

**Report on the Treatment of the Interest  
Tax Shield when Determining Excess  
Earnings in the Gas Control Inquiry**

Prepared on behalf of :

**Powerco Ltd**

**Vector Ltd**

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# 1 Background

In the draft report on the Gas Control Inquiry of 21 May 2004, the Commerce Commission estimated the net acquirers benefits (NAB) that would arise if various gas pipeline businesses were subjected to control. In the case of Vector Limited, it was estimated that the NAB would be between \$ 3.6 million and \$ 7.5 million per annum, with a midpoint value of \$ 5.7 million.<sup>1</sup> For Powerco Limited the range was \$ 3.4 million to \$ 6.2 million, with a midpoint of \$ 4.9 million. Given these results the Commission concluded that there are sufficient grounds to warrant some form of control of the companies.

I have examined the Commission's calculation of the midpoint value for Vector.<sup>2</sup> While I have not examined the corresponding calculation for Powerco, I have been informed that the identical method of calculation was applied. I focus in this report on just one aspect of the calculation, namely, the treatment of the interest tax shield.

The tax amounts submitted by Vector and Powerco, as part of their information disclosure to the Commission in February 2004, were after interest amounts, that is, the actual tax paid on the net earnings of their gas businesses, after deduction of interest payments. However, in calculating excess earnings in the manner proposed by the Commission, the tax paid amount should be adjusted to the before interest amount by adding back the interest tax shield, or alternatively, the interest tax shield should be deducted from net earnings. The Commission did not make that adjustment and therefore the Commission's estimates of excess earnings are overstated by the amount of the interest tax shield. Since the bulk of the NAB arising from the proposed control is likely to derive from an expected reduction in the calculated excess earnings, this overstatement is likely to have been a major influence in the Commission's proposal to impose control.

It is possible that the Commission's overstatement has arisen from simple misunderstandings in the disclosure process. The companies understood the information request to be for tax paid amounts; on the other hand, the Commission may have expected that it would receive information on the before interest tax amounts. In that event, there should now be ready agreement for correction of the NAB estimates to incorporate the interest tax shield. However, in case it is the Commission's view that the calculation of excess earnings should be based on the tax paid amount, I show below why that view is incorrect. I also show that the interest tax shield is taken into account in the calculation of return measures under the gas and electricity information disclosure regulations and was taken into account by the Commission in the airfields inquiry undertaken in August 2002.

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<sup>1</sup> The range in the NAB values arises mainly from the Commission adopting a range estimate for the weighted average cost of capital (WACC). The highest NAB value is obtained when WACC is assigned the lower end of the range and the lowest NAB value is obtained when WACC is assigned the upper end of the range.

<sup>2</sup> From the spreadsheet titled "Gas Inquiry Model - Draft Report - Vector.xls", provided by the Commerce Commission to Vector on 21 May 2004.

## 2 Calculation of Excess Earnings

The Commerce Commission defines excess earnings as follows :<sup>3</sup>

$$\text{Excess Earnings}(\$) = \text{Net Earnings}(\$) - (\text{Asset base} \times \text{WACC}) \quad (1)$$

where

Net Earnings equals the earnings before interest of the gas pipeline businesses less tax, depreciation, and operating expenses plus any revaluation gains/losses;

Asset base is the ODV value of the gas distribution assets owned by a gas pipeline business; and

WACC, the weighted average cost of capital, is the average value for the industry, as determined by the Commission.

This formula is widely used in rate-of-return regulation and is equivalent to a comparison of the return on investment (ROI) with WACC.

It is easily shown that the tax amount used in application of the formula should be the before interest amount. The building block model can be stated as follows:

$$R = O + D + T + k_e S + k_d B \quad (2)$$

where

$R$  = allowed earnings (including revaluations)

$O$  = Operating costs

$D$  = Depreciation and amortisation expense

$T$  = Tax paid

$k_e$  = Required return on equity

$S$  = Equity value of company

$k_d$  = Required return on debt

$B$  = Debt held in company

and the definition of WACC adopted by the Commission is:

$$\text{WACC} = k_e \frac{S}{V} + k_d (1 - t) \frac{B}{V} \quad (3)$$

where

$t$  = the statutory tax rate, and

$V$  = the asset base (=  $B + S$ )

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<sup>3</sup> Pars. 5.27 and 5.28 of the Draft Report on the Gas Control Inquiry, 21 May 2004.

thus

$$V(WACC) = k_e S + k_d (1-t)B \quad (4)$$

Equation (1) can be restated as :

$$R = C + D + T + k_d Bt + k_e S + k_d (1-t)B \quad (5)$$

where

$$k_d Bt = \text{interest tax shield}$$

Thus substitution from (4) gives:

$$R = C + D + T + k_d Bt + V(WACC) \quad (6)$$

and therefore

$$\text{Excess Earnings} = \{R - [C + D + (T + k_d Bt)]\} - V(WACC) \quad (7)$$

Comparison of equation (7) with the basic formula (1) shows that the calculation of Net Earnings should be based on the before interest tax amount, that is, tax paid ( $T$ ) plus the interest tax shield ( $k_d Bt$ ), or alternatively, the interest tax shield should be deducted from earnings.

The argument presented above reduces essentially to the basic principle that the interest tax shield should be "counted only once", that is, it should be included in the calculation of WACC, or the calculation of tax, but not in both. Given that the interest tax shield is included in the definition of WACC adopted by the Commission, it should not also be included in the tax amount.<sup>4</sup>

### 3 Treatment of Interest Tax Shield in the Disclosure Regulations

In the Gas Information Disclosure Regulations, the interest tax shield is treated correctly, in the manner described above. Under these Regulations, there is no definition for the ROI – rather the accounting rate of profit (ARP)

$$ARP = \frac{a - b - c + d}{e} \quad (8)^5$$

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<sup>4</sup> It is appropriate to note that calculation of residual income, popularised as Economic Value Added (EVA<sup>®</sup>) by Stern Stewart Inc., correctly uses the before interest tax amount. Refer to, for example, chapter 12.4 of Brealey, R. and S. Myers, "Principles of Corporate Finance", 7<sup>th</sup> Ed., McGraw Hill, New York, 2003.

<sup>5</sup> Schedule 1, Part 2, par 1(c) of the Gas (Information Disclosure) Regulations (1997)

where

a = earnings before interest and tax

b = cash tax

c = interest tax shield

d = revaluations, and

e = average total funds employed, less half the amount of revaluations

“Cash tax” is defined as income tax paid in a financial year and “interest tax shield” is defined as the sum of interest expense and capitalised interest, multiplied by the standard company tax rate.

Similarly, under the Electricity (Information Disclosure) Regulations, the interest tax shield is also treated correctly. Here the ROI is defined:<sup>6</sup>

$$ROI = \frac{a + g - q + r + s + d - [p + s \times t + b]}{c - e - \frac{r}{2} - f + h} \quad (9)$$

where

a = earnings before interest and tax

c = average total funds employed

d = ODV depreciation adjustment

e = average total works under construction

f = value of system fixed assets at book value

g = amortised goodwill

h = value of system fixed assets at ODV value

p = income tax expense

q = interest tax shield

r = revaluations

s = value of subvention payment

t = standard entity income tax rate

It is clear that under these regulations the interest tax shield is deducted from earnings when assessing the financial performance of utility companies.

## 4 Commerce Commission Treatment of the Interest Tax Shield in the Airfields Inquiry

In the Commerce Commission’s inquiry into the airfield activities of Auckland, Christchurch and Wellington Airports in 2002 to determine whether these entities should be subject to control, the Commission also performed a net acquirer’s benefit test. This

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<sup>6</sup> Schedule 1, Part 3, par 1(c) of the Electricity (Information Disclosure) Regulations (1999)

was very similar to the test applied to gas pipeline businesses and was based on the same underlying economic model.

In the Commission's NAB calculations for Auckland Airport<sup>7</sup> the tax amount applied was effectively the before interest amount but the method used was not as straightforward as merely adding the interest tax shield back to tax paid or deducting it from allowed earnings. Instead, the Commission determined an effective tax rate by adjusting the normal corporate tax rate to reflect the impact of interest paid and then applied this rate to the earnings before interest and tax (EBIT) to determine net earnings. The effective tax rate was calculated using the following formula :

$$t_e = \frac{T + It}{NPBT + I} \quad (10)$$

where

$NPBT$  = Net profit before tax

$I$  = Interest paid

$T$  = Tax paid (as before)

$t$  = Statutory tax rate (as before)

and by definition of EBIT and NPBT, it follows that

$$t_e = \frac{T + It}{EBIT}$$

It is easily shown that when determining excess earnings, this approach is equivalent to using the before interest tax amount or deducting the interest tax shield.

The Commission calculated Net Earnings as:

$$\text{Net Earnings} = EBIT(1 - t_e)$$

that is

$$\begin{aligned} \text{Net Earnings} &= EBIT \left(1 - \frac{T + It}{EBIT}\right) \\ &= EBIT - T - It \end{aligned}$$

which, restated in the symbols used in section 2 above, is

$$\begin{aligned} \text{Net Earnings} &= (R - C - D) - T - k_d Bt \\ &= R - [C + D + (T + k_d Bt)] \end{aligned} \quad (11)$$

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<sup>7</sup> These calculations are contained in the Commerce Commission spreadsheet titled "Part B App 13 (b) High SR OC AIAL - Revised for MED (Public Version).xls" , forming part of their final report "Part IV Inquiry into Airfields Activities at Auckland, Wellington and Christchurch International Airports", dated 1 August 2002.

and is thus the same as obtained before.

## 5 Conclusion

The Commission has overstated the NAB for Vector and Powerco because it has incorrectly based its calculations on tax paid rather than the before interest tax amounts. This error may have resulted from misunderstandings in the disclosure process. However, in case it is the Commission's view that the calculations should be based on tax paid, this report has shown that the correct method of calculation is based on the before interest amount of tax and also shown that method to be consistent with the gas and electricity disclosure regulations and the Commission's own work in respect of the airfields inquiry.

## Appendix I : Qualifications and Experience

Tony van Zijl is a Director of LECG and provides consulting advice and litigation support in the areas of financial reporting, financial management, capital markets, cost of capital, and valuation. He has given expert evidence on these matters in High Court proceedings and arbitrations.

He is Professor of Accounting & Financial Management at Victoria University of Wellington. He is a member of the Institute of Finance Professionals of New Zealand (Certified Securities Analyst Professional) and of the Institute of Chartered Accountants of New Zealand (Fellow Chartered Accountant).

Professor van Zijl is currently a member of the Valuation and Property Standards Board of the New Zealand Property Institute. He was a foundation member of the Accounting Standards Review Board and is a former Chairman of the Financial Reporting Standards Board. He is also a former New Zealand President of the Accounting and Finance Association of Australia and New Zealand.

He has served on government working parties on securities law reform, capital charging for tertiary education institutions, and value-based reporting for state owned enterprises.

Professor van Zijl holds a PhD in Finance, a Diploma in Accounting, and Bachelor's degrees in Economics (Honours) and Mathematics - all from Victoria University of Wellington. His PhD thesis dealt with theoretical aspects of the Capital Asset Pricing Model.