# Pipeline Profits

*Gas Pipeline Rates of Return*

Prepared by

**Simon Terry Associates Ltd**

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# Executive Summary

- This report examines the rates of return achieved by the nation's two largest gas pipeline companies and compares these with returns available in the market generally. The purpose of the study is to contribute a background document to the review of the gas sector initiated by the Ministry of Economic Development (MED) in March 2001.

- Any business owes a duty to its shareholders to maximise returns, consistent with sustaining the business whilst meeting any statutory and regulatory requirements. Private enterprises which have a natural monopoly character are traditionally regulated to constrain their pricing. Up to 1992, the gas industry was regulated by the Commerce Commission which set the prices gas utilities were permitted to charge. From April 1993, the industry was extensively deregulated but became subject to "light handed" regulation. Light handed regulation consists of two components: information disclosure and the threat of formal regulation.

- Our study analyses the financial performance of the Natural Gas Corporation (NGC) and the company previously known as Enerco and then Orion, prior to its purchase by UnitedNetworks in 1999. These two companies have undertaken the overwhelming majority of the transmission and distribution of natural gas since deregulation and analysing them provides a good guide to the overall performance of the gas industry under light handed regulation.

- We examine the eight financial years between 1992 and 2000. Both NGC and Enerco were floated in 1992, just prior to industry deregulation, so this provides a natural starting date. The core analysis undertaken is the calculation of the internal rates of return achieved by NGC and Enerco/Orion.

- As the regulations requiring disclosure of financial information relating to pipeline activities did not come into force until 1997, there are only four years of such information to assess.

- During the period from 1997 to 2000, NGC achieved a post tax real rate of return of 18% on its gas transmission and distribution activities, according to information disclosed under the Regulations.

- We analyse NGC's performance over the period 1992-2000 by drawing on the company's annual reports. The real after-tax rate of return on a dollar invested into this business in 1992, and held until 2000, was 19%. To achieve the equivalent return, the investor would need to have found an investment that yielded 19¢ tax-paid (or 29¢ pre-tax) at the end of every year for eight years and still returned the original dollar invested. The annual reports provide insufficient information to separately identify the financial flows associated with just the gas transport activities so these results are for the combined gas-trading and pipelines businesses. However, statistics on the profitability of individual sectors provided by NGC suggest these bundled results are reflective of those that could be expected from analysis of the pipeline activities alone.

- Turning to Enerco/Orion, for the period from 1997 to 2000, it is estimated to have achieved a post tax real rate of return on its pipeline operations of between 15% and 33% depending on the assumptions used. The main factor which drives these widely spread results is whether the asset value at the end of the period is taken as the book value or the sale price achieved (which was about double book value).

- Analysis of Enerco/Orion's combined gas-trading and lines business for the years 1992 to 2000 shows real after-tax rate of return estimates of between 23% and 29%, again depending on the assumptions. As with NGC, while these are bundled results, they appear to be fully reflective of the results that would be expected for analysis of the pipeline operations alone.

- In order to estimate the extent of any excess returns, it is necessary first to define what an appropriate or normal return would be. This varies from sector to sector but also to some extent between companies within a sector. The weighted average cost of capital (WACC) is one generally accepted measure of the level of returns that are appropriate for a sector or company.

- A basic benchmark is that not more than a competitive rate of return ought to be secured over time by private investors who purchase pipeline assets at the time of deregulation. The 9.5% adjusted rate of return on assets available from the New Zealand sharemarket for the period from 1992 to 2000 can validly be compared to the rates of return achieved by the gas companies over that period. For the period from 1997 to 2000, the adjusted sharemarket return of 5% can be compared to the results we have calculated for this shorter period. In both cases, the returns to NGC and Enerco/Orion are estimated to be at least double the benchmarks, and in some cases are triple.

- Gas pipeline operations are relatively low risk investments and are generally compared against like infrastructure assets, such as electricity networks. The MED estimates that the appropriate real post-tax WACC for electricity lines companies is between 7.5 and 10 percent. With the tax shield removed, this translates to a real rate of return on assets of 10.4%. The returns calculated for NGC and Enerco/Orion are around double this for all but one result.

- The Commerce Commission undertook a detailed study of the appropriate WACC for a natural monopoly service provider as part of its study into airfield pricing. Applying the Commission's methodology for derivation of the WACC, we estimate that real rates of return on assets of 8% for 1993 and 9% for 1997 would be the appropriate comparators. Again, the returns calculated for NGC and Enerco/United are at least double these figures for all but one result.

- As the Commerce Commission notes, "An actual return in excess of the appropriate target WACC over time would suggest that the entity was earning an excessive or monopoly return".

- In dollar terms, the two pipeline operations are collecting at least $60m a year more than is needed to properly sustain these activities.

- The scale of the excess returns prompts a number of observations. The first is that monitoring by government of gas transport charges has been quite inadequate. It is the absence of effective monitoring that has allowed very high rates of return to go not only unchecked, but unidentified, for so long.

- The framing of the information disclosure regulations is part of the problem. The disclosed financial information does not reveal ongoing excess returns in a direct or user friendly manner. Whenever pipeline operators revalue their asset bases upwards, the regulations will reveal excess returns only in the single year when the revaluation is declared. However, single year spikes far above the acceptable WACC have not led to a regulatory response and it appears their significance was not understood by Government.

- When businesses revalue their assets upwards, the accounting rate of profit (ARP) measure will show a one-year increase, because the ARP calculation treats revaluation gains as income. Correctly interpreted, a single-year ARP well above the benchmark signals a permanent upward shift in the profitability of the disclosing business, and hence a matching upward shift in its long-run rate of return. Correctly applied, the light-handed regulatory regime should then require an immediate regulated rollback of allowed revenue, or a rebate to customers of the full amount of all revaluations. New Zealand regulatory practice has been to react to single-year spikes in disclosed ARPs as though these were transitory one-off high-profit years, rather than indicators of long-term excess charges and profits.

- Constructing an effective discipline on gas transport pricing will be a key task for the Gas Review as there are no suitable mechanisms available to private parties. Legal action through the courts has been foreclosed by a series of judgements which have ruled out the main legal avenues by which monopoly pricing might have been successfully challenged. The Commerce Commission does have jurisdiction to investigate monopoly pricing under part IV of the Commerce Act but only the Minister of Commerce may order a price control investigation.

- Should Government's objectives for regulation of the gas industry be confined to restraining gas transport charges, Part IV of the Commerce Act does provide a ready mechanism. The Commerce Commission's airfield activities study conducted under these provisions has provided clear benchmarks in respect of the conditions that would qualify for price control regulation.

- If Government instead wishes to follow the precedent set for the electricity lines companies and place the Commerce Commission in a backstop regulatory role - an approach labeled "targeted regulation" - it could introduce new legislation to give the commission further powers specifically relating to gas pipeline businesses. As the Gas Review covers a wide range of other issues, it is too early to judge the best means and institutional arrangements for regulation at this stage.

- Rates of return which are consistently above the level required to meet the appropriate cost of capital are monopoly profits. These are pure transfers of wealth to the asset owners. They perform no economic function in relation to securing the continued supply of the service. They are not required as an incentive for entry, nor for ongoing replacement of assets as they wear out.

- The light handed regulatory regime has failed to check such excess returns. It has also failed to ensure that disclosed financial information was publicly analysed to ensure that its significance was properly understood. As a result, all those making use of the pipelines have paid more than was required to properly sustain the services. Gas producers, wholesalers, retailers and ultimately consumers have all been affected by high pipeline charges.

- A minimum output from the Gas Review therefore is a recommendation for a new set of regulatory arrangements to provide an effective check on the market power of pipeline owners.

# 1.    Introduction

This report estimates the rates of return achieved by the nation's two largest gas pipeline companies and compares these with returns available in the market generally.   It records the effects of pipeline companies' application of the Optimised Deprival Valuation (ODV) methodology to the pricing of their gas pipeline services, and the influence that the light-handed regulatory regime has had on the level of revenue collected.

The purpose of the study is to contribute a background document to the review of the gas sector initiated by the Ministry of Economic Development (MED) in March 2001. The terms of reference for the Review[1] are wide ranging but include the following questions in respect of pipeline charges:

- "Are concerns about excessive prices/profits in gas transport markets justified?"

- "What criteria should be used in determining an appropriate valuation methodology for gas networks?"

- "What is the history of valuations of gas pipeline businesses (focussing particularly on "privatisation" price and subsequent movements)?"

This study addresses those questions and also directly addresses two of the five "overall outcomes the Government seeks" from its recent energy policy statement.[2]   These are:

- "Costs and prices to consumers which are as low as possible, while ensuring that prices reflect the full costs of supply including environmental costs", and

- "Fairness in pricing so that the least advantaged in the community have access to energy services at reasonable prices".

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.

Past work carried out by the authors in this field includes: *Lining Up the Charges*, an analysis of excess returns achieved by electricity lines companies and a critique of the ODV methodology, and *Rates of Return at Auckland International Airport*.

This report has been prepared independently by STA in part on a pro bono publico basis and in part through the sale of subscriptions to the report.  STA has no conflicts of interest arising from issues covered in this paper.

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1    The specific questions relating to pipeline charges and use of the ODV methodology are set out in Appendix 1.  The full terms of reference for the Review is available at www.med.govt.nz.

2    *Energy Policy Framework*, Minister of Energy, 3 October 2000.

# 2.    Background and Framing of the Study

## 2.1.    Deregulation of the Gas Industry

Any business owes a duty to its shareholders to maximise returns, consistent with sustaining the business and whilst meeting any statutory and regulatory requirements. For those businesses that have market power by virtue of being in a natural monopoly position, the duty to maximise profits would, if unfettered, lead to the extraction of monopoly rents from customers.  In order to provide an element of protection to customers, governments will typically institute some form of regulation. Traditionally, this takes the form of industry-specific price or rate of return regulation.  In the early 1990s, New Zealand decided to trial "light-handed" regulation.

In the case of the gas industry the pipelines that comprise the transmission and distribution systems have clear natural monopoly characteristics.  It is not generally economic for a would-be competitor to duplicate pipelines in order to offer competing gas transport services.

Up to 1992, the gas industry was regulated.  The Commerce Commission periodically determined the prices gas utilities were permitted to charge for the bundled supply of pipeline transport and gas.  Gas was the last activity to be removed from active price regulation; the Commerce Commission issued its last price determination in 1992.[3]

With the passage of the Gas Act in 1992, the industry structure was formally deregulated from April 1993.[4]  Under the new framework, so called "light handed" regulation took the place of the Commission's price setting role.  Light handed regulation consists of two components: information disclosure, and the threat of regulation.  The latter was never adequately defined and this contributed to widespread scepticism as to whether government would ever make good the threat.[5]

The disclosure regulations for the gas industry were modeled on those developed for electricity lines companies, which were deregulated on a parallel timetable to that for gas.  However, while disclosure regulations for electricity came into effect for the 1993/94 financial year, the gas industry waited more than four years for disclosure regulations to be promulgated in July 1997.

Delay was not the only problem in respect of the disclosure requirements and the light-handed approach to utility regulation.  Government had only poorly articulated how information disclosure and recourse to the Commerce Act alone would in practice deliver timely and effective discipline.  The general thinking appeared to be that if

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3    Commerce Commission, Decision 266, 19 February 1992.

4    The Gas Act 1982, passed a decade earlier, provided the previous legislative framework.

5    " … we do not think that the [electricity] industry considers price control a credible threat." Paragraph 192, *Report of the Ministerial Inquiry into Electricity*, June 2000.  The same comment applies to the gas industry.

network owners are forced to disclose contract conditions and system information then users and competitors will be empowered to check the market power of natural monopoly suppliers, either by negotiation or through the Courts.

However, under the Commerce Act 1986, the Courts have no powers to restrict monopoly profits.[6] Even if they had such powers, and ignoring the high costs of litigation - which are prohibitive for all but the largest and most determined companies - the would-be litigant will not be able to rely on the regulations to yield evidence sufficient to satisfy a Court. (STA documented this in an extensive analysis of the first crop of disclosed gas industry data in 1998.)[7]

The inadequate discipline provided by the regulatory regime operating through the 1990s was recognised by the Ministerial Inquiry into the Electricity Industry. In particular, that inquiry identified the absence of a credible threat of regulation as a key problem. The inquiry report in turn recommended that the Commerce Act be amended to provide the Commerce Commission with the ability to impose price control on individual distribution companies. "We want, at least in the first instance, to minimise the intrusiveness of regulation, without resiling from the need for a credible threat of regulation to be in place and operable without any further decision making by the government."[8] The Government has announced its intention to accept this recommendation for "targeted" price control and, at the time of writing, had introduced legislation to give effect to this and most other inquiry recommendations.

These reforms for the electricity industry naturally raise the question: What changes should be made for gas?

Until recently, the Ministry of Economic Development (MED) had been planning simply to revamp the gas disclosure regulations.[9] This was to include a requirement for gas pipeline companies to provide valuations commissioned under the optimised deprival methodology (ODV).[10] To date, pipeline companies have been under no obligation to value their assets in any particular manner. The proposed reform, approved in principle by the Cabinet in May 2000, would have provided an implicit signal to gas companies that pricing on the basis of ODV values was legitimate, as has been the conventional wisdom in respect of the electricity lines companies.

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6 *Vector Ltd v Transpower New Zealand Ltd*, Court of Appeal judgement of 31 August 1999, CA32/99, 6 NZBLC 102,908, paragraphs 59-67, pp.25-28.

7 See Sections 6 and 7 of *Pipeline Pantology*, Simon Terry Associates, 1998, and *Supposing Disclosing is Exposing*, Simon Terry Associates, 1998.

8 *Report of the Ministerial Inquiry into Electricity*, June 2000, para 193.

9 *Amendments to the Gas (Information Disclosure) Regulations 1997*, MED, May 2000.

10 In terms of economic principle, ODV is the lower of Optimised Depreciated Replacement Cost (ODRC) or Economic Value (the discounted present value of the cashflow stream that is able to be secured from the business). Under price cap regulation the cashflow stream would be restricted to the "required revenue" approved by the regulator as sufficient to sustain the business and this would set the EV. In New Zealand's deregulated environment, Economic Value falls below ODRC only in marginal parts of most networks serving small customer bases, and ODV has come to be identified effectively with the ODRC cap on valuation.

However, within two months a series of reports were released which critiqued the ODV methodology and strongly challenged its application in New Zealand.[11]  In light of these critiques, MED began reconsidering its position on the application of ODV to the gas sector.  That investigation eventually merged with other gas industry issues before government to form the basis for the Gas Review announced in March 2001.

## 2.2.    Study Sample

This study analyses in detail the financial performance of the nation's two largest gas pipeline companies, which traded under the names Natural Gas Corporation and Enerco during the 1990s.  (The former Enerco pipelines are now owned by United Networks.)  These two networks have undertaken the vast majority of the transmission and distribution of natural gas since deregulation in 1993.

Together, NGC and United's gas network operations today account for $178 million or 94% of all revenue collected from transmission and distribution pipelines.[12]  The following table compares data for the 1998 year[13] from those companies subject to information disclosure.  It shows that NGC and Enerco together accounted for well over 80% of all pipelines, gas throughput, fixed assets, and retail gas sales, and supplied three quarters of all gas customers.  Thus, by analysing just these two companies, it is possible to estimate the overall performance of the gas industry under "light-handed regulation".

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11    At this time, STA released its analysis of the excess rates of return secured by electricity lines companies, *Lining Up the Charges*, and entered into an exchange of letters with MED challenging the use of uncompensated ODV-based line charges.   Our affiliated partner, The Brattle Group, examined the issues for utilities in general and overseas practice in *Asset Valuation and the Pricing of Monopoly Infrastructure Services: A Discussion Paper*.  Also at this time, the New Zealand Institute of Economic Research examined a series of theoretical issues in Gale, S. and McWha, V., *The Origins of ODV: Report to Air New Zealand*, NZIER, Wellington, August 2000.

12    NGC pipeline revenue is $116 million and Orion is $62 million for the year to June 2000, against total disclosed revenue of $189 million for the period.  A number of pipelines are exempted from the disclosure regulations.  Most of these, including Nova Gas, are minor in relative terms and counting them would not affect industry wide results, as set out in the accompanying table.  The Maui line is the only significant pipeline partially excluded from the regulations.  However, the Maui line is operated by NGC and no separate transport charges are payable for use of this pipeline.  Source: *New Zealand Gas Company Analysis*, Cap Gemini Ernst & Young, March 2001, Appendix 1.

13    1998 is representative of the situation following introduction of mandatory information disclosure in 1997, but before Enerco and NGC underwent major restructuring from 1999.

**Table 2-1**

**Disclosed Gas Company Statistics for 1998**

|  | Enerco | NGC | Trans Alta | Power-co | Wang-anui Gas | Total | **Enerco + NGC %** |
|---|---|---|---|---|---|---|---|
| Kilometres of distribution pipelines | 4,281 | 2,428 | 929 | 457 | 346 | 8,441 | **79.5** |
| Kilometres of transmission pipelines |  | 2,174 |  |  |  | 2,174* | **100.0** |
| Total km of pipeline | 4,281 | 4,602 | 929 | 457 | 346 | 10,615 | **83.7** |
| Customers supplied | 108,377 | 45,834 | 16,405 | 25,468 | 10,776 | 206,860 | **74.5** |
| Distribution system throughput PJ | 16.70 | 8.52 | 2.32 | 1.72 | 1.01 | 30.27 | **83.3** |
| Transmission system throughput PJ |  | 68.07 |  |  |  | 68.00 | **100.1** |
| Book value of total fixed assets $ million | 310.5 | 494.2 | 55.6 | 33.2 | 13.5 | 907.1 | **88.7** |
| Book value of network fixed assets $ million | 276.3 | 481.3 | 54.9 | 28.0 | 13.3 | 853.7 | **88.7** |

* Including the Maui pipeline.

Sources: Ernst and Young, *The Ernst and Young Gas Company Analysis 1998* Appendix 1 p.20; *New Zealand Gazette 1998*.

## 2.3.   Study Period

Selection of the time period often has an important influence on the results of financial analysis.  Important considerations in this case were the:

- Date of gas industry deregulation;
- Date of privatisation of pipeline assets;
- Availability of consistent and sufficiently detailed information on the companies.

The pipeline assets inherited by both NGC and Enerco were in private ownership before deregulation in 1993.  However, both of the companies that previously held the assets were extensively restructured in 1992 and new listed vehicles publicly floated for each.

Information disclosed through the 1992 flotations provides a solid base against which to measure the subsequent performance of the two gas companies.  As this information is for the period immediately prior to deregulation, it represents an ideal reference point from which to evaluate the results under light handed regulation.

Thus, the study covers eight financial years from 1992/93 to 1999/2000.  Consistent sets of data are available for this period for the operation of the "bundled" gas businesses – that is, for pipeline transport and gas sales combined.  Due to the four year delay in the

promulgation of the disclosure regulations, data exclusive to pipeline transport is available only for the four years from 1997 to 2000.

The study period is long enough and the data complete enough to enable us to derive sound estimates of the profitability of the two companies, and hence to evaluate the extent to which light-handed regulation was successful in restraining the exercise of their market power.

## 2.4. Methodology

The core of this study is the calculation of the internal rates of return achieved by NGC and Enerco/Orion. As noted above, this is undertaken to examine whether these companies secured rates of return above the level that the regulator[14] has signaled to be acceptable, and to estimate whether, and if so the extent to which, deregulation raised the cost of gas to consumers over the period 1992-2000.[15]

The methodology involves tracing the stream of actual outlays and receipts applicable to the business and then calculating an internal rate of return on the overall investment. A full description of the analytical technique is set out in Appendix 2.

Use of this method highlights two problems with the disclosure requirements specified by the Gas (Information Disclosure) Regulations 1997, which were intended to reveal excess returns. The first, as already noted, is that no information disclosure was required for the first four years after deregulation. More fundamentally, the "Accounting Rates of Profit" (ARPs) disclosed under the Regulations focus on single-year data and hence fail to make transparent the actual rates of return secured by pipeline owners over longer periods of time.[16]

The internal rate of return (IRR) which we calculate is a standard measure of long-run profitability. Technically, the IRR is the discount rate which, when applied to the cashflow stream faced by an investor, brings the present value of that stream to zero.

In simple terms, the IRR formula is a way to translate the cash inflows and outflows over the life of a project into an equivalent investment prospect in which the investor

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14      The de facto regulator for the gas sector has been the Ministry of Economic Development (formerly the Ministry of Commerce).

15      The methodology was developed by Simon Terry Associates and has previously been used to assess monopoly profits in electricity distribution networks and at Auckland International Airport. See *Lining Up the Charges* and *Rates of Return at Auckland International Airport.*

16      The ARP formula is discussed in section 5 below. The consultants who designed the ARP formula for electricity warned that "because Electric Power Companies 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" (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). The recent Commerce Commission report on airports pricing calculates its ARPs for the twelve-year period 1989-2000.

puts up an initial sum, receives an annual rate of interest on that sum for as long as the investment is held, and then recovers exactly the principal amount at the end of the project. An alternative way of thinking about this is a bank account into which the money is deposited at the beginning of the period and from which the same amount is withdrawn at the end of the period; the IRR is then the interest rate paid on the deposit while it remains in the bank.

The IRR of a business can thus validly be compared with a competitive market rate of return suitably adjusted for business risk. Under traditional rate-of-return regulation around the world over the past fifty years, infrastructure industries have been allowed to earn IRRs equal to their competitive cost of capital but no more. Under light-handed regulation, if excess profits are being taken they would be identified by comparing the IRR of a company with a relevant benchmark cost of capital. A pipeline operator with an IRR above the competitive benchmark is collecting from its customers more revenue than is actually required to sustain the business.

Under light-handed regulation, in theory, network operators are supposed to be incentivised to deliver economic outcomes for consumers directly comparable to those which would emerge from a perfectly competitive industry performing the same services (or supplying a perfect substitute for them) – or from a perfectly-regulated industry under traditional rate-of-return regulation.

Our benchmark for this outcome is that not more than a competitive rate of return ought to be secured, over the medium to long term, by private investors who commit funds to the acquisition of network assets at the time of deregulation. For Enerco (now part of UnitedNetworks) the entry date is assumed to be at flotation in April 1992, and for NGC, at the flotation date of October 1992.

In the following two sections we present our estimates of the rates of return earned by NGC and Enerco/Orion. In Section 5, we compare these against relevant benchmarks.

# 3.    NGC Rates of Return

## 3.1.    Origins of NGC

NGC was originally set up in 1967 as a statutory corporation to undertake the treatment and transmission of Kapuni gas. In 1977, NGC contracted to purchase part of the Crown's entitlement to Maui gas, and in 1978 it was effectively absorbed into Petroleum Corporation of New Zealand (Petrocorp) as its natural gas transmission, treatment and trading division.[17]   In the course of the 1980s, NGC progressively established a foothold in gas distribution and retailing, acquiring existing networks in Gisborne and Hamilton, and constructing new distribution systems in Bay of Plenty, Rotorua-Taupo, Taranaki, Waikato, Northland and Horowhenua.

In 1988, NGC, along with the rest of Petrocorp, was privatised by sale to Fletcher Challenge Ltd, which embarked on a four-year restructuring process culminating in the floating of NGC on the sharemarket in September 1992. On 16 September 1992, Natural Gas Corporation Holdings Ltd (an FCL subsidiary) acquired from FCL the beneficial ownership of all shares in NGC Ltd for a price of $462 million.[18]  Natural Gas Corporation Holdings Limited partly financed the acquisition by allotting 42 million ordinary shares to Petrocorp for approximately $42 million. The company acquired further funding to complete the acquisition by the issue of $420 million of Convertible Capital Notes to Petrocorp.[19]   Two-thirds of Petrocorp's investment in NGC Holdings was then offered through a public issue of 280 million five-year fixed-interest convertible notes and 28 million ordinary shares, of which 140 million notes and 14 million shares were reserved for allocation to the Australian firm AGL, which took over management responsibilities for NGC's sales and distribution activities. The remaining 140 million notes and 14 million shares were successfully offered to public and institutional investors in New Zealand at a price of $1.00 and $0.90 each respectively.[20]  The float thus underwrote FCL's $462 million price tag for the business at that time.

The capital notes matured in October 1997, with 352.4 million converted to ordinary shares, and the remainder redeemed for cash.[21]   In 1999 FCL sold its one-third shareholding to AGL which thereby raised its stake from 33.3% to 71.6%.[22]

Investors therefore had the opportunity to purchase shares in NGC in October 1992 for an effective price of $0.99 per share (being the weighted average of one ordinary share

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17    Natural Gas Corporation, *Prospectus: Natural Gas Notes* 8 March 1991 p.1.

18    NGC Annual Report 1994 p.8.

19    NGC Holdings Ltd, *Prospectus: Convertible Capital Notes and Ordinary Shares, 22 September 1992* p.84.

20    NGC Holdings Ltd, *Prospectus: Convertible Capital Notes and Ordinary Shares, 22 September 1992* p.8.

21    NGC Holdings Ltd Annual Report 1998 p.5.

22    NGC Holdings Ltd Annual Report 1999 p.4.

and ten capital notes).[23]  The evolution of the business over the subsequent eight years is traced in Appendix 3 Table A2.

In the years immediately post-flotation, NGC's operations included:

- Gas sales and distribution: marketing and selling gas in the central North Island, Northland, Gisborne, Taranaki and Kapiti regions and distributing gas to those customers via its low pressure gas distribution network.

- Gas transmission: NGC owns and operates the vast majority of high pressure gas pipelines and operates the Maui gas pipeline on behalf of Maui Development Limited.

- Gas acquisition and wholesaling: NGC purchases gas from the Maui, Kapuni and other fields and wholesales gas to utility customers, power producers and other large-scale customers such as petrochemical manufacturers.

- Gas Processing: NGC owns and operates the gas treatment and processing plant at Kapuni, and sells the resulting LPG and by-products such as carbon dioxide.

In recent years, NGC has expanded its operations to encompass electricity generation and retailing.

Total length of pipelines shown in the annual reports includes not only gas pipelines actually owned by NGC but also those that NGC operates or manages on behalf of other owners.  Total length of gas distribution pipelines owned by NGC grew by 23% from 2,014 km at June 1992 to 2,479 km at June 2000.  Over the same period, the number of gas customers, as shown in the NGC annual reports, grew by 220% from 31,636 to 101,164.

Annual sales revenue (excluding electricity generation and retailing) increased from $236 million to $323 million over the seven year period to June 2000, an increase of 37%.  Network revenues (as shown in the disclosure statements) were relatively static from 1997 until the acquisition by AGL of the Hutt Valley/Porirua network previously owned by TransAlta (the disclosures for 2000 show NGC and AGL combined as they are related parties given the extent of AGL's ownership of NGC).

Flotation of NGC coincided with the deregulation of the gas and electricity sectors. Previously, charges for gas pipelines had been subject to rate of return regulation, overseen by the Commerce Commission.  With deregulation, NGC elected to base its transmission and distribution prices on an asset base valued using the ODV methodology.  However, the asset values for "pipelines, compressors and gate stations" recorded in NGC's accounts continued to be based on acquisition value until 1997.  In that year, the company's pipeline systems were revalued upwards by $164.1 million, a 53% increase over historic cost.[24]  The scale of that revaluation is more or less equivalent to the entire gross capital expenditure undertaken by NGC over the period 1993-2000. It is also equivalent to the total depreciation charged over that same period.

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23    The initial purchase had to be made in bundles of 10 convertible notes for each share; but this bundle converted to eleven shares in 1997.

24    NGC Annual Report 1997, pp.6-7.

Absent the revaluation, the book value of fixed assets at the end of the period under consideration would have changed little from the 1993 figure.

## 3.2. "Bundled" Returns

The financial statements for NGC provide a consistent set of figures only for the combined gas trading and pipeline businesses (and, more recently, electricity retailing and generation).[25] Since 1997, when the information disclosure regulations came into force, disaggregated figures have been provided by NGC for transmission, distribution, retailing and wholesaling.

Table A7 in Appendix 3 shows the data we have extracted from the financial statements for the combined businesses for the period 1993-2000. Given that our analysis focuses on the gas activities, and particularly the pipeline business, we have endeavoured to eliminate from the analysis investments in electricity generation and retail where these are identified in the accounts.

We calculate the real, after-tax, internal rate of return for a hypothetical investor who purchases one notional share in NGC at the time of flotation. At flotation, investors were required to purchase shares and convertible capital notes in a one to ten ratio. Our notional share is made up of one-eleventh of a bundle of one ordinary share and ten convertible capital notes. Our analysis is aimed at identifying cashflows exclusive of financing costs; therefore our notional share does not receive the coupon payments associated with the notes.

Our investor holds the "share", makes no further investment in the company and receives a corresponding proportion of the free cash flow of the company each year until the end of 2000 when the "share" is sold at a price equating to the net fixed asset backing as shown in the books. The free cash flow is derived by deducting, from the operating cash flow, amounts reflecting capital expenditure, taxation and acquisitions. Proceeds from divestments are added back in and an adjustment is made for the net cash flow from changes in gearing. The associated cash flows are set out below:

**Table 3-1**

**Estimated NGC Returns 1993 Through 2000 (in $/share)**

|  | Sept | Year ending June | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
|  | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| Real purchase price | $1.03 | | | | | | | | |
| Real net surplus post-tax | | $0.19 | $0.17 | $0.16 | $0.19 | $0.18 | $0.30 | $0.33 | $0.25 |
| Real sell price | | | | | | | | | $0.90 |
| Cash Stream | -1.03 | 0.19 | 0.17 | 0.16 | 0.19 | 0.18 | 0.30 | 0.33 | 1.15 |
| **IRR of cash stream =** | **19.2%** | | | | | | | | |

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25      The calculations also exclude the purchase of TransAlta's Hutt Valley gas network.

The IRR calculated above contains a slight inaccuracy due to the fact that the true entry date is October 1992 rather than June 1992. The effect is to understate (slightly) the true IRR.

To achieve the equivalent of the above IRR, the investor would have had to have found an investment where for every dollar invested at the beginning of year 1 the investment returned 19¢ tax-paid (or 29¢ pre-tax) at the end of each and every year for eight years and, at the end of the eighth year, returned the original dollar invested (all adjusted for inflation as the IRR above is a *real* IRR).

Appendix 3 Table A8 shows the returns that our investor achieves assuming different selling dates. These range from 19.2% to 25.0%.

## 3.3.    Disaggregated Returns

NGC discloses information on both its distribution and transmission businesses as required by the disclosure regulations. Because the disclosure regulations do not require an exposure at the level normally expected of statutory accounts, we have had to supplement the analysis with figures drawn from the annual accounts. Table A9 in Appendix 3 sets out the data for our IRR analysis.

The approach to this calculation is fundamentally the same as for the "bundled" data but because there is no share structure or debt for the disclosed business units our calculations deal with the total cashflows for the transmission and distribution units (and total assets).

**Table 3-2**

**Estimated NGC Returns using Disclosure Data (in $000)**

|  |  | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Purchase price at beginning of 1997 | 342,366 |  |  |  |  |
| Gross operating surplus |  | 68,130 | 69,395 | 67,907 | 70,768 |
| Capital Expenditure (net) |  | 33,394 | 9,281 | 13,178 | 0 |
| Tax |  | -16,667 | -17,185 | -16,492 | -18,760 |
| Sale price |  |  |  |  | 473,412 |
| Real cash stream | -342366 | 18,069 | 42,929 | 38,237 | 525,420 |
| **IRR of cash stream** | **17.8%** |  |  |  |  |

Applying the same analysis to the bundled analysis but for the same period as the disclosed analysis gives a 17.1% (post-tax) return for the bundled business over the period 1997 through 2000 as shown in the table below.

**Table 3-3**

**Estimated Bundled IRR for NGC – 1997 through 2000 (in $/share)**

|  |  | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Purchase price at beginning of 1997 | $1.19 |  |  |  |  |
| Real net surplus post-tax |  | $0.18 | $0.30 | $0.33 | $0.25 |
| Sale price |  |  |  |  | $0.90 |
| Real cash stream | -$1.19 | $0.18 | $0.30 | $0.33 | $1.15 |
| **IRR of cash stream** | **17.1%** |  |  |  |  |

# 4. Enerco/Orion Rates of Return

## 4.1. Origins of Enerco/Orion

Enerco New Zealand Ltd emerged from the 1992 restructuring of Welgas Holdings Ltd, a holding company through which Brierley Investments Ltd had built up a major position in the gas industry since acquiring an initial 20% stake in the Wellington Gas Company in December 1971.[26] The Welgas business comprised distribution networks in Wellington, Auckland, and Hawkes Bay, together with a stake in Southern Petroleum which was divested separately. The customer base was just over 50,000, rising steadily at a couple of percent a year. Sales of gas were flat at about 14 PJ p.a. Wholesale gas was purchased from NGC under a set of contracts for delivered gas dating from 1980, with prices controlled by the Commerce Commission. The historic-cost book value of fixed assets was $56 million at June 1990[27]; by December 1991 this had been raised to $77.5 million[28], mainly by revaluations of existing assets approved by the Board. This book value of $77.5 million was effectively the asset base purchased by investors taking up shares in April 1992 at the offer price of $1.35 per 50-cent share.[29]

The subsequent evolution of Enerco's gas distribution and retail business is shown in Appendix 3 Table 1. Over the first six years to 1998 the length of pipelines increased by 77% and customer numbers doubled, partly through acquisition in October 1993 of Progas (the former Palmerston North City Council Gas Department) and partly through increased market penetration, including a major new mains pipeline to serve the Albany area. Gas volume rose only 30%, reflecting the fact that expansion was concentrated at the small-customer level. In the meantime, revenues rose 75% while operating costs rose only 55%, and the book value of fixed assets trebled, mainly through revaluations rather than new construction. Deregulation of the industry was thus followed by a major increase in Enerco's long-run profitability, and hence in the value of the business to a purchaser. Of particular significance is the extent to which revenues outstripped operating costs, causing operating surplus to rise steeply; this increased surplus made the increased asset valuation sustainable.

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26  On the history of Welgas see Brierley Investments Ltd *Annual Report 1983* p.12 and Enerco *Offer Memorandum* 23 March 1992, p.10.

27  Enerco *Offer Memorandum* 23 March 1992 p.41.

28  Enerco *Offer Memorandum* 23 March 1992 p.41.

29  Enerco *Annual Report 1992* p.2. The successful issue of 56 million shares at $1.35 valued the company at $75.6 million.

Figure 4.1 below shows the path of Enerco/Orion's operating surplus following deregulation.

**Figure 4-1**

**Enerco/Orion Operating Surplus and Taxable Income on a 100% Equity Basis**
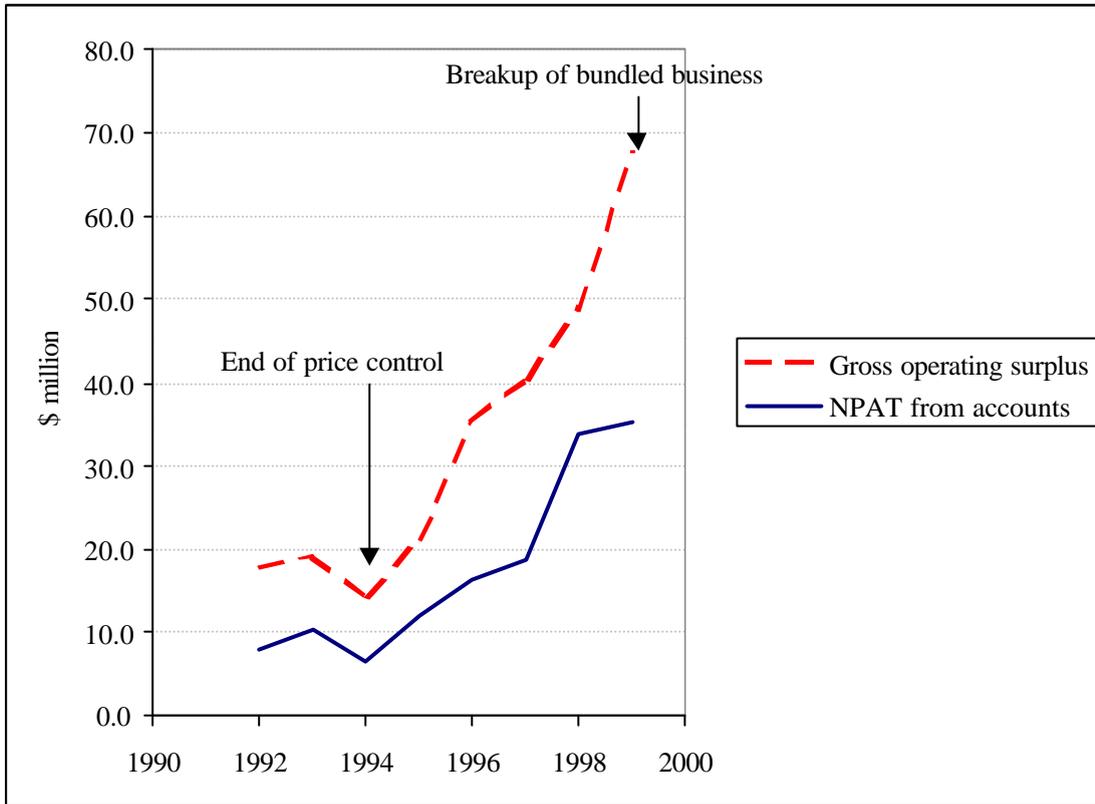


Source: *Annual Reports* of Enerco NZ Ltd and Orion

In the two years following 1998 a further restructuring was undertaken as Enerco became a fully-owned subsidiary of Orion.[30] Gas trading was separated from the pipeline networks and the businesses were sold separately: gas trading and the retail customer base to Contact Energy for $110.7 million[31], and the pipeline networks to UnitedNetworks for $550 million.[32]

Thus, a gas pipeline and retail business which had a market value of $77 million in early 1992 was sold eight years later in early 2000 for a total of $660 million. Along the way

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30    Orion, under its earlier name Southpower, purchased a controlling stake in Enerco in October 1993, to enable Enerco to fight off an NGC takeover attempt. A one-for-three rights issue to existing shareholders, at $2.80, was undertaken in November 1993. Southpower subsequently bought NGC's 19.9% stake in Enerco.

31    $100.5 million for small customers in late 1998, plus $10.2 million for industrial customers in April 2000.

32    *New Zealand Gazette* 21 August 2000 Issue 99 p.2487; Orion *Annual Report* 2000 p.8.

$110 million had been spent on purchases of fixed assets (including replacement investment to make good wear and tear), and $32 million on the acquisition of Progas.

The realised capital gain on Enerco/Orion as an investment prospect was roughly $500 million over eight years. This capital gain was recorded in three processes of asset revaluation. In March 1994, an ODV valuation added $82.1 million to the book value of fixed assets as recorded in Enerco's revaluation reserves. In March 1997 a second ODV revaluation added another $58.4 million. Finally, in April 2000 the sale of pipelines with a book value of $280.4 million[33] for $550 million realised another $270 million of capital gains, to which was added approximately $110 million from sale of the retail gas customer base.

This extremely rapid increase in the market value of the business suggests that the switch from price regulation to light-handed regulation raised Enerco's profitability quite dramatically. This was not the declared intent of deregulation – on the contrary, the original case for the policy switch was made on the grounds that effective disciplines on pricing and profitability could be maintained by a deregulated market environment in the absence of an industry regulator.

## 4.2. "Bundled" Returns

Until 1997 the main source of information is the annual reports of Enerco which provide figures for the combined business activities of gas trading and pipeline operation. From 1997 on, under the Gas (Information Disclosure) Regulations 1997, disaggregated figures were published for the "distribution" (pipelines) and "retail" (gas trading) businesses.

Appendix 3 Tables A3 and A4 present a detailed analysis of the combined gas-trading and lines business for the March years 1992 to 2000. Our analysis focuses on the gas distribution and retail business, ignoring other investments picked up and disposed of along the way (such as Enerco's investment in Energy Direct in 1994-95 and its participation in a successful gas exploration venture near Wairoa in the late 1990s) except insofar as net cash injections from financing and investment activities helped to fund capital expenditure in the core gas business.

We calculate the real, after-tax, internal rate of return for a hypothetical investor who purchases one notional share in Enerco at the time of flotation in April 1992. Our investor holds the share, makes no further investment in the company and receives the free cash flow of the company each year until the end of March 2000 when the share is sold.

The real after-tax eight year Internal Rate of Return on this investment prospect is estimated to have been between 22.5% and 32% depending on the choice of assumptions.

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33      *New Zealand Gazette* 21 August 2000 p.2487, "Fixed assets held for sale".

The most important source of variation in the estimated rate of return is the size of the allowed capital gain realised upon sale of the share. The most conservative approach is to assume, as was done in the analysis of NGC above, that the investor receives no more than the book value of fixed assets at the time of sale, with no component of "goodwill". In this case the cashflow stream in our model includes an estimate of $16.5 million for fixed assets sold with the retail customer base during the March 1999 year, and a further $280 million for the remaining fixed assets sold in March 2000. This yields an IRR of 22.5%.

The alternative would be to enter the actual prices received in market transactions for the assets of the business. Actual payments of $550 million by UnitedNetworks for the pipeline assets, and $10.2 million by Contact Energy for industrial retail gas customers, were included in the information disclosed for the year to March 2000 by Orion under the regulations, and arguably represent the true position, given the absence up to that time of any regulatory cap on either the sale price of assets or the prices charged for services or gas. Contact Energy's payment of $100.5 million for the bulk of Enerco/Orion's gas customers during the year to March 1999 was not formally disclosed in the *Gazette* but was equally a reflection of the value which the market attributed to the business as a going concern in a deregulated environment. Assuming that the actual price paid by a willing buyer for the pipeline business in 2000 was received by our hypothetical investor, the return on the investment prospect rises to 29.2% real, post-tax.[34]

These results are set out in Table 4-1 below.

## Table 4-1

## Enerco/Orion Estimated IRR (in $/share)

| | April 1992 | Year ending March | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| Real purchase price | 1.44 | | | | | | | | |
| Real net surplus post-tax, net of capex | | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.43 | 0.12 |
| Cash from actual sale of retail customer base | | | | | | | | 1.19 | 0.11 |
| Cash from actual sale of pipelines | | | | | | | | | 6.32 |
| Book value of fixed assets when sold | | | | | | | | 0.19 | 3.17 |
| Cash stream if assets sold at book value | -1.44 | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.63 | 3.28 |
| IRR | **22.5%** | | | | | | | | |
| | | | | | | | | | |
| Cash stream if pipelines sold at market value | -1.44 | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.43 | 6.43 |
| IRR | **29.2%** | | | | | | | | |

The very high profitability of Enerco/Orion in a light-handed regulatory environment was well known to investors and recognised in the marketplace. A profitability analysis

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34   Note that this excludes from the analysis the price received for the customer base, except for an estimated $16.5 million of fixed assets included in that sale.

similar in many ways to that set out in Table 4-1 was presented by John Gray, Chairman of Enerco, on page 6 of the 1998 Annual Report.  It differed from our analysis only in that it used dividends paid in place of our estimate of operating surplus, and the Enerco share price in place of our book value of fixed assets.  The results of this analysis were presented as follows:

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**Enerco as an Investment:**

It may be of interest to traverse the experience of a hypothetical foundation investor in Enerco who took up 10,000 shares in the company at the issue price of $1.35 when the company listed in April 1992.  The total investment was then $13,500.

Assuming the investor pays tax at the marginal 33% rate, took up a 1 for 3 share issue made in November 1993 at $2.80 per share to lift the total investment to $22,832; remains a shareholder and drew down all dividends as declared plus the return of capital, his or her investment will be worth $72,000 (at $5.40 per share) plus an income of $13,203.

This equates to a post-tax 273% return on the investment over a six-year period.

Enerco *Annual Report 1998* p.6.

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Further demonstration of the profitability enjoyed by the Enerco/Orion gas business was the prices paid for the separated businesses, in the open market, by Contact Energy and UnitedNetworks.  UnitedNetwork's purchase of fixed assets with an ODV book value of $280 million for a total price of $550 million reflected the future stream of profits which UnitedNetworks anticipated being able to secure from this natural monopoly business.

Similar confidence in profitability was evident in Orion's buyout of the minority shareholders in Enerco/Orion during the period October 1998 – February 1999, at a price of $5.70 per share.  Repeating the analysis of Table 4-1 for an investor who entered at April 1992 and sold the share to Orion at March 1999[35] for $5.70, we obtain an Internal Rate of Return of 31%.

## 4.3.    Disaggregated Returns for Pipelines Only

The disclosure regulations for gas pipelines require disclosure only of aggregated profit and loss figures with few explanatory notes, no cashflow statement, and with fixed assets shown at book value only.  In analysing the rate of return on the Enerco/Orion

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35    Crediting the sale at March 1999 rather than October 1998 has the effect of reducing the IRR.

pipelines business using disclosure figures we were not able to construct a full capital-expenditure series, nor to disaggregate interest receipts and payments fully, as was done for the bundled-gas-business analysis. Instead, we have conducted the analysis on the basis of the disclosed Net Profit After Tax, except for the 1999 year when the disclosed tax provision, at $23.3 million, exceeded pre-tax surplus of $20.8 million. For that year we have replaced the disclosed tax figure with our own estimate, constructed by taking imputed tax at 33% of the disclosed "surplus before tax" and adding a $4 million allowance for deferred taxation, on the basis of the disclosed balance sheet for 1998. We have also added to profits an estimated interest tax shield for the three years 1997-1999 in which an interest expense was recorded for the bundled gas business in the Annual Reports of Enerco and Orion. [36]

The issue of whether assets ought to be entered into the cashflow stream at book value or market value when sold off at the end of the four-year cashflow analysis 1997-2000 again arises, and again the results are very sensitive to this. Again we have analysed both cases and obtained a corresponding range of internal rates of return between 14.5% and 32.5%, real, post-tax.

Appendix 3 Table A6 sets out the data and Table 4-2 summarises the results. In this analysis the pipeline business is purchased for the book value of fixed assets at the beginning of the March 1997 year, and sold for either book value or market value at March 2000.

**Table 4-2**
**Internal Rate of Return of Enerco/Orion Pipelines, Real 1997 dollars ($ million)**

|  |  | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Purchase price at beginning of 1997 | -207,028 |  |  |  |  |
| Net profit after tax |  | 15,645 | 19,512 | 14,967 | 21,258 |
| Assets sold at book value |  |  |  |  | 268,199 |
| Assets sold at market value |  |  |  |  | 526,820 |
| Real cash stream selling at book | -207,028 | 15,645 | 19,512 | 14,967 | 289,457 |
| **IRR of cash stream** | **14.5%** |  |  |  |  |

| Real cash stream selling at market | -207,028 | 15,645 | 19,512 | 14,967 | 548,078 |
|---|---|---|---|---|---|
| **IRR of cash stream** | **32.5%** |  |  |  |  |

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36    This adjustment is made to bring the analysis as close as possible to the methodology used elsewhere in this study. Because interest is tax-deductible, NPAT as disclosed is reduced by interest expense but boosted by the tax shield of 33% of interest expense. We have added back 67% of interest expense to NPAT to obtain an estimate of net surplus before interest. For the 2000 March year no data on interest expense was published to the best of our knowledge, and in the absence of information, no tax shield has been credited.

These results for the separate pipelines-only business can be compared with the bundled gas-plus-pipelines rate of return over the same four year period, shown in Table 4-3.

**Table 4-3**

**Bundled Returns for Enerco/Orion 1997-2000**

| | April | Year ending March | | | |
|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 |
| Real purchase price at March 1996 | 2.44 | | | | |
| Real net surplus post-tax, net of capex | | 0.26 | 0.37 | 0.43 | 0.12 |
| Cash from actual sale of retail customer base | | | | 1.19 | 0.11 |
| Cash from actual sale of pipelines | | | | | 6.32 |
| Book value of fixed assets when sold | | | | 0.19 | 3.17 |
| Cash stream if book value is realised at sale | -2.44 | 0.26 | 0.37 | 0.63 | 3.28 |
| **IRR** | **19.7%** | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Cash stream if market price is realised at sale | -2.44 | 0.26 | 0.37 | 0.43 | 6.43 |
| **IRR** | **36.1%** | | | | |

# 5. Excess Returns and Valuation Methodology

## 5.1. Excess Returns

In order to estimate the extent of any excess returns, it is necessary first to define what an appropriate or normal return would be. This varies from sector to sector but also to some extent between companies within a sector. It is designed to allow for the particular market risks and financing costs of an enterprise such that investors receive appropriate reward for the risks taken.

The weighted average cost of capital (WACC) is the generally accepted measure of the level of returns that must be secured if a sector or company is to be financially sustainable. As its name implies, the WACC is calculated by weighting the costs of debt and equity finance to determine the average cost (at the margin) of raising new capital. In other words, it calculates the return the marginal investor requires to compensate for the cost of finance and perceived level of risk.

Utilities have a long history internationally of being price controlled by independent regulators that allow them to earn returns equal to their competitive cost of capital, but no more. A pipeline operator with an IRR above its WACC is recovering revenues from its customers in excess of those actually required to sustain the business.

Under light-handed regulation, in theory, network operators are supposed to be incentivised to deliver economic outcomes for consumers which should be directly comparable to those which would emerge from a perfectly competitive industry performing the same services (or supplying a perfect substitute for them) – or from a perfectly-regulated industry under traditional rate-of-return regulation.

The following subsections set out a series of potential benchmarks for such a comparison.

### 5.1.1. Average Sharemarket Returns

A basic benchmark is that not more than the going market rate of return ought to be secured over time by private investors who purchase pipeline assets at the time of deregulation. This comparison can be made by measuring the rates of return achieved for gas transport operations against those achieved across the full range of investment opportunities listed on the local stock exchange. We do this by imagining a hypothetical investor purchasing in 1992 a share package comprised of the NZSE40 stocks, and selling out at a later date having collected all declared dividends on those stocks over the period.

It is convenient to use a basket of the top forty stocks as a proxy for returns achieved by listed companies. The stocks comprising the basket are set in proportion to their weighting in the NZSE40 index. The real post-tax return on this investment, measured

by the IRR, provides an indication of the rate of return actually available on companies with generally greater business risks than those confronting pipeline owners, electricity networks, and similar activities. Such network utilities ought, therefore, to secure IRRs lower than those observed in the sharemarket as a whole. Note that the returns observed on the stocks comprising the NZSE40 are *equity* returns.

The following table shows the returns available to an investor taking up an NZSE40 portfolio and disposing of the holding in 2000. If that investor enters in December 1991, immediately prior to the commencement of gas deregulation, and exits at the end of calendar 2000, the real post tax return is 10.5%. A shortcoming of this benchmark is that utility companies with natural-monopoly network activities have substantial weight both in the index and in the declared dividends to a representative portfolio; both NGC and Enerco (until 1999) are included in the NZSE40, and will have raised the average sharemarket return with which we are here comparing them.[37]

**Table 5-1**

**New Zealand Sharemarket Returns 1992 Through 2000[38]**

|  |  | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|---|
| Price at start of year |  | 107.99 |  |  |  |  |  |  |  |  |
| Dividend |  |  | 7.06 | 9.34 | 8.93 | 12.05 | 13.95 | 13.29 | 14.21 | 13.40 | 12.31 |
| Sell price at end 2000 |  |  |  |  |  |  |  |  |  | 110.95 |
| Cash stream |  | -107.99 | 7.06 | 9.34 | 8.93 | 12.05 | 13.95 | 13.29 | 14.21 | 13.40 | 123.26 |
| **Real IRR (%)** | **10.5%** |  |  |  |  |  |  |  |  |  |

We also require a benchmark with which to compare the returns shown by Information Disclosure for the period from 1996 through 2000. The above exercise is repeated to cover the calendar years 1996 through 2000 and the results are shown in Table 5-2. An investor taking up a nominal $100 investment in the stocks comprising the NZSE40 at the beginning of 1996 and selling out at the end of 2000 would, we estimate, achieve an IRR of 2.9%.

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37    Another major utility sector company with substantial weight in the sharemarket index has been Telecom New Zealand Ltd, a network operator subject to information disclosure and "light-handed regulation".

38    Source: New Zealand Stock Exchange annual indices.

**Table 5-2**

**New Zealand Sharemarket Returns 1996 Through 2000**[39]

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Price at start of year | 101.32 | | | | |
| Dividend | 7.63 | 7.27 | 7.78 | 7.33 | 6.74 |
| Sell price at end 2000 | | | | | 77.66 |
| Cash stream | 101.32 | 7.63 | 7.27 | 7.78 | 7.33 | 84.40 |
| **Real IRR (%)** | **2.9%** | | | | |

As noted before, the stock market returns that have been calculated are equity returns and, therefore, cannot be directly compared with the overall return on asset figures calculated in sections 3 and 4. To estimate a comparable figure would require derivation of a return on investment figure that accounted for not only the return to equity holders but also allowed for the return to debt-holders. Returning briefly to the IRRs derived in sections 3 and 4, those returns calculated a completely ungeared return on the assets, i.e. interest charges were not deducted from the cash flows. Therefore, derivation of a comparable figure for our stockmarket portfolio requires estimation of the gross (i.e. pre-tax) cost of debt. To do this would require calculation of the weighted average for each of the companies in the index of their interest rate on term debt. The weighted average debt figures would then need to be combined with the (equity) IRR calculated above to give an overall return on assets. To combine these figures they would each be weighted by the leverage of the portfolio.

Estimating the weighted average, for each of the companies in the index, of debt/equity ratio and interest rate on term debt is beyond the scope of this study. Instead we have assumed parameters of 30:70 and 12% respectively. Using those parameters yields an estimated observed market return on assets of 9.5% for 1992-2000 and 5.0% for 1996-2000. The 9.5% figure can be used to compare with the IRRs estimated for the "bundled" businesses and the 5.0% can be compared with the IRRs calculated on the disclosed results (which were for a shorter period).

| Entry Year | Benchmark Return | Estimated Outturn | Difference |
|---|---|---|---|
| **Bundled Investment in NGC** | | | |
| 1992 | 9.5% | 19.2 | 9.7 |
| 1997 | 5% | 17.14 | 12.14 |
| **Pipeline-only Investment** | | | |
| 1997 | 5% | 17.8 | 12.8 |

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39    Source: New Zealand Stock Exchange annual indices.

| Entry Year | Benchmark Return | Estimated Outturn | Difference |
|---|---|---|---|
| **Bundled Investment in Orion** | | | |
| 1992 | 9.5% | 22.5 | 13 |
| 1992 market price exit | 9.5% | 29.2 | 19.7 |
| 1997 | 5% | 19.7 | 12.7 |
| 1997 market price exit | 5% | 36.1 | 31.1 |
| **Pipeline-only Investment** | | | |
| 1997 | 5% | 14.5 | 9.5 |
| 1997 market price exit | 5% | 32.5 | 27.5 |

For both periods, the returns to NGC and Enerco/Orion are estimated to be at least double the benchmarks and in some cases are triple.

## 5.1.2. MED's Range of Appropriate Rates of Returns

Gas pipeline operations are relatively low risk investments and are thus more generally compared against like infrastructure assets, such as electricity networks.

The electricity inquiry report relied on MED estimates of the appropriate WACC for lines companies when determining "reasonable rates of return" for this sector. It noted that for much of the period from 1995 to 1999 "the Ministry of Economic Development considered that a nominal post-tax WACC for distribution companies of between 7.5 and 10 percent was appropriate." [40]

The returns calculated above for NGC and Enerco/Orion are roughly double this range.[41] However, as noted in section 2.4, the method of calculating the IRR that we have used makes it inappropriate to compare directly with a WACC figure. Instead, it is necessary to adjust WACC by increasing it to remove the effect of the interest tax shield. After adjusting, the 7.5 – 10.0 % range becomes 9 – 11.7 % (with a midpoint of 10.35%). The returns calculated for NGC are well in excess of this range and are practically double the lower bound. For Enerco/Orion the returns are significantly in excess of the benchmark return when the exit price is defined at book value. However, if the exit price used is the market price actually paid by United to acquire the pipeline business then the calculated returns are double and triple the benchmark.

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40    *Report of the Ministerial Inquiry into Electricity*, June 2000, para 73.

41    Note also that the MED figures are expressed in nominal terms and should be a little lower to match those above which are inflation adjusted.

| Entry Year | Benchmark Return | Estimated Outturn | Midpoint Difference |
|---|---|---|---|
| **Bundled Investment in NGC** | | | |
| 1997 | 10.35% | 17.1 | 6.75 |
| **Pipeline-only Investment** | | | |
| 1997 | 10.35% | 17.8 | 7.45 |

| Entry Year | Benchmark Return | Estimated Outturn | Midpoint Difference |
|---|---|---|---|
| **Bundled Investment in Orion** | | | |
| 1997 | 10.35% | 19.7 | 9.35 |
| 1997 market price exit | 10.35% | 36.1 | 25.75 |
| **Pipeline-only Investment** | | | |
| 1997 | 10.35% | 14.5 | 4.15 |
| 1997 market price exit | 10.35% | 32.5 | 22.15 |

### 5.1.3.  Investor Expectations

As well as considering observed returns in the market, it is also of interest to consider the position of our hypothetical investor at the time of entering into the investment and to estimate the cost of capital at that time.

The Commerce Commission recently undertook a detailed study of the appropriate WACC for a natural monopoly service provider as part of its study into airfield pricing.[42]  We have adopted the Commission's calculation methodology in order to derive forward-looking WACCs as at June 1993 and June 1997.  Those WACCs also need to be adjusted to remove the effect of the interest tax shield in order to provide a valid comparison with the rate of return estimates from sections 3 and 4.

Of the five major variables feeding into the Commission's calculation, three should be the same for gas pipelines, with the risk free rate and leverage being the two that require assessment in this case.[43]  Significantly, the Commission selected an asset beta by taking  the midpoint of the average for regulated US utilities and the average for regulated UK utilities.  That is, the figure is the "average of the average" of a range of regulated entities, gas pipeline networks being a core member of this group.

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42    *Price Control Study of Airfield Activities at Auckland, Wellington and Christchurch International Airports – Draft Report*, Commerce Commission, July 2001.  Note that, as the title suggests, this study considered only the activities of the airfields and did not consider the airports' contestable activities (such as concessions, parking, etc).

43    The market premium is clearly the same, the asset beta was calculated by taking an average of infrastructure asset betas (including gas and electricity lines businesses) and there is no particular reason to alter that.  The debt premium is expected to be similar.

Applying the Commission's methodology for derivation of WACC, adjusting to eliminate the effect of the interest tax shield, and converting to real terms we estimate rate of return figures of 8% and 9% for 1993 and 1997 respective ly. The table below compares the returns expected by our hypothetical investor at the time of entry with the actual outcomes.

| Entry Year | Benchmark Return | Estimated Outturn | Difference |
|---|---|---|---|
| **Bundled Investment in NGC** | | | |
| 1993 | 8% | 19.2 | 11.2 |
| 1997 | 9% | 17.14 | 8.14 |
| **Pipeline-only Investment** | | | |
| 1997 | 9% | 17.8 | 8.8 |

| Entry Year | Benchmark Return | Estimated Outturn | Difference |
|---|---|---|---|
| **Bundled Investment in Orion** | | | |
| 1993 | 8% | 22.5 | 14.5 |
| 1993 market price exit | 8% | 29.2 | 21.2 |
| 1997 | 9% | 19.7 | 10.7 |
| 1997 market price exit | 9% | 36.1 | 27.1 |
| **Pipeline-only Investment** | | | |
| 1997 | 9% | 14.5 | 5.5 |
| 1997 market price exit | 9% | 32.5 | 23.5 |

The significance of the scale of excess returns is made clear by the Commerce Commission's airfields study. The commission's draft report recommended that price control be imposed on airfield activities after it assessed excess returns at 60% above the "normal" rate calculated by the commission and 38% above the airport's own target rate.[44]

## 5.1.4. Estimated Excess Returns

The WACC ranges discussed above provide a fairly clear guide to the acceptable rate of return that gas pipeline businesses should be securing. As the Commerce Commission notes, "An actual return in excess of the appropriate target WACC over time would suggest that the entity was earning an excessive or monopoly return".[45]

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44 Ibid, para 10.17, p 142. The actual rate of 13.47 exceeded the mean normal rate of 8.40% by 5.07% (or 60% of the normal rate) and exceeded AIA's target rate of 9.76% by 3.71% (or 38%).

45 *Price Control Study of Airfield Activities at Auckland, Wellington and Christchurch International Airports – Draft Report*, Commerce Commission, July 2001, para 8.83, p 125. .

Another, and perhaps more informative, way to look at estimating excess returns is to consider what amount of money was collected in excess of that required to properly sustain the business.

To do this we adjusted the models used to estimate the returns achieved by the companies so that the revenue could be scaled back until a target rate of return was achieved. By subtracting the scaled revenue from the original revenue we obtain an estimate of the amount of "excess" revenue collected. There are several candidates for the target rate of return to be used, these include the market rates of return calculated in section 5.1.1, the MED's (adjusted) rates from section 5.1.2, and the forward-looking rates estimated in section 5.1.3. Applying each of these rates will yield a range of estimates of the annual average revenue overcollection. The results are set out below. (We have used the lower estimate for Enerco/Orion, with asset values at time of sale constrained to book value only.)

**Table 5-3**

**Estimated Average Excess Returns 1993 - 2000 ($ million per annum)**

|  | Benchmark Return | | |
|---|---|---|---|
|  | **Stockmarket 1993-2000** | **Investor 1993** | **MED (adjusted)** |
|  |  |  |  |
| **NGC** | 45 | 55 | 40 - 50 |
| **Enerco/Orion** | 20 | 24 | 20 |
| **Total** | 65 | 79 | 60-70 |

**Estimated Average Excess Pipeline Returns 1997 - 2000 ($ million per annum)**

|  | Benchmark Return | | |
|---|---|---|---|
|  | **Stockmarket 1997-2000** | **Investor 1997** | **MED midpoint (adjusted)** |
|  |  |  |  |
| **NGC** | 73 | 41 | 36 |
| **Orion** | 11 | 6 | 5 |
| **Total** | 84 | 47 | 41 |

We estimate that the gas and pipeline bundled operations of NGC and Enerco/Orion have collected at least $60 million a year more than was required to properly sustain these businesses under the valuations for pre-established assets held at the time of industry deregulation. For pipelines alone the excess revenue has been over $40 million.

We are not aware of any similar study of the long run rates of return of gas pipeline operations having been conducted by MED, other government agencies, or released by private parties. Neither have we seen estimates of the resulting excess costs to consumers, as well gas producers, gas wholesalers and gas retailers.

## 5.2.    Commentary on Results

The scale of the excess returns set out in the previous section prompts a number of observations. The first is that monitoring by Government of gas transport charges has been inadequate. It is the absence of effective monitoring that has allowed very high rates of return to go not only unchecked, but unidentified, for so long.

The framing of the information disclosure regulations is part of the problem. The disclosed financial information does not reveal ongoing excess returns in a direct or user friendly manner. Whenever pipeline operators revalue their asset bases upwards, the regulations will reveal excess returns only in the single year when the revaluation is declared. That is, they will reveal an ARP above the "appropriate" WACC for only a single disclosure round. Such single year spikes far above the acceptable WACC have not led to a regulatory response and it appears their significance was not understood by Government. Even once the significance of a one year spike is appreciated (as discussed further below), to obtain a measure of a company's performance over any significant period, the analyst must construct consistent time series from a company's accounts, which is a substantial research task in itself. In absence of the Ministry of Economic Development undertaking such analysis, or of the work being carried out and released by private parties, the presumed force of the requirement to disclose is all but lost.

It is common practice for regulators to provide "safe-harbour" indications of what constitutes "acceptable" behaviour. For example, MED has made it known that it considers an acceptable return on assets should lie in the range of 7.5-10% for electricity lines companies, and a similar range would apply to gas pipelines.

Under the Gas (Information Disclosure) Regulations 1997 the disclosed performance measure that identifies the corresponding return on assets for gas pipeline operators is the ARP [46.] This measure is intended to be directly comparable with the relevant WACC in order to determine whether there are excess returns.

The ARP definition of profit correctly combines the current net operating surplus with capital gains from asset revaluation, and is conceptually quite closely related to the approach used in our IRR calculations above. However, the Regulations provide for the ARP to be calculated and disclosed on a single-year basis, rather than over a period of several years.

When businesses revalue their assets upwards, the ARP measure will show a one-year increase, because the ARP calculation treats revaluation gains as income. Correctly

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46      The revised Electricity Industry Information Disclosure Regulations have replaced the ARP with a closely related substitute, the Return on Investment (ROI).

interpreted, a single-year ARP well above the benchmark signals a permanent upward shift in the profitability of the disclosing business, and hence a matching upward shift in its long-run IRR. Correctly applied, the light-handed regulatory regime should then require an immediate regulated rollback of allowed revenue, or a rebate to customers of the full amount of all revaluations, for any company disclosing a single-year ARP above the benchmark.

New Zealand regulatory practice has been to react to single-year spikes in disclosed ARPs as though these were transitory one-off high-profit years, rather than indicators of long-term excess charges and profits.

If in a single year, an asset owner simultaneously increases its asset values, tariffs, and operating surplus, then with the sole exception of the one-year blip in its ARP as the revaluation is recorded, the business will be able to disclose a stable, apparently-market-related, accounting rate of return on assets while actually securing a far higher Internal Rate of Return on the initial investment commitment.

In the gas pipeline sector, the four-year delay in implementing disclosure regulations meant that Enerco's substantial 1994 revaluation went unrecorded in the disclosure records and did not prompt a regulatory response. A second Enerco revaluation for the 1997 year, in the first disclosure round, led to Enerco disclosing a one-off ARP of 35.25% for that year. At the time of making disclosure, Enerco recorded a strong protest against having to state this rate of return, on the basis that inclusion of asset revaluations in rate of return was inconsistent with accounting standard SSAP 28 issued by the New Zealand Institute of Chartered Accountants.[47]

Enerco's attention to the implications of disclosing high rates of return is indicated in the 1994 Enerco Annual Report where the Chairman noted that moving to ODV was beneficial to shareholders because "our return on assets ratio is not shown at an inflated level".[48] Once the assets had been revalued the rate of return for the 1995 year, calculated using as denominator the increased asset value, fell to an apparently low level. The Chairman then commented in the 1995 Annual Report that "the return on shareholders' funds at 6.4% is at the low end of an acceptable range for a gas retailer of our size while interest rates remain in the 9% to 10% range".[49]

In the case of NGC, tariffs for transportation services from 1994 on were priced to include a capital charge on assets valued using ODV, long before any such revaluation of pipeline assets appeared in the balance sheet for 30 June 1997. The resulting pipeline tariffs contributed to the high level of operating surplus seen in Appendix 3 Table A2. Once NGC's reported asset values had been adjusted upwards, its levels of profitability,

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47      New Zealand Gazette 1997 p.4157. SSAP 28 has since been superseded by FRS 3 which equally excludes revaluations from the profit and loss account and thus understates the true economic returns on ownership of a business.

48      Enerco New Zealand Ltd *Annual Report 1994* p.3.

49      Enerco New Zealand Ltd *Annual Report 1995* p.2.

as revealed by standard accounting ratios, were diluted to single-digit rates of return on assets, and thus remained below the threshold level for regulatory attention.[50]

In Figure 5-1 we construct a simplified model to show how regulatory tolerance of unilateral, uncompensated asset revaluation to ODV levels, and the resulting ability of pipeline owners to increase the amount of revenue secured from customers, with only a single-year breach of the competitive rate-of-return threshold, can enable the owners of pipeline system to recover rents (that is, pure transfers of wealth from customers to the asset owners) under light-handed regulation. In the years following a revaluation, the asset base that forms the denominator of the ARP calculation will have increased by the amount of the revaluation. This increased asset value can then be used to "justify" a permanently higher level of charges for the service. We show the extent of those excess revenue recoveries by comparing the time-path of total revenue that can be "justified" under ODV-based disclosure regulations with that which would have been approved by a traditional rate-of-return regulator, using the ODHC price-setting formula adopted by the Commerce Commission in its recent airports report.

The dashed line in Figure 5-1 is the revenue that a traditional regulator would have allowed over the life-cycle of the fixed assets, which is 50-70 years for gas pipelines. As each existing asset wears out and has to be replaced, it is rolled into the asset base at a value corresponding to the actual current replacement cost for that asset. A full commercial return on new investment is thus assured going forward. Eventually, as actual replacement investment accumulates, the regulated price would converge to the price pre-emptively imposed by the revaluing pipeline owner. Until that date, however, customers are forced to pay above the actual economic cost of sustaining the pipeline business.

The solid heavy line is the revenue that can be collected under light-handed regulation, provided that the high ARP in the year of revaluation is not challenged. The shaded area shows the excess amount that customers are obliged to pay for gas transport, relative to the revenue required to sustain the business, as a result of the uncompensated change in the rules of the game governing network prices.

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50    In its 1998 annual report, for example, NGC published after-tax rates of return on its pipeline systems of 7.8% for 1997 and 6.6% for 1998. Similarly, the 1999 annual report yields EBIT/total assets ratios for NGC of 7.2% for energy trading and 9.4% for transmission and distribution.

Figure 5-1
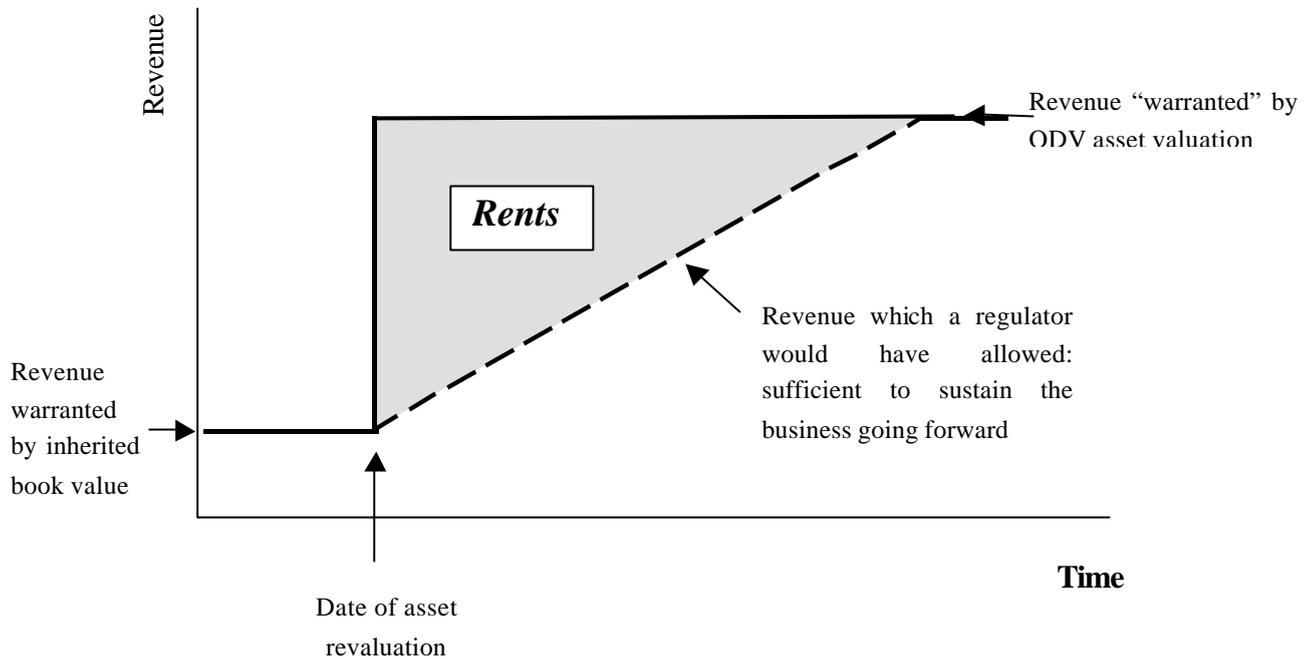


To prevent this unnecessary wealth transfer from customers to asset owners, the appropriate regulatory response would be to provide customers with some compensating offset.

One possibility in New Zealand would have been to make it mandatory for gas pipeline businesses that undertook revaluations to restrain their disclosed revenue sufficiently to stay strictly within the acceptable rate of return range when measured by their long-run Internal Rate of Return. If this were achieved by rebate, a $100 million asset revaluation would require a one-year drop in tariffs sufficient to reduce total income from sales by the equivalent of the revaluation - $100 million. In subsequent years tariffs would rise to secure an acceptable rate of return on the ODV valued assets. In effect, the business would have bought, from its customers, the right to raise its prices by an amount that produced an acceptable return on $100 million; it would make this purchase by a $100 million rebate on charges in the year of the revaluation.

Neither this, nor any equivalent mechanism to protect the interests of consumers, was incorporated into the design of New Zealand's light-handed regulatory framework.

In the terms of reference for the Gas Review, MED notes that pipeline owners have "adapted ODVs for use in the gas industry" at their own volition. It notes that there were certain circumstances that led the government to specify the use of ODV valuations for the electricity disclosure regulations, including the claim that "there was a lack of a good set of book values as the start-point for any form of historical cost based valuation". Although MED records that it was considering specifying the ODV methodology for gas information disclosure purposes also, it has made clear that the risk of it not doing so rests with the pipeline owners. Three of the four gas distribution

companies (Powerco, Wanganui Gas and NGC) undertook, and disclosed, revaluations under ODV during the 2000 financial year.[51]

A factor that contributed to the inadequate level of monitoring of asset revaluations was the extent to which MED, at the operational level, placed reliance on the proposition that gas prices are ultimately capped by electricity prices. This theory relies on electricity being a close substitute for gas so that as long as electricity prices are monitored and regulated as necessary, then gas prices will be held in check. We have not seen supporting econometric or other analysis for this position from the Ministry, but note that MED has raised an extensive list of questions on this issue as part of the Gas Review.[52] The excess returns on gas transport and sale which we have estimated provide a *prima facie* case against this theory. Electricity prices may place some limit on gas, to the extent that electricity and gas are in fact substitutes. However, the IRRs found in this study strongly suggest that competition from electricity has not been an effective check on monopoly profits in gas.

## 5.3. Reform Options

Constructing an effective discipline will be a key task for the Gas Review as there are no avenues for redress available for private parties such as pipeline customers to exercise countervailing power.

Legal action through the courts has been foreclosed by a series of judgements which have ruled out the main legal avenues by which monopoly pricing might have been successfully challenged. The Court of Appeal has extinguished the "essential facilities" doctrine on the basis that the Commerce Act superceded it. Other like doctrines which embraced concepts such as "fair and reasonable" charges have similarly been ruled out.[53]

The Commerce Commission does have jurisdiction to investigate monopoly pricing under part IV of the Commerce Act. However, no private entity has the right to cause such a price control study to be initiated by the commission. Only the Minister of Commerce may order a price control investigation.

Should Government's new objectives for regulation of the gas industry be confined to restraining gas transport charges, Part IV of the Commerce Act does provide a ready mechanism. This part of the Act was recently revamped and provides for price control of individual companies. Further, the Commerce Commission's airfield activities study[54] conducted under these provisions has interpreted the Act, making much clearer

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51    *New Zealand Gas Company Analysis*, Cap Gemini Ernst & Young, March 2001, pages 4 and 11.

52    See the terms of reference for the Review, p 4.

53    Stevens, L.L., *The Goals of the Commerce Act*, paper presented to Competition Law at the Turn of the Century Conference, Wellington, November 2000, available on the website of the Institute for the Study of Competition and Regulation Inc, pp.6-11.

54    It should be noted that this price control inquiry considered only the monopoly airfield activities of the international airports, rather than the full suite of businesses each airport company

the particular tests to be satisfied and providing clear benchmarks for the circumstances that would qualify for price control regulation.[55] Importantly, the study also implicitly rejected the ODV methodology for regulatory purposes. It instead used valuation estimates for built assets based on Optimised Depreciated Historic Cost.

Should Government instead wish to follow the precedent set for the electricity lines companies, and place the Commerce Commission in a backstop regulatory role through "targeted regulation", it could introduce new legislation to give the Commission further powers specifically relating to gas pipeline businesses. The principal differences under this approach are that the Commission:

- sets in advance defined thresholds for "declaration of control";

- is responsible for determining what information is disclosed; and

- monitors the performance of individual companies on an ongoing basis.

As the Gas Review covers a wide range of other issues, there is also the possibility that the Government may conclude that a regulatory response is desirable in relation to pipeline access conditions, pipeline interconnection conditions, and governance arrangements for gas market trading. Thus, it is too early to judge the best means and institutional arrangements for regulation at this stage. However, the excess returns observed in respect of gas transport strongly suggest that any new regulatory regime must contain clear and effective powers to regulate gas pipeline charges.

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operates. *Price Control Study of Airfield Activities at Auckland, Wellington and Christchurch International Airports – Draft Report*, Commerce Commission, July 2001.

[55] The following are the three tests identified by the Commission (as quoted) and our brief interpretative comments:

- "The first is to assess whether competition is limited or is likely to be lessened …": This is a question of whether the market is contestable; gas pipelines are generally considered non-contestable.

- "The second issue is whether control is necessary or desirable in the interests of acquirers [consumers] or suppliers … ." In the airports investigation, this centred on whether excess returns were being taken.

- "The third issue is to make a recommendation on whether control should be imposed. … This brings into consideration the wider net benefits test. The focus here is on the interests of the economy as a whole. The aim is to maximise economic efficiency regardless of which particular individuals receive the benefits." In the airports investigation, the Commission compared the extra costs faced by consumers of the service to the direct and indirect costs of price regulating. It estimated the direct costs of regulating AIA at $1.2 million per annum. Source: *Price Control Study of Airfield Activities at Auckland, Wellington and Christchurch International Airports – Draft Report*, Commerce Commission, July 2001, Executive Summary, paras 15 - 18.

# 6. Conclusions

This study has worked from the public record to estimate the rates of return secured by the nation's two largest pipeline owners over the period since industry deregulation. We have then compared these with various benchmark figures of the sort commonly used by regulators as proxies for the rate of return that ought to prevail under competitive conditions.

We estimate that the real after-tax Internal Rate of Return on the NGC business 1992-2000 was 19%, and the rate for NGC pipelines in the 1997-2000 disclosure period was 18%. For Orion, the Internal Rate of Return 1992-2000 was between 23 and 29%, while for pipelines only over the period 1997-2000, the IRR was between 15% and 33%.

These rates of return for the owners of gas pipelines in New Zealand since deregulation have been more than double the levels generally considered acceptable by regulators in New Zealand and overseas.

Rates of return consistently above the level required to meet the appropriate competitive cost of capital are monopoly profits. These are pure transfers of wealth from customers to the asset owners. They perform no economic function in relation to securing the continued supply of the service. They are not required as an incentive for entry, nor for ongoing replacement of assets as they wear out.

The light handed regulatory regime has failed to check these excess returns. It has also failed to ensure that disclosed financial information was publicly analysed to ensure that its significance was properly understood. As a result, all those making use of the pipelines have paid more than was required to properly sustain the services. Natural gas producers, wholesalers, retailers and consumers have all been affected by high pipeline charges.

The existing regulatory regime has not proven an effective substitute for more formal price control. A minimum output from the Gas Review therefore is a recommendation on how to secure a more effective check on the market power of pipeline owners.

# Appendix 1    Gas Review Terms of Reference Extract

**BACKGROUND NOTE – POSSIBLE ADOPTION OF ODVS FOR GAS**

*The following issues and questions should be considered in relation to asset valuation.  This list should not be considered exhaustive.*

## Why Use Asset Valuations?

- Asset valuation provides a reference point for a regulatory regime to measure reasonable prices/profits.  Are concerns about excessive prices/profits in gas transport markets justified?

## Use of ODVs in Gas and Electricity

- ODVs were chosen for use in the electricity information disclosure regulations for the following reasons:
◊ there was a lack of a good set of book values as the start-point for any form of historical cost based valuation;
◊ to facilitate cross-company comparisons;
◊ ODV mimics asset values in a perfectly contestable market; and
◊ the constraints imposed by the maximum asset values/lives, optimisation and economic valuation rules substitute for a regulator overseeing investment decisions.

- Pipeline owners have adapted ODVs for use in the gas industry.  However, since the Government has not specified an ODV methodology for gas pipelines, there is no assurance of the quality of the valuations.  On 1 May 2000, Cabinet authorised drafting to begin on an amendment to the gas information disclosure regulations to incorporate a standardised ODV methodology.  Work on promulgating the new regulations is in abeyance.

## Alternatives

- There are alternatives to using ODV to value sunk assets.  These include depreciated historical cost, indexed depreciated historical cost, depreciated replacement cost, optimised depreciated replacement cost, or the market value of the assets if line charges were held constant in real terms.

- The costs and benefits of using ODVs for utility industries has been the subject of some recent reviews[56].  The efficiency and wealth transfer effects of any changes in asset valuation methodologies should be considered.

## Questions

- Some specific questions to be considered are:
◊ What criteria should be used in determining an appropriate valuation methodology for gas networks?
◊ What are the pros and cons of each alternative methodology in meeting these criteria?

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56    *Lining up the Charges*, prepared by Simon Terry Associates Ltd, July 2000, and *The Origins of ODV* – Report to Air NZ, NZIER, August 2000.

◊   What is the history of valuations of gas pipeline businesses (focussing particularly on "privatisation" price and subsequent movements)?  Were the privatisation prices determined at arms length?

◊   What are the practicalities of adoption of historic cost valuation approaches using the "privatisation" price?

# Appendix 2   Methodology for Calculation of IRRs

This appendix describes the technique used to calculate the profitability of the two main gas companies, as measured by their Internal Rates of Return.[57]

We define the annual income secured by the owners of an asset to consist of the gross operating surplus from the business, adjusted (i) for funds committed by the existing owners of the assets to capital expenditure during each year and (ii) for tax. To this we add capital gains secured as a result of holding the assets through the period, and realised at the end of the period either by notional sale at book value, or by actual sale to a willing buyer.

To measure the basic rate of return we follow the fortunes of a hypothetical investor who is assumed to buy into the business at the time of its flotation on the sharemarket; to hold this investment for some period of time (receiving during this period regular payments of income as defined above); and to sell out of the business at the end of the period, receiving the market value if an actual sale has occurred, or the book value of fixed assets otherwise. Note that if the business revalues its assets then this will affect the book value and, therefore, any revaluation will be reflected in the end of period sale price.

This investor's stream of real outlays and receipts is used to calculate an internal rate of return on the investment, which can then validly be compared with the competitive cost of capital, and with the return from a representative stock market share bundle purchased, held and sold off over the same time period.

While conceptually simple in principle, the calculation presents practical difficulties when working with the sort of data published in company annual reports and information disclosed under the regulations as they presently stand. Four problems in particular have to be confronted:

- In order to focus on the core business and its underlying real rate of return on funds, activities such as the acquisition and disposal of non-core investments, the production and sale of goods and services other than those being analysed, and the use of borrowed funds rather than equity finance, have to be stripped away as much as possible. Ideally this should leave only those revenues and operating costs directly associated with the core business activity, and should remove any additional returns to equity holders which are secured by debt management, so that the rates of return calculated are those which would accrue to an investor who commits to full equity ownership simply of the core business.[58]

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57    The methodology was developed by Simon Terry Associates and has previously been used to assess monopoly profits in electricity distribution networks and at Auckland International Airport. See *Lining Up the Charges* and *Rates of Return at Auckland International Airport*.

58    The effect of gearing an investment with debt finance is to raise the realised post-tax return to equity investors above the level which they would secure under 100% equity ownership of the business. Our focus here is in the rate of return from the core activity itself. If that basic return exceeds the competitive benchmark, it follows that the return secured under more complex

So far as possible, we endeavour to identify the profitability of the non-contestable segment of the gas business, namely the operation of pipeline networks. However, the main New Zealand gas companies have generally operated as "merchant pipelines" selling a bundled delivered-gas product made up of commodity gas and pipeline transportation services. A notional split between lines and energy businesses for purposes of disclosure has been required for regulatory disclosure purposes since 1997, but only Enerco underwent an actual split of the business with separate divestment of pipelines and retail gas trading, and this split was completed only in April 2000 after the end of our analysis period.

We therefore analyse the profitability of the bundled gas trading/pipeline businesses of NGC and Enerco, supplemented by a disaggregated analysis for the four years during which separate information was disclosed. The rates of return displayed by the bundled businesses will be indicative of the profitability of the pipeline networks alone to the extent that margins on gas trading were no more important than pipeline charges in contributing to overall profitability. In any disaggregation between the two sources of profitability, the need to allocate common costs means that there is a large arbitrary component to disaggregated profit estimates. The 1997 gas disclosure regulations allow gas companies to choose their own cost allocation methodology[59], and this has undoubtedly affected the allocation of disclosed profits between lines and energy. Enerco adopted an avoided-cost methodology[60], whereas NGC adopted a fully-allocated methodology.[61] In both cases, however, the disclosed allocation of profitability between lines and energy trading indicated that the lines businesses were a major source of profit.

With the exception of the 1999 year, disclosures by Enerco and Orion show the pipelines contributing over 85% of the pre-tax profit of the combined lines and energy business. NGC's disclosures show transmission and distribution pipelines contributing roughly 60% of the bundled lines and energy total pre-tax profit.

We conclude that the profitability of the bundled energy and lines businesses is fully representative of the performance of the pipelines part of the business taken as a stand-alone operation, and that the rates of return calculated in this study are not attributable simply to energy trading but are representative of pipeline network profits as well.

- We are intending to identify the direct cash costs that the business incurs in carrying out its operating and investing activities over the period of concern. Calculation of the gross operating surplus of the core activity has already made some allowance for

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financing arrangements will be higher. Our analysis will consequently understate the amount of excess profits.

59  Gas (Information Disclosure) Regulations 1997 clause 21.

60  Enerco New Zealand Ltd, "Information for Disclosure Pursuant to the Gas (Information Disclosure) Regulations 1997", *New Zealand Gazette* No 174 1997, p.4155.

61  NGC, *Disclosure of Allocation Methodologies as Required by Regulation 21, Gas (Information Disclosure) Regulations 1997*, mimeo, released 30 January 1998.

physical wear and tear on the capital stock by virtue of maintenance expenditure. Normally accounts would also provide for an annual charge, depreciation, that would apportion the original cost of the assets over the individual asset's lives. In this case, however, our stream of real cash outlays must exclude a non-cash item such as depreciation. It is necessary to account for new purchases of fixed assets which are effectively a new commitment of resources by the investor, and this is done by subtracting, from the current income credited to the model's investor, an estimate of the funds which that investor would have been called upon to contribute year by year to the financing of cash outlays on purchases of fixed assets during the year.

To estimate this, we have used the annual cashflow statements to calculate net cash outlays on purchases of fixed assets, and we have then calculated the net cash gain from all other investing and financing activities; this has been credited against net fixed-assets purchases to leave as a residual the amount of cash required from the asset owners each year to fund capital expenditure on replacement and expansion of the fixed assets inventory. Increases in the value of fixed assets due to this investment are later recovered by the investor when the investment is liquidated.

This approach of subtracting actual required cash funding of gross capital expenditure from the investor's income avoids reliance on the accounting concept of notional depreciation, which is potentially a source of confusion in the context of assets whose value rises rather than falls over time. The depreciation concept does enter to the extent that the book value of assets sold at the end of the period is determined either by the net book value as shown in the accounts of the business, or by the market valuation of the business as a going concern in an actual sale of the assets to a new owner.

- Adjustment of the net operating surplus to an after-tax basis may be done in several ways. One is to calculate pre-tax gross operating surplus assuming full equity ownership (that is, with interest receipts and payments stripped out), deduct depreciation as allowed for in the company accounts, and then to charge the hypothetical 100% equity owner a 33% tax rate either on this amount or on this amount adjusted for the interest tax shield. A second is to use tax expense as provided for in the annual profit and loss statements. A third is to deduct actual cash tax paid as recorded in the cashflow accounts. Having checked that our results are not sensitive to the choice of tax estimation methodology, we have opted for cash tax paid in analysing the bundled lines and energy operations, but have used a mix of tax provision and imputed tax in analysing the disclosed information for pipelines only, given that disclosure of cashflow statements is not required under the Regulations.

- A fourth problem is to decide what price the hypothetical investor should be assumed to receive when the investment is liquidated. One option is to assume that the investor sells out for the book value of the fixed assets as recorded in the firm's balance sheet at the date of assumed exit. The alternative is to assume that the investor receives the market value for each share, as measured by the price at which willing buyers value the business as a whole. For NGC we have used the book

value of assets as the assumed selling price. The Enerco fixed pipeline assets, however, were sold in April 2000 for double their ODV book value, and this was disclosed as a market value in a note to the gazetted disclosure information for 2000. There is no regulatory cap on the amount which can be paid for a pipeline network, and it is counter-intuitive to insist that a hypothetical investor must be assumed to forego the chance to sell at double the book value. In our analysis of Enerco we have therefore allowed the hypothetical investor to take advantage of the market opportunity to sell the business to UnitedNetworks at the price actually paid. To maintain consistency with the NGC analysis, we have presented results also for the scenario in which the Enerco investment is liquidated at the book value of fixed assets.

In order to allow for inflation, all numbers have to be deflated to dollars of uniform purchasing power. We have used the PPI (Inputs) for this purpose. Annual data are deflated by the average of the PPI for the period; dated valuations are deflated using the PPI for the corresponding quarter.

# Appendix 3    Tables

Table A1

***Summary Statistics on Enerco/Orion Gas Operations***

| Years ending | Book value of fixed assets $ millions | Revenue excluding interest & assets sales $m | Revenue from network only $m | Expenses excl interest & depreciat-ion | Expenses of network only $m | TJ of gas sales | TJ of gas conveyed on networks | Km of pipe (Annual Reports) | Km of pipe (Disclos-ure) | Customers (Annual Reports) | Customers (Disclos-ure) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 30-Jun-90 | 56 | | | | | 13,669 | | | | | |
| 30-Jun-91 | 91 | 106 | | 71 | | 13,405 | | 2,300 | | | |
| 30-Jun-92 | 77 | 112 | | 95 | | 14,188 | | 2,400 | | 55,000 | |
| 30-Jun-93 | 77 | 118 | | 99 | | 14,420 | | 2,500 | | 60,000 | |
| 31 Mar-94 (9 mths) | 203 | 95 | | 81 | | 11,084 | | 3,200 | | 60,000 | |
| 31-Mar-95 | 202 | 149 | | 127 | | 17,141 | | 3,246 | | 90,000 | |
| 31-Mar-96 | 205 | 167 | | 132 | | 17,308 | | 3,292 | | 89,867 | |
| 31-Mar-97 | 289 | 190 | 68 | 149 | 35 | 18,396 | 17,227 | 3,968 | 5,356 | 101,490 | 100,240 |
| 31-Mar-98 | 312 | 196 | 78 | 147 | 36 | 18,455 | 16,595 | 4,241 | 6,132 | 109,323 | 108,377 |
| 31-Mar-99 | 285 | 204 | 71 | 157 | 39 | | 15,856 | | 6,539 | | 111,217 |
| 31-Mar-00 | 280 | 113* | 62 | 65* | 20 | | 16,391 | | 6,780 | | 114,633 |
| 31 Dec-00 (9 mths) | 265 | | 51 | | 8 | | 13,314 | | 6,943 | | 119,071 |
| % change 1992-1998 | 305.2 | 75.0 | | 54.7 | | 30.1 | | 76.7 | | 98.8 | |

\*  Gas trading operation divested to Contact.

Note:  The discrepancy between disclosed and Annual Report pipeline lengths is unexplained at this stage.

Sources:Enerco New Zealand Ltd Annual Reports for years 1992-1998; Orion Annual Reports 1999 and 2000; Information for Disclosure under the Gas (Information Disclosure) Regulations 1997, in New Zealand Gazette No 174 15 December 1997 (Enerco); No 121 21 August 1998 (Enerco); No 99 21 August 2000 (Orion); No 53 28 May 2001 (UnitedNetworks)

Table A2

## *Summary Statistics on NGC's Gas Operations*

| Years ending | Book value of fixed assets[1] $ millions | Sales Revenue[1] $m | Revenue from network only $m | Expenses excluding interest & depreciation | Expenses of network only $m | TJ of gas sales | TJ of gas conveyed on networks | Km of distribution pipelines | Km of pipe (Annual Reports)[4] | Km of pipe (Disclosure) | Customers (Annual Reports) | Customers (Disclosure) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30-June 1992 | | | | | | | 61,100 | 2,014 | | | 31,636 | |
| (9½ months) 30-Jun-93 | 358 | 173 | | 96 | | 38900 | 58,000 | 2,096 | 5257 | | 34,483 | |
| 30-Jun-94 | 348 | 236 | | 134 | | 42000 | 60,000 | 2,174 | 5367 | | 37,033 | |
| 30-Jun-95 | 351 | 242 | | 147 | | 42000 | 61,200 | 2,236 | 5463 | | 39,674 | |
| 30-Jun-96 | 350 | 253 | | 148 | | 42800 | 65,200 | 2,299 | 5526 | | 42,104 | |
| 30-Jun-97 | 528 | 279 | 95 | 164 | 28 | 51900 | 68,900 | 2,382 | 5609 | 4506 | 44,617 | 43,349 |
| 30-Jun-98 | 527 | 300 | 95 | 174 | 25 | 46300 | 65,100 | 2,464 | 5730 | 4602 | 47,080 | 45,845 |
| 30-Jun-99 | 549 | 260 | 96 | 186 | 28 | 36200 | 67,000 | 2,445 | 5838 | 4433 | 66,793 | 47,739 |
| 30-Jun-00 | 596 | 323 | 116[2] | 456 | 34 | 40700 | 81,200 | 2,479 | 5872 | 4666 | 101,164[3] | 48,279 |
| % change 1993-2000 | 166.5 | 186.7 | | | | | | | | | | |

Notes

1.  Excludes treatment plants, meters and generation.
2.  Includes revenue from assets acquired by AGLNZ, NGC-only revenue would be expected to be similar to the prior year.
3.  Includes customers supplied by TransAlta New Zealand.
4.  Annual report totals include gas and petroleum product pipelines/easements owned/operated/managed by NGC.

**Table A3**
**Data for Calculation of Real Post-Tax Internal Rate of Return on Enerco Investment**

| | Period to | Jun-92 | Jun-93 | Mar-94 | Mar-95 | Mar-96 | Mar-97 | Mar-98 | Mar-99 | Mar-00 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Number of shares on issue | 56,000,000 | 56,140,000 | 83,891,837 | 84,785,206 | 84,898,539 | 84,965,205 | 84,965,205 | 84,965,205 | 84,965,205 |
| 2 | Book value of fixed assets $000 | 76,780 | 77,435 | 203,048 | 201,845 | 204,958 | 288,649 | 312,213 | 285,477 | 280,866 |
| 3 | Value of network assets at actual sale $000 | | | | | | | | | 550,000 |
| 4 | Margin over book value of network assets at sale $000 | | | | | | | | | 269,134 |
| 5 | Sums received from sale of retail gas customers $000 | | | | | | | | 100,500 | 10,200 |
| | of which, estimated fixed-assets component | | | | | | | | 16,500 | |
| 6 | Book value of fixed assets per share $ | 1.37 | 1.38 | 2.42 | 2.38 | 2.41 | 3.40 | 3.67 | 3.36 | 3.31 |
| 7 | Buy-in price $ per share | 1.35 | | | | | | | | |
| 8 | Operating revenues excl interest and gains on sale of investments $000 | 112,758 | 118,086 | 95,666 | 154,177 | 168,486 | 189,964 | 209,030 | 203,693 | 113,344 |
| 9 | Operating expenses excl interest, depreciation & exploration write-offs | 94,758 | 98,620 | 80,842 | 127,482 | 132,083 | 149,167 | 147,205 | 136,144 | 79,905 |
| 10 | Interest expense $000 | 507 | 1,770 | 1,407 | 2,001 | 41 | 616 | 2,882 | 7,493 | 8,000 |
| 11 | Depreciation expense $000 | 5,064 | 4,822 | 3,695 | 8,770 | 9,212 | 10,122 | 11,939 | *10,300* | *10,000* |
| 12 | Operating surplus with no depreciation or interest deducted $000 [8-9] | 18,000 | 19,466 | 14,824 | 26,695 | 36,403 | 40,797 | 61,825 | 67,549 | 33,439 |
| 13 | Cash purchases of fixed assets net of sales of fixed assets $000 | 1,463 | 4,449 | 3,467 | 6,870 | 12,046 | 35,318 | 35,382 | *16,454* | *12,663* |
| 14 | Net cash from investing activities other than fixed assets $000 | 7,274 | 84 | -77,271 | 49,857 | -4,299 | -2,242 | -4,022 | | |
| 15 | Net cash from financing activities $000 | -7,776 | 1,064 | 72,622 | -36,744 | -447 | 28,982 | 13,281 | | |
| 16 | Financing & other investment contribution to capex $000 [14+15] | -502 | 1,148 | -4,649 | 13,113 | -4,746 | 26,740 | 9,259 | | |
| 17 | Net cash purchases of fixed assets funded from surplus $000 [13-16] | 1,965 | 3,301 | 8,116 | -6,243 | 16,792 | 8,578 | 26,123 | | |
| 18 | Surplus net of required contribution to capex $000 [12-17] | 16,035 | 16,165 | 6,708 | 32,938 | 19,611 | 32,219 | 35,702 | 51,095 | 20,776 |
| 19 | Notional taxable profits, equity basis $000 [12-11] | 12,936 | 14,644 | 11,129 | 17,925 | 27,191 | 30,675 | 49,886 | 57,249 | 23,439 |
| 20 | Imputed tax on [19] @33% | 4,269 | 4,833 | 3,673 | 5,915 | 8,973 | 10,123 | 16,462 | 18,892 | 7,735 |
| 21 | Provision for tax in profit & loss accounts $000 | 4,503 | 2,430 | 3,147 | 8,028 | 10,040 | 9,761 | 13,205 | 14,433 | 10,472 |
| 22 | Current taxation as per note to accounts , $000 | 4,866 | 2,550 | 3,480 | 8,146 | 8,201 | 10,611 | 4,314 | | |
| 23 | Cash tax actually paid, from cashflow statements, $000 | 10,570 | 4,088 | 3,564 | 12,721 | 7,307 | 12,676 | 6,993 | na | na |
| 24 | Tax series used for purposes of analysis $000 | 10,570 | 4,088 | 3,564 | 8,146 | 8,201 | 10,611 | 4,314 | 14,433 | 10,472 |
| 25 | Post-tax surplus used for analysis $000 [18-24] | 5,465 | 12,077 | 3,144 | 24,792 | 11,410 | 21,608 | 31,388 | 36,662 | 10,304 |

Table A4
Cashflows for Enerco/Orion IRR Analysis

| Period to: | Jun-92 | Jun-93 | Mar-94 | Mar-95 | Mar-96 | Mar-97 | Mar-98 | Mar-99 | Mar-00 |
|---|---|---|---|---|---|---|---|---|---|
| PPI Inputs Dec 1997=1000: figure for the final quarter of the period | 936 | 960 | 972 | 983 | 990 | 992 | 996 | 993 | 1044 |
| PPI Inputs Dec 1997=1000: average for the period | 928 | 953 | 971 | 981 | 987 | 991 | 995 | 1000 | 1021 |
| **Data in Real Terms:** | | | | | | | | | |
| Shares on issue | 56,000,000 | 56,140,000 | 83,891,837 | 84,785,206 | 84,898,539 | 84,965,205 | 84,965,205 | 84,965,205 | 84,965,205 |
| Real buy-in price $ per share | 1.44 | | | | | | | | |
| Real net post-tax surplus per share | 0.10 | 0.22 | 0.04 | 0.30 | 0.14 | 0.26 | 0.37 | 0.43 | 0.12 |
| Real sell price per share: | | | | | | | | | |
|     Fixed assets at market | | | | | | | | 5.74 | 6.32 |
|     Fixed assets at book value | | 1.44 | 2.49 | 2.42 | 2.44 | 3.42 | 3.69 | 3.38 | 3.17 |
|     Retail customers at market value | | | | | | | | 1.19 | 0.11 |
| **Adjusted to March-year basis:** | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| Real buy-in price $ per share | 1.44 | | | | | | | | |
| Real net post-tax surplus per share: | | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.43 | 0.12 |
| Real sell price per share: | | | | | | | | | |
|     Margin over book value actually paid in takeover | | | | | | | | 2.32 | 3.15 |
|     Fixed assets at book value | 1.46 | 1.44 | 2.49 | 2.42 | 2.44 | 3.42 | 3.69 | 3.38 | 3.17 |
|     Retail customers at market value | | | | | | | | 1.19 | 0.11 |
|     Estimated fixed-asset component of sale of retail customers | | | | | | | | 0.19 | |

**Table A5**
**Internal Rate of Return Scenarios for Enerco/Orion**

| **Scenario 1: Selling out to United in March 2000** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| **Real purchase price** | -1.44 | | | | | | | | |
| **Real net surplus post-tax, net of contribution to capex** | | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.43 | 0.12 |
| **Cash from actual sale of retail customer base** | | | | | | | | 1.19 | 0.11 |
| **Cash from actual sale of pipelines** | | | | | | | | | 6.32 |
| **Book value of fixed assets when sold** | | | | | | | | 0.19 | 3.17 |
| **Cashflow stream if only book value of fixed assets realised at sale:** | | | | | | | | | |
| **Cash stream** | -1.44 | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.63 | 3.28 |
| **IRR** | **22.5%** | | | | | | | | |

**Cashflow stream if market value of the pipeline business is realised at sale:**

| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| **Cash stream** | -1.44 | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.43 | 6.43 |
| **IRR** | **29.2%** | | | | | | | | |

| **Scenario 2: Selling out to Orion at February/March 1999** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
| **Real purchase price** | -1.44 | | | | | | | |
| **Real net surplus post-tax, net of contribution to capex** | | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 0.43 |
| **Cash from sale of retail customers** | | | | | | | | |
| **Margin over book value at sale** | | | | | | | | 2.32 |
| **Book value of pipeline assets at sale** | | | | | | | | 3.38 |
| **Cash stream** | -1.44 | 0.19 | 0.08 | 0.30 | 0.14 | 0.26 | 0.37 | 6.13 |
| **IRR** | **31.0%** | | | | | | | |

### Table A6: Disclosure and Other Data on Enerco/Orion Pipeline Network Business:$000

| March years | 1996 | 1997 | 1998 | 1999 | 2000 | 2000 Apr-Dec |
|---|---|---|---|---|---|---|
| Fixed assets at cost/valuation from Annual Reports or estimated | 222,655 | 288,649 | 324,094 | *307,716* | *313,105* | *304,358* |
| Depreciation as disclosed | | | | | | 7,115 |
| Depreciation from annual reports | | 10,122 | 11,939 | | | |
| Estimated depreciation | | | | *10,300* | *10,000* | |
| Accumulated depreciation (estimate in italics) | | 0 | 11,939 | *22,239* | *32,239* | *39,354* |
| Revaluation | | 58,392 | | | | |
| Implied capital expenditure on fixed assets | | 7,602 | *35,445* | *-16,378* | *5,389* | *-8,747* |
| Book value of fixed assets from annual reports | 204,958 | 288,649 | 312,213 | 285,477 | 280,866 | |
| Pipelines book value from Annual Reports | 188,680 | 266,575 | 276,267 | 260,407 | 261,881 | 258,915 |
| Book value of fixed assets disclosed | | 287,262 | 310,523 | 285,477 | 280,000 | 265,004 |
| Disclosed sale price to United | | | | | 550,000 | |
| Revenues from network charges as disclosed | | 68,045 | 77,551 | 71,393 | 62,352 | 51,282 |
| Bundled revenues from Annual Reports | | 189,964 | 209,030 | 203,693 | 113,344 | |
| Expenses as disclosed | | 44,917 | 48,437 | 50,582 | 31,646 | 51,628 |
| Surplus before taxation as disclosed | | 23,128 | 29,114 | 20,811 | 30,706 | -346 |
| Bundled tax provision from Annual Reports | | 9,761 | 13,205 | 14,433 | | |
| Annual Reports tax minus disclosed tax on retail | | 8,579 | 12,687 | 13,495 | | |
| Taxation as disclosed | | 7,888 | 11,619 | 23,279 | 8,996 | -114 |
| Cash tax on bundled business from Annual Reports | | 12,676 | 6,993 | | | |
| Bundled tax expense provision from Annual Reports | | 9,761 | 13,205 | 14,433 | | |
| 1999 tax est as 33% of surplus plus $4m deferred tax | | | | 8,453 | | |
| NPAT as disclosed | | 15,240 | 17,495 | -2,468 | 21,710 | -232 |
| NPAT from disclosure with 1999 adjusted | | 15,240 | 17,495 | 9,943 | 21,710 | |
| Interest expense from Annual Reports | | 382 | 2,872 | 7,493 | na | |
| Interest expense disclosed | | na | na | na | na | 31,335 |
| NPAT adjusted for interest tax shield | | 15,496 | 19,419 | 14,964 | 21,710 | |
| | | | | | | |
| PPI Inputs Dec 1997=1000 | 990 | 992 | 996 | 993 | 1044 | 1139 |
| PPI Inputs Dec 1997=1000 annual average | 987 | 991 | 995 | 1000 | 1021 | |

### IRR Analysis

| | 1996 | 1997 | 1998 | 1999 | 2000 | |
|---|---|---|---|---|---|---|
| Purchase price | -207,028 | | | | | |
| NPAT minus tax shield | | 15,645 | 19,512 | 14,967 | 21,258 | |
| Sale price at book | | | | | 268,199 | |
| Sale price at market | | | | | 526,820 | |
| | | | | | | |
| Real cashflow selling at book | -207,028 | 15,645 | 19,512 | 14,967 | 289,457 | |
| **IRR** | **14.5%** | | | | | |
| | | | | | | |
| Real cashflow selling at market | -207,028 | 15,645 | 19,512 | 14,967 | 548,078 | |
| **IRR** | **32.5%** | | | | | |

Table A7
**Data for Calculation of Real Post-Tax Internal Rate of Return on NGC Investment**

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|
| Hypothetical return to share purchased Sept-92 | | | | | | | | |
| | | | | | | | | |
| Shares on issue | 42,000,000 | 42,000,000 | 42,000,000 | 42,000,000 | 42,000,000 | 394,380,997 | 394,380,997 | 683,301,994 |
| Capital Notes | 420,000,000 | 420,000,000 | 420,000,000 | 420,000,000 | 420,000,000 | | | |
| Book value of Fixed Assets ($000) | 378,319 | 363,973 | 361,691 | 355,362 | 509,138 | 563,292 | 597,920 | 1,274,155 |
| Fixed Asset backing per share/note | $0.82 | $0.79 | $0.78 | $0.77 | $1.10 | $1.43 | $1.52 | $1.86 |
| Asset backing net of term debt & gas asset | $1.09 | $1.13 | $1.25 | $1.17 | $1.65 | $1.56 | $1.42 | $0.96 |
| Weighted average Purchase price | $0.99 | | | | | | | |
| | | | | | | | | |
| Gross Operating Surplus ($000) | 107,805 | 152,720 | 145,329 | 154,101 | 157,402 | 170,059 | 160,140 | 150,841 |
| (excluding interest/dep'n) | | | | | | | | |
| Capital Expenditure | 14,362 | 12,869 | 12,930 | 13,431 | 33,093 | 51,326 | 21,060 | 28,637 |
| Acquisitions (net of goodwill) | 4,487 | 25,994 | 30,299 | 0 | 0 | 6,500 | 28,423 | 48,242 |
| Net cash from financing (net of goodwill) | 0 | -36,600 | -22,300 | -46,100 | -32,100 | 25,540 | 44,260 | 128,052 |
| | | | | | | | | |
| Net Surplus (pre-tax) ($000) | 88,956 | 77,257 | 79,800 | 94,570 | 92,209 | 137,773 | 154,917 | 202,014 |
| Cash Tax ($000) | 3,395 | 3,146 | 595 | 9,053 | 11,469 | 21,401 | 23,666 | 25,707 |
| Net Surplus (post-tax) ($000) | 85,561 | 74,111 | 79,205 | 85,517 | 80,740 | 116,372 | 131,251 | 176,307 |
| per share | $0.19 | $0.16 | $0.17 | $0.19 | $0.17 | $0.30 | $0.33 | $0.26 |
| Sell Price | | $1.13 | $1.25 | $1.17 | $1.65 | $1.56 | $1.42 | $0.96 |

Table A8
Cashflows for NGC IRR Analysis

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|
| PPI Inputs Dec 1997=1000 annual average | 953 | 972 | 982 | 988 | 991 | 998 | 999 | 1036 |
| PPI Inputs Dec 1997=1000 | 960 | 976 | 983 | 988 | 990 | 1002 | 999 | 1057 |

**Data in Real Terms**

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|
| Real weighted average purch price | | $1.03 | | | | | | |
| Real Net Surplus (post-tax) / share | | $0.19 | $0.16 | $0.17 | $0.19 | $0.18 | $0.30 | $0.33 | $0.25 |
| Real Sell Price | | | $1.16 | $1.27 | $1.19 | $1.67 | $1.55 | $1.42 | $0.90 |

Real cash stream for entry at September 1992 and exit
at end of:

| | | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|---|---|---|---|
| Jun-94 | -$1.03 | $0.19 | $1.33 | | | | | | |
| Jun-95 | -$1.03 | $0.19 | $0.16 | $1.44 | | | | | |
| Jun-96 | -$1.03 | $0.19 | $0.16 | $0.17 | $1.38 | | | | |
| Jun-97 | -$1.03 | $0.19 | $0.16 | $0.17 | $0.19 | $1.85 | | | |
| Jun-98 | -$1.03 | $0.19 | $0.16 | $0.17 | $0.19 | $0.18 | $1.85 | | |
| Jun-99 | -$1.03 | $0.19 | $0.16 | $0.17 | $0.19 | $0.18 | $0.30 | $1.76 | |
| Jun-00 | -$1.03 | $0.19 | $0.16 | $0.17 | $0.19 | $0.18 | $0.30 | $0.33 | $1.15 |

| **Real IRRs exiting at June** | | | **23.2%** | **23.5%** | **20.3%** | **25.0%** | **23.2%** | **22.3%** | **19.2%** |

**Table A9**
**Disclosure and Other Data on NGC Pipeline Business ($000)**

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| | | | Year ended/as at June | | |
| Book value of fixed assets from annual reports | *338258* | *493242* | *521091* | *538774* | *581206* |
| Disclosed book value of trans/dist assets | | 480160 | 491633 | 482915 | 500397 |
| Series used for analysis | **338258** | **480160** | **491633** | **482915** | **500397** |
| | | | | | |
| Revenues for trans/dist as disclosed | | 95196 | 94527 | 95919 | 100247 |
| Expenses as disclosed | | 45144 | 42542 | 45993 | 41366 |
| Net profit before taxation disclosed | | 50052 | 51985 | 49926 | 58881 |
| | | | | | |
| Depreciation as disclosed | | 17465 | 17289 | 17913 | 14417 |
| | | | | | |
| Gross Surplus excluding depreciation | | 67517 | 69274 | 67839 | 73298 |
| | | | | | |
| Capital expenditure from annual reports | | *33093* | *51326* | *21060* | *28637* |
| Capex excluding non-pipeline & net of disposals | | | 2765 | | 0 |
| Capex series used for analysis | | **33093** | **2765** | **21060** | **0** |
| | | | | | |
| Surplus after deducting capex | | 34424 | 66509 | 46779 | 73298 |
| | | | | | |
| Taxation disclosed | | 16457 | 18274 | 19037 | 21961 |
| Tax @ 33% on disclosed NPBT | | 16517 | 17155 | 16476 | 19431 |
| | | | | | |
| Post-tax surplus using disclosed tax expense | | 17967 | 48235 | 27742 | 51337 |
| Post-tax surplus using tax @ 33% | | 17907 | 49354 | 30303 | 53867 |
| | | | | | |
| PPI Inputs Dec 1997=1000 | 988 | 990 | 1002 | 999 | 1057 |
| PPI Inputs Dec 1997=1000 annual average | 988 | 991 | 998 | 999 | 1036 |

**IRR Analysis**

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Purchase Price | -342366 | | | | |
| NPAT (tax @ 33%) | | 18069 | 49440 | 30334 | 52008 |
| Sale price at book | | | | | 473412 |
| | | | | | |
| Real cashflow | -342366 | 18069 | 49440 | 30334 | 525420 |
| **IRR** | **17.8%** | | | | |