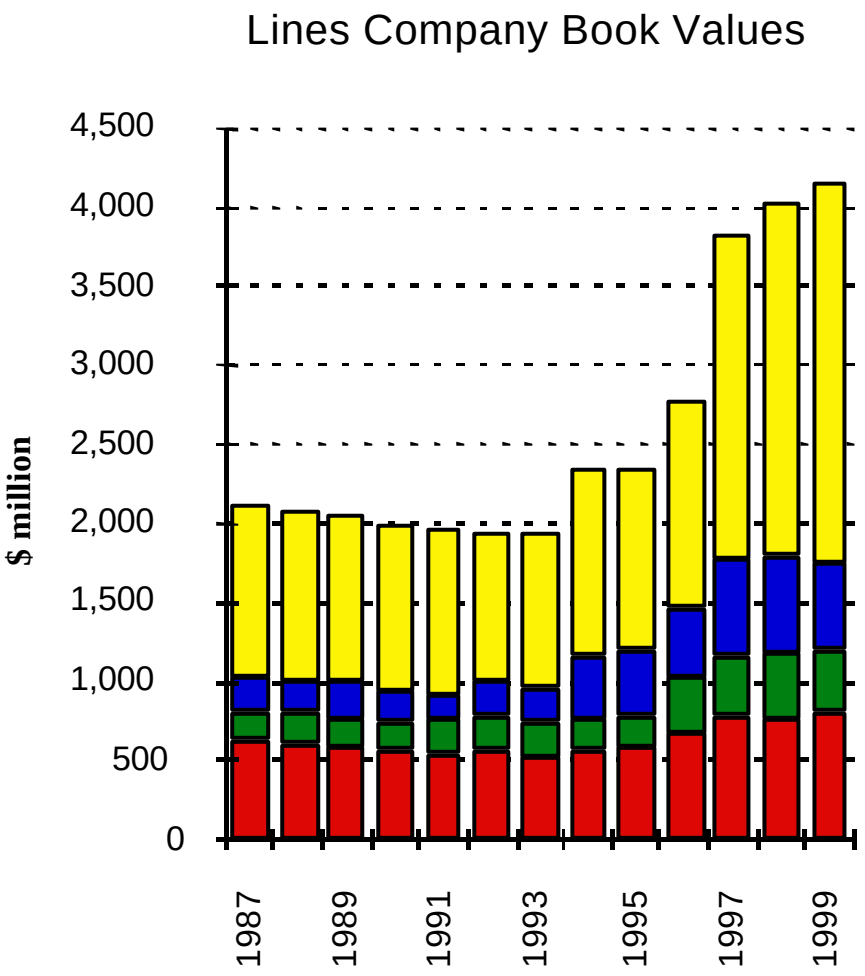
Lining Up the Charges

Electricity Line Charges and ODV



Simon Terry Associates

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Executive Summary

- The report of the Ministerial Inquiry into the Electricity Industry failed to answer the question that motivated the inquiry: are prices fair? In particular, are electricity lines charges fair? The inquiry report does not adequately analyse whether overcharging is taking place, or the extent of it, and does not examine whether lines companies are using an appropriate pricing and valuation methodology.

- The inquiry proposes that the core issue of the pricing methodology be passed to an industry-elected board. We are not aware of any OECD jurisdiction that allows individual companies or industry bodies to be the final arbiter on electricity lines pricing methodology. While the Commerce Commission is to have the power to impose price control on individual companies, it is cast more in a backstop role and the inquiry does not recommend that final control over pricing methodology should rest with the Commission.

- The valuation placed on fixed assets is the main driver of a typical lines company's costs, which are in turn reflected in customer charges. "If the valuations are wrong, then line charges are wrong" the inquiry report acknowledged.

- Since the time line companies were compelled to corporatise in 1993, these valuations have risen dramatically. In the past eight years, electricity lines companies have more than doubled the book value of their networks from $2 billion to $4.2 billion.

- This sharp rise in book values is not due to an extraordinary level of investment in their networks during the 1990s. Expenditure remained largely confined to routine maintenance and replacement. What happened was that existing asset values were simply written-up following introduction of a new valuation methodology – Optimised Deprival Valuation (ODV). The result was huge windfall gains to network owners.

- These gains can be measured in dollar terms by examining the rise in lines company operating surpluses. While the average line charge has remained just over 3 cents per kWh for the past decade, lines company operating costs have fallen considerably. As there is little incentive for a monopoly supplier to share these savings, gross operating surpluses have grown substantially. These have doubled over the past decade from 0.76¢/kWh to 1.47¢/kWh – an increase of about $200 million a year compared to the level pre-corporatisation.

- This means that consumers are currently paying around $200 million more each year than would have been required to properly sustain the lines companies if they had retained the valuations they commenced with when corporatised in April 1993.

- The lines companies have therefore overcollected about $1 billion during the past five years. While a considerable proportion of this money has made its way back to customers by way of rebates, there is nothing to ensure this will continue into the future and there are major leakages (such as tax on the surplus) even if all companies rebated overcollections. The degree to which these overcollected revenues are returned depends on the individual network each customer is connected to and its ownership structure.

- This overcollection can also be examined by estimating the rate of return on investment achieved. The true returns are calculated by combining operating surpluses with the capital gains from asset revaluations. For the six years following corporatisation, the rate of return was between 24% and 35% pre-tax, approximately 16%-23% post-tax. This range is more than double that which the Ministry of Economic Development (MED) considers appropriate for distribution companies - 7.5% to 10%.

- It compares very favourably with returns available from the New Zealand sharemarket over a similar period. If a basket of the top forty companies, factored according to their weights in the NZSE40, were purchased and held for eight years, these stocks would have generated a 14.2% post-tax rate of return.

- The issue at the heart of the fair pricing question is windfall capital gains – gains from revaluations. The inquiry report argues that revaluations ought not to be taken into account in the reporting of underlying profitability.

- We believe that on this issue the inquiry is wrong, as a matter both of economic theory and of international legal precedent. Capital gains obtained from revaluing assets are a source of income. For a natural monopoly, which prices its services directly from the value of its assets, the treatment of that capital gain is of great importance. If prices are raised in line with the increased asset value without any offsetting adjustment, the owner reaps windfall gains which are far more than just a one off boost. The owner can effectively earn a return on and of capital that it has never actually invested in the business. Consumers pay for these increased earnings through higher charges while receiving no improvement in the scope or level of service. Such earnings are pure monopoly rents.

- It is a well established principle in the economic and current-cost-accounting literature that real holding gains, whether or not realised as immediate cashflows, represent real income to the asset owners in the period when those gains accrue. This was established for subsequent regulatory practice in the US when the Supreme Court outlawed a range of practices under which utilities had inflated their asset values used for price setting. The issue was confronted in the UK during the introduction of the RPI-X incentive regulation and some consumer charges were reduced substantially to correct for asset revaluations before imposition of the new price cap.

- The key principle, that revaluation gains are indeed income, was also supported by a 1995 decision in the International Court of Justice. This principle was embodied in advice put forward by Ernst and Young as consultants to MED in 1994.

- The primary problem facing consumers is that lines businesses are able to write-up their assets using the ODV methodology and then use these much higher values as a justification for capturing monopoly rents.

- The ODV methodology was first introduced to New Zealand when the newly separated Transpower adopted it to value its national transmission assets. Soon after this, the regional lines companies were compelled to corporatise and the government established a light-handed regulatory regime, the key components of which are information disclosure and the threat of price regulation. As part of this, government required lines companies to provide ODV valuations simply for the purpose of performance comparison, not for the purpose of pricing. However, the lines companies have adopted the ODV valuations into their accounts and then priced their services on the basis of these much higher valuations.

- The ODV methodology relies on the deprival concept. Yet deprival was never suitable as the conceptual basis for rate base determination, was never proposed for that purpose by the original theorists who developed the concept, and has not established a successful track record in that role anywhere in the world.

- Deprival is a concept from the world of insurance and damages estimation. When applied to price setting for natural monopolies, it is inevitably circular. As deprival value rests on revenue expectations, it cannot at the same time be the basis for setting revenues. For this reason its use for rate base purposes was rejected by the US Supreme Court.

- A new pricing methodology is required and the financial adjustments required are manageable. Of the $6.4 billion currently recorded as invested in fixed assets of the 32 electricity transmission and distribution companies, a return to a fair pricing methodology could most likely be achieved with no transfers of wealth in respect of 28 of these which account for most of that combined valuation. For the four remaining lines companies, a reduction in book values to achieve fair pricing could indeed involve a loss of wealth by the private shareholders in those companies. It is a question of who suffers: investors or consumers?

- When considering the position of the lines companies, it must be noted that a 1997 survey recorded that 56% of lines company CEOs expected “the regulator to enforce the regulatory ‘cap’ on line revenues” by 1999 and a further 20% some time from the year 2000 onwards.

- There is no defined level of pricing explicitly approved by the Government. Instead, officially, there is just the threat of regulation. Given the large number of lines companies disclosing returns on investment for a single year which exceeded 28%, it should not come as a surprise if the government makes good its threat of regulation. This has been a recogised business risk for lines companies.

- The importance of confronting now the application of the ODV methodology goes beyond the issue of fair prices for electricity customers. Customers of all network utilities have a stake in the outcome. This is because of the progressive adoption of the ODV methodology by other monopoly utilities.

- Gas suppliers and major airports were early to revalue under ODV, following on the heels of electricity industry revaluations. As plans for reform of the water and possibly roading sectors advance, so does the question of whether these industries will also generally adopt some form of ODV valuation and pricing.

- The electricity industry tends to be used as the template for regulation of other network industries. Thus, if ODV gains formal acceptance following implementation of the reforms recommended by the inquiry report, this will set a strong precedent for its adoption elsewhere. ODV valuations may then become locked into the economy and customers of monopoly services will be permanently poorer, quite unnecessarily, by hundreds of millions of dollars a year if all network utilities adopt ODV pricing and do not rebate consumers.

- It is proposed in the inquiry report that government issue a statement of economic policy under Section 26 of the Commerce Act. We suggest that this statement be expanded, or a separate one issued, which gives direction to the Commerce Commission to design price setting apparatus within specified criteria. Through this statement, government could cast the general parameters of the pricing and valuation methodologies to be adopted while leaving the detailed design to the proposed new industry regulator.

1. Introduction

This report examines the application of the Optimised Deprival Valuation (ODV) methodology to the pricing of electricity lines services. It critiques the output of the electricity inquiry on this issue and focuses on the soundness of the methodology, its application to line charges, and the resulting revenue overcollection.

Simon Terry Associates Ltd (STA) are specialists in network utility economics and energy sector analysis. During the past decade, we have consulted widely on issues arising from deregulation of New Zealand's energy markets. We have acted as retained advisers to a range of corporate clients, assisted overseas regulatory authorities, and prepared research documents in support of arbitrations and litigation on these matters.

Among the past work carried out by the authors is the *Hydro New Zealand* report, an alternative blueprint for reform of the electricity sector developed nine years ago when plans for restructuring were first being conceived. *Hydro New Zealand* contains a chapter which critiqued the ODV methodology as presented in 1991.

This report has been prepared independently by STA on a pro bono publico basis as an input to debate on the recommendations of the Ministerial Inquiry into the Electricity Industry. It is also hoped that it will stimulate investigation into the wider application of ODV to other network industries. STA has no conflicts of interest arising from issues covered in this paper and we are not currently working on any related assignments.

2. Inquiry Expectations and Output

2.1 Expected Inquiry Output

A centrepiece of Labour's pre-election energy policy was an electricity industry inquiry. Three of the five issues listed were related to the possible regulation of lines companies. The first was "establishing whether there is a need to regulate distribution and transmission companies ...". [1]

The clear political message communicated in this policy was that lines company pricing would be seriously scrutinised, and would be disciplined by regulation if necessary. When the terms of reference for the inquiry were announced in February 2000 its scope had been expanded, and emphasis had shifted to assessing required regulatory mechanisms rather than price levels. However, Energy Minister Pete Hodgson made clear when announcing the inquiry that, in the end, the inquiry must clearly address the issue of prices paid by consumers:

> "Our overall objective with this inquiry is to ensure that electricity is delivered in an efficient, reliable and environmentally sustainable manner to all consumers. New Zealanders need to be sure that they will get *fair value* for their money" he said [2].
>
> "The government will be satisfied when consumers, when they get their monthly bill, can say 'yes, that's a *fair deal'* ".[3] (Emphasis added)

A month later at the annual conference of the Electricity Networks Association, Hodgson further warned lines companies that "Where … your interests are secured at the expense of customers, then a regulatory response from Government can be expected". [4]

Thus, whatever the letter of the inquiry's terms of reference, there was a clear expectation on the part of the minister, those submitting, and the public at large, that electricity lines pricing would be seriously scrutinised. We would therefore have expected meaningful answers to at least the following questions;

- Are lines companies overcharging?
- If so, to what extent?
- Are their current asset valuations and pricing methodologies appropriate?
- If not, what would be the appropriate asset valuation and pricing methodologies?

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1 *Changing Course: Labour on Energy*, Labour Party, October 1999, p8.

2 *Ministerial Inquiry into the Electricity Industry*, Energy Minister Pete Hodgson, 3 February 2000.

3 *Questions and Answers*, Energy Minister Pete Hodgson, 3 February 2000

4 Hon Pete Hodgson, Minister of Energy, Speech to Electricity Networks Association Conference, 16 March 2000.

The inquiry panel[5], led by chairman David Caygill, has simply failed to deliver on this issue. While *Inquiry into The Electricity Industry*[6] (the inquiry report) offers a number of useful recommendations with respect to the industry as a whole, it has not answered the above questions. In particular, the report:

- Does not adequately analyse whether overcharging is taking place or the extent of it. The report offers no opinion as to whether overcharging is likely to be occurring;

- Does not examine whether lines companies are using an appropriate pricing methodology; and

- Does not identify and compare options for regulating prices. It describes only one possible model in broad terms and provides only limited grounds for proposing even this.

The inquiry report in general is short on analysis. It delivers a coherent set of recommendations but does not begin to compare the prescribed path against alternatives.

2.2 Lines Company Pricing Recommendations

The inquiry's key recommendations pass to other bodies the question of what is a fair price for lines services.

The core issue of the pricing methodology (and associated asset valuation methodology) is to be passed to an industry-elected board (the Board).[7] That body would then have the power to impose the selected methodology on most[8] distribution companies.[9]

The Commerce Commission plays a backstop role. The inquiry report recommends that the Commission be given the power to impose price control on individual distribution companies (recommendation 33). It is also the Commission which would determine the threshold beyond which price control would be imposed (recommendation 33). It appears that the Commission is to focus on vetting the application of the pricing methodology determined by the Board.

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5 The panel was: David Caygill (chair), Susan Wakefield, and Stephen Kelly.

6 *Inquiry into The Electricity Industry*, June 2000, Report to the Minister of Energy.

7 *Inquiry Report*, Recommendations 23 and 24; paragraphs 169-170.

8 The report makes clear that those companies which are majority owned by trusts or local bodies would be captured under these provisions (recommendation 30). However, it appears that the remaining privately held companies are to escape similar treatment. This discrimination in favour privately owned companies is curious given that the arguments advanced (paragraphs 188 and 189) in support of controls being applied are made without distinction between different forms of ownership. At the point where the report does distinguish ownership, it notes that "Privately owned companies experience more pressure to earn higher profits, which increases their incentives to reduce costs, but also to increase prices". (paragraph 195).

9 *Inquiry Report*, Recommendations 9, 10, 30, 52; paragraphs 187-189 on the required content of distribution company SCIs.

Our first criticism of these recommendations is that it is inappropriate to pass price setting functions to an industry-elected Board.[10] Core public policy issues are inherent in the setting of prices for natural monopoly services. We are not aware of any OECD jurisdiction that allows individual companies or industry bodies to be the final arbiter on electricity lines pricing methodology.

Our second major concern is the strong implicit approval given by the inquiry report for the continued use of the ODV methodology. It recommends (paragraph 182) "that the Commerce Commission undertake a once and only recalibration of ODVs by all distribution companies and Transpower using a common and specific basis". The report then notes that "We would expect that any adjustments to ODVs would flow through to prices" (paragraph 182).

Only in the weakest manner does the report contemplate other valuation methodologies. It notes (paragraph 183) "We recommend that the Commerce Commission consider whether refinements to ODV or the adoption of other methodologies are necessary to maintain a robust basis for information disclosure purposes or to calculate line charges". It does not begin to identify those other valuation methodologies. It offers no assessment of the benefits or deficiencies of ODV. It offers no criteria for assessment of a valuation methodology.

Yet asset valuation is *the* issue if one is examining lines company pricing in New Zealand.

[10] We have concerns about composition of the Board as well as the delegation of powers to it. The Board is likely to be dominated by a supply-side interests and does not appear to give sufficient opportunity for representation by consumers and demand-side participants. Even if the majority of the Board members are independent directors, as recommended, this does not alter our concern that public policy issues should be resolved by government as they are core functions of the state.

3. "If the valuations are wrong, then line charges are wrong"

3.1 Submitters' Concern About ODV

The extent to which asset valuations and the resulting capital charges drive lines pricing was clearly set out for the inquiry panel in a submission by a group of trust-owned companies. They stated that for a typical line company, 82% of all costs were driven by the ODV valuations and the rate of return taken on those valuations.[11] In other words:

"If the valuations are wrong, then line charges are wrong" the inquiry report acknowledged (paragraph 181).

There was no shortage of parties submitting to the inquiry that valuations were indeed wrong as a result of interpretations of the ODV methodology. "Over the past five years there has been a significant transfer of wealth from consumers to the shareholders of the line companies via the creative application of ODV methodologies" stated Major Electricity Users Group (MEUG).[12] The inquiry panel acknowledged the potential for creative application and it was clearly a factor prompting the recommendation that the Commission do a once only reassessment of all ODVs to put them on a uniform footing.

However, there were also clear suggestions to the inquiry that there was something seriously wrong with the methodology itself, not just its application.

- "Historically line companies have made a major revaluation in one year, declared a very large profit, waged a publicity campaign to explain that it was not real profit but all smoke and mirrors, and then continued to earn returns on the revalued assets in the subsequent years at a still healthy rate" stated the Fletcher

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11 "35. An approximate break down of total cost structure (including capital costs) for a typical medium sized line company (such as NTL) is as follows:

- Transmission 32%
- EBIT (capital costs) 40%
- Depreciation 10%
- Asset Maintenance 7%
- Employment 5%
- Corporate & other 6%

100%

40. Uncontrollable cost portion

- Transmission costs are largely a function of Transpower's ODV and WACC, which are beyond the control of lines companies.
- EBIT (capital cost) is a function of ODV and WACC
- Depreciation is a function of ODV
- Asset maintenance costs are closely related to ODVs and network attributes."

Source: Submission to the Inquiry, from four trust-owned companies, paragraphs 35 and 36.

12 Submission to the Inquiry, MEUG, March 2000, paragraph 5.2, p6.

Challenge Group of Companies. " ... any revaluations, up or down, need to be declared as a profit or loss."[13]

- STA submitted that "The vital question for the inquiry in respect of pricing is therefore: ... What valuation methodology should be used to set the initial ratebase for price regulation?" "What is the justification for pricing services to support an optimised deprival valuation?" we asked.[14]

Even lines companies questioned the ODV methodology. The joint submission by four trust-owned lines companies stated that:

- "The extent of year-on-year changes to ODV valuations within the industry (including Transpower) is sufficiently great to call the credibility of the methodology into question. The methodology has given lines companies sufficient latitude to engage in opportunistic behaviour". [15]

3.2 Baseline Data

So what analysis did the inquiry report undertake on the question of lines company asset valuations to see if a review of the methodology was indeed required?

To trace changes in the valuation of each lines company between 1996 and 1999, the inquiry panel elected to use ODV valuations as its measure.[16] The resulting figures showed that the total of all valuations rose by only 6.7% during the four-year period surveyed. That is, the impression given by the inquiry report was one of very little change in the total valuation of all lines companies.

These figures, however, fail to reveal the scale of asset revaluations which have in fact taken place.

The ODV valuations filed each year with the Ministry of Economic Development by lines companies show simply the estimated cost of replacing each network at that time.[17] They reveal nothing about the capital gains being taken via revaluations of actual book values.

A comparison over time of actual book values requires analysis of a decade's worth of financial reports and disclosed information for each lines company and reconciliation of changes in their accounting policies over the period. Conscious that this was an important input to the inquiry, STA undertook this work and submitted it to the inquiry panel.

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13 Submission to the Inquiry, Fletcher Challenge Group of Companies, p 3.

14 *Asset Valuation and Price Setting*, STA Ltd supplementary submission to the Inquiry, March 2000, p 7,9.

15 Submission to the Inquiry by four trust-owned companies, (Network Tasman, Electralines, Westpower and Buller Network), paragraph 43.

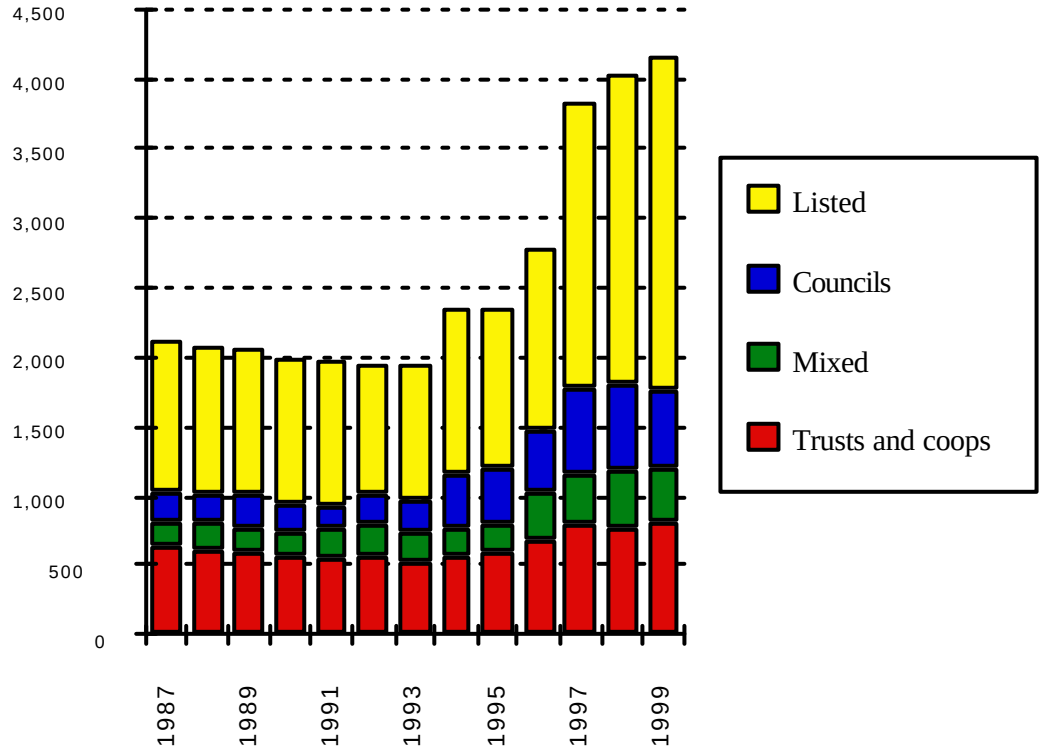
16 Inquiry Report, Table 4, p 15,16.

17 Changes in the valuations primarily reflect changes in technology assumptions, volumes and the age of components.

The results from the analysis were compelling. In the past eight years, electricity lines companies have more than doubled the book value of their networks from $2 billion to $4.2 billion. (See accompanying chart with values expressed in millions of dollars.)

This sharp rise in book values is not due to an extraordinary level of investment in their networks during the 1990s. Expenditure remained largely confined to routine maintenance and replacement. Inflation was low throughout the decade. What happened was that existing asset values were simply written-up following introduction of the ODV methodology. The result was a huge windfall gain to network owners.

Distribution Real Fixed Assets 1987-1999 by Ownership Type, Deflated to 1999 Dollars using the PPI (Inputs)



Between 1993 and 1999, asset values recorded in lines company books (which are the relevant data for evaluating the issue of the rate of return on and of shareholders' investment) rose more than 100%.

This means that even if lines companies achieved "commercially acceptable" accounting rates of return on investment as measured by their annual book value at the start of each one-year period, they captured in addition a 100% capital gain, which translates to a permanent rate of return on initial investment roughly double the commercially-acceptable norm.[18]

These gains can be measured in dollar terms by examining the rise in lines company operating surpluses. The chart on the following page shows the average revenue per kilowatt-hour collected by lines companies each year for the past decade. Excluding the Transpower charges that appear part way through the series, the average charge for distribution services in real terms remained just over 3 cents per kWh in real terms.

However, when the numbers are examined in more detail it is clear that there have been a number of changes within the lines businesses. The average lines company's operating costs have fallen substantially, suggesting a number of efficiency improvements. In a competitive environment, this type of behaviour is generally accompanied by price reductions – efficiency improvements by one operator are viewed as a means of securing a price advantage and therefore improving market share. Thus, there is a clear incentive to share efficiency improvements with customers. But the chart indicates that little or no such sharing has taken place in this instance.

Perhaps this is not surprising as, in a natural monopoly, incentives to share efficiency improvements with customers do not exist. It might be expected that the disclosure regime, in particular the disclosure of rates of return, would provide a proxy for this incentive. However, under the ODV methodology, the write-up of asset values has obscured the real improvements in profitability that these organisations have achieved.

It should be borne in mind that certain companies will be doing much better than this average aggregate indicates as there are a number of trust-owned companies that have determined to keep their returns at or as close to zero as possible.

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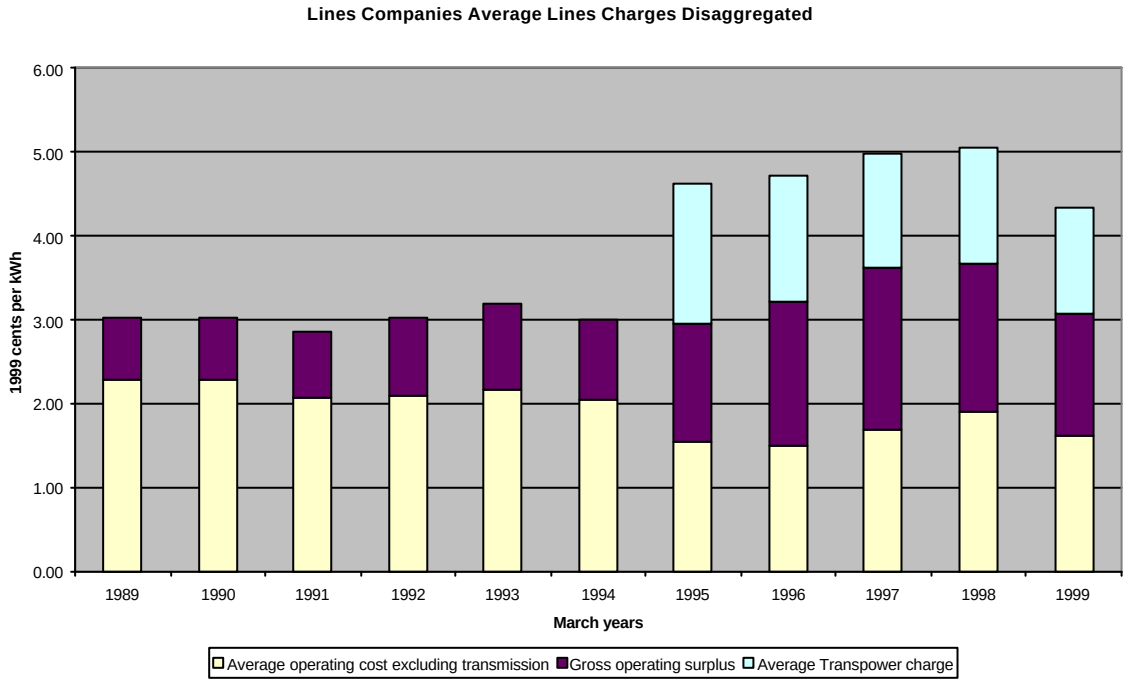
[18] The calculation proceeds as follows. Suppose that the Weighted Average Cost of Capital is 7.5% (cf Inquiry Report paragraphs 73 and 74 pp.14-15). Suppose a buyer with this cost of finance buys an asset for $100 at the beginning of 1996 and revalues the asset to $138 in 1997, $144 in 1998 and $149 in 1999 (the time-path of actual book revaluations by lines companies over those years). Suppose that net pre-tax profit in each year is exactly 7.5% of the book value for the end of the preceding year (that is, net profit is $7.50 in 1996 and 1997, $10.33 in 1998, and $10.80 in 1999). At the end of 1999 the asset is disposed of for its book value, with the seller thereby realising $149 in cash in addition to the $10.80 net profit at the end of 1999. The cashflow stream for the project is -$100, $7.50, $7.50, $10.33, $159.80. The net discounted present value of this cashflow stream, measured at the time of purchase and using a 7.5% discount rate, is $41.30, giving an internal rate of return for the project of 18.1%. This rate of return in a monopoly industry would be widely considered to warrant regulatory intervention.

The data reveals that the "Gross Operating Surplus", plotted on the chart below, has doubled over the past decade from 0.76¢/kWh to 1.47¢/kWh. The total annual operating surplus for all lines companies rose by about $200 million - from an average of $197 million 1989-1993 to an average of $409 million 1995-1999. (See Appendix 2 for details.)

This means that consumers are currently paying around $200 million more each year than is required to properly sustain the lines companies if they had retained the valuations they commenced with when corporatised in April 1993.[19]

The lines companies have therefore overcollected about $1 billion during the past five years. While a considerable proportion of this money has made its way back to customers by way of rebates, there is nothing to ensure this will continue into the future and there are major leakages even if all overcollections were rebated. The position of each customer depends on which lines network they are connected to and this is further examined in Section 7.1.



This overcollection can also be examined through estimating the rate of return on investment achieved. When the true returns to the lines businesses are calculated by combining annual operating surpluses (net of estimated capital expenditure requirements) with the capital gains from asset revaluations, the internal rate of return on funds from 1993/94 to 1998/99 (that is, over the six years following corporatisation) was between 24% and 35% pre-tax, approximately 16%-23% post-

[19] This was required under the Energy Companies Act 1992, Part IV, Clause 32.

tax. Even higher rates of returns were available if an investor committed funds between 1995 and 1997.[20]

This range is more than double the "reasonable rates of return" cited by the inquiry report. "The Ministry of Economic Development considered that a nominal post-tax WACC for distribution companies of between 7.5 and 10 percent was appropriate" (paragraph 73).

It certainly compares very favourably with returns available to investors in other sectors of the New Zealand economy. As a proxy for returns achieved by listed companies we took the basket of top forty companies and factored these according to their weights in the NZSE40 and examined their performance over a similar period.[21]

Assume that in year zero (1991) an investment of $100 is made in such a basket of stocks. Then the table below shows, for years one through eight, the income that would be received from that investment assuming the stocks are sold in year eight.

Year	(Investment)/Income
0	($100.00)
1	$6.72
2	$9.08
3	$8.77
4	$11.89
5	$13.83
6	$13.29
7	$14.23
8	$160.43

The internal rate of return generated by the above series is 14.2% post-tax. Note that this is the rate of return one could have expected after investing in a basket of companies that face a variety of risks.[22] It would be reasonable to assume that, in the vast majority of cases, the risks these businesses face would be much greater than those faced by an electricity lines business.

3.4 The Issue is Gains From Revaluations

Thus, the issue at the heart of the fair pricing question is windfall capital gains – gains from revaluations. The inquiry panel was clearly aware of this issue and signalled its position when reviewing a second set of data.

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20 The full range of estimated rates of return is set out in Appendix 2.

21 Source: New Zealand Stock Exchange annual indices.

22 Note that the NZSE40 is dominated by Telecom New Zealand. Telecom's revenue comprises contestable and non-contestable segments. The non-contestable revenue from the local loop is capped by the "Kiwi Share" which restricts price increases to the rate of inflation.

In paragraph 75 (p.15), the report examines lines company "Return on Investment" (ROI), a performance measure which includes capital gains in the return obtained by the owners of the businesses. However, instead of raising for investigation the revaluation gains which the data reveals, the report attacks the regulatory requirement for lines companies to disclose this information. The inquiry panel argues that "published ROIs do not provide helpful information about underlying profitability" because they "treat… revaluations as a component of the return on investment in the year of the revaluation".

This argument, that revaluations ought not to be taken into account in the reporting of underlying profitability, is the crux of the inquiry's stance on lines pricing. If it is accepted, all windfall gains captured to date from customers by lines companies[23] would be acceptable practice, provided only that book values have not risen above the ODV ceiling. Thus, there would have been no undue profit taking if these revaluation gains were ignored when setting prices, and no resulting overcharging.

We believe that on this issue the inquiry is simply wrong, as a matter both of economic theory and of international legal precedent.

[23] Cf Ministry of Economic Development, *Discussion Paper on the Requirement for Economic Valuations Under the Electricity ODV Handbook*, April 2000, section 5.9 p.9: "If a network segment valued at EV was revalued upward to ODRC, then the ELB may be able to raise prices to all consumers and justify the price increase on the basis that returns are below or equal to normal returns based on the ODRC of the whole network. The result is a 'windfall' gain to the shareholders of the ELB at the expense of its customers."

4. Revaluation Gains *are* Income

4.1 Introduction

Capital gains obtained from revaluing assets are a source of income. They increase the wealth of a company just as rising house prices increase the wealth of home owners.

For a natural monopoly which prices its services directly from the value of its assets, the treatment of that capital gain is of great importance. If prices are raised in line with the increased asset value without any offsetting adjustment, the owner reaps windfall gains which are far more than just a one off boost.

An increased asset value supports both increased depreciation charges (the annualised proportional allowance for wear and tear) and increased charges to "compensate" the owner for use of capital employed (return on capital). Thus, from the windfall increase in asset value, the owner receives expanded returns in terms of both return *on* and return *of* capital.

If there is no offsetting adjustment for the windfall gain, the owner can effectively earn a return on and of capital that it has never actually invested in the business. Consumers pay for these increased earnings through higher charges while receiving no improvement in the scope or level of service. Such earnings are pure monopoly rents.

To properly account for windfall gains (also known as holding gains) and avoid this problem, gains from revaluations must be treated as income. The proposition put forward by the inquiry report, that they not be treated as income, is a fundamental departure from accepted principles of economics and international regulatory practice. Such holding gains are inescapably part of the real return to investors on their financial stake in the enterprise, and are hence deductible from required revenue.

It is a well established principle in the economic and current-cost-accounting literature that real holding gains, whether or not realised as immediate cashflows, represent real income to the asset owners in the period when those gains accrue.[24]

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[24] Hicks, J.R., *Value and Capital*, Clarendon Press, second edition 1941, pp.171-181; Edwards, E.O. and Bell, P.W., *The Theory and Measurement of Business Income*, University of California Press, 1961; Bell, P.W., "On Current Replacement Costs and Business Income", in Sterling, R.R. (ed.) *Asset Valuation and Income Determination: A Consideration of the Alternatives – Papers Given at a Symposium held at the School of Business, University of Kansas, May 1970*, Scholars Book Co, Lawrence Ka, 1971, p.26; Solomons, D., "Economic and Accounting Concepts of Income", in Harcourt, G.C. and Parker, R.H. (eds) *Readings in the Concept and Measurement of Income*, Cambridge University Press, 1969, pp.154-160; Baxter, W.T., *Depreciating Assets: An Introduction*, Institute of Chartered Accountants of Scotland, 1981, Chapter 5; Tweedie, D.P. and Whittington, G., *The Debate on Inflation Accounting*, Cambridge University Press 1984; Scott, M. FG, "Some Economic Principles of Accounting: A Constructive Critique of the Sandilands Report", in Parker, R.H., Harcourt, G.C. and

4.2 International Precedent

The generally-accepted principle underlying calculation of the required revenue which a natural monopoly can legitimately collect from its customers is that the owners of the enterprise should be entitled to maintain their financial wealth in real terms (that is, that they should suffer no loss of wealth as a result of entry into the business), while recovering operating costs and the market rate of return on their net financial exposure in the enterprise.

The United States, with its long history of private ownership of monopoly utilities, was the first to formally address this basic principle which was established by the Supreme Court as subsequent regulatory practice in the 1945 *Hope* case:

> "The investor interest has a legitimate concern with the financial integrity of the company whose rates are being regulated. From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock... By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital."
>
> "Rates which enable the company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risks assumed certainly cannot be condemned as invalid, even though they might produce only a meagre return on the so-called 'fair value' [e.g. replacement-cost] rate base."[25]

Through that decision, the Court put an end to a range of practices by which US utilities had in the 1920s and 1930s inflated their rate bases for purposes of rate-making. It is noteworthy that included among the outlawed practices were the use for rate base purposes of current-replacement-cost valuations, as well as of financial transactions by which the assets of utility companies were transferred at fictitiously high prices to "holding companies" for the purpose of recording the inflated transfer prices as 'historic-cost' book value.

Whittingon, G., *Readings in the Concept and Measurement on Income* second edition, Philip Allan, 1986, p.225; *Accounting for Economic Costs and Changing Prices: A Report to HM Treasury by an Advisory Group* (the "Byatt Report"), HMSO, London, 1986, Vol.1 paragraphs 83, 101-102, 130 and 131 and Table C on p.34; Baxter, W.T., *Accounting Theory*, Garland Publishing, New York, 1996, pp.277-282; Whittred, G., Zimmer, I. And Taylor, S., *Financial Accounting: Incentive Effects and Economic Consequences*, Harcourt Brace, Sydney, 4th ed 1997, pp.254 - 257.

[25] Federal Power Commission v. Hope Natural Gas 321 U.S. 591 (1945).

As a result, asset revaluations have not been allowed into US financial reports[26], nor into the rate base for rate-making since the *Hope* decision.[27]

The issue was confronted in the UK in the wake of sales of utility companies by the UK government in the 1980s after many newly privatised companies revalued their assets. The basic test of revenue adequacy was stated by the Byatt Report: "Potential competitors would not enter a market ... unless they expected to be able to earn a normal profit after maintaining their real financial stake".[28] This was the basis for the 1997 re-setting of transportation rates for BG plc by the UK Monopolies and Mergers Commission in 1997, in which the basic transportation charge was reduced by 21% to correct for asset revaluations before imposition of the new RPI-2% price cap[29].

The key principle, that revaluation gains are indeed income, was clearly stated in the 1995 International Court of Justice arbitration over Heathrow Airport landing charges, by Professor Julian Franks of the London Business School:[30]

> "An asset's economic rate of return for a single period is its economic income (that is the combined sum of the net cash flow received during the period and the change in the value of the assets over the period) expressed as a proportion of the value of the assets at the beginning of the period. For example, if the net cash flow received is £100 and the value of the assets at the beginning of the period is £1,000 and at the end is £1,050, the rate of return is (100+50)/1,000 or 15 percent."

The tribunal accepted the principle, and stated in its findings:[31]

> "A fundamental difference between an accounting rate of return and an economic rate of return is that the former takes no account of unrealised

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26 Walker, R.G., *The SEC's Ban on Upward Asset Revaluations and the Disclosure of Current Values*, University of NSW School of Accounting Working Paper 106, 1991.

27 On the significance of the *Hope* decision see Sherman, R., "Is Public Utility Regulation Beyond Hope?" in Danielson, A.C. and Kamerschen. D.R. (eds), *Current Issues in Public-Utility Economics: Essays in honor of James C. Bonbright*, Lexington Books, Lexington Mass., 1983. On US regulatory practice after *Hope* see, e.g., Bonbright, J.C., *Principles of Public Utility Rates*, Columbia University Press, New York, 1961; Bonbright, J.C., Danielson, A.L. and Kamerschen, D.R., *Principles of Public Utility Rates* second edition, Public Utilities Reports Inc.,. Arlington Va, 1988; Kahn, A.E., *The Economics of Regulation*, John Wiley, New York, 1970.

28 Accounting for Economic Costs and Changing Prices: A Report to HM Treasury by an Advisory Group (the "Byatt Report"), HMSO, London, 1986, Vol.1 pp.20-21 paragraph 83.

29 Monopolies and Mergers Commission, *BG plc - A Report Under the Gas Act 1996 on the Restriction of Prices for Gas Transportation and Storage Services*, HMSO, London, 1997. The 21% reduction in the gas transportation charges of BG (formerly British Gas) plc, was ordered on the basis that the company's falling Market to Asset Ratio (MAR) due to book revaluations of assets had 'operate[d] against the public interest by generating revenues higher than necessary for Transco to finance its activities".

30 United States-United Kingdom Arbitration Concerning Heathrow Airport User Charges, 101 International Law Reports 216 (1995) p.451.

31 United States-United Kingdom Arbitration Concerning Heathrow Airport User Charges, 101 International Law Reports 216 (1995) p.452.

capital gains or losses whereas the latter includes in the relevant 'return' any *appreciation or depreciation* in the value of the assets of the business the profitability of which is being measured." (Emphasis added.)

4.3 The Correct Accounting Formula

If a company were to revalue its fixed assets on the basis of a sustainable increase in the Economic Value of the enterprise (i.e. on the basis of projections of future cashflows sufficient to support the higher valuation), the full amount of that revaluation (apart from any component attributable to general inflation) would form part of the rewards to owners of the enterprise from their ownership, and hence income in the period when the revaluation accrues to the company's books.

Because it would increase the owners' real economic income, the revaluation would raise the economic rate of return (which in New Zealand policy documents is called the "Accounting Rate of Profit", ARP, or Return on Investment ,ROI) far above the Weighted Average Cost of Capital for the corresponding period, unless a matching deduction was made from revenue.[32] The simplest way to make the required adjustment would be to credit the full amount of the revaluation against required revenue in the period of the revaluation - effectively a one-off rebate to customers of the cash amount of the book revaluation.

If that adjustment, or some equivalent, were not made, the owners of the enterprise would be transferring wealth from customers to themselves as a pure windfall gain unrelated to any financial sacrifice or economic resource commitment by the asset owners. Such a windfall would be a pure monopoly rent, secured by the exercise of the company's market power as a natural monopoly.

A variety of alternative procedures exist internationally for recording real asset revaluations in company accounts. A common procedure in the UK, Australia and New Zealand is to enter real holding gains (that is, increases in the value of existing assets which do not arise from any sacrifice made by the owners of the assets, and which hence have a windfall character) in revaluation reserves, which ultimately find their way into shareholders' hands as the benefits are realised. The gains from such revaluations are generally excluded from the profit and loss account, as a matter of law in the UK[33] and of accounting convention, following the UK lead, in Australia and New Zealand[34]. To ensure that this category of income was not inadvertently

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32 This assumes that the firm is pricing so as to achieve a WACC return on its existing asset base.

33 Accounting for Economic Costs and Changing Prices: A Report to HM Treasury by an Advisory Group (the "Byatt Report"), HMSO, London, 1986, Vol.1 p.31 paragraph 130.

34 In New Zealand the Financial Reporting Act 1993, s.11 simply requires companies to prepare their accounts in accordance with "generally accepted accounting practice". The Act provides for an Accounting Standards Review Board to oversee the development of that practice in relation to financial reporting (s.24). The definition of "generally accepted accounting practice" in s.3 includes "in relation to matters for which no provision is made in applicable financial reporting standards and that are not subject to any applicable rule of law, accounting policies

overlooked by users of the accounts of UK nationalised industries, the Byatt Report recommended[35] the creation of a new separate account, the "Statement of Total Investment Returns", to supplement the standard profit and loss account and to give a full picture of the benefits derived by investors from their ownership of assets whose value has changed in real terms.

Accordingly, in order to calculate the required revenue for a natural monopoly enterprise, whose legitimate target is to secure an Accounting Rate of Profit equal to no more than its appropriate Weighted Average Cost of Capital, the correct equation is the one put forward by Ernst and Young as consultants to the New Zealand Ministry of Commerce on disclosure regulation design in 1994:[36]

> "A general formula for determining the required level of earnings before interest and tax in a monopoly business is:

$$\text{Required EBIT}^{1} = \text{WACC} \times \text{Asset Base} + \text{Tax} + \text{Interest Tax Shield} - \text{Revaluations (if any)}$$

Where:

$$\text{Asset Base} = \frac{\text{Opening Funds} + \text{Closing Funds} - \text{Revaluations}}{2}$$

$$= \text{Average Total Funds Employed} - (\text{Revaluations}/2)$$

1. Note that in this formula defining Earnings Before Interest and Tax (EBIT), the WACC must be on a post-tax basis. Also tax must be calculated assuming a level of gearing consistent with the interest cost used in calculating the interest tax shield.

Ernst and Young continued:

> "It can be seen that this formula can be rearranged so that the WACC is equivalent to the Accounting Rate of Profit proposed as a performance measure. The financial variables used in deriving the ARP have been carefully developed to come as close as possible to producing an accounting measure calculated from the financial statements typically prepared by utilities-type businesses, which is comparable with financial WACC estimates.

that (i) are appropriate to the circumstances of the reporting entity, and (ii) have authoritative support within the accounting profession in New Zealand."

35 Accounting for Economic Costs and Changing Prices: A Report to HM Treasury by an Advisory Group (the "Byatt Report"), HMSO, London, 1986, Vol.1 paragraphs 130 and 131 and Table C on p.34.

36 Ernst and Young, Rationale for Financial Performance Measures in the Information Disclosure Regime, Including Use of Optimised Deprival Values and Avoidance of Double Counting of Asset Related Expenses: A Report to Energy Policy Group, Energy and Resources Division, Ministry of Commerce, by Ernst & Young for Briefing ESANZ, August 1994, p.3.

> "... Of the three financial performance measures, ARP is the one, which is most focused on monitoring monopoly behaviour. We note that because E[lectric] P[ower] C[ompanie]s need not revalue their assets every year, any conclusions on monopoly behaviour and comparisons between EPCs would need to be drawn from several years' data... Disclosed ARPs in excess of the general view on appropriate WACCs should be subject to close scrutiny by customers."

The requirement for lines companies to disclose their return on income (ROI) was designed to capture precisely this information. Yet the inquiry report rejects this measure as an indicator of "monopoly behaviour" - its full statement from paragraph 75 being:

> "A number of distribution companies appear to have been earning high ROIs. Further analysis shows that some of the apparently high ROIs are a consequence of the methodology set by the regulations, which treats revaluations as a component of the return on investment in the year of the revaluation. Accordingly published ROIs do not provide helpful information about underlying profitability"

The inquiry panel offered no references in support of this stance. Again, our view is that the inquiry report is wrong and that a correction of this point is a vital step on the path to developing a fair and sustainable pricing methodology for lines businesses.

As we later argue, this involves not simply a change to the ODV methodology for application to pricing. The ODV concept is itself altogether unsound for pricing electricity line services. However, before moving on to discuss this, we first step back to examine the origins of ODV and its introduction to New Zealand.

5. Origins of ODV in New Zealand

5.1 What is ODV?

ODV has been interpreted in New Zealand as a form of de facto replacement cost valuation.

For each significant component of a network, the official valuation process assesses two things: the present cost of the "optimal" replacement (discounted for the age of the existing component) and the cashflow stream which that component is able to support today. ODV takes the lesser of these for each component and sums the value for the network.

The current approach to ODV in New Zealand attempts to define the value of assets by asking the question "if deprived of these assets, what would an owner pay to replace them"? Replacement cost sets the ceiling. However, given the opportunity to replace the assets, one would only purchase the most economic set of assets to provide the required level of service, i.e. any previous "mistakes" would not be replicated. In some circumstances, there may be insufficient revenues associated with the assets to justify replacing them. In these cases, the asset owner would only be willing to pay an amount equal to the capitalised earning ability of the assets.

More formally, ODV is defined as:

> *the minimum of:*
> *Optimised Depreciated Replacement Cost ("ODRC");*
> *and Economic Value ("EV")*[37],

where EV is the greater of the discounted present value of expected cashflows, or the disposal value of the assets.

Calculating ***ODRC*** is a five-step process:

1. Detailed identification of the assets involved
2. Calculation of the Replacement Cost of each asset ("RC")
3. Assessment of the Depreciation of those assets ("DRC")
4. "Optimisation" of the system – a notional process that sets out to determine the most cost-effective set of assets that would provide the required level of service. This is intended to eliminate the cost of any overbuilt and/or redundant assets and to use "modern equivalent" assets where appropriate.
5. From the DRC and the optimisation process, assess the ODRC.

[37] Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Line Businesses, Third Edition, April 1999, Ministry of Commerce

EV is applied to assets that would be incapable of (or prevented from) extracting a revenue stream that would support an ODRC value of the assets in the marketplace. An assessment is made of the maximum tariff that could be charged without the consumers disconnecting or some other barrier being encountered. The EV is then the present value of the maximum revenue the assets can earn, less capital and operating expenditure, plus (in the case of assets which may be removed from service), the present value of the net realisable value of the assets at the time of retirement.

5.2 Why Was ODV Introduced?

The first round of electricity industry reform recommended that Transpower, then a wholly-owned subsidiary of ECNZ, be separated from ECNZ and set up as a stand-alone entity owned by a "club" of industry participants. Ultimately, only the first of these recommendations was implemented (the club proposal foundered for lack of industry support).

For the separation to take place it was necessary to separate transmission and energy pricing and to derive a value for Transpower's assets. The Transpower Establishment Board ("TPEB") which oversaw the separation process sought advice on appropriate valuation methodologies and accepted the advisor's recommendation that Optimised Deprival Value was the best methodology.

It is notable that, in its report to the Minister of State-Owned Enterprises recommending the adoption of ODV, the TPEB stated that "the most common practice for electricity utilities in other countries is to value the transmission system on historic cost".[38]

The TPEB consulted with ECNZ, the distributors, Major Electricity Users Group ("MEUG") and Treasury over the use of ODV.

In dismissing depreciated historical cost as a basis for valuing Transpower's assets, TPEB stated that:[39]

- Use of historic cost for new assets would effectively be the same as ODV;
- Reverting to historic cost for the (then) existing transmission assets might reduce transmission costs by some 15% - 25%.
- Such a reversion would have led to a "hole" in ECNZ's accounts of some $1.4 billion and funding this would have been a problem for ECNZ and the Government.
- Historical cost would be difficult to ascertain in some cases because of inconsistent accounting practices.
- When assets needed to be replaced there would be significant price rises for consumers (presumably TPEB considered that a superior option was to face

[38] The Separation of Transpower, A Report to the Minister of State Owned Enterprises, September 1991, p23.

[39] Ibid, p 25-26.

consumers with these price increases immediately – and well before the investment needed to be made).

- The lower asset value that would result from depreciated historical cost would, in time, increase gearing and put pressure on Transpower's credit rating and cost of finance.

One member of TPEB (Kerry McDonald) expressed concern over the impact on the economy of valuing Transpower's assets at other than depreciated historic cost. However, despite opposition from consumers and the dissenting voice within the Board, TPEB recommended that the ODV methodology be adopted.

A key recommendation from TPEB, arising from the use of ODV, was that the TPEB valuation of Transpower's assets "be used … in determining the level of transmission prices".[40]

5.3 A Yardstick for Distributors

Soon after Transpower was separated, the former Electricity Supply Authorities ("ESAs") were compelled to corporatise under the Energy Companies Act 1992. Shares in the corporatised organisations were variously placed in trust, given away and/or sold. This process required the Government to consider the regulatory framework for these natural monopoly distributors.

Consistent with the general light-handed regulatory approach then still under development, it was determined that distributors would best be disciplined by information disclosure. This involved a variety of performance measures including prices, returns and reliability of service measures being disclosed publicly.

For disclosed information to be an effective discipline, it needs to be of a form that allows meaningful comparisons between companies – i.e. the information needs to be prepared on a consistent basis across the companies concerned.

The requirement for consistency raised the issue that the distribution assets had been installed at different times and under different conditions (for example, installation of underground cables vs. overhead lines). How could such disparate asset bases be meaningfully compared? The way in which the Government considered that this would best be effected would be to require each company to disclose an asset valuation prepared under a uniform methodology – ODV, in its ODRC manifestation.

The precise sequence of events is difficult to trace at this point. However, the end point seven years after corporatisation is clear. The distribution companies have taken the ODV valuations required simply to fulfil their disclosure requirements and adopted those valuations for their financial accounts. The pricing implications for consumers of that adoption are discussed in Sections 3 and 7.

[40] Ibid, p 27.

It is important to note that the use of ODV for the pricing of services is *not* required of distributors. The official rules for derivation of ODV valuations are contained in the "*Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Line Businesses*" ("ODV Handbook") available from the Ministry of Economic Development. In the preface to that document there is a paragraph titled Tariff Setting which states that:

> "Tariff setting is an independent process from preparation of ODVs. *There is specifically no regulatory requirement that prices be determined on the basis of system assets being valued according to ODV*." (Emphasis added)

However, the ministry's focus on ODV valuations as a benchmark and its reluctance to intervene on pricing matters, as discussed in Section 7.2, led over time to an assumption on the part of lines companies that ODV pricing was the de facto pricing policy.

5.4 Rationale for ODV Pricing

5.4.1 "ODV Will Lead to Efficient Prices"

It was asserted that the use of ODV for pricing would lead to prices that are a good proxy for those that would eventuate in a competitive market where supply and demand are balanced.[41]

ODV protagonists would claim that tariffs reflecting ODV send the "correct" signals to consumers, thereby ensuring they value their consumption of electricity distribution services appropriately. But is this correct in the case of pricing for lines services? The expenditure on the distribution network is sunk. Therefore, for marginal increases in usage that do not trigger a capacity increase, the correct price signal would seem to be zero – i.e. an extra unit of electricity carried does not require any marginal increase in the distribution system (until such time as the next subdivision or infill housing scheme is introduced).

Pricing signals that arise in a competitive market reflect the real short-run marginal cost of, for example, carrying additional electricity, or generating an extra unit of electricity by burning fossil fuel and/or using more of the available hydro storage (which means that water is not available to offset fuel burn in a later period).

The problem with the "efficient prices" argument for ODV is that it is based on prices set in a hypothetical long term competitive market with balanced supply and demand and short-lived non-lumpy assets. This picture simply does not translate sensibly to electricity networks.

[41] Ibid, p 28.

5.4.2 "ODV Avoids Future Rate Shocks"

At some time in the future there will be a requirement to expand portions of the network and/or replace assets that have reached the end of their lives. Revenue or loans would need to be raised at that time to fund these capital expenses and this would cause periodic rate shocks. Adopting ODV immediately, and pricing accordingly, is claimed to align prices now with those that would prevail in the future, thus avoiding future rate shocks.

However, from the consumer perspective, this is simply trading the certainty of higher prices today for the possibility of higher prices tomorrow, i.e., to avoid a future rate shock, the rate shock is implemented immediately. It would be difficult to convince consumers of the benefits of this course of action. There seem to be neither efficiency nor equity arguments here.

A variation on the argument is that an ODV-based level of charging provides security by demonstrating to the capital markets that the enterprise can sustain the level of revenues required to install replacement assets. One could view this as an insurance policy on behalf of the future consumers with the current consumers paying the "premium" in the shape of ODV-based tariffs.

The problem with this argument is that, given the essential nature of electricity (and assuming current technology), future capital markets would be in no doubt as to the ability of a distribution company to raise revenue commensurate with a sensible asset expansion (or asset replacement) programme.

5.4.3 "Asset Values Will Trend to ODV Over Time Anyway"

Over time, as a monopoly enterprise is expanded and as its existing assets are replaced, these new assets would appear in the accounts at current costs less depreciation. Thus there will be a continual trend for the asset base to trend toward DRC.

It is correct that if, over time, all of the assets were renewed or replaced then the financial accounts would reflect ODRC assuming no technological change that renders the distribution system obsolescent. However, this is *not* an argument in support of inflating the asset base to ODRC at some mid point in the life of the assets with consequent distributional impacts for owners and consumers.

5.4.4 "ODV Pricing Obviates the Need to Regulate"

A perceived virtue of adopting an ODV regime, particularly one wherein ODV virtually equates to ODRC, is that it appears to obviate the need for heavy-handed regulation. However, this perceived gain comes only at the cost of a key policy goal and a high cost to consumers.

There is a circularity in the Return on Investment ("ROI")[42] calculation in the disclosure regulations. Assume a starting point with assets valued at historic cost and where the revenue stream of the business is providing a market return on the existing book value but lies below that which would provide a market return on the ODRC of the assets. This is the situation that most of the lines businesses would have been in at the time of corporatisation. Then apply an ODV calculation according to the Ministry's ODV Handbook but do not make the current level of revenue a binding constraint. Why is this important? To constrain revenue at the current level would make the EV part of the ODV calculation binding, thereby locking in the existing asset valuation. However, the ODV Handbook allows the asset owner to assume that tariffs may be moved up to the level where consumers would disconnect, provided that the ODRC ceiling for asset valuation is not exceeded in the process. Such an approach means that ODRC becomes the only binding constraint in the ODV calculation – i.e. the ODV essentially equates to ODRC except for a few special cases. If the ODV Handbook becomes viewed as the official pricing policy, the regulator is then legitimising monopoly pricing regardless of its impact on economic welfare.

From the perspective of the asset owner there is a virtuous circle of increased asset values leading to increased tariffs. Those increased tariffs, in turn, underpin the increased asset value. The only limit on this virtuous circle is imposed by the ceiling of ODRC.

Asset owners have clear financial incentives to push their asset values up to ODRC and then to price their services to achieve a market return on ODRC. This is theoretically the maximum monopoly rent that could be extracted without providing the opportunity for a new entrant to duplicate the facilities and enter the market (although the absence of easements from the valuations means the true cost of replication is considerably higher). Provided that the regulator is content with price levels that extract these monopoly rents then all parties are content (except, of course, the consumer). Accordingly, there is no requirement for heavy-handed regulation because the industry is, naturally enough, content to regulate itself to this level.

[42] Previously known as Accounting Rate of Profit or ARP – essentially a single period measure intended to provide a measure that can be compared with the cost of capital for lines businesses generally.

6. Theoretical Criticisms of ODV

6.1 Deprival Value Should not be a Ratebase for Monopoly Pricing

The ODV methodology relies on the deprival concept for its derivation. Yet deprival was never suitable as the conceptual basis for rate base determination, was never proposed for that purpose by the original theorists who developed the concept, and has not established a successful track record in that role anywhere in the world.

6.1.1 Deprival is not a Cost Concept

Deprival is not a cost concept. Rather, it is a concept from the world of insurance and damages estimation. Deprival rules are basically a means of estimating the maximum insurable loss associated with possession of an asset. For a commercial operation, that loss can be assessed only by reference to expected future net cashflows, and these in turn will depend on the extent of "those legal powers of control and exclusion that we associate with the rights of property"[43]. Tax obligations, for example, represent a legally-required deduction from the cashflows which a competitive firm can anticipate, and therefore reduce the deprival value of the enterprise. Similarly, the common law requirements in most modern industrial economies for natural monopolies to restrain their exercise of their monopoly power, and to charge only "fair and reasonable" prices (even though these are demonstrably lower than the market's total willingness-to-pay), are well-established in law and have the effect of reducing deprival value below what it would be in a world where monopoly power could be exploited without restraint.

The deprival concept came into accounting and economic theory because of its operational usefulness as a set of procedures to be used in financial reporting to assist efficient use of resources by firms operating under competitive conditions. Accounting theorists such as Solomons, Parker and Baxter found that the deprival framework for analysis clarified otherwise-difficult issues in the design of current cost accounts, and pointed out that under competitive conditions, market forces provided an incentive for all firms in an industry to carry their fixed assets at an ODRC valuation for reporting and monitoring purposes.

For a competitive industry in a steady state, all of whose assets are replaceable (and are in fact replaced over time), and whose revenues have historically already converged to levels which yield the market return on the depreciated replacement cost of those assets, a going-forward set of prices, revenues, and costs will correspond to a DRC asset valuation. This then implies that the deprival value of each firm's assets will be equal to DRC – not as a matter of principle, but simply as a matter of fact, since what each firm would lose if deprived of its assets is merely the expected revenue. When the industry operates under competitive conditions so that a return

[43] Bonbright, J.C., *Valuation of property*, Columbia University Press, New York, 1937, p.69.

can be obtained only on an optimised asset base, then deprival value will trivially equate to ODRC – again as a matter of simple fact, not of price-setting principle.

6.1.2 Deprival value is inescapably circular when used to set prices

Deprival value rests on revenue expectations. It therefore cannot be at the same time the basis for setting revenues. For this reason its use for rate base purposes was rejected by the US Supreme Court in the *Hope* decision. Only once some limit to future revenues has been exogenously imposed, thereby breaking the circle, can deprival value become anchored to a fixed rate base - and in that situation it is the rate base that determines deprival value, not the reverse. The exogenously-imposed limit, whatever it happens to be, will dictate the base from which prices and revenues are set.

The application of ODV to the electricity lines businesses in New Zealand has largely ignored the pre-existing level of revenue at the time of corporatisation. Instead, the approach has been to assume that ODV equals ODRC except in rare circumstances such as lengthy rural lines with sparse customers.

Given that lines companies were not and are not operating in a competitive market (which renders the large literature on deprival value under competitive conditions simply inapplicable) and that the established revenue streams and book values at the time of corporatisation did not correspond to ODRC, then what the owners would have lost on deprival would have been not ODRC, but simply the present value of actual projected cashflows on the basis of the (then) existing set of tariffs.

No economic costing principle obliges users to pay more than the short-run avoidable costs of operating and maintaining the facilities, plus a profit sufficient to provide the owners with a return on and of their financial capital committed to the enterprise.

Only at the end of a full cycle of realised asset replacement conducted under agreed (or legislated) new full-cost-recovery rules, could there be legitimacy for ODRC-based charges. By then there would have been actual sacrifices by the present owners, in the form of actual non-amortised prior investment or acquisition outlays, which would have brought capitalised outlays up to ODRC, subject of course to the condition that full replacement of all assets had been determined to be commercially warranted - something that cannot be guaranteed in advance.[44]

[44] In relation to the existing assets which are perpetually renewed , Cooper has suggested that no valuer ought to enter a replacement-cost valuation for these without first securing a formal Certificate of Replacement, specifying a clear intention to replace. See Cooper, K., "Valuation Techniques and Problems". (Continuing Education Paper No 439), in *Infrastructure Assets Forum*, New Zealand Society of Accountants, Wellington, 1995, p.20. This procedure might cover the valuer's legal exposures, but ought not to satisfy any user of the resulting valuation until that user had evaluated for themselves the facility's future prospects.

6.1.3 Deprival concept originator rejected its use for rate-base estimation

The deprival value concept was clearly stated by the US economist James C. Bonbright in the 1930s.[45] Its subsequent use and misuse outside the USA is partly attributable to a failure to take account of the wider context of Bonbright's work on asset valuation, of which the deprival concept formed only a part. Bonbright drew a clear distinction[46] between the legal appraisal of property value for the purpose of indemnifying property owners in the event of loss (the sort of exercise for which deprival value was and is the appropriate concept) and rate-making by regulators responsible for overseeing the prices of natural monopoly utilities.

"Economists", Bonbright correctly said, "refer to the ... problem [of choosing a rate base] as one of *choosing* a proper rate base - of deciding how much the property should be permitted to be worth rather than of discovering how much it actually is worth."[47]

And he went on:

> "For the value of a public utility system depends on earnings anticipated by present or prospective owners, and this anticipation will not serve as a basis by which a court or commission may ascertain whether the earnings realised by any proposed rate are too high or too low. To attempt, therefore, to fix rates by a valuation of the property, in the strict sense of the word "valuation", is to put the cart before the horse. It would mean that rates, however exorbitant, could never be lowered if the result of the reduction would be to reduce the earning power of the company and thereby adversely to affect the outlook for future profits."[48]

Various potentially-objective benchmarks were considered by Bonbright to enable this circle to be broken by a regulator seeking to establish a rate base for price setting. An initial choice, he thought, was between a "cost plus" standard and a "competitive standard".[49] The cost plus standard would protect the producer from suffering any real loss, in return for which it would restrict prices to the lowest level consistent with a fair return on and of the capital included in the rate base. The competitive standard would focus more closely on the price that would be charged by the lowest-cost producer in a competitive market, and would thus amount to capping prices on the basis of benchmark prices from competitive markets for similar products.

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45 Bonbright, J.C., *Valuation of property*, Columbia University Press, New York, 1937, Vol.1 Chapter 4.

46 Bonbright, J.C., *Valuation of property*, Columbia University Press, New York, 1937, Vol.2 p.1078.

47 Bonbright, J.C., *Valuation of property*, Columbia University Press, New York, 1937, Vol.2 p.1081

48 Bonbright, J.C., *Valuation of property*, Columbia University Press, New York, 1937, Vol.2 p.1083.

49 Bonbright, J.C., *Public Utilities and the National power Policies*, Columbia University Press, New York, 1940, pp.13-14.

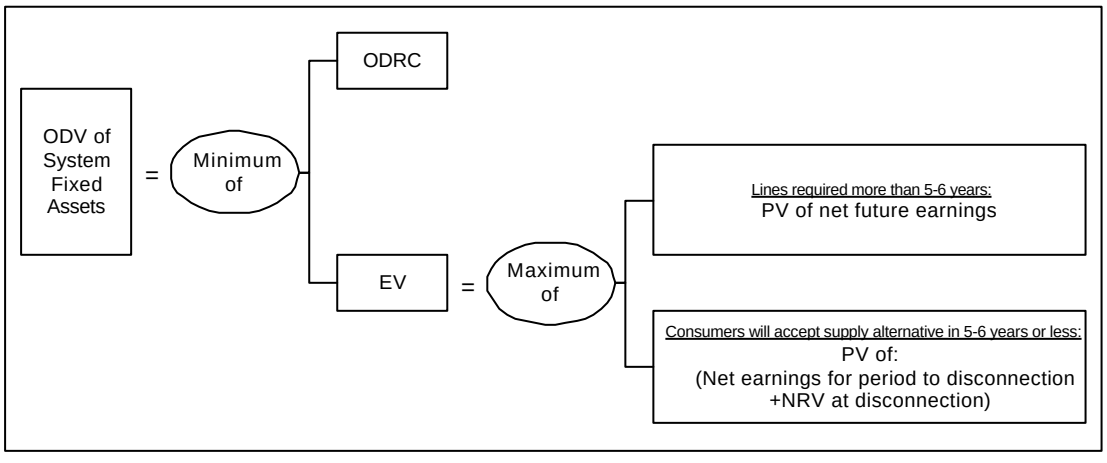
Within the cost-plus paradigm, having distinguished between "replacement cost" and "prudent investment" theories of the rate base[50], Bonbright came down firmly on the side of the latter: "The test of fair rates is their adequacy to yield a well-managed company a reasonable return on its actual capital invested. ... if the company, in prior years, has been permitted to amortise a portion of its gross capital investment, through annual charges to depreciation, it cannot fairly claim the right to continue earning a return on this investment, which it has already fully recouped. Any other rule would involve double counting against the ratepayers."[51]

It is double-charging of this sort which lines companies have imposed on consumers, and which the procedures for revaluation accounting discussed in Section 4 above were designed to prevent. Bonbright's solution was to prohibit real windfall revaluations of assets in the books of natural monopolies for ratemaking purposes, and to base allowed revenues on the minimum required to yield a fair return on and of the investor's actually-incurred past financial sacrifices.

Bonbright's arguments prevailed in the US Supreme Court's *Hope* decision which set the basis for subsequent utility regulation in the USA[52]. They have also recently been adopted in general outline by regulators in the UK.

6.2 Deprival Value is not ODRC

A long series of publications and official statements in New Zealand and overseas have explained that ODV is the lower of ODRC or Economic Value, with Economic Value in turn reflecting the Net Present Value of future earnings or the Net Realisable Value of the assets when sold off, depending on circumstances[53]. A schematic chart prepared by the Ministry of Commerce makes clear that the reduction of the ODV concept to essentially ODRC is no more than a rhetorical device.



50 Bonbright, J.C., *Valuation of property*, Columbia University Press, New York, 1937, Vol.2 p.1085.

51 Bonbright, J.C., *Valuation of property*, Columbia University Press, New York, 1937, Vol.2 p.1139.

52 *Hope* includes a test for fair rates which derives directly from Bonbright's:

53 Cf Energy Policy Group, Ministry of Commerce, *Handbook for Optimised Deprival Valuation of Electricity Line Businesses*, 23 June 1994, p.4 para 2.15 and Figure 2.1.

If in fact there is any "essential" element to ODV it is Economic Value, since from a theoretical point of view the aim of a valuation is to approximate the "value to the owner" of assets in their current real-world situation, and in a commercial setting that value arises essentially from the ability of the assets to command future revenue flows.

The role which has sometimes been given ODRC in the valuation of natural monopolies is simply to place a notional cap on Economic Value, at a replacement cost ceiling which is (implausibly) supposed to reproduce the hypothetical entry-cost threshold for a (non-existent) potential new competitor. This cap does no more than mimic the upper bound of deprival value identified by economic theory for a firm in a competitive market. In a competitive market, continual pressure to innovate and to cut costs will steadily reduce the ODRC ceiling, forcing older firms to write down the book value of their obsolescent equipment. The literature clearly acknowledges that falling deprival valuations will often be realistic and desirable, especially where core assets are not expected to be replaced or do not require replacement.

This is of particular relevance in the case of an electricity lines business where the rate of asset replacement is extremely low. For certain asset classes a comprehensive maintenance programme could see those assets having almost perpetual lives.

The reasoning behind the deprival approach to valuation for reporting purposes is clearly set out in the formulation of the methodology by Harcourt and Parker[54], based on earlier work by Solomons[55]. As Harcourt and Parker put it, "An *upper limit* to the value of an asset to a firm is set by its current replacement cost .., for the loss which the firm suffers from being deprived of the asset *cannot exceed* the cost of restoring it to its former position." (Emphasis added)

Clearly, however, many elements in the market situation of a particular firm may have the effect of limiting the Economic Value of the firm's assets to a figure far below this upper limit of replacement cost.

Solomons, in presenting his interpretation of the deprival-value concept, acknowledged the very wide bounds within which the "value to the owner" of an asset might fall under commercial conditions:[56]

> "... a valuation concept which, I think, could do much to integrate many of the conflicting ideas... is Bonbright's concept of 'value to the owner'. 'The value of a property to its owner', said Bonbright, 'is identical in amount with the adverse value of the entire loss, direct and indirect, that the owner might expect to suffer if he were to be deprived of the property.' Expressed in this

54 Harcourt, G.C. and Parker, R.H., *Readings in the Concept and Measurement of Income*, Cambridge University Press, 1969, Introduction.

55 Solomons, D., "Economic and Accounting Concepts of Cost and Value", in Backer, M., *Modern Accounting Theory* Prentice-Hall, Englewood Cliffs NJ, 1966.

56 Solomons, D., "Asset Valuation and Income Determination: Appraising the Alternatives", in Sterling, R.R. (ed.) *Asset Valuation and Income Determination: A Consideration of the Alternatives*, Scholars Book Co, Lawrence, Ka, 1971, p.111.

> way, 'value to the owner' would appear to be so much too subjective a concept to be of use to the accountant. And so it would be if it could not be quantified objectively, at least within tolerably close limits. Fortunately, we can approximate it fairly well, if we note that *it is bounded by net realisable value on the lower side and replacement cost on the upper side*. It is clear that an asset cannot be worth less to its owner than he could sell it for. It is also clear that the loss which he would sustain, if he were deprived of an asset, cannot be greater than the cost to which he would be put to replace it or its services." (Emphasis added.*)*

Deprival value, therefore, is not necessarily or essentially replacement cost. ODRC is merely the theoretical upper limit to deprival value, in the sense of the maximum insurable loss that a commercial operation could ever credibly attribute to its assets.

Deprival value will equate to ODRC only under particular circumstances (for example, a perfectly competitive market in long-run equilibrium) which bring Economic Value into line with ODRC. Nothing in the concept of deprival, nor in the generally-accepted economic theory of resource allocation, guarantees the owner of an asset any valuation greater than Net Realisable Value. This can be extremely low for precisely the type of infrastructural assets which loom large in many utility companies.

In practice, the deprival value of privatised utility companies in the UK has been determined by the market acquisition valuation of each operation as a going concern. Under competitive conditions in the financial markets this can provide a first approximation to Economic Value (the discounted cashflow anticipated from the company by the market[57]). In a long series of UK privatisations the acquisition value of the new companies, subsequently locked-in by RPI-X price cap regulation intended to block unilateral upward revaluation of existing assets, was established not by their ODRC but by the market sale price established by a process of tendering and share floats. In no UK privatisation to date has the market been prepared to pay ODRC for the assets (this is in stark contrast to the prices paid for lines businesses in New Zealand, many of which have changed hands far in excess of ODRC). Subsequent regulatory practice has established the Market-to-Asset Ratio (MAR)[58] as

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57 The New Zealand Institute of Valuers' definition of market value should be borne in mind: "Market value is defined as the estimated amount for which an asset should exchange on the date of valuation between a willing buyer and a willing seller in an arms' length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently, and without compulsion." Values established other than in an open market meeting these conditions in full would obviously have no authority as estimates of deprival value.

58 Monopolies and Mergers Commission, Gas: Volume 1 of Reports under the Fair Trading Act on the Supply Within Great Britain of Gas Through Pipes to Tariff and Non-Tariff Customers, and Other Supply within Great Britain of the Conveyance or Storage of Gas by Public Gas Suppliers, HMSO, London, August 1993, p.48 paragraph 2.194: "OFGAS and BG agreed on the need to allow for the difference between the amounts realised from the sale of BG and BG's CCA asset value at that time, and for subsequent discrepancies between the ratio of the stock market's valuation and CCA-based values, referred to in Chapter 7 as the Market to Asset Ratio (MAR). The MAR was some 41% at the date of privatisation.... If there was no allowance for the MAR, shareholders would enjoy significant and excessive gains at the expense of BG's customers." In the USA a similar measure has been termed the "Q Ratio"; see Bonbright, J.C.,

an important statistic in reviews of price caps to enable regulators to take account of the inflation-adjusted acquisition cost of the assets to their present owners.[59] The choice of this as the main building block for the UK regulatory ratebase explicitly separates deprival value from replacement cost.

In recent regulatory reviews of price caps in the UK, the ratebase used has been real original acquisition cost based on the share price at privatisation, adjusted for subsequent net (prudent) investment. Post-privatisation trends in the market value of shares in the privatised enterprises have been heavily discounted for price-setting purposes.

The result is a wide gap between the allowed revenues of UK utilities and the "required revenues" that would hypothetically result from imposition of an ODRC ratebase valuation.[60] Consequently the regulatory rate base, which determines the deprival value of the assets on the basis of the price path allowed by regulation, remains completely divorced from replacement cost and will converge on ODRC over time only to the extent that the owners of the privatised utilities in due course decide actually to replace existing assets, in the process entering the new assets into the ratebase at their new cost, as they are allowed to do. This procedure achieves a transition over time to replacement-cost-based pricing without any transitional windfall wealth transfers between the parties.

In summary, the basic principle governing deprival valuation of any asset whose services are subject to a regulatory (or market-derived) restraint is that the asset value depends on the allowed price, and not the other way round. As Grout notes,

> "if it is known at the time of privatisation that a utility will not be allowed to earn the cost of capital on the replacement cost of its assets then the market value of the utility will be less than the replacement cost of these assets. At this point the cost of capital does not determine the pricing policy. Indeed, the basic relationship becomes circular...
>
> This ... is precisely the situation in several sectors in the UK, including gas and electricity, but the most dramatic is the water industry."[61]

Precisely the same analysis applies to lines companies.

Danielson, A.L. and Kamerschen, D.R., Principles of Public Utility Rates, 1988, p.336. The Q ratio is defined as "the ratio of the market value of a utility's securities to the replacement cost of its assets". In UK discussion the MAR has usually compared the RPI-adjusted acquisition cost of the assets at privatisation to the ODRC.

59 Board, M. et al, *Accounting Requirements for Regulated Industries*, Centre for the Study of Regulated Industries Research Report No 9, London, May 1998, p.3 notes that under UK incentive regulation, "recoverability is based on RPI indexed acquisition cost (a form of regulatory CPP or financial capital maintenance)."

60 See Newbery, D., "Determining the Regulatory Asset Base for Utility Price Regulation", *Utilities Policy* 6(1):1-8, 1997.

61 Grout, P., "The Cost of Capital in Regulated Industries", Chapter 16 in Bishop, M., Kay, J. and Mayer, C., *The Regulatory Challenge*, Oxford University Press, Oxford, 1995, pp.391-2.

In effect the establishment valuation of the lines companies in the early 1990s, and hence the deprival value to their owners, was the present value of the expected (and allowed or perceived as reasonable) revenues to be secured from users.

In unilaterally raising asset valuations to ODRC, a lines company uses its market power to *increase* the deprival value of its assets by forcing up its Economic Value from the old. In no sense would such a revaluation *reflect* deprival value.

7. The Road Back from ODV

7.1 Introduction

In Section 3 we demonstrated that consumers are currently paying around $200 million more each year than is required to properly sustain lines companies if they had retained the valuations they commenced with when corporatised in April 1993.[62]

Currently much of the money actually makes its way back to customers. However, there is nothing to ensure this will continue into the future and there are major leakages along the way. The position of each customer depends on which lines network they are connected to.

Trusts: Some 41% of customer connections are with companies in 100% trust ownership.[63] The trust may distribute its income according to the trust deed and the behaviour varies from customer rebates in some instances to charitable trusts that disburse the funds to community groups meeting certain criteria.

For a trust-owned lines business where the trust distributes all income back to the beneficiaries it may be thought that there is just a simple transfer from one pocket to another as the owners and the consumers are the same group. For example, Vector is owned by the Auckland Energy Consumer Trust ("AECT") and typically AECT will distribute dividends to the customers in Vector's area[64].

If we look at the accounts for the year ended 31 March 1999, Vector paid $43.5 million in dividends to AECT. For the year ended 31 March 2000 Vector has declared a final dividend of $75.4 million, a figure that is boosted by one-off asset divestments. When that money passes from AECT to its income beneficiaries (Vector's customers in the Auckland, Manukau and Papakura areas) then those dividends are classed as income in the hands of the beneficiaries. The dividends may, or may not have imputation credits attached depending on Vector's tax position and that will determine whether the beneficiaries need to pay additional tax on that income or not.

The point to note is that the profit stream that is paid out by Vector will be taxed in the hands of the beneficiaries at their individual marginal tax rates. Therefore, to the extent that Vector sets its prices to over-collect revenue the owners of Vector suffer a loss of up to 39% depending on their personal marginal tax rate.

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62 This was required under the Energy Companies Act 1992, Part IV, Clause 32.

63 Inquiry Report, Table 2, Ownership of Distribution Companies.

64 At present there is a dispute between AECT and the local councils who are to receive the trust property in 2074 when the trust terminates. That dispute has halted distributions from the trust property in the meantime.

Local Body-Owned: Companies owned 100% by local bodies account for 16% of customer connections and may use the additional income to supplement rates or may rebate it. There are lines businesses that are owned by councils where the councils are able to utilise the dividends from the lines business as revenue to offset rates from residents. For those electricity consumers that are also ratepayers, any overcollection of revenues by the lines business will again cause leakage of funds paid in taxes. It would seem clear that this group of customers would be better off with lower electricity charges and higher rates.

Private Ownership: For the 43% of customer connections serviced by companies which are at least partly privately owned, they do not receive back that portion of surpluses arising from overcollection which is paid to private shareholders as a component of declared profits.

Thus, overcollecting revenues via ODV is not simply a problem for customers of privately-owned lines businesses. It is a problem for all customers of electricity lines businesses.

7.2 Catching Bolting Horses

When confronted with the consequences of the move to ODV valuations, a frequent response is, "Yes, but the horse has bolted".

This is far from the case. The few horses that are genuinely beyond the stables are still in eyeshot and there are plenty of hands to recapture them. There is a good range of options for moving to fair and sustainable pricing. Even if some special cases proved very difficult, this would give no grounds for failing to address the issue. If the concern is that it's too hard because the financial adjustments required would be too great, then the concern is overstated.

The New Zealand government did not privatise any lines companies. The Crown never owned the local electricity networks.[65] They were owned either by local bodies or, more often, were creatures of statute – Electric Power Boards (something close to community trusts). So it is not as though Government collected sale proceeds based on ODV valuations of electricity assets and could be exposed on that basis. It is not even that so much of the lines industry is in private hands.[66]

The nation's largest lines business, Transpower, is in Crown ownership as an SOE.[67] It has demonstrated that it is feasible to, over time, write down the value of its fixed

[65] The only exception is The Power Company. While the Crown owns this company, it has not onsold any shares in it.

[66] In some other industries discussed below, there is a greater proportion of private sector holdings, notably Auckland International Airport and the major gas lines companies.

[67] While the Crown did attempt to sell it in the early 1990s, here ODV spelt one desperate vendor. Concern over the asking price for the newly written up assets and a lack of interest on the part of the electricity distributors invited to purchase the company resulted in abandonment of the sale.

assets substantially. From a peak value of $2.92 billion in 1993, Transpower has reduced its book value to $2.22 billion in 1999.[68] This included a fall of $550 million in 1997. All this was accomplished without any shareholder (Crown) injection.

Further reductions that could be required as a result of a change in valuation methodology could be achieved by a range of mechanisms.[69] The decade that has passed since Transpower was first saddled with an enormous debt burden – an 83/17 gearing in 1991– have allowed it to considerably improve its position and thus its financial options.[70]

For the 22 companies which are 100% trust-owned, writing down book values should not involve any party having to make a sacrifice (providing debt levels are low). It amounts only to a reconstruction of the accounts. This process raises a host of technical issues, but the real assets held by the trusts today are in essence the assets they began life with. The change consists of no more than returning to the original understanding of their value.

Much the same is true for the five lines companies which are 100% owned by local bodies. Here the issue of any borrowing the enterprise may have made and any dividends paid to the local body can (for the purpose of considering wealth effects) be considered "internal transfers". If transfers need to be made back to the lines companies, no wealth will have been lost by the relevant Councils.

This leaves just four companies which have some private shareholding. For three of these, the private shareholders are a minority. United Networks, which accounts for a quarter of all customer connections, is the single lines business which is majority owned by private shareholders.

So, of the $6.4 billion currently recorded as invested in fixed assets of the 32 electricity transmission and distribution companies, a return to a fair pricing methodology could most likely be achieved with no transfers of wealth in respect of 28 of these which account for most of that combined valuation.

For the four remaining lines companies, a reduction in book values to achieve fair pricing could indeed involve a loss of wealth by the private shareholders in those companies. It is a question of who suffers: investors or consumers?

It should first be made clear that there are no private property rights at stake.[71] The network owners would retain their assets but with the change that the earning power would be capped by regulation.

However, one scenario is that lines companies may seek approval to have customers fund, via a surcharge, the difference between the revenue stream expected prior to the imposition of a revenue cap and that which could be expected subsequently. If

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68 Transpower Annual Reports, 1993 and 1998/99.

69 *Hydro New Zealand*, Electricity Reform Coalition, February 1991, Section 9.5.

70 Transpower Annual Reports, 1991 and 1998/99.

71 As discussed further below, there is currently no official approval for ODV based prices.

consumers were to pay some or all of this difference, the worst case is that they would make no gains over the present position. Customer charges would continue to embody monopoly rents. The difference would be that a fair basic level of charges would have been set with a surcharge added to this to sustain the level of monopoly rents currently enjoyed by investors. A variation on this is that the surcharge could diminish over time, gradually eliminating the monopoly rent through an adjustment period. This would amount to a sharing of the cost of adjustment.

However, before consumers could reasonably be asked to share the cost, the lines companies would need to surmount some fairly steep hurdles in order to prove that investors are entitled to some measure of compensation from customers.

A starting point is, what were investor expectations as to the risk of price regulation? An ANZ Securities survey in 1997 recorded that 56% of lines company CEOs expected "the regulator to enforce the regulatory 'cap' on line revenues" by 1999 and a further 20% some time from the year 2000 onwards.[72] Thus there was a strong expectation on the part of those managing the assets that regulation would come and there was every opportunity to take this into account if these companies were making purchases subsequently. Equally, there was every opportunity for those who had made acquisitions to quit their position if it appeared too risky. It should be noted that the expectations of those surveyed were that prices would be capped at the levels current at the time of intervention rather than reduced, but the important point here is that they expected regulatory intervention. The precise form of intervention was clearly unknown and price levels had to be a risk.

More recently, the past year has seen:

- An attempt by the previous Government to introduce CPI-X price regulation;
- Labour's policy announcement last October outlining its plans to hold an electricity inquiry; and
- The appointment of the inquiry panel in February.

Again, there has been a long period of warnings that change was coming, allowing time for investors to reposition. An industry conference which was advertised in the weeks prior to the inquiry reporting even pitched for attendees under the banner title of *Adapt to Changing Pricing, Profitability and Asset Values Resulting from Electricity Industry Reform*.[73]

The most basic point here is that there was no defined level of pricing explicitly approved by the Government. Unlike all other OECD jurisdictions, there was no state or local government cap on actual prices or formal approval for a particular price setting process. Instead, officially, there was just the threat of regulation. That has allowed the industry an enormous latitude to develop its own pricing and valuation

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72 The New Zealand Electricity Sector, ANZ Securities, 1996/97, Section 2.2, Question 6.

73 Adapt to Changing Pricing, Profitability and Asset Values Resulting from Electricity Industry Reform, Flyer for Conference of July 4 and 5 2000, organised by Business Information in Action.

policies, and to take considerable advantage of this.[74] However, the flip side is clear: those same players are exposed to Government making good its threat and intervening in some unspecified manner.

That's the simple position. What must immediately be stated though is that the de facto regulator, the Ministry of Economic Development, has not remained silent on the pricing question. Certainly, the introduction to the ODV handbook (as noted above) contains a clear statement that "There is specifically no regulatory requirement that prices be determined on the basis of system assets being valued according to ODV", as already noted. But the contrary is equally true. Specifically, there is no regulatory *prohibition* that prices be determined on the basis of system assets being valued according to ODV.

If the ministry had stated nothing more, then there would have been something much closer to pure uncertainty and an unspecified threat of regulation. However, the increasing attention placed on the ODV valuation process in recent years and the strong link to pricing implied in the ministry's documents on this issue can only serve to have reinforced in the minds of lines company managers and owners that ODV was the long term ceiling and the issue was simply how ODV would be defined to curb creative interpretations.

Further, the industry would clearly have been watching the response from the ministry as a series of very high rates of return were reported under information disclosure. In 1996, Mercury Energy (now Vector) disclosed an ARP of 29.24%, attracting a "please explain" letter from the ministry and a flurry or correspondence. However, the company was not required to make any adjustments as a result. Following after this, Orion disclosed an ARP of 31% for the 1997 year, and Tasman Energy 28%. Eastland Energy then disclosed an ARP of 91% for the 1998 year, still without attracting retribution. In the same year Otago Power recorded 46%, Electricity Ashburton 33.5%, WEL Energy 27.9% and Powerco 21.5%.[75]

So lines companies would indeed have grounds for asserting that they were never given clear signals by the regulator that pricing on the basis of ODV valuations would be a problem. However, this line of argument eventually returns to the simple question of business risk. That is, a jurisdiction such as New Zealand which goes against the grain and eschews effective price regulation will always be a risky place to invest and prone to a change of stance. A government which maintains a light-handed regime with the threat of regulation as a key component can not be accused of acting unreasonably if the threat is acted upon.

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74 See Electricity Line Businesses Review of Three ODVs , Report to the Ministry of Commerce by KPMG, November 1999.

75 Ministry of Commerce, *Electricity Information Disclosure Statistics 1999*, Wellington, November 1999, p.7. See also Inquiry into the Electricity Industry *Report to the Minister of Energy*, June 2000 Table 3 p.14.

7.3 The Spread of ODV to Other Sectors

The importance of confronting now the application of the ODV methodology goes beyond the issue of fair prices for electricity customers. Customers of all network utilities have a stake in the outcome. This is because of the progressive adoption of the ODV methodology by other monopoly utilities.

Gas suppliers and major airports were early to revalue under ODV, following on the heels of electricity industry revaluations. In neither case had government made ODV pricing the benchmark. While the gas industry was subject to information disclosure regulations from 1997, these did not require the completion of ODV valuations.[76]

As plans for reform of the water and possibly roading sectors advance, so does the question of whether these industries will also generally adopt some form of ODV valuation and pricing. Port companies may consider adopting it. In fact almost any industry or subsector that has a strong degree of natural monopoly character is a contender.

The electricity industry tends to be used as the template for regulation of other network industries. Thus, if ODV gains formal acceptance following implementation of the reforms recommended by the inquiry report, this will set a strong precedent for its adoption elsewhere. If the Commerce Commission carries out the once only reassessment of lines company valuations on an ODV basis (as the inquiry foresees) and these are used as the starting values for price regulation, it will be very difficult to challenge the valuations after that point.

They will then become locked into the economy and customers of monopoly services will be permanently poorer, quite unnecessarily, by hundreds of millions of dollars a year if all network utilities adopt ODV pricing and do not rebate consumers. That would be a huge and permanent deadweight cost on the economy.

[76] The Ministry of Economic Development announced in May that the disclosure regulations are to be amended to require ODV valuations to be prepared according to a handbook from the 2000/01 financial year.

8. A Way Forward

8.1 An Economic Policy Statement

If as part of its response to the inquiry, government accepts that revaluation gains should be counted as income, and that as a result, lines companies have overcollected from customers relative to the rates of return that would be considered reasonable, what should be the policy response? This involves consideration of how past revaluations should be regarded for pricing purposes and what should be the accepted pricing policy into the future.

An answer to these questions is beyond the scope of this paper as it is a substantial task. However we here consider, as the inquiry report has, mechanisms for development of a response.

The inquiry report has proposed that the Commerce Commission define a threshold for acceptable pricing (paragraph 196). If a lines company exceeded this level, the Commission would regulate the maximum price which that company could charge. However, the inquiry report recommends that the proposed new industry Board be the party which in the first instance develops a formal pricing methodology to apply to lines companies.

We do not believe it is appropriate to delegate to industry the development of a pricing methodology. Core public policy questions are involved which should be determined by government before other bodies work on the detail.

One mechanism suggested by the inquiry report does however offer a clear way forward. As a means of implementing some of the wide range of reforms proposed by the inquiry report, it recommends that government issue a statement of economic policy under Section 26 of the Commerce Act. Our suggestion is that this statement be expanded, or a separate one issued, which gives direction to the Commerce Commission to design price setting apparatus within specified criteria.

Through this statement, government could cast the general parameters of the pricing and valuation methodologies to be adopted while leaving the detailed design to the proposed new industry regulator.

Appendix 1: Data on Asset Values of Distribution Companies

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Alpine Energy													
Fixed Assets Book Value	30,644	31,870	31,052	31,134	31,216	31,221	30,766	29,079	29,900	70,300	72,300	71,657	71,966
ODV as per Inquiry Table 4										65,790	65,790	65,790	69,723
Horizon (Bay of Plenty)													
Fixed Assets Book Value	42,456	43,096	46,643	44,518	42,392	40,695	43,834	42,076	43,000	62,292	71,554	75,048	66,195
ODV as per Inquiry Table 4										56,834	66,951	66,951	67,905
Buller Electricity													
Fixed Assets Book Value	3,550	4,119	4,234	4,398	4,562	4,688	5,182	5,234	5,600	5,900	6,200	6,200	6,200
ODV as per Inquiry Table 4										12,930	12,930	13,205	13,205
Central Electric													
Fixed Assets Book Value	23,348	25,852	26,637	27,039	27,442	28,578	29,114	30,507	35,000	39,600	42,400	42,400	42,400
ODV as per Inquiry Table 4										46,558	46,558	51,332	64,660
Central Power (including Electro Power)													
Fixed Assets Book Value	37,918	47,218	48,791	53,896	59,001	60,730	52,973	55,477	57,800	109,000	138,600	143,281	134,204
ODV as per Inquiry Table 4										124,935	128,895	135,401	128,966
CHB Power Holdings													
Fixed Assets Book Value	6,169	6,491	6,579	6,701	6,823	6,692	6,980	7,009	7,100	7,200	7,500	29,000	27,950
ODV as per Inquiry Table 4										25,090	25,090	28,892	27,847
Counties Power													
Fixed Assets Book Value	16,707	19,349	21,579	22,267	22,954	23,475	23,219	24,587	27,000	30,100	36,500	36,500	36,500
ODV as per Inquiry Table 4										54,450	54,450	75,161	75,161
Dunedin													
Fixed Assets Book Value	41,644	45,364	83,513	46,806	10,099	15,814	17,653	59,405	58,800	84,600	86,300	77,725	75,303
ODV as per Inquiry Table 4										85,600	80,700	80,700	80,618

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Eastland Energy (including Wairoa Power)													
Fixed Assets Book Value	47,053	47,572	46,990	36,044	25,098	23,374	24,470	24,309	26,000	26,500	26,500	19,259	16,194
ODV as per Inquiry Table 4										33,720	33,720	67,130	63,070
Electricity Ashburton													
Fixed Assets Book Value	23,500	25,062	25,383	25,736	26,088	28,649	28,901	28,361	30,100	32,600	35,200	63,995	65,269
ODV as per Inquiry Table 4										55,000	55,000	58,300	58,296
Electricity Invercargill													
Fixed Assets Book Value	11,675	12,733	13,283	12,446	11,609	19,285	19,045	18,025	18,100	17,100	17,100	33,855	33,086
ODV as per Inquiry Table 4										35,529	35,529	33,280	33,280
Hawkes Bay Power													
Fixed Assets Book Value	58,297	58,440	59,438	58,499	57,561	71,692	64,431	64,681	62,500	62,700	63,800	63,800	63,800
ODV as per Inquiry Table 4										115,800	115,800	118,164	103,325
Horowhenua/Electra													
Fixed Assets Book Value	23,739	25,600	28,334	30,242	32,149	31,845	31,687	31,089	32,800	56,200	62,500	62,477	63,773
ODV as per Inquiry Table 4										50,050	56,360	65,300	60,444
Mainpower (including Kaiapoi)													
Fixed Assets Book Value	21,954	28,068	27,863	28,399	28,935	28,600	27,286	28,815	30,500	32,100	33,400	33,847	86,159
ODV as per Inquiry Table 4										68,743	68,743	88,167	82,219
Marlborough Electricity													
Fixed Assets Book Value	40,474	40,210	39,645	39,305	38,965	38,107	36,983	36,453	36,800	36,600	38,100	38,100	38,100
ODV as per Inquiry Table 4										75,100	75,100	75,536	70,119
Citipower (Nelson)													
Fixed Assets Book Value	7,545	7,706	7,613	7,656	7,700	7,030	801	454	6,600	6,900	6,900	6,900	6,900
ODV as per Inquiry Table 4										13,666	13,666	18,737	14,541

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Tasman Energy													
Fixed Assets Book Value	30,493	32,899	34,339	35,989	37,639	36,492	29,339	30,724	31,000	32,700	82,900	82,900	82,900
ODV as per Inquiry Table 4										90,390	107,906	93,417	86,917
Waitaki Power													
Fixed Assets Book Value	10,613	10,161	10,039	10,061	10,083	10,128	10,288	10,370	10,800	11,000	11,000	11,389	11,461
ODV as per Inquiry Table 4										41,648	43,207	44,142	40,993
Northpower													
Fixed Assets Book Value	39,866	41,300	42,197	41,901	41,605	44,116	41,934	48,938	50,400	53,400	56,000	49,829	46,222
ODV as per Inquiry Table 4										105,400	105,400	115,164	104,684
Southpower/Orion													
Fixed Assets Book Value	105,994	113,566	118,877	118,662	118,447	170,502	189,443	301,965	327,271	334,288	511,180	503,088	432,418
ODV as per Inquiry Table 4										387,874	477,567	477,567	477,567
Otago Power													
Fixed Assets Book Value	40,558	43,810	43,547	42,976	42,405	42,066	35,959	35,548	35,300	34,900	34,300	14,891	12,380
ODV as per Inquiry Table 4										37,064	37,064	51,313	51,300
Powerco (including Egmont Electricity and Wairarapa Electricity)													
Fixed Assets Book Value	161,314	157,618	159,092	158,639	158,185	163,118	180,070	223,093	148,389	272,700	368,309	403,824	303,703
ODV as per Inquiry Table 4										207,149	224,041	261,891	247,922
Scanpower													
Fixed Assets Book Value	6,616	6,749	6,607	6,573	6,540	6,370	6,199	5,959	5,800	6,400	6,500	6,617	5,436
ODV as per Inquiry Table 4										17,515	17,515	19,110	16,013
The Lines Company (including King Country Energy)													
Fixed Assets Book Value	22,724	22,764	21,863	21,416	20,970	23,314	26,888	35,731	27,600	28,000	54,200	54,200	54,200
ODV as per Inquiry Table 4										60,990	62,862	62,862	59,762
The Power Company													
Fixed Assets Book Value		28,001	29,731	31,077	32,422	34,031	35,413	32,626	32,300	33,400	38,100	38,100	38,100
ODV as per Inquiry Table 4										89,531	89,531	93,903	142,913

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Top Energy													
Fixed Assets Book Value	19,468	23,235	25,552	26,167	26,782	27,095	26,960	35,752	37,800	51,700	54,100	50,867	71,817
ODV as per Inquiry Table 4										66,287	66,287	69,621	70,836
TrustPower (including Tauranga Electricity)													
Fixed Assets Book Value	198,491	197,127	178,148	179,032	179,916	118,718	120,708	125,886	82,973	125,103	217,419	234,675	0
ODV as per Inquiry Table 4										174,892	224,658	241,300	
Power NZ/United Networks (including Capital Power, Energy Direct, TransAlta)													
Fixed Assets Book Value	232,558	256,047	270,875	282,654	294,433	282,667	298,912	445,727	485,200	493,021	1,025,453	1,075,233	1,155,330
ODV as per Inquiry Table 4										852,077	872,990	833,960	1,018,300
Mercury Energy/Vector													
Fixed Assets Book Value	206,750	236,493	269,390	282,279	295,169	301,096	297,239	318,165	355,800	356,092	368,364	429,275	871,268
ODV as per Inquiry Table 4										765,745	783,495	715,377	710,100
Waipa Electricity													
Fixed Assets Book Value	15,359	12,854	13,046	13,311	13,577	13,792	13,881	13,520	13,000	46,100	45,900	45,392	44,764
ODV as per Inquiry Table 4										42,663	42,663	42,663	43,011
WEL Energy													
Fixed Assets Book Value	50,529	51,103	51,015	62,723	74,431	81,502	88,152	87,984	89,100	124,200	125,100	133,934	142,009
ODV as per Inquiry Table 4										105,770	105,770	129,400	129,400
Westpower													
Fixed Assets Book Value	28,316	29,666	31,088	31,476	31,864	37,563	37,449	61,336	65,300	78,100	79,000	67,578	52,545
ODV as per Inquiry Table 4										32,671	32,671	32,671	50,332
Totals													
Fixed Assets Book Value	1,598,779	1,724,439	1,815,368	1,812,365	1,809,362	1,846,016	1,881,361	2,298,431	2,299,033	2,753,896	3,815,779	3,998,936	4,151,652
ODV as per Inquiry Table 4										3,997,461	4,228,909	4,326,407	4,263,429

Appendix 2

(a) Electricity Distribution Companies' Disclosed Book Value of Fixed Assets and Gross Pre-Tax Operating Surplus

$000 at 1999 prices Using the PPI (Inputs)

March years	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total distribution companies' book value $million	2,195.3	2,044.8	1,973.7	1,999.4	1,990.0	2,378.1	2,750.7	3,027.5	3,776.6	3,947.6	4,019.9
Lines company revenue exclusive of TransPower charges passed through	673,189	690,428	664,104	720,689	745,611	707,400	680,708	784,944	899,060	922,708	779,149
Total gross pre-tax operating surplus of distribution companies $000	168,608	170,006	183,180	224,166	240,455	223,526	325,689	418,329	484,287	445,562	372,396
Depreciation allowances $000	96,529	96,849	99,201	106,846	104,877	112,364	85,877	97,923	109,628	128,213	120,221
Net pre-tax operating surplus real (depreciation-based) $000	42,900	53,805	68,729	100,127	122,446	103,675	231,142	312,804	367,770	314,068	250,841
Capital spend (arbitrary estimate 1995 on)	221,353	186,131	198,269	242,027	180,690	180,000	180,000	180,000	180,000	180,000	180,000
Net operating surplus (capital-spend-based)	-81,924	-35,478	-30,339	-35,054	46,633	36,039	137,019	230,728	297,398	262,281	191,062

(b) Internal Rates of Return on the Basis of Pre-Tax Operating Surplus

	All equity	All equity	Geared 50% at 10% interest	Geared 50% at 10% interest
	Depreciation basis	Capital-spend basis	Depreciation basis	Capital-spend basis
Internal gross pre-tax rates of return for investor exiting in March 1999 after buying-in at:				
March 1990	14%	10%	15%	9%
March 1991	17%	13%	20%	14%
March 1992	20%	16%	25%	18%
March 1993	23%	20%	35%	24%
March 1994	28%	24%	38%	31%
March 1995	29%	25%	41%	33%
March 1996	29%	26%	43%	35%
March 1997	17%	29%	48%	41%
March 1998	23%	20%	24%	18%