a previous corporate structure. Therefore, to enable JGN to apply its roll-forward approach fully, the WOBCA breaks down and quantifies JGN's direct costs and overheads and JAM's "underlying" direct costs and overheads. [26]

The WOBCA has been examined in detail by PwC, who concluded that the methodology used for allocations was simple, justifiable, transparent, consistent and auditable and for all costs allocated to JGN, the WOBCA methodology has been accurately applied.

However, no reconciliation was provided of the costs incurred by Jemena and its various related parties to enable the direct and indirect cost allocations or "margins" that have been incorporated in the expenditure to be identified with certainty or confirmed as reasonable.

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[25] PwC's letter describes the methodology as follows in para 2: "The [Whole of Business Cost Allocation] WOBCA methodology determines the Cost of Service of SPI (Australia) Assets Pty Limited (SPIAA), Jemena Ltd (together, Jemena) and JAM to Jemena Gas Network (JGN), incorporating Direct, Indirect and Corporate Enterprise Service Function (ESF) costs for the base year of the 2010 Access Arrangement (being 2008/09).

[26] This sentence is taken from the AAI, at the top of p. 79.

Removal of Non-Recurrent Items

The costs of one-off events such as corporate branding and development of a shared IT delivery service have been identified and excluded from the base-year costs. [27]

Step Changes

Items of future expense that were not incurred in the base year have been identified in appendix 6.3 to the AAI. They total $4.1 m p.a. or $20.5 m over the next period. We discuss them in detail in section 4.9 below.

Other Costs

The cost of governmental levies, marketing costs, the cost of UAG, prospective carbon costs, the cost of self-insurance and debt-raising costs are also added to the base-year costs.

Marketing Costs

Expenditure on marketing to promote the sale of gas is projected to continue at a higher level than in the base year. Jemena also states that it will continue the marketing programme it has developed over the past two years, including the "natural gas the natural choice" campaign and targeted incentives for appliance installers, with the primary aim of significantly increasing the sale and installation of gas heating appliances. These factors, combined with the fact that in the present period it curtailed its marketing expenditure significantly, appear to account for the increase in forecast marketing expenditure.

Our terms of reference did not require us to examine it although we note that the expenditure may be an important ingredient in achieving the projected rate of growth in gas sales that underpins the estimates.

Conversely, if the marketing is not undertaken, the forecast levels of new connections and thus the growth factor applied to operating expenditure as a whole may prove to have been over-stated.

Government Levies

Expenditure on government levies is projected to continue at its level in the base year. The levies are not a technical matter and have not been examined by us.

UAG

Expenditure on UAG is a combination of the volume of gas unaccounted for and the price at which it is bought. We comment later in our report on the allowance by volume that we consider reasonable for the next period but do not examine the price of the gas bought or thus the expenditure on UAG.

However, we note here that the decrease in expenditure on UAG over the present period appears to reflect the decrease in the volume of UAG reported on p. 8 of appendix 6.8 to the AAI.

Carbon Costs

We have not reviewed the proposed carbon costs as that was not within our terms of reference, although we note that they remain prospective at the time of writing this report.

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[27] See the AAI, p. 80.

Self Insurance and Debt-Raising Costs

Jemena claims expenditure related to self-insurance [28] and debt-raising costs. Our terms of reference did not require us to examine these matters although we note that such costs are normal business costs and ought not to appear as a step change without compelling reason. [29]

4.4 Jemena's Supporting Documentation

Jemena states that its operating expenditure forecasts "are arrived [at] on a reasonable basis and the costs of a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services". To support this view, it presented a total factor productivity report, a benchmarking study of operational performance and a benchmarking report on operational expenditure, which we now discuss.

Total Factor Productivity Report

JGN engaged Economic Insights to prepare a total factor productivity (TFP) report and the report is presented in appendix 6.7 to the AAI. The terms of reference for the work asked Economic Insights to provide a report "detailing its analysis of time series and multilateral total factor productivity efficiency estimates, and partial factor productivity (PFP) estimates, that is suitable for validating JGN's opex and capex forecast and use in support of statements about JGN's relative cost performance". [30]

Economic Insights concluded, "JGN's changes in output and input quantities have led to a strong productivity performance over the last 11 years, driven largely by significant reductions in opex. The partial productivity of opex has grown strongly at the very high annual rate of 6.8 per cent since 1999. However, the rate of growth was somewhat lower at 4.8 per cent over the last 6 years and is forecast to decrease to a still quite strong 1.7 per cent over the next 6 years". [31]

They also concluded, "JGN's TFP index exhibited relatively strong growth over the past 11 years. The average annual growth rate was 1.9 per cent for the period 1999 to 2009 although this was only just over 1 per cent for the last 6 years. Going forward the annual growth rate is forecast to reduce to 0.2 per cent for the next 6 years. JGN has been able to achieve relatively strong productivity growth rates because of its increasing penetration rates and, principally, by cutting opex input use. However, caution needs to be exercised in using past productivity growth rates as a guide to likely future attainable efficiency improvements. The combination of the convergence effect and expected changes to safety and compliance requirements [gas distribution businesses] will face are expected to lead to a much more modest TFP performance going forward.

"Overall – and particularly once differences in network density and system structure are taken into account – the results of this study indicate that JGN is a relatively efficient performer compared to the three Victorian [gas distribution businesses]." [32]

Whilst total and partial factor productivity concepts may be considered esoteric, they have been applied fairly consistently to gas and electricity utilities in Australia and New Zealand for over ten years by several parties. The methodology uses operating expenditure as one of

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[28] Self-insurance costs are not included in the allocations of ESF costs made in the WOBCA model: see PwC para 57.

[29] Any allowance for debt-raising costs would presumably also need to consider the method used to determine the allowed WACC.

[30] AAI appendix 6.7: Economic Insights' report, p. 2.

[31] *Ibid*, pp 25-26.

[32] *Ibid*, p 34.

the inputs but capital is represented by surrogates: pipeline lengths, meters and the value of other assets. It can thus be accepted that the report provides a supporting opinion that Jemena has, largely, obtained value for money in its past expenditures and, in the absence of evidence to the contrary, is likely to continue to do so.

Benchmarking Study of Operational Performance

Reference was made in the AAI to a benchmarking study prepared by or for Jemena and it was provided to us on request. [33] However, the study reviewed the operational performance of the Jemena and ActewAGL Distribution gas networks, benchmarked against other gas distributors in Australia using data from regulatory reports. It did not examine operating expenditure.

Benchmarking Report on Operating Expenditure

In a submission made to the AER in November 2009, Jemena provided a benchmarking report that examined operating expenditure. The analysis presents results essentially in terms of Jemena's position in relation to certain of its peers in the Australian gas distribution industry in terms of the following performance indicators: operating expenditure as a proportion of the length of mains; operating expenditure as a proportion of customer numbers; and operating expenditure as a proportion of the regulatory asset base.

The calculations have been normalised for network design differences – whether the mains are run down both sides of streets ("dual mains") or only one side, the presence of very high pressure mains and customer density. Once normalised, the results show that Jemena is in line with its peers and that in all the performance indicators it was within the 95% confidence interval of the analysis. [34]

It appeared to us that the benchmarking related to a period prior to or substantially prior to the proposed base year, FY 2009. [35] If that is correct, then Jemena's costs in the benchmarking may differ from those in the base year that form the basis of its projections in the next period. [36]

We noted that the benchmarking did not take account of differing network ages and considered, given that Jemena has a substantially refurbished network, that this could have favoured the business in the comparisons. However, we also noted the views expressed in the benchmarking report that age is considered to have only a third-order effect and that "unless a network is particularly new, this [age] is unlikely to have a significant impact as renewal and replacement of assets has the effect of keeping the average age of assets fairly consistent once a network reaches maturity"; and that "This is also one respect in which gas and electricity networks differ in that the impact of age on mains and facilities is not as significant for gas".

As a general principle, we considered that benchmarking is likely to be less robust if disparate entities are compared or if "related party" transactions are involved as, in the latter case, the comparisons may be made with entities whose efficiency is not readily demonstrated.

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[33] *Jemena Gas Network performance benchmark study, FY 2000 – FY 2008*, Cutting, D, May 2009. We infer from the cover of the report that it was prepared by or for Jemena but the authorship of the report is not stated explicitly.

[34] The report demonstrates that this conclusion is unaltered if the normalisation adjustments are excluded from the analysis.

[35] The period or year to which the benchmarking relates is not clear to us from the benchmarking report itself but we infer that it is a period ending in FY 2008 as section 3.1 on p. 10 of the report states, "Performance indicator data was collected for each of the networks in the sample over the relevant time period (2002 to 2008)".

[36] It may have been possible to determine this from a comparison of the information used in the study and that provided in relation to the base year but we did not attempt that task.

We also consider, as a general principle, that benchmarking is best presented as an accompaniment to other substantiating analyses such as a "bottom-up" analysis of operating costs.

Overall, we accept that the operating expenditure benchmarking analysis presented by Jemena suggests, *prima facie*, that the business operates with a cost structure within the levels of confidence in the benchmarking. However, the lack of a "bottom-up" analysis of operating costs related directly to the cost-efficiency of the services offered and supporting this finding ought to be noted.

4.5 "Out-sourcing" Contract

We have already noted in this report that that Jemena out-sources the delivery of its operating and maintenance activities and capital works programme to JAM, a related party, and directly or indirectly to other related parties.

We considered whether these out-sourcing arrangements reflect efficient costs or will ensure efficient costs and whether, as a result, they are a proper basis for the expenditure estimates for the next period. [37]

Jemena states that it has "forecast its opex with regard to the costs it will incur through its management structure and through its outsourcing of asset management activities" and it describes the out-sourcing structure in chapter 3 of its AAI. It states in that chapter that, during 2009, its management conducted a "service model" project, the objective of which was to establish an asset management agreement under which Jemena procures asset management services at an efficient level of cost and with incentives aligned to ensure ongoing service and cost performance. Jemena states that it "initiated bilateral negotiations with JAM to develop their new asset management agreement"; and, "The negotiation framework followed standard commercial practices for competitively tendering work" and, "The resultant agreement, which came into effect from 1 August 2009, creates a number of valuable outcomes for JGN: services and accountabilities are clearly defined; costs are transparent; strong incentives to ensure JAM delivers JGN's required services at the lowest sustainable cost; risk is allocated to the party that can best manage it; JGN has certainty of asset management resourcing, at least until the end of 2018".

Clause 5.9 of the resulting asset management agreement (AMA) provides that the Manager is the exclusive provider of the Services (other than in relation to Owner Functions) from time to time to the Owner in respect of the Assets during the Term and provides details of circumstances in which the Manager may appoint an "alternative service provider". There is no stated requirement in the AMA that subcontracts must be awarded through competitive bidding. In the section relating to subcontractors, [38] clause (a) states that The Manager must not subcontract any part of the Services other than to a Subcontractor who meets all of six stated requirements, the fifth of which states: has been selected through a process which includes probity controls consistent with Good Industry Practice, Laws and Authorisations. [39]

In summary, our opinion is that the AMA may be characterised as follows.

(a) Negotiation of the agreement was bilateral, implying that no other party was invited to tender for the provision of the asset management services.
(b) The negotiation was undertaken with a related party (JAM), a wholly owned subsidiary of the Jemena group of companies, a situation that is not normally

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[37] The arrangements have only just come into effect and so they have no bearing on the efficiency of expenditure in the base year.

[38] AMA, p. 41 onwards.

[39] Capitalised terms in this paragraph are terms used in the AMA.

considered a substitute for competitive market pricing, no matter what precautions are taken to ensure "probity".

(c) Despite the claimed advantage that costs will be transparent in the arrangement, they were not so made in the information supplied to us. [40]

(d) There appears to be a circularity of argument in Jemena's claim that the contract arrangement reflects or will ensure efficient costs (and is thus a proper basis for the expenditure estimates put forward in the AAI for the AER's approval) when, at the same time (quoting from p. 36 of the AAI), Jemena states, "JAM is only entitled to recover **efficient** [our emphasis] costs. The target cost amounts that are set each year and any cost overruns that JAM is paid during each year are required to be authorised by JGN as being efficient. The measure for efficiency in the asset management agreement **is equivalent to the test in rule 79 and 91 of the National Gas Rules** [our emphasis]. When the risk and benefit sharing mechanism is applied at the end of each financial year, JAM is only entitled to recover overspend to the extent that the costs are efficient costs (by the same measure)". The quoted passage appears to suggest that payments to JAM will be limited to the amounts agreed to by the AER or that Jemena considers ought to be so agreed to. If this inference is correct, the agreement cannot be advanced as "evidence" of efficient costs. Instead, it would appear that the effect of the agreement is that JAM is to manage and operate the network within the limit of the expenditure agreed to in the regulatory decision.

(e) If the argument is not circular, then the nature, scope and content of each of the main projects and programmes of work in the next period ought to be disclosed, along with the cost estimates that JAM prepared for each of them as the basis of its estimates, the overheads that have been applied and the margins that have been estimated for application to those costs.

(f) We have already noted in this report that no reconciliation was provided of the costs incurred by Jemena and its various related parties to enable the direct and indirect cost allocations or "margins" that have been incorporated in the expenditure to be identified with certainty or confirmed as reasonable.

(g) The assumed breakdown of the work between work undertaken internally by JAM, work negotiated by JAM for implementation by other parties on a cost-plus arrangement or other non-competitive arrangements and work to be sub-contracted by JAM to other parties under competitive tendering procedures should be indicated, together with the profit margins or mark-ups applied in each category. This breakdown is necessary to demonstrate that: (i) the bulk of sub-contracted work is to be let competitively; (ii) work subcontracted competitively will be awarded on the basis of sound specifications and documentation; (iii) work that is carried out internally or by related parties directly or through a chain of such parties is supported by suitable internal efficiency benchmarks; (iv) the margins applied to each component are fair and reasonable; and (v) the arrangements are such that there is no double-counting of costs, whether direct or indirect, that are incurred by Jemena through the asset management contract or other cost allocations. [41]

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[40] We have already noted in this report that no reconciliation was provided of the costs incurred by Jemena and its various related parties to enable the direct and indirect cost allocations or "margins" that have been incorporated in the expenditure to be identified with certainty or confirmed as reasonable.

[41] The method of allocation of corporate overheads to each cost category is described in the WOBCA (see section 4.3 of this report) but we did not receive the actual workings or a reconciliation of allocations with audited totals in the source document, the "TM1" report. In addition, since the contract with JAM covers capitalised as well as expensed work, it would also appear necessary for the overhead allocation model to demonstrate that no double counting of costs to Jemena arose through the separate analyses or treatments of capital and operating expenditure. (We infer from the PwC report that many fixed costs, e.g., labour and associated expenses, are allocated directly to assets and the 'enterprise support costs' were the only ones subjected to the WOBCA methodology but it is not clear to us that PwC checked the accuracy of directly allocated costs.)

(h) We would expect material of the type described above to be readily available if such cost estimates formed the basis of the overall estimate but it appears not to be the case, since the information was not, as far as we are aware, supplied in response to the AER's requests. [42]

Further, we note that schedule 11 to the AMA is intended to set out the unit rates (Target Cost Estimates, TCE) for the Routine Capital Works but the rates, each comprising stated amounts of direct costs and overheads, are blank and are to be completed "as part of the Implementation Plan". The AMA does not describe how the rates are to be set.

In addition: whilst the AMA sets out in detail such matters as: planning; budgeting; KPI measurement and use of KPIs for determining the amounts of performance related payments to the Manager; and accounting principles to be adopted, it cannot be concluded that the capital or revenue costs for any particular period are efficient.

4.6 "Cost Efficiency" and the AMA

Cost-efficiency and payments to JAM by Jemena under their AMA were then considered. For the avoidance of doubt, we do not discuss the principle of including a share of indirect expenses in the capitalised value of fixed assets in this section of the report; the issue we are concerned with here is the nature of the payments to JAM that are variously referred to as 'cost allocations', 'overhead recovery factors', profit margins', etc in the AMA. [43]

Overhead Recovery Factor and Margin

An overhead recovery factor and a margin appear to be added to the Target Cost Estimates, both capital and operating. [44] The overhead recovery factor is thought to be 6%. [45] The margin, which appears from p. 160 of the AMA to be a profit margin, is initially **[c-i-c]%** but the amount of the margin paid in each year depends on the assessment of JAM's performance against a comprehensive list of KPIs set out in Schedule 3 of the AMA.

Overhead Recovery Factor

The overhead recovery factor has not been substantiated but it should be. KPMG noted [46] in its review of the IT plan a "6% allocation of corporate capital expenditure" added to the estimated cost of the IT programme (we infer from the documents that this item is the overhead recovery factor that we discuss, as KPMG refer to it as such later on the same page and as the IT Strategic Plan refers to it as such, e.g. in the table on p. 6 of the plan). KPMG's understanding was that "the details behind this margin [will be addressed] in the access arrangement submission" and that it "would like to see attention paid in [the submission] to ensuring the drivers and logic behind JAM applying the 6% corporate overhead allocation are investigated, documented, verified and approved by JGN and that they are in line with good industry practice".

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[42] Information was provided by Jemena on the percentage of works ultimately contracted out using competitive tendering: see its response of 11 December 2009. The information is understood to relate to JAM's present practice.

[43] The use of the same terms but with different and in some cases undefined meanings in the various documents provided by Jemena adds to the confusion of this matter. As far as possible, we have defined the meanings we attribute to the terms.

[44] We draw this inference from the definitions and schedule 13 in the AMA, which seem to suggest (as we would expect) that O & M is one of the services to which overheads are allocated and that it attracts a share of allocated expense. However, this is not substantiated.

[45] The magnitude of the overhead recovery factor is disclosed only in relation to IT. It remains unclear what other overhead costs may be included in the expenditure estimates.

[46] Page 39 onwards of KPMG's review.

KPMG also noted that JGN applied "**[c-i-c]**% Jemena asset management margin" to the cost of the IT programme and made the same comment about this margin. [47] This margin has not been substantiated either but it also should be. [48]

We were not able to find any justification for the overhead allocation factor or the margin in the AAI.

Profit Margin

JGN's request for a proposal (RFP), presented in appendix 3.3 to the AAI (and which we assume was issued only to JAM) states on p. 8 onwards:

[c-i-c]

[47] KPMG refers to the margin here as if it were a fee for services rendered (see their quoted text) but the RFP, which we discuss in the next section of this text, recognises this margin as a profit margin.

[48] The overhead allocation and margin referred to are shown explicitly in table 1 of the IT strategic Plan (the table is understood to show IT capital expenditure). Note: they are applied **cumulatively**.

The AMA describes the impact of the annual performance review on the total annual margins in terms of the four possible outcomes: [49]

[c-i-c]

Observations

It seems that the arrangements contemplate **a profit margin of up to [c-i-c]% to be earned by JAM in addition to the overhead recovery factor** (although whether the latter has been applied to O & M as well as to capital expenditure is unclear to us), in which case the issue is: does JAM earn more than a fair return on the assets it owns and uses in its business of asset management? If all its overheads (*viz.* indirect expenses) have been allocated to its customers (*viz.* JGN, etc) through the WOBCA methodology, there cannot be any overhead left to justify the overhead recovery factor claimed or the margin claimed. If this inference is correct, both the overhead recovery factor and the margin would seem to produce additional profit to the owner of both companies. [50]

Schedule 11 gives the categories of the routine capital works. Although not completed, the schedule makes it clear that overhead costs are included in the TCE rates for routine capital work. It appears to follow, therefore, that the **[c-i-c]**% margin is being applied **on top of** the overhead costs for routine capital works. The same arrangements appear to apply to non-routine capital works and to operating and maintenance services.

The IT Strategic Plan makes it clear that both a 6% factor and the **[c-i-c]**% margin are applied cumulatively to capital expenditure items in the IT programme in the way stated above. The inference is that they are also applied cumulatively to the other expenditure streams

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[49] The details of the arrangement are set out in Schedule 5 of the AMA.

[50] In commenting on our draft report in relation, principally, to matters of confidentiality, Jemena said that it is incorrect to state or infer that JGN "has applied an additional 6% overhead recovery fee to JAM's operating and maintenance expenditure (O & M) to forecast JGN's O & M expenditure". See Jemena's correspondence to the AER of 20 January 2010. Jemena provided a brief statement in that letter in support of this point and referred *inter alia* to a "forecast data model" that had been supplied to the AER on 26 August 2009. We had been provided with that model but considered that a reconciliation of all costs still appeared necessary to demonstrate that the reported expenditure is at an efficient level. We did not consider it within our scope to attempt the reconciliation ourselves or to attempt to interpret the model. Given the doubt expressed in the main text in relation to the application or otherwise of the overhead recovery factor, and given the confusing use of terms in some instances, we did not consider it appropriate to recommend an adjustment in expenditure in respect of the factor, although we have noted our concerns in relation to it for consideration by the AER.

contracted to JAM. We, however, have no means of verifying this as no details or reconciliation were provided.

It appears that the profit margin applies to any costs charged via JAM under the AMA, whether JAM undertakes the function or activity or another party does and that the margin is applied to both capital and operating expenditure. There is no distinction made between the **[c-i-c]**% performance margin and the **[c-i-c]**% base margin that comprise the total margin of **[c-i-c]**% – see p. 161 of AMA.

No information has been provided to support the derivation or application of the profit margin or the derivation or application of the overhead recovery factor (save a part of it identified as capitalised costs from the WOBCA, but even they could not be reconciled with the 6% overhead).

In short, if Jemena does earn more than a fair return, or if any costs are recovered more than once, then the resulting cost to customers would be above an efficient level.

General Principle

As a general principle, only genuine costs ought to be stated in the expenditure projections submitted by Jemena for review by the AER. These costs should be free of concealed profits.

Put another way, we consider that Jemena should provide sufficient information to substantiate the overhead costs and profit margins, to substantiate that these overhead costs and profit margins are not duplicated or recouped elsewhere and to substantiate that the capital and operating expenditure estimates, inclusive of the overhead costs and profit margins, provide for a lowest sustainable cost for undertaking the proposed work, particularly as the AMA is between related parties, is not market tested and has not been subjected to competitive tender.

Questions Remaining

In that context, the following questions remain.

(a) Does JAM incur costs on behalf of JGN that are commensurate with the overhead recovery factor that has been added? If not, there is a concealed profit being earned. (Substantiation of the overhead recovery factor applied in the forecast period and provision of a "bottom-up" reconciliation using forecast WOBCA (Jemena Group) and JAM costs would help address this point but such information was not provided.)

(b) Consistent with the wording of the RFP, the net amount realised by JAM out of the performance margin appears to be a profit that accrues to Jemena Ltd, the parent of both JAM and JGN, over and above the allowed return on the regulatory asset base.

(c) If so, and if these factors are being built into the regulatory asset base through the reported costs of completed work, then the asset base is being overstated cumulatively to the benefit of Jemena Ltd and the operating expenditure forecasts may also be over-stated and thus above an efficient level.

(d) If, on the other hand, these charges – the overhead allocation factor and the margin of **[c-i-c]**% – relate to the recovery of identifiable costs and do not incorporate a concealed profit, then a justification of them ought to be provided by Jemena through a reconciliation of its costs and JAM's costs.

Evans & Peck's Report

Evans & Peck's findings appear to be consistent with this summary of the situation in that they recognise the AMA as "essentially a cost plus margin contract for the services, with

margin at risk based on the delivery of services at the target cost and meeting of specific performance KPIs." [51]

Evans & Peck also observed that, because of the wide variability in the ratio of project management costs to construction costs, setting a project management fee in this manner would not reflect the cost of providing the service required for non-routine capital works and therefore considered that the project management fee should be agreed **based upon a first principles estimate of the cost of providing the project management services for each program of works or each separate project**.

We agree with that view and note that it supports the need, expressed above, for a detailed derivation of the margin.

Margin Added to Jemena's Base-Year Operating Expenditure

As already noted in section 4.3 under the sub-heading "Margin", a margin applies to the base O & M and is included as a separate item in the base-year level of operating expenditure. Jemena advised on 18 December that it is "**[c-i-c]**% of the **total** [our emphasis] JAM costs attributable to Jemena in the base year". We infer from this that the margin has been applied to costs passed through from other entities and is not restricted to a margin on the additional services that JAM added itself. For the reasons just discussed, we recommend its removal unless Jemena is able to demonstrate through reconciliation of its costs or by other means that the item is required to recover identifiable costs and does not incorporate a concealed profit element.

Pitcher Partners' Probity Review

Pitcher Partner's report, presented in appendix 3.4 to the AAI, states in full: "This report should be read in conjunction with our reports of 6 February, 10 March, 1 April and 28 May 2009. Since our report of 28 May 2009 the contract has been executed by both Boards. The project has therefore concluded. No probity issues arose during the process."

Without the four other reports referred to, the report does not support the claim of efficiency neither does it comment on the possible implications of the common ownership of the parties.

4.7 Proposed Test in Relation to Related Parties

We considered whether the following test would assist in determining the reasonableness of the profit margins in the AMA in the next period or, more broadly, profit margins charged to related parties generally.

If it were considered acceptable, for regulatory purposes, for JAM or any other related party to earn a profit margin on the cost of the services that it provides itself to the regulated business (but not on costs that it passes through from other parties), then:

(a) the reasonableness of such a margin would need to be demonstrated by Jemena (in that regard, the margin would presumably be applied only to JAM's direct labour costs and its own on-costs, as if JAM were an outside provider of such services); but
(b) the question would remain: "How many of the costs (including the cost of such a margin) would find their way into the regulatory accounts of the regulated business if the intermediate company did not exist?"

To expand on the last point: any regulated business could increase its reported costs by introducing an intermediate company or a chain of them, if the test in (b) above was not applied.

[51] E & P report, p. 1.

In essence, our view is that the profit margin in the AMA is explicit and ought to be ruled out of the regulatory accounts which are to report costs free of concealed profit margins and to which a return on capital is agreed.

Likewise, in relation to the recovery of overhead costs by JAM: somehow, Jemena Group's costs are allocated to JGN, presumably through the WOBCA methodology. However, the following question does not seem to have been answered – "Have any costs related to the services that JAM provides (or that other related parties provide) been booked to JGN's asset groups directly or via the WOBCA methodology? If so, they should be excluded from recovery by other methods such as project management fees, as JAM is reimbursed for them already.

4.8 Recommended Base-Year Level of Expenditure

In reaching our conclusion on an appropriate base-year level of operating expenditure, we noted again that no detailed "bottom-up" assessment of future O & M expenditure has been provided. Nor have any volumes of work carried out, detailed cost breakdowns or detailed cost estimates of the constituent elements of O & M in the current period or the next been provided, or any business cases in relation to the main O & M expenditure streams. Instead, other than in minor instances, the basis of estimation of operating expenditure in the next period is the escalation of the sum in the present period, plus the identified step changes, rather than the estimation of future requirements.

We noted again that Jemena has relied on its TFP report and the two benchmarking studies when claiming that its projected expenditure in the next period is prudent and efficient. However, evidence of comparative positions does not establish efficiency *per se;* and such studies ought to be only as an accompaniment to a detailed "bottom-up analysis" of the expenditure. No such analysis was made available for our review.

We noted again that Jemena has also relied on its out-sourcing contract, the AMA, but that it is a contract with a related party, involves other related parties, was not bid competitively, is for a long term, is not accompanied by a reconciliation of costs – in short, it does not contain the elements normally expected in a competitive market. [52]

In these circumstances, given that the base-year level of expenditure is the foundation of the projected future costs, we consider the most robust approach to determining a reasonable level of expenditure in the base year is to adopt the lowest of the level considered prudent and efficient by IPART in its review, the level incurred in the base year by Jemena and the level proposed by Jemena as the starting-point for the next period.

To compare like with like, we considered that the base levels of O & M and of A & O should be totalled, in each case, before comparison, as we understand (from the AER) that some business functions have been transferred between the two. On this basis, the combined levels of O & M and A & O for the allowed, incurred and proposed scenarios are $104.0 m, $101.9 m and $**[c-i-c]** m respectively. If, however, Jemena's proposed "margin" of $**[c-i-c]** m is added to the last scenario, the comparative figures become $104.0 m, $101.9 m and $**[c-i-c]** m respectively. There is then no material difference in total between the last two scenarios – incurred and proposed – and either could be selected. We have selected the latter but, as already concluded in this report – see page 26 under the heading "Margin Added to Jemena's

[52] We note also that whilst the AMA makes elaborate provision for resolving disputes between JGN and JAM, the initial arbiter is the Executive Committee, which comprises the Chief Executive Officers of each of the parties or, if the Chief Executive Officer of the Owner is the same as that of the Manager, the Chief Executive Officer and the most senior manager of each of the Owner and the Manager and the Contract Managers of each of the parties. The provision seems to keep things within the group – only as a last resort does the AMA provide for independent arbitration.

Base-Year Operating Expenditure" – the item called "margin" of $**[c-i-c]** m in the "proposed" scenario ought to be ruled out in the absence of its substantiation by Jemena.

Conclusion

When considering the reasonableness of that level, we noted that Jemena had overrun the approved level in the O & M expenditure category in the first three years of the present period, that it underran it in the fourth year (the base year) and that it expects to underrun it in the final year (the present year).

We noted again that the ownership of the business changed during the present period (prior to the base year). However, we did not consider that any weight ought to be placed on that as justification for increasing expenditure above the level in the base year as the costs involved in business ownership changes, such as legal expenses, shareholder communications and meetings, re-branding, management reorganisations and the like are not recurring costs.

We noted that Jemena had underrun the approved level in the A & O expenditure category in the first three years of the present period, that it overran it in the fourth year (the base year) and that it expects to overrun it in the final year (the present year). Taking the combination of O & M and administration and overheads together, they underran the approved level in the base year by a small margin.

On balance, we considered the combination of O & M and A & O costs in the base year to be representative and thus suitable for use in determining the base level of expenditure in the next period for the purpose of this review.

Therefore, our recommended level of base O & M plus A & O is the proposed level less the "margin" of $**[c-i-c]** m, less Jemena's identified "one-off" events ($1.6 m), giving a level of $**[c-i-c]** m prior to: the removal if considered necessary of any further non-recurrent items (of which we identified none); the imposition of any further efficiency gains (of which we did not find a need); the addition of step changes to add any new business costs that are expected to recur annually (which we discuss in section 4.9); and the addition of marketing and other costs that we have not assessed. [53]

Details are given in Table 4.4.

The additional costs being sought by Jemena in its correspondence of 18 December 2009 are not considered as part of our review.

[53] A preferred alternative to this method of determination would be to carry out a detailed, "bottom-up" review of all operating expenditure elements, considering each in detail, reviewing their necessity, scope and timing, obtaining supporting evidence that the costs either have been or will be incurred efficiently (which in essence would require it to be demonstrated that past work was undertaken through competitive procurement processes or at rates that can be confirmed to be competitive market rates; that planned work is based on cost estimates that reflect competitive market rates; that on-costs recover only the verifiable indirect costs of the business and not profit margins and that the returns to the business are matched to the returns agreed by the regulator). For reasons that we have already explained, it was not possible for us to follow such an approach.

Table 4.4: Recommended Level of Base-Year Opex ($2010 m)

	Allowed	Incurred	Jemena's proposal incl. step changes	Recommended base-year level before addn of approved step changes & deductn. of effy gains
O&M base costs d/	82.1	77.9	c-i-c	c-i-c
O&M step changes	-	-	c-i-c	a/
Margin d/	-	-	c-i-c	-
A&O base costs d/	21.9	24.0	24.3	24.3
A&O "one-off" events	-	-	(1.6)	(1.6)
A&O step changes	-	-	.4	a/
Marketing	19.8	6.5	8.2	c/
Government levies	3.7	3.1	3.1	c/
UAG b/	10.4	12.5	12.6	c/
Carbon costs	-	-	.0	c/
Self insurance	-	-	2.5	c/
Debt raising	-	-	.0	c/
	137.9	124.0	131.3	**c-i-c**

a/ Considered later in this report.

b/ The volume of UAG as a percentage of gas receipts is reviewed later in this report but the projected level of expenditure on UAG is not.

c/ For determination by the AER.

d/ Considered together when determining recommended level.

4.9 Proposed Step Changes

Jemena has factored step changes into its forecast level of operating expenditure that it claims affect its future expenditure and are not reflected in its present costs. Most of these occur between the base year and the start of the next period. Jemena states that they represent changes in both its operating environment and its regulatory obligations. The proposed step changes total $4.1 m p.a. or $20.5 m over the next period before the addition of escalation and, potentially, they continue indefinitely thereafter.

The effect of the step changes proposed by Jemena is to add approximately 4.4% to average operating expenditure in the next period compared to our recommended level for the base year.

The step changes are mostly the result of business decisions made by Jemena, not decisions made exclusively in response to external factors. [54] Some are proposed on the ground that the base year for some activities does not reflect future expectations: others arise from incremental operating expenditure related to capital investments.

The proposed step changes are reviewed below but we note the following general points. First, in a competitive market, businesses do not normally add to their own costs unless they are satisfied that there is a benefit to customers in terms of the product delivered or to the business in terms of efficiency. Regulation presumably ought to incentivise natural monopolies in a similar way. Second, businesses are dynamic, with variations occurring from year to year. Such variations ought not to form the basis of a claim for a step change, as the effect of that would be to allow costs to be passed on readily in contravention of the efficiency objective implicit in the regulatory framework.

[54] We estimate that only about 40% of the proposed step changes fall fully into that category.

We consider that a methodology such as that used by Jemena that starts with a base year and then applies cost escalators, O & M workload escalators [55] and step changes (which apart from some adjustments made elsewhere for abnormal items in the base year and for work that is discontinued [56] are all additional costs) without any explicit consideration of business efficiency improvements or potential cost savings is likely to lead to a forecast of future costs that is above an efficient level.

The criteria that we propose when considering Jemena's step changes are set out below. They are for application in parallel with demonstration by the business: (a) that it has adjusted its base-year expenditure to remove items that were abnormal or will clearly not recur and to add items that would normally be present; and (b) that the step changes do not duplicate any allowances for workload escalation or inflation in the next period that have been applied separately.

For a step change to be accepted, the business should then be able to demonstrate that:

(a) it is related to a fundamental change in the business environment arising from external factors or offset by cost efficiencies in other areas; or
(b) it is attributable to the imposition of new or changed obligations due to external factors including, if relevant, mandated improvements in service levels (an extension of the interpretation of (a) above); or
(c) it is of a type that will improve (as opposed to maintain) service levels voluntarily as opposed to being mandated – in respect of which customers' willingness-to-pay for the improved service should be demonstrated (a further extension of the first criterion); or
(d) it will bring cost savings or benefits to customers – in respect of which, the business should be able to demonstrate that: (i) it is continually looking for better ways of using its resources and improving its processes and systems to improve service levels or achieve cost efficiencies; (ii) it has defined the savings and benefits in terms of their nature and the expected time if their realisation; and (iii) where the savings and benefits are quantifiable, they have been quantified in sufficient detail for cost-benefit analyses to be prepared and that the cost-benefit analyses justify the investment; or
(e) alternatively, if it does not meet any of these criteria, the business has demonstrated that it will continue to operate efficiently as a whole, despite the cost increase.

Allowance for Productivity Savings

IT Capex and Step Changes in Business and IT Opex

Jemena states in its IT Strategic Plan, "The step changes delivered by capital investment in new [IT] systems equate to a net 1% financial gain year on year over from 2010/11 to 2014/15. The financial benefits are realised by a reduction in the work required to maintain and support ageing systems as they are progressively replaced with externally supported systems at a lower comparative cost. There are new systems introduced to replace manual and labour intensive operations. However, the marginal increase in work effort is

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[55] Page 81 of the AAI states "the level of JGN's market expansion and growth in customer connections drives increases in its outsourced O & M activity".

[56] The discontinued items that we noted were the discontinued field operations and activities reported by Jemena in its response of 16 November to question 12. They comprised the discontinuation of appliance testing, the discontinuation of periodic testing of MP and LP regulators, the abandonment of a planned survey of boundary regulators (and its replacement with a replacement programme), a reduction on repairs costs for mains shorter than 12 metres, and a change in disconnection policies where the disconnection is temporary. The savings were not quantified but are assumed to have been adjusted for in Jemena's proposed base-year level of expenditure. (These changes in field operations and activities are separate from changes in direct costs driven by full-time equivalent employees and from changes in direct costs driven by the proposed step changes (which include additional FTEs).

outweighed by the retirement of ageing systems giving a net financial gain. Part of the financial benefit is realised due to the economies of scale provided by natural and planned business growth." [57]

This adjustment is not listed as a step change in appendix 6.3 to the AAI and we have not attempted to verify that it has been incorporated in the proposed levels of operating expenditure in the next period.

No Other Allowances for Productivity Gains

Apart from adjustments for the discontinued field operations discussed above, we could not find any indication that Jemena has allowed for other specific improvements in organisational efficiency or productivity in its proposal.

We considered whether there was any overlap of the operating expenditure programme with the proposed capital expenditure programme (or whether there were possible trade-offs between the two that had not been recognised by Jemena) but did not identify any matters of that type in our discussions. That may have been because individual projects and programmes were generally not identified by Jemena. However, we recognised the normal prospect of changes in work practice being made over the next period and in efficiencies arising and considered that general prospect when assessing the proposed step changes.

Assessment of Proposed Step Changes

The proposed step changes were discussed at our meeting with staff in October and additional information was provided subsequently in response to the AER's queries and ours.

For the avoidance of confusion, the changes are referred to in the discussion below by their reference number in appendix 6.3 to the AAI. [58]

Safety Assessments and Safety Management Studies

Step changes 1.2 and 1.3 relate to new or increased requirements for safety assessments and safety management studies in relation to certain types of pipeline. The step change therefore appears to meet the criteria that we have set out above.

The need appears clear in principle but the method of assessment of cost assumes the addition of four full-time employees for these tasks in addition to the cost of workshops.

No evidence is provided to demonstrate that the additional employees are needed exclusively for these tasks, that it is not possible for the work to be undertaken by existing staff through the re-prioritisation or re-allocation of their tasks or that the proposed additional staff will not fill other un-stated functions as well. To the contrary, responses from Jemena received on 16 November state that "JAM resources support multiple assets" and that "common resources are used to provide these services". [59]

In addition, Jemena notes, "Time writing is being implemented within JAM to track and monitor time allocation". It is not clear to us how an assurance of efficient labour use and an assessment of additional labour unit requirements can be given in the absence of a history of time recording or accompanying analysis. [60]

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[57] Section 4.7 of the IT Strategic Plan.

[58] There is no mention in appendix 6.3 of the $20 m one-off reduction in fees, from which we infer that this item is subsumed in the base year level of opex.

[59] The quotations are taken from Jemena's response to question 14.

[60] *Ibid*.

There is no mention of whether the costs will be sustained indefinitely or only temporarily or whether there will be a diminution in the requirement over time. [61]

The same comments are relevant to all the proposed step changes that are said to require, when other labour reallocations are included, 11 additional FTEs.

We therefore consider that the need for the proposed expenditure on additional FTEs in relation to this step change (and in relation to all other step changes involving proposed additional FTEs) is not demonstrated sufficiently and, in our calculations, we have removed their cost.

In relation to the workshops, we accept that they are an appropriate tool but no detailed substantiation of the daily rates per head proposed for them has been given. If the rates relate to wages, salaries, on-costs or overheads, we consider that they have already been recovered through the WOBCA or through the budget for O & M expenses. If the costs relate to the incidental costs of running the workshops, the claimed cost of $0.25 m p.a. for these step changes appears excessive. We therefore recommend that the workshop costs be agreed to but at a reduced level. In the absence of detailed information, we recommend that the AER accept half the requested level of expenditure in respect of them.

Impacts Stemming from Pipeline Operators, Producers and Shippers

Step change 1.4 relates to impacts stemming from pipeline operators, producers and shippers and is said to be caused by a separation of functions within the industry. Assuming so, and if it is accepted that this is a matter driven by external factors, then the step change might meet the criteria that we have set out above. However, it does not arise from technical causes and thus we have not examined it further.

JAM Staff Training

Step change 1.5 relates to additional training that is said to be necessary to reduce or avoid instances of non-conformance with the business's safety and operational plan, its occupational health and safety obligations and its environmental obligations. We were advised during our meeting with staff that this work had been out-sourced by the previous owner of the business but the results were not considered satisfactory and thus it has been decided to re-build an internal training team for the purpose. That suggested to us that the step change might not be permanent, or that it might decline over time, and that it included an element of "catch-up".

No details were provided of the composition of the costs, the supporting argument being in essence that the amount requested is the difference between the amount considered necessary and the amount included in the base-year level of operating expenditure.

There was no mention of whether the costs will be sustained indefinitely or only temporarily or of any savings that might be effected elsewhere in the organisation to allow existing technical staff to deal with part or all of these tasks or of any reduction in the task though improvements resulting from the training.

In addition, it is not clear to us that this training is a matter driven by external factors or that it will improve service levels (as opposed to maintaining them) and so the step change does not appear to meet the criteria that we have set out above.

In light of these factors, we recommend that this step change be rejected.

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[61] It could be added that the rates per employee appear high, given that some are designated "junior"; and it is not stated whether the rates are base salaries alone or if they include labour on-costs or overhead allocations. If the latter are included, there may be double counting, as overheads are recovered separately through Jemena's whole-of-business cost allocation (WOBCA) model.

Short-Term Trading Market

Step change 1.6 relates to claimed additional commercial management costs said to be caused by amongst other things a separation of functions within the industry. Assuming so, and if it is accepted that this is a matter driven by external factors, then the step change might meet the criteria that we have set out above. However, it does not arise from technical causes and thus we have not examined it further. (We draw the AER's attention to the fact that the cost of this proposed step change is related to additional FTEs and our comments on additional FTEs earlier in this section of the report may be relevant.)

"Gas Make Whole" Project [62]

Step change 1.7 appears to relate to costs that are consequent on the changes that have occurred in the ownership of the business and the separation of some of its functions. However, it is not clear from the explanations given in appendix 6.3 to the AAI that the stated costs are certain, the inference being only that they are "likely". [63]

The circumstances suggest to us that the step change might not be permanent, or that it might decline over time. However, there was no mention of whether the costs will be sustained indefinitely or only temporarily or of any savings that might be effected elsewhere in the organisation to allow existing staff to deal with part or all of these tasks.

The cost increase is said to arise from a proposed additional FTE and our comments in relation to additional FTEs made earlier in this section of the report may be relevant.

In short, the step change appears to relate to an internal and transitional matter and so does not appear to meet the criteria that we have set out above.

In light of these factors, we recommend that this step change be rejected.

Additional Regulatory Reporting Activities

Step change 1.8 relates to regulatory reporting activities and appears to be a matter for the AER's consideration. However, we draw the AER's attention to the fact that the cost of this proposed step change is related to the partial addition of a FTE and our comments on additional FTEs earlier in this section of the report may be relevant.

Inspection of Exposed Mains

Step change 1.9 relates to a proposed increase in the inspection of exposed mains. It is considered necessary by Jemena on the ground that the present inspection methods are ineffective.

The reason is plausible but the cost estimate of 333 sites at a cost of $1,500 each is unsubstantiated, other than by the statement that 20% of it is labour, 35% is traffic control and 45% of it relates to plant hire.

The circumstances suggest an element of "catch-up" and suggest to us that the step change ought to decline over time.

It is not clear to us that this work is a matter driven by external factors but it could possibly be argued that it will lead to an improvement in service levels (as opposed to maintaining them) and thus comply with the criteria set out above.

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62 Also referred to by Jemena as the "GASS Make Whole" project.

63 The actual statement made reads, "There is a major change to the business and it is likely that there has been a systematic under-delivery of daily business to accommodate the [Gas Make Whole] project". The meaning of this statement is not clear to us but the reference to "likely" is noted.

On balance, whilst recognising an element of doubt, we consider it appropriate to recommend acceptance of this item.

Repairs to Exposed Mains

Step change 1.10 relates to additional repair work anticipated from the increased level of inspection under the preceding item. However, the proposed annual estimate is based on the costs expected at three identified sites, plus a small allowance for *ad hoc* minor repairs.

No substantiation of the proposed costs was provided although 15 sites were listed for attention and remedial work during the next period.

No evidence was provided to demonstrate that the costs of the three identified projects are representative of other potential work under this heading.

We consider the amount estimated under this step change generally reasonable in relation to the particular projects cited (although we could not reconcile the need for repair at only three major sites with the large number of inspections cited in support of expenditure under step change 1.9, casting further doubt in our minds in relation to that step change).

In addition, the circumstances suggest an element of "catch-up" and suggest to us that the step change ought to decline over time.

It is not clear to us that this work is a matter driven by external factors but it could be argued that it will lead to an improvement in service levels (as opposed to maintaining them) and thus comply with the criteria set out above.

On balance, whilst recognising an element of doubt, we consider it appropriate to recommend acceptance of this item.

Encroachment

Step change 1.11 relates to the encroachment of urban development on trunk and primary mains routes but it is not clear to us why this constitutes a new item for the business, as opposed to "business as usual". If the work can be interpreted as the latter, then the allowances for growth in the escalation formula for O & M costs should be sufficient without the need for this step change.

A further point is that the costs relate to an additional FTE; there was no mention of any savings that might be effected elsewhere in the organisation to allow existing staff to deal with part or all of any such related tasks; and our comments earlier in this section of the report in relation to additional FTEs are relevant.

In light of these factors, we recommend that this step change be rejected.

Re-Coating of Receiving, Regulating and Off-take Stations

Step change 1.12 relates to the proposed re-coating of external surfaces at trunk receiving stations, primary regulating stations and packed off-take stations of which there are approximately 25, 26 and 13 in number respectively. According to the asset management plan (AMP), the stations are generally around thirty to thirty-five years old. The proposal is to attend to forty of these during the next period.

A major "clean-up" is said to be required in place of the spot repairs carried out in recent years. The reason appears plausible but the estimate includes internal support costs that may be recovered through the WOBCA model.

It is not stated that the proposed costs are net of the cost of the spot repair programme that Jemena presently undertakes and that will be reflected in the base-year level of operating expenditure.

Furthermore, it is not clear to us that this is a matter driven by external factors or that it will improve service levels (as opposed to maintaining them) and so the step change does not appear to meet the criteria that we have set out above.

In light of these factors, we recommend that this step change be rejected.

Pressure Vessel Repairs

Step change 1.13 relates to the need to remove certain pressure vessels from their pits for inspection. Work at seven sites is cited as the basis of the estimate but the work is said to be "ongoing".

The matter appears to be related to external factors to an extent but not entirely. If this view is accepted, then the step change would meet the criteria that we have set out above partially. However, the cost estimate is unsubstantiated and the circumstances suggest to us that the step change might reduce over time in light of further experience.

After consideration of these factors, we recommend that costs be accepted but at a reduced level. In the absence of detailed information, we recommend acceptance of half the proposed level of expenditure.

Water Bath Heaters

Step changes 1.14 and 1.15 relate to the cost of overhauling water bath heaters. It is claimed that a step change is required because this is a new type of asset in the network but ten installations have been introduced in the present period.

It is claimed that six-monthly overhauls (which presumably have been carried out in the present period and therefore will be reflected in the proposed base-year level of O & M) need to be increased in sophistication and that five-yearly overhauls will need to commence. The annual cost of the former is said to be $16,000 and the annual cost of the latter $45,000.

No substantiation of the cost is provided. In its absence and because assets of this type are already installed in the system, we consider that the allowances for growth in the escalation formula for O & M costs are sufficient without the need for this step change.

Costs Related to Special Meter Readings

Step change 1.16 relates to special meter readings. If it is accepted that this is a matter driven by external factors, then the step change might meet the criteria that we have set out above. However, it does not arise from technical causes and thus we have not examined it further. (We draw the AER's attention to the fact that the cost of this proposed step change is related to additional FTEs and our comments on additional FTEs earlier in this section of the report may be relevant.)

Compliance with New Data Requirements

Likewise, step change 1.17.

AMA Contract Management

Step change 1.18 is stated to relate to management of the asset management agreement between Jemena and JAM. The new agreement is said to require active management and additional resources are said to be required for this task – $273,000 p.a. – but no commensurate benefit is cited. [64]

[64] Jemena stated, when commenting on our draft report on 20 January 2010, that the margin paid to JAM under the previous O & M arrangements in 2008-09 was higher than that under the AMA and that it thus considered there was a commensurate benefit.

We question the necessity and cost-efficiency of proposing two additional FTEs for management of this contract, given its stated simplicity and transparency and the other overheads proposed in relation to it.

In addition, there is no mention of whether the costs will be sustained indefinitely or only temporarily.

We note also that the cost relates to the addition of FTEs and our comments on additional FTEs earlier in this section of the report are relevant.

In summary, we do not consider that this item meets the criteria that we have set out above and we therefore recommend that it be rejected.

Conclusion in Relation to Step Changes

In reaching our conclusion in relation to the proposed step changes (and having reviewed each of them as discussed in the preceding text in this section of the report), we noted that the absence of substantiation of the forecast costs could be considered a ground for rejection of most or all of them. However, we accepted that several were related to external events or that they met the other criteria set out above and thus met our test of acceptability.

In several cases, however, we considered the level of additional labour proposed failed to take account of possible efficiencies within the business and its related parties as a whole or failed to demonstrate that such efficiencies are not possible. Further, we noted that no detailed assessment of labour requirements generally within the business and its related parties had been provided in support of the stated need for additional FTEs. We therefore considered that the proposed increases in FTEs should not be assessed in isolation and that they ought to be reduced in the absence of adequate substantiation of need.

We have proposed various other adjustments for the reasons stated in this section of the report.

We acknowledge that, where reductions have been recommended, we did not have sufficient data to make a calculation but have relied instead, after consideration of the facts, on a level that we consider reasonable between the upper bound in each case (the amount proposed by Jemena) and the lower bound (rejection, based on inadequate substantiation of need or cost).

For convenience, we summarise the proposed step changes and our recommended levels of expenditure in relation to each of them in Table 4.5. The adjustments are before the application of real cost escalators. [65]

4.10 Conclusion re Base-Year Level of Expenditure

In concluding our review of Jemena's proposed operating expenditure in the next period, we noted again that, as presented by Jemena, everything hinges on the reasonableness of the base-year level of expenditure and that careful scrutiny of the proposed step changes and adjustments between the base-year level and the proposed level in the first year of the next period is essential if costs in the next period are not to be above efficient levels.

We noted again the lack of disclosure of details of the cost, nature and scope of the proposed projects and programmes in the next period and the consequential lack of ability to confirm the reasonableness of those aspects.

[65] An alternative method of assessment (which we did not adopt because we considered it less robust) would have been to accept all the proposed step changes and then propose an efficiency improvement target for the business.

We noted again that we were unable to consider the reasonableness of the unit rates and costs that one would expect to have been applied in the build-up of the expenditure estimate as none was disclosed.

We noted again the lack of reconciliation of costs and the accompanying questions that surround the reasonableness of the overhead allocations and profit margins that have been added to the expenditure estimate.

We noted again that cost efficiency is not demonstrable unless the costs are of measurable inputs struck at market prices, contain an appropriate level of market testing, do not include additional cost allocations or margins other than those that are demonstrated to be appropriate and reasonable, and can be related to measurable or observable outputs.

We therefore recommend that:

(a) the base-year level of operating expenditure be set at $**[c-i-c]** m as shown in Table 4.4 at the end of section 4.7 of this report prior to the addition of step changes and those items for determination by the AER without review by us; and that

(b) adjustments be made in the requested level of technical step changes, as shown in Table 4.5.

4.11 Roll-Forward Escalation

We did not examine the reasonableness of the escalation factors assumed for labour, materials and other input costs as other expert opinion has been tabled in relation to them. However, we considered the methodology for escalation reasonable except that the composition of the "general escalation factor" [66] appears to be inappropriate. As proposed, this escalator is the numerical average of the escalators of aluminium, steel, plastic and concrete. The influence of aluminium and concrete appears high for a gas distribution network. We tested a combination of 85% plastic, 14% steel and 1% cast iron (not that we claim any accuracy in those percentages) to see what impact a change would have but found that the impact was immaterial. Given the lack of materiality, no adjustment is proposed in this regard.

Matters for the AER's Consideration

We note, however, the following matters for the AER's consideration in relation to roll-forward escalation.

(a) The escalation factor attributed to growth is contingent on the assumption of a high rate of growth in demand and a commensurate increase in network assets (through the addition of new connections and consequential work) but if the forecast rate of growth is not realised, operating expenditure will have been over-estimated.

(b) The requested reconciliation of the costs of Jemena and its related parties ought to demonstrate that no errors have arisen through the application of cost escalation factors to capital expenditure and to operating expenditure separately.

(c) No increase is planned in the size of JAM's work force in the next period in relation to the direct costs of asset management, asset strategy, engineering and operations, the response centre and the control centre, [67] but that there may be an increase in the work force in relation to the direct costs of field operations and through the proposed step changes (although we have recommended that the additions to the work force under the latter heading be rejected).

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[66] So described in Jemena's forecast data model.

[67] Discussion on 16 December.

Table 4.5: Step Changes

	Section in AAI Apndx 6.3	Proposed Annual Cost ($)	Addnl FTEs etc	Cost Attrib. to Addnl FTEs etc ($)	Summary of the Adjustment (see main text for full details)	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Formal safety assessments	1.2	400,000	2	220,000	Remove addnl FTEs and adjust	90,000	90,000	90,000	90,000	90,000
Safety management studies for primary mains and trunks	1.3	300,000	2	240,000	Remove addnl FTEs and adjust	30,000	30,000	30,000	30,000	30,000
Effects of upstream changes in pipeline, shipper & producer actions	1.4	20,000			Non-technical: not assessed	c/	c/	c/	c/	c/
Increase in staff (JAM) training	1.5	400,000			Reject	-	-	-	-	-
Implementation of STTM	1.6	300,000	2	300,000	Non-technical: not assessed	c/	c/	c/	c/	c/
'Gas Make Whole' project	1.7	90,000	0.9	90,000	Transitional; and remove FTE	-	-	-	-	-
Addnl activities on reg. accounts	1.8	50,000	0.3	30,000	Non-technical: not assessed	c/	c/	c/	c/	c/
Inspection of exposed mains	1.9	500,000			Accept	500,000	500,000	500,000	500,000	500,000
Repair of exposed mains	1.10	400,000			Accept	400,000	400,000	400,000	400,000	400,000
Mains encroachment	1.11	125,000	1	125,000	Reject	-	-	-	-	-
Painting (re-coating) of receiving, regulating and off-take stations a/	1.12	520,000			Reject	-	-	-	-	-
Pressure vessel repairs	1.13	300,000			Accept at reduced level	150,000	150,000	150,000	150,000	150,000
Existing water bath heater overhauls	1.14	60,000			Reject	-	-	-	-	-
Future water bath heater sites	1.15	113,000			Reject	-	-	-	-	-
Addnl telecom costs associated with increased volume of special readings	1.16	37,000			Non-technical: not assessed	c/	c/	c/	c/	c/
Total ($2009)		3,615,000		1,005,000		1,170,000	1,170,000	1,170,000	1,170,000	1,170,000
Total ($2010) b/		3,705,375		1,030,125		1,199,250	1,199,250	1,199,250	1,199,250	1,199,250
Prep. of materials for ongoing compliance w new NGR data rqmts	1.17	152,000	0.33	152,000	Non-technical: not assessed	c/	c/	c/	c/	c/
AMA contract management	1.18	273,000	2.5	273,000	Non-technical: not assessed	c/	c/	c/	c/	c/
Total ($2010)		4,130,375	11.03	1,455,125		1,199,250	1,199,250	1,199,250	1,199,250	1,199,250

Source: AAI, Appendix 6.3. (Note: there are errors in Table 1 in that appendix: the amounts in some lines are juxtaposed.)

a/ Includes trunk receiving stations (TRS), primary regulating stations (PRS) and packaged off-take stations (POTS).

b/ The inflation factor applied by Jemena was 2.5%.

c/ Not assessed by us.

5 Capital Expenditure in Present Period

5.1 Summary of Expenditure

Capital expenditure in the present period is projected to be $556.6 m compared with $563.4 m approved by IPART in the last decision, a decrease of $6.8 m or 1.2%. A breakdown of the expenditure by its main categories is shown in Table 5.1.

Table 5.1: Capex in Present Period *vs.* Decision ($2010 m)

		FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Total
Market expansion	Allowed	63.2	62.1	60.8	61.1	61.6	**308.8**
	Incurred	49.7	40.4	41.9	48.9	53.9	**234.8**
	Variance	(13.5)	(21.7)	(18.9)	(12.2)	(7.7)	**(74.0)**
System reinforcement, renewal & replacement	Allowed	69.1	46.4	43.1	26.8	19.7	**205.1**
	Incurred	47.7	90.7	46.7	39.6	47.8	**272.5**
	Variance	(21.4)	44.3	3.6	12.8	28.1	**67.4**
Non-system assets	Allowed	9.2	9.2	9.2	10.6	11.2	**49.5**
	Incurred	2.2	.7	19.7	12.8	13.9	**49.3**
	Variance	(7.0)	(8.5)	10.5	2.2	2.7	**(.2)**
Total	**Allowed**	**141.5**	**117.7**	**113.2**	**98.5**	**92.5**	**563.4**
	Incurred	**99.6**	**131.7**	**108.3**	**101.3**	**115.6**	**556.6**
	Variance	**(41.9)**	**14.0**	**(4.9)**	**2.8**	**23.1**	**(6.8)**
		-30%	**12%**	**-4%**	**3%**	**25%**	**-1%**

Source: AAI, p. 49, Table 4.8. Figures may not add due to rounding.

There was a significant underrun of $74 m on market expansion expenditure, which is said to be related to a substantially lower number of new customer connections than forecast.

There was a significant overrun of $67.4 m in system reinforcement, renewal and replacement expenditure, which is said to be related to higher than forecast expenditure on: replacement and renewal of ageing high pressure facilities; the primary loop security of supply project; mine subsidence mitigation projects; and the upgrading of high pressure facilities required by the increase in operating pressure in the Moomba-Sydney pipeline. This was said to be partially offset by lower expenditure on system reinforcement projects due to substantially lower than forecast utilisation of the network and the deployment of low differential pressure district regulators to increase the capacity of the existing system and defer reinforcement work. [68]

There was no material variation in expenditure on non-system assets in total although there was a variation, evident in the table, in its timing.

Table 5.2 shows the variances by expenditure sub-category, excluding non-system expenditure, which we deal with separately.

We discussed the expenditure with Jemena staff at the October meeting. We inquired about the impact of the Sydney primary loop project on other works proposed for the current period

[68] Source: AAI, p. 50.

but deferred within the period or into the next. We asked Jemena to quantify the effect on expenditure of the lower growth in the current period.

Table 5.2: Variances in Network Expenditure ($2010 m)

	Allowed	Incurred	Variance	Pctge
Market expansion	308.8	234.8	(74.0)	-24%
Capacity development	42.5	30.8	(11.7)	-27%
Total growth-related capex	351.3	265.6	(85.7)	-24%
Security of supply a/	58.1	96.5	38.4	66%
Mines subsidence b/	1.2	21.7	20.5	1682%
Mains & services renewal	22.4	26.6	4.2	19%
Facilities renewal & upgrade	18.9	38.0	19.1	101%
Meter renewal & upgrade	49.8	56.0	6.2	13%
Govt authority work	12.2	2.7	(9.5)	-78%
	162.6	241.5	78.9	48%
Total	**513.9**	**507.1**	**(6.8)**	**-1%**
Total excl. market expansion	205.1	272.3	67.2	33%

Source: AAI, appendix 7.3, Table 5.1 of PB report (AAI appendix 7.4) and responses to questions. Figures show actual expenditure to Feb. 2009, estimated thereafter, and may not add due to rounding.
a/ The Sydney primary loop project.
b/ Gross expenditure, before recoveries.

We sought business cases for major capex projects in the current period to confirm their necessity, optimality and cost effectiveness but received only a brief summary of salient points without supporting details.

We reviewed the Parsons Brinckerhoff capex report [69] submitted by Jemena in support of its claim that the current period capex is complying expenditure.

We asked for an explanation of the variances. In response, Jemena identified the main projects responsible, citing 28 projects involving expenditure of over $1 m each and giving summarised reasons for the changes in their scope and timing. [70]

The projects were not classified by expenditure category but in many cases, we were able to deduce the classification. No information was provided about costs. Jemena also provided a list of 17 capex projects in the current period, indicating in outline the options considered for each, the cost of the options and a brief statement on risk assessment. This was in response to our request for the business cases of each of the major programmes proposed in the present period, sufficient to demonstrate: the necessity; optimality in terms of the work being the least-cost solution to the perceived need; and cost-effectiveness of implementation. However, no business cases were provided and the information on costs that was provided was minimal. [71]

5.2 Market Expansion Expenditure

Background

AGL Gas Networks (AGLGN), Jemena's predecessor, forecast an increase in customer numbers over the present period of 177,574 and a market expansion capex of $248 m in FY

[69] Appendix 7.4 to the AAI.

[70] The information referred to was provided on 16 November 2009 (Table 1).

[71] The document referred to was provided on 27 November 2009 (document number AA10-SA-74502).

2005 dollars ($286 m in FY 2010 dollars). [72] [73] This equated to an average rate of $1,394 per customer connected in FY 2005 dollars ($1,611 in FY 2010 dollars). On review, IPART's consultant, Energy Consulting Group (ECG), recommended acceptance of the unit rates for mains expansion except for the rate for new homes, for which it recommended an adjustment from $102 m to $76 m in FY 2005 dollars; acceptance of the unit rates for service connections of $655 in FY 2005 dollars; and adjustment of the unit rate for meters from $451 to $399 in FY 2005 dollars. The reduced total recommended was $233 m in FY 2005 dollars ($269 m in FY 2010 dollars) for the current period.

After considering advice from MMA, IPART increased the forecast gas consumption and the forecast number of customer connections to 205,589 over the current period in its draft decision. AGLGN revised its expenditure forecast in response to IPART's decision and the revised forecast was reviewed by ECG, who recommended, in total, a market expansion capex of $268 m in FY 2005 dollars ($308.8 m in FY 2010 dollars), which IPART accepted in its final decision.

Variances

Expenditure incurred in the present period is forecast to be $234.7 m, representing an under-expenditure of $74.1 m or 24%. The breakdown of the variance is set out in Table 5.3.

Table 5.3: Variances in Market Expansion Expenditure ($2010 m)

		FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Total
Mains	Allowed	14.7	13.7	12.1	12.1	12.1	**64.8**
	Incurred	11.4	8.0	9.3	10.2	13.8	**52.7**
	Variance	(3.3)	(5.7)	(2.8)	(1.9)	1.7	**(12.1)**
Services	Allowed	29.4	29.1	29.3	29.4	29.6	**146.8**
	Incurred	22.7	20.6	21.8	26.0	28.3	**119.4**
	Variance	(6.7)	(8.5)	(7.5)	(3.4)	(1.3)	**(27.4)**
Meters	Allowed	19.0	19.2	19.4	19.6	20.0	**97.2**
	Incurred	15.6	11.7	10.8	12.7	11.8	**62.6**
	Variance	(3.4)	(7.5)	(8.6)	(6.9)	(8.2)	**(34.6)**
Total	**Allowed**	**63.1**	**62.0**	**60.8**	**61.2**	**61.6**	**308.8**
	Incurred	**49.7**	**40.3**	**41.9**	**48.9**	**53.9**	**234.7**
	Variance	**(13.4)**	**(21.7)**	**(18.9)**	**(12.3)**	**(7.7)**	**(74.1)**

Sources: ECG April 2005 review of AGLGN's response to draft decision and Jemena's responses to questions in December 2009. Figures may not add due to rounding.

Jemena states in its AAI that the under-expenditure on market expansion in the current period arises from the lower number of actual connections made, which Jemena estimates to be 127,855 for the period compared to the anticipated connections of 205,589, a reduction of 38%. [74] However, the percentage reduction in volume was greater than the percentage reduction in cost, indicating that the rate per connection increased in relation to the rate recommended by ECG at the time of preparation of the decision. Table 5.4 summarises the figures and indicates the unit costs and their variance.

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[72] Source: ECG's report of 30 August 2004 on AGLGN's proposed access arrangement.

[73] FY 2005 dollars have been converted to FY 2010 dollars using a factor of 1.156, representing an average compounded inflation rate of 3% p.a.

[74] Jemena states on p. 3 of its AAI that "prior to the 2004 draft decision, IPART's consultants had strongly queried the basis of JGN's assumptions about the effects of NSW Government policy on gas hot water usage. As a result, JGN increased its demand forecast to meet the consultant's opinions… Actual demand for 2005-09 has fallen short of JGN's original forecast and is significantly lower than IPART's allowed forecast."

Table 5.4: Implied Unit Rates for New Connections ($ FY 2010)

	Allowed	Incurred	Variance
Mains	315	412	31%
Services	714	934	31%
Meters	473	490	4%
Total	1,502	1,836	22%

Jemena advised that its market expansion unit rates ranged from $1,450 to $2,890 for volume customers [75] and we note that the incurred total rate falls within the range indicated in the table above.

Jemena noted in its presentation to the AER on 16 October 2009 that market expansion unit rates had increased due to changed ground restoration requirements (after laying pipes) and traffic management costs that had not been forecast. It stated, "Over the current access arrangement period, improvements to the methodology for completion of some component elements of market expansion work have been offset by increases in other component areas. Specifically, savings have been achieved through ensuring competition between meter suppliers to maintain low meter costs [and] increased use of common trenching, lowering main and service installation unit costs for new estates. These savings have been more than offset by higher-than-forecast construction costs due to clarification, in 2006, of the responsibilities within the OH&S Act, higher-than-forecast construction costs due to the construction CPI being higher than the normal CPI, [and] increased council restoration rates." Based on our experience in Australia and New Zealand, we accepted that gas (and electricity) distribution businesses have experienced higher costs in the last seven years or so, due to the factors mentioned (increased restoration costs, additional traffic management requirements and higher costs generally).

Jemena commissioned Parsons Brinckerhoff (PB) to review its capex in the current period. In relation to market expansion expenditure, PB commented that Jemena's documentation "provided clear explanations for the variation between forecast and actual expenditure" and said that "The main driver for higher costs per connection than forecast was costs for obtaining approvals and compliance with developer requirements during connection of services", a reason different from that given to us by Jemena. [76]

Conclusion

In conclusion, noting ECG's original concern regarding some of the unit rates and notwithstanding PB's view of the reasonableness of the incurred costs but in the absence of a quantitative statement of the effects of the various cost-increasing factors and in the absence of detailed cost information (which could be expected to show a considerable variance in the cost of new connections in different circumstances but which could also be expected to disclose the amount of any capitalised overheads or capitalised profit margins arising from the related parties to whom or through whom the work was outsourced) we considered the expenditure reasonable in terms of scope and nature but are not able to attest to its cost efficiency.

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[75] Source: Jemena presentation to the AER of 16 October 2009.

[76] The document that PB referred to was "*JGN distribution market expansion unit rates – FY 05 to FY 10, Revision A*". It was not provided by to us.

5.3 Other Network Expenditure

Composition

Other network expenditure included capacity development (which, together with the market expansion expenditure just discussed is categorised by Jemena as growth-related expenditure), security of supply (which comprised only the Sydney primary loop project), expenditure to remedy damage to pipelines caused by mines subsidence, expenditure on the renewal of mains and services, expenditure to renew and upgrade facilities other than pipelines, expenditure to renew and upgrade meters and work for government authorities (mainly the relocation of assets on transport corridors).

Background

ECG reviewed AGLGN's forecast capex for other network expenditure for IPART in 2004 under various headings. [77] In relation to reinforcement, renewal and replacement work, eight of thirteen key projects identified by AGLGN were reviewed, along with historical cost performance data on minor unspecified projects. The recommended level of expenditure in this category was $36.2 m in FY 2005 dollars, a reduction of $8.7 m from AGLGN's forecast level. The recommended level included $10.9 m for a major project in North Turramurra deferred from the previous period and $25.3 m for "typical non-major projects".

In relation to programmed rehabilitation work, ECG noted (p. 69) that AGLGN "[had] not identified any specific risk relating to any of the remaining un-rehabilitated networks" and added, "the condition of such mains does not normally suddenly deteriorate. Integrity issues are generally managed through maintenance while a long-term strategy is developed". It added that AGLGN had not supported the renewal programme with asset condition key performance indicators "to show trends over time… which may justify an accelerated replacement program" and it calculated reduced levels of expenditure in some instances.

In regard to the Sydney Primary Loop project, ECG noted (p. 72) that "the implementation of this project would achieve a level of security for Sydney comparable to that currently available in Victoria" and added "the project is necessary to maintain safety and integrity of the system", recommending acceptance of the project without reduction in its [then] cost estimate.

IPART accepted ECG's recommendations in both its draft and final decisions and set an allowance equivalent to $205.1 m in FY 2010 dollars, as shown in Table 5.2.

Variances

Expenditure incurred in the present period in these categories is forecast to be $272.3 m, an overrun of $67.2 m or 33%. This was shown in Table 5.2, along with the variances in each expenditure sub-category. We examine the variances by sub-category in the following text.

Capacity Development

Expenditure on capacity development is forecast to be $30.8 m, an underrun of $11.7 m or 27%. The expenditure is growth-related and the underrun appears to be attributable to the same reasons as the reduction in expenditure on market expansion. It is also of almost the same amount in percentage terms.

PB did not comment specifically on the costs or rates of the works undertaken in this category.

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[77] Quotations attributed to ECG in this section of the report are taken from ECG's report of 30 August 2004 on AGLGN's proposed access arrangement.

Our conclusion is the same as that set out at the end of section 5.2 above in relation to the expenditure on market expansion, *viz.* we considered the expenditure reasonable in terms of scope but are unable to attest to its cost efficiency.

Security of Supply

The Sydney primary loop project is the only item in this expenditure category. The project entailed laying approximately 30 km of 550 mm diameter pipe on a second route in parallel with the Sydney main trunk pipeline between Horsley Park and Tempe. Work on trunk receiving stations and primary receiving stations was included. The project was undertaken primarily for risk mitigation.

Provision for the project was made in the previous period but the work was deferred because the preferred route became unavailable. The project was reviewed for IPART by ECG in 2005 and its acceptance was recommended at an estimated cost of $51.6 m in FY 2005 dollars ($58.1 m in FY 2010 dollars). IPART accepted the recommendation without adjustment.

The reported cost of the project on completion was $96.5 m in FY 2010 dollars, a cost increase of $38.4 m or 66% above the allowance.

The project was reviewed by PB as part of its capex review in the present period. Section 5.3.1 of PB's report [78] summarises the reasons for undertaking the project and concludes that the project, as constructed, was the most effective risk mitigation option at the least cost in terms of net present value.

PB's opinion (p. 23) is that "JGN acted prudently, efficiently and in accordance with good industry practice, in investigating the construction of the SPL and, following consideration of various risk mitigating options and alternative solutions and configuration, had selected the least cost risk mitigation solution".

PB notes (p. 24), "JGN entered into various contractual arrangements to deliver the program of works. Pipes, pipe coating, ALBVs, pressure regulating stations, horizontal directional drilling and other items were procured by a combination of lump sum and schedule of rates. PB did not review the documentation of the reasons for adopting this combination of procurement methodologies and the resultant overall benefits. However, PB considers that JGN's standard procurement policy "which is followed for all projects, ensures the resources have been procured at the lowest sustainable cost".

In reviewing Jemena's revised estimate undertaken in 2005 prior to the works proceeding but after the IPART allowance was set, PB notes (*ibid*) that "The revised 2005 cost estimate was $91.3 million" and that it "found the cost estimating process is robust and the difference in the cost estimate is mainly due to changes in scope of the project and pipeline routes". It found that "the project was delivered to budget, with the actual project cost of $88.8 million in 2007/08 dollars, being within 10% of the forecast estimate of $97.4 million in 2007/08 dollars ($91.3 million in 2004/05 dollars)"

No business case or quantitative detailed cost data was provided to enable us to verify the business case or to consider the reasonableness and efficiency of the construction costs for the work as built.

No quantitative assessment of the risk reduction benefits was provided, although we acknowledge that IPART, after taking engineering advice, considered the proposed project to be appropriate not only in the present period but also in the preceding period.

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[78] '*Review of Jemena Gas Networks capital expenditure, 2010/11 - 2014/15 access arrangement period*', August 2009.

Again, therefore, we were able to find the work reasonable in scope but are unable to attest to its cost efficiency.

Mines Subsidence

Expenditure to repair damage to pipelines caused by mines subsidence is forecast to be $21.7 m, an overrun of $20.5 m or around twenty times the level foreseen. This is before the deduction of recoveries, if any, from other parties in respect of the damage.

PB suggests (p. 20) that the scope and impact of mine subsidence work was not clearly understood or defined at the time of the cost review in 2004 and that only a minimal allowance had been made for it.

The work appears necessary but the question arises: why should the expenditure be capitalised if, as we presume, no new assets were created or the lives of existing assets, when repaired, were not thereby extended? We therefore consider that this expenditure should not be added to the regulatory asset base, although there ought to be a mechanism for the business to recover its efficient costs.

Renewal of Mains and Services

Expenditure on the renewal of mains and services is forecast to be $26.6 m representing an over-expenditure of $4.2 m or 19%. We noted that ECG had reduced AGLGN's forecast for this work by the equivalent of $25.7 m in FY 2010 dollars on the ground that AGLGN had not identified specific risks relating to those remaining parts of its network that had not already been rehabilitated. [79]

In its October 2009 presentation to the AER, Jemena noted in relation to the over-expenditure in this category that work had been required, because of customer complaints about poor service, in areas not accepted in the 2004 review. PB noted the same (p. 20).

We identified five projects related to this work from the list of overruns provided by Jemena and were satisfied that the expenditure arose through assessments of network condition and was reasonable in terms of scope. However, once again, the lack of information made verification of cost efficiency impossible. [80]

Renewal and Upgrading of Other Facilities

Expenditure on the renewal and upgrading of other facilities corresponds to the "fixed plant" category in the 2005 decision. It includes capital expenditure at primary and terminal receiving stations, on district regulator sets, on cathodic protection equipment and on the installation of additional valves. The forecast expenditure in this category is $38.0 m compared with the allowed level of $18.9 m, an over-expenditure of $19.1 m or 101%.

In its AAI, Jemena states that the overrun arises from "higher-than-forecast expenditure on ...replacement and renewal of ageing high pressure facilities [and] upgrade of high pressure facilities required by [the Moomba-Sydney Pipeline] pressure upgrade". [81] Further explanation was provided in the October presentation to the AER where Jemena noted that only a limited scope of work had been allowed for in its 2003/04 estimates and that

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[79] We do not agree with ECG's view, expressed in 2004-05, "Although the cast iron and galvanised steel mains in question are long-term assets and are considered by AGLGN to be more than 50 years old, the condition of such mains does not normally suddenly deteriorate. Integrity issues are generally managed through maintenance while a long-term strategy is developed". Our experience is that whilst management through maintenance can work for a while, leakage rates can increase rapidly.

[80] The point discussed in section 6.2 relating to the capitalisation of ad-hoc renewal (repair) of mains and services may be relevant to the present period as well.

[81] See the AAI, section 4.4.

significant additional work had been required to address key issues that included asset age, availability and spare parts support, compliance issues, etc.

The principal reason for the overrun appears to be the under estimation of costs in 2003/04.

Based on the descriptions of eight relevant projects in Jemena's list of overruns and on detailed information on the replacement of district regulator sets, we were satisfied that the work was reasonable in scope and timing. However, for reasons already explained we are not able to attest to its cost efficiency.

Renewal and Upgrading of Meters

Forecast expenditure on meter renewal and upgrading is $56 m compared to an approved level of $49.8 m, an overrun of $6.2 m or 13%.

The accepted initial life for a residential meter, before the verification of its accuracy is required, is 15 years. In its AMP, Jemena notes that prior to 2006, it operated under a statistical sampling plan approved by the Department of Fair Trading and that the plan allowed a 10-year life extension to be assigned to meter populations that had passed sampling tests of accuracy. It says that the introduction of AS/NZS 4944:2006 *"Gas meters – in-service compliance testing"* in 2006 allowed meter life extensions of 1, 3, or 5 years, depending on the test results, not more. This change, during the current period, makes comparison between the allowed expenditure and the incurred expenditure in residential meter replacement problematic.

In Jemena's October presentation to the AER, it noted in relation to industrial and commercial meters, "We have experienced a 40% increase in meter replacement in these categories" and, "In the case of residential gas meters and water meters we have experienced a 30% increase in replacement of defective meters".

Jemena provided a table of unit costs for meter replacements but no meter replacement volumes or incurred cost information to allow us to analyse the volume and cost variances.

Again, therefore, we were able to find the work reasonable in scope but are unable to attest to its cost efficiency.

Work for Government Authorities

Expenditure on work for Government authorities (mainly relating to the relocation of assets) is forecast to be $2.7 m, an underrun of $9.5 m or 78%.

We have no comment to make, other than to conclude that obviously, the original budget was not required fully and to note again that the expenditure we have assessed is gross expenditure, before the deduction of any capital contributions. [82]

5.4 Other Considerations in Relation to Network Expenditure

Documented Current Practices

When considering the level of network-related capital expenditure incurred in the present period we took into account Jemena's stated capital expenditure planning and approval processes and its expenditure "governance" processes, all of which are described briefly in the AAI.

We considered from the documents and our meeting with staff that the business's technical documentation was sound and that its engineering management was knowledgeable in

[82] PB did not review this item other than to note its variance and the difficulty of its estimation.

relation to the network and its needs. We considered that the present AMP – we did not review the 2003 AMP – was well structured [83] and noted that it includes performance levels, a capacity development plan, life-cycle plans for particular asset classes, risk assessments and a plan for compliance with the relevant technical standards. We thus considered the AMP to be suitable, in a general sense, for the prudent management of the assets, our only observation in relation to it being – and this is related solely to our review, not to the management of the assets – that it (the AMP) did not have a close connection with the cost of the proposed work and thus did not assist us in verifying the optimality of the various projects and programmes of work.

However, we noted that, in general, the documents describe the business's present practice, not its practice in the earlier years of the present period or in preceding years.

Any conclusions to be drawn from the present documents in relation to practices in earlier years of the present period can thus only be inferred.

Parsons Brinckerhoff Report

We noted (and have already referred to) PB's 2009 report [84] in which a high-level prudence and efficiency review of Jemena's capital expenditure in the present period was carried out prior to Jemena lodging its proposed access arrangement in August 2009. We noted that PB also analysed two selected projects in the present period in detail.

We noted that PB's terms of reference [85] were limited in that it was asked to "review two JAM documents: the historic (sic) expenditure report which sets out capital projects and expenditure JAM has undertaken or will undertake for JGN during 2005/06 to 2009/10; and the JGN asset management plan for 2010/11 to 2014/15 which sets out JAM's proposed capital expenditure plans and asset management practices relating to the management, review and approvals of capital expenditure; and provide an opinion as to whether these documents provide a reasonable basis for JGN to determine its conforming capital expenditure (as provided for in rule 79(1)) made and to be made, respectively, under the National Gas Rules".

We reviewed PB's methodology and findings and noted that the assessment of prudence and efficiency comprised, in essence, four tests: the effectiveness of the asset management and investment processes and capital expenditure governance; an inter-business high-level benchmarking of capital expenditure; a direct review of the historical expenditure under the main categories; and a detailed review of a sample of two projects, the Sydney primary loop project (due to its cost impact) and rehabilitation of the Bathurst low pressure network, identified by PB as being typical of such works.

In respect of capital expenditure and governance processes generally, PB found (p. vi) that "JGN's governance **processes** [our emphasis] are robust and provide a sound framework for assessing/making expenditure decisions. The Asset Management Plan clearly sets out agreed performance targets and life cycle management planning as would be expected of a prudent and efficient service provider."

In respect of the high-level benchmarking exercise, PB stated, "[the exercise] indicated that JGN's expenditure compares well against a group of similar operators around Australia." It acknowledged, "While by itself benchmarking is not evidence of prudent or efficient expenditure, it enables significant differences from the industry norms to be identified and investigated. PB's opinion (p. vi) is that JGN's capex during the 2005-10 periods (sic)

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[83] It states that it generally follows the guidelines set out in the *International infrastructure management manual* but we did not attempt to verify that.

[84] See footnote 78.

[85] See the appendix to its report.

reflects the expenditure of a prudent and efficient operator, complying with rule 79 of the NGRs."

In relation to capital expenditure in the present period, PB stated (*ibid*), "The actual Capital Expenditure over the current period is 5.7% less than the value agreed by IPART in 2005 as a result of variation in expenditure across categories. There were also differences in the value of spending in each regulatory area; however, the reasons for these differences are documented appropriately. It is PB's opinion that the expenditure has been **managed** [our emphasis added] in a prudent and efficient manner". In addition, "Where detailed assessment of completed projects has been undertaken, PB found that the projects have been **developed and delivered** [our emphasis added] in an efficient and prudent manner. Where actual project costs have exceeded forecast costs, a review of the factors contributing to the higher expenditure provided adequate explanation. The post implementation review for the Sydney Primary Loop highlighted significant changes in the scope for the project which were not included in the IPART approved expenditure."

In our view, however, the benchmarking of capital expenditure is generally of limited relevance, as capex ought to be determined by the particular requirements of the network concerned, is affected by long-term planning considerations that are difficult to account for in a benchmarking exercise and is characterised by "lumpiness" in the expenditure profile that may distort comparisons taken at a particular time.

Of more importance, however, we infer from PB's wording that its review focussed more on the adequacy of processes than on the efficiency of the expenditure incurred and to that extent we were not able to rely on its findings when carrying out our review.

We did not consider PB's conclusion that that the expenditure conforms to the Rules or the *Gas Code* as that is a matter for the AER to determine.

In short, we consider that the arguments advanced by PB tend only to demonstrate prudence in the manner in which the works were identified, planned and executed but do not demonstrate efficiency, which in our opinion would require either a "bottom-up" appraisal of the costs incurred or identification of wholly competitive processes in tendering the work. In addition, a justification and reconciliation of any capitalised overheads or profit margins that have been added to the expenditure would need to be provided.

5.5 Non-Network Expenditure

Non-network expenditure in the present period comprised expenditure on plant and equipment, vehicles, IT, land, buildings, leasehold assets and access arrangement infrastructure totalling $49.3 m compared with the allowance of $49.6 m. A breakdown of the expenditure is in Table 5.5. [86]

[86] The source of the figures stated in the table is noted in the footnote to the table but in its response to the AER of 1 December 2009, Jemena cited different figures for IT capex in the period, totalling $25.2 m of approved IT expenditure and a forecast $28.9 m of incurred IT expenditure. We were not able to resolve this discrepancy before concluding our report but it appeared that the $25.5 m approved figure may be expressed in FY 2005 dollars, equivalent in FY 2010 dollars to the $29.0 m cited by us in the table. The discrepancy in the figure for incurred expenditure is not material and may arise from more up-to-date data.

Table 5.5: Non-Network Expenditure in Present Period ($2010 m)

		FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	Total
Plant and Equipment	Allowed	1.2	1.2	1.2	1.2	1.2	**5.8**
	Incurred	.4	.1	.0	.1	1.5	**2.1**
	Variance	(.8)	(1.1)	(1.2)	(1.1)	.3	**(3.7)**
Motor Vehicles	Allowed	2.3	2.3	2.3	2.3	2.3	**11.5**
	Incurred	1.7	.6	1.7	4.0	1.7	**9.7**
	Variance	(.6)	(1.7)	(.6)	1.7	(.6)	**(1.8)**
IT	Allowed	5.7	5.8	5.8	5.8	5.8	**29.0**
	Incurred	.1		12.5	7.0	7.1	**26.7**
	Variance	(5.6)	(5.8)	6.7	1.2	1.3	**(2.3)**
Land, Buildings & Leasehold	Allowed	.0	.0	.0	.0	.0	**.0**
	Incurred			5.5	.2	1.5	**7.3**
	Variance	.0	.0	5.5	.2	1.5	**7.3**
Access Arrangement	Allowed				1.4	2.0	**3.3**
	Incurred				1.4	2.0	**3.5**
	Variance	.0	.0	.0	.0	.0	**.2**
Total	**Allowed**	**9.2**	**9.2**	**9.3**	**10.7**	**11.2**	**49.6**
	Incurred	**2.2**	**.7**	**19.7**	**12.8**	**13.9**	**49.3**
	Variance	**(7.0)**	**(8.5)**	**10.4**	**2.1**	**2.7**	**(.3)**
		-76%	**-92%**	**112%**	**20%**	**24%**	**-1%**

Source: AAI, appendix 7.3. Figures may not add due to rounding.

Whilst the net variance between incurred expenditure and allowed expenditure is immaterial (-1%), there are variances within programmes both in timing and cost.

IT Expenditure

Background

Expenditure on IT is the largest component of non-network expenditure. The IT capex proposed by AGLGN for the current period was $27.9 m in FY 2005 dollars ($32.3 m in FY 2010 dollars). In its review, ECG noted that there were "no business plans … for a number of projects, nor are there any clear off-sets in the operating and maintenance expenditure justifying the significant increase in IT expenditure" and it recommended an expenditure level of $25 m in FY 2005 dollars ($28.9 in FY 2010 dollars) for the projects with identified business needs, plus an allowance of $1.2 m p.a. for unspecified system enhancement. IPART accepted ECG's recommended level of expenditure in its draft and final decisions.

Incurred IT expenditure underran the allowance for the period by $2.3 m or 8%. However, two observations are needed in relation to this underrun:

- no IT expenditure is reported in the first two years of the period; [87] and
- replacement of the GASS system and the introduction of a geographic information system (GIS), both of which were allowed for in IPART's decision, were not undertaken in the present period, although preparatory work for their introduction in the next period may have been undertaken. [88]

[87] Jemena stated in its response to the AER of 1 December 2009 that this appeared to have been due to the separation from AGL and that IT costs appeared to have been under-reported in those years. It noted, "It would be reasonable to assume that higher costs associated with JGN's allocation of AGL corporate IT costs would have been recorded however JGN is unable to demonstrate such costs. Comprehensive record keeping commenced only under Jemena ownership".

[88] Jemena states in its response to the AER of 1 December 2009 that the allowance (in FY 2005 dollars) for GIS implementation was $3.2 m but the allowance for GASS replacement was "not specifically referenced" which we infer to mean not specifically stated.

Jemena did not provide any significant information on its IT expenditure in the present period in its AAI. However, in response to questions, Jemena provided on 1 December 2009 an outline of this expenditure and our assessment is based on that information.

Amongst other things, the information received in December confirmed that rather than immediately replace the GASS system, a decision was taken to modify it to prolong its life and to increase its efficiency.

It is noted that this work was undertaken "through a broader program of work involving separation from AGL".

Jemena states that "only the portion of the cost of the project specifically involved in increasing GASS efficiency and prolonging its life was claimed by JGN" (we infer this to mean that only that portion is included in the expenditure reported to us for assessment and shown in the table above).

Jemena also states, "Given the organisational focus on the separation from AGL, the GIS project was unable to commence".

Jemena states in its 1 December 2009 response that following the ownership transition, "significant new [IT] investment has taken place, including:

- new IT infrastructure platforms for all JGN systems;
- the porting of the GASS application system from an expensive to operate IBM mainframe platform compared to a lower cost IBM AIX platform; and
- re-development of significant components of the GASS system to simplify the application making it more efficient and easier to maintain".

Jemena provided with its 1 December response a list of the main IT projects carried out in the present period, including those just mentioned, indicating briefly the options considered and the business cases. However, the information was provided only in outline: no details, business cases or detailed statements of cost were provided.

We consider it reasonable to say that the changes of ownership of the business that occurred during the present period may well have dictated the actions that took place in preference to those foreseen at the time of the decision in 2004. However, the AER may wish to note and satisfy itself in relation to the following points.

- Expenditure made in the present period to modify a system (GASS) that is to be replaced in the next period may need to be written off when the new system is implemented.
- Expenditure is being requested in the next period for projects for which a regulatory allowance was made in the present (the GASS and the GIS).
- Of the reported expenditure – *viz.* that which was sent for our examination and summarised in the table above – as much of it as is related to the sale and purchase of the business or to its subsequent reorganisation may need to be removed from the regulatory accounts on the ground that there is no commensurate benefit to customers.

Details of cost allocations over the existing period and a reconciliation of all costs related to IT in Jemena and its related parties in the present period would appear to be needed to address these points.

In conclusion, we can observe only that the IT expenditure **may** have been reasonable but that we are not able to verify that or attest to its cost efficiency.

Motor Vehicles

AGLGN originally forecast $12.1 m in FY 2005 dollars ($14.0 m in FY 2010 dollars) for capital expenditure on vehicles in the present period. ECG recommended to IPART that this

be reduced to $9.8 m in FY 2005 dollars ($11.5 m in FY 2010 dollars) after considering historical expenditure and noting, with reference to AGLGN's forecast, that "many vehicles are retained longer than the forecast four years [and] there is no material change to current work practice". ECG's recommendation was accepted by IPART in both its draft and final decisions. [89]

Incurred expenditure on vehicles is forecast to be $9.7 m, an underrun of 16%. Jemena has not given reasons for the under-expenditure and we did not make further enquiry.

We consider the expenditure reasonable.

Land, Buildings and Leasehold

No allowance appears to have been made for expenditure in this sub-category (land, buildings, etc) in the decision but the incurred expenditure is forecast to be $7.3 m. Jemena advises that the "overspend" was due to consolidation of its depots, site offices and control centre, none of which was forecast.

Insufficient information is available for us to assess this item.

Plant and Equipment

The AGLGN forecast for plant and equipment expenditure in the current period was accepted by IPART and the forecast level of incurred expenditure of $2.1 m will underrun the allowance by $3.7 m. Given this and the routine nature of the work, we considered the expenditure reasonable without further enquiry.

Access Arrangement Expenditure

We noted that Jemena forecasts expenditure on access-arrangement-related matters in line with IPART's allowance. Other than querying why such expenditure ought to be capitalised, we consider it a matter for examination by the AER.

5.6 Conclusion Regarding Capex in Present Period

A common theme in all the expenditure categories reported in this section is the lack of information available on which to verify the scope, necessity, timing and optimality of the expenditure incurred. In most instances, quantities of routine work were not provided either, making it impossible to verify unit rates.

At best, we have been able to conclude (sometimes by giving Jemena the reasonable benefit of doubt) that the work undertaken was reasonable in scope or appeared so.

However, in no case have we been able to attest to the cost efficiency of the expenditure because of the lack of information on the details, volumes and costs of completed work.

These points have been made repeatedly in the preceding text.

In addition, we note the following points for the AER's consideration in relation to capital expenditure in the present period.

(a) No information was provided to us in respect of Jemena's capitalisation policies, raising a question as to the quantum of indirect costs or profit margins that have been added to the stated levels of incurred expenditure.

(b) In our opinion, the arguments advanced by PB tend only to demonstrate prudence in the manner in which the works were identified, planned and executed but do not demonstrate efficiency. The latter would require the predominant use of competitive

[89] Source: see footnote 72.

processes when tendering the work or a detailed comparison of input costs and outputs sufficient to demonstrate efficiency.

(c) The expenditure incurred to remedy damage to pipelines resulting from subsidence in mines appears necessary but the question arises: why should the expenditure be capitalised if, as we presume, no new assets were created or the lives of existing assets, when repaired, were not thereby extended?

(d) The circumstances relating to expenditure on IT raise the following questions:

(i) Expenditure made in the present period to modify a system (GASS) that is to be replaced in the next period may need to be written off when the new system is implemented.

(ii) Expenditure is being requested in the next period for projects for which a regulatory allowance was made in the present (the GASS and the GIS).

(iii) Of the reported expenditure – *viz.* that which was presented to the AER for examination and is summarised in the tables in this section of the report – as much of it as is related to the sale and purchase of the business or to its subsequent reorganisation may need to be removed from the regulatory accounts on the ground that there is no commensurate benefit to customers.

(iv) Details of indirect cost allocations in the present period and a reconciliation of costs related to IT services in Jemena and its related parties in the present period would appear necessary to address these questions.

(e) It is not clear to us why expenditure related to "access arrangements" should to be capitalised (its inclusion in the schedule of capital expenditure suggests that that is intended).

(f) In all cases, capital contributions or recoveries by or from other parties need to be deducted from the gross expenditure in accordance with the applicable regulatory accounting policies.

Taking all matters reported in this section into consideration and thus concluding that the efficiency of the capital expenditure in the present period is not adequately demonstrated by Jemena, we are able to recommend only that the incurred level of expenditure be accepted as reasonable in terms of scope, subject to the adjustments shown in Table 5.6.

Expenditure on mine subsidence work has been removed on the assumption that it should not be capitalised.

The recommended level for IT work is accepted on the assumption that the business is able to satisfy the AER in relation to the questions in (d) above.

Expenditure in relation to the access arrangement is left for the AER to consider, noting our query in (e) above.

No assessment of any profit or overhead elements that may be included in the reported expenditure is possible as no details were provided.

We have not recommended the lesser of the allowed and incurred levels, as changes in scope make the former inappropriate in most cases.

Table 5.6: Recommended Level of Expenditure ($2010 m)

	Allowed	Incurred	Accepted
Network Capex			
Market expansion	308.8	234.8	234.8
Capacity development	42.5	30.8	30.8
Total growth-related capex	351.3	265.6	265.6
Security of supply	58.1	96.5	96.5
Mines subsidence b/	1.2	21.7	.0
Mains & services renewal	22.4	26.6	26.6
Facilities renewal & upgrade	18.9	38.0	38.0
Meter renewal & upgrade	49.8	56.0	56.0
Govt authority work	12.2	2.7	2.7
	162.6	241.5	219.8
	513.9	507.1	485.4
Non-Nework Capex			
Plant and equipment	5.8	2.1	2.1
Motor vehicles	11.5	9.7	9.7
IT	29.0	26.7	26.7
Land, buildings etc c/	.0	6.6	6.6
Access Arrangement	3.3	3.5	b/
	49.6	48.6	45.1
Recommended Level a/	563.5	555.7	**530.5**

a/ Subject to the qualifications in the main text. Figures may not add due to rounding.

b/ For evaluation by the AER.

c/ A sum of $0.655 m identified in appendix 7.6 to the AAI for the provision of work stations in FY 2010 for additional FTEs has been deducted, consistent with our recommendations on the step changes in opex in the next period.

6 Capital Expenditure in Next Period

6.1 Summary of Expenditure

Capital expenditure in the next period is forecast to be $885.2 m compared with the forecast incurred level in the present period of $556.6 m, an increase of 59%. The increase in market expansion capex is 58%; the increase in system reinforcement, renewal and replacement expenditure is 40%; and the increase in expenditure on non-system assets is 170%. A summary of the forecast expenditure is shown in Table 6.1.

Table 6.1: Forecast Capex in Next Period ($2010 m)

FY ->	2011	2012	2013	2014	2015	Total	Incr. over Present Period
Market expansion	64.7	75.6	80.7	76.8	73.2	**371.0**	58%
System reinforcement, renewal & replacement	82.7	71.4	69.0	69.9	88.0	**381.0**	40%
Non-system assets	25.7	20.1	18.1	34.2	35.0	**133.2**	170%
Total	**173.1**	**167.1**	**167.8**	**181.0**	**196.2**	**885.2**	59%

Source: AAI, p. 116, Table 7.6. Figures may not add due to rounding.

The increase in expenditure from FY 2010, the last year of the present period, to FY 2011, the first year of the next, is particularly noticeable at 50%. Annual increases in subsequent years are more modest, comprising a decrease of 3% in the second year, no change in the third and 8% increases in each of the final two. [90]

Jemena has presented two principal plans that form the basis of its capital expenditure forecast, the asset management plan (AMP) and the IT Strategic Plan.

Jemena states in its AAI that its capital expenditure programme is designed to carry out ongoing renewal and upgrading of its mains and services, to address priority areas with high leakage rates and capacity constraints, to increase capacity to deal with load growth, to accommodate increasing upstream gas operating pressures, to comply with the technical regulatory requirements and to carry out an accompanying IT programme to support the business and optimise IT opex. [91]

Jemena states that it is targeting growth of 50% in gas heating appliance connections. [92] It considers (AAI p. 20) that there is "a substantial opportunity for JGN to invest beyond its current plans and start connecting customers in existing urban areas. Urban in-fill projects have the potential to provide more households with the benefits of natural gas and increase the utilisation and efficiency of the network as a whole".

Jemena states in its AAI that its forecast network reinforcement expenditure is also affected by the forecast demand and that it is based on disaggregated estimates of load growth at a

[90] Asked about the step increase from FY 2010 to FY 2011, Jemena said only that it arose from the inherent "lumpy" nature of capex. Source: response of 16 November.

[91] See the AAI, p. 104.

[92] We were not required to review the demand forecasts but understand that they took account of the potential impact of the recent economic downturn.

localised level for individual local government areas. It states that the performance of the networks at that level is reviewed regularly in order to assess areas of network constraint and forecast the timing of reinforcement work. [93]

Jemena states that project cost estimates are produced at each of the first three stages of its project governance process. These stages are "requirement", "feasibility" and "committed", with the fourth being the business case. A narrowing order of accuracy accompanies the incremental development of each project. The accuracy levels are reported to be ± 50%, ± 30% and ± 10% for the first three stages respectively. [94]

The AMP is accompanied by a table of expenditure by project and programme and by year in appendix 7.6 to the AAI but the stage of estimation of each project or programme is not stated.

The expenditure estimates have been prepared in FY 2010 dollars, then inflated by input real cost escalation factors determined by Competition Economists Group (CEG) and inflated by forecast inflation using the CPI. [95]

We discussed the expenditure generally and several projects in particular with Jemena staff at the October meeting. We sought clarification of the work deferred from the present period to the next and we asked specifically about the reason for the significant uplift in capital expenditure in the next period in relation to the present. Questions were also asked in relation to certain particular items to clarify our understanding of the documentation.

We reviewed the Parsons Brinckerhoff capex report submitted by Jemena in support of its claim that the capex in the next period is expected to be compliant expenditure.

We noted that no business cases or detailed project-related papers were provided other than in respect of one or two particular projects and that the information on costs that was provided was minimal.

We accepted that many of the projects and programmes are presumably still at the formative stage, we noted their general descriptions in the AMP but would have expected that business cases could have been provided for many of them, given that the projects planned for commencement in the first year or so in the next period must already be advanced in their preparation if they are to be commenced on time.

6.2 Network Expenditure

Network-related capital expenditure in the next period is projected to be $752 m, comprised of $457 m of growth-related expenditure and $295 m of expenditure on renewal and upgrading. A summary of the proposed expenditure is in Table 6.2.

Market Expansion Expenditure

Market expansion expenditure is forecast to be $371 m in the next period. It makes up 49% of the network capex and shows an increase of 58% from its level in the present period.

Jemena states that market expansion expenditure is calculated directly from the number of new connections documented in its demand forecast. It states that the volume of mains, services and meters are directly proportional to the forecast of new connections by customer

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93 See the AAI, section 5.10.2.

94 See PB's report in appendix 7.4 to the AAI.

95 CEG's report is given in appendix 6.4 to the AAI. We have not examined the reasonableness of the escalation or inflation escalators.

class and the capex is calculated by applying unit rates of construction to the individual volumes of mains, services and meters by customer class. [96]

Table 6.2: Forecast Network Capex in Next Period ($2010 m)

FY ->	2010	2011	2012	2013	2014	2015	Total in Next Period
Growth							
Market expansion - mains	13.8	16.4	18.7	19.8	18.9	18.0	91.8
Market expansion - services	28.3	34.6	39.9	41.7	39.8	37.6	193.6
Market expansion - meters	11.8	13.7	16.9	19.2	18.1	17.6	85.6
	53.9	64.7	75.6	80.7	76.8	73.3	371.0
Sydney infill project	-	-	-	-	-	-	-
Capacity development	14.1	31.5	16.0	9.5	8.9	20.0	86.0
	68.0	**96.1**	**91.6**	**90.2**	**85.8**	**93.2**	**457.0**
"Stay-in-Business" Renewals & Upgradin	-	-	-	-	-	-	
Security of supply	-	-	-	-	-	-	-
Mains and services renewal	2.9	3.6	9.9	12.3	7.7	5.5	39.0
Mines subsidence a/	1.9	1.7	3.8	-	-	-	5.5
Facilities and SCADA renewals & upgradin	-	-	-	-	-	-	
Facilities	9.9	20.3	17.7	18.3	23.9	28.3	108.6
SCADA	0.4	1.0	1.0	1.1	1.1	1.0	5.1
	10.3	21.3	18.8	19.4	25.0	29.3	113.7
Meter renewals and upgrading	18.0	24.0	22.4	27.1	27.6	32.5	133.7
Government authority work c/	0.6	0.6	0.6	0.6	0.6	0.7	3.1
	33.7	**51.2**	**55.4**	**59.4**	**61.0**	**68.0**	**295.0**
	101.7	**147.3**	**147.0**	**149.7**	**146.8**	**161.2**	**752.0**

Source: Appendix 7.6 to the AAI.
a/ Gross expenditure, before recoveries.
b/ "Facilities" includes valves, regulators and other assets excluding pipework.
c/ Relates mainly to mains relocations.

In response to our request, Jemena provided a table of unit rates for this expenditure and we reconciled the rates with the volume and expenditure data available. We made further enquiries into the method of estimation of the rates in each category (e.g. "electricity to gas", "new estates" and so on) and received details of the calculations (e.g. metres of new main per customer connection, etc). The rates were within the range we expected.

We noted that market expansion expenditure is routine in nature, prudent by virtue of being customer initiated and estimated from customer connection numbers. We therefore considered it reasonable.

We also noted from Jemena's responses of 2 December that 85% of its routine capex is arranged through competitive tender although, as we discuss later, overhead allocations and profit margins are understood to have been applied to all capital expenditure through the related party transactions involved.

Considering these matters, we concluded that the forecast level of market expansion expenditure was reasonable in scope but we are not able to attest to its cost efficiency.

Capacity Development Expenditure

Capacity development expenditure is forecast to be $86 m in the next period. It makes up 11% of the network capex and shows an increase of 179% from its level in the present period.

[96] See the AAI, section 5.10.2.

In its AAI, Jemena states that capacity development projects are identified through its AMP and that its forecast includes an annual budget allocation of $0.1 m p.a. for small projects identified after approval of the AMP each year. [97] Jemena states (p. 113), "External quantity surveyors estimate the costs for about 90 per cent of the projects using the [Jemena pricing model], while the average unit rates are used for the remaining 10 per cent".

We reviewed the capacity development plans in the AMP, noted that it included a summary (Table 3-14) of the planned quantities of works and were satisfied the plans were sufficiently detailed for our purposes and that the planning process was conventional. We noted that options had been considered, although cost information on the options was not provided.

In total, 168 separate projects and programmes are listed under this heading in appendix 7.6 to the AAI. The major projects are the continuation of the Wakehurst Parkway secondary main ($8.3 m) and the Blue Mountains new primary main across the Nepean River at Emu Plains ($7.0 m).

The Wakehurst Parkway secondary main project is part of Jemena's long-term strategy to improve capacity and supply reliability. The project comprises a new secondary main to Warringah to support an increasingly complex and heavily loaded system serving the expanding load in Sydney's northern beaches.

PB noted in its review of this project that options had been considered and that it (PB) was satisfied with the proposed scope and timing of the work. It noted that economic assessments of options were not available for its review. It concluded, "Evidence of economic assessment of the options, or combination of options investigated would have reinforced the case for compliance with Rule 79, however PB accepts that finalisation of the material options available for construction are required before economic evaluation of the options can be reliably completed". It adds, "A basis of cost estimates is required for compliance with Rule 74. PB's opinion (p. 39) is that **the methodology for cost estimation is appropriate** [our emphasis added] for this project and it therefore complies with Rule 74".

Assuming we interpret PB's opinion correctly, it is limited to the cost estimation methodology and thus does not extend to an endorsement of the cost estimate itself.

The Blue Mountains project is intended to provide the capacity needed to connect new customers in the area and to improve the reliability of supply to existing customers. The project includes a new primary reducing station on the western side of the Nepean River.

In its October presentation to the AER, Jemena provided further information in support of these projects, noting that without the planned work, local network pressures were expected to fall to an unacceptable level.

The other projects listed in the appendix are small.

After review, we were satisfied that the scope of the planned works was based on need and that their timing appeared appropriate. We did not receive business cases or detailed technical reports for any of the planned works. Nor did we receive sufficient information to enable us to attest to their cost efficiency.

Renewal and Upgrading of Facilities and SCADA

Expenditure on the renewal and upgrading of SCADA and facilities is forecast to be $114 m in the next period. It makes up 15% of the network capex and shows an increase of 199% from its level in the present period.

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[97] The amount could be considered a contingency, although it is normal to budget in this way for minor works, so we accepted it.

In total, 91 separate projects and programmes are listed under this heading in appendix 7.6 to the AAI. The biggest project is the replacement of district regulator sets (DRS) throughout the network at $14.8 m. This project was discussed in detail with Jemena in order for us to be satisfied that the proposed expenditure was a cost-effective solution to the problems outlined by staff at our meeting. We concluded that although the cost per unit was high at approximately $100,000, and although no cost breakdown was provided to check the estimate, we accepted that the proposed solution, although expensive, was appropriate.

Upgrading of packaged off-take stations (POTS) and water bath heaters on the Marsden-to-Dubbo and Junee-to-Griffith laterals at $7.6 m to accommodate the higher operating pressures on the Moomba-to-Sydney pipeline were also listed and were discussed. We understand that the pressure increases are planned to take place in the next period. [98]

We noted that expenditure on terminal receiving stations (TRS) is expected to involve mainly the upgrading of older stations approaching 40 years in age and we considered the work prudent.

Other works in this category appeared conventional and we noted that they were supported by life-cycle plans in the AMP. However, the final item in the list in appendix 7.6, the "Reverse Gas Flow - Wollongong to Wilton (Licence 2)" project has the "detailed" description: "Cost to maintain the integrity of the asset outweighs the return on capital. Licence 2 pipeline could be better utilised by hauling gas from EGP pipeline at Wollongong to JGN Licence 1 pipeline at Wilton". We considered that this item needed further explanation. The expenditure involved is $15.6 m and we recommend that it be deleted unless Jemena is able to clarify its purpose and cost efficiency.

Related to "Integrity Digs" and "Integrity Management"

Several projects listed in appendix 7.6 were described as "integrity digs on pipelines, generally following condition analysis from pigging". The expenditure forecast is $13.7 m over the next period. It is presented as capital expenditure but does not appear to relate to the addition of a new asset or to remedial work that would extend the life of an existing asset and we therefore consider that it ought not to be added to the regulatory asset base but expensed. [99] [100]

The item "Integrity Management of Sydney Loop – Horsley Park – Tempe" appeared to be similar in nature. The forecast expenditure on that item is $3.9 m over the next period. The documents did not describe the nature of the work being planned.

We recommend that these items be removed from the capital expenditure forecast and not added to the regulatory asset base, although there ought to be a mechanism for the business to recover its efficient costs. [101]

Conclusion

After considering these points and removing the items of expenditure so discussed, we were satisfied the scope of the planned works, in general, was based on need and that its timing was appropriate. However, insufficient information was provided to enable us to attest to the cost efficiency of the expenditure.

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[98] Upgrading of POTS under the "Riverina HP facilities upgrade project, stage 2" of $7.6 m project is included.

[99] At least one other gas distribution business classified this type of work as opex.

[100] The AER identified five additional instances when commenting on our draft report that should possibly be treated similarly but we did not have time to investigate them.

[101] We considered if they ought to be regarded as subsumed in the base-year level of opex or treated as a step change. Noting that they are not caused by an external event and noting that a network-growth-related escalation factor is applied to the bas-year level of operating expenditure to increase the latter as new network assets are added, we recommend the former (that these items be considered subsumed in the base-year level of opex).

Meter Renewals and Upgrading

Expenditure on meter renewals and upgrading is forecast to be $134 m in the next period. It makes up 18% of the network capex and shows an increase of 139% from its level in the present period.

In total, 17 separate projects and programmes are listed under this heading in appendix 7.6 to the AAI. The main programmes include the replacement of aged industrial and commercial meters ($23.5 m) and regulators ($16.8 m), the replacement of aged residential meters ($39.4 m), regulators ($10.6 m) and water meters ($10.7 m), the replacement of defective residential meters ($5.7 m), regulators ($5.7 m) and the replacement of "106" regulators ($8.4 m). These account for $120.8 m or 90% of the forecast expenditure in the metering category.

Jemena states in its AAI that meter renewal and upgrading is a high-volume, routine activity with costs based on forecast volumes and unit rates. It notes that forecast volumes are based on the life expectancy of various types of meter and that data is available from its GASS system on their numbers.

Aged Residential Meter Replacement

Concerning aged residential meter replacement ($39.4 m), Jemena notes in its AMP that a new statistical sampling standard came into force in 2007 that, together with other circumstances, limits life extensions to 5-year increments. The life extensions are acceptable if satisfactory results are obtained from statistical testing of meter populations.

Jemena states that it has now adopted a policy of allowing only one 5-year life extension to the meter life of 15 years, giving a maximum life of 20 years, compared with its previous policy of allowing a 10-year life extension. It assumes that its meters will pass the statistical sampling tests to allow a 5-year extension. The reasons it gives for its change in replacement policy are that, in its view, the repeated extension of lives is likely to lead to increased numbers of meters registering less accurately and that it anticipates that large numbers of new meters may be manufactured to lower standards or installed to lower standards.

We do not agree with the reasons put forward by Jemena for its accelerated replacement policy for residential meters, as there is no reason why a further life extension should not be countenanced if the sampling tests are passed, replacement meters of inferior quality should not be bought and installation work of inferior quality should be rejected.

We noted that no business case had been presented by Jemena outlining the costs and benefits of its proposed change in replacement policy.

We consider a 20- to 25-year life reasonable for residential gas meters. We accept that meters are not all of the same design or operate in the same environment but it is reasonable to assume that only a portion, not all, will require replacement after 20 years. We consider that a gas distribution business, acting prudently and efficiently, would allow for this and we therefore recommend that the residential aged meter replacement expenditure forecast be reduced in volume.

We are unable to calculate the reduction required as no information on the age profile of the meter population (or on adjusted remaining lives after testing) was provided. No information was provided on special factors, if any, applicable to particular types of meter.

In addition, calculation would require a view to be formed on the portion of the meter population as a whole that could reasonably be expected to fail a second sampling test. No information was provided on that matter either.

In the absence of that information, we have estimated the reduction by assuming a level of expenditure equal to the average of the upper and lower bounds, recommending that the

amount involved ($39.4 m) be halved in relation to volume. The adjustment could be reconsidered if the business provides the missing information.

Concerning the unit replacement cost of the meters, we reviewed Jemena's residential meter replacement rates and found them comparable with those of other gas distribution businesses. However, because of the lack of detailed cost data, we are not able to attest to the cost efficiency of the expenditure.

Aged Residential Regulator Replacement

Concerning aged residential regulator replacement ($10.6 m), Jemena's AMP states that particular types of regulator are known to have deficiencies and that they are to be replaced in a planned manner in conjunction with the planned residential meter replacement work. Horizontal diaphragm regulators installed prior to 1996, which are prone to internal corrosion, were cited in particular. We were satisfied that the planned replacements are prudent. [102]

Concerning the unit replacement cost of the regulators – $50 per unit – we considered it typical of prevailing rates in the industry. However, because of the lack of detailed cost data, we are not able to attest to the cost efficiency of the expenditure.

Defective Residential Meter and Regulator Replacement

The replacement of defective (as opposed to aged) residential meters ($5.7 m) and regulators ($5.7 m) is clearly prudent work and normal business practice and we noted that the forecast expenditure in the next period on this item is of a similar level in each year to the level in FY 2010. [103]

We were surprised to see that the unit rate for replacement of defective meters was lower than for the unit rate for planned meter replacements and were advised by Jemena this arose because “statistical sampling costs were not involved”. [104]

Because of the lack of detailed cost data, we are not able to attest to the cost efficiency of the expenditure.

Residential Aged Water Meter Replacement

The next category of expenditure relates to the replacement of water meters used in multiple unit dwellings ($10.7 m) to enable charges to be made for energy delivered from central gas-fired hot water heaters. We understand that there is no mandatory replacement age for these meters.

Jemena stated in its AMP that its practice has been to replace these meters on failure but that it now proposes to replace them in a planned manner at 25 years of age. It noted that meters older than 25 years exhibited “degraded” performance.

On review and in light of Jemena's stated experience, we accepted that a 25-year life for these meters was appropriate.

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[102] We noted the statement that the deficient regulators would be replaced “in conjunction with the planned residential meter replacement work” and considered whether that ought to cause us to amend our view in relation to the meter replacement expenditure dealt with in the preceding item. However, we concluded that if joint replacement were a sufficient reason (and if the aged meters and defective regulators did coincide with each other), then all of that ought to be explained and substantiated in the business case for the work or in equivalent technical documentation and that no such documentation had been received.

[103] See the table in appendix 7.6 to the AAI.

[104] It was not clear to us why sampling costs would be capitalised and added to the regulatory asset base under the other meter replacement expenditure categories but we were not able to clarify their extent in order to remove them.

We considered the reported unit replacement cost of $92 to $150 reasonable but were unable to reconcile the expenditure stated in appendix 7.6 with the quantities set out in table 4-54 of the AMP and the reported unit replacement rate. Clarification was not available at the time of reporting.

In the absence of a detailed statement of quantities and costs, we are unable to attest to the cost efficiency of the expenditure.

Industrial and Commercial Aged Meter Replacements

Jemena classifies industrial and commercial meters by their type –diaphragm, rotary or turbine. Industrial and commercial meters are subject to the same rule in relation to age before testing as the other gas meters discussed in this report but Jemena states in its AMP that it elects to refurbish or replace turbine meters at 5-yearly intervals, rotary meters at 10-yearly intervals and diaphragm meters at 15-yearly intervals to ensure metering accuracy on the larger loads experienced in this market category and to reduce the incidence of loss of supply due to rotary meter failure. Meters are refurbished where economic and the age profiles provided in its AMP show in-service meter ages of up to 35 years.

Jemena noted its experience with older rotary meters that deteriorate in accuracy due to un-repairable wear. [105] It proposes a policy of refurbishing rotary meters once only, giving a maximum life of 20 years. [106]

Concerning turbine meters, Jemena notes a number of design issues with its current stock and states that a substantial number are likely to register gas consumption incorrectly due to over-sizing arising from customers' reduced gas consumption or to "incorrect" pipe configurations where turbine meters have replaced rotary meters in the past. It states that the forecast expenditure is based on continuing to "down-size" meters to match gas consumption and to replace meters of old design with new turbine or rotary meters. It notes that this will increase the capital expenditure in this category over the next period but that it will result in lowered capital demands in subsequent periods, as the refurbishment cycle will be increased to 10-years for meters of this type.

PB reviewed this expenditure programme in its report and we noted that it considered the project drivers, scope of work, and timing appropriate. PB noted that unit costs for the work are based on the experience of past works but did not offer an opinion on the efficiency of the rates. It noted, "JGN's case for compliance with Rule 79 could be better supported by a discussion on the potential reduction in unaccounted-for-gas and/or operating costs compared with the increased capital expenditure of replacing the industrial and commercial meters at a greater frequency than statutory requirements". However, it concluded, "PB considers that the basis of cost estimates is reasonable, and therefore complies with Rule 74, however recommends that the presentation of the information be improved". [107]

We infer PB to mean that more information on these matters should have been provided by Jemena to demonstrate the appropriateness and cost efficiency of the proposed expenditure.

Likewise, we would have expected Jemena to underpin its proposed strategy and expenditure in this area with technical details of the programme and details of the targeted improvement in meter accuracy, the targeted reduction in UAG and the targeted improvements in other performance measures but no such information was received.

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[105] The AMP notes that the refurbishment of rotary meters is limited to replacement of bearing sets, cleaning and calibration.

[106] We note from the age profile information in the AMP for these meters that there are a number older than 20 years that would presumably need to be replaced under such a policy but the charts did not lend themselves to further analysis.

[107] AAI, appendix 7.4, p 36.

For these reasons, the lack of technical data and detailed cost data, we are not able to attest to the cost efficiency of the expenditure ($23.5 m).

Industrial and Commercial Aged Regulator Replacements

In relation to industrial and commercial regulator replacements, Jemena states in its AMP that the regulators are identified when the meter is replaced. No other detail is provided on this expenditure of $16.8 m.

We are therefore unable to form a view on its prudence or cost efficiency.

Industrial and Commercial Defective Meter Replacement

The replacement of defective (as opposed to aged) industrial and commercial meters ($0.3 m) is clearly prudent work and normal business practice and we noted that the forecast expenditure in the next period on this item is of a similar level in each year to the level in FY 2010. [108]

However, because of the lack of detailed cost data, we are not able to attest to the cost efficiency of the expenditure.

Replacement of "106" Regulators

At the October presentation to the AER, Jemena stated that the programme for replacement of "106" regulators ($8.4 m) arose from an incident in 2008 that identified a problem with this type of regulator that allowed gas to escape. Jemena described its response to it and we accepted that the work was prudent. Jemena advised that the unit cost of replacement was approximately $200 and we were satisfied that it reflected the work involved.

However, because of the lack of detailed cost data, we are not able to attest to the cost efficiency of the expenditure.

Other Metering Projects and Programmes

The remaining 10% of expenditure on metering renewals and upgrading is accounted for by projects that appear routine in nature and we accepted them as reasonable but because of the lack of detailed cost data, we are not able to attest to their cost efficiency.

Mains and Services Renewal

Expenditure on the renewal of mains and services is forecast to be $39 m in the next period. It makes up 5% of the network capex and shows an increase of 47% from its level in the present period.

In total, 19 separate projects and programmes are listed under this heading in appendix 7.6 to the AAI. The main programmes are "ad-hoc mains and services renewal" at $**[c-i-c]** m and "Warringah programmed mains and services area renewal" at $6.3 m, together accounting for a third of the expenditure.

Ad-Hoc Mains and Services Renewal

In relation to ad-hoc mains and services renewal, Jemena indicated that renewal works of greater than 12 metres in length are capitalised and projects are justified by risk assessments including the cost of repairs, the number of leaks, the alternative solutions available, safety and the level of service. [109] We were advised that expenditure in this category is mainly on older cast iron and steel mains and services that are still to be rehabilitated. In that sense, it

[108] See the table in appendix 7.6 to the AAI.

[109] Presentation to the AER on 16 October 2009.

appears to be more repair work in nature, rather than renewal, with no significant improvement in the *value* of the asset base.

Jemena was asked to provide additional information and justification for the programme, given the increase in level from the present period. In reply, it stated in its response of 16 November, "The increase in 'ad-hoc mains and services renewal' is directly related to the historic[al] 'negative step change' in mains repair volumes. The change in focus comes from JAM belief that the sound technical solution satisfying economic drivers, public perception and safety comes from the replacement of mains on capex rather than repeated calls to a section of main to effect repairs. The reduction in opex counters the increase in capex". The mix of technical and accounting reasons in the explanation is confusing but we take the reply to mean that the business has decided to replace more leaky mains, rather than patching them up. The explanation appeared to confirm our view that the work is in essence more repair work than renewal.

The capitalisation of repairs – by and large, all repairs to leaks entail the replacement of some pipework – raises several issues.

- The rationale for charging replacements up to 12 metres to revenue and replacements of 12.1 metres or more to capital is unclear. Surely, only one treatment is correct, and whichever it is it should apply regardless of length.
- If the value of old pipes has not been restated to reflect their depreciated replacement cost, then capitalising the replacements will increase the regulatory asset base and allowed profit.
- If the repairs are capitalised but the area of the network concerned is then rehabilitated as a whole (as would appear likely, given their nature), the repaired pipes may be abandoned along with the rest of the network. If so, the capitalised value of the repairs would then need to be written off.

In general, our view is that such expenditure should be expensed but the AER may wish to ask for (or make) calculations to assess the impact of the alternatives on customer prices.

Warringah Programmed Mains and Services Area Renewal

In relation to the Warringah project, we note that the work comprises the replacement of a network that has reached the end of its economic life and is no longer providing adequate service levels. We noted that the timing of the work is linked to capacity development projects (e.g., the Wakehurst Parkway project).

We normally expect to see works based on network deterioration of this type supported by a business case. However, no such material was provided in support of the expenditure.

PB reviewed a smaller project in this expenditure category, the Smithfield to Liverpool programmed mains and services area renewal project. It agreed with the project scope, noted that the business case demonstrated a positive net present value and noted that the business case provided indicative cost-per-metre rates for rehabilitated pipe. It concluded that the project is conforming capital expenditure in accordance with Rule 79 of the National Gas Rules. However, we noted that PB did not offer an explicit opinion on the indicative rates presented to it.

Because of the lack of detailed project and cost data, we are not able to attest to the cost efficiency of the expenditure.

Other Expenditure

The remaining 2% of network expenditure is accounted for by work in relation to mines subsidence and the requirements of governmental authorities.

Expenditure on mines subsidence is forecast to be $5.5 m over the next period, a considerable reduction on the level in the present period. This is before the deduction of recoveries, if any, from other parties in respect of the damage. The work appears necessary but the question arises: why should the expenditure be capitalised if, as we presume, no new assets were created or the lives of existing assets, when repaired, were not thereby extended? We therefore consider that this expenditure should not be added to the regulatory asset base.

Expenditure on government authority work is forecast to be $3.1 m over the next period. The expenditure level is 15% above that in the present period but again is minor and is based on third party requirements. We did not examine it further.

6.3 Other Considerations in Relation to Network Expenditure

Parsons Brinckerhoff Report

Background

We noted (and have already referred to) PB's 2009 report in which a high-level prudence and efficiency review of Jemena's capital expenditure in the next period was carried out prior to Jemena lodging its proposed access arrangement in August 2009. We noted that PB also analysed certain selected projects forecast for the next period in detail.

We have already noted that PB's terms of reference were limited and reported its general findings and our views on them in section 5.4 of this report.

We noted in the same section that we consider that the arguments advanced by PB tend only to demonstrate prudence in the manner in which the works were identified, planned and executed but do not demonstrate efficiency, which in our opinion would require either a "bottom-up" appraisal of the costs incurred or identification of wholly competitive processes in tendering the works In addition, a justification and reconciliation of any capitalised overheads or profit margins that have been added to the expenditure would need to be provided.

Particular Matters in Relation to Costs

In section 7 of its report, PB reviewed Jemena's pricing model, noting that it includes default unit rates for labour and materials and other items, that unit cost rates are based on actual costs of previous similar JAM projects and contracts as well as rates obtained from the market and that it incorporates a risk assessment tool for determining contingency allowances. [110]

PB states [111] that it was generally satisfied with the pricing process and that "A **brief** [our emphasis] review of rates for pipe supply, pipeline construction and restoration works show these to be in line with current industry rates". However, of importance, it expressed concern that "the source of the unit rates in the database, any assumptions (e.g. discounts to account for economies of scale) that have been used to calculate the rates and the date of the last update are not noted".

We consider from our own experience that a very wide range of pipeline costs is possible, depending on the laying conditions, the surface restoration work required if the pipe is laid in a trench, the much lower rates that are possible where directional boring techniques can be used, the wide variation of cost-related factors that may apply in relation to ground

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[110] This is understood to relate to the tolerances that are applied to cost estimates at the various stages of their development rather than to the inclusion in the estimates of contingency sums for possible additional costs or work.

[111] AAI appendix 7.4, section 7.2.1.

conditions, location (e.g. CBD *vs.* suburban) and remoteness from depots, etc, and the wide range of traffic management costs that may apply.

Anything less than a detailed costing study or evidence of competitively bid rates or robust market testing, combined with a reconciliation of all overhead costs to check the appropriateness of any capitalised indirect cost allocations or margins is unlikely to be sufficiently robust for an endorsement of cost efficiency to be given.

For example, writing in relation to the unit rates for new connections under the heading of market expansion expenditure, PB concludes, [112] "[its] opinion is that the **basis of estimate** [our emphasis] for forecast unit rates for market expansion is reasonable" and, "PB's opinion of **the methodology** [our emphasis] for developing the market expansion unit rates is that it is sound, based on actual historic (sic) costs with an allowance for future trends".

However, PB also notes (p. 50) that rate increases have arisen through "increases arising from the Collaborative Delivery Agreement (CDA) implemented with contractors in 2008" and, "details of the CDA have not been reviewed [by PB]".

Again, it would appear that PB was satisfied with the **process** but did not find itself able to express an unqualified opinion on the **cost efficiency** of the forecast expenditure.

In relation to procurement practices and processes, PB states (p. 52), "We consider the procurement practices and **processes** adopted by JAM to be: efficient and prudent [and] able to achieve the lowest cost [and] in line with good industry practice".

Again, this falls short of opining that the costs themselves are cost efficient.

We also note that business cases identifying the justification for projects were not always available to PB for its review.

Our summation of sections 6 and 7 of PB's report is that PB agrees with the scope and timing of the works it reviewed but largely limits its assessment of the efficiency of the costs to that of the methodology for their estimation rather than expressing an unqualified opinion on the efficiency of the forecast expenditure.

6.4 Non-Network Capex

Non-network capital expenditure in the next period is projected to be $133 m, representing 15% of the total forecast capital expenditure and an increase of 170% over the level in the present period. A summary of the proposed expenditure is given in Table 6.3.

IT Capex

Jemena states in its IT strategic plan [113] that it intends to implement new information systems "to attain efficiency and capability standards consistent with today's good industry practice and to meet the increasing requirements of the wholesale and retail gas market. An extensive assessment has found that the life and usefulness of JGN's information technology infrastructure and applications are coming to an end after many years of service".

The major new project under the heading "customer service, billing and metering IT systems" is the proposed replacement of Jemena's 25-year-old in-house "GASS" IT system. GASS is its primary metering, billing, and works management system and it is intended to replace it with **[c-i-c]**

[112] *Ibid* section 7.3.1.

[113] Appendix 7.2 to the AAI.

along with some in-house development by JAM's sub-contractor, Enterprise Business Services (EBS). [114]

Table 6.3: Forecast Non-Network Capex in Next Period ($2010 m)

FY ->	2010	2011	2012	2013	2014	2015	Total in Next Period
Motor vehicle fleet replacement	1.7	3.1	3.3	4.4	8.2	3.6	22.8
Leasehold improvements	1.5	0.5	-	-	0.1	0.3	0.9
IT and Communications							
Business restructuring a/	-	-	-	-	-	-	-
Corporate, financial & office systems	0.0	1.4	3.1	6.1	3.3	0.3	14.2
Bus. intelligence and m'gmt reporting	0.0	0.3	0.3	0.2	0.2	0.2	1.2
Electronic content m'gmt systems	0.4	0.4	0.1	0.1	0.1	0.1	0.8
GIS	0.9	6.4	0.5	0.5	0.6	1.0	9.0
SCADA	0.7	1.2	0.1	0.1	0.1	0.3	1.9
Network and load m'gmt systems	0.8	1.8	0.0	0.2	0.2	0.4	2.6
Market services & risk m'gmt	1.3	1.2	0.6	0.6	0.9	0.6	3.9
Network services delivery	1.4	1.8	0.2	1.0	1.8	0.7	5.4
Customer service, billing & metering	0.1	0.1	0.7	1.1	14.8	23.1	39.7
Engineering services b/	-	0.2	2.4	0.2	-	0.1	3.0
IT infrastructure	1.4	6.0	8.1	3.1	3.4	3.7	24.2
"Beneficial" scenario costs	-	-	-	-	-	-	-
	7.1	20.9	16.0	13.2	25.4	30.5	106.1
Scada and comms (non-network)	0.8	0.9	0.5	0.3	0.1	0.1	1.9
Fixed and mobile plant and equipment	0.7	0.2	0.3	0.3	0.3	0.5	1.6
Site remediation c/	-	-	-	-	-	-	-
	11.9	**25.7**	**20.1**	**18.1**	**34.2**	**35.0**	**133.2**

Source: Appendix 7.6 to the AAI.

a/ Relates to acquisition of the business by Agility and the later separation of Babcock & Brown.

b/ Includes programme, portfolio and engineering management costs, documentation and records costs, engineering management costs and related costs.

c/ Relates to remedial work on contaminated sites.

Jemena states that was GASS is designed for an "integrated" business and that retail separation has accelerated the need to its replacement. [115]

Replacement of Jemena's 1998-implemented SAP 4.6 financial, human resources and logistics systems with **[c-i-c]** is also proposed, as is the re-engineering of the works management and services delivery capability. The latter will be accompanied by **[c-i-c]**, the provision of "field mobility" technology, the upgrading of network design and document management systems and other improvements.

Introduction of a GIS for the first time will replace the present network record systems.

The new systems will make it possible to increase the level of automation of work management and will reduce the level of manual processing.

Security camera installation is planned to improve the security of critical assets.

Jemena's IT strategic plan sets out this strategy, describing the present systems and the planned work. The planned projects and sub-projects are identified and described, related risk assessments are outlined and the costs of the projects are summarised.

[114] EBS and Jemena are related parties.

[115] October presentation to the AER.

The plan covers the period ending FY 2015 and includes forecast IT capital expenditure over the next period totalling $94.7 m. [116] The forecast capital expenditure budget is large and the IT operating and maintenance budget in the plan (p. 7) is not much smaller at $81 m (of which $15 m will be capitalised through the network capex). These budgets do not include the possible impacts of Government legislation on climate change issues.

The plan states that the basis for estimating the IT capital expenditure estimate consists of (a) business cases with detailed programme and project statements and costing including business and cost benefits where applicable and (b) strategic planning for the Jemena businesses with support from EBS and, for specific studies, from external consultants. [117]

The estimates are said to be based on experience where Jemena has performed similar projects or conducted studies. It is also stated that EBS used in-house and external consultants knowledgeable in energy IT systems to produce estimates. [118]

The plan states that JGN's share of services for IT opex and capex is 31% of [the] expenditure for regulated assets and that the basis of capex and opex cost sharing is described in the AMP. The shared IT capex is for corporate IT systems and shared IT infrastructure covering data centres, telecommunications, hardware platforms, technical environments and security. IT capex and opex that are exclusively applied for JGN usage and purposes and for any other company are directly costed to that company. [119]

The IT plan states that the proposed capital investment would deliver annual savings in operating expenditure of 1% p.a. throughout the next period and that these benefits derived from a reduction in the work required to maintain and support the ageing systems as they are progressively replaced over the period. Details of the calculation of this saving or its method of inclusion in the operating expenditure estimates were not disclosed.

Supporting documentation, including business cases, is listed in an appendix but was not provided.

KPMG's Review

KPMG was engaged by Jemena to review the IT programme and strategy in terms of prudence and efficiency and its report was submitted by Jemena in appendix 7.5 to the AAI. KPMG assessed the programme against the requirements of the Rules and compared it with the IT programmes of other similar businesses and broader industry practice.

KPMG concluded that the programme was reasonable and largely aligned with the requirements of the Rules. It compared the forecast capital expenditure as a percentage of total capex with that of other utilities, finding that Jemena's was 11% compared to a 5% average but it was satisfied that this arose largely from recent under-expenditure. (Jemena states (AAI. p. 111) that the proposed IT capital expenditure "overcomes the historical under-investment in IT systems due to JGN's recent disruptive period of ownership change combined with a lack of viable systems solutions for the Australian regulated energy industry".)

In chapter 6, KPMG noted, "JGN splits costs shared with all Jemena businesses on a 31% basis under the terms of the EB services agreement and is responsible for allocating 31% of all shared IT costs as a JGN capital expense".

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[116] We were unable to reconcile that figure with the IT expenditure forecast of $106.1 m in the AAI and summarised in Table 6.3 above.

[117] *Ibid*, p. 18.

[118] *Ibid*.

[119] IT strategic plan, p. 13.

In the same chapter, KPMG identified certain issues with the basis of the cost allocations made. In particular, KPMG recommended that the drivers and logic behind applying the 6% corporate overhead allocation at the corporate business level and the **[c-i-c]**% JAM margin "should be investigated, documented, verified and approved [as being] in line with good industry practice" and that this is documented in the plan. [120]

KPMG also recommended (p. 5 of its report) that Jemena consider documenting all calculations and inputs used to produce its forecasts and estimates; that Jemena consider testing and documenting the necessity of each proposed IT initiative proposed; that Jemena consider further documenting alternative investment options to the proposed IT initiatives; and that Jemena undertake sensitivity analyses of the cost drivers.

As far as we were able to tell, neither the IT plan nor the AAI as provided to the AER contained this recommended additional information or documentation.

Change in Level of International Prices for IT Services

Jemena states in its IT Strategic Plan, "Australia and Jemena have experienced a one-off step change in the costs per unit for software licenses and IT infrastructure due to reset of the [Australian dollar] compared to our suppliers currencies primarily the USA. Almost all software and technologies are imported from USA based companies or written in USA currency based contracts. Jemena's main suppliers of software and technologies, including Oracle Limited, IBM Limited and Sun Systems have increased prices to Jemena across all applications and hardware products ranging from 25% to 33%. The [Australian dollar] has fallen back to its long-term value compared to the USA base currency by 20% - 28% and economic advice and expectation is that it will stay at that average level consistent with the last two decades. The percent fall is consistent with recent prices now being quoted per item and new prices lists. The outlook for Software and Hardware prices is based on the long-term average for the $AUD. Prices are typically set once per year based on an annual agreement; more sensitive to market competition and the size of the Jemena business. Prices are not overly sensitive to currency fluctuations unless a major re-alignment of currencies takes place as it has in 2008/09." [121]

We note for the AER's consideration that this adjustment is not listed as a step change in appendix 6.3 to the AAI in relation to opex and we have not attempted to verify whether or how it has been incorporated in the proposed levels of capital or operating expenditure in the next period.

Our Assessment

JGN has fallen behind the Australian gas industry in the use of IT systems and applications (due, it says, to a combination of the lack of functionally in suitable market solutions for the Australian energy industry and the disruption caused by recent ownership changes). The IT strategic plan proposes the implementation of new systems for manual operations and the replacement or upgrading of ageing systems with largely market-sourced and proven applications to remedy this situation.

Overall, in that context, we considered that the IT plan was sound in terms of its scope and focus as far as we were able to tell without having had access to the business cases or other supporting documentation referred to in the plan. However, we noted that the documentation given to us for review did not include details of options considered in each case or the business cases for each item. Such information would normally help verify that the proposed works were expected to deliver a net benefit to customers.

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[120] AAI appendix 7.5, page 39.

[121] Section 4.9 of the IT Strategic Plan.

On requesting business plans, Jemena provided only a table summarising the project options that it had considered and the reasons for selection but the information was at a very high level and the information provided on costs was considered minimal at best. [122]

We noted the proposed split of costs to JGN but did not attempt to verify whether that had been done in the estimates reviewed by us.

We noted that an overhead allocation of 6% and a 'Jemena Asset Management Margin' of **[c-i-c]**% are added cumulatively to the total capital expenditure forecast in the plan to give the total capital expenditure of $94.7 m already reported. [123] We inferred from its report that KPMG had some reservations about these mark-ups (as we do) but we could not find a satisfactory explanation of them in the material provided by Jemena to the AER and sent to us for review.

We noted also that neither the IT plan nor the AAI disclosed the calculation of the identified saving in operating expenditure or its method of inclusion in the operating expenditure estimates.

Overall, therefore, whilst we considered that that the capital expenditure programme was likely to be appropriate in terms of scope, we are not able to attest to its cost efficiency. The main reasons for the latter are that Jemena has not demonstrated to our satisfaction that the proposed expenditure is efficient, has not provided details and costs of options; has not provided details of the calculated net benefit to customers that will arise from the expenditure, has relied on benchmarking (which, for reasons already explained in this report, is not considered a robust approach), has not explained or justified its cumulative application of 6% for overheads and **[c-i-c]%** for margin, and has not demonstrated how work carried out by a related party is demonstrably competitively priced.

Finally, we note three points that require further explanation by Jemena and consideration by the AER. First, in its response to the AER of 1 December 2009, a contingency sum of $2.37 m was identified in table 7 in relation to customer services, metering and billing application software. Its purpose was not identified. Second, in table 4 of the same response (which repeats appendix 7.6 to the AAI), Jemena lists, under IT infrastructure, a line item "organic growth – infrastructure" that totals $2.49 m over the next period. This item is not explained. However, costs related to software licenses linked to connection numbers appear to be accounted for separately. Third, an item "AER – market changes and access arrangements" is included in the IT expenditure (its inclusion in the estimates suggests that it is intended to be capitalised but it is not clear to us why it should be). There was not time to clarify these items before reporting and so they are deducted from our recommended level of expenditure for further consideration by the AER.

Motor Vehicles

Capital expenditure on motor vehicle fleet replacement is estimated to be $22.8 m, an increase of 135% over the level in the present period. In its AAI, Jemena notes that it has an aging fleet and that vehicle replacement is based on age and mileage but it does not disclose details such as the age profile of the fleet or other information that would underpin this expenditure. The reason for the jump in expenditure from the level in FY 2010 of $1.7 m p.a. to a peak of $8.2 m in FY 2014 is not explained.

Without any information on the method of calculation, we consider that the level of expenditure in the present period should be maintained and an adjustment is recommended accordingly.

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[122] Table supplied with response to the AER of 1 December.

[123] See the discussion in section 4 generally and in section 4.6 in particular in relation to cost efficiency and the AMA.

Other Expenditure Items

The other expenditure items forecast for the next period are minor, comprising leasehold improvements ($0.9 m), non-network SCADA and communications ($1.9 m) and expenditure on fixed and mobile plant and equipment ($1.6 m). The expenditure on leasehold improvements relates to the provision of workstations for additional staff ($0.537 m) (which we have removed, consistent with our recommendations concerning the new FTEs in the proposed step changes in operating expenditure) and to the relocation of the North Parramatta control centre to the Sydney Olympic Park site. The remained of that item appears reasonable. The expenditure on non-network SCADA and communications and on fixed and mobile plant is identified in appendix 7.6 to the AAI and appears reasonable. Given the small amounts involved, we did not review these items further.

6.5 Conclusion Regarding Capex in Next Period

Again, a common theme in all the expenditure categories reported in this section is the lack of information available on which to verify the scope, necessity, timing and optimality of the expenditure foreseen. In most instances, the planned quantities of routine work were not provided either, making it impossible to verify unit rates.

We appreciate that many of the projects planned for the next period are still under preparation but there must be some that are in an advanced state of planning if their expenditure is to proceed on time in the next period.

In some instances, the existence of business plans was acknowledged in the documentation but they were not provided.

Not all the questions asked were responded to fully, the most that was received generally being summarised tables of options and suchlike without the accompanying detailed assessments that are normally required to demonstrate that the planned expenditure is expected to be accompanied by positive benefits to the business and to customers.

At best, we have been able to conclude (sometimes by giving Jemena the reasonable benefit of doubt) that the work foreseen is reasonable in scope or appears so.

However, in no case have we been able to attest to the cost efficiency of the expenditure because of the lack of information on the details, volumes and costs of planned work.

These points have been made repeatedly in the preceding text.

In addition, we note the following points for the AER's consideration.

(a) No information was provided to us in respect of Jemena's capitalisation policies, raising a question as to the quantum of indirect costs or profit margins that have been added to the stated levels of forecast expenditure.
(b) In general, our view is that expenditure on the ad-hoc repair of mains and services (p. 62) should be expensed not capitalised but the AER may wish to ask for (or make) calculations to assess the impact of the alternatives on customer prices.
(c) It is not clear to us how the stated increase in the cost of international IT services (p. 68) has been incorporated in the capital expenditure estimates.
(d) In our opinion, the arguments advanced by PB tend only to demonstrate prudence in the manner in which the works were identified, planned and executed but do not demonstrate cost efficiency. The latter would require a "bottom-up" appraisal of the expenditure combined, where possible, with reliance, for estimating purposes, on costs derived from competitive processes, together with a justification and

reconciliation of any capitalised overheads or profit margins that have been added to the forecast expenditure. [124]

(e) Given the conclusions reached in section 4 of this report in relation to the implications of the contractual arrangements and related party transactions that apply in Jemena's case, a reconciliation of the type just referred to appears desirable to support the business's claims.

(f) The expenditure incurred to remedy damage to pipelines resulting from subsidence in mines appears necessary but the question arises: why should the expenditure be capitalised if, as we presume, no new assets were created or the lives of existing assets, when repaired, were not thereby extended?

(g) It is not clear to us why expenditure related to "access arrangements" should be capitalised (its inclusion in the schedule of capital expenditure suggests that that is intended).

(h) In all cases, capital contributions or recoveries by or from other parties need to be deducted from the gross expenditure in accordance with the applicable regulatory accounting policies.

Taking all matters reported in this section into consideration and thus concluding that the efficiency of the capital expenditure forecast for the next period is not adequately demonstrated by Jemena, and on the assumption that a margin that constitutes a profit element has been incorporated in all the stated levels of incurred expenditure, we recommend that Jemena's forecast level of expenditure be accepted as reasonable in terms of scope, subject to the adjustments shown in Table 6.4 . The adjustments include a reduction of **[c-i-c]%** to remove the assumed profit margin, pending receipt of explanations from the business sufficient to clarify the capitalised indirect costs and margins and to establish the cost efficiency of the expenditure.

Table 6.4: Recommended Level of Expenditure ($2010 m)

FY ->	2011	2012	2013	2014	2015	Total
Jemena's proposal	173.1	167.1	167.8	181.0	196.2	885.2
Less recommended reductions						
Network Capex						
Mines subsidence b/	c-i-c	c-i-c	-	-	-	c-i-c
Reverse gas flow: Wollongong-Wilton	-	-	c-i-c	c-i-c	c-i-c	c-i-c
Integrity digs and integrity management	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Aged residential meter replacement	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Industrial & commercial aged meter replacement	-	-	-	-	-	-
Non-Network Capex						
Customer services metering & billing contingency	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Organic growth in IT infrastructure	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
AER: market changes & access arrangements b/	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Motor vehicle fleet replacement	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Work stations for additional FTEs	c-i-c		-	-	-	c-i-c
	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
*Removal of **[c-i-c]** % Margin*	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c	c-i-c
Recommended level of capex a/	**152.0**	**141.9**	**142.8**	**148.2**	**162.5**	**747.2**

a/ Subject to the qualifications in the main text. Figures may not add due to rounding.
b/ For evaluation by the AER.

No adjustment has been incorporated in relation to (b) or (c) above.

[124] The related issues are discussed at length in section 4 generally and in section 4.6 in particular.

Expenditure on mines subsidence work has been omitted on the assumption that it should not be capitalised.

The reverse gas flow item is deleted pending further explanation.

The "integrity digs and integrity management" items are presented as capital expenditure but do not appear to relate to the addition of a new asset or to remedial work for the extension of the life of an existing asset and we therefore consider that they ought not to be added to the regulatory asset base but expensed.

The adjustment to the aged residential meter replacement programme is made on the ground that only a portion of the meters, not all, will require replacement after 20 years.

No adjustment is made in relation to the aged industrial and commercial meter replacement programme on the assumption that the business provides, to the AER, a satisfactory justification for this programme, which totals $23.5 m. (In addition, it is not clear to us why sampling costs would be capitalised and added to the regulatory asset base under the other meter replacement expenditure categories but we were not able to clarify their extent in order to remove them. See footnote 104.)

The adjustments concerning the customer services metering and billing contingency and the organic growth in IT infrastructure have been made pending the provision of clarifications to the AER by the business.

Expenditure on market changes and access arrangements has been left for the AER to consider, noting our query in (g) above.

Expenditure on motor vehicle fleet replacement has been reduced to the level in the present period, pending the provision of clarifications to the AER by the business.

Expenditure on workstations for additional FTEs has been removed, consistent with our assessment of the proposed step changes in operating expenditure. [125]

The adjustment of the **[c-i-c]%** profit mark-up will need to be confirmed by the AER once a justification and reconciliation of any capitalised overheads or profit margins that have been added to the expenditure has been received from the business.

The AER could also consider an adjustment to remove the 6% overhead allocation that is believed to have been included in the estimates pending receipt of the justification and reconciliation from the business. However, we have not shown such an adjustment as, in principle, the capitalisation of overheads attributable to the construction and putting into operation of new fixed assets is acceptable (provided the amounts are identified and not also recovered through the operating expenditure estimate) whereas the incorporation of a profit margin or asset management margin for a related party, applied to the whole of the expenditure programme, would appear not to be justifiable for the reasons we have set out in section 4.6 of this report. [126]

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[125] A similar amount has been removed from the expenditure reported for FY 2010 in our consideration of capital expenditure in the present period.

[126] The 6% on-cost means removal of up to 6/106^{ths} or 5.66% of the total, after removing the **[c-i-c]%** profit margin.

7 Level of Unaccounted-for Gas

7.1 Factors Affecting Unaccounted-for Gas

The terms of reference require us to include in the report a discussion of the factors that affect UAG and account for its level in different networks. These factors have been set out in the proposals of at least one other business – see, for example, section 9.2.3.3 of ActewAGL Distribution's proposal – from which some of the following text has been drawn and in some cases edited.

Unaccounted-for gas is defined as the difference between the receipts (measured at the points of supply into a network) and the deliveries (measured by customer and operational gas meters) of gas, following correction for changes in the quantity of gas stored in the pipeline. UAG is caused by factors such as leakage from the system, operational losses, metering error, billing system error, inaccuracy in the conversion from the quantities of gas measured to energy and theft. [127] All pipeline systems incur some amount of UAG, at the least due to measurement errors and conversion inaccuracies. UAG is typically expressed and reported as a proportion of receipts.

Ignoring metering and billing system errors and conversion inaccuracies (which are common to all networks) and theft (which is usually regarded as uncommon and immaterial), the following factors may vary from network to network and are mentioned here in response to the request in the terms of reference.

System Losses

System losses include the unavoidable loss of gas through the purging of pipelines, third party damage to mains, losses from other equipment (e.g. regulator vents), the replacement and repair of gas mains, the testing of service lines during meter replacement, un-metered operational use (e.g. consumption by heaters associated with bulk metering points and losses during pipeline inspections), etc. [128]

Leakage

Apart from system losses, leakage from distribution networks that use modern materials and jointing techniques is small because it involves gas escaping through minute holes. In addition, leaks of any size are likely to be detected because the odorant in the gas enables the leaking gas to be detected, even at low concentrations. This kind of leakage is related to leaking pipes and pipe joints, above-ground fittings and connections and the venting of gas regulators. Leaking fittings, along with excessive regulator venting, are usually reported by the public and repaired.

Leakage is prevalent in old cast iron and galvanised steel pipes and the presence of such pipes or otherwise is usually the principal determinant of the level of UAG experienced in a network.

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[127] Jemena identify the same factors in appendix 6.8 to its AAI.

[128] Some types of regulator are designed with relief valves that vent gas into the atmosphere in the event of the downstream pressure rising above the metering pressure. This sort of event is not common, but with age, regulator relief valves may leak. If leaks from relief valves are small, it may take some time before they are detected and replaced.

Optimality

It is uneconomic to attempt to eliminate UAG. Instead, an optimal level of UAG ought to be sought through the adoption of good practice and the replacement of leaking pipes and components where it is clearly economic.

The efficient level of UAG for a particular gas network will depend on the features of the network concerned and ought to be determined in relation to its own condition and circumstances.

7.2 Level of UAG on the Network

As far as Jemena's network is concerned, it appears to have largely been rehabilitated and includes, now, only a small proportion of old cast iron or galvanised steel mains – both of which are prone to leakage – in its low- and medium-pressure systems. [129] It can thus be expected to exhibit a low level of UAG and this is evident in the history of UAG reported in appendix 6.8 to the AAI. Figure 5.1 in that appendix shows a steady decline in UAG from around 5.8% to around 2.4% over the years 1992 to 1997 and the appendix notes "between 1988 and 1996, AGL and then Jemena undertook a massive mains rehabilitation programme". That programme would account for the reduction that took place in UAG. From 1997 onwards, the reported level of UAG fluctuates between 2.1% and 2.7%. The figures quoted for the present period are 2.1% in FY 2004, 2.6% in FY 2005, the same in FY 2006, 2.3% in FY 2007 and 2.1% in FY 2008. [130]

We noted that Jemena has analysed the level of UAG measurement uncertainty in section 5.1 of the appendix and has commented in section 5.2 of the appendix on possible future impacts on the level of UAG. The impacts cited are due to probable flow increases through the Wilton receipt point and a possible change in gas composition due to changing sources, with an accompanying change in calorific value. However, these impacts are based on supposition, in addition to which it is questionable whether changes in part of the network (and prospective, at that) ought to be applied to the level of UAG in the network as a whole without it being demonstrated that there is no possibility of off-setting reductions occurring elsewhere.

We also noted that Jemena had presented a brief benchmarking analysis of UAG in section 7 of the appendix which showed Jemena to be in a good position (although not the best) but for the reasons stated above in relation to optimality, we did not consider it appropriate to place any weight on the analysis.

In the absence of evidence of unsatisfactory stewardship of the assets, and given that the network has been substantially rehabilitated, the best guidance available as to the level of UAG to accept in the next period is the actual level reported by the business at present. On that basis, we propose that the arithmetic average of the level of UAG in the five most recent years reported – FY 2004 to FY 2009 – be taken, using the data provided by Jemena on p. 10 of the appendix. The resulting recommended level is 2.34%.

We consider it reasonable for this percentage to remain fixed for the next period.

7.3 Price of Gas

We did not assess the efficiency of the price of gas assumed when costing UAG, as that was outside our brief.

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[129] See the network statistics in section 2.2 above.

[130] See p. 10 of the appendix.

8 Conclusion

8.1 Opinion

Having considered the information received from the business and the factors required to be considered as summarised in this report, and based on that information, the representations made to us by the business and our own experience, our opinion in respect of Jemena's expenditure proposals in relation to its network is as stated below.

(a) We recommend that the base-year level of operating expenditure be set at $**[c-i-c]** m as shown in Table 4.4 at the end of section 4.7 of this report prior to the addition of step changes and those items for determination by the AER without review by us; and that adjustments be made in the requested level of technical step changes, as shown in Table 4.5.

(b) We conclude in relation to Jemena's actual and forecast capital expenditure for the period 1 July 2005 to 30 June 2010 that its efficiency is not adequately demonstrated by Jemena and thus we are able to recommend only that the incurred level of expenditure be accepted as reasonable in terms of scope, subject to the adjustments shown in Table 5.6.

(c) We conclude in relation to Jemena's forecast capital expenditure from 1 July 2010 to 30 June 2015 that its prospective efficiency is not adequately demonstrated by Jemena and thus we are able to recommend only that the forecast level of expenditure be accepted as reasonable in terms of scope, subject to the adjustments shown in Table 6.4 . The adjustments include a reduction of **[c-i-c]%** to remove the assumed profit margin, pending receipt of explanations from the business sufficient to clarify the position in relation to capitalised indirect costs and margins and to establish the cost efficiency of the expenditure.

(d) A reasonable level of unaccounted-for gas to allow in the decision would be 2.34% of gas receipts.

8.2 Matters for the AER's Consideration

Various matters have been noted throughout the report for the AER's consideration but in concluding the report, we would like to draw attention to the following sections that have a direct bearing on the opinions stated above.

- Matters relating to the base-year level of operating expenditure are summarised in section 4.10.
- Matters relating to the roll-forward escalation of operating expenditure are noted in section 4.11 under the sub-heading "Matters for the AER's Consideration".
- Matters relating to the scope and efficiency of the reported capital expenditure in the present period are summarised in section 5.6.
- Matters relating to the scope and efficiency of the forecast capital expenditure for the next period are summarised in section 6.5.

8.3 Qualifications of the Reviewers

Our opinion has been formulated for and on behalf of Wilson Cook & Co Limited by Mr Jeffrey Wilson with the support of Mr Peter Cole, Mr Pat Hyland and Mr Bernard Ivory with

peer review by Mr Derek Walker. Mr Wilson is a professionally qualified engineer, experienced in undertaking reviews this type. Messrs Cole, Walker and Hyland are also professionally qualified engineers and Mr Ivory is a chartered accountant and economist. All team members have considerable experience in the energy sector and in assessments of this type. Curricula Vitae of the team members are attached.

8.4 Conditions Accompanying Our Opinion

Assessment Not an Assessment of Condition, Safety or Risk

Notwithstanding any other statements in this review, this review is not intended to be and does not purport to be an assessment of the condition, safety or risk of or associated with the business's assets and nothing in this report shall be taken to convey any such undertaking on our part to any party whatsoever.

All Earlier Advice Superseded

For the avoidance of doubt, we confirm that this report supersedes all previous advice from us on this matter, whether written or oral, and constitutes our sole statement on the matter.

Disclosure

Wilson Cook & Co Limited has prepared this report in accordance with the instructions of its client on the basis that all data and information that may affect its conclusions have been made available to it. No responsibility is accepted if full disclosure has not been made. No responsibility is accepted for any consequential error or defect in our conclusions resulting from any error, omission or inaccuracy in the data or information supplied directly or indirectly.

Disclaimer

This report has been prepared solely for our client, the Australian Energy Regulator (AER), for the stated purpose. Wilson Cook & Co Limited, its officers, agents, subcontractors and their staff owe no duty of care and accept no liability to any other party, make no representation or warranty as to the accuracy or completeness of the information or opinions set out in the report to any person other than to its client including any errors or omissions howsoever caused, and do not accept any liability to any party if the report is used for other than its stated purpose.

Non-Publication

With the exception of its publication by the AER, in relation to its review of the business's expenditure proposals, neither the whole nor any part of this report may be included in any published document, circular or statement or published in any way without our prior written approval of the form and context in which it may appear.

Appendix A: Curricula Vitae of Reviewers

CURRICULUM VITAE

Jeffrey Wilson **Engineering and Management Consultant, Adviser & Valuer**

Born	1947
Nationality	New Zealander
Education	ME, University of Auckland, 1970 BCom, University of Auckland, 1979 Courses and conferences locally and internationally on technical, managerial, leadership, governance and financial reporting matters, including IoD courses.
Languages	English : mother tongue Portuguese: reasonable reading ability, limited conversational ability French: reasonable reading ability, limited conversational ability
Professional Affiliations	FIET (UK), CEng (UK), FIPENZ, CPEng (NZ), MIEEE (USA) International Professional Engineer (IntPE) and APEC Engineer Member, New Zealand Association of Economists Member, Institute of Directors NZ
Countries of Work Experience	New Zealand, Australia. Europe: Portugal and Russia. SE Asia, the Pacific and Africa: Bangladesh, Bhutan, Cambodia, PR China, East Timor, Federated States of Micronesia, Fiji, India, Indonesia, Kyrgyz Republic, Laos, Malaysia, the Maldives, Mongolia, Nepal, Pakistan, Papua New Guinea, the Philippines, Samoa, Sri Lanka, Tanzania, Thailand and Vietnam.
Key Qualifications	Qualified in commerce and engineering. Corporate governance experience, including chairmanship, since 1988, in electricity utilities, state-owned entities (Industrial Research Ltd), private companies, trust-owned companies and other bodies (listed on next page). 38 years of professional experience in engineering and management consulting, advisory work and valuations including corporate development and management training in utility businesses, power system planning, economic and financial evaluation of projects, economic and financial modelling and evaluations, asset and business valuations and management of major multi-disciplinary projects. Adviser in New Zealand to electricity and gas utilities on valuation and regulatory matters. Adviser in Australia to regulatory bodies in New South Wales, the ACT, Victoria, Tasmania, Western Australia and federally (the Australian Energy Regulator) in relation to expenditure projections and fixed asset valuations for price determinations. (Wilson Cook & Co is currently working in NSW, the ACT and WA.) Adviser to the Independent Pricing and Regulatory Tribunal of NSW on various special assignments including prudential matters and economic and financial modelling of isolated combined heat and power schemes. Power sector project experience as Project Director, Team Leader, Power Engineer or Economist on power planning and corporate and sector restructuring projects in S.E. and South Asia, Portugal, Tanzania and Russia from 1984 to 2003. Experience in numerous due diligence investigations, project and business assessments,

risk assessments and valuations.

Expert witness in the High Court on various matters from c.1976 to the present time.

Consultant to the World Bank and Asian Development Bank on project formulation and sector policy development. Experience includes 2 years on the staff of the Asian Development Bank.

Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
May 2003 – Present	Wilson Cook & Co Limited – Founder and Managing Director	Engineering and management consultants, advisers and valuers.
Sep 1983 – May 2003	Worley Consultants, Beca Worley International then Meritec Limited – Department Manager	Manager in charge of power planning and management consulting services, economic and financial evaluations and asset valuations, 1984-2003.
	Meritec Group Ltd – Director and Chairman	Member of Board of Directors of Meritec Group over various periods from 1987 to 2002. Chairman from 1998 – 2001.
	Companies in Public and Private Sector	Non-executive director. Various appointments in the energy and industrial sectors since 1990.
Sep 1981 – Sep 1983	Asian Development Bank – Project Engineer	Technical and economic evaluation of projects. Loan administration.
May 1974 – Sep 1981	Mandeno, Chitty & Bell – Senior Engineer/Economist then Partner	Management and direction of a wide range of design and construction projects from power generation to boiler plant and building services. Project evaluations.
May 1971 – May 1974	New Zealand Electricity Department – Assistant Electrical Engineer	Substation design and construction supervision. Power system operational studies.

Company Directorships

Company directorships in public and state-owned companies in the energy and industrial sectors as follows:

Counties Power Ltd	July 2000 – Present	
Industrial Research Ltd	July 1997 – June 2000	
Materials Performance Technologies Ltd	c. July 1998 – June 2000	a/
Supalink Ltd	November0 1997 – June 2000	a/
Mercury Energy Ltd	November 1993 – July 1994	b/
Geothermal Energy (NZ) Ltd	March 1990 – March 1991	
Meritec Group Ltd	Chairman, March 1998 – February 2001 Director, December 1995 – August 2002, February 1994 – August 1994, and February 1988 – February 1991	
Various private organisations, companies and trusts	President, director or trustee of various organisations and entities since around 1978.	

a/ IRL representative.
b/ Resigned due to conflict with consulting practice.

Experience in the Gas Sector

Valuation of Gas Distribution Network
November 2008 – Present

Review for IPART of Prudential Requirements related to Isolated Electricity Supplies in NSW
November 2007 – June 2008

Regulation and Valuation of Electricity and Gas Network Fixed Assets - Powerco
September 2006 – Present

Regulation and Valuation of Electricity and Gas Network Fixed Assets –Vector
April 2006 – Present

Audit of New Zealand's Infrastructure (Electricity and Gas)
September 2003 – December 2003

Valuation of Gas and Electricity Assets for Vector Ltd (for two years), United Networks Ltd, Orion Limited (for two years), Transpower Limited (for two years) and Unison Ltd
January 2002 – May 2003

Due Diligence of Gas and Other Network Assets (Confidential)
June 2002 – January 2003

Valuation of Gas Treatment Plants
2002

Review of Field Maintenance Services for Gas Networks
November 2001– January 2002

Sale and Purchase of Gas Network, New Zealand
December 1999 – April 2000

Asset Management Plan for Gas Distributor and Preparation of Gas Network Valuation Handbook
1994 – 2001

Confidential Valuation of High Pressure Gas Transmission Pipeline
c. 1998

Valuation of High Pressure Gas Transmission Network
1994

New Zealand and Australian Experience in the Regulatory Assessments etc

Technical Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power's proposed Second Access Arrangement
October 2008 – Present

Principal Technical Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors
November 2007 – Present

Adviser to Vector Limited on Expenditure-Related Matters
June 2008 – December 2008

Due Diligence Review – Technical Adviser
November 2007– April 2008

Review of Public Lighting Expenditures – Integral Energy
August 2007 – February 2008

Review of Aurora's Expenditures for Price Determination (Tasmania)

December 2006 – June 2007

Review of Audit Guidelines (NSW)
March 2007 – April 2007

Western Australia: Review of Western Power's Revised Expenditure Forecasts
March 2006 – September 2006

Consultant to IPART, NSW, for Cost Pass-Through Review
January – April 2006

Consultant to the Office of the Tasmanian Energy Regulator, for Mid-Term Review
August 2005 – February 2006

Consultant to the Economic Regulation Authority of Western Australia, for Review of Western Power's Asset Valuation and Expenditure Forecasts
August 2005 – January 2006

Principal Technical Consultant to Essential Services Commission, Victoria, for EDPR 2006
October 2004 – October 2005

Consultant to IPART, NSW, for Review of EnergyAustralia's Public Lighting Expenditures
June 2005 – August 2005

Review of Western Power's Estimates of Capex and Opex
February 2004 – May 2004

Review of DNSPs' Revised Estimates of Capex and Opex
January 2004 – May 2004

Submissions to Commerce Commission
February 2004 – April 2004

Appointment to Western Australian Electricity Sector Reform Panels
October 2003

Review of Electricity Distributors' Capital and Operating Expenditures for NSW Regulator
December 2002 – September 2003

Capital Expenditure Reviews for Regulatory Purposes
May 1998 – November 1998

Asset Management Plan and Long Term Network Development Plan Update for WEL Energy Group
August 1996 – January 1998

NSW State Government – Guidelines for Valuation of Network Fixed Assets
May 1995 – January 1996

New Zealand and Australian Energy Sector
1991 – 2000
Consultant to over 30 power utilities and energy companies in Australasia

New Zealand Power Sector
October 1983 – December 1991
Consultant

International Experience in the Electricity Sector

Details of Mr Wilson's experience internationally are available on request.

Other Experience

Details of Mr Wilson's other experience are available on request.

Publications and Papers

4. "Use of high-temperature water for the transport and distribution of heat", Trans. NZIE, 1981 (with B G Smith).
10. "Economic decision-making", Technical Forum, Auckland, April 1987 (with I.L. Wilson).
13. "Small isolated power systems - the issues", proceedings of Minerals and Energy Forum, Pacific Economic Co-operation Conference Specialist Group Meeting, August 1990.
14. "Capital investment appraisal in New Zealand's power sector in the 1990's", ESEA Generation Forum, Rotorua, March 1992.
15. "Valuation and regulation of New Zealand electricity companies: progress and issues", 10th CEPSI Conference, Christchurch, 1994.
16. "Developing transparent, efficient and effective procurement processes for power infrastructure in APEC member economies - a comparative study report", APEC Energy Working Group Report and Workshop, May 1997 (with W Jamieson of Norton Rose) **(ACENZ silver award-winning project).**
18. "Asset management strategies for power distribution utilities", Conference on Best Practice Asset Management for Utilities, Wellington, October 1997 (with R T Clifton and D S Todd).
21. "Long term network planning - best practice features", EEA Annual Conference, Auckland, June 1998 (with P C White and R T Clifton).
23. "Asset management plans and security of supply in the New Zealand electricity distribution industry", EEA Forum, Wellington, September 1998.
24. "Aspects of risk analysis and electricity network planning", Conference on Risk Management for Utilities, Auckland, December 1998 (with R T Clifton and G C Horvath).
25. "Outsourcing of engineering design and network maintenance services", AESIEAP CEO's Conference, Cebu, November 1999 (with R Clifton, M Tucker and L Lorentz).
26. "Review of international best practice in power system planning in the New Zealand context (with particular reference to the choice of voltage levels for sub-transmission and distribution and security of supply planning criteria)", EEA Conference, Auckland, June 2000 (with M.J. Whaley and H Tong).
27. "New Zealand electricity sector reform – a review of current issues", CEPSI 2000, Manila, October 2000 (with M.J. Whaley).
30. "New Zealand's experience of 'de-regulated' electricity supply", CIRED 18th International Conference on Electricity Distribution, Turin, 6-9 June 2005.
31. "New Zealand's power sector regulatory environment – an update", CIRED 19th International Conference on Electricity Distribution, Vienna, 21-24 May 2007.
32. "How useful is your asset management plan?", NZ 2nd Annual Electricity Network Asset Management Summit, Wellington, 20-21 November 2007.

CURRICULUM VITAE

Peter Cole — Fuels and Energy Specialist (Gas Distribution)

Born	1942
Nationality	New Zealand
Education	BE (Mechanical Engineering, 1st Class Honours), University of Auckland, 1972 MPhil, Massey University, 2007
Languages	English : mother tongue French: reading ability
Professional Affiliations	MIPENZ Chartered Professional Engineer (New Zealand)
Countries of Work Experience	New Zealand, Australia, Bangladesh, Indonesia, Malaysia, Niue, the Philippines, Samoa, Singapore, Thailand, Vietnam and the Yemen.
Key Qualifications	Qualified in mechanical engineering with 37 years of professional experience in engineering consulting, advisory work and asset valuations. Adviser to governments, institutional and private clients on fuel- and energy-related policies, plans and designs. Adviser on energy supply options, fuel selection and utilisation. Specialist in gas reticulation and use. Experienced in natural gas and LPG market studies, planning, distribution and utilisation matters. Experienced in CNG/NGV planning, technology and implementation. Experienced in the design of mechanical and energy-related services for hospitals, institutional and commercial buildings. Experienced in the co-generation of heat and power. Experienced in the assessment of projects, including risk assessment. Experienced in the management of energy sector projects in New Zealand and overseas. Expert witness on energy- and gas-related matters. Corporate governance experience. Familiar with international lending agency and regulatory requirements.

Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
Sept. 2001 - present	Empower Consultants Ltd – Energy Specialist/ Director	Specialist consultant for gas and energy sector projects in New Zealand and overseas. Consultant to Wilson Cook & Co Limited.
April 1979 - September 2001	Meritec Ltd – Director	Management of gas sector projects in New Zealand and overseas including distribution and utilisation (industrial conversion and CNG). Gas sector planning in New Zealand and overseas. Preparation of reports and studies on natural gas, NGV/CNG and LPG markets, distribution and utilisation. Planning and design of energy distribution and utilisation systems. Expert witness on energy and related matters.
February 1972 - April 1979	Meritec Ltd – Engineer/Senior Engineer	Design of mechanical and energy services for hospital, institutional and commercial buildings.
April 1968 - February 1972	Meritec International Ltd - Senior Draughtsman	Design draughting work - mechanical services.
February 1967 - April 1968	A & T Burt Ltd - Estimator & Contract Supervisor	Estimating for and supervision of building services contracts.
June 1965 - February 1967	Ward Construction Ltd - Draughtsman	General mechanical and structural draughting.
August 1964 - April 1965	United Baltic Corporation Ltd – Marine Engineer	Watch-keeping and general engine maintenance.
November 1959 -	New Zealand Shipping Co. Ltd - Marine Engineering Apprentice	

New Zealand and Australian Experience

Gas Network Valuation for Vector Limited
November 2008 – Present

IPART Review of Prudential Requirements related to Isolated Electricity Supplies in NSW
November 2007 – June 2008

Gas Network Fixed Asset Valuation for Powerco Limited
October 2006 - continuing

Gas Network Fixed Asset Valuation for Vector Limited

May 2006 – continuing

Use of Landfill Gas as a Boiler Fuel at Nelson Hospital
2003- 2007

Gas Supply Options Study for Powerco Limited
September 2005 to June 2006

Gas Valuation Advice for NZ Commerce Commission
2003 - 2004

Mid-Central Health Limited Gas Supply Contracts
1998- 2004

Gas Network Fixed Asset Valuation for Vector Limited
January - August 2003

Gas Network Due Diligence for Vector Limited
July- August 2002

Gas network Valuation Handbook for Ministry of Economic Development
2001

Gas Network Due Diligence for Siemens Limited
January - March 2001

Gas Supply Contract for Water Care Services Limited
2000

Cogeneration Studies for Various Clients
1990 to 2000

Gas Network Due Diligence for Vector Limited
December 1999 - April 2000

LPG Consultancy Services for Rockgas Limited
1978 to 1999

Audit of LPG Installation
1999

Comparative Fuel Study for Natural Gas Corporation
Completed 1998

Gas Network Due Diligence for United Networks Limited
1998

Expert Witness for Crown Law Office on Gas Pipelines
November 1996- July 1997

Adviser to Department of Inland Revenue
May 1995 - May 1996

Gas Pipeline Feasibility Study (Confidential)
1996

Consulting Services to Capital Coast Health Ltd (Wellington) – Gas
1996

Landfill Gas Utilisation Study for Waitakere City Council
1993

Rockgas Limited
1986 – 1990

International Experience

Natural Gas Codes in Bangladesh
2005- 2006

Reduction of Vehicle Emissions in Jakarta
2003- 2005

Gas Sector Policy and Regulatory Framework for the Philippines
1998- 2002

Landfill Gas Utilisation in the Philippines
1999- 2001

Natural Gas Utilisation Project
1996 – 2000

Natural Gas as a New Energy Resource for the Philippines
July 1997 – December 1999

New Zealand Ministry of Foreign Affairs & Trade – Natural Gas Utilisation in Transport
1993 to 1999

LPG Substitution in Yemen
1994 – 1998

Feasibility Study of Options for Transport of Natural Gas
Completed 1986

Technical Audit of CNG Pilot Project
Completed 1986

Selected Papers

1. *"The New Zealand NGV programme and the lessons learnt"*, Technical Symposium and Investment Round Table on Transport Related Contracts for Natural Gas, ESCAP/Petronas, Kuala Lumpur, 1996.
2. *"Natural gas as an energy source for industrial and commercial buildings in ASEAN"*, ASEAN Energy Conference, Bangkok 1995.
3. *"The economics of compressed natural gas as a vehicle fuel- the New Zealand perspective"*, Petroleum Institute of Thailand conference: Gas Utilization Policies: an International Perspective, Pattaya, 1987.
4. *"Transport fuels in New Zealand – a new direction"*, World Energy Conference Regional Symposium, .Perth, 1986 (with RK Green, JK Raine, NB Smith and P Waring).

CURRICULUM VITAE

Derek Walker — Utility Management Adviser

Born	1954
Nationality	New Zealander
Education	BE (Hons) (Electrical), University of Canterbury, 1975 BBS, Massey University, 1991 Various engineering and management training programmes, including Institute of Directors company director courses.
Languages	English : mother tongue
Professional Affiliations	Member, Institution of Professional Engineers, New Zealand Member Institute of Directors in NZ
Countries of Work Experience	Australia, New Zealand.
Key Qualifications	Qualified professionally in engineering and management. 25 years' experience in management and senior engineering roles in the distribution sector of the electricity supply industry, leading to a thorough understanding of, and practical experience in, all aspects of the industry including generation, wholesale market, retail, distribution and utilisation. Development and utilisation of costing and pricing models for network and energy retail businesses. Knowledge and experience in planning, designing, maintaining and operating urban and rural electricity distribution networks. Considerable experience in negotiating and implementing major business transactions including mergers, acquisitions and sales. High-level understanding and practical application of all business management disciplines including strategic and business planning, performance management, finance, accounting, treasury, legal, risk management, engineering, marketing and human resources. Thorough knowledge and practical experience of governance responsibilities for both commercial and not-for-profit organisations. Ability to see the "big picture" and think laterally and strategically. Ability to develop and maintain a high performance management and organisation team culture in a changing environment. Empathy with staff and customers giving an ability to build strong loyalty. Excellent written and verbal communication skills and a high level of computer literacy. Familiar with the Australian and New Zealand electricity supply industry. Consultancy experience in multi-disciplinary teams since 2000.

Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
2001 – Present	Director and Principal, Third Bearing Ltd.	Business and management consulting and consultant to Wilson Cook & Co.
1989 – 2000	Chief Executive, CentralPower Limited (previously the Manawatu-Orua Electric-Power Board). Appointed Managing Director in November 1993.	Responsible for all aspects of the business's development and operation.
1981 – 1989	Ashburton Electric-Power Board. Substation and Distribution Engineer from 1981; Chief Engineer from 1986; and Commercial Manager from 1988.	Responsible, in final position, to the Chief Executive for all engineering, marketing and sales activities.
1979 – 1981	Electricity Division, Hamilton City Council. Design Engineer.	Responsible for electricity distribution network planning and design functions.
1975 – 1978	South Canterbury Electric-Power Board. Assistant Engineer.	Engineering planning, design, construction supervision and operational duties.

Company Directorships

Directorships or trusteeships in private and public companies and trusts in the energy sector and in other organisations as follows:

Spiers Group Limited	2007 – Present
Quotable Value Limited	2005 – Present
NZ Windfarms Limited	Director, 2004 – 2005. Chairman, 2005 – Present
Central Energy Trust	2003 – Present
The Bio Commerce Centre Limited	Chairman, 2003 – Present
Third Bearing Limited and associated companies	2001– Present
Palmerston North City Holdings	2000 – 2005
Palmerston North Airport Limited	Director, 2000 – 2002. Chairman, 2002 – Present
Manawatu Life Education Trust	Chairman, 1995 – 1997. Trustee, 1997 – Present.
Palmerston North Theatre Trust	Trustee, 1994 – 1998. Chairman, 1998 – 2006
Energy Brokers New Zealand Limited	Director, 1994 – 1996. Chairman, 1996 – 2000
Electricity Networks Association	1994 – 2000
CentralPower Limited and subsidiaries	1994 – 2000

Relevant Experience

Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power's proposed Second Access Arrangement

October 2008 – Present

Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors

November 2007 – Present

Review of Prudential Requirements related to Isolated Electricity Supplies in NSW

November 2007 – June 2008

Brief Review of Projected Expenditures Arising from National Electricity Market (NEM) Responsibilities (Tasmania)

June 2007 – July 2007

Review of Aurora's Expenditures for Price Determination (Tasmania)

December 2006 – June 2007

Western Australia: Review of Western Power's Revised Expenditure Forecasts

March 2006 – September 2006

Review of Cost Pass-Through Expenditures of NSW DNSPs for IPART

January – April 2006

Consultant to the Office of the Tasmanian Energy Regulator, for Mid-Term Review

August 2005 – February 2006

Consultant to the Economic Regulation Authority of Western Australia, for Review of Western Power's Asset Valuation and Expenditure Forecasts

August 2005 – January 2006

Principal Technical Consultant to Essential Services Commission, Victoria, for EDPR 2006

October 2004 – October 2005

Business and Management Consulting

Director and Principal, Third Bearing Limited

Grid Security Committee (New Zealand)

Committee Member
1999 – 2000

Electricity Distribution Business Experience

Various positions, including Chief Executive then Managing Director of CentralPower Ltd
1975 – 2000

CURRICULUM VITAE

Patrick Hyland **Asset Management Specialist**

Born	1957
Nationality	New Zealand and Canadian
Education	BE (Hons) (Electrical), University of Canterbury, 1979 ME (Electrical), University of Canterbury, 1980 *Training Courses:* "Construction contracts", a course on contract law with an emphasis on NZS 3910. "Project evaluation", a course on the financial evaluation and risk assessment of projects by Arthur Young Associates. "Management skills", a two-week course with emphasis on management by objectives. "ISRS orientation and management training", a three-day course on the International Safety Rating System. "Industrial relations", a two-day course by consultant Mr P Meuli. "Process Control", a four-day course by Engineering Information Transfer. "Interaction management", a five-day trainer's course in teaching the Interaction Management programme by Mentor Human Resource Group Ltd. "Authorisation holder's certificate (power plant)", a course for authorisation to work on operational power plant. First aid and CPR certification and subsequent revalidations. "Power system dynamic simulation", a six-day course by Dr J Undrill.
Languages	English : mother tongue
Professional Affiliations	Member, Electricity Engineers Association (New Zealand).
Countries of Work Experience	New Zealand, Australia.
Key Qualifications	Qualified in electrical engineering. 27 years of professional experience in power engineering and in project management. Experience initially in generating plant and transmission networks, then in distribution networks. Experience in due diligence investigations, numerous project and business assessments, risk assessments and reviews. Experience in the preparation and review of asset management plans. Has specialised in the assessment of network service delivery and the prediction of asset lives. Has also specialised in analytical work and the assessment of risk. Adviser to several of New Zealand's largest generation and network businesses. Adviser to network businesses in Australia.

Author of several published papers in these fields (listed at the end of this CV).

Winner of industry award for a project in automation and control (the Association of Consulting Engineers of New Zealand's Silver Award of Merit, 1992).

Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
December 2005 to Present	Hyland McQueen Ltd – Principal.	Consultancy services to the power industry.
		Consultant to Wilson Cook & Co Limited.
May 1995 to December 2005	Austral Engineering Associates Ltd – Principal.	Consultancy services to the power industry.
June 1992 to December 1994	Worley Consultants Ltd – Senior Engineer.	Responsible for project management and detailed design of projects for the power industry.
September 1987 to June 1992	Electricity Corporation of New Zealand – Group Electrical Engineer, South Island Hydro.	Responsible for various major projects and electrical standards at power stations in the South Island.
May 1986 to August 1987	New Zealand Electricity Department – Project Manager.	Responsible for the detailed design, procurement and construction of the $10 million refurbishment of the Roxburgh 220 kV switchyard.
March 1981 to April 1986	New Zealand Electricity Department – Assistant Engineer.	Steam-field electrical design for Ohaaki geothermal power project; substation design standards, HVDC and filter bank controls and maintenance engineering.

Experience in the Electricity Sector

Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power's proposed Second Access Arrangement

October 2008 – Present

Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors

November 2007 – Present

Due Diligence Assessment of the Orion Gas Network

February 2000 to March 2000

Advice to Vector Limited on Expenditure-Related Matters

June 2008 – December 2008

Review of Asset Management Planning Documents

November 2007 to Present

Maintenance Optimisation Review

August 2007 to November 2007

Translating Generator Condition to Risk
May 2007 to August 2007

Insurance Risk Model Assumptions Measurement
June 2007 to July 2007

Tariff Meter Management Review
January 2007 to March 2007

Review of Asset Management Planning Documents
November 2006 to January 2007

Creation of Life-Cycle Models for Generation Plant
February 2006 to August 2006

Generation Embedding Risk
May 2006 to July 2006

Network Maintenance Contract Pricing for Lines Company
January 2006 to March 2006

Creation of Asset Management / Risk Management Software System
August 2005 to September 2006

Life Cycle and Risk Modelling Integration Project
December 2004 to October 2006

Impact Assessment of Energy-Efficient Lights on Networks
August 2004 to September 2005

Independent Review of Electricity Metering Plan – United Energy Distribution Ltd, Australia
February 2005

Engineering Overview for New Generation Proposal
December 2004 to March 2005

Hydro Generator Life Prediction
August 2004 to November 2004

Asset Management Assessment for Marsden B Power Station
January 2004 to April 2004

Cost and Risk Assessment for Due Diligence
February 2004

Asset Management Strategy Development
January 2004 to March 2004

Plant Risk Model Redevelopment
October 2003 to May 2004

Maintenance Contract Costing Model
September 2003 to December 2003

Line Charge Assessment
July 2003

Development and Drafting of Asset Management Plan
March 2003 to May 2003

Maintenance Processes Audit
August 2002 to September 2002

Network Reliability Modelling for Setting Network Maintenance Service and Capital Development Requirements
November 2002 to December 2002

Drafting 2003/04 Asset Management Plan
August 2003 to September 2002

Due Diligence Assessment of the Asset Planning of CitiPower Limited, Melbourne
June 2002 to July 2002

Develop Business Case for Rollout of Maximo CMMS
August 2001 to January 2002

Development of an Assets Inspection Data Collection Process
May 2001 to September 2001

Distribution Transformer Maximum Demand Approximation
February 2001 to May 2001

Capital Projects Database
November 2000 to March 2001

Development of "PlantRisk" Model for Asset Replacement Forecasting
June 2000 to February 2001

Drafting Asset Management Plan Describing Asset Replacement Requirements
August 2000 to December 2000

Sale of Contracting Division – Preparation of Maintenance Schedules
May 2000 to August 2000

Drafting an Asset Management Plan for Network Waitaki Ltd
August 1999 to November 1999

Maintenance and Replacement Documentation for United Energy Ltd – Melbourne
September 1999 to November 1999

Risk Statement for UnitedNetworks Ltd
July 1999 to October 1999

Reliability Forecasting Model for United Energy Ltd – Melbourne
June 1999 to October 1999

Weather Normalisation of Network Reliability Data for United Energy Ltd – Melbourne
April 1999 to May 1999

Asset Management Philosophy and Revision of the Asset Management Plan
February 1999 to April 1999

Compliance Testing Strategy for Domestic Metering for United Energy Limited – Melbourne
August 1998 to April 1999

Due Diligence Assessment of Electricity Network for United Networks Limited
September 1998 to December 1998

Overhead Line Reliability-Centred Maintenance Review for United Energy Limited – Melbourne
February 1998 to September 1998

Network Information System Review for Power New Zealand Limited
July 1997 to December 1997

Distribution Transformer Maintenance Strategy and Cost Model for Power New Zealand Limited

April 1997 to July 1997

Substation Database Design for Power New Zealand Limited
January/February 1997

Subdivision Design Review for Power New Zealand Ltd
July 1996 to December 1996

Maintenance Review for Power New Zealand Ltd
May 1995 to July 1996

Power Station Manuals Preparation
May 1994 to November 1994

Revenue Metering Project
July 1992 to March 1994

Revenue Metering Project
September 1991 to July 1992

Publications and Papers

1. Densem & Hyland, "Out of condition or condition drives assets", paper presented to EEA Conference, July 1996.
2. Densem, Hyland, Cochrane Whatley & Zonneveld, "Identify the maintenance risks or pay the cost", paper presented to Distribution 2000 Conference, Sydney, November 1997.
3. Hyland & Moffat, "Road-testing meter compliance", paper presented to EEA Conference, June 1999.
4. Hyland & McQueen, "What's that creeping up on you", paper presented to EEA Conference on distribution transformer management, June 2002.
5. McQueen M, Hyland & McQueen D, "An alternative to distribution transformer maximum demand recording", paper presented to Distribution 2003 Conference, Adelaide, November 2003.
6. McQueen, Hyland & Watson, "Monte Carlo simulation of residential electricity demand for forecasting maximum demand on distribution networks", IEEE Trans. PES, January 2004.
7. McQueen, Hyland & Watson, "Application of a Monte Carlo simulation method for predicting voltage regulation in low voltage networks", IEEE Power Engineering Society, July 2004.
8. Hyland, "Living with uncertainty: managing capital and maintenance expenditure for network reliability", 1st Annual Electricity Networks Asset Management Conference, Wellington, November 2006.
9. Hyland, "Asset replacement planning – one size does not fit all", 2nd Annual Electricity Networks Asset Management Conference, Wellington, November 2007.

CURRICULUM VITAE

Bernard Ivory **Financial Analyst / Economist**

Born	1932
Nationality	New Zealander
Education and Training	Bachelor of Commerce (Accountancy & Economics) University of New Zealand 1955 Professional examinations of The Institute of Chartered Accountants of NZ (1953) and of The Chartered Institute of Corporate Management (NZ) (1954) Other training: industrial engineering, cost and management accounting and budgetary control, marketing, supervisory and management training and development in-house with employer. Professional examinations of the NZ Institute of Valuers 1974-1980 (sat and passed 13 of 14 units)
Languages	English: mother tongue
Professional Affiliations	Institute of Chartered Accountants NZ (Hon ACA retired) 1953-2005 The Chartered Institute of Corporate Management (NZ) (CCM) 1954-2001 Institute of Chartered Management Consultants NZ (CMC) 1974-1999 Institute of Directors NZ (Fellow) 1972-2001
Countries of Work Experience	Australia, Bangladesh, Bahrain, Bhutan, Cambodia, East Timor, Fiji, Indonesia, India, Kiribati, Laos, Maldives, Malaysia, Mongolia, Nauru, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Solomon Islands, Thailand, Tonga, Tuvalu, USA, Vanuatu, Vietnam.
Key Qualifications	More than 30 years of professional experience in financial and economic analysis and management consulting with an emphasis in the last 20 years on the electricity supply industry. Experienced in the preparation and assessment of financial models of companies and projects.

Employment Record

From-To (Month/Year)	Employer/Position	Description of Duties
May 2003 – Present	Consultant to Wilson Cook & Co Limited.	Financial analyst and management consultant.
1962 - 1972 then 1974 - 2005	PA Consulting Group, Australia and New Zealand.	Specialised in the fields of financial and economic analysis, management information and systems, institutional development and strategic business and country planning.
1972 - 1974	Lockwood Buildings Ltd.	Rotorua, NZ, General Manager.
1952 - 1962	Skellerup Industries Ltd.	Christchurch, NZ, Company Secretary and Accountant.

Experience in the New Zealand and Australian Electricity Sectors

Consultant to the Economic Regulation Authority of Western Australia for Review of Expenditure Forecasts of Western Power's proposed Second Access Arrangement
October 2008 – Present

Consultant to the Australian Energy Regulator for Review of Expenditure Forecasts of the ACT and NSW Electricity Distributors
November 2007 – Present

Review of Prudential Requirements related to Isolated Electricity Supplies in NSW
November 2007 – Present

Electricity Distributors' Cost Pass-Through Application – Review for IPART
January 2006 – April 2006

Economic Regulation Authority of Western Australia – Review of Western Power's Asset Valuation and Expenditure Forecasts
August 2005 – January 2006

Office of the Tasmanian Energy Regulator – Mid-Term Review
August 2005 – February 2006

Review of DNSPs' Revised Estimates of Capex and Opex for NSW Regulator (IPART)
September 2003 – October 2003

Review of Electricity Distributors' Capital and Operating Expenditures for NSW Regulator (IPART)
December 2002 – September 2003

Review of Customer Capital Contributions for Electricity Connections (for IPART)
March 2001 – October 2001

Waikato Energy Group: Pricing Network Services, Hamilton, NZ
1994

Transpower Ltd – Review of Proposed Pricing Policies
1991

International Experience in the Electricity Sector

Establishment of New Management Contract for EDTL
November 2006 – March 2007

Corporatisation of the Bangladesh Power Development Board, Dhaka, Bangladesh
2006 – 2007

Update of the Electricity Tariff Rationalisation Study for PT PLN (Persero)
2004

Preparation of the Assam Power Sector Development Programme, Guwahati, India
2003

Implementation Framework for IPP Projects Outside Java-Bali
2002-2003

Governance and Institutional Support for Private Sector Development, Sri Lanka
2002

Third Power Project Rehabilitation Loan, Sri Lanka
2001

Power Sector Restructuring, Sri Lanka

2000-2001

Evaluation of Hydropower Proposals, Solomon Islands Electricity Authority
1999

Privatisation Study of Electricity and Water Assets, Bahrain
1998

World Bank/Privatisation Commission of Pakistan
1997

Corporate and Financial Development of Electricité du Laos
1996-1997

Institutional Strengthening of Fiji Electricity Authority
1996-1998

Review of Technical and Financial Performance of Assam State Electricity Board, India
1992

Financial and Organisational Restructuring of Karachi Electric Supply Corporation
1992

Establishment of Lanka Electricity Co (Private) Ltd, Sri Lanka
1985-1987