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Reply to: Auckland Office
Our ref: 0901
Email: jeffrey.wilson@wilsoncook.co.nz

29 October, 2009

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: COUNTRY ENERGY's WAGGA WAGGA NETWORK

In response to your instructions, we have reviewed certain matters in the gas access arrangement proposal submitted by Country Energy Gas (Country Energy) to the Australian Energy Regulator (AER) in July 2009 in relation to capital expenditure on the Wagga Wagga network in the last three years of the present access arrangement period, FY 2008 to FY 2010, and in the next period, FY 2011 to FY 2015, and have pleasure in submitting our report. [1]

1 Scope of Review

The particular scope of the review in relation to Country Energy was as follows.

(a) Review the actual and estimated capital expenditure for the last three years of the present period against the criteria in the *National Gas Rules* (the Rules) or the *Gas Code* [2] as relevant, noting that the expenditure was or is projected to be significantly higher than that approved by IPART. [3] [4]

(b) Determine whether the actual and forecast capital expenditure for the present period is the basis for the forecast capital expenditure for the next period and, if so, consider whether such an approach is reasonable. Review the forecast capital expenditure in the next period against the requirements of the Rules.

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1 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 Country Energy or to 'the business' are to Country Energy Gas; and references to 'the network' are to the Wagga Wagga network.

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

3 Independent Pricing and Regulatory Tribunal of NSW, the previous jurisdictional regulator.

4 Consideration of the reclassification of gas network management costs in this period was excluded.

(c) Review the proposed level of unaccounted-for gas (UAG) in the network for reasonableness. [5]

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.

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* and capital expenditure in the next period was to be assessed in accordance with rule 79 of the Rules. [6]

We were to consider whether the past capital expenditure and capital expenditure forecasts for the business were reasonable and represent the best 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 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.

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 is applicable, we were to provide an alternative estimate for the expenditure or propose an alternative option for it 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 28 August 2009 and we consulted the AER before the work began to clarify what was practical to achieve in the limited time available for the

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[5] The report was to include a discussion of the factors that affect UAG and account for its level in different networks.

[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.

review. The scope of this report reflects the conclusions so reached and outlined at the beginning of this section of the report.

2 Relevant Material and Consultation

For the purpose of the review, we received and considered the business's proposals and its supporting documents, particularly the Access Arrangement Information (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 14 August 2009.

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

3 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; [7]
- physical inspection of the assets;
- re-calculation 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;
    - 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;
- 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 instead solely on the submissions received from the business and the representations made in response to our enquiries.

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

4 Independence and Probity

Wilson Cook & Co Limited and its reviewers are all independent of Country Energy 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.

5 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.

6 Capital Expenditure in Present in Present Period

Background

Gas has been available in Wagga Wagga since the late 1880s with manufactured gas provided until 1981 when supplies of natural gas became available from the Cooper Basin. Gas supply was managed by the Wagga Wagga City Council until the network was acquired by Great

Southern Energy in June 1997. Great Southern Energy, along with Advance Energy and NorthPower, were merged to form Country Energy on 1 July 2001. As part of this merger, Country Energy Gas Networks became the owner and operator of the Wagga Wagga gas network. The network presently serves around 18,300 customers, predominately domestic and small commercial in nature, and several large "contract" customers whose demand accounts for around 43% of total gas sales.

The present access arrangement came into effect on 1 January 2006 and was for a period of 4½ years, ending 30 June 2010.

Capital Expenditure in Present Period

Capital expenditure in the present period was $15.6 m compared with the $8.1 m approved by IPART in the last determination, an increase of $7.5 m. Country Energy states in its AAI that the main areas in which expenditure exceeded forecast were as follows.

(a) The cast iron and galvanised steel pipe refurbishment programme increased in scope because of a decision to upgrade system pressures in a large number of suburbs to meet the growth in demand. This involved more extensive pipe rehabilitation and network extension than had originally been planned, as well as the installation of additional valves, [8] the replacement of all meters and regulators on the upgraded sections (because of the pressure change) and the installation of additional network pipe interconnections. Cost increases are also said to have arisen because of the cost of compliance with new safety standards. The total additional expenditure was approximately $1.5 m.

(b) Gas pressure in the main transmission pipeline supplying the network was increased in November 2008 from 3,000-5,500 kPa to 8,500-10,000 kPa. As a consequence, it was necessary to re-build the Bomen receipt point at a cost of approximately $1.5 m. [9]

(c) The Rail Infrastructure Corporation replaced the Murrumbidgee rail bridge deck in 2007, requiring the removal of the high-pressure pipeline from the bridge and its replacement in the river-bed at a cost of $0.8 m.

(d) Unforeseen growth in new customer connections contributed to approximately $1.9 m in additional capital expenditure.

(e) A major meter replacement programme was commenced in FY 2008 to comply with regulatory requirements in relation to accuracy. It resulted in a 25% increase in meter replacement costs, increasing capital expenditure by approximately $0.2 m.

(f) The re-classification of network management costs as capital expenditure instead of operating expenditure led to a further increase of $1.4 m in capital expenditure above the IPART-approved level.

Material and labour cost increases are stated to have contributed to the additional expenditure but the sums itemised above account for $7.3 m of the overrun of $7.5 m.

We discussed each of the itemised sums with staff at the August meeting. We were satisfied that item (a), entailing the replacement of cast iron and galvanised steel pipes, meters and regulators and the addition of valves and interconnections was prudent work to have undertaken, given the age of the network, the widespread occurrence of leaks from old pipes and the other general information received in relation to network condition. However, a detailed breakdown of the

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[8] Country Energy notes in its *Asset Condition Report* of December 2008 that the installation of additional valves was a change in its design practice. The purpose of the additional valves is to facilitate shutting off gas near "high risk" areas such as hospitals and schools in the event of significant leakage occurring and also to minimise the use of "squeeze-off" for the isolation of sections of polyethylene pipe.

[9] We understand that the rise in transmission pipeline pressure stemmed from a matter outside the business's control – the connection of a gas-fired power station at Uranquinty – in August 2008.

$1.5 m of expenditure involved was not available and thus we are unable to comment on the efficiency of the expenditure, other than to observe that the amount appeared reasonable for the work as described to us.

We considered that the necessity of items (b) and (c) was clear and that the expenditure on those items was unavoidable. Again, however, a breakdown of the costs was not available as a basis for commenting on the efficiency of the expenditure. We noted, however, that both projects were specialised in nature and that the work was undertaken under urgency. We noted that SKM had considered the cost of the gate station but was unable to form a basis of comparison with any benchmark because of its size and because it had not been tendered competitively, owing to time constraints. [10] We therefore considered, on balance, that the expenditure ought to be accepted as reasonable.

In relation to item (d), the additional expenditure arising from growth and consequential new connections, we noted an apparent inconsistency in the stated number of connections reported, as evidenced by the footnote to table 1 on p. 6 of the AAI. [11] However, if the 64% increase reported on p. 7 of the AAI is applied to the forecast connections given on p. 36 of IPART's final decision, the additional, un-forecast connections total approximately 540 over the period. The $1.9 m attributed to the work then implies an average cost per connection of $3,600, which is within the range of cost possible using the cost components reported by SKM for mains, services and meters.

We were advised that the meter replacement programme (item (e)) commenced in 2007 following the findings of an audit to check compliance with metering regulations that had been introduced in or around 2002. The work comprises the replacement, over five years, of meters that are older than 15 years. The programme is considered justified by compliance reasons and reasonable in approach. We noted that around 75% of the work has been contracted out competitively and that the remainder relates to complex installations.

Item (f) is not a technical (engineering) matter and was not assessed.

Conclusion

In conclusion, we consider that the capital expenditure made or planned in the last three years of the present period was reasonable with the exception of the expenditure re-classification item, which we did not review.

7 Capital Expenditure in Next Period

Proposed Expenditure and Basis of the Estimate

Country Energy proposes $18.0 m of capital expenditure in the next period, made up of $9.0 m on asset replacement and refurbishment and $9.0 m in growth-related expenditure.

Staff confirmed that next period capital expenditure was based on planned work programmes and not the actual or forecast expenditure for the current period.

Assessment

To gain a fuller understanding of the expenditure drivers in the next period, we sought and obtained information on various matters including the following.

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[10] See p. 17 of SKM's report, Appendix B of the AAI.

[11] The note to the table reads, "The total volume customer numbers in table 1 represent a decrease in reported customer numbers compared to those included in the previous access arrangement. The variance is the result of a change of systems used for calculating customer numbers. The original customer numbers were derived from an internal database. However more accurate customer numbers are derived from the billing system, which dynamically accounts for vacant premises and disconnections providing a more overall annual average."

(a) In relation to the drivers of replacement expenditure (leakage, pipe corrosion, etc) and the role that load growth will play in augmentation expenditure, we asked the business to describe its network rehabilitation plans, which were identified as a major component of planned expenditure in the next period.

(b) We asked for a sample of recent analyses of key sections of the network, sufficient to demonstrate that pressure criteria could not be met without rehabilitation or, based on projected load growth, would not be met during the period without rehabilitation, expansion of capacity or extension.

(c) We sought additional information on rehabilitation costs and a breakdown of capital costs in terms of pipe lengths, number of pressure regulating stations, etc to assist our judging the reasonableness of the cost estimates.

(d) We sought general information on the prevailing ground conditions and laying conditions and any other factors affecting pipe-laying costs that expanded the details provided in SKM's cost review report. [12]

(e) In relation to refurbishment expenditure, we asked for details of a sample of the proposed refurbishment projects listed on p. 25 of the AAI with an emphasis on those of higher cost, sufficient to identify the project drivers and including network pressure studies and information on gas leakage rates, safety incidents and pipe condition assessments as well as project costs. We also sought age-quantity histograms of the network assets, including a breakdown of pipes by material type; further details of the meter replacement programme sufficient to identify the meter population ages, link the replacement strategy to the forecast costs and explain the adoption of a 15-year life as opposed to a life deduced by statistical sample testing; and a performance history of the network in terms of service reliability (SAIFI, CAIDI and SAIDI) and network performance (leakage rates, unaccounted for gas etc).

These matters were the subject of our discussion with the business, along with the matters discussed in the preceding section of this report.

Replacement and Rehabilitation Expenditure (Mains)

We were informed that the major part of the planned asset replacement and refurbishment capital expenditure related to the ongoing programme to upgrade network pressures and replace old pipes. As already discussed, this programme commenced in FY 2007 to address supply pressure problems and gas leaks caused by ageing assets that have new growth areas connected to them. At present, pressure in these areas falls to critically low levels in periods of high demand. Large areas are being converted progressively from low- or medium-pressure to medium-high pressure operation (80-250 kPa). This entails refurbishing a large proportion of existing mains and consumer services and replacing meters and regulators. Some of the localities that are programmed for pressure upgrading in the next period are listed in the AAI, p. 25. Some existing interconnections need to be upgraded and new ones built to deliver sufficient gas into the upgraded areas. The forecast expenditure on this work as a whole is $7.2 m.

In response to our questions, the business tabled the following documents in support of this expenditure:

- Asset condition report, December 2008;
- Gas network management plan – main index;
- Gas network management plan – distribution;

[12] We noted, however, that a considerable amount of the refurbishment work associated with cast iron and galvanised steel pipes entails the insertion of new plastic pipes of a smaller bore (operating at a higher pressure), rather than the construction of new pipelines by trenching or boring. The SKM unit rates, however, refer to the cost of new pipelines, not insertion work.

- Kooringal mains upgrade project proposal; and
- Lake Albert pressure increase project proposal.

It was explained that there is significant leakage due to about 18% of the pipes being in fair-to-poor condition, owing to age and/or the condition of the material used (cast iron and galvanised steel pipes with leaks and older types of polyethylene pipe that have become brittle following "squeeze-off"). [13]

The asset condition report provides details of pipe condition and includes maps showing areas where the pipes in poor or fair condition are located. The report also provides information on the findings of the pressure surveys that have been used to identify areas where capacity enhancement is required. We noted that the asset condition survey, based on physical inspections, maintenance history and leakage surveys, reports that 4.5% of the network is in poor condition with the majority of the poor condition network being cast iron pipe (representing 21% of the cast iron pipe installed) and galvanised steel (representing 22% of the galvanised steel pipe installed). These findings, combined with increased demand, support the proposed expenditure.

The Kooringal mains upgrade project appears a targeted response justified on physical condition assessment.

The Lake Albert pressure increase project appears to be a response to a combination of circumstances: an increasing trend of low-pressure incidents, and leakage on cast iron and galvanised steel pipe in the northern part of the area. The project involves laying new mains and inserting polyethylene pipe in old cast iron and galvanised steel pipe, a common practice in the industry and less expensive than laying new pipes. The project appears justified based on assessed condition and service quality.

A project plan, included in the asset condition report as table 8, summarises work proposed by type, quantity and cost.

We noted that SKM had reviewed Country Energy's unit rates for pipe laying and other routine work and found them reasonable. We reviewed SKM's methodology and findings and considered them reliable.

On the assumption that the two projects reviewed are representative of the type of work planned as a whole, we considered that the forecast capital expenditure in the mains replacement category in the next period was appropriate and reasonable.

Overall, we considered that the planned programme to remedy the condition of the network and reduce the high level of UAG presently experienced was probably overdue and that the planned expenditure on it was reasonable.

Replacement Expenditure (Meters)

The balance of $1.8 m of the proposed replacement capital expenditure programme is for meter replacement and comprises the continuation of the present programme until FY 2013 and ongoing meter replacement expenditure thereafter as meters reach the 15-year age limit. [14]

Only 10% of meters are older than 15 years, which is consistent with a policy of age-based replacement to ensure that meters conform to the accuracy requirements of the *Gas Supply (Gas Meters) Regulations 2002*. Under regulations, the meter owner has an option of submitting a sample-testing regime for approval. However, the meter population of the network is small and there are several types of meter involved so an aged-based replacement programme appears a reasonable strategy.

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[13] Leakage from old cast iron or galvanised steel pipes is not peculiar to the Wagga Wagga network although the business considers that the excessively dry ground conditions prevailing at present are aggravating the situation.

[14] See, for example, table 16 on p. 25 of the AAI. According to table 7 in the asset condition report, the 15-year age limit will be reached by 1,756 meters in FY 2014 and a further 1,610 meters in FY 2015.

Considering these factors and noting that SKM had reviewed County Energy's meter costs and found them reasonable, the necessity for and estimated cost of the meter replacement programme is accepted as reasonable.

Growth-Related Expenditure

Growth-related expenditure is projected to be $9.0 m spread among customer connections ($2.7 m), the extension of mains ($1.1 m) and network reinforcement ($5.2 m). The expenditure is net of customer capital contributions and assumes the inclusion of the costs of the following work:

- new mains associated with the pressure upgrading programme;
- extensions or upgrading to cater for system growth;
- a programme of installation of critical line valves; and
- the connection of 150 new customers p.a. and the installation of the accompanying mains, assuming 25 metres of main per new customer connection. [15]

Whilst this work is obviously justified by growth, the AAI provides only a lump sum for the proposed 150 new customer connections forecast each year. [16] This does not give us sufficient information to analyse the planned expenditure ourselves but we note that SKM reviewed the principal unit rates involved and considered them reasonable.

Management Experience and Knowledge of the Network

We were given a further level of comfort by the understanding gained during our discussions that the network management team is knowledgeable about the network, that it has comprehensive asset management plans in place and that it has a full understanding of the network requirements.

Conclusion

In conclusion, therefore, and noting that the level of capital expenditure in the present period does **not** form the basis of the forecast expenditure in the next, we consider that the capital expenditure planned for the period is reasonable.

8 Level of Unaccounted-for Gas

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. 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

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[15] The assumptions imply an average cost per new customer connection other than contract customer connections of $3,600, the same rate as reported on p. 6.

[16] Table 8 in the asset condition report provides some further information but not in sufficient detail for cost analysis.

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. [17]

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.

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.

Level of UAG on Wagga Wagga Network

As far as the Wagga Wagga network is concerned, the presence of leaking cast iron and galvanised steel pipes means that UAG will be high, as indeed it presently is, but that it will fall as the refurbishment proceeds.

The AAI states, "The average of actual unaccounted for gas from the previous access arrangement is 5.75%, and it is proposed to continue to use this average for this Access Arrangement." [18] Whilst a UAG of 5.75% is relatively high, it can be accepted for the present, given the network condition. However, in our opinion, a declining level ought to be assumed over the period in response to the planned refurbishment programme.

Calculation of Recommended Level

Based on tables 1 and 8 in the asset condition report, the planned refurbishment programme will upgrade 48,000 m of mains and services during the next period, of which 41,604 m are assumed to be in service during the final year of the period. This latter quantity is out of a total quantity of pipe categorised at present as "poor, fair or unassigned" in terms of condition and thus assumed to be in need of refurbishment.

The table below shows the progression in UAG that could be expected, assuming that the network, when fully refurbished, will have a UAG of 2% of gas receipts and that the difference between that level and the present level of UAG is reduced *pro rata* as the refurbishment proceeds. The calculations assume that the refurbished pipes are brought into service only at the

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[17] 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.

[18] AAI, p. 40.

end of the financial year of their refurbishment, so the effect of the refurbishment is under-stated to some extent in the calculations. The calculations assume that leaks occur on services as well as mains and, as the table shows, services are being replaced at the same time as mains as the work proceeds. [19]

The calculations are not claimed to be exact but to represent a reasonable level of reduction in UAG over the next period, commensurate with the capital expenditure proposed for network refurbishment. [20]

FY ->	2,011	2,012	2,013	2,014	2,015	End of Period
Quantity refurbished - mains (m)	8,402	6,498	7,055	7,410	4,017	33,382
Quantity refurbished - services (m)	2,169	3,390	3,659	3,021	2,379	14,618
Total refurbished (m)	10,571	9,888	10,714	10,431	6,396	48,000
Refurbished pipes in service (m)		10,571	20,459	31,173	41,604	48,000
Pct of "unassigned, fair and poor" pipes refurbished		8%	16%	25%	33%	38%
Projected UAG a/	**5.75%**	**5.4%**	**5.1%**	**4.8%**	**4.5%**	4.3%

a/ Assumes 2% UAG on completion of refurbishment of all pipes and a pro-rata reduction of difference between that and the present level as the work proceeds. Also assumes a total length of pipe categorised as "unassigned, fair or poor" in condition (and thus needing refurbishment) of 124,979 m at present. Source of quantities: Asset Condition Report.

Conclusion

In conclusion, we propose that Country Energy's present level of unaccounted-for gas of 5.75% of gas receipts should be accepted for the first year of the next period (FY 2011) but reduced in accordance with the calculation in the table above in the following years, FY 2012 to FY 2015.

If, in its revised proposal, the business provides more up-to-date information on its present and historical levels of UAG (as it has indicated it may do), the UAG figures in the table above could be revised accordingly.

9 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 Country Energy's expenditure proposals in relation to its Wagga Wagga network is as stated below.

(a) Country Energy's actual and forecast capital expenditure from 1 July 2007 to 30 June 2010 is considered prudent and efficient with the exception of the expenditure re-classification item which, at the AER's request, we did not review.

(b) Country Energy's proposed capital expenditure from 1 July 2011 to 30 June 2015 is considered prudent and efficient

(c) Country Energy's present level of unaccounted-for gas of 5.75% of gas receipts should be accepted for the first year of the next period (FY 2011) but reduced in accordance with the calculation in the table in section 8 above in the following years, FY 2012 to FY 2015. (If, in its revised proposal, the business provides more up-to-date information on its present and historical levels of UAG (as it has indicated it may do), the UAG figures in the table above could be revised accordingly.)

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19 It was not possible for us to make the calculation for mains alone as a breakdown of pipes by condition was given only as a whole. The effect of an error in this assumption is likely to be minor.

20 Precise calculation is not possible in the absence of detailed knowledge of the location and volume of the leaks.

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 Derek Walker and Mr Pat Hyland, with internal review by Mr Bernard Ivory. 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.

10 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.

Yours faithfully

Wilson Cook & Co Limited

Attachment: CVs.

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