

**COMMERCE COMMISSION**

Gas Control Inquiry

Draft Framework Paper

**16 July 2003**

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## 1 EXECUTIVE SUMMARY

### Introduction

- 1.1 The Commerce Commission (Commission) is undertaking the Natural Gas (gas) Control Inquiry (the Inquiry) in response to a request from the Minister of Energy (Minister) dated 30 April 2003. The Minister has requested the Commission to report by 1 November 2004.
- 1.2 The letter of request and subsequent correspondence with the Minister (terms of reference) require the Commission to report on whether goods and services supplied by persons in markets directly related to either a natural gas transmission system or a natural gas distribution system or both (gas services) should be controlled.
- 1.3 The Commission's process for the Inquiry consists of a two stage consultative process. The first stage will focus on defining the Commission's framework for investigating the performance of the relevant sectors. The second stage will focus on application of the framework and interpretation of the associated findings.
- 1.4 As part of the first stage, the Commission has released this paper (the Draft Framework Paper). The Draft Framework Paper sets out the Inquiry background and presents the proposed legal and analytical frameworks to be used.
- 1.5 The legal framework contains the Commission's interpretation of the terms of reference; considers the relevant goods and services; identifies the suppliers and acquirers; and discusses the Commission's interpretation of the relevant parts of the Commerce Act 1986 (Commerce Act).
- 1.6 The analytical framework sets out the Commission's proposed approach to examining:
  - the level of competition for gas services (including the definition of the relevant markets); and
  - whether control is necessary or desirable in the interests of acquirers.
- 1.7 The emphasis of the Draft Framework Paper is on methodologies and principles, with the application of these and the interpretation of findings being undertaken in stage two of the Inquiry.

## **Background**

### *Announcement of Inquiry*

- 1.8 On 6 November 2002, the Minister stated that he would request the Commission to report on whether increased regulatory control should be introduced for gas services.

### *Request for Inquiry*

- 1.9 On 30 April 2003 the Commission received a request from the Minister to undertake the Inquiry. The request from the Minister was clarified by a letter from the Commission to the Minister on 20 June 2003 and the Minister's reply to that letter dated 9 July 2003. The Minister's letter of request, the Commission's letter of clarification and the Minister's reply to that letter make up the terms of reference for the Inquiry.
- 1.10 The terms of reference require the Commission to report under section 56 of the Commerce Act as to whether an Order in Council under section 53 of the Commerce Act should be made in relation gas services.
- 1.11 In reaching its view on whether control should be introduced the Commission is to advise the Minister on:
- whether gas services may be controlled in terms of section 52 of the Commerce Act;
  - the methodology that the Commission considers appropriate for valuation of pipeline assets for the purposes of its advice on the matters covered in the terms of reference;
  - the net benefits to the public of control; and
  - any other matter that the Commission may think relevant to a decision on whether control should be introduced.
- 1.12 If the Commission recommends that gas services should be controlled, the Minister requires the Commission's specific advice on the technical provisions relating to declaration of control as set out in section 57A of the Commerce Act.

### *Inquiry Process*

1.13 The Commission's process is detailed in the table below.

<b>Item</b>	<b>Indicative Date</b>
Proposed process released by Commission	30 May 2003
Written submissions on proposed process due	16 June 2003
Draft Framework Paper released by Commission	16 July 2003
Commission's Process released	
Gazette notice published pursuant to s57(2) of the Commerce Act	25 July 2002
Written submissions on Draft Framework Paper due	15 August 2003
Conference on Draft Framework Paper	1-5 Sept 2003
Cross submissions following conference due	19 September 2003
Draft Report released by Commission	March 2004
Written submissions on Draft Report due	April/May 2004
Conference on Draft Report	May/June 2004
Cross submissions following conference	June 2004
Final Report provided to Minister of Energy	By 1 Nov 2004

### *Submissions and Conference*

1.14 Submissions on the Draft Framework Paper will be accepted by the Commission until noon Friday 15 August 2003 with a conference being conducted during the first week of September 2003.

### *Related Commission Work*

1.15 The Commission's role in the Inquiry may be compared with its regulatory functions in other sectors, particularly:

- its recent inquiry into airfield activities at Auckland, Wellington and Christchurch international airports (the Airports Inquiry);
- the development and implementation of a targeted control regime for large electricity lines businesses; and
- its obligations to make determinations in respect of designated access services and specified services in the telecommunications sector.

- 1.16 Of the three functions identified above, the Airports Inquiry has the most direct relevance and similarity to the current Inquiry. In both cases the Commission was asked by Government (the Minister of Commerce in the case of airports and the Minister of Energy in the case of gas services) to recommend whether control should be declared. In both cases, the decision to declare control rests with the relevant Minister, who may take into account a broader set of considerations than is available to the Commission when making its recommendations.
- 1.17 Accordingly, in preparing this Draft Framework Paper, the Commission has drawn extensively on the framework it developed and applied in the Airports Inquiry.
- 1.18 Although the Commission's regulatory functions in the electricity lines sector and the telecommunications sector are not directly comparable to this Inquiry, the Commission nevertheless expects to draw on its experiences with those regimes where relevant (for example in relation to questions of efficient pricing, asset valuation, and weighted average cost of capital).

## Legal Framework

### *Suppliers*

- 1.19 At this stage the Commission considers the following transmission pipelines may be subject to the Inquiry.

Company	Pipe Systems
NGC	South, North, Kapuni to Rotowaro, Bay of Plenty, Morrinsville, LTS, Frankly Road
Maui Development Limited (Shell, Todd, OMV)	Oaonui to Huntly (Maui pipeline)
Todd Energy	Kapuni to Hawera
Swift Energy	Rimu to NGC South, Waihapa to New Plymouth and TCC power stations
Westech Energy	Surrey Road to NGC LTS

- 1.20 The Commission is aware that NGC is currently the only transmission business that provides third party access to its transmission system. However Maui Development Limited is currently working through a proposal to offer a service to transport third party gas on the Maui pipeline.
- 1.21 The Commission considers that the distribution businesses identified below may be subject to the Inquiry.

Company	Region
NGC	Northland, Whangaparoa, South Auckland, Waikato, Bay of Plenty, Rotorua Taupo, Gisborne, Kapiti Coast
Powerco	Napier and Hastings area, Southern Hawkes Bay, Taranaki, Manawatu, Levin and Foxton, Hutt/Mana and Wellington
Vector	Greater Auckland, Tuakau and Ramarama
Wanganui Gas	Wanganui/Rangitikei
Nova Gas	Wellington, Porirua, Hutt Valley, Hastings, Hawera, Papakura and Manukau City

### ***Imposition of Control***

- 1.22 Section 52 of the Commerce Act requires the Commission to address two key issues. The first is to assess whether competition is limited or is likely to be lessened in markets in which gas services are supplied, as required by section 52(a). This requires an assessment of both structural and behavioural considerations within the context of the relevant markets.
- 1.23 The second issue is whether control is necessary or desirable in the interests of acquirers of gas services, as required by section 52(b). The focus here is on the benefits of control for the acquirers of gas services (both direct and indirect acquirers). This has involved an analysis of what would happen if the status quo were to continue (the counterfactual), contrasted with the potential benefits and detriments to acquirers if control were to be imposed.
- 1.24 In order to consider whether control is necessary or desirable, the Commission needs to examine the pricing behaviour of the gas pipeline businesses, and compare this to what it considers to be appropriate pricing principles. An examination of the pricing of gas services requires the Commission to consider issues such as asset valuation, weighted average cost of capital (WACC) and cost allocation.
- 1.25 Section 56 of the Commerce Act allows the Commission to report to the Minister on whether market conditions are such that the Minister should recommend control. In this assessment, the Commission addresses such discretionary considerations as may be relevant. It is for the Minister to consider whether to recommend to the Governor-General to declare control. The Minister has a broad discretion and can take into account a range of factors.
- 1.26 In addition to the two key issues set out in section 52 of the Commerce Act the Minister has requested the Commission to give specific advice on the net benefits to the public of control. This request reflects that wider considerations of economic efficiency may also be relevant to the Minister's discretion whether to recommend control.

- 1.27 However, in making its recommendation to the Minister it seems clear that the two conditions within section 52 (first that gas services are, or will be, supplied or acquired in a market in which competition is limited or is likely to be lessened; and second that it is necessary or desirable for gas services to be controlled in the interests of persons acquiring the gas services) are the conditions that the Commission needs to be satisfied of. Therefore the Commission, in making its recommendation to the Minister, must confine its consideration to the net benefits to acquirers test.

### **Analytical Framework**

- 1.28 Section 52 of the Commerce Act requires the Commission to consider two key issues, being, whether gas services are, or will be, supplied in a market in which competition is limited and whether it is necessary or desirable for gas services to be controlled in the interests of acquirers.

### ***Regulation***

#### ***Efficiency Trade-Offs***

- 1.29 In order to recommend control, the Commission must be satisfied that acquirers would benefit from control, compared to the situation without control. In making that assessment the Commission will consider the economic efficiencies that may result from the imposition of control.
- 1.30 The three aspects of economic efficiency are allocative, productive and dynamic efficiencies. It is widely accepted that competitive markets provide strong incentives for promoting these forms of efficiency. However, there may be a tension between the achievement of static (allocative and productive) and dynamic efficiencies. As a result, the Commission may need to consider such tradeoffs in attempting to promote the long-term benefit of acquirers and the public.
- 1.31 Where there are tensions between short-term allocative efficiency and long-term dynamic efficiency, the Commission takes the view that the latter will generally better provide a long-term benefit to acquirers and the public and will therefore be given greater weight when considering efficiency tradeoffs. However, static efficiency will be considered in the Commission's assessments of whether control should be imposed.

### ***Regulatory Risk***

- 1.32 In undertaking its role under the Commerce Act, the Commission will need to manage the risks associated with regulatory intervention.
- 1.33 These risks can arise from:

- the administrative and other costs that industry participants will face from complying with the Commerce Act and the Commission's role under it;
- the Commission making incorrect decisions on the basis of imperfect information;
- regulatory decisions and processes undermining the incentives to achieve efficiency that businesses had in the absence of control; and
- gaming of the Commission's processes by market participants.

1.34 The Commission will manage the regulatory risks through the integrity, transparency and thoroughness of the Commission's investigatory and analytical processes, and through the consistent application of the Commerce Act.

### ***Analytical Overview***

1.35 In order to consider whether gas services are supplied in a market in which competition is limited (the first key issue of s 52) the Commission proposes to review the level of competition in gas services by:

- defining the markets for gas services; and
- evaluating the level and nature of competition within those markets compared with a benchmark of workable competition.

1.36 The definition of gas services markets and the evaluation of competition are discussed in the 'Competition Analysis' section.

1.37 In order to consider whether control is necessary or desirable in the interests of acquirers (the second key issue of s 52) the Commission proposes to compare the outcomes in the counterfactual against the likely outcomes under control. To achieve this, the Commission will:

- use a building blocks type approach (in addition to comparative performance analysis, if possible) to determine an 'efficient level of revenue' and therefore an 'efficient prices' standard for the supply of gas services;
- assess the current and expected behaviour of suppliers of gas services against the 'efficient prices' standard; and
- analyse the benefit to acquirers (using the efficient prices standard and supplier behaviour) of imposing control relative to a counterfactual.

1.38 The construction of efficient prices through the building blocks approach involves determining relevant pricing principles for promoting efficiency, efficient level of capital required, efficient rate of return of capital, efficient rate of return on capital and efficient level of operating costs.

1.39 The key building block components are discussed in the sections titled 'Pricing Principles', 'Asset Base and Valuation', 'Weighted Average Cost of Capital' and 'Operating Capital Expenses'.

- 1.40 In addition to the requirements under s 52 of the Commerce Act the terms of reference require the Commission to look at the net benefits to the public of control. The Commission proposes to undertake this analysis in parallel with the analysis of the net benefits to acquirers.
- 1.41 The Commission's proposed methodology for determining the benefits to acquirers and the public from control are discussed in the section titled 'Benefits and Costs of Control'.

### ***Competition Analysis***

- 1.42 As noted earlier, control can be recommended only where goods or services are supplied or acquired in markets in which competition is limited or is likely to be lessened. It therefore follows that the definition of the relevant markets and the analysis of competition within those markets lies at the heart of any control inquiry under the Commerce Act.

### ***Gas Services Markets***

- 1.43 To provide a framework within which to analyse whether competition might be limited, the Commission has defined the market(s) related to gas services. The markets for transmission and distribution services were considered separately.
- 1.44 For the transmission market the Commission considers it appropriate to recognise the different competition possibilities in different regions. Accordingly the Commission proposes to adopt two discrete transmission markets:
- the provision of gas transmission services between North Taranaki and Huntly; and
  - the provision of gas transmission services for the rest of the North Island.
- 1.45 For distribution the Commission considers that the relevant markets for gas distribution are defined by the geographic regions the distribution systems cover and that the characteristics of gas distribution are similar in each region allowing them, to a large extent, to be dealt with collectively.

### ***Existing Competition***

- 1.46 The constraint on prices of gas services provided by existing competition emanates from direct competition, such as bypass or parallel pipelines and indirect competition through interfuel substitution.
- 1.47 Bypass pipelines, primarily for distribution, have been constructed where suitable conditions exist. This has given rise to pockets of competition thereby constraining the distribution charges in those areas. However, the Commission considers that the extent of bypass pipelines is limited.

- 1.48 With respect to transmission, the open access to the Maui pipeline will theoretically create two parallel competing pipelines between Taranaki and Huntly. This competition is limited to the geographic area where the two pipelines are contiguous and there may be practical limitations on the level of competition between the two pipelines.
- 1.49 The market power of gas pipeline businesses in the supply of gas services could be constrained to some extent by interfuel competition between gas and suitable substitutes. Interfuel competition could constrain the gas energy price which in turn would constrain the price for gas services.
- 1.50 Based on previous experience the Commission considers that interfuel competition provides some competitive constraint on the suppliers of gas services but is not sufficient in itself to produce workable competition.

### *Potential Competition*

- 1.51 Potential competition between suppliers of gas services is limited by barriers. Potential barriers are related to the:
- large long term investment required in infrastructure related assets;
  - constraints on available space for gas pipelines and significant planning implications;
  - time taken to build a pipe system allowing the incumbent to organise strategies to meet the prospective competition; and
  - incumbents benefiting from economies of scale, at least until the point where full capacity is reached.
- 1.52 The significance of these issues varies across geographic areas, making some areas more contestable than others.

### *Pricing Principles*

- 1.53 The Commission considers that, as part of the process of determining whether the second statutory threshold for control (section 52(b)) has been met, and whether control should be recommended, it must judge the behaviour of the suppliers of gas services against an ‘efficient prices’ standard.<sup>1</sup>
- 1.54 The relevant pricing principles for promoting ‘efficient prices’ are developed in the main report using the three aspects of efficiency, namely, allocative, productive and dynamic efficiency.
- 1.55 The Commission considers that both the level of prices and the structure of prices (e.g. between consumers) is relevant to the efficiency of prices. At this stage the Commission expects to focus initially on the efficient level of average

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<sup>1</sup> Efficient price, in this context, means a price that may be observed in a market characterised by effective or workable competition, rather than the perfect competition.

prices, including their level over time, but may also consider the efficiency of specific pricing methodologies, if warranted.

- 1.56 Prices (and costs) can be susceptible to short-term fluctuations in market conditions. The Commission's pricing principles are expressed over the medium-term, so that such short-term fluctuations do not distort judgements on whether prices are efficient and suppliers have been behaving efficiently. The Commission considers this is desirable for evaluating whether the potential benefits (if any) of control could be realised.
- 1.57 In considering the efficient price level the Commission will consider price paths over time, with particular regard to the NPV principle. That is, the Commission proposes to consider current and future prices in the context of past prices, while taking account of the possibility that past prices may reflect above- or below-normal returns attributable to superior or inferior efficiency or other causes.

### ***Asset Base and Valuation***

- 1.58 The valuation of assets is central to the building block approach to determining efficient prices. For capital intensive businesses, capital charges are a significant portion of the total revenues required by the business.
- 1.59 There are several distinct approaches that might be used to derive the current efficient value of assets. The first, drawing on the NPV principle, is to set the current value on the basis of past expenditures and revenues. This backward-looking approach is consistent with historical cost accounting, and may be called the historical cost approach.
- 1.60 Other approaches seek to set the current value of existing assets on the basis only of forward-looking costs. Such approaches might be necessary if, for example, no historical cost information was available. The forward-looking approaches considered by the Commission include opportunity cost and replacement cost valuation approaches.
- 1.61 The Commission considers other valuation approaches based on recent market transaction values or discounted cash flow analysis of future costs and revenues are problematic. Because they reflect the supplier's revenue expectations, there is a risk such valuation approaches include expectations of monopoly rents. Accordingly, the Commission does not propose to use valuation approaches that rely upon business revenue expectations.
- 1.62 The Commission intends to consider both historical and replacement cost approaches for the establishment of efficient asset values for gas pipeline businesses.
- 1.63 In either case, the Commission must determine an appropriate depreciation profile, and consider the extent to which the assets presently in service are used and useful.

- 1.64 If the historical approach is used, the Commission must derive a current efficient asset value by subtracting accumulated depreciation from the opening asset value identified at some time in the past. It must also assess whether capital expenditure since that time has been prudent.
- 1.65 If the replacement cost approach is used, the Commission must decide what level of optimisation to apply, and must then apply a depreciation methodology to derive the current ODRC from the ORC.
- 1.66 The Commission considers that pricing, in practice, involves many pragmatic considerations and commercial judgements. The Commission would not necessarily consider a specific price path to be inefficient merely because it differed from a price path consistent with ODRC with tilted annuity depreciation, or from a price path consistent with historical cost valuation with straight line depreciation. Nevertheless, the Commission must establish some benchmarks for efficient price paths in order to determine whether there is evidence of monopoly pricing, and to assess the net benefits of control.

### ***Weighted Average Cost of Capital***

- 1.67 Weighted average cost of capital (WACC) is the weighted average cost of each new dollar of capital raised at the margin. In the simplest terms, it is the cost of debt and the cost of equity weighted by the proportion of debt and equity. Like the asset base, it is relevant both for the purpose of determining prices and for the purpose of assessing performance. It is the element of the pricing models that allows for a required rate of return to be earned by debt and equity security providers.
- 1.68 Key determinants of WACC are the risk-free rate, debt premium, market risk premium, asset beta and leverage.

### ***Risk Free Rate***

- 1.69 The risk-free rate is the interest rate that an investor would earn on a riskless investment. Rates for Government stock are usually used to approximate the risk-free rate.
- 1.70 In determining the appropriate risk-free rate, the Commission will first consider what term (maturity) of the rate to use. The alternatives are to use the maturity corresponding to the period for which prices are set, or the period of the life of gas pipeline business assets. The Commission's view is that the risk-free rate should match the term for which prices are fixed.
- 1.71 After determining the appropriate maturity date the next step is to determine how the rate is fixed. The options depend on how prices are reset. If prices are reset over a period rather than at a point in time then the options involve various risk free rates over that period, such as the ending rate, the midpoint rate, the average of the beginning and ending rates, and the average of all rates over the period. The Commission favours the latter. If prices are simply reset at some point in time then the appropriate action would be to choose the

average risk free rate over a period of one month prior to the price being reset. The Commission's approach is that a risk-free rate at a particular date should not be used.

- 1.72 After determining the appropriate maturity date the next step is to determine how the rate is set. The options depend on how prices are reset. If prices are reset over a price revision period then the options involve various risk free rates over that period, such as the ending rate, the midpoint rate, the average of the beginning and ending rates, and the average of all rates over the period. If prices are simply reset at some point with no revision period then the appropriate action would be to choose the average risk free rate over a period of one month prior to the price being reset. The Commission's approach is that a risk-free rate at a particular date should not be used.

### *Debt Premium*

- 1.73 The debt premium determines the premium over and above the risk-free rate that is required by investors for holding the debt. It reflects marketability, expected default losses and compensation for risk (return deviating from that expected).

### *Market Risk Premium*

- 1.74 The Tax-Adjusted Market Risk Premium (TAMRP) represents the additional premium that investors require to hold the market portfolio—a diversified basket of 'risky' assets—over and above the returns that can be obtained from investing in risk-free assets subject to adjustments for personal taxes.
- 1.75 A number of approaches can be used to estimate TAMRP. The common approach is to observe ex-post risk-free rates, tax rates, and market returns, and calculate an arithmetic average over a number of years. Other methods involve: estimating the relationship between TAMRP and market volatility changes over time; estimating the TAMRP consistent with the current value of shares and expected growth in market dividends; and considering estimates of the TAMRP for foreign markets.

### *Beta*

- 1.76 Risk relates to the possibility that return may deviate from the expected return. The total risk of an asset or business is made up of both diversifiable risk and undiversifiable risk.
- 1.77 Looking at an entity such as an asset in a portfolio, the beta of an entity measures the sensitivity of an entity's cash flows to changes in the economy that impact on asset values and returns (not the specific risk associated with investing in a particular company). It is a relative concept and specifically measures the sensitivity of returns to changes in the returns of the market. The higher the beta, the more volatile and risky the asset.

- 1.78 Beta may or may not be capable of being estimated directly. Betas can only be directly estimated for listed companies, and only with any degree of accuracy where there is data for a significant period and for a significant number of entities. Where a beta cannot be estimated directly, a proxy or surrogate beta can be estimated by making adjustments for differences in gearing to the betas of entities or assets with similar activities and risks.
- 1.79 Characteristics important in assessing the suitability of comparators include the nature of the firm's output, the nature of the customer, the duration of any contracts with customers, the extent of any regulation, degree of monopoly (e.g., as reflected in the price elasticity of demand), the nature of options for expansion, operating leverage, market weight, and capital structure.

### *Leverage*

- 1.80 If a company has no debt—is entirely financed by equity—its asset and equity beta are identical. By adding debt to a company's capital structure, the shareholding becomes more risky, such that its equity beta is greater than its asset beta. The level of systematic risk associated with equity (the equity beta) is magnified according to the proportion of debt in the funding mix. The greater the proportion of debt, the greater the systematic risk associated with the residual cashflows available for distribution to shareholders, and the greater difference between its asset and equity beta. For otherwise identical investments, a company with more debt in its capital structure will have a higher equity beta and a higher required rate of return on equity than a company with less debt.
- 1.81 A leverage rate is used to determine the cost of equity, and also to weight the costs of debt and equity to derive WACC. The leverage (or debt) ratio reflects the proportion of total assets that are funded by debt (as opposed to equity).
- 1.82 A number of alternatives exist to determine the appropriate debt ratio. The Commission considers that actual leverage ratio—based on the market values of debt and equity at the time prices are set—is the most appropriate ratio to use (and is consistent with use of a firm's actual costs).

### ***Operating and Capital Expenses***

- 1.83 Under the building block approach, determining efficient revenues involves determining efficient levels of operating and capital expenditures.
- 1.84 The Commission proposes to draw inferences about the relevant capital and operating expenditures from disclosed financial statements and other sources where necessary. The Commission may also engage consultants to review the efficiency of past operating and capital expenditures.
- 1.85 Similarly, the Commission may review forecast expenditures by each gas pipeline business, and may adjust them as necessary to determine a level of expenditures consistent with efficient prices.

### ***Benefits and Costs of Control***

- 1.86 The Commission considers a recommendation that control should be declared must be supported by evidence that control would be in the interests of acquirers. In practice, this means the Commission must assess the net benefits to acquirers of control (the factual) relative to the situation with no control (the counterfactual). This is essentially the statutory test provided in s52(b), which may be called the “net acquirers’ benefit test”.
- 1.87 However, the terms of reference for the Inquiry require the Commission to also undertake a net public benefit test, as distinct from a net acquirers’ benefit test. The difference between these two tests is explained in the main report under the section titled ‘Benefits and Costs of Control’. In summary, a net public benefit analysis considers net total welfare effects. Under this analysis, any deadweight efficiency loss due to allocatively inefficient prices would count as a net public detriment, but any transfer of wealth from consumers to suppliers (or vice versa) would not.
- 1.88 The net benefits of control (whether to acquirers or to the public) are estimated by directly comparing the factual with the counterfactual. The Commission’s proposed approach follows that taken in the Airports Inquiry, namely:
- identifying the potential benefits of control, for which the starting point is the performance of the counterfactual relative to the workable competition benchmark;
  - acknowledging that not all of those benefits would be realised in the factual (control); and
  - identifying the additional costs that might be incurred in the factual, which include the additional administration and compliance costs (direct costs) and inefficiencies that may be caused by behavioural responses to control (indirect costs).

### ***Benefits of Control***

- 1.89 The potential benefits of control relate to reducing any inefficiencies (allocative, productive and dynamic) and/or excess returns in a market. An analysis of performance in the counterfactual compared to an efficiently operating market could be used to measure these benefits. However, it cannot be assumed that all of the potential benefits would actually be realised in practice through the imposition of control.
- 1.90 A useful starting point for the analysis of the benefits of control remains the inefficiencies that may be present in the counterfactual. The sources of potential benefit include:
- allocative inefficiency being reduced (with the resulting lower prices passed on to consumers). Inefficient levels of service quality for the price charged could also be addressed through control. There may also be indirect or spill-over benefits from any lower prices to related markets;

- excess returns being reduced , with a transfer of wealth from suppliers to consumers (being a net benefit to acquirers). The increase in consumers' wealth is matched by a reduction in suppliers' wealth (resulting in zero net public benefit);
- productive inefficiency being reduced by control (with resulting cost savings likely to be passed on to consumers in lower prices); and
- dynamic inefficiency being reduced by control, because of better utilisation/allocation of resources. This would benefit New Zealand and potentially lower required revenue from gas services (to cover costs) likely leading to lower prices for end use consumers.

1.91 The sources of potential benefits are discussed in the main report under allocative, productive and dynamic efficiency effects.

### *Costs of Control*

1.92 There are already significant costs arising from the present regulatory regime, which are expected to persist into the future (in the counterfactual situation). For the purpose of this Inquiry, it is the additional costs of control over and above those currently incurred that are relevant to determining whether control should be introduced.

1.93 In general, the costs of control comprise direct and indirect costs. The direct costs of control include:

- the compliance costs of the regulated entities and other market participants involved in the regulatory process (e.g. the cost of staff time, the information supply costs, the diversion of time of senior executives); and
- the administrative costs of the regulatory body.

1.94 The indirect costs of control are related to the inefficient forms of behaviour stimulated by control, and can theoretically include:

- the distortions to behaviour caused by the potential for poor, or uncertain, regulatory decision making (in terms of allocative, productive and dynamic inefficiencies);
- the scope given for opportunistic behaviour on the part of the regulator and the regulated firm; and
- the potential for regulatory capture (with the regulator coming to serve particular groups' interests), and a subsequent movement away from efficient outcomes.

1.95 The Commission considers that the costs of control can only be assessed when the nature of that control is made explicit. In calculating the costs of control, the Commission propose to use price cap regulation, as this is one of the more common forms of regulatory control overseas. Use of this form of control, for the purpose of estimating the costs of control, should not be seen as

predetermining the form of control that the Commission would employ if control were declared.

- 1.96 The Commission considers that the direct costs of control can be evaluated more generically, although reference to price cap forms of control will be made as necessary. The indirect costs of control are more dependent on the form of control used and how it is applied, and price cap forms of control are evaluated more closely in this regard.
- 1.97 The direct costs of control fall on market participants (compliance costs) and the regulator (and ultimately on the public). The direct costs of control for all parties occur largely at the time of price reviews and price-resetting. At these times, the costs may be substantial. At other times, the regulatory body largely has a monitoring role, while the regulated entity must ensure that compliance is maintained.
- 1.98 The indirect costs associated with regulation are difficult to quantify. Any approach to measuring indirect costs can be done, at best, only on a fairly arbitrary basis. The Commission considers that, in the absence of any superior alternatives, the indirect costs of control can largely be measured by considering how much of the benefits of control can be realised by control.

## 2 INTRODUCTION

- 2.1 The Commerce Commission (Commission) is undertaking the Gas Control Inquiry (the Inquiry) in response to a request from the Minister of Energy (Minister) dated 30 April 2003. The letter requires the Commission to respond to the Minister by 1 November 2004. The initial request and subsequent correspondence with the Minister (the terms of reference) require the Commission to report on whether goods and services supplied by persons in markets directly related to either a natural gas transmission system or a natural gas distribution system or both (gas services) should be controlled.
- 2.2 In response to the request from the Minister, the Commission proposed a process for the Inquiry on the 30 May 2003 and invited interested parties to make submissions on that process.
- 2.3 The Commission's proposes a two stage consultative process. The first stage will focus on defining the Commission's framework for investigating the performance of the relevant sectors. The second stage will focus on application of the framework and interpretation of the associated findings.
- 2.4 As part of the first consultative stage, the Commission has released this paper (Draft Framework Paper). The Draft Framework Paper sets out the Inquiry background and presents the proposed legal and analytical frameworks to be used and seeks comment on those frameworks.
- 2.5 The legal framework contains the Commission's interpretation of the terms of reference; considers the relevant goods and services; identifies the suppliers and acquirers; and discusses the Commission's interpretation of the relevant parts of the Commerce Act 1986 (Commerce Act).
- 2.6 The analytical framework sets out the Commission's proposed approach to examining:
- the level of competition for gas services, including the definition of the relevant markets; and
  - whether control is necessary or desirable in the interests of acquirers and the public (including sections on pricing principles; asset valuation; weighted average cost of capital; operating and capital expenses; and the benefits and costs of control).
- 2.7 The emphasis of the Draft Framework Paper is on methodologies and principles. Application of these will be addressed in stage two of the Inquiry. Although it is difficult to have a strict separation of the framework and its application, the Commission considers it beneficial to have the framework issues debated at an early stage in the Inquiry. In making submissions on the Draft Framework Paper, the Commission requests submitters to concentrate on the issues addressed within the Draft Framework Paper.

- 2.8 The Draft Framework Paper refers to various sections of the Commerce Act. It does not, however, seek to set out in detail every provision of the statutory regime under Parts 4 and 5 of the Commerce Act. The Commerce Act prevails over any inconsistencies contained in, or any omissions from, the Draft Framework Paper.
- 2.9 Throughout the Draft Framework Paper the Commission has set out a number of questions to guide submissions. Interested parties are encouraged to respond to these questions, and any other matter raised in the Draft Framework Paper, in their submissions. A complete list of questions is set out in Annex 1.

### 3 BACKGROUND

#### Announcement of Inquiry

- 3.1 On 6 November 2002, the Minister stated that he will request the Commission to report on whether increased regulatory control should be introduced for gas services. Specifically the Minister noted:<sup>2</sup>

There has been significant debate over whether gas pipeline prices are excessive. Some commentators believe that there is evidence that monopoly rents have been received by at least the main pipeline owners. However the issues are not straightforward, and there is room for debate.

A formal inquiry by the Commerce Commission under section 56 of the Commerce Act offers the best way of dealing with the various monopoly issues, including appropriate asset valuation. The Government will be asking for an inquiry covering all gas transmission and distribution pipelines, including the Maui pipeline. Such an inquiry is expected to take 18 to 24 months.

- 3.2 The announcement by the Minister was followed by an official request to the Commission on 30 April 2003.

#### Request for Inquiry

- 3.3 Section 56 of the Commerce Act allows the Commission to report to the Minister of Commerce (in this case the Minister of Energy)<sup>3</sup> on whether or not an Order in Council under section 53 of the Commerce Act should be made.
- 3.4 On 30 April 2003 the Commission received a request from the Minister to undertake the Inquiry. The request from the Minister was clarified following a letter from the Commission to the Minister on 20 June 2003 and the Minister's reply to that letter dated 9 July 2003. The Minister's letter of request, the Commission's letter of clarification and the Minister's reply to that letter make up the terms of reference for the Inquiry.
- 3.5 The terms of reference require the Commission to report under section 56 as to whether an Order in Council under section 53 of the Commerce Act should be made in relation to the goods and services supplied by persons in markets directly related to either a natural gas transmission system or a natural gas distribution system or both (gas services).

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<sup>2</sup> Pete Hodgson: Gas pipeline monopolies under investigation. [www.beehive.govt.nz](http://www.beehive.govt.nz). 6 November 2002

<sup>3</sup> The authority for the Minister of Energy to request this inquiry is section 13 of the Ministry of Energy (Abolition) Act 1989. That section directs the Minister of Energy to exercise and perform the powers and duties conferred on the Minister of Commerce under sections 53, 54 and 56 of the Commerce Act 1986 with respect to specified classes of goods and services. An Order in Council has been made declaring that section 13 of the Ministry of Energy (Abolition) Act 1989 applies to gas services.

- 3.6 Section 53 of the Commerce Act allows the Governor-General, by Order in Council, on the recommendation of the Minister of Commerce (in this case the Minister of Energy) to declare that specified goods or services may be controlled.
- 3.7 In reaching its view on whether control should be introduced the Commission is to advise the Minister on:
- whether gas services may be controlled in terms of section 52 of the Commerce Act;
  - the methodology that the Commission considers appropriate for valuation of pipeline assets for the purposes of its advice on the matters covered by the terms of reference;
  - the net benefits to the public of control; and
  - any other matter that the Commission may think relevant to a decision on whether control should be introduced.
- 3.8 If the Commission recommends that gas services should be controlled, the Minister requires the Commission's specific advice on the technical provisions relating to declaration of control as set out in section 57A of the Commerce Act.

### **Inquiry Process**

- 3.9 In response to the request from the Minister, the Commission released a proposed process for the Inquiry on 30 May 2003 and invited interested parties to make submissions on that process. After careful consideration of the submissions received the Commission has adopted the process detailed in the following table.

<b>Item</b>	<b>Indicative Date</b>
Proposed process released by Commission	30 May 2003
Written submissions on proposed process due	16 June 2003
Draft Framework Paper released by Commission	16 July 2003
Commission's Process released	
Gazette notice published pursuant to s57(2) of the Commerce Act	25 July 2002
Written submissions on Draft Framework Paper due	15 August 2003
Conference on Draft Framework Paper	1-5 Sept 2003
Cross submissions following conference due	19 September 2003
Draft Report released by Commission	March 2004

Written submissions on Draft Report due	April/May 2004
Conference on Draft Report	May/June 2004
Cross submissions following conference	June 2004
Final Report provided to Minister of Energy	By 1 Nov 2004

- 3.10 The process draws on that used by the Commission for the Airports Inquiry (completed in August 2002) and the Commission's general procedure for determining authorisation applications under the Commerce Act.
- 3.11 A key change compared to the process for the Airports Inquiry, is the release of the Draft Framework Paper in the early stages of the Inquiry, along with the request for submissions and a conference on that paper.

### ***Gazette Notice***

- 3.12 Section 57(2)(a) of the Commerce Act provides that, before making any report under section 56 of the Commerce Act, the Commission must publish its intention to do so in the Gazette and in any other manner (if any) that the Commission considers appropriate.
- 3.13 In accordance with this section the Commission will publish its process in the Gazette at the earliest possible opportunity.

### ***Framework Submissions and Conference***

#### ***Submissions***

- 3.14 Submissions on the Draft Framework Paper will be accepted by the Commission until noon, Friday 15 August 2003.
- 3.15 Submission requirements are:
- 25 hard copies should be supplied. Submitters need only staple in the top left corner, as spiral or spine bound copies will be unbound for ease of producing additional copies if required;
  - in addition to hard copies, electronic copies of submissions should ideally be sent in .pdf format, although Word is equally acceptable. Written or non PC-generated submissions will be scanned by Commission staff and automatically converted to .pdf;
  - all submissions will be published on the Commission's web site (for confidential information see the section titled 'Confidentiality'); and
  - submissions must show the organisation's name and address, date and be duly signed. In the case of personal submissions, a contact address and telephone number is required, and the submission is to be signed with the submitter's name printed beneath the signature. Personal submissions will

have their contact address and telephone number removed for the purpose of publishing on the Commission's web site, only their name will be disclosed.

3.16 Hard copies of submissions should be mailed to:

Gas Pipelines Inquiry  
Commerce Commission  
PO Box 2351  
Wellington  
electronic copies to;  
gaspipelinesinquiry@comcom.govt.nz

### *Conference*

3.17 Following submissions, the Commission will hold a conference on the Draft Framework Paper between 1 and 5 September 2003.

3.18 Submitters wishing to orally present at the conference will be required to furnish additional information as follows:

- presenters' name(s), position title(s), and their organisation(s);
- contact number(s), preferably a mobile number, in case of urgent rescheduling needs;
- oral presentation duration time required (time for questions and breaks will be added when planning the final conference timetable);
- two presentation time preferences;
- presenters are required to provide 40 hard copies of their oral presentation, and to make them available at the time of presenting at the conference; and
- where material is presented at the conference that is additional to the original submission, an electronic version is also required or the hard copy made available at the conference will be scanned for publishing on the Commission's web site under 'Conference Transcripts and Presentation Material'.

3.19 A conference procedure notice will be released closer to the conference time reiterating the above requirements.

3.20 Cross-submissions will be accepted following the conference with a closing time of noon, Friday 19 September 2003. Cross-submission requirements will closely follow submission details and will also be specified in the conference notice.

### *Role of Experts*

3.21 The Commission considers the role of experts to be as experts in their fields, and they should not act as an advocate for any particular party. If the

Commission considers that experts are in fact acting as advocates for a particular party their submission may be treated as though they are part of that particular party's submission, rather than as an expert opinion.

### *Confidentiality*

- 3.22 Requests for confidentiality are discouraged. The Commission must be able to test all information to the maximum extent possible, which requires public disclosure. However, the Commission recognises that there will be instances where information may genuinely be confidential.
- 3.23 In such instances confidential information will normally be available for inspection by the independent legal advisors of interested parties. Such confidential information will also be available to any independent experts employed by those parties. Legal advisors and experts must give the Commission an appropriate written undertaking to ensure that such information will remain confidential, and will not be disclosed by legal advisors or experts to third parties, including the parties they represent.
- 3.24 The Commission requires parties, where at all possible, to provide a 'public version' of confidential material, which at least conveys the thrust of the material (or argument) without disclosing sensitive information. This public version should be given to the Commission when an application for confidentiality of that information is sought.

### **Related Commission Work**

- 3.25 The Commission's role in the Inquiry may be compared with its regulatory functions in other sectors, particularly:
- its recent Inquiry into airfield activities at Auckland, Wellington and Christchurch international airports (the "Airports Inquiry");
  - the development and implementation of a targeted control regime for large electricity lines businesses; and
  - its obligations to make determinations in respect of designated access services and specified services in the telecommunications sector.
- 3.26 This section highlights similarities and differences between this Inquiry and these other regulatory functions.

### ***Airports Inquiry***

- 3.27 On 26 May 1998 the Minister of Commerce requested the Commission to report, pursuant to Part IV of the Commerce Act, as to whether any of the airfield activities supplied by three international airports – Auckland, Wellington and Christchurch – should be controlled. The request was revised on 25 July 2001.

- 3.28 The Airports Inquiry was the first Part IV Inquiry undertaken by the Commission under the Commerce Act. The Commission reported to the Minister of Commerce on 1 August 2002, with the following recommendations (in summary):
- competition is limited in the relevant markets;
  - a declaration of control would be in the interests of acquirers in respect of Auckland International Airport;
  - a declaration of control would not be in the interests of acquirers in respect of Wellington and Christchurch International Airports.
- 3.29 The Minister announced on 23 May 2003 that, having considered the Commission's report and other matters, control would not be declared in respect of airfield activities at any of the three airports.<sup>4</sup>

### ***Electricity Lines Sector Regulation***

- 3.30 Part 4A of the Commerce Act, which came into effect on 8 August 2001, requires the Commission to develop and implement a targeted control regime applying to large electricity lines businesses ('lines businesses'). Subpart 1 of Part 4A requires the Commission to:
- set thresholds for the control of lines businesses, after consulting on possible forms of thresholds;
  - assess lines businesses against the thresholds and identify any lines business that breaches the thresholds;
  - determine whether or not to declare control of any goods or services supplied by any of the lines businesses so identified; and
  - in respect of each identified lines business, either make a control declaration or publish reasons for not making a control declaration.
- 3.31 The Commission consulted on possible thresholds, and on 31 March 2003 decided to set two thresholds – a price path threshold and a quality threshold. The Commission subsequently set thresholds applicable from 6 June 2003 and will assess lines businesses against them, in the first instance, as at 6 September 2003.<sup>5</sup>
- 3.32 The Commission plans to re-set thresholds to apply to Transpower New Zealand Ltd from 1 July 2004, and to other lines businesses from 1 April 2004. To that end the Commission has released a discussion paper on how the price path threshold might be re-set.<sup>6</sup> At this stage, the Commission is minded to re-set the price path threshold applying to distribution lines businesses (i.e., lines businesses other than Transpower) with reference to comparative benchmarking analysis of their relative price efficiency.

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<sup>4</sup> Refer to: [http://www.med.govt.nz/buslt/bus\\_pol/airports/decisions/](http://www.med.govt.nz/buslt/bus_pol/airports/decisions/)

<sup>5</sup> New Zealand Gazette of Thursday 5 June 2003: Commerce Act (Electricity Lines Thresholds) Notice 2003.

<sup>6</sup> Commerce Commission, 30 May 2003, Discussion Paper – Resetting the Price Path Threshold.

- 3.33 Any lines business identified as having breached the thresholds set by the Commission may become subject to an investigation. The Commission anticipates the framework for such an investigation could be broadly similar to the framework proposed in this paper for the Inquiry.
- 3.34 The processes by which control may be declared in respect of electricity lines businesses and in respect of gas pipelines businesses have important similarities and differences, which may be summarised as follows:

Part 4A Process (applicable to electricity lines businesses)	Part IV Process (applicable to the Inquiry)
Commission may initiate an inquiry in respect of a lines business it has identified as having breached thresholds set by the Commission.	Minister initiates an inquiry by requesting the Commission to make recommendations.
Commission considers whether or not control should be declared.	Commission considers whether control may be declared and recommends whether control should be declared.
Commission decides whether control should be declared.	Minister decides whether control should be declared.

- 3.35 Setting thresholds and periodically assessing electricity lines businesses against them is part of a special-purpose monitoring regime under the Commerce Act, and is therefore not directly comparable to this Inquiry. However, this Inquiry is comparable to the process the Commission may follow after identifying any lines business in breach of thresholds.

### ***Telecommunications Sector Regulation***

- 3.36 The Commission has three major functions under the Telecommunications Act 2001, being to:
- resolve access disputes between carriers;
  - oversee the telecommunications service obligations (TSO) regime and apportion the annual costs between carriers; and
  - monitor the regulatory regime, and recommend to the Minister changes (either additions, modifications or amendment) to the list of regulated services.
- 3.37 The Commission considers applications for determinations to resolve disputes relating to access terms and conditions. An access seeker, or a provider of a designated or specified service, may apply to the Commission to determine access pricing and other terms for designated and specified services as well as designated multi-network services. The Commission will issue determinations, setting the terms and conditions of access in the case of designated and specified services, and specifying the functions and cost formula for specified multi-network services.

- 3.38 The Commission is required annually to identify and determine the allocation of specified TSO costs relating to local residential telephone services between liable telecommunications companies.
- 3.39 The Commission annually assesses whether telecommunications service providers (currently Telecom NZ Limited) have complied with the conditions contained in the TSO Deed, and reports to the Minister on non-compliance. The Commission also provides a copy of the report on non-compliance to the relevant telecommunications service provider. Non-compliance will be considered during the Commission's allocation of costs of the TSO to all liable persons.
- 3.40 In comparison with this Inquiry, the Commission's regulatory functions described above in the telecommunications sector are more akin to authorising revenues, prices or quality standards following a declaration of control under Part V of the Commerce Act. Accordingly these functions are not directly comparable to this Inquiry.
- 3.41 The Telecommunications Act also provides for the Minister of Communications to request the Commission to prepare a report on whether additional telecommunications services should be designated or specified, or whether existing classifications should be amended. This function is comparable to this Inquiry, but to date the Minister of Communications has made no such requests.

### **Summary**

- 3.42 Of the three functions identified above, the Airports Inquiry has the most direct relevance and similarity to this Inquiry. In both cases the Commission was asked by Government (the Minister of Commerce in the case of airports and the Minister of Energy in the case of gas services) to recommend whether control should be declared. In both cases, the decision to declare control rests with the relevant Minister, who may take into account a broader set of considerations than is available to the Commission when making its recommendations.
- 3.43 Accordingly, in preparing this Draft Framework Paper, the Commission has drawn extensively on the framework it developed and applied in the Airports Inquiry.
- 3.44 Although the Commission's regulatory functions in the electricity lines sector and the telecommunications sector are not directly comparable to this Inquiry, the Commission nevertheless expects to draw on its experiences with those regimes where relevant (for example in relation to questions of efficient pricing, asset valuation, and weighted average cost of capital).

## Industry Information

- 3.45 Background information on the gas industry is available on a number of industry participant websites and the website for the Ministry of Economic Development (MED) ([www.med.govt.nz](http://www.med.govt.nz)).
- 3.46 The information on the MED website includes a government initiated review of the New Zealand gas sector prepared by ACIL Consulting<sup>7</sup>; gas sector review papers titled ‘Background’, ‘Market Structure and Economic Regulation’, and ‘Open Access to the Maui Pipeline’; and the Government Policy Statement on the development of New Zealand’s gas industry.

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<sup>7</sup> ACIL Consulting, “Review of the New Zealand Gas Sector, A Report to the Ministry of Economic Development”, October 2001.

## 4 LEGAL FRAMEWORK

- 4.1 The purpose of this section is to set out the terms of reference, identify the key parties and set out the statutory framework for the Inquiry.

### Terms of Reference

- 4.2 Section 53 of the Commerce Act allows the Governor-General, by Order in Council, on the recommendation of the Minister of Commerce to declare that specified goods or services be controlled. The Minister of Commerce must not make a recommendation unless he or she is satisfied that the goods or services may be controlled under s 52.
- 4.3 Section 56 allows the Commission to report to the Minister of Commerce on whether or not an Order under s 53 should be made. The Commission may report on its own initiative or following a request from the Minister of Commerce. Where the Minister of Commerce makes a request, it must be in writing and must specify the date by which the Commission must report.
- 4.4 Under s 54, the Minister of Commerce may require the Commission to advise on thresholds that would assist in assessing whether goods or services should be controlled.
- 4.5 For the purposes of the Inquiry, the Minister can, pursuant to s 13 of the Ministry of Energy (Abolition) Act 1989, exercise and perform the powers and duties conferred on the Minister of Commerce under ss 53, 54 and 56 of the Commerce Act with respect to the prices of specified classes of goods and services. An Order in Council was passed under s13 of the Ministry of Energy (Abolition) Act providing that gas services are services to which s 13 applies.<sup>8</sup> According to that Order in Council, “gas services” includes services in connection with either or both gas transmission or gas distribution.

### ***Notice from the Minister and Subsequent Communication***

- 4.6 The Commission is undertaking the Inquiry in response to a request from the Minister on 30 April 2003. The letter provided as follows:

The purpose of this letter is to request the Commission to report to me no later than 1 November 2004 on whether or not an Order in Council under section 53 of the Act should be made in relation to the goods and services connected with either gas transmission or gas distribution or both (“gas services”). For the avoidance of doubt, “bypass” pipelines and pipelines owned by Maui Development Limited are to be included...

In reaching its view on whether control should be introduced, I ask for the Commission’s specific advice on:

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<sup>8</sup> Energy Services (Gas) Order 2003. Appendix 1 comprises a copy of this order.

- whether gas pipeline services may be controlled in terms of section 52 of the Act;
- the methodology that the Commission considers appropriate for valuation of pipeline assets for the purpose of its advice on the matters covered in this letter;
- the net benefits to the public of control; and
- any other matter that the Commission may think relevant to a decision on whether control should be introduced.

If the Commission recommends pipeline services should be controlled, I also request the Commission's specific advice on the technical provisions relating to declaration of control as set out in section 57A of the Act.

4.7 The Commission wrote to the Minister on 20 June 2003 to confirm its interpretation of certain terms referred to in his letter of 30 April 2003.

4.8 The Minister responded on 9 July 2003 confirming the Commission's interpretation of his letter of 30 April 2003. In particular, the Minister stated:

- The references to "gas pipeline services" and "pipeline services" to mean "gas services" as explicitly defined.
- "Gas" to mean natural gas, and only that gas. Liquefied petroleum gas (LPG) was not intended to be covered by the inquiry.
- "Connected with" to mean "supplied by persons in markets directly related to". Goods or services physically connected with gas transmission and distribution pipelines that may include goods and services not owned or operated by owners of gas pipelines were not intended to be covered by the review.
- "Gas transmission or gas distribution" to mean "a gas transmission system or a gas distribution system" where "transmission system" and "distribution system" are defined in the Gas (Information Disclosure) Regulations 1997 and the Gas Act 1992 respectively. Small-scale pipelines such as those in commercial buildings were not intended to be covered by the review.
- "Pipelines owned by Maui Development Limited" to mean only those pipelines owned by Maui Development Limited (MDL) that form a gas transmission or distribution system (or part thereof). Other pipelines owned by MDL that are not part of a transmission system or distribution system were not intended to be covered by the inquiry."

4.9 The terms of reference for the Inquiry consist of the original letter of request dated 30 April 2003, the Commission's letter seeking clarification dated 20 June 2003 and the Minister's reply dated 9 July 2003.

### ***Goods and Services Covered by the Terms of Reference***

4.10 With respect to the goods and services to be covered by the Inquiry the terms of reference state:

...whether an Order in Council under section 53 of the Act should be made in relation to the goods and services supplied by persons in markets directly related to either a natural gas transmission system or a natural gas distribution system or both (“gas services”)

- 4.11 The Commission is aware that gas services as defined in the terms of reference will consist of a number of services.

1. What services are included in “gas services”?

## Identification of Suppliers

### *Transmission*

- 4.12 The gas transmission system transports gas at high pressures<sup>9</sup> from the outlets of gas field processing plants to large industrial and commercial consumers in the gas wholesale market, NGC’s transmission network and local gas distribution systems.
- 4.13 The transmission pipelines that the Commission is aware of are identified in the table below.

Company	Pipe Systems
NGC	South, North, Kapuni to Rotowaro, Bay of Plenty, Morrinsville, LTS, Frankly Road
Maui Development Limited (Shell, Todd, OMV)	Oaonui to Huntly (Maui pipeline)
Todd Energy	Kapuni to Hawera
Swift Energy	Rimu to NGC South, Waihapa to New Plymouth and TCC power stations
Westech Energy	Surrey Road to NGC LTS

- 4.14 The Commission is aware that NGC is currently the only transmission business that provides third party access to its transmission system. However, Maui Development Limited is currently working through a proposal to offer a service to transport third party gas on the Maui pipeline.

2. What transmission businesses (systems) should be covered by the Inquiry and why?

<sup>9</sup> Transmission systems generally operate at pressures over 2000 kPa

### **Distribution**

4.15 Gas distribution systems transport and distribute natural gas from transmission pipeline gate stations (used for isolation, pressure reducing and metering) to the meters of end consumers. There are five gas distribution businesses operating within the North Island, which the Commission considers to be covered by the Inquiry. The table below shows the locations where each company owns distribution systems.

Company	Region
NGC	Northland, Whangaparoa, South Auckland, Waikato, Bay of Plenty, Rotorua Taupo, Gisborne, Kapiti Coast
Powerco	Napier and Hastings area, Southern Hawkes Bay, Taranaki, Manawatu, Levin and Foxton, Hutt/Mana and Wellington
Vector	Greater Auckland, Tuakau and Ramarama
Wanganui Gas	Wanganui/Rangitikei
Nova Gas	Wellington, Porirua, Hutt Valley, Hastings, Hawera, Papakura and Manukau City

4.16 The Commission considers that the distribution businesses (systems) identified above will be subject to the Inquiry.

3. What other distribution businesses (systems) are covered by the Inquiry?

### **Identification of Acquirers**

4.17 There are many acquirers of the relevant gas services. The acquirers expected to be the major information providers are:

- Contact Energy;
- Genesis Energy;
- Ballance Agri-Nutrients;
- Petroleum Exploration Association of New Zealand;
- e-Gas Ltd;
- Fonterra Dairy Coop Group;
- Small business consumers; and
- Residential consumers.

4. What other key acquirers should be involved in the Inquiry?

### ***Other Key Parties to the Inquiry***

- 4.18 In addition to the suppliers and acquirers, the Commission expects a range of other key parties to participate in the Inquiry.

### **Control Provisions – Part IV**

- 4.19 The control provisions, as detailed in Part IV of the Commerce Act, provide for the imposition of control over the supply of goods and services by Order in Council (Order).
- 4.20 The Commission, of its own initiative, or following a request from the Minister<sup>10</sup> (s 56(3)), may report (to the Minister) on whether it considers that goods or services should be controlled (s 56(1)). In considering (making) such a report, the Commission may have regard to all matters it considers necessary or desirable (s 56(2)).
- 4.21 The Governor-General may make an Order controlling the supply of goods or services on the recommendation of the Minister (s 53(2)). The Minister must not make such a recommendation unless satisfied that the requirements of s 52 are met (s 53(3)). Section 52 provides that goods or services may be controlled if they are, or will be, supplied or acquired in a market in which competition is limited or is likely to be lessened (s 52(a)), and that it is necessary or desirable to impose control, either in the interests of persons acquiring the goods or services (s 52(b)(i)), or in the interests of suppliers of the goods or services (s 52(b)(ii)).
- 4.22 The Minister may also request that the Commission advise on thresholds that it considers would assist in assessing whether the requirements under s 52 are satisfied (s 54).
- 4.23 Goods or services subject to control may be identified by a description of the goods and services, or by a description of the kind or class to which the goods or services belong (s 57A(1)). The control may apply to goods or services supplied in or for delivery within specified regions, areas, or localities in New Zealand; supplied in different quantities, qualities, grades, or classes; or supplied by or to or for the use of different persons or classes of persons (s 57A(2)).
- 4.24 If an Order has been made, controlled goods or services cannot be supplied unless an authorisation (or an undertaking) has come into effect in respect of the supply of those goods and services, and the supply is in compliance with the authorisation (or undertaking) (s 55). The Commission is responsible for making such authorisations (ss 70 and 71), or accepting such undertakings (s 72).

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<sup>10</sup> Where the Minister of Energy can exercise and perform the powers and duties of the Minister of Commerce under ss 53, 54 and 56 of the Commerce Act, the ‘Minister’ is referred to for the sake of convenience.

## **The Form of Control – Part V**

- 4.25 Following any Order, Part V of the Commerce Act provides for the administration of control. Section 70(1) empowers the Commission to make an authorisation of all or any component of the prices, revenues, or quality standards relating to the supply of the controlled goods or services, using whatever approach it considers appropriate.
- 4.26 In exercising its powers under s 70(1), the Commission must have regard to (s 70A):
- the extent to which competition is limited or is likely to be lessened in respect of the controlled goods or services;
  - the necessity or desirability of safeguarding the interests of persons who acquire (whether directly or indirectly) or supply the controlled goods or services; and
  - the promotion of efficiency in the production and supply or acquisition of the controlled goods or services.
- 4.27 The Commission notes that in order to undertake this Inquiry it is necessary to have regard to the net benefits to acquirers and the net benefits to the public. The Commission considers that the net benefits of control can only be assessed when the nature of that control is made explicit. However, any form of control used during the Inquiry will be preliminary and will not pre-empt any decision the Commission may make in the future regarding control when exercising its discretion under Part V.

## **Section 52 – May Control be Imposed?**

- 4.28 Section 52 of the Commerce Act provides:

Goods or services may be controlled if—

- (a) the goods or services are, or will be, supplied or acquired in a market in which competition is limited or is likely to be lessened; and
- (b) it is necessary or desirable for those goods or services to be controlled either—
  - (i) in the interests of persons acquiring the goods or services (whether directly or indirectly), if the goods or services are acquired from a person who faces limited or lessened competition for the supply of those goods or services; or
  - (ii) in the interests of suppliers, if the goods or services are supplied to a person who faces limited or lessened competition for the acquisition of those goods or services.

- 4.29 The Minister’s letter of 30 April 2003 specifically refers to s 52:

...whether gas pipeline services may be controlled in terms of section 52 of the Act.

### ***Is Competition Limited or Likely to be Lessened?***

4.30 The first matter the Commission must address is whether competition is ‘limited or is likely to be lessened’ in the market for the supply of gas services.

#### ***Competition***

4.31 ‘Competition’ is defined in s 3(1) of the Commerce Act to mean “workable or effective competition”. The High Court in *ARA v Mutual Rental Cars (Auckland Airport) Ltd*<sup>11</sup> and *Fisher and Paykel Ltd v Commerce Commission*<sup>12</sup> approved the following formulation of workable competition:<sup>13</sup>

Workable competition means a market framework in which the pressures of other participants (or the existence of potential new entrants) *is sufficient to ensure that each participant is constrained to act efficiently* and in its planning to take account of those other participants or likely entrants as unknown quantities. To that end there must be an opportunity for each participant or new entrant to achieve an equal footing with the efficient participants in the market by having equivalent access to the means of entry, sources of supply, outlets for product, information, expertise and finance. This is not to say that particular instances of the items on that list must be available to all. That would be impossible. For example, a particular customer is not at any one time freely available to all suppliers. Workable competition exists when there is an opportunity for sufficient influences to exist in any one market which must be taken into account by each participant and which constrain its behaviour.

4.32 As to the particular elements and principles that underlie workable or effective competition, the courts in New Zealand have generally approved the Australian Trade Practices Tribunal’s discussion in *Re Queensland Co-operative Milling Association Ltd: Re Defiance Holdings Ltd*<sup>14</sup> (QCMA).

4.33 In *QCMA* the Australian Trade Practices Tribunal cited the United States Attorney-General’s observation that “the basic characteristic of effective competition in the economic sense is that no one seller, and no group of sellers acting in concert, has the power to choose its level of profits by giving less and charging more” and that “the antithesis of competition is undue market power in the sense of the power to raise price and exclude entry”.<sup>15</sup> The Australian Trade Practices Tribunal in *QCMA* stated:

Competition expresses itself as rivalrous market behaviour.

...

In our view effective competition requires both that prices should be flexible reflecting the forces of demand and supply and that there should be independent rivalry in all dimensions of the price-product-service packages offered to consumers and customers.

<sup>11</sup> (1987) 2 TCLR 141, at 166.

<sup>12</sup> [1990] 2 NZLR 731, at 757.

<sup>13</sup> Contained in Heydon, *Trade Practices Law* Vol 1 (2<sup>nd</sup> ed) Sydney, Law Book Co, 1989, page 1548.

<sup>14</sup> (1976) 8 ALR 481, 514-517. Refer the High Court decision in *Fisher and Paykel Ltd v CC* [1990] 2 NZLR 731, 759, and the Court of Appeal decision in *Tru Tone Ltd v Festival Records Retail Marketing Ltd* [1988] 2 NZLR 352.

<sup>15</sup> Report of the National Committee to Study the Anti-Trust Laws (1955).

Competition is a process rather than a situation. Nevertheless, whether firms compete is very much a matter of the structure of the markets in which they operate. The elements of market structure which we would stress as needing to be scanned in any case are these:-

- 1) the number and size distribution of independent sellers, especially the degree of market concentration;
- 2) the height of barriers to entry, that is the ease with which new firms may enter and secure a viable market;
- 3) the extent to which the products of the industry are characterised by extreme product differentiation and sales promotion;
- 4) the character of 'vertical relationships' with customers and with suppliers and the extent of vertical integration; and
- 5) the nature of any formal, stable and fundamental arrangements between firms which restrict their ability to function as independent entities.

4.34 The New Zealand Court of Appeal in *Telecom Corporation of New Zealand Limited v Commerce Commission*<sup>16</sup> confirmed the need to give weight to both structure and behaviour when examining a market environment, and confirmed that the weighting must vary according to the particular facts. Richardson J (as he then was) stated:

...structures only function through people and at the end of the day it is how participants in the market behave that counts.<sup>17</sup>

4.35 The Court of Appeal endorsed the approach of the Commission of the European Community in *re Continental Can Co Ltd*<sup>18</sup>, and said:

The approach reflects the concern for how firms behave and eschews a total preoccupation with structure.<sup>19</sup>

4.36 The five elements from *QCMA* were used by counsel as the basis for analysing competition in the relevant market both before the High Court and the Court of Appeal in *Tru Tone Ltd v Festival Records Retail Marketing Ltd*. Counsel also referred to a sixth element – 'behaviour in the market'. Both courts implicitly accepted this basis of analysis.<sup>20</sup> In discussing this analysis the Court of Appeal stated:<sup>21</sup>

The first five are the elements of market structure emphasised in the assessment of the competition process in *Re Queensland Co-operative Milling Association Ltd* (1976) 25 FLR 169, 189 and in such New Zealand cases as *Re Application by Visionhire Holdings Ltd* (1984) 4 NZAR 288. The sixth, behaviour in the market, reflects the reality that constraints on the operation of firms are a key indicator of market power.

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<sup>16</sup> [1992] 3 NZLR 429.

<sup>17</sup> *Ibid* at 444.

<sup>18</sup> (1972) CMLR D11.

<sup>19</sup> *Telecom Corporation of New Zealand Limited v Commerce Commission*, [1992] 3 NZLR 429, 444.

<sup>20</sup> High Court *Tru Tone Ltd v Festival Records Retail Marketing Ltd* (1988) 2 TCLR 525, Court of Appeal *Tru Tone Ltd v Festival Records Retail Marketing Ltd* [1988] 2 NZLR 352

<sup>21</sup> Court of Appeal *Tru Tone Ltd v Festival Records Retail Marketing Ltd* [1988] 2 NZLR 352.

- 4.37 In assessing the state of competition in the relevant markets the Commission will take into account both the structural elements of the market and the behaviour of market participants, as relevant considerations.

***Limited or Likely to be Lessened***

- 4.38 The Commission must determine whether competition in the markets for gas services is limited or is likely to be lessened. The Commission focuses on the higher test of limited, and considers it need only look at the test of ‘likely to be lessened’ in circumstances where competition is not found to be limited.<sup>22</sup>
- 4.39 The ordinary meaning of ‘limited’ applies as the term is not defined in the Commerce Act. Competition will be ‘limited’ where it is restricted. Consequently, the Commission views limited competition as denoting a restriction or impairment to workable or effective competition.
- 4.40 In applying the test of limited competition, the Commission considers the purpose of the Commerce Act, which is to promote competition in markets (for the long-term benefit of consumers within New Zealand). The control provisions of the Commerce Act are interpreted in the light of the objective of maintaining competitive and efficient markets, and also having regard to the meaning of competition in the Commerce Act as being workable or effective, but not perfect, competition.
- 4.41 The Commission’s view is that a nominal or *de minimis* restriction or impairment of competition in a market is not sufficient to satisfy the limited competition requirement. There needs to be *more than* a nominal or *de minimis* restriction or impairment of competition.
- 4.42 In determining whether workable or effective competition is limited in the relevant markets for gas services, the Commission considers the structural and behavioural elements exhibited. This involves taking into account all of the relevant factors, including: the number and relative sizes of competitors in the market; the nature of entry and of any barriers to entry that may exist; the behaviour of incumbents, and the competitive constraint that one gas pipeline business may have upon another; the existence of countervailing power of the gas pipeline businesses; and the regulatory environment within which market participants operate.

***In the Interests of Acquirers***

- 4.43 The second condition within section 52 is whether there is evidence to show that control of prices for gas services is ‘necessary or desirable’ in the interests of either the persons acquiring, or persons supplying, the specified goods or services. The Commission concludes that the relevant interests to be examined

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<sup>22</sup> The Commission interprets the phrase ‘likely to be lessened’ as describing the situation where a future event or occurrence or set of circumstances is anticipated to have an effect on competition in a market in which workable or effective competition may or may not currently be ‘limited’. It is forward looking.

within the Inquiry are those of acquirers (whether directly or indirectly) of gas services.

- 4.44 The Commission considers the reference to direct or indirect acquirers in section 52 requires an examination of the interests of direct acquirers such as gas retail businesses and large gas consumers, as well as the interests of indirect acquirers such as the end users who purchase gas from gas retail businesses.
- 4.45 The term ‘interests’ is not defined in the Commerce Act and, therefore, the ordinary meaning of the word applies. Control will be ‘in the interests of’ acquirers (as asked in section 52) where it is to their advantage or benefit. Consequently, the Commission must determine whether the imposition of control would benefit the direct and indirect acquirers of gas services.
- 4.46 In assessing whether acquirers would benefit from control, the Commission assesses the consequences of any limited competition in the relevant markets. Consequences of lack of workable or effective competition can manifest themselves in various ways including allocative, productive and dynamic inefficiencies, and inferior product quality. Lack of workable or effective competition can also lead to suppliers earning excessive returns.
- 4.47 The Commission approaches the question as to whether control is “necessary or desirable...in the interests of” acquirers by measuring the likely benefits of control that would accrue to acquirers of gas services, balancing against those the likely costs of such control that would be borne directly or indirectly by those same acquirers. Only then can it be determined whether the interests of acquirers would be met by control. The Commission considers that if the weighing of these benefits and costs demonstrates that an improvement in the economic welfare of acquirers would result, then control would be demonstrated to be necessary or desirable in the interests of acquirers.

### *Counterfactual*

- 4.48 The benefits and costs to acquirers that would be likely to flow from control of gas services in the future are assessed against a counterfactual of what might otherwise happen in the future in the absence of control. Thus, a comparison is made between two hypothetical future situations, one with control and one without. The differences between these two scenarios are then attributed to the impact of control. In framing a suitable counterfactual, the Commission bases its view on a pragmatic and commercial assessment of what is likely to occur in the absence of control.<sup>23</sup> As with many business acquisitions, the most likely counterfactual may be a continuation of the status quo, with the gas pipeline businesses operating under the present form of regulation, which includes information disclosure and an implied threat of control.

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<sup>23</sup> See the discussion in Commerce Commission, *Decision No. 277: New Zealand Electricity Market*, 30 January 1996, especially page 16.

- 4.49 However, if this Inquiry were to lead to the recommendation that control should not be imposed, and that were to be accepted by the Minister, the status quo might be affected. The constraining impact of the threat of control may (at least for a time) be reduced. This might allow the gas pipeline businesses somewhat greater latitude in behaviour, and could result in inefficiencies or excess pricing. Alternatively, that outcome could have the effect of providing a benchmark over which gas pipeline businesses would not wish to pass, for fear of resurrecting the threat of control.
- 4.50 A further consideration is that it is not possible to anticipate how other circumstances may change in the future.
- 4.51 Taking account of all of these considerations, the Commission takes the continuation of the status quo as the counterfactual, which includes an assumption that the current regulatory regime will remain, and will maintain its current level of effectiveness.

### *Acquirers*

- 4.52 Earlier in this Chapter, the Commission stated that acquirers of gas services included not only direct acquirers (gas retailers), but also indirect acquirers (end use consumers). Section 52 provides no grounds for distinguishing between New Zealand and overseas acquirers, unlike the public benefit test in section 67 of the Commerce Act, where ‘public’ is interpreted as the public of New Zealand.
- 4.53 The Commission does not consider it necessary, for the purposes of section 52, to determine the relative shares of any net benefits received by direct acquirers and indirect acquirers. This would expand the analysis beyond what is required to determine whether there are net benefits of control to acquirers.

### **Recommendations Regarding Control**

#### *Section 52 Test*

- 4.54 As noted above, the purpose of the Commerce Act is “to promote competition in markets *for the long-term benefit of consumers* within New Zealand”. Yet the Commerce Act contains provision in Part IV for imposition of controls on goods and services. The fact that the provisions in Part IV exist is recognition that markets, for whatever reasons, do not always operate efficiently or deliver competitive outcomes. For example, a market may be composed of only one supplier which may be able to exploit that position by raising prices above the competitive level, or by allowing costs to rise, or by being slow to innovate, without suffering any adverse consequences from competitors.
- 4.55 Provision exists for goods and services to be placed under control where (in terms of s 52, as discussed above) there is limited competition or competition in a market is lessened **and** it is necessary or desirable for goods or services to be controlled in the interests of acquirers. The Commission has to find

positively on both aspects in order to satisfy itself that control of goods or services may be imposed.

- 4.56 In the context of an Act designed to promote competition, control of goods or services may be seen as a measure of last resort to be introduced only where it is likely to achieve a better outcome than the uncontrolled and uncompetitive market is capable of producing. In making that assessment, account must be taken of costs that control itself will impose. It is generally accepted that, as a means of promoting competition-like outcomes, control imposes several costs: e.g., the costs of the regulator, the compliance costs on the regulated, and the market distortions flowing from imperfectly conducted control.
- 4.57 Section 52 provides that, in order to recommend control of goods or services, the Commission must satisfy itself that acquirers would benefit from control, compared to the status quo. The costs created by control (that acquirers bear) need to be outweighed by the benefits achieved by control (that flow to acquirers). The Commission considers that if the weighing of the benefits and costs demonstrates that an improvement in the economic welfare of acquirers would result, then control would be demonstrated to be necessary or desirable in the interests of acquirers. This, in turn, requires some evidence that suppliers of the relevant goods or services are actually taking advantage of the market power they possess by virtue of competition being limited. For instance, suppliers might be setting prices above the competitive level so as to earn excess returns, or operating inefficiently.

### *Public Benefits Test*

- 4.58 The former long title of the Commerce Act stated that the purpose was to promote competition in markets in New Zealand. The report from the Commerce Committee on the Commerce Amendment Bill commented that:

Currently the Act's long title implies that competition is an end in itself. This narrow view is not reflected in the body of the Act, which through such mechanisms as the 'public benefit test' takes a wider view of the impact of conduct on the wellbeing of New Zealanders as a whole. (page 5)

- 4.59 In respect of this wider view, it had been argued that, while the purpose was to promote competition in markets in New Zealand, competition should be seen as a means to an end, and that the underlying purpose of the Commerce Act was to promote economic efficiency. This approach was endorsed by the Court of Appeal in *Tru Tone Ltd v Festival Records* in stating that the Commerce Act:<sup>24</sup>

... is based on the premise that society's resources are best allocated in a competitive market where rivalry between firms ensures maximum efficiency in the use of resources.

- 4.60 The Commerce Act was amended in 1990, with the addition of s 3A, which placed greater emphasis on efficiency in the implementation of the public benefit test:

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<sup>24</sup> [1988] 2 NZLR 358.

Where the Commission is required under this Act to determine whether or not, or the extent to which, conduct will result, or will be likely to result, in a benefit to the public, the Commission shall have regard to any efficiencies that the Commission considers will result, or will be likely to result, from that conduct.

- 4.61 The current purpose of the Commerce Act (as amended on 26 May 2001) is to “promote competition in markets for the long-term benefit of consumers within New Zealand”. The report from the Commerce Committee on the Commerce Amendment Bill discussed the intention of the Commerce Act’s purpose and considered the relative weight given to ‘competition’ versus ‘efficiency’ implied by the purpose statement. It stated:

The new purpose statement is intended to make transparent the existing policy of the Act by making clear that competition is not an end in itself but a means to increasing consumer welfare in the long-term. The ultimate goal is to facilitate effective competition to promote economic growth, while accommodating the unusual situation where competition does not improve the welfare of New Zealanders as a whole. (page 7)

- 4.62 In commenting on the Commerce Act’s purpose, the explanatory note to the Commerce Amendment Bill (No. 2) also said:

The purpose statement clarifies that competition is not an end in itself, but a means to promote the long-term benefit of consumers and New Zealanders as a whole.

- 4.63 The reference to ‘long-term’ benefit to consumers within New Zealand means that an efficiency-based analysis is consistent with the Commerce Act’s purpose. In the long-term, New Zealand consumers in general will benefit from continuous improvements in the allocation of resources, the quality of products and production processes, all of which are usually encouraged by the competitive process.
- 4.64 The Commission’s view is that the purpose of the control provisions is to address circumstances where markets, due to a lack of competition, are not delivering efficient outcomes for consumers. Any recommendation on whether a declaration of control should be made should consider an assessment of the likely long-term benefit to consumers within New Zealand.
- 4.65 When adjudicating on applications for authorisations of business acquisitions and restrictive trade practices, the Commission conducts a public benefit (also referred to as a net benefit) test. In conducting such a test, and in assessing benefits and detriments, the Commission takes into account economic efficiency (under the headings allocative, productive, and dynamic efficiency) and product quality. In assessing the public benefit, the Commission assesses the potential net efficiency gains that the acquisition will achieve. Such a test does not take account of distributional issues, i.e. welfare transfers between suppliers and acquirers are not considered.

### *Applicable Test*

- 4.66 Section 52 contains two criteria for the imposition of control, focusing on monopoly pricing. However, wider considerations of economic efficiency may

also be relevant to the Minister’s discretion as to whether to recommend control. If greater weight is placed on removing monopoly profits, any recommendation of control would be based on the section 52 test. But, if greater weight is placed on achieving efficiencies, recommendations would be based on the wider public benefits test.

- 4.67 The Commission is reporting to the Minister under s 56. The two conditions in section 52 over which the Minister has to be satisfied—first, that gas services are, or will be, supplied or acquired in a market in which competition is ‘limited’ or ‘likely to be lessened’; and second, that it is ‘necessary or desirable’ to impose control in the interests of the persons acquiring gas services—are the conditions over which the Commission needs to be satisfied. The Commission must confine its consideration to the net benefits to acquirers. However, the Commission notes that the Minister in exercising his discretion may wish to take into account other factors including the Commission’s analysis of net efficiency benefits.
- 4.68 The Minister of Energy has asked the Commission to give specific advice on the net benefits to the public of control.

### **Current Regulatory Environment**

- 4.69 The operation of the gas industry and the supply of gas services in New Zealand is governed by a combination of legislation, regulations, standards and arrangements.

### **Current Legislation**

- 4.70 The current legislation, regulations and standards related to gas services are set out in the table below.

<b>Gas Industry Legislation, Regulations and Standards</b>	
Gas specific regulations and legislation	The Gas Act 1992 The Gas Regulations 1993 Gas (Information Disclosure) Regulations 1997
General legislation applying to the Gas Industry	Plumbers Gasfitters & Drainlayers Act 1976 Health Safety and Employment (HSE) Act 1992 Hazardous Substances & New Organisms Act 1996
Other related legislation	Commerce Act 1986 Fair Trading Act 1986 Building Act 1991 Building Regulations 1992 Consumer Guarantees Act 1995
Codes and Standards applicable to the Gas Industry	New Zealand Building Code 1993 New Zealand Gas Pipeline Access Code 1998 NZS 5442: 1990 Specification for reticulated natural gas

- 4.71 The regulatory framework currently employed to promote efficiency in the supply of gas services is set out in the following table.<sup>25</sup>

Category of Regulation	Current Arrangements
Competition legislation, governing certain kinds of anti competitive conduct as well as mergers or takeovers that are likely to be conducive to such conduct	Commerce Act
Access regulation providing for non-discriminatory access to certain "bottleneck assets".	<p>The New Zealand Gas Pipeline Access Code            NGCT Transmission Information Memorandum            Reconciliation Agreements            Transmission Service Agreements</p> <p>The current access arrangements have been developed on a voluntary basis in response to the provisions of the Commerce Act which "prevent a dominant firm restricting supply of a product or service which cannot be viably duplicated where this prevents competition". The amendments in to the Commerce Act in 2001 replace this concept of dominance with clauses that would prevent a firm that has "a substantial degree of power in a market" taking advantage of that power to restrict entry or preventing competition in any other market.</p>
Price regulation, to avoid monopoly pricing of access prices	<p>Information disclosure regulations, including the adoption of Optimised Deprival Value (ODV) asset valuation methodology by the gas transmission and distribution industry asset owners for disclosure purposes.</p> <p>Part IV of the Commerce Act (threat of implementation and any such inquiries and subsequent control)</p>
Regulation of safety and technical standards	Legislation, regulations and technical standards.

### **Gas Government Policy Statement**

- 4.72 Pursuant to section 26 of the Commerce Act, the Commission received (27 March 2003), from the Minister of Commerce, a Government Policy Statement (GPS) that sets out the Government's policy for the development of New Zealand's gas industry, and its expectations for industry action.
- 4.73 The GPS identifies the Government's overall policy objective for gas as:
- "To ensure that gas is delivered to existing and new customers in a safe, efficient, fair, reliable, and environmentally sustainable manner."
- 4.74 Consistent with this overall objective, the Government is seeking the following specific outcomes:

<sup>25</sup> Adapted from the ACIL Report

- gas resources are used efficiently;
- market barriers to gas exploration and field development are minimised;
- the costs of producing and transporting gas are signalled so that investors and consumers can make decisions consistent with obtaining the most value from gas;
- delivered gas costs and prices are subject to sustained downward pressure;
- the quality of gas services, and in particular trade-offs between quality and price, should as far as possible reflect customers' preferences;
- risks relating to security of supply, including transport arrangements are properly and efficiently managed by all parties;
- gas safety is promoted; and
- greenhouse gas emissions are minimised.

4.75 The GPS states that the Government favours industry led solutions where possible, but is prepared to use regulatory solutions where necessary. As a result, the Government has invited the gas industry to establish:

- a governance structure and decision-making process to manage the further development of gas market arrangements; and
- a work programme that enables the development of efficient gas market arrangements in a timely and effective manner.

4.76 Principles guiding the development of the governance structure are also detailed in the GPS.

4.77 With respect to the industry lead solutions the Government expects the industry to develop arrangements with respect to:

- production and wholesale markets - development of wholesale gas trading, secondary trading market and capacity trading arrangements;
- transmission and distribution - establishment of an open access regime across all high pressure transmission pipelines to provide access on reasonable terms and conditions; establishment of consistent standards and protocols across all distribution pipelines to provide access on reasonable terms and conditions; arrangements for the effective control and management of gas;
- retail markets - protocols for customer switching, developing arrangements for consumer complaints, development of model consumer contracts;
- gas safety - effective and internationally consistent safety standards and conventions, ensuring competency of those undertaking gas work and operation of effective self-audit, monitoring and reporting on levels of competency and safety compliance; and

- open access to the Maui Pipeline – the Government invites Maui Development Limited, NGC, Contact Energy and Methanex to present a proposal to enable open access to the Maui pipeline.

4.78 The Government plans to monitor the progress of the industry lead solutions and expects that efficient industry arrangements will be in place by December 2004.

### ***Current Regulatory Monitoring***

4.79 Economic regulation of gas pipeline businesses is currently addressed through the Gas (Information Disclosure) Regulations 1997 (the Regulations), the general competition requirements of the Commerce and Fair Trading Acts, and the threat of further regulation, including control. The Regulations require six categories of information to be disclosed. These are:

- line charges;
- contracts (agreements);
- pipeline capacity information;
- line charge (pricing) methodologies;
- financial statements and performance measures; and
- methodologies for allocation of costs, revenues, etc.

5. How effective are the current disclosure provisions?

6. Are there important aspects of performance that the current disclosure regime does not cover adequately or at all?

## 5 ANALYTICAL FRAMEWORK

### Regulation

#### *Efficiency Trade Offs*

- 5.1 The purpose of the Commerce Act is “to promote competition in markets for the long-term benefit of consumers within New Zealand”. The Commerce Act also contains provision in Part IV for imposition of controls on goods and services, recognising that markets, for whatever reasons, do not always operate efficiently or deliver competitive outcomes. For example, a market may be composed of only one supplier which may be able to exploit that position by raising prices above the competitive level, or by allowing costs to rise, or by being slow to innovate, without losing market share to competitors.
- 5.2 Provision exists for goods and services to be placed under control where (in terms of s 52) there is limited competition or competition in a market is lessened and it is necessary or desirable for goods or services to be controlled in the interests of acquirers. The Commission has to find positively on both aspects in order to satisfy itself that control of goods or services should be recommended.
- 5.3 In order to recommend control, the Commission must satisfy itself that acquirers would benefit from control, compared to the situation without control. The costs created by control (that acquirers bear) need to be outweighed by the benefits achieved by control (that flow to acquirers). In making that assessment the Commission will consider the economic efficiencies that may result from the imposition of control.
- 5.4 The three aspects of economic efficiency are:
- **Allocative efficiency**, where resources are allocated to produce the highest valued combination of outputs. Allocative efficiency would be achieved if the price paid by any user reflected the marginal costs incurred in meeting that demand;
  - **Productive efficiency**, where a given level of output is produced at the lowest possible cost and that production is distributed across businesses to minimise industry wide production and transaction costs; and
  - **Dynamic efficiency**, which concerns maintaining allocative and productive efficiency over time. In practice this means that firms have incentives to innovate and invest in new assets, products and processes at the right time, to ensure capacity matches demand.
- 5.5 It is widely accepted that competitive markets provide strong incentives for the achievement of these forms of efficiency. However, there may be a tension between the achievement of static (allocative and productive) and dynamic efficiencies. The tension is based upon the concept that if prices are

continually (on an ongoing basis) driven down to marginal cost (static efficiency) the incentive to innovate or invest (dynamic efficiency) is reduced. As a result, the Commission may need to consider such trade-offs in attempting to promote the long-term benefit of acquirers and the public.

- 5.6 Where there are tensions between short-term allocative efficiency and long-term dynamic efficiency, the Commission takes the view that the latter will generally better provide a long-term benefit to acquirers and the public and will therefore be given greater weight when considering efficiency tradeoffs. However, static efficiency will be considered in the Commission's assessments of whether control should be imposed.

### ***Regulatory Risk***

- 5.7 In undertaking its role under the Commerce Act, the Commission will need to manage the risks associated with regulatory intervention.
- 5.8 These risks can arise from:
- the administrative and other costs that industry participants will face from complying with the Commerce Act and the Commission's role under it;
  - the Commission making incorrect decisions on the basis of imperfect information;
  - regulatory decisions and processes undermining the incentives to achieve efficiency that businesses had in the absence of control; and
  - gaming of the Commission's processes by market participants.
- 5.9 The Commission is also aware that there are complex interrelationships throughout the gas industry and between the gas industry and other industries (such as the electricity industry) that could result in decisions made in one area having unintended consequences elsewhere. Industry consultation is likely to play an important part in minimising any unanticipated outcomes.
- 5.10 The Commission will manage the regulatory risks through the integrity, transparency and thoroughness of the Commission's investigatory and analytical processes, and through the consistent application of the Commerce Act.

### **Analytical Overview**

#### ***Requirements and Components of Analysis***

- 5.11 Section 52 of the Commerce Act requires the Commission to consider two key issues, being, whether gas services are supplied in a market in which competition is limited and whether control is necessary or desirable in the interests of acquirers.

- 5.12 In order to consider the first key issue (competition is limited) the Commission proposes to review the level of competition in gas services by:
- defining the markets for gas services; and
  - evaluating the level and nature of competition within those markets compared with a benchmark of workable competition.
- 5.13 In order to consider the second key issue (control necessary or desirable in the interests of acquirers) the Commission proposes to compare outcomes in the counterfactual against the likely outcomes under control. To achieve this, the Commission will:
- use a building blocks type approach (in addition to comparative performance analysis, if possible) to determine an ‘efficient level of revenue’ and therefore an ‘efficient prices’ standard for the supply of gas services. (Efficient prices in this context means the prices that are likely to be observed in a market that is workably, rather than perfectly competitive);
  - assess the current and expected behaviour of suppliers of gas services against the ‘efficient prices’ standard; and
  - analyse the benefit to acquirers (using the efficient prices standard and supplier behaviour) of imposing control relative to a counterfactual.
- 5.14 In addition to the requirements under s 52 of the Commerce Act the terms of reference require the Commission to look at the net benefits to the public of control. The Commission proposes to undertake this analysis in parallel with the analysis of the net benefits to acquirer’s analysis.
- 5.15 The components of analysis identified above are discussed in more detail under the ‘Competition’, ‘Building Blocks’, ‘Comparative Analysis’ and ‘Benefits and Costs of Control to Acquirers’ headings that follow.

### *Competition*

- 5.16 If gas services were supplied or acquired in a market or markets in which competition was limited or likely to be lessened, then section 52(a) of the Commerce Act would be satisfied.
- 5.17 To determine whether competition is limited or is likely to be lessened, the Commission will need to define the market(s) related to the supply and acquisition of gas services. In defining the market(s) for gas services the Commission will need to take into account the relationships between the gas services and other operations within the gas industry.
- 5.18 After defining the relevant market(s), the Commission will need to investigate whether any of the gas pipeline businesses are able to exercise market power in the gas services market(s), such that competition is limited or likely to be lessened. In doing this, the Commission will consider the constraints on the exercise of market power in the gas services market.

- 5.19 The proposed market definition principles, gas services markets, potential competition and existing competition are discussed in section titled “competition analysis”.

### *Building Blocks*

- 5.20 The building blocks approach involves using theoretical principles and models along with known or estimated data on the relevant costs of providing gas services to construct efficient levels of revenue and therefore, indirectly, efficient prices for gas services. This approach was used by the Commission in the Airports Inquiry and has also been proposed to determine the efficient TSO costs for local residential telephone services.
- 5.21 The construction of efficient prices through the building blocks approach involves determining:
- the relevant pricing principles for promoting efficiency;
  - the efficient level of capital required by the business (asset value);
  - the efficient rate of return of capital (depreciation);
  - the efficient rate of return on capital; and
  - the efficient level of non-capital (or operating) costs.
- 5.22 The building block components are discussed in the sections titled:
- **Pricing Principles** – addresses the relevant pricing principles for promoting efficiency;
  - **Asset Base and Valuation** – addresses the efficient level of capital required by the business and the efficient rate of return of capital (depreciation);
  - **Weighted Average Cost of Capital** – addresses the efficient rate of return on capital; and
  - **Operating and Capital Expenses** – addresses the efficient level of non-capital costs.

### *Comparative Analysis*

- 5.23 The Commission will also consider alternatives to the building blocks approach, in which inferences about efficient price levels may be drawn from comparative performance analysis of gas pipeline businesses. Such analyses could involve comparing New Zealand businesses with similar businesses in other countries. These comparisons are inevitably backward looking.

### *Benefits and Costs of Control to Acquirers*

- 5.24 Under Part IV of the Commerce Act, goods and services may be controlled if it is necessary or desirable for those goods and services to be controlled in the interests of acquirers.
- 5.25 In establishing whether control of gas pipeline businesses is in the interests of acquirers, it will be necessary to consider the net benefit of control to acquirers by assessing the benefits and costs of control. This analysis will be undertaken by comparing two hypothetical future situations, one with control and one without (the counterfactual).
- 5.26 In the Airports Inquiry, the Commission considered that, if the weighing of these benefits and costs demonstrated that an improvement in the economic welfare of acquirers would result, control would be demonstrated to be necessary or desirable in the interests of acquirers.
- 5.27 The Minister's letter of request requires the Commission to undertake a net benefit of control analysis with respect to the "interests of acquirers" (as required by s 52 of the Commerce Act) and "the public" (terms of reference). The Commission also undertook both types of analysis for the Airports Inquiry. Although both types of net benefit analysis are required for this Inquiry, the "the interests of acquirers" is the statutory test of whether control is necessary or desirable (and, therefore, the basis for the Commission's recommendations). However "the public" analysis will be conducted in parallel with the "interest of acquirers" analysis. The "Benefits and Costs of Control" section discusses how the benefits and costs of control will be determined.

## Competition Analysis

### ***Relevance to Analysis***

- 5.28 As noted earlier, control can be introduced only where goods or services are supplied or acquired in markets in which competition is limited or is likely to be lessened. It therefore follows that the definition of the relevant markets and the analysis of competition within those markets lies at the heart of any control inquiry under the Commerce Act.
- 5.29 Many of the tests established in Commission decisions and court judgements under Parts 2 and 3 of the Commerce Act on issues of market definition and competition analysis are applicable to the analysis required by a control inquiry. However, the competition threshold under Part 4 of the Commerce Act (competition is ‘limited’ or ‘lessened’) is arguably lower than the ‘substantially lessening competition’ threshold in Parts 2 and 3. Control also presents unique challenges in terms of market definition and competition analysis.
- 5.30 In undertaking its competition analysis the Commission defines markets in a way which best facilitates the analysis. It then considers such matters as:
- the number, size and strength of existing market participants, and their potential to expand;
  - the potential for new parties to enter the market; and
  - the constraint on market participants from the countervailing power of acquirers, or from the regulatory regime, or from any other source.
- 5.31 In this section, the relevant markets are delineated, and it is considered whether competition is limited in these markets in terms of section 52 of the Commerce Act.

### ***Market Definition Principles***

- 5.32 Section 3(1A) of the Commerce Act provides that:

[T]he term ‘market’ is a reference to a market in New Zealand for goods and services as well as other goods and services that, as a matter of fact and commercial commonsense, are substitutable for them.

- 5.33 The purpose of defining a market under the Commerce Act is to provide a framework within which to analyse the extent of competition, or its antithesis, which is market power. The concept of a market is thus considered by the Courts to be an instrumental one. The definition of a market is not an end in itself; rather it is an exercise to assist with the analysis of the market behaviour at issue. In *Queensland Wire* the Court stated:<sup>26</sup>

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<sup>26</sup> *Queensland Wire Industries Pty Ltd Co Ltd* (1989) 167 CLR 177.

In identifying the relevant market, it must be borne in mind that the object is to discover the degree of the defendant's market power. Defining the market and evaluating the degree of power in that market are part of the same process, and it is for the sake of simplicity of analysis that the two are separated ...

- 5.34 The process of identifying the relevant market(s) should keep the objective in mind. In the present case, the objective is to determine whether any of the gas pipeline businesses operate where competition is limited such that they have the potential to exert market power.
- 5.35 From a technical perspective, the process of establishing market boundaries can be seen as one of identifying the smallest area of product, geographic and functional space over which a hypothetical monopolist could exert a significant degree of market power. This approach focuses attention on any close substitutes that would prevent a hypothetical monopolist from exercising market power by raising its price or reducing quality. All such substitutes must be included in the market.
- 5.36 An appropriately defined market will include products that are regarded by buyers as being similar or close substitutes ('product' dimension), and in close proximity ('geographical' dimension), and are thus products to which they could switch if a single supplier were to attempt to exert market power. It will also include those suppliers currently in production who are likely, in that event, to shift promptly to offer a suitable alternative product even though they do not do so currently.<sup>27</sup>
- 5.37 In addition to the product and geographical dimensions, markets can be defined in relation to functional level, in recognition of the fact that the supply chain typically consists of a number of distinct functional levels. For example, the market between manufacturers and wholesalers might be called the 'manufacturing market', that between wholesalers and retailers is usually known as the 'wholesaling market', and that between retailers and end-customers the 'retailing market'.
- 5.38 Finally, markets may be defined in relation to time. A time element may be appropriate where trading conditions are likely to differ in identifiable ways at different future periods.
- 5.39 Despite the criteria discussed above, markets are not always easy to define in practice. Transactions in the economy do not always fall neatly into a series of discrete and easily observable markets. Hence, it may not be practical - nor, indeed, always necessary - to identify the precise boundaries of the particular activities to analyse their competitive impact. Moreover, as already noted, it is appropriate to tailor the definitions used to meet the requirements of the case in hand.

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<sup>27</sup> These have been referred to by the Commission as 'near entrants', to be distinguished from 'new entrants'. See: The Commission's Approach to Adjudicating on Business Acquisitions Under the Changed Threshold in Section 47 – A Test of Substantially Lessening Competition, Commerce Commission Practice Note 4, 2001, page 19.

## Gas Services Markets

5.40 Gas pipelines consist of high pressure transmission pipelines and the lower pressure distribution pipelines. They are considered separately below.

### Transmission

5.41 The gas transmission system transports gas at high pressures<sup>28</sup> from the outlet of gas processing plants to large industrial and commercial consumers in the gas wholesale market, NGC's transmission network and local gas distribution systems.

5.42 The transmission systems that the Commission is aware of are identified in the table below. The Commission is aware that NGC is currently the only transmission business that provides third party access to its transmission system. However Maui Development Limited is currently working through a proposal to offer a service to transport third party gas on the Maui pipeline.

**Table 1: Transmission Businesses**

Company	Pipe Systems
NGC	South, North, Kapuni to Rotowaro, Bay of Plenty, Morrinsville, LTS, Frankly Road
Maui Development Limited (Shell, Todd, OMV)	Oaonui to Huntly (Maui pipeline)
Todd Energy	Kapuni to Hawera
Swift Energy	Rimu to NGC South, Waihapa to New Plymouth and TCC power stations
Westech Energy	Surrey Road to NGC LTS

5.43 In previous decisions the Commission has recognised the high pressure gas transmission network as having natural monopoly characteristics. For instance the Commission stated in Decision No. 387, dated 17 March 2000, “the network has been characterised by high capital costs and large sunk costs and there appears to be surplus capacity in most parts of the system. New entry is considered most unlikely.”<sup>29</sup>

5.44 This situation may be changing in one important respect. As discussed elsewhere in this report, until now use of the Maui pipeline has been reserved for the delivery of Maui gas to meet the Crown's contractual obligations to supply three buyers (NGC, Contact and Methanex). However the Commission understands that moves are now underway to make the Maui pipeline an “open access” pipeline which will be able also to provide gas transmission services to other buyers and in respect of other gas.

<sup>28</sup> Transmission systems generally operate at pressures over 2000 kPa

<sup>29</sup> Commerce Commission Decision No. 387, “Natural Gas Corporation Holdings Limited and TransAlta New Zealand Limited”, 17 March 2000, p28.

- 5.45 The Maui pipeline runs alongside NGC's North pipeline between North Taranaki and Huntly. It is anticipated that open access to the Maui pipeline would greatly facilitate the transmission of gas from new Taranaki fields to northern markets. Also, and of particular relevance to the present exercise, there may be the potential for an open access Maui pipeline to compete with part of the NGC network.
- 5.46 It is recognised that there may be important practical limitations to future competition between the Maui and the NGC North pipelines. The former stops at Huntly, while the great bulk of gas consumers are in the Auckland region and they would continue to be reliant on the NGC pipeline for much of the transmission distance. Further the size and type of the two pipelines are significantly different. Nevertheless the Commission considers that it is necessary to explore the potential for competition between the two pipelines over the distance that the two pipelines are contiguous. It may be that the potential for competition in this area is sufficiently different from that applying elsewhere to justify placing the area in a discrete geographic market. Such an approach may best aid the assessment of market power.
- 5.47 The Commission has therefore adopted two discrete transmission markets for the purpose of its competition analysis:
- the provision of gas transmission services between North Taranaki and Huntly; and
  - the provision of gas transmission services for the rest of the North Island.

### *Distribution*

- 5.48 Gas distribution systems transport gas at low pressure (relative to transmission networks) from the outlet of the transmission pipelines to end use consumers. The owners of the regional distribution networks are as set out in the table below.

**Table 2 – Distribution Businesses**

Company	Region
NGC	Northland, Whangaparaoa, South Auckland, Waikato, Bay of Plenty, Rotorua Taupo, Gisborne, Kapiti Coast
Powerco	Napier and Hastings area, Southern Hawkes Bay, Taranaki, Manawatu, Levin and Foxton, Hutt/Mana and Wellington
Vector	Greater Auckland, Tuakau and Ramarama
Wanganui Gas	Wanganui/Rangitikei
Nova Gas	Wellington, Porirua, Hutt Valley, Hastings, Hawera, Papakura and Manakau City

- 5.49 Gas distribution networks have historically been viewed as natural monopolies. Typically, investments in gas pipelines are irreversible, lumpy and have a high degree of specificity meaning that infrastructure investments

are, for the very large part, sunk. High sunk costs and economies of scale have generally meant that it has not been economically viable for a competitor to duplicate an existing network. However, in limited areas, competition for distribution to large customers has developed over recent years principally through the use of bypass pipelines and recently constructed limited networks.

- 5.50 Bypass opportunities tend to be limited to areas where there is a concentration of medium to large consumers who are close to the transmission pipeline or where an existing bypass network can expand its scope or where there is an alternative source of gas (e.g. landfill gas). Incumbent network owners usually take account of the threat of bypass when setting their network charges. The threat of bypass is likely to have a greater impact on the incumbent network company if there has been experience of actual bypass in the region.
- 5.51 The Commission remains of the view that bypass and potential bypass can place an important constraint on the incumbent network company, but usually only in relatively confined areas.
- 5.52 The Commission considers that the relevant markets for gas distribution are defined by the geographic regions identified in Table 2. The characteristics of gas distribution are very similar in each region and accordingly to a large extent the Inquiry will deal with the different distribution markets collectively.

7. What are the relevant markets for gas transmission and gas distribution?
8. Are the characteristics of different distribution markets sufficiently similar that they can be considered collectively?

### ***Existing Competition***

- 5.53 The constraint on gas services prices provided by existing competition emanates from direct competition such as bypass or parallel pipelines and indirect competition through interfuel substitution.

### ***Bypass and Parallel Pipelines***

- 5.54 Bypass pipelines have been constructed primarily for distribution where suitable conditions exist. This has given rise to pockets of competition. Further the potential for bypass where circumstances are propitious also constrains distribution charges in those areas. However, the Commission considers that the geographic extent of bypass competition is limited.
- 5.55 With respect to transmission the open access to the Maui pipeline will create two parallel competing pipelines between Taranaki and Huntly. This competition is limited to the geographic area where the two pipelines are contiguous and, as previously stated, there may be practical limitations on the level of competition between the two pipelines.

### *Interfuel Competition*

5.56 The market power of gas pipeline businesses in the supply of gas services could be constrained if gas faced strong competition from other energy forms. If end use consumers of gas, including electricity generators, could easily switch to substitute energy sources in the event of a small yet significant non-transitory increase in price (a ‘ssnip’) then the market power of parties providing services for the creation and supply of gas would be limited. If this situation existed the gas services supplied by each business would face a relatively elastic (price responsive) demand curve. Put another way, interfuel competition would provide a constraint on the gas energy price which in turn would constrain the gas service charges.

5.57 In the past, the Commission has considered the level of interfuel competition and the constraint that this has on individual energy forms. With respect to interfuel competition between gas and other fuels, the Commission has stated:

...all of the evidence is consistent with the conclusion that natural gas and other fuels, especially electricity and to a lesser extent coal, are indeed substitutes for each other, both technically and commercially - but they are at best imperfect substitutes and cannot be regarded as being in the same market.<sup>30</sup>

5.58 This approach is consistent with decisions of the courts. In the High Court judgment in *Power New Zealand Ltd v Mercury Energy Ltd* (1996) 1 NZLR 686, subsequently upheld in February 1997 by the Court of Appeal, the court said:

It is common ground that gas is not in close competition with electricity. We see no reason to question this approach.

5.59 In addition, the High Court in *Shell v Kapuni Gas* (1997) heard a substantial amount of economic evidence on market definition and stated:

We accept that (light fuel oil, coal, and electricity) are substitutable (for natural gas) in certain favourable circumstances, but always at the edges and seldom in response to a SSNIP (small but significant non-transitory increase in price).<sup>31</sup>

5.60 Since these decisions, there have been important changes in energy related markets. Further the pending depletion of the Maui gas field is likely to have a major impact on gas prices in comparison with the prices of other energy forms. Electricity generators have indicated that they will be using additional coal and fuel oil for generation purposes in the future. However notwithstanding these actual and prospective changes in market circumstances, the Commission would require additional information to persuade it that the conclusions on the extent of inter-fuel competition reached in the cases cited above do not continue to apply.

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<sup>30</sup> Commerce Commission Decision 270, “Natural Gas Corporation of New Zealand Limited and Enerco New Zealand Limited”, 22 November 1993.

<sup>31</sup> *Shell (Petroleum Mining) Company Limited and Another v Kapuni Gas Contracts Limited and Another* (1997) 7 TCLR, 463 (HC).

### ***Potential Competition***

5.61 Gas pipeline businesses may face some competition from other gas pipeline businesses in the provision of gas services. However potential competition is limited by barriers to entry that exist for the supply of gas services.

### ***Entry Barriers***

5.62 The nature of the investment required in gas transmission and distribution acts as a barrier to entry and limits the constraint which can be provided by potential entrants. There are a number of considerations that lead the Commission to this view.

5.63 First, entry would require a large, long-term investment in infrastructure related assets. The Commission is aware that, in real terms, the capital cost of installing distribution pipelines has reduced in recent years due to the introduction and improved specification of PVC pipes. However, the cost remains substantial and is sunk, meaning that the investment would not be recoverable in the event of business failure.

5.64 Secondly, a new entrant would need to negotiate easements and obtain environmental and land planning consents, which can be costly and time-consuming.

5.65 Thirdly, the time lag between a company considering the possibility of building a distribution or transmission pipeline and coming into service could provide the incumbent time to organise strategies to meet the prospective competition, including increasing capacity if that was the basis for the new entry.

5.66 Finally, incumbents are likely to benefit from economies of scale, at least until the point where it faces capacity constraints.

5.67 The significance of these issues can vary across geographic areas, which makes some areas more contestable than others. As discussed previously potential competition is more likely to exist in areas that contain a concentration of medium to large consumers and are close to a transmission pipeline, an existing bypass network or an alternative gas source (such as landfill gas).

5.68 The factors listed above combine to suggest that barriers to entry are relatively high and hence potential competition in pipelines services is limited.

### ***Countervailing Power of Consumers***

5.69 The potential for a gas pipeline business to wield market power may be constrained by countervailing power in the hands of consumers. Typically this can occur where the customers are large in relation to the supplier, are readily able to switch from one supplier to another, or are able to foster new supply, including own supply.

- 5.70 For instance it is understood that there have been examples in the past of large customers encouraging bypass distributors to enter the market by offering medium to long-term distribution arrangements. Also a large retailer was able to negotiate more favourable transmission terms once it indicated a credible interest in constructing a transmission pipeline itself.

*Summary of Commission's Current Conclusions on Competition*

- 5.71 Existing competition in the gas services markets is limited to that faced by distributors from bypass pipelines. However, in general this competition is restricted to the supply of gas to medium or large consumers who are close to the transmission pipeline. There is potential for competition for the transmission of gas from Taranaki to Huntly if an open access arrangement is put in place for the Maui pipeline. There is also potential for additional bypass pipelines to be constructed where propitious circumstances exist. In general however, barriers to entry to the markets are considered to be high. Competition to gas from other fuel forms place some competitive constraint on those providing gas services, but based on its previous analysis, the Commission is of the view that this inter-fuel competition is not sufficient in itself to produce workable competitive markets.
- 5.72 The above conclusions reflect, in general, the position reached by the Commission in its most recent adjudications in relation to the gas and other energy sectors. Whether they remain appropriate will be determined having regard to the information provided in the context of this Inquiry.

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| <p>9. How substitutable are electricity and other energy sources for gas in industrial, commercial and residential applications?</p> <p>10. Does interfuel competition constrain transmission and distribution charges? How is likely to change in the future?</p> <p>11. What scope is there for competition between gas distributors?</p> <p>12. What are the major structural, regulatory and strategic barriers to entry to supplying gas?</p> <p>13. Do gas transmission or distribution firms currently exercise market power?</p> <p>14. What degree of countervailing power do industrial, commercial and residential customers currently have?</p> <p>15. To what degree would the Maui pipeline (assuming open access) and the NGC system compete?</p> <p>16. Are there capacity constraints in gas transmission? If so, where are they? How costly would it be to increase capacity to overcome the constraints?</p> |
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## **Pricing Principles**

### ***Relevance to Analysis***

5.73 The Commission considers that, as part of the process of determining whether the second statutory threshold for control (section 52(b)) has been met, and whether control should be recommended, it must judge the behaviour of the suppliers of gas services against an 'efficient prices' standard.<sup>32</sup> The Commission considers the process of forming such a judgement makes the costs of the current situation and the potential benefits of control more apparent.

### ***Determining Efficient Prices***

5.74 Having determined that particular services are provided in a market that has limited competition, there are two broad approaches to determining the extent to which the prices for those services are efficient. One approach involves comparing the prices with those of comparable services provided in other markets either that have effective competition or in which the prices are otherwise known or assumed to be efficient. The second approach is to construct efficient prices with reference to economic principles and theoretical models.

5.75 The first approach, which may be called "comparative benchmarking", was used recently by the Commission for the determination of interconnection prices for telecommunication services.<sup>33</sup> In that case, the Commission was required by the Telecommunications Act 2001 initially to make a determination on interconnection prices based on international benchmarking of regulated prices. Since then, parties affected by that determination have applied for a review of the initial determination using forward-looking costs.

5.76 Comparative benchmarking has also been considered by the Commission in the context of setting thresholds for the control of electricity lines businesses.<sup>34</sup> No decision has yet been made on resetting thresholds in this way.

5.77 In its Inquiry into airfield activities, the Commission considered comparative benchmarking, but concluded that meaningful comparisons were problematic due to the variability in business conditions between the New Zealand airports and potential international comparators. The critical importance of comparing apples with apples is a significant constraint on this particular approach.

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<sup>32</sup> Efficient price, in this context, means a price that may be observed in a market characterised by effective or workable competition, rather than the perfect competition.

<sup>33</sup> Commerce Commission, 2 September 2002, International Benchmarking: A Comparative Review of Interconnection Pricing.

<sup>34</sup> Commerce Commission, 30 May 2003, Regulation of Electricity Lines Businesses: Discussion Paper on Resetting the Price Path Threshold.

5.78 Accordingly, the Commission will consider the comparative benchmarking approach for this Inquiry, but at this stage it considers the effectiveness of this approach may be limited by constraints on finding suitable comparators, or by constraints on the ability to properly account for different cost drivers between comparators.

17. What is the potential for assessing the efficiency of gas pipeline prices using the comparative benchmarking approach?
18. Could international data be used to supplement data from the New Zealand gas pipeline businesses?

5.79 The other approach to determine efficient prices, which may be called the "building block approach", involves using theoretical principles and models to construct efficient prices combined with known or estimated data on the relevant costs of providing the services. This was the approach used by the Commission in its Airports Inquiry. The Commission has also proposed this approach to determine efficient costs associated with Telecommunication Service Obligations (TSO).<sup>35</sup>

5.80 The building block approach involves determining:

- the efficient level of capital required by the business (asset value);
- the efficient rate of return on capital;
- the efficient rate of return of capital (depreciation); and
- the efficient level of non-capital (or operating) costs.

5.81 The efficient level and rate of return of capital are discussed below under the section heading "Asset Base and Valuation". The efficient rate of return on capital is discussed below under the section heading "Weighted Average Cost of Capital".

5.82 The remainder of this section discusses the relevant pricing principles for promoting efficiency. These principles are developed within the three aspects of efficiency, namely, allocative, productive, and dynamic efficiency. The Commission proposes to draw on these principles to determine efficient price building blocks for gas services.

19. Which of the two approaches discussed (the comparative benchmarking and building block approaches) are best-suited to the purpose of the Inquiry?
20. What issues and risks arise in respect of each approach?
21. What alternative approaches should the Commission consider?

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<sup>35</sup> Commerce Commission. June 2003, Draft Determination for TSO Instrument for Local Residential Service for period between 20 December 2001 and 30 June 2002.

### ***Allocative Efficiency***

- 5.83 The level and structure of prices are the key considerations in determining whether allocative efficiency is achieved.

### ***Level and Structure of Prices***

- 5.84 Allocative efficiency is achieved when the price paid by any user reflects the costs incurred in meeting their demand. 'First best' efficient pricing requires that users be charged a price equal to the marginal cost of supply. Marginal cost (MC) is the additional cost incurred when an additional unit of output is produced.
- 5.85 Marginal cost as defined above is a private cost. However, production can give rise to 'externalities', which are those costs and benefits that fall on third parties or society in general. Where there are significant externalities, MC pricing will not take account of all the costs and benefits to society. In such circumstances, marginal social cost (MSC) pricing should ideally be used, which would incorporate those externalities in prices. MSC equals the MC of production plus any costs borne by (or minus any benefits accruing to) third parties. Externalities can also be dealt with through administrative measures (e.g., resource management law and constraints), which may be more practical (and ultimately less costly) than trying to deal with them through MSC pricing. Accordingly, it is MC pricing which forms the basis for discussions here.
- 5.86 For suppliers with a high proportion of fixed costs, marginal cost is likely to be below average cost, which means MC pricing would yield insufficient revenue to cover all costs. This would not be sustainable for a business, so pricing above MC to cover a share of fixed costs may well be legitimate (further discussed below). Fixed costs are costs that are static and do not change as a result of changes in output. However, these costs may change in the long term as a result of future capital investments.
- 5.87 Further, natural monopolies typically provide more than one product or service. Significant common costs make marginal cost pricing unsustainable. Common costs are those costs incurred by the multi-product firm that are common to two or more outputs, and may change very little if one of those products is no longer produced.
- 5.88 As a result of fixed and common costs, marginal cost pricing may not comply with allocative efficiency requirements. This raises the question of what is the most appropriate second-best pricing alternative? Generally speaking, demand differentiated pricing that is 'second best' can cover total costs (needed to ensure firm survival) while minimising the distortion to allocative efficiency by linking prices paid by different acquirers to their demand characteristics.<sup>36</sup>

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<sup>36</sup> Rigas Doganis, *The Airport Business*, London: Routledge, 1992. W.J. Baumol and R.D. Willig, *Pricing Issues in the Deregulation of Railroad Rates*, in: J. Finsinger (ed.), *Economic Analysis of Regulated Markets*, London, 1983, page 92.

- 5.89 One form of demand differentiated pricing is Ramsey pricing, which covers costs by structuring prices according to demand characteristics. Specifically, the price for each user (or group of users) would be set by adding a percentage mark-up on marginal cost, with the size of the mark-up being inversely proportional to the price elasticity of demand of that user or group of users. The mark-ups are scaled up until revenues cover costs. By doing this, costs can be allocated more heavily to those with the greatest willingness to pay; i.e., those users least sensitive to price increases pay the highest mark-ups, and vice versa.<sup>37</sup>

22. Are the pricing structures used by gas pipeline businesses efficient?

### *Service Quality*

- 5.90 For a price to be allocatively efficient, the quality of service demanded must be of a standard that reflects that price, and meets consumers' preferences. Over time, product quality is a material consideration in terms of both allocative and dynamic efficiency. The Ramsey pricing principle also applies here, to the extent that prices can be differentiated on the basis of demand for quality.
- 5.91 In markets where suppliers have limited ability to differentiate on the basis of quality, the quality actually delivered may not be optimal (i.e., quality may be too high or too low).
- 5.92 The implementation of Ramsey Pricing and multi part tariffs requires knowledge of, or good proxies for, price elasticities of demand and cost functions. In practice, however, cost functions and price elasticities of demand (for quantity or quality) are not perfectly known.

23. Is quality an issue in relation to the pricing of gas services? Is the quality provided too high or too low?

### *Cross Subsidisation*

- 5.93 Cross-subsidisation can be said to exist where the incremental revenue earned from the sale of a given product is either below the incremental cost or is above the stand-alone cost of supplying that product. Incremental cost is the additional costs imposed by a product (or group of users) on a supplier. They include all the additional marginal, fixed and common costs created by supplying the product. Stand-alone costs are those costs incurred by a supplier in producing only the one product. They are the minimum costs that an efficient supplier would incur in providing the service. Two potential cross-subsidisation concerns can emerge:

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<sup>37</sup> J. Vickers, Regulation, Competition, and the Structure of Prices, Oxford Review of Economic Policy, vol.13, No.1, 1997.

- if a supplier charged a price lower than the incremental costs of supply, its revenues would not cover its cost. If, at the same time, the supplier is still cost recovering over all, this suggests that the consumers of one product are supporting the consumers of another product. This does not send appropriate signals for resource allocation and use. It may also be perceived as unfair by consumers; and
- if a supplier charged a price above the stand-alone cost of supply, it would imply over-recovery. Once again, inappropriate signals for resource allocation and use are created. In addition, if the concept of stand-alone costs makes no allowance for the economies of scope that can be gained from providing several products together, and a monopolist charges for each product up to its notional stand-alone costs, with no adjustments to reflect economies of scope, it would also over-recover.

24. Is cross-subsidisation an issue in the pricing of gas services?

25. What incentives do gas pipeline businesses have to cross-subsidise?

5.94 The Ramsey pricing principle is also relevant to how prices should vary over time. In general, if tomorrow's consumers were assumed to have the same price elasticity of demand as today's consumers, and competitive conditions remained constant over time, then Ramsey Pricing would require prices to remain approximately the same, in real terms, over time. This observation may have implications for the manner in which capital costs are recovered over time, especially for capital intensive businesses.

5.95 A variant of Ramsey pricing, in circumstances where average cost exceeds marginal cost at the relevant output levels, is the multi-part tariff. A two-part tariff (the most common form of multi-part tariff) combines a single fixed charge component that is paid by all users regardless of the quantity of output purchased, together with a variable charge component that increases (often proportionally) with the volume of output purchased. The fixed costs of the operator are recovered through the sum of the fixed charges received, while the variable (output-related) costs are reflected in the variable charge component.

5.96 Another possible pricing approach is average cost pricing. This approach would be used where demand differentiated pricing is preferred but impractical (e.g., there is a lack of information) or undesirable (e.g., significant administration costs can be involved with Ramsey Pricing). Average cost pricing is simpler in practice than demand differentiated pricing, but less effective, in terms of minimising departures from allocative efficiency. This is because it ignores potential gains that can be made from structuring prices to take account of differing demand characteristics.

5.97 The Commission understands that most gas pipeline businesses in New Zealand use combinations of the methods described above:

- some prices vary according to volume transported, in combination with fixed charges for connection or access (multi-part pricing);

- some prices vary between specific consumers or consumer groups according to the threat of competition from pipeline bypass or from natural gas substitutes (Ramsey pricing); and
- prices may vary at certain times when there is network congestion (short run marginal cost pricing).

### *Normal Returns*

- 5.98 Underlying allocatively efficient pricing is an understanding that firms in effectively competitive markets will earn normal returns on average. The Commission considers that normal returns means returns commensurate with the risks faced. The weighted average cost of capital (WACC) is thus used (in the building blocks approach) for determining the level of normal returns on the asset base and is consistent with a ‘workable and effective’ competition standard rather than a perfect competition standard (where returns would be based on marginal costs).
- 5.99 In competitive markets, any returns in excess of (or less than) normal returns could reflect superior (or inferior) performance. In markets where there is limited competition, it can be difficult to distinguish such superior performance from monopoly (excess) returns. Nevertheless, some allowance for any superior performance needs to be made when returns are assessed. To not do so would place an asymmetric risk on the gas pipeline businesses, because they would never be allowed above normal returns (for superior performance), but could receive below normal returns. Such an asymmetric risk would not promote efficiency.

26. How can the Commission identify whether above-normal returns are attributable to superior performance or monopoly pricing?

### *The NPV Principle*

- 5.100 To earn normal returns over time means, in the context of the building block approach, that capital charges (being revenue less operating costs) over the life of an asset should approximately equal the actual capital expenses incurred in respect of the asset, in present value terms. This may be called the net present value (NPV) principle.
- 5.101 The NPV principle means that efficient prices for a particular period depend, to some extent, on previous prices and previous capital expenditures associated with the services. By analogy, loan repayments for a particular period cannot be determined without regard to the amounts borrowed and the repayments already made.
- 5.102 However, although a firm may be deemed to have earned above-normal returns at some period in the past does not necessarily mean its current and future prices are inefficient. The Commission is not proposing that prices should be controlled using the NPV principle. That is, future prices would not

necessarily be controlled at a level below some level deemed to be efficient simply because past prices were observed to be above that level.

- 5.103 In a competitive market, the NPV principle might be expected to hold on average over the medium to long term. However, it might not hold over the short term, or for individual firms, depending on their relative efficiency. Firms earning above-normal returns for a period, whether due to luck or superior performance, would not necessarily earn below-normal returns in subsequent periods. Relatively inefficient (or unlucky) firms, consistently earning below-normal returns, might eventually exit the market.
- 5.104 In a controlled market, the regulator ultimately determines whether the NPV principle holds. If the NPV of capital charges were consistently to fall short of actual capital expenses, new investment would soon stop, to the detriment of consumers. If the NPV of capital charges were consistently to exceed actual capital expenses, over-investment may result (i.e. the "Averch-Johnson effect" associated with rate of return regulation), and in any case consumers (considered as a whole over time) might pay more for the services than necessary (which is a detriment).

#### *Level of Costs and Assets*

- 5.105 As operating costs are recovered through prices, they should be minimised for any given quantity of production. Whether prices are at their most efficient level will depend, in part, on whether the appropriate level of fixed assets is being used to support production. Where prices depend on the level of the asset base, a sub-optimal level of assets could result in prices above or below those necessary to meet demand.

#### *Short Run and Long Run Perspectives on Pricing*

- 5.106 In determining allocatively efficient prices, it is possible to take a short-run or long-run perspective. Typically, a more short-run perspective is taken given the uncertainties over the appropriate long-run costs that promote efficient outcomes. Nonetheless, there may be occasions where a more long-run perspective is desirable.
- 5.107 The overriding concern is that the appropriate level and structure of prices is determined and that depending on individual circumstances this may involve taking either a more long run or short run perspective to pricing.
- 5.108 The structure of prices has implications for whether cost recovery is occurring in the most efficient way and whether there is cross-subsidisation, either between different users of a particular product, or between users of different products.

### ***Productive Efficiency***

- 5.109 Productive efficiency means meeting demand at the lowest possible costs, including minimising transaction costs resulting from exchange of products. In the short-run, this involves choosing and making best use of the appropriate level of variable inputs. Over time, it involves making investments that ensure that costs can continue to be minimised.
- 5.110 In evaluating whether prices are efficient, it is important to assess whether firms can further reduce costs. This could be done by considering the mechanisms that could drive cost minimisation. Competition forces firms to minimise costs, subject to consumers' quality demands, or risk losing supply to other providers.
- 5.111 However, where competition is lacking, other factors would have to be considered to determine whether sufficient incentives for cost minimisation remain. A producer who faces limited competition in a market may lack the competitive pressures to remain efficient in production. Organisational slack may creep into its operations, bureaucracy may expand, principle-agent problems may arise, salaries may become inflated, and waste may occur, all because a satisfactory level of profit is assured even when the firm is less than fully efficient. As a result, costs in general may increase. The increase in costs is a measure of the value of the resources being wasted, which in turn indicates the value of the output foregone by the economy as a whole from those resources not being employed more productively and efficiently elsewhere.
- 5.112 Profit motivation can encourage cost minimisation, but the incentives it provides may not be sufficient, particularly for monopoly businesses which may suffer from agency problems to a greater extent than firms in competitive markets.

### ***Dynamic Efficiency***

- 5.113 Dynamic efficiency means maintaining allocative and productive efficiency over time. In practice, this means making investments and innovating so that costs continue to be minimised and prices over time generally reflect this.
- 5.114 For industries where new and improved products and production processes could be expected to be introduced relatively frequently, dynamic efficiency is largely about ensuring such improvements are introduced in a timely fashion.
- 5.115 For industries characterised by large long-term investments, and slow innovation in 'new and improved' products and production processes, dynamic efficiency is largely about appropriate new investment management, particularly appropriate investment choices and the timing of those choices. Determining appropriate costs over time requires considering whether current, and prospective, investments are necessary. Over- or under-investment should be avoided. In practice, evaluating dynamic efficiency precisely in quantitative terms is difficult.

**Conclusion**

- 5.116 The above principles should not be seen independently, but rather as inter-related considerations for evaluating efficiency.
- 5.117 The Commission considers that both the level of prices and the structure of prices (e.g. between consumers) is relevant to the efficiency of prices. At this stage the Commission expects to focus initially on the efficient level of average prices, including their level over time, but may also consider the efficiency of specific pricing methodologies, if warranted.
- 5.118 Prices (and costs) can be susceptible to short-term fluctuations in market conditions. The principles above are expressed over the medium-term, so that such short-term fluctuations do not distort judgements on whether prices are efficient and suppliers have been behaving efficiently. The Commission considers this is desirable for evaluating whether the potential benefits (if any) of control could be realised.
- 5.119 In considering the efficient price level the Commission will consider price paths over time, with particular regard to the NPV principle. That is, the Commission proposes to consider current and future prices in the context of past prices, while taking account of the possibility that past prices may reflect above- or below-normal returns attributable to superior or inferior efficiency or other causes.

## Asset Base and Valuation

### Relevance to Analysis

5.120 The building block approach involves determining:

- the efficient level of capital required by the lines business to provide lines services;
- the efficient rate of return on capital;
- the efficient rate of return of capital (depreciation); and
- the efficient level of operating costs.

5.121 In general, these “efficient cost” building blocks are used to calculate the efficient revenue in a period, as follows:

$$R_t = A_{t-1} \times WACC_t + D_t + O_t$$

where:

- $R_t$  is the efficient revenue in period  $t$
- $A_t$  is the asset value at the end of period  $t$
- $WACC$  is the weighted average cost of capital in period  $t$
- $D_t$  is the depreciation in period  $t$ , and
- $O_t$  is the efficient operating cost in period  $t$ .

5.122 The valuation of assets is central to the building block approach to determining efficient prices. For capital intensive businesses, capital charges are a significant portion of the total revenues required by the business.

5.123 Applying the NPV principle to the efficient revenues over time implies that efficient asset values are related to depreciation as follows:

$$D_t = A_{t-1} - A_t + Capex_t - Disposals_t$$

Where:

- $Capex_t$  is the capital expense during period  $t$ ; and
- $Disposals_t$  is the carrying value of any asset removed from the asset base during the period.

5.124 Provided prices are set strictly in accordance with the building block expression, the NPV principle will hold no matter what depreciation profile is used. However, not all depreciation profiles are necessarily equally efficient. In practice, this means the Commission could find a business' prices to be inefficient, and could find evidence of excessive returns, by virtue of applying a different depreciation profile over the period of analysis. This is discussed further below in the context of different asset valuation methodologies.

- 5.125 The return of, and on, capital forms the firm's capital charges that it would hope to recoup, along with its operating costs, through its prices. Should the firm's revenues exceed its capital and operating costs, the firm will earn excess profits. Although this could happen in several different circumstances, a firm that persistently earns excessive profits over time may be doing so by exploiting a position of market power to the detriment of consumers.
- 5.126 Evidence of persistent and materially excessive returns and/or costs could lead the Commission towards a recommendation that control should be declared, because both represent detriments to consumers. However, to recommend control, the Commission must be satisfied the quantum of excess returns or costs is material, and is not attributable to superior efficiency. Moreover, the Commission must be satisfied that control would provide net benefits to consumers, relative to the status quo.
- 5.127 The Commission proposes to forecast efficient revenues for each of the relevant businesses. The forecast "efficient revenues" will be compared with forecast revenues derived from each of the businesses' own current and planned prices, as indicated by current business plans and pricing policies. All of these forecasts will also depend on assumptions about future demand, and future capital and operating costs.
- 5.128 As discussed above, a critical parameter in the forecast of efficient revenues is the current value of efficient capital employed. In effect, the NPV of future efficient capital charges is equal to the current efficient asset value. This means that excess returns can be identified directly by comparing the NPV of future free cash flows (deduced from current business plans and pricing policies) with the current value of efficient capital employed (as determined by the Commission).

### ***Asset Valuation Concepts***

- 5.129 There are several distinct approaches that might be used to derive the current efficient value of assets. The first, drawing on the NPV principle, is to set the current value on the basis of past expenditures and revenues. This backward-looking approach is consistent with historical cost accounting, and may be called the historical cost approach. In its simplest form, the historical cost approach is conceptually equivalent to establishing the outstanding balance of a loan as the present value of past borrowings and repayments.
- 5.130 Other approaches seek to set the current value of existing assets on the basis only of forward-looking costs. Such approaches might be necessary if, for example, no historical cost information was available. The forward-looking approaches considered by the Commission include opportunity cost and replacement cost valuation approaches. They are discussed further below.
- 5.131 The Commission considers other valuation approaches based on recent market transaction values or discounted cash flow analysis of future costs and revenues are problematic. Because they reflect the supplier's revenue expectations, there is a risk such valuation approaches include expectations of

monopoly rents. Accordingly, the Commission does not propose to use valuation approaches that rely upon the business' revenue expectations.

### *Historical Cost Approach*

- 5.132 In this approach, the current value is derived from past capital expenditures (or the efficient level of such past expenditures) associated with the assets. This approach requires information dating back to when the oldest assets in service were first commissioned. For long-lived pipeline assets, this may be some time ago, and the relevant information may not be readily available.
- 5.133 A variant of this approach, which may be necessary where sufficient historical information is unavailable, is to roll forward the historical cost value from some arbitrary date in the more recent past. In this case, the calculation requires an estimate of the efficient asset value at that date (the "opening valuation").
- 5.134 In general, the information needed for this calculation may be found in annual financial statements, with certain conditions.
- 5.135 First, the financial statements must relate only to the relevant business activities - in this case gas transmission or distribution activities. Where businesses providing gas services have also been involved in other activities, the available financial statements may not adequately identify the value of the relevant pipeline assets, expenditures and revenues in isolation.
- 5.136 Second, if the relevant assets have been traded, statements of financial position (following a trade) will reflect the value at which they were traded, rather than a value consistent with past expenditures and revenues.
- 5.137 Third, even where assets have not been traded, statements of financial position may have been prepared using a methodology that gives asset values that also depart from the values consistent with past expenditures and revenues. Such valuation methodologies may (for example) involve discounted future cash flows (DCF), or some estimate of market value, or replacement cost.
- 5.138 In light of these considerations, care must be taken in choosing an arbitrary date at which to establish the opening asset value. At this stage the Commission intends to investigate the historical cost approach, looking back as far as is reasonably practicable, taking into account the quality of available information, and the dates of significant events, such as:
- deregulation of the sector in 1993 (following enactment of the Gas Act 1992);
  - corporatisation or privatisation of relevant businesses (such as flotation of NGC in 1992); and
  - other transactions involving the relevant assets (such as the successive acquisitions of some distribution assets by Enerco, Orion, UNL, Vector, and Powerco).

- 5.139 In the Airports Inquiry, the Commission determined opening asset values based on book values established at the corporatisation dates of each airport – the dates at which the relevant assets were vested in a new corporate body.
- 5.140 In contrast, in the context to setting thresholds for the control of electricity lines businesses, the Commission’s draft decision is that the vesting values (i.e. book values at the time of corporatisation) are not necessarily the most appropriate opening values upon which to base a price or profit monitoring regime looking forward. Furthermore, the Commission considered numerous submissions and other evidence suggesting the vesting values of electricity lines businesses did not consistently or accurately represent the genuine historical costs associated with those businesses.
- 5.141 Given the importance of relevant historical data, under this approach, the Commission proposes to seek as much information as can reasonably be made available about the past expenditures and revenues associated with each gas pipeline business. In the absence of any better information, the Commission may draw inferences from disclosed financial statements, whether issued by the current or previous owners of the relevant assets.
- 5.142 Once a particular date in the past has been chosen, with the associated asset value, the current value of the asset base could be derived with reference only to historical expenditures and revenues (assuming they are known), and the appropriate WACC, for each period since that date (using the expressions in paragraphs 5.121 and 5.123), as follows:

$$A_t = A_{t-1}(1 + WACC_t) - Disposals_t + Capex_t + Opex_t - Revenue_t$$

- 5.143 However, if past revenues had included above-normal returns (relative to a particular price path based on a particular depreciation profile) then the expression above would provide a current asset value that would require below-normal returns in the future (relative to the same price path). This outcome might harm efficiency.
- 5.144 Therefore, the current efficient asset value may instead be derived using a depreciation profile that is deemed to be consistent with an efficient price path over the period. Accordingly, when applying this approach, the Commission proposes to roll forward the historical cost asset value from the opening date as follows:

$$A_t = A_{t-1} - D_t^* + Capex_t - Disposals_t$$

Where:  $D_t^*$  is the depreciation associated with a deemed efficient price path.

- 5.145 Although the Commission may have a view on the most efficient depreciation methodology, it does not take the view that all other approaches are necessarily inefficient, or sufficiently inefficient to warrant intervention. In the absence of better information, the Commission may consider using a depreciation methodology consistent with the depreciation policy disclosed by each business in relevant annual financial statements.

In the context of the historical cost approach:

27. What is the appropriate opening valuation date for each gas pipeline business (e.g. end of last price control, public flotation, other)?
28. Where can the information needed to calculate current asset values be found?
29. What is the appropriate rate of depreciation to apply to historical costs?

### *Opportunity Cost*

5.146 From an economic perspective, the ‘cost’ of an asset (resource) is not necessarily the payment actually made for it, but rather its opportunity cost (although the two may be the same). Opportunity cost is defined in standard economics textbooks as:<sup>38</sup>

...the amount lost by not using the resource (labour or capital) in its best alternative use.

5.147 In decisions involving the efficient allocation of assets between alternative uses, the relevant costs are opportunity costs. By committing an asset to one use, all other possible uses are excluded. Some of these excluded uses may be more valuable than others. Since asset owners are assumed rationally to want to maximise the returns they get from the employment of an asset, its opportunity cost becomes the return they forgo from it not being employed in the next best alternative use. Opportunity cost is thus the highest alternative use value of assets used up or pre-empted.<sup>39</sup>

5.148 In competitive markets, an asset that is non-specialised, and which therefore has multiple uses, is likely to have a value (productivity) in its current use that will not be much greater, if at all, than that in its next best use. In these circumstances, the maximum amount of money that the user will be prepared to pay for the asset will not differ significantly from its opportunity cost, and so the amount paid will be a good measure of that opportunity cost. Put differently, the amount paid by the user will not differ much from the minimum amount needed to keep the asset employed in its current use. That ‘minimum amount’, called the asset’s ‘transfer earnings’, is determined by its opportunity cost.

5.149 Any payment of less than opportunity cost will cause an asset to be moved to its best alternative use. Any payment above opportunity cost is an economic rent, a return over-and-above the minimum necessary to keep the asset in its current employment. A feature of competitive markets is that they tend to constrain existing use values to opportunity cost, at least at the margin, although rents may be earned on units below the margin or on scarce resources.

<sup>38</sup> David Begg, Stanley Fischer and Rudiger Dornbusch, *Economics* (2nd edition), London: McGraw-Hill, 1987, page 118.

<sup>39</sup> D. Solomon, *Economic and Accounting Concepts of Cost and Value*, in: M. Backer (ed.), *Modern Accounting Theory*, 1966, Chapter 6, page 127.

However, when markets are not competitive, there may be potential for significant economic rents to be earned.

- 5.150 The situation changes significantly when an asset is so specialised that it has few, if any, alternative uses. This is likely to be the case with pipeline assets. Once the investment in creating the asset has been made, the outlay cannot be recouped by re-selling the asset for some other use. The asset, or that portion of its value that cannot be recouped, is 'sunk'. For a fully sunk asset, any residual value (net of the costs of disposal) is its net realisable value (NRV) as scrap. In these circumstances the opportunity cost in relation to alternative uses of the asset is very low or even zero, as the owner forgoes very little (only its NRV) in its present use.
- 5.151 If a regulator were to insist on a zero or low valuation for the asset in the course of setting prices on the grounds that this would reflect its opportunity cost, the investors who had purchased the asset in the expectation of earning at least a normal (or competitive) return would not be able to do so. As long as the regulator allowed the investor to earn a return above the opportunity cost of the asset, it would be in the interests of the owner to keep it employed in its current use. However, investors, finding the value of their investments expropriated, would be unwilling to replace the asset when it wears out.<sup>40</sup> Continuity of supply would therefore be put in jeopardy, and dynamic efficiency would in consequence be jeopardised.
- 5.152 The usual solution to this issue over the valuation of specialised assets is to assign a value to them that exceeds their "alternative use" opportunity costs, on the grounds that continuity of supply and dynamic efficiency are very important in a capital-intensive, utility-type industry. Dynamic inefficiency losses from under-investment are likely to be large in respect of gas pipelines, and may extend to other comparable industries. This is because any expropriation of investments is likely to have spill-over effects as investors react in a similar way in other similar industries, particularly those industries that are regulated, or have the potential to be regulated, in a similar way. There would also be an adverse signalling affect to other investors in the economy who were affected, or potentially affected, by Commission decisions.

### *Replacement Cost Approaches*

- 5.153 The opportunity cost discussed above is supplier-centric. It considers what the asset would be worth to the owner or supplier if demand (in the asset's current use) were to cease (hypothetically). Another approach is to consider the value of the asset from the perspective of consumers (in some senses this might be considered the opportunity cost of the consumer). What would the asset be worth to consumers, hypothetically, if they were faced with deprivation, and assuming they had the option of constructing or acquiring another asset of equivalent service potential? Or, what "shadow price" would a cost-

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<sup>40</sup> For example, Mark Armstrong, Simon Cowan and John Vickers, *Regulatory Reform: Economic Analysis and British Experience*, Cambridge, Mass.: MIT Press, 1994, pages 85-86, 186-87. Alternatively, if investors were aware of the regulator's intentions, the asset would never be built in the first place.

minimising asset manager give to an existing asset, when considering whether to replace or refurbish it? Asking these questions gives rise to replacement cost valuation approaches.

- 5.154 An important consideration in the replacement cost valuation approach is the extent to which demand will be long-lasting, such that each relevant asset will be maintained and then refurbished or replaced as it reaches the end of its economic life. Assuming it is, the value of an asset, at any time, is the value of deferring future capital renewal and associated operating expenses. For example, the value of an asset with 5 years remaining life is the difference, in net present value terms, between the future expenses (capital and operating) associated with a new or refurbished asset and the future expenses associated with the existing asset (which include the cost of its replacement or refurbishment in 5 year's time).<sup>41</sup>
- 5.155 As with the conventional analysis when considering whether to refurbish or replace an existing asset, this valuation should take into account all practical factors relevant to determining the future costs. For example, if an existing cast iron pipe can be refurbished by inserting a plastic liner, its replacement cost value should reflect the relatively lower cost of that relining operation compared with open trenching, for example.
- 5.156 Under certain conditions this replacement cost valuation approach gives rise to a time profile of asset values identical to those obtained using tilted annuity depreciation, where the tilt reflects both replacement cost inflation and the difference in operating costs associated with new and old assets.
- 5.157 In practice, there may be some uncertainty about the future demand for services provided by an asset. In principle, this uncertainty, or the estimated risk of future stranding, could also be reflected in the tilt. Accordingly, the methodology may be called optimised depreciated replacement cost (ODRC).
- 5.158 The above definition of optimised depreciated replacement cost, involving tilted annuity depreciation, is more or less consistent with the approach proposed by the ACCC in relation to the regulation of electricity transmission networks in Australia<sup>42</sup>. It is also consistent with the Commission's proposed approach to determining the efficient costs of telecommunications service obligations for local residential telephone service (TSO).<sup>43</sup>
- 5.159 In practice, regulatory or other applications of replacement cost valuation methodologies do not always use tilted annuity depreciation. The Ministry of Economic Development's Handbook for Optimised Deprival Valuation (ODV) of System Fixed Assets of Electricity Line Businesses, for example, uses straight line depreciation. In such cases, the strict use of building block analysis may lead to price paths that move up and down according to the age of assets in service.

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<sup>41</sup> This concept is discussed in a report for the ACCC prepared by NERA: "Depreciation within ODRC Valuations", September 2002

<sup>42</sup> ACCC, Draft Statement of Principles for the Regulation of Transmission Revenues, 27 May 1999.

<sup>43</sup> Commerce Commission. June 2003, Draft Determination for TSO Instrument for Local Residential Service for period between 20 December 2001 and 30 June 2002.

- 5.160 The Commission is aware that some gas pipeline businesses have, in recent years, adopted ODV valuation for the purposes of preparing annual financial statements under the information disclosure regulations. Those valuations reflect straight line depreciation. ODV differs from the ODRC methodology by the inclusion of an “economic value” test. That is, an asset’s ODV may be lower than its ODRC where, in practice, the owner would not replace it if deprived (i.e. where the future free cash flows associated with an asset would not support the ODRC).
- 5.161 In relation to tilted annuity depreciation, the Commission considers that while the appropriate tilt may be defined in principle, its empirical determination is not straightforward, because it requires numerous assumptions about the future, all of which are highly uncertain, such as:
- future demand for the services;
  - the price elasticity of future demand (including the effect of possible substitute services); and
  - the rate of technical change and other factors affecting future capital and operating costs.
- 5.162 In the face of these empirical difficulties, it may not be practical to identify theoretically efficient prices based on tilted annuity depreciation with a high degree of precision or certainty.
- 5.163 Notwithstanding the difficulties, the Commission has proposed using ODRC with tilted annuity depreciation in the context of determining TSO costs.<sup>44</sup> The Commission considers this is appropriate in the TSO case due to:
- the need for consistency with related decisions that are constrained by specific statutory obligations (namely the obligation to use "forward-looking cost" in relation to TSLRC modelling); and
  - the relatively high rate of technical progress associated with those services.
- 5.164 However, the Commission's proposed use of ODRC with tilted annuity depreciation to determine TSO costs does not necessarily imply the Commission must use the same approach to determine current asset values for gas pipeline businesses, or as the basis for determining efficient prices for gas services.
- 5.165 At this stage, the Commission considers ODRC with tilted annuity depreciation may provide an upper bound for current asset values, or, more generally, as a cross-check on asset values otherwise considered. When investigating the use of replacement cost approaches, the Commission will consider straight line and other depreciation profiles.

In the context of replacement cost approaches:

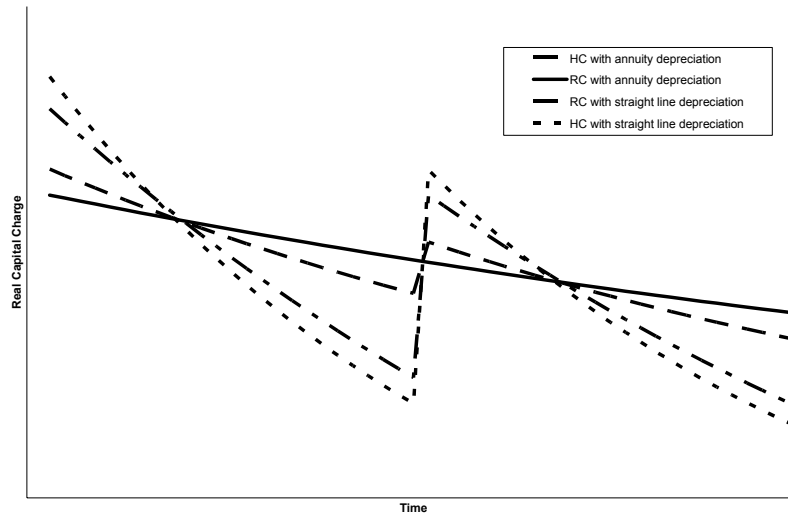
<sup>44</sup> Commerce Commission. June 2003, Draft Determination for TSO Instrument for Local Residential Service for period between 20 December 2001 and 30 June 2002.

30. What is the rate of technical progress in the relevant assets?
31. What is the economic life of the assets?
32. What issues affect the optimisation of assets and the derivation of current efficient asset values?
33. How should ODRC be derived from ORC?

### *The NPV Principle and Path Dependency*

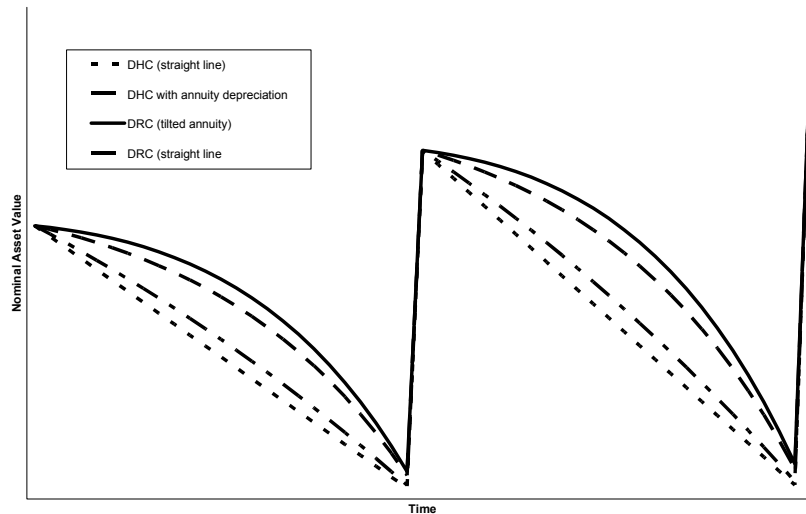
- 5.166 The Commission considers that arbitrary changes in the capital charging policy during the life of an asset may not be efficient, and may not be in the long term interests of consumers.
- 5.167 In general, switching from one capital charge methodology to another part way through the life of an asset would likely violate the NPV principle. Depending on its direction, such a switch could give rise to above-normal or below-normal returns to suppliers, when measured over the life cycle of the assets. In both cases, consumers could suffer detriment (in the latter case via consequential adverse investment incentives).
- 5.168 The effect of switching valuation methodologies mid-way through an asset's life cycle may be illustrated with reference to Figure 1, which portrays four different price paths that have the same NPV over the asset's life. The asset is replaced with a new asset in the middle of the period shown, and the asset's replacement cost is assumed to inflate each year at a rate lower than CPI inflation. In each case the price path is consistent with a different valuation / depreciation methodology, viz:
- historical cost and straight line depreciation;
  - replacement cost and straight line depreciation;
  - historical cost and annuity depreciation; and
  - replacement cost and annuity depreciation (also called tilted annuity).

**Figure 1 – Illustration of Different Capital Charge Methodologies**



5.169 The nominal asset values corresponding to each capital charging method described above are illustrated in Figure 2.

**Figure 2 – Asset values under different valuation methodologies**



5.170 Any change in capital charging methodology for an asset part way through its economic life could represent a significant shift in the remaining price path that would leave neither consumers nor suppliers “whole” in terms of the NPV principle.

### ***The Relevant Asset Base***

5.171 Whether the current efficient asset value is determined based on replacement or historical cost approaches, it is important to consider what specific assets should be included in the asset base.

- 5.172 In a competitive market, firms would not be able to recover in their prices the costs of assets that were not needed to meet customer demand. Excessive capacity or asset redundancy could reflect a variety of factors, including poor investment evaluations, unexpected market downturns and sheer bad luck. Firms that do not operate in a competitive market (and that might be subject to regulation) should be exposed to the normal risks inherent in competitive markets. To do otherwise would be to underwrite poor investment decisions, and to introduce moral hazards (lack of responsibility for poor decisions undermining incentives to invest prudently).
- 5.173 Under the historical cost approach, it is common in overseas regulatory jurisdictions such as the United States to apply two criteria: the assets must be 'prudently acquired', and they must be 'used and useful'.<sup>45</sup> This test is normally applied in the context of cost of service or pure rate of return regulation.
- 5.174 Clearly, in the regulatory context, it would send poor signals to regulated businesses (and to potentially regulated businesses) if a regulator were to underwrite previous poor investment decisions by allowing those assets to be included in the asset base for charging purposes. It would also likely be regarded as unfair on users if a regulator were to allow in the asset base those assets that were not required to provide the service.
- 5.175 Further, users might also question situations in which regulated businesses acquire assets, and include them in the asset base for charging purposes, unnecessarily far in advance of being needed. Against these considerations, it has to be remembered that, if regulation were to impose such costs but prevent upside benefits from investment being retained by the firm, the overall allowed return would be reduced. Regulated returns would be less than expected returns, thereby reducing incentives to invest. Thus, if businesses were required to bear optimisation risks, they must be compensated for this in an ex ante sense, either through a premium on that allowed return, or through the depreciation regime.

### *Optimisation*

- 5.176 In the context of the replacement cost approach, the process by which the relevant asset base is constructed is sometimes called optimisation. Establishing the efficient asset base covers a spectrum of options, varying in the extent to which the hypothetical asset base mirrors the existing asset base. A common approach is to start with the existing assets, and then progressively adjust asset valuations to reflect changes in the required deployment, modernity and scale of the assets to achieve the same level of services as supplied by the existing assets.
- 5.177 In this way, optimisation can range from the elimination of surplus assets at one end of the spectrum, to the complete redesign of the operation at the other. Some of the possibilities are set out in Table 3.

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<sup>45</sup> Armstrong, Cowan and Vickers, *Regulatory Reform*, op. cit., page 87.

**Table 3 – Degrees of Optimisation**

Degree of optimisation	Adjustment
Low	Surplus assets eliminated
↓	Technological obsolescence eliminated
↓	Over-design eliminated
↓	Site re-configuration – highest ‘brownfields’
↓	Changed location
High	Complete or ‘greenfields’ approach

5.178 Greenfields optimisation involves the hypothetical designing and building of an entirely new, optimal collection of assets for the entity, regardless of historical constraints that may apply to the existing assets. In the gas pipeline business context, this might involve a complete redesign of a pipeline system, possibly in a different configuration. In contrast, lower levels of optimisation (brownfield) involves replacing under-utilised and removing redundant assets, but retaining the historical configuration of key assets.

34. Which gas pipeline assets, if any, were imprudently acquired, and how should the “prudent” level of expenditure on those assets be determined?
35. Which gas pipeline assets, if any, are not used or not useful?
36. What issues arise in relation to optimising gas pipeline assets?
37. How should gas pipeline businesses be compensated for stranding risk associated with optimisation?

### *Intangible Assets*

5.179 A further consideration is the extent to which intangible assets might be identified and included in the efficient asset base. Viewed another way, to the extent any excess returns identified through the building block approach are attributable to superior efficiency, the quantum of that superior efficiency represents an intangible asset owned by the firm. In other words, a failure to take proper account of managerial efficiency when measuring excessive returns is conceptually equivalent to a failure to account for the associated intangibles in the asset base.

- 38. What intangible assets are relevant to the analytical framework for the Inquiry?
- 39. How should intangible assets be valued? How do they depreciate?
- 40. How can intangible assets be determined to be "used and useful"?
- 41. What is the replacement cost of intangible assets? How might they be optimised?
- 42. How should easements be valued?
- 43. What other assets should be included in the asset base? How should they be valued?

### ***Conclusions on Asset Valuation***

- 5.180 The Commission intends to consider both historical and replacement cost approaches for the establishment of efficient asset values for gas pipeline businesses.
- 5.181 In either case, the Commission must determine an appropriate depreciation profile, and consider the extent to which the assets presently in service are used and useful.
- 5.182 If the historical approach is used, the Commission must derive a current efficient asset value by subtracting accumulated depreciation from the opening asset value identified at some time in the past. It must also assess whether capital expenditure since that time has been prudent.
- 5.183 If the replacement cost approach is used, the Commission must decide what level of optimisation to apply, and must then apply a depreciation methodology to derive the current ODRC from the ORC.
- 5.184 The Commission considers that pricing, in practice, involves many pragmatic considerations and commercial judgements. The Commission would not necessarily consider a specific price path to be inefficient merely because it differed from a price path consistent with ODRC with tilted annuity depreciation, or from a price path consistent with historical cost valuation with straight line depreciation. Nevertheless, the Commission must establish some benchmarks for efficient price paths in order to determine whether there is evidence of monopoly pricing, and to assess the net benefits of control.

- 44. What asset valuation approach or approaches should the Commission use to establish the current efficient asset value (and thereby establish the efficient level of prices)?

## **Weighted Average Cost of Capital**

### ***Introduction***

- 5.185 This Chapter examines the second aspect relating to return on capital: weighted average cost of capital (WACC). WACC is relevant for determining prices and for assessing performance. It is the element of the pricing models that allows for a required rate of return to be earned by debt and equity security providers.
- 5.186 In formulating its views expressed on WACC in this Report, the Commission has obtained independent advice from Dr Martin Lally.

### ***WACC Methodology***

- 5.187 Companies are typically funded by a combination of debt and equity. WACC is the weighted average cost of each new dollar of capital raised at the margin. In the simplest terms, it is the cost of debt and the cost of equity weighted by the proportions of debt and equity. It is expressed by the following formula:

$$\text{WACC} = W_d R_d (1 - t_c) + W_e R_e$$

Where:

- $W_d$  = proportion (weight) of debt funding
- $R_d$  = cost of debt
- $t_c$  = statutory corporate tax rate
- $W_e$  = proportion (weight) of equity funding
- $R_e$  = cost of equity

- 5.188 Determination of the elements of WACC is subjective and involves considerable uncertainty. Careful and detailed examination is required to ensure that figures used (and assumptions adopted) are reasonable. If WACC is too high, gas pipeline businesses will be able to achieve excess returns, while if it is too low, it may discourage investment. For this reason, a range for WACC is estimated around a point estimate.

### ***Cost of Debt***

- 5.189 The cost of debt is the promised interest rate required by investors. It can, in some instances, be observed directly as the yield on debt issued by a company (e.g., when debt is traded), but is typically determined by way of a margin over and above the risk free rate, which is assumed to reflect the cost for which a firm of similar credit risk with an efficient capital structure could be expected to obtain financing. Computed in this way, the cost of debt ( $R_d$ ) is expressed by the following formula:

$$R_d = R_f + \text{Debt Premium}$$

Where:  $R_f$  = risk-free rate

Debt Premium = Liquidity Premium + Expected  
Default Losses + Risk Premium

- 5.190 The debt premium determines the premium over and above the risk free rate that is required by investors for holding the debt. It reflects marketability, expected default losses and compensation for risk (return deviating from that expected). If the Capital Asset Pricing Model (CAPM) model is invoked (discussed in the next section), then the risk compensation would be the product of the debt beta and the market risk premium.
- 5.191 In determining the debt premium, the Commission will consider such factors as how the gas pipeline businesses finance their assets (debt or equity), the actual premiums that the businesses pay above the risk-free rate, their liquidity and cashflow situation, and their credit ratings. However, as noted above, the key consideration in determining the debt margin is the cost for which a firm of similar credit risk with an efficient capital structure could be expected to obtain financing.
- 5.192 The cost of debt is estimated for the same period as that used to determine the risk-free rate (the period for which prices are fixed and not the duration of the gas pipeline businesses assets or its debt).

### **Cost of Equity**

- 5.193 The cost of equity is the expected rate of return just compensating for risk. While the cost of debt can often be observed directly as the yield on debt issued by the company, the cost of equity cannot, and must be estimated. A number of methods are available to estimate the cost of equity. However, the CAPM is the most popular, due to its intuitive appeal and relative ease of application.
- 5.194 The CAPM develops a relationship between the non-diversifiable risk of an asset (measured by its beta) and the opportunity cost of investing in that asset.<sup>46</sup> The essential principle underlying the CAPM is that risk-averse investors will not hold risky assets unless they are adequately compensated for the non-diversifiable risks that they bear and, therefore, the greater an asset's non-diversifiable risk, the greater the expected return. The CAPM links the risk-free rate, the asset's non-diversifiable risk, and the expected return on the market portfolio. Given the non-diversifiable risk of an asset, it provides the premium that investors can expect in terms of expected rate of return (over and above the risk-free rate) it determines non-diversifiable risk adjusted expected return on equity.<sup>47</sup>

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<sup>46</sup> Ramesh Rao, *Financial Management: Concepts and Applications*, Maxwell McMillan Publishing, Second Edition, 1992, page 327.

<sup>47</sup> *Ibid*, pages 330-331.

5.195 The standard CAPM model for determining the expected rate of return on equity ( $R_e$ ) was developed by Sharpe and Lintner and is expressed by the following formula.<sup>48</sup>

$$R_e = R_f + \beta_e(\text{MRP})$$

Where:  $\beta_e$  = equity beta

Market Risk Premium (MRP) =  $R_m - R_f$

$R_m$  = expected rate of return on the market portfolio

### **Taxes**

5.196 In developing the costs for the different capital components, issues regarding taxes arise. The standard CAPM does not take personal taxation incurred by investors explicitly into account and, therefore, does not adjust for the effect of any imputation credits attaching to dividends or the fact that capital gains are in general taxed less onerously than ordinary income. Building on the work of Brennan, Lally has developed a version of the CAPM that explicitly takes account of personal tax rates that differ across both investors and sources of income, and which is applicable to the New Zealand tax regime. However, the resulting cost of equity is still an expected rate of return before personal taxes.<sup>49</sup>

5.197 The Brennan-Lally model can be expressed as follows:

$$R_e = t_{\text{div}}\text{Div} + R_f(1-t_{\text{int}}) + \beta_e(\text{TAMRP})$$

Where:  $t_{\text{div}}$  = parameter reflecting the excess of the personal tax rate on cash dividends over the capital gains tax rate

Div = dividend yield of the company

$t_{\text{int}}$  = parameter reflecting the excess of the personal tax rate on interest over the capital gains tax rate

TAMRP = Tax-Adjusted Market Risk Premium  
 $= R_m - R_f(1-t_{\text{int}}) - t_{\text{divm}}\text{Div}_m$

$t_{\text{divm}}$  = weighted average of  $t_{\text{div}}$  over the individual companies in the market portfolio

<sup>48</sup> Sharpe W F, Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk, Journal of Finance, Vol 19, 1964, pp 425-442. Lintner J, The Valuation of Risky Assets and the Selection of Investments in Stock Portfolios and Capital Budgets, Review of Economics and Statistics, Vol 47, 1965, pp13-37.

<sup>49</sup> Brennan M, Taxes, Market Valuation and Corporate Finance Policy, National Tax Journal 23, 1970, pages 417-427. Lally M, The CAPM under Dividend Imputation, Pacific Accounting Review, Vol 4, 1992, pages 31-44.

$Div_m =$  dividend yield of market portfolio

- 5.198 Assuming fully imputed dividends, that all investors have the ability to fully use them, that the average across investors of their marginal ordinary tax rates is 33%, and that capital gains are not taxed, it follows that  $t_{div}$  and  $t_{divm}$  are each zero, and  $t_{int}$  is 33%. These assumptions result in a simplified Brennan-Lally model expressed as follows:

$$R_e = R_f(1 - 0.33) + \beta_e(\text{TAMRP})$$

Where:  $\text{TAMRP} = R_m - R_f(1 - 0.33)$

- 5.199 While there has recently been a change in the top marginal personal tax rate, the assumption that the average investor faces a 33% marginal ordinary tax rate is still valid.
- 5.200 The Commission's view is that the cost of equity should be computed using the tax-adjusted Brennan-Lally CAPM.

### **Risk Free Rate**

- 5.201 The risk-free rate is the interest rate that an investor would earn on a riskless investment. However, there is no such thing as the risk-free rate in reality. Governments are typically the only entities in the market for funds considered to have such a low level of risk. Therefore, rates for Government stock are usually used to approximate the risk-free rate.
- 5.202 The risk-free rate is used in calculating both the cost of debt and the cost of equity. The choice of the risk-free rate significantly impacts on the resulting WACC and should be determined carefully.
- 5.203 A question that has to be resolved in determining the appropriate risk-free rate relates to the term (maturity) of the rate used. Alternatives are to use the maturity corresponding to the term for which prices are fixed, or the life of gas pipeline business assets. The Commission's view is that the term of the risk-free rate should match the term for which prices are fixed, on the basis that charges should reflect expected costs and risks over the term for which prices are fixed but not be affected by the expectations of costs and risks beyond that point.
- 5.204 After determining the appropriate maturity date the next step is to determine how the rate is fixed. The options depend on how prices are reset. If prices are reset over a period rather than at a point in time then the options involve various risk free rates over that period, such as the ending rate, the midpoint rate, the average of the beginning and ending rates, and the average of all rates over the period. The Commission favours the latter. If prices are simply reset at some point in time then the appropriate action would be to choose the average risk free rate over a period of one month prior to the price being reset. The Commission's approach is that a risk-free rate at a particular date should not be used.

### **Market Risk Premium**

- 5.205 The Tax-Adjusted Market Risk Premium (TAMRP) represents the additional premium that investors require to hold the market portfolio—a diversified basket of ‘risky’ assets—over and above the return that can be obtained from investing in risk-free assets subject to adjustments for personal taxes. It is not affected by firm specific factors. Continuing debate exists about the appropriate size of the TAMRP.
- 5.206 A number of approaches can be used to estimate TAMRP. The common approach is to observe ex-post risk-free rates, tax rates, and market returns, and calculate an arithmetic average over a number of years. Other methods involve: estimating the relationship between TAMRP and market volatility changes over time; estimating the TAMRP consistent with the current value of shares and expected growth in market dividends; and considering estimates of the TAMRP for foreign markets. Whatever approach is used, it is important to ensure that current estimates of investors’ expectations are incorporated.
- 5.207 In estimating the TAMRP from averaging historical returns, a time period for the analysis has to be chosen. The choice involves a trade-off between using more data (which potentially improves the statistical precision of the TAMRP estimate), and using potentially less relevant data (by using data that is too historic). Whatever period is used, there will always be some statistical uncertainty surrounding the estimate.

### **Beta**

- 5.208 Risk relates to the possibility that return may deviate from the expected return. The total risk of an asset or business is made up of both diversifiable risk and undiversifiable risk.
- 5.209 Diversifiable (or unsystematic) risk is unique to the asset or firm and can be eliminated by diversification. The risk of obsolescence of its technology, the risk of reduced revenues caused by increasing competition, and the risks associated with patent approval, antitrust legislation, labour contracts, management styles, geographic location are all examples of unique risks.
- 5.210 Undiversifiable (or systematic) risk is market risk, which is not unique to the firm. Such risk cannot be eliminated by diversification. It is related to, and dependent on, the state of the economy as a whole. The more systematic risk that is inherent in the operations of a company, the higher will be the cost of any debt and equity used to fund its operations.
- 5.211 A common misconception is that all variability and uncertainty in the returns accruing to an asset are included in the computation of WACC. Only the undiversifiable risk is relevant in determining the cost of equity. Investors are not compensated through CAPM for diversifiable risk. The CAPM implies that investors hold a diversified portfolio and, accordingly, diversify away this risk.

5.212 Beta measures the sensitivity of an asset's return to market returns—it's systematic risk.<sup>50</sup> It is probably the most contentious of the WACC components. It also significantly affects the resulting WACC.

### *Asset Beta*

5.213 The asset beta ( $\beta_a$ ) measures the sensitivity of a company's return to market returns when the company has no debt. The greater the extent of this systematic risk, the greater the asset beta.

### *Equity Beta*

5.214 The equity beta is related to the asset beta by the following formula:

$$\beta_e = \beta_a(1 + (W_d/W_e))$$

Where:  $W_d$  = proportion (weight) of debt funding

$W_e$  = proportion (weight) of equity funding

5.215 If a company has no debt—is entirely financed by equity—its asset and equity beta are identical. By adding debt to a company's capital structure, the shareholding becomes more risky, such that its equity beta is greater than its asset beta. The level of systematic risk associated with equity (the equity beta) is magnified according to the proportion of debt in the funding mix. The greater the proportion of debt, the greater the systematic risk associated with the residual cashflows available for distribution to shareholders, and the greater difference between its asset and equity beta. For otherwise identical investments, a company with more debt in its capital structure will have a higher equity beta and a higher required rate of return on equity than a company with less debt.

### *Pure Play Comparisons*

5.216 Beta may or may not be able to be estimated directly. Betas can only be directly estimated for listed companies. Where a beta cannot be estimated directly, a proxy or surrogate beta can be estimated by making adjustments for differences in gearing to the betas of similar entities or assets that are 'pure play'—comparable companies with similar activities and risks. While such an approach is useful, it is often difficult to find a 'pure play' comparison.<sup>51</sup> It is acknowledged that estimation of betas invariably involves an element of judgement of what is most appropriate. Even if a beta can be estimated

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<sup>50</sup> Non-systematic risks necessarily have no effect on beta. However, they may affect the expected cashflows and should, therefore, be dealt with there. For example, the expected cashflows may incorporate no allowance for the possibility of an adverse event, such as an earthquake. If this has a probability of 1% and will lower cashflows by \$100 million in the event of it occurring, the expected cashflows should be reduced by \$1 million.

<sup>51</sup> Beta estimates in New Zealand are further complicated by the relative thinness of the New Zealand Stock Exchange.

directly, one should still seek comparators because the statistical reliability of beta estimates for single companies are poor, due to high variability in equity returns.

### *Factors*

5.217 Differences in betas across companies rise from differences in the sensitivity of returns to unexpected changes in the economy. The relevant factors that impact on betas are identified below.

- **Industry, i.e., the nature of the product or service.** Firms producing products with low income elasticity of demand (necessities) should have lower sensitivity to unexpected changes in the economy than firms producing products with high income elasticity of demand (luxuries), because demand for their product is less sensitive.
- **Nature of the customer.** There are a number of aspects to this.
  - The split between private and public sector demand. Firms producing a product whose demand arises exclusively from the public sector should have lower sensitivity to unexpected changes in the economy than firms producing a similar product demanded exclusively by the private sector, because demand should be less sensitive.
  - The personal/business mix, with the former being more sensitive to unexpected changes in the economy.
- **Pricing Structure.** Firms with revenues comprising both fixed and variable elements should have lower sensitivity to unexpected changes in the economy than firms whose revenues are entirely variable.
- **Duration of contract prices with suppliers and customers.** The longer prices are fixed (by contract, for example), the more exposed a firm is to unexpected changes in economic conditions, and the higher is beta.
- **Presence of price or rate-of-return regulation.** Firms subject to rate-of-return regulation should have lower sensitivity to unexpected changes in the economy, because the regulatory process is geared towards achieving a fair rate of return. Price regulation will have a similar effect, providing prices are frequently reset. However, as the reset interval increases, such a firm tends to resemble one with an output price contractually fixed for a long period. So beta increases with the length of the interval for which prices are fixed.
- **Degree of monopoly, i.e., price elasticity of demand.** So long as firms act to maximise their cash flows, theory offers ambiguous results. If monopolists do not optimise their cash flow, and react to unexpected changes in demand by varying the cushion provided by suboptimal pricing and cost control more than do non-monopolists, then their returns should exhibit less sensitivity to demand, and hence to unexpected changes in the economy.
- **Nature of the firm's real options.** The existence of options permitting expansions of the firm (adopting a new product, expanding existing

operations, etc) should increase the firm's sensitivity to unexpected changes in the economy, as the values of these growth options should be more sensitive to such changes than equity value exclusive of them, and these two value components should be positively correlated. By contrast, the existence of options permitting contractions of the firm should reduce the firm's sensitivity to unexpected changes in the economy, because the option value should be negatively correlated with equity value exclusive of it.

- **Operating leverage.** If firms have linear production functions and demand for their output is the only random variable, then firms with greater operating leverage (higher fixed to total operating costs) should have greater sensitivity to unexpected changes in the economy because their cash flows will be more sensitive to demand.
- **Market weight.** Increasing an industry's weight in the market proxy against which its beta is defined will draw its beta towards 1, although not necessarily in a monotonic fashion. Even for a market weight as low as 5%, the effect can be substantial.
- **Capital structure.** Firms with greater financial leverage will have greater sensitivity of equity returns to unexpected changes in the economy, because cash flows to shareholders will be more sensitive to demand. In addition, firm leverage only matters in relation to market leverage. Thus, for a given level of firm leverage, firms in different markets that have different market leverages will have different betas.

5.218 Comparators ideally should be similar in the above respects. However, so long as differences can be corrected for, this is not strictly necessary (and will therefore expand the set of comparators, with resulting improvement in the statistical reliability of the beta estimate).

### **Weights**

5.219 A number of options exist with respect to selection of the weights used to determine WACC. They include:<sup>52</sup>

- Proportions present in the company's financial structure.
- Target or long-run proportions of the company.
- Proportions present in the financial structure of comparator private sector companies (used to estimate  $\beta_e$ ).

5.220 All these ratios involve market values rather than book values.

5.221 The Commission considers that actual leverage ratio—based on the market values of debt and equity at the time prices are set—is the most appropriate ratio to use (and is consistent with use of a firm's actual costs).

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<sup>52</sup> Treasury, Estimating the Cost of Capital for Crown Entities and State-Owned Enterprises, October 1997, page 33.

### **Nominal Versus Real WACC**

5.222 WACC can be expressed in real or nominal terms. The relationship between the real and nominal WACC—between any real and nominal rate—is defined by the Fisher equation:

$$(1 + R_{\text{nom}}) = (1 + R_{\text{real}})(1 + i)$$

Where:  $R_{\text{nom}}$  = nominal rate  
 $R_{\text{real}}$  = real rate real  
 $i$  = rate of inflation

5.223 A decision must be made over whether WACC should be computed in nominal or real terms. The choice must be consistent with the treatment of asset revaluation. Three options are available.<sup>53</sup>

- Apply a nominal rate to the depreciated historic cost of assets.
- Apply a nominal rate to revalued assets and include any revaluation amounts as income.
- Apply a real rate to revalued assets, but do not include any revaluation amounts as income.

5.224 For the purposes of this Inquiry, the Commission proposes to include revaluation gains in income, and consistency then requires the use a nominal WACC.

### **Conclusion**

5.225 After the asset base, WACC has the next most significant impact on the calculation of excess returns. The Commission's approach to determining WACC can be summarised as follows:

5.226 The cost of equity is computed using the tax-adjusted Brennan-Lally CAPM.

5.227 The cost of debt is estimated for the same period as that used to determine the risk-free rate (the period for which prices are fixed and not the duration of the gas pipeline businesses assets or its debt).

5.228 The term of the risk free rate should match the term for which prices are fixed, on the basis that charges should reflect expected costs and risks over the term for which prices are fixed, but not be affected by expectations of costs and risks beyond that point. In revising the rate used, the Commission's approach is to use an average yield on government stock over the period in which prices are revised, assuming that prices are revised over a period rather than at a point in time. If prices are revised at a point in time, the Commission's approach is

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<sup>53</sup> Treasury, Estimating the Cost of Capital for Crown Entities and State-Owned Enterprises, October 1997, page 18.

to use the average yield on government stock over the month preceding that point in time.

- 5.229 The Commission does not consider any of the various approaches to estimating the TAMRP to be better than any other.
- 5.230 The Commission uses an ordinary tax rate of 33% in computing the cost of equity, but the statutory corporate tax rate (which in the late 1980s was 28%) in computing the after-tax cost of debt.
- 5.231 In selecting comparators to determine beta, the Commission considers a number of factors. In the case at hand, the regulatory environment is fundamental to the performance of the gas pipeline businesses and is, therefore, the dominant factor considered in choosing comparators.
- 5.232 A firm's actual leverage ratio - based on the market values of debt and equity at the time prices are set - should be used (consistent with the use of a firm's actual costs).
- 5.233 The Commission proposes to include revaluation gains in income, and consistency then requires the use of a nominal WACC.

**Operating and Capital Expenses**

- 5.234 Under the building block approach, determining efficient revenues involves determining efficient levels of operating and capital expenditures.
- 5.235 In relation to historical cost valuation, the Commission proposes to draw inferences about the relevant capital and operating expenditures from disclosed financial statements and other sources where necessary. The Commission may also engage consultants to review the efficiency of past operating and capital expenditures.
- 5.236 Similarly, the Commission may review forecast expenditures by each gas pipeline business, and may adjust them as necessary to determine a level of expenditures consistent with efficient prices.

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| <p>45. How can past expenditures be reviewed for efficiency?</p> <p>46. How can forecast expenditures be assessed for efficiency?</p> |
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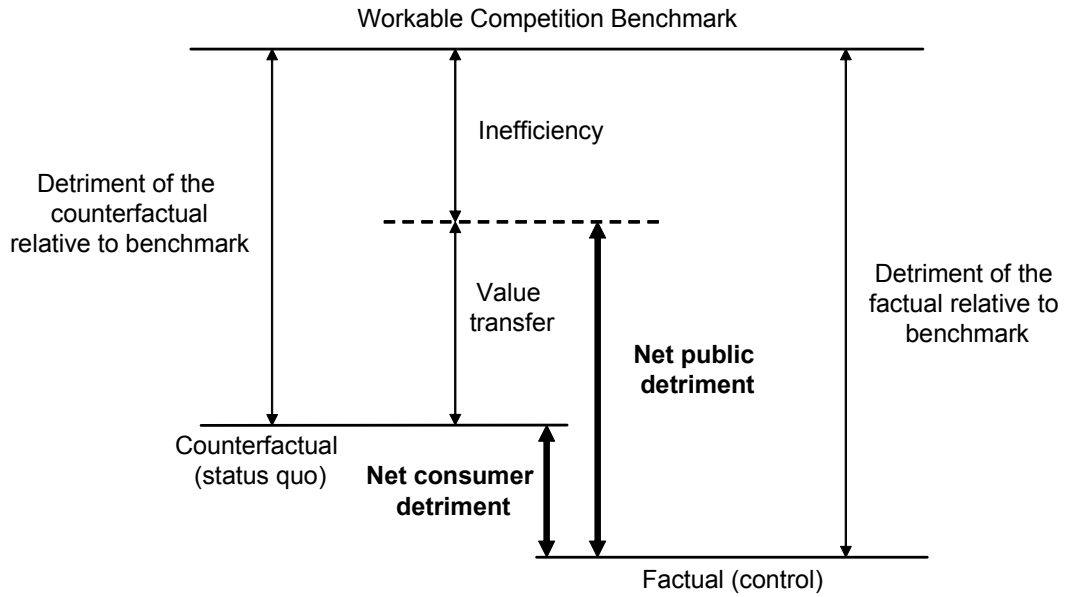
## **Benefits and Costs of Control**

### ***Introduction***

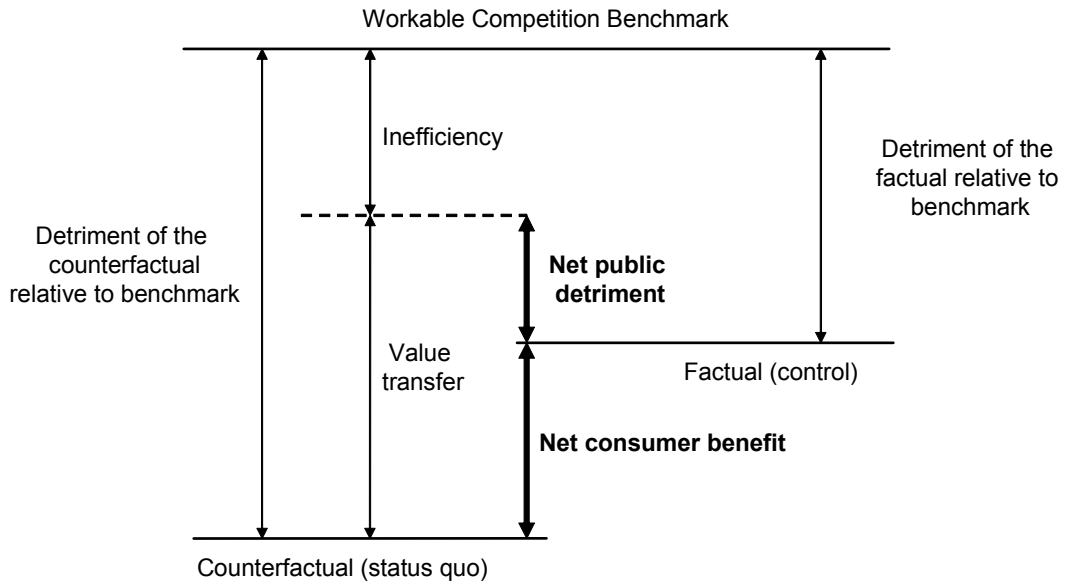
- 5.237 The Commission considers a recommendation that control should be declared must be supported by evidence that control would be in the interests of acquirers. In practice, this means the Commission must assess the net benefits to acquirers of control (the factual) relative to the situation with no control (the counterfactual). In framing the factual and counterfactual, the Commission bases its view on a pragmatic assessment of what is likely to occur under both scenarios. This is essentially the statutory test provided in s52(b), which may be called the “net acquirers’ benefit test”.
- 5.238 However the Minister’s terms of reference require the Commission also to undertake a net public benefit test, as distinct from a net acquirers’ benefit test. The difference between these two tests is discussed below. In summary, a net public benefit analysis considers net total welfare effects. Under this analysis, any efficiency loss would count as a net public detriment, but any transfer of wealth (or surplus) from acquirers (consumers) to suppliers (or vice versa) would not.
- 5.239 As noted in the section on Pricing Principles, the pricing behaviour of gas pipeline businesses is, in the first instance, assessed against an “efficient prices” standard. This standard is consistent with what the Commission considers would occur in a market with workable or effective competition.
- 5.240 The net benefits of control (whether to acquirers or to the public) are estimated by directly comparing the factual with the counterfactual. The Commission’s proposed approach follows that taken in the Airports Inquiry, namely:
- identifying the potential benefits of control, for which the starting point is the performance of the counterfactual relative to the workable competition benchmark;
  - acknowledging that not all of those benefits would be realised in the factual (control); and
  - identifying the additional costs that might be incurred in the factual, which include the additional administration and compliance costs (direct costs) and inefficiencies that may be caused by behavioural responses to control (indirect costs).
- 5.241 Each of these steps is discussed in the ‘Benefits’ and ‘Costs’ sections.
- 5.242 The Commission may also consider an alternative representation of the net benefit analysis, which is to separately compare the costs and benefits of the factual and the counterfactual with the hypothetical benchmark of workable competition. Thus, a comparison is made between two hypothetical future scenarios, one with control and one without, relative to workable competition.

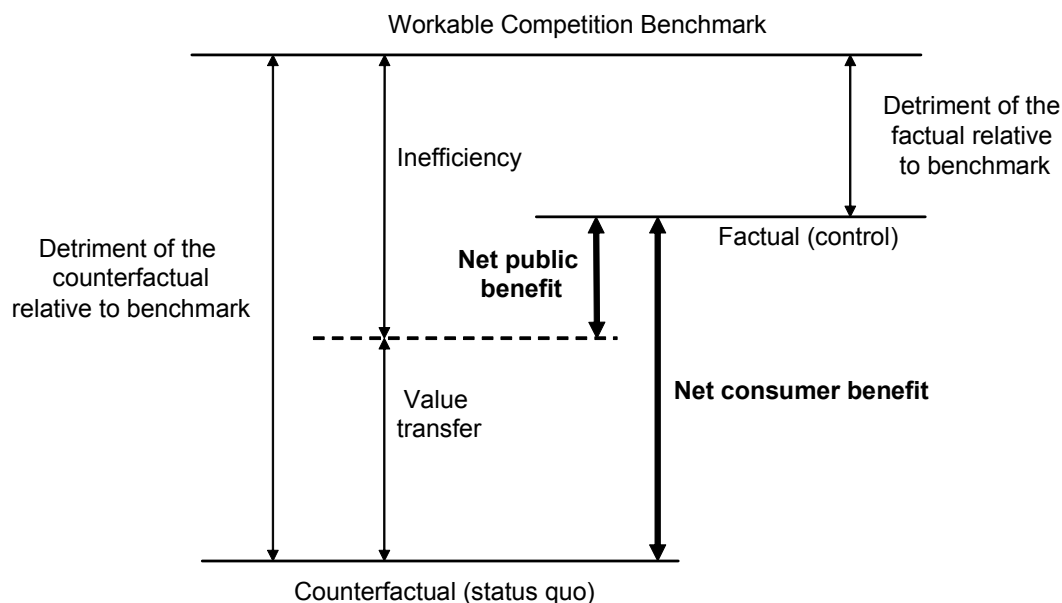
- 5.243 Under this approach it is assumed that both the factual (control) and the counterfactual (without control) are likely to have some detriment relative to the workably effective competition benchmark. The net benefits of control (whether to acquirers or to the public) would then be calculated as the difference between these two distinct assessments.
- 5.244 The quantification of net benefits of control (both to acquirers and to the public) is illustrated schematically in the figures below. In each of these diagrams, the levels of detriment associated with the factual and counterfactual are represented as two line segments, lying some distance below the segment representing the workable competition benchmark.
- 5.245 The detriment associated with the counterfactual (no control) is assumed to have two components – an inefficiency component and a wealth transfer component. In principle, the detriment associated with the factual (control) could similarly have two components, but for simplicity of illustration is assumed to comprise only an inefficiency component. In other words, it is assumed that control would largely address the detriment represented by wealth transfers but would incur efficiency losses to a greater or lesser extent than the counterfactual.
- 5.246 The diagrams illustrate how the net benefit test could produce different outcomes depending on the relative sizes of the different components of detriment under the factual and counterfactual scenarios (relative to the workable competition benchmark). Three distinct cases are illustrated:
- Case 1 (Figure 3) – net detriment both to acquirers and to the public from the imposition of control;
  - Case 2 (Figure 4) – net benefit to acquirers, but net detriment to the public; and
  - Case 3 (Figure 5) – net benefits both to acquirers and to the public.

**Figure 3 – Net public and consumer detriments**



**Figure 4 – Net consumer benefit but net public detriment**



**Figure 5 – Net consumer and public benefits**

47. What is the best way to determine whether declaration of control would be in the interests of acquirers?
48. What is the best way to determine whether declaration of control would be in the public interest?

### ***The Counterfactual***

- 5.247 At this stage, the Commission considers the counterfactual would be a continuation of the status quo, with the gas pipeline businesses operating under the present form of regulation, which includes information disclosure, and a threat of control under Part IV of the Commerce Act. However, the Commission notes that there is always the possibility that a further inquiry may occur in the future, if behaviour at any of the gas pipeline businesses were to warrant this.
- 5.248 With respect to the status quo the Commission will consider the impact of this Inquiry recommending that control should not be imposed and this being accepted by the Minister. Specifically, the constraining impact of the threat of control could (at least for a time) be reduced. This might allow the gas pipeline businesses somewhat greater latitude in behaviour, leading to an increase in inefficiencies or excess pricing.
- 5.249 The Commission also considers that both the factual and the counterfactual should reflect the initiatives flowing from the Government's policy statement: development of New Zealand's gas industry, particularly:

- the establishment of an open access regime across all high-pressure transmission pipelines so that gas market participants can access transmission pipelines on reasonable terms and conditions; and
- the establishment of consistent standards and protocols across all distribution pipelines so that gas market participants can access distribution pipelines on reasonable terms and conditions.

5.250 Having regard to the above matters, the Commission considers that, in general, the counterfactual is a continuation of the status quo. The conclusion made is that the current regulatory regime will remain, and will maintain its current level of effectiveness.

49. Are there specific qualifications that should be considered when setting the counterfactual?

### **Benefits**

5.251 The potential benefits of control relate to reducing any inefficiencies (allocative, productive and dynamic) and/or excess returns in a market. An analysis of performance in the counterfactual compared to an efficiently operating market could be used to measure these benefits. However, it cannot be assumed that all of the potential benefits would actually be realised in practice through the imposition of control. Clearly, different forms of control may be more or less effective. Further, control can create additional costs and inefficiencies to those resulting from lighter forms of regulation, as discussed below.

5.252 A useful starting point for the analysis of the benefits of control remains the inefficiencies that may be present in the counterfactual. The sources of potential benefit include:

- Allocative inefficiency being reduced by control (with the resulting lower prices passed on to consumers). Inefficient levels of service quality for the price charged could also be addressed through control. There may also be indirect or spill-over benefits from any lower prices to related markets.
- Excess returns being reduced by control, with a transfer of wealth from suppliers to consumers (being a net benefit to acquirers). The increase in consumers' wealth is matched by a reduction in suppliers' wealth (resulting in zero net public benefit).
- Productive inefficiency being reduced by control (with resulting cost savings likely to be passed on to consumers in lower prices).
- Dynamic inefficiency being reduced by control, because of better utilisation/allocation of resources. This would benefit New Zealand and potentially lower required revenue from gas services (to cover costs) likely leading to lower prices for end use consumers.

5.253 The sources of potential benefits are now discussed below. The models to be used to quantify the potential benefits of control over time are also introduced.

### ***Allocative Efficiency Effects***

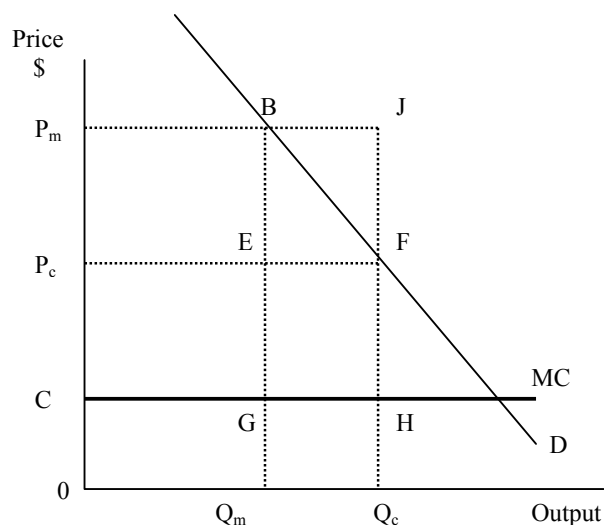
5.254 The evaluation of allocative inefficiencies within the gas pipeline businesses would require a calculation of the efficient price for gas services over time. The total revenue and cost for gas services could be used to do this. Cost would be measured by the sum of appropriate gas services expenses and a normal return on investment, the latter being calculated by multiplying the appropriate asset base by an appropriate WACC. Revenue would be measured by multiplying gas pipeline prices by the relevant quantity of service provided.

5.255 Where revenue exceeds cost, or equivalently, where the gas pipeline businesses' actual returns on gas services (after allowing for expenses) are greater than normal returns, prices would be above the efficient level. From this, the potential benefits to acquirers can be estimated, if control were to have the effect of reducing prices for gas services to a level closer to the efficient level.

### ***Analysing Current and Future Performance***

5.256 Given the inelastic demand for gas services, large price increases would likely have limited adverse impact on demand by consumers. Deadweight losses (DWL) associated with inefficient pricing would emerge in the gas services market, but these would be likely to be small relative to the size of the distribution effects (i.e., the wealth transfer from consumers to suppliers through the higher prices). These effects are explained in Figure 6.

5.257 The cost structure of gas services is such that fixed costs make up a large proportion of total costs, while marginal costs are very low so long as excess capacity exists. The point at which the demand curve (D) meets the price axis is not shown on the chart, but is termed point A. The demand curve is assumed to be linear for simplicity.

**Figure 6 – Allocative Inefficiency in the Gas Services Market**

5.258 A gas pipeline business must cover all of its costs, including fixed and overhead costs, so the competitive average price is assumed to be set above marginal cost (MC) at  $P_c$ , with output at  $Q_c$  ( $P_c$  includes an appropriate level of normal returns reflecting an appropriate asset base and WACC).

5.259 Inefficient pricing would be reflected in the price being raised above the competitive level to, say,  $P_m$ , with output in consequence shrinking to  $Q_m$ . This would result in:

- a loss of net surplus equal to the area BFHG. This loss is shared between acquirers' (consumer) surplus of BFE and the supplier's (producer) surplus of EFHG;
- resources no longer required because of the reduction in output, represented by the area  $GHQ_cQ_m$ , which are assumed to be absorbed elsewhere in the economy, with no impact on welfare; and
- additional surplus gained by the supplier at the expense of acquirers, depicted by area  $P_cP_mB E$ , which is a wealth transfer from acquirers. In efficiency terms, this transfer is assumed to have no direct effect, since one party gains at the expense of the other.

5.260 Hence, the detriment arising from the loss of allocative efficiency in the gas services market is represented by the area BFHG. The supplier earns excess returns equal to the value of area  $P_cP_mB E$ .<sup>54</sup>

5.261 An alternative possibility is that the actual price could be below the competitive price. To generate that outcome using Figure 6, the 'm' subscript can now be treated as indicating the competitive position, and the 'c' subscript

<sup>54</sup> This analysis assumes for simplicity that the AC curve is actually horizontal, rather than downward sloping, in the range between points E and F. In any case, given the price inelastic demand curve, the output difference between the two points is unlikely to be significant, so that the average costs at those two points are likewise not expected to differ significantly.

the actual position. In this case, acquirers of gas services benefit at the expense of the service provider, who earns less than normal returns. The total revenue produced by the service is represented by the area  $OP_cFQ_c$ , and the total cost is equal to  $OP_mJQ_c$ , leaving a loss to the gas pipeline business of  $P_cP_mJF$ .<sup>55</sup> The deadweight loss from the over-production by  $Q_mQ_c$  is shown by the triangular area  $BJF$ . In this scenario, as in the previous one, the deadweight loss is likely to be very small relative to the wealth transfer from, in this case, suppliers to consumers/acquirers.

### *Incentives for Allocative Efficiency*

- 5.262 An unregulated profit maximising business may have incentives to establish an efficient structure of prices based on Ramsey pricing principles since by charging higher prices to price-inelastic consumers, businesses are likely to maximise revenues. However, allocative efficiency might be lost to the extent that overall price levels were "too high". Such efficiency losses would generally be small because the price elasticity of demand is likely to be low.
- 5.263 Control could constrain a gas pipeline's price levels, potentially achieving modest allocative efficiency gains, as long as the regulator gets the price path right. However, control may lock in inefficient price structures, and could force prices levels too low, or could allow them to remain too high, which would also involve inefficiencies compared with the theoretical benchmark.

### *Productive Efficiency Effects*

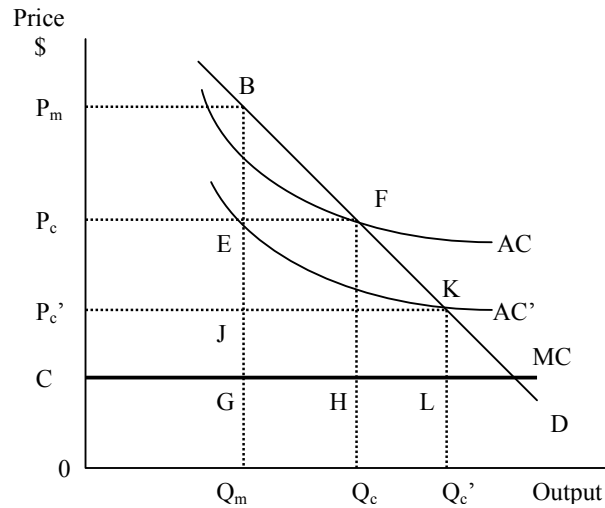
- 5.264 A productively efficient operation is one that meets demand at the lowest possible cost. The impact of productive inefficiencies in the gas services market of a gas pipeline business can be modelled by further developing Figure 6, as shown in Figure 7. The further assumptions built into the model are:
- the competitive price and output is assumed to be found, as before, at the point where the existing average cost (AC) curve intersects with the demand (D) curve; and
  - all productive inefficiency is assumed to be felt in fixed costs, so that average fixed costs are inflated, and the AC curve is 'too high'. This assumption is made to simplify the graphical illustration of the effects of productive inefficiency.<sup>56</sup> The level of the average cost curve when costs are minimised is at  $AC'$ .

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<sup>55</sup> This statement is subject to the same qualification as given in the previous footnote.

<sup>56</sup> Similar effects would be seen if it were assumed that productive inefficiency were felt in variable costs, although an additional shift of the MC curve downward would have to be shown in addition to the AC curve shift.

Figure 7 – Productive Inefficiency in the Gas Services Market



5.265 The inefficiently high level of costs results in welfare effects that can be analysed at two levels. First, as a productive inefficiency, the wastage of resources is an outright loss, as their transfer to other productive employments would lead to no loss of output in gas services. In terms of Figure 7, this loss is measured at a given output by the vertical distance between AC and AC', multiplied by that output.

5.266 Second, in an efficient setting the inflated costs would not be present, so that the competitive average cost curve would be AC', not AC as assumed so far. This, in turn, would mean that the efficient price and output would be  $P_c'$  and  $Q_c'$  respectively, not  $P_c$  and  $Q_c$  as assumed in Figure 6. As a consequence, the allocative inefficiency loss and wealth transfer flowing from price at  $P_m$  being above the efficient level is larger than previously estimated. The allocative efficiency loss increases from BEF to BJK, and the transfer increases from  $P_c P_m BE$  to  $P_c' P_m BJ$ .

5.267 In summary, the model used in Figure 7 shows that, if productive inefficiency in the counterfactual were found in the costs, and if those inefficiencies were to be reduced under control through the pressure of lower prices forcing greater efficiency, this would allow a further reduction in prices beyond that described in Figure 6.

5.268 However, without a precise measure of the slope of the AC' curve, it is not possible to calculate the additional allocative efficiency effect (or those proportions that reflect consumer, and producer, surplus gains respectively). Accordingly, a conservative approach will be taken, with only wasted resource measured as a potential benefit of control.

### *Incentives for Productive Efficiency*

5.269 An unregulated profit-maximising business generally has strong incentives for cost efficiency since cost reductions translate into increased profits.

Shareholders and the board have a number of options for constraining agency costs which might otherwise lead to cost inefficiencies. Options include the use of external benchmarking of the business' performance, increasing debt and dividends to reduce free cash flows, the use of outside directors, the use of incentive schemes for managers, and requiring managers to contract out certain functions. Competition in capital markets (i.e. the threat of takeover of poorly performing firms) reinforces these incentives.

- 5.270 Unless profit constraints apply (as may occur with the threat of regulation) shareholders would generally not be content to forgo returns achievable through cost efficiencies even if they were already earning above normal returns.
- 5.271 Control may reduce incentives for cost efficiency provided by profits, since a regulated business can expect to retain a smaller proportion of any cost reductions. Regulation may also divert management from running the business, and may involve substantial direct costs.
- 5.272 Reducing prices through control could provide incentives for efficient cost reductions if investors placed greater weight on prevention of losses than on increasing profits. Such a constraint would be similar in some ways to shareholders requiring higher debt levels or dividend payouts to reduce free cash flows available to management. Thus, overall, it is possible that incentives for cost efficiency may be reduced rather than increased by control.

### ***Dynamic Efficiency Effects***

- 5.273 Control risks damaging dynamic efficiency because it introduces the possibility that a regulated business will not be able to earn an adequate return on investment because of decisions by the regulator. The incentives to innovate to reduce costs may be weakened by control, because the business gets to keep a smaller share of any benefits. On the other hand, if control were to result in lower prices, there might be beneficial dynamic effects on downstream industries (i.e. demand for downstream services might be stimulated).

### ***Costs***

- 5.274 The first step in evaluating the costs of control is recognising that there are already significant costs arising from the present regulatory regime, which are expected to persist into the future (in the counterfactual situation). These costs include costs incurred by the gas pipeline businesses in meeting the Gas (Information Disclosure) Regulations 1997 and costs incurred by direct consumers in monitoring that information. For the purpose of this Inquiry, it is the additional costs of control over and above those currently incurred that are relevant to determining whether control should be introduced.

- 5.275 The regulatory costs already incurred by participants in the gas services market may increase or decrease if the present regime were to be augmented by one of control under the Commerce Act.
- 5.276 In general, the costs of control comprise direct and indirect costs. The direct costs of control include:
- the compliance costs of the regulated entities and other market participants involved in the regulatory process (e.g. the cost of staff time, the information supply costs, the diversion of time of senior executives); and
  - the administrative costs of the regulatory body.
- 5.277 The indirect costs of control are related to the inefficient forms of behaviour stimulated by control, and can theoretically include:
- the distortions to behaviour caused by the potential for poor, or uncertain, regulatory decision making (in terms of allocative, productive and dynamic inefficiencies);
  - the scope given for opportunistic behaviour on the part of the regulator and the regulated firm; and
  - the potential for regulatory capture (with the regulator coming to serve particular groups' interests), and a subsequent movement away from efficient outcomes.
- 5.278 The costs of control will be viewed in a dynamic setting. For example, costs may increase over time if there were a succession of poor decisions, or costs could decline over time as the entities involved become more familiar with the regime. Costs will also be dependant on how enlightened, transparent and consistent are the regime and the actions of the regulator. The effectiveness of the regime is likely to be greater the more information is available to all parties.
- 5.279 The Commission considers that the costs of control can only be assessed when the nature of that control is made explicit. However, the Commission does not wish to prejudge the form that control might take, in the event that it were to be introduced.
- 5.280 The Commission proposes to use price cap regulation to evaluate the costs of control for this Inquiry. Price cap regulation was used to evaluate the costs of control in the Airports Inquiry and is the most frequently used form of control used overseas. Overseas experience demonstrates that this form of control can be used in either a heavy-handed or light-handed way.
- 5.281 Direct and indirect costs are further discussed below. The Commission considers that the direct costs of control can be evaluated more generically, although reference to price cap forms of control will be made as necessary. The indirect costs of control are more dependent on the form of control used and how it is applied, and price cap forms of control are evaluated more closely in this regard.

*Direct Costs*

- 5.282 The direct costs of control fall on market participants (compliance costs) and the regulator (and ultimately on the public).
- 5.283 The direct costs of control for all parties occur largely at the time of price reviews and price-resetting. At these times, the costs may be substantial. At other times, the regulatory body largely has a monitoring role, while the regulated entity must ensure that compliance is maintained.<sup>57</sup> Users may also engage in monitoring activity. The intention of price cap regulation is that price reviews are infrequent, and at pre-set intervals, when compared to rate-of-return regulation.
- 5.284 As previously mentioned compliance costs are currently incurred as a result of the current disclosure regime. The imposition of control would inevitably raise the level of compliance costs incurred by gas pipeline businesses. The calculation of the compliance cost increase could be based on an average employee cost multiplied by the number of employees, the likely consultant costs and any direct compliance costs.
- 5.285 Likewise the cost of administering any regime would be also be roughly equivalent to the average employee cost multiplied by the number of employees plus direct investigation costs.

50. What are the compliance costs of the status quo?

51. What would the compliance costs be under price cap regulation?

*Indirect Costs*

- 5.286 The indirect costs associated with regulation are difficult to quantify. Any approach to measuring indirect costs can be done, at best, only on a fairly arbitrary basis.
- 5.287 Ideally it would be desirable to estimate indirect costs independently of the theoretical benefits that control would aim to achieve. However, there is no historical data for New Zealand that would allow such an estimation to be made.
- 5.288 One approach is to assess indirect costs by scaling down the size of the benefits that control seeks to obtain. This was the approach used by the Commission in the Airports Inquiry, and is the approach proposed in this Inquiry.
- 5.289 Another approach is to consider the incentives for efficiency under control, and to then derive quantitative assessments consistent with the strength of

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<sup>57</sup> Costs between reviews may be higher if the regulator has to consider application for cost passsthroughs in respect of new investment.

those incentives (relative to the counterfactual). The Commission may also consider this approach.

52. How should the Commission determine the indirect costs of control?

### **Conclusion**

- 5.290 The Commission considers that the benefits and costs of control can be determined by comparing outcomes in the counterfactual against the likely outcomes under control. The Commission considers that the counterfactual for each gas pipeline business is likely to resemble the status quo. However, there may be specific issues that have to be considered, which may modify this general view.
- 5.291 The costs of control are not easy to estimate. There is uncertainty surrounding the factors to be considered in measuring them, and there is a lack of data for New Zealand, which has not had any price control for almost two decades.
- 5.292 The costs of control are those that are additional to the counterfactual and can be seen as being both direct and indirect in nature.
- 5.293 The Commission considers that, in the absence of any superior alternatives, the indirect costs of control can largely be measured by considering how much of the benefits of control can be realised by control.

## **6 CONCLUSION**

- 6.1 The Commission is undertaking the Inquiry in response to a letter of request from the Minister dated 30 April 2003. The letter requires the Commission to respond to the Minister by 1 November 2004. The initial request and subsequent correspondence with the Minister (the terms of reference) require the Commission to report on whether goods and services supplied by persons in markets directly related to either a natural gas transmission system or a natural gas distribution system or both (gas services) should be controlled.
- 6.2 The Commission proposed a process for the Inquiry on the 30 May 2003 and invited interested parties to make submissions on that process.
- 6.3 After consideration of the process submissions the Commission proposes a two stage consultative process. The first stage will focus on defining the Commission's framework for investigating the performance of the relevant sectors. The second stage will focus on application of the framework and interpretation of the associated findings.
- 6.4 As part of the first consultative stage, the Commission has released the Draft Framework Paper. The Draft Framework Paper sets out the Inquiry background and presents the proposed legal and analytical frameworks to be used and seeks comment on those frameworks.
- 6.5 The legal framework contains the Commission's interpretation of the terms of reference, considers the relevant goods and services, identifies the suppliers and acquirers and discusses the Commission's interpretation of the relevant parts of the Commerce Act.
- 6.6 The analytical framework sets out the Commission's proposed approach to examining:
  - the level of competition for gas services, including the definition of the relevant markets; and
  - whether control is necessary or desirable in the interests of acquirers and the public.
- 6.7 The analytical framework discusses how the two key elements (whether gas services are supplied in markets where competition is limited and second that control is necessary or desirable in the interests of acquirers) of s 52 of the Commerce Act will be considered. The section titled 'Competition Analysis' addresses the first key issue while the sections titled 'Pricing Principles', 'Asset Base and Valuation'; 'WACC; Operating and Capital Expenses; and Benefits and Costs of Control' address how the second key issue will be considered.
- 6.8 The emphasis of the Draft Framework Paper is on methodologies and principles. The application of these will be addressed in stage two of the Inquiry.

- 6.9 Throughout the Draft Framework Paper the Commission has set out a number of questions to guide submissions. Interested parties are encouraged to respond to these questions, and any other matter raised in the Draft Framework Paper, in their submissions. A complete list of questions is set out in Annex 1.
  
- 6.10 Submission on the Draft Framework Paper will close on the 15 August 2003. Following submissions the Commission will hold a conference on the Draft Framework Paper between the 1<sup>st</sup> and 5<sup>th</sup> of September 2003.

**ANNEX 1 : LIST OF QUESTIONS**

1. What services are included in “gas services”?
2. What transmission businesses (systems) should be covered by the Inquiry and why?
3. What other distribution businesses (systems) are covered by the Inquiry?
4. What other key acquirers should be involved in the Inquiry?
5. How effective are the current disclosure provisions?
6. Are there important aspects of performance that the current disclosure regime does not cover adequately or at all?
7. What are the relevant markets for gas transmission and gas distribution?
8. Are the characteristics of different distribution markets sufficiently similar that they can be considered collectively?
9. How substitutable are electricity and other energy sources for gas in industrial, commercial and residential applications?
10. Does interfuel competition constrain transmission and distribution charges? How is likely to change in the future?
11. What scope is there for competition between gas distributors?
12. What are the major structural, regulatory and strategic barriers to entry to supplying gas?
13. Do gas transmission or distribution firms currently exercise market power?
14. What degree of countervailing power do industrial, commercial and residential customers currently have?
15. To what degree would the Maui pipeline (assuming open access) and the NGC system compete?
16. Are there capacity constraints in gas transmission? If so, where are they? How costly would it be to increase capacity to overcome the constraints?
17. What is the potential for assessing the efficiency of gas pipeline prices using the comparative benchmarking approach?
18. Could international data be used to supplement data from the New Zealand gas pipeline businesses?

19. Which of the two approaches discussed (the comparative benchmarking and building block approaches) are best-suited to the purpose of the Inquiry?
20. What issues and risks arise in respect of each approach?
21. What alternative approaches should the Commission consider?
22. Are the pricing structures used by gas pipeline businesses efficient?
23. Is quality an issue in relation to the pricing of gas services? Is the quality provided too high or too low?
24. Is cross-subsidisation an issue in the pricing of gas services?
25. What incentives do gas pipeline businesses have to cross-subsidise?
26. How can the Commission identify whether above-normal returns are attributable to superior performance or monopoly pricing?
27. What is the appropriate opening valuation date for each gas pipeline business (e.g. end of last price control, public flotation, other)?
28. Where can the information needed to calculate current asset values be found?
29. What is the appropriate rate of depreciation to apply to historical costs?
30. What is the rate of technical progress in the relevant assets?
31. What is the economic life of the assets?
32. What issues affect the optimisation of assets and the derivation of current efficient asset values?
33. How should ODRC be derived from ORC?
34. Which gas pipeline assets, if any, were imprudently acquired, and how should the "prudent" level of expenditure on those assets be determined?
35. Which gas pipeline assets, if any, are not used or not useful?
36. What issues arise in relation to optimising gas pipeline assets?
37. How should gas pipeline businesses be compensated for stranding risk associated with optimisation?
38. What intangible assets are relevant to the analytical framework for the Inquiry?
39. How should intangible assets be valued? How do they depreciate?
40. How can intangible assets be determined to be "used and useful"?

41. What is the replacement cost of intangible assets? How might they be optimised?
42. How should easements be valued?
43. What other assets should be included in the asset base? How should they be valued?
44. What asset valuation approach or approaches should the Commission use to establish the current efficient asset value (and thereby establish the efficient level of prices)?
45. How can past expenditures be reviewed for efficiency?
46. How can forecast expenditures be assessed for efficiency?
47. What is the best way to determine whether declaration of control would be in the interests of acquirers?
48. What is the best way to determine whether declaration of control would be in the public interest?
49. Are there specific qualifications that should be considered when setting the counterfactual?
50. What are the compliance costs of the status quo?
51. What would the compliance costs be under price cap regulation?
52. How should the Commission determine the indirect costs of control?