

24 February 2006

Declaration of Control of Transpower

Transpower

NERA
Economic Consulting

Project Team

Greg Houston

Elisabeth Ross

Brendan Quach

NERA Economic Consulting
Darling Park Tower 3
201 Sussex Street
Sydney NSW 2000
Tel: +61 2 8864 6500
Fax: +61 2 8864 6549
www.nera.com

Contents

Executive Summary	ii
1. Introduction	1
2. Background	2
3. The Nature of Transmission Investment	3
4. The Threshold is Not an Efficient Price	5
4.1. Transmission Regulation Requires Unique Consideration	5
4.2. Building blocks are Inconsistent with Thresholds	8
4.3. Timing of the Implementation of the Thresholds	12
4.4. Use of TFP to Set X-factor	14
5. ‘Business as Usual’ versus ‘Additional’ Investment	17
6. The Commission’s Assessment of Excess Profits	20
7. Timing of Cost Recovery	23
7.1. The Timing of Cost Recovery	23
7.2. Recovery of Preliminary Costs Associated with New Investment	26
8. Conclusion	28
Appendix A. Australian and UK Treatment of WUC	30
Appendix B. NERA Credentials	32

Executive Summary

The Commerce Commission ('the Commission') has recently announced its intention to declare control of Transpower following investigations into Transpower's breach of its price path threshold. Transpower has engaged NERA Economic Consulting to comment on several aspects of the Commission's supporting analysis; namely the appropriate timing of cost recovery and the Commission's use of Transpower's price threshold as a basis for estimating the extent of any excess profits.

The Commission has implicitly assumed that the existing price threshold is a proxy for 'efficient prices' for the purpose of assessing whether or not Transpower has earned excessive profits. However the price threshold does not, and was not intended to, represent an efficient price. The Commission has consistently referred elsewhere to the price threshold as 'a screening mechanism', designed to identify businesses that *may* warrant investigation. At the time the thresholds were implemented no analysis was performed of the extent to which existing prices were consistent with efficient prices, nor whether it was reasonable to expect prices to be consistent with the existing level over time.

There are several reasons why the existing price threshold is unlikely to represent a reasonable proxy for Transpower's efficient price, including:

- the price cap does not provide for the implications of lumpy nature of grid investment;
- the building blocks methodology historically used by Transpower is inconsistent with a price threshold;
- the timing of the thresholds was essentially arbitrary and no analysis was undertaken of whether the existing prices were efficient; and
- the efficiency factor applied to Transpower's price path cannot be relied upon to give a reasonable estimate of the expected efficiency improvements achievable by Transpower.

In attempting to explain Transpower's breach of threshold, the Commission has implicitly made a distinction between 'business as usual' investment, which it claims is factored into the price threshold, and other types of investment. Whilst dividing investment between some notion of the steady state requirements and that needed over and above this level ought to be possible in abstract terms, it is likely to be both artificial and unworkable in practice. In any case, the issues identified above suggest there is no reason to believe that Transpower is earning a reasonable return on its 'business as usual' investment and consequently including lumpy 'business as usual' expenditure within the price threshold may result in under-recovery.

Basing an assessment of excess profits on an essentially arbitrary price is fundamentally inappropriate. The Commission would only be justified in concluding that Transpower had earned excess profits if its revenues could not be reconciled a properly determined estimate of Transpower's efficient price (or average revenue). Without undertaking an assessment of what this might be, the Commission cannot reasonably conclude that Transpower has been earning excess profits.

The Commission has raised concerns about Transpower’s proposal to move from recovering the costs of its investments on an as-commissioned basis to recovering the costs on an as-spent basis. In an environment where prices are determined by reference to their costs – as under a building block approach - the two methods for recovering costs should be financially equivalent. To the extent that this equivalence holds, allowing costs to be recovered ‘as-spent’ provides for smoother prices, and for price signals that are consistent with a capacity-constrained network.

1. Introduction

The Commerce Commission ('the Commission') has announced its intention to control Transpower following investigations into why Transpower has breached its price threshold in the three assessments to date. On 31 January 2006, the Commission has published a reasons paper¹ explaining the analysis behind its view.

NERA Economic Consulting ('NERA') has been engaged by Transpower to discuss the appropriateness of the Commission's approach to calculating excess profits and the appropriate timing of cost recovery.

The remainder of this report is structured as follows:

- section 2 sets out the background to the threshold and control regime;
- section 3 reviews the nature of transmission investment;
- section 4 outlines the reasons why the price threshold is unlikely to be a reasonable approximation of the efficient price;
- section 5 argues that attempting to distinguish between 'business as usual' and 'additional' investment is unworkable in practice;
- section 6 discusses the appropriateness of the Commission's approach to calculating excess profits;
- section 7 discusses the appropriate timing of cost recovery for grid investment; and
- section 8 provides concluding remarks.

¹ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Intention to Declare Control, Transpower New Zealand Ltd*, 31 January 2006

2. Background

The Commerce Commission implemented the 'Threshold and Control Regime' in 2003 in accordance with Part 4A of the Commerce Act 1986. The regime comprises a price threshold and a quality threshold for all electricity lines businesses ('ELB'). The thresholds are designed as 'screening mechanisms' such that only companies that breach their thresholds will be investigated by the Commission. The Commission may then declare control following an investigation into the extent of any excess profits and analysis of the net benefits of control.

Transpower has breached its price threshold in each of its three assessments to date. The Commission commenced a 'post-breach inquiry' into Transpower's performance in January 2005. Stemming from those investigations, the Commission published its intention to declare control of Transpower in December 2005.² The Commission's analysis supporting its views is set out in *Regulation of Electricity Lines Businesses, Targeted Control Regime: Intention to Declare Control, Transpower New Zealand Ltd*, 31 January 2006.

The price threshold permits ELBs to increase their average prices by no more than CPI-X each year. Transpower's price threshold is set for a one year period, whilst distribution businesses operate under a five year regulatory period. The first price threshold was set retrospectively in June 2003, dating back to a starting point coinciding with each ELB's lowest average price between 8 August 2001 - when Part 4A came into effect - and 6 June 2003 when the thresholds were gazetted.

Transpower's X-factor was set at CPI for the first regulatory period, and was subsequently reset at 1 per cent from July 2004 on the basis of the estimated total factor productivity of the electricity distribution industry. The X-factor was maintained at that level for the following regulatory period. Although Transpower fundamentally disagreed with the implementation of the threshold regime, it accepted the X-factor of 1 per cent for the 2004/05 threshold on the basis that the thresholds were simply a screening mechanism and 1 per cent was a reasonable estimate for transmission productivity improvements given the lack of available information. However, it argued that an X-factor of negative 7 to 10 per cent would be more appropriate for the 2005/06 period because of a planned major grid upgrade. In its decision to maintain the existing threshold the Commission responded that insufficient evidence had been provided in support of Transpower's suggested X-factor.

Transpower is also required to operate within the regulatory processes governed by the Electricity Commission. One such process is the requirement for Transpower to submit a grid upgrade plan ('GUP') to the Electricity Commission for approval. The GUP must contain relevant information on proposed 'reliability' and 'economic' investments. The Electricity Commission then assess the proposals on the basis of whether they satisfy the grid investment test ('GIT'), which determines the net economic benefits of the proposed grid investment.

² Commerce Commission, *Intention to declare control of Transpower's transmission services*, Release No. 80, 22 December 2005

3. The Nature of Transmission Investment

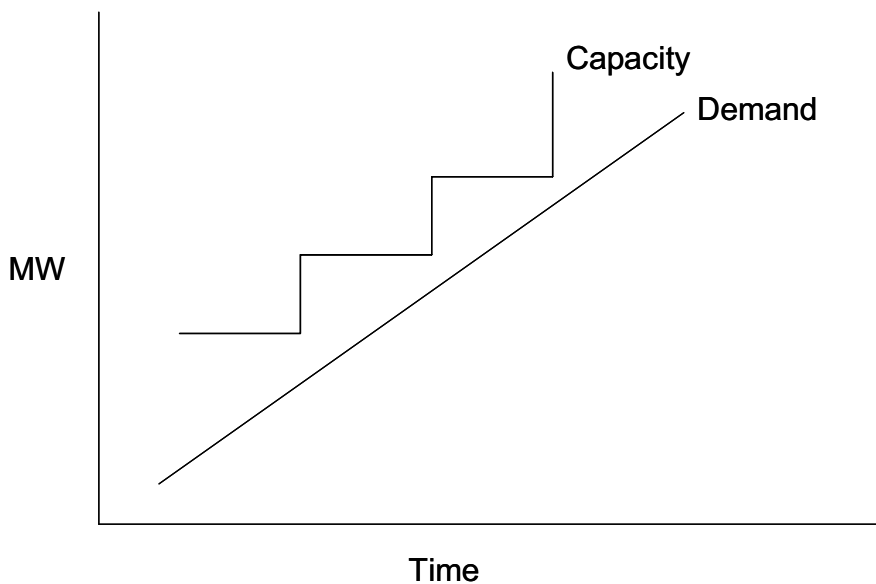
Electricity lines businesses (ELBs) are all characterised to some extent by economies of scale. In other words, the unit cost of capacity falls as the size of any increment of capacity increases.

Transmission systems exhibit economies of scale to a greater extent than distribution investments, with the consequence that the profile of efficient investment over time is likely to be ‘lumpy’. This is because it is generally cheaper to add capacity in discrete quantities rather than small increments. One consequence is that it is neither possible nor efficient to tailor increases in capacity to the profile of expected increases in demand. There may be periods of time over which it is efficient for there to be ‘surplus’ transmission capacity. This characteristic of transmission investment has been recognised by other regulators. For example, the Australian Energy Market Commission (AEMC) has recently noted:³

...due to scale economies it is generally cheaper to build the transmission grid in large lumps. This can create overcapacity for a period.

The graph below depicts a typical pattern of capacity versus demand over time.

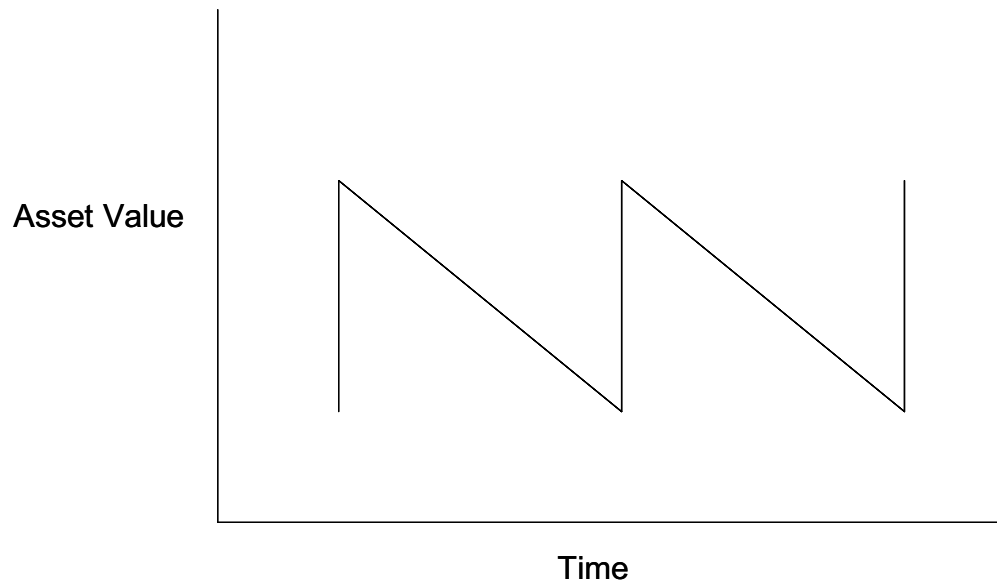
Figure 3.1
Comparison of Capacity and Demand over Time



The lumpy nature of efficient transmission investment means that the underlying costs of transmission will ‘spike’ at the time new investment is made and then gradually decrease over time until the asset requires replacement or expansion. The effect is to produce a ‘saw tooth’ pattern of investment or costs, shown in the graph below.

³ Australian Energy Market Commission, Review of the Electricity Transmission Revenue and Pricing Rules, Consultation Program, Transmission Pricing: Issues Paper, November 2005, p.50

Figure 3.2
Investment or Costs over Time



The lumpy nature of transmission capital expenditure has important implications for the revenue requirements and therefore the regulation of transmission businesses. These are discussed in the following sections.

4. The Threshold is Not an Efficient Price

The Commission claims that one of the potential benefits of control is the limitation of excess profits in the 2006/07 regulatory period, “implied by [the] level of 2005/06 unexplained threshold breach”.⁴ Implicit in this claim that Transpower has earned excess profits is an assumption that the threshold represents a reasonable proxy for an efficient price and therefore that any revenues above this level that cannot be reconciled must necessarily be excess profits. In our opinion, it is unlikely that the existing price threshold for Transpower is consistent with what could be expected to be an efficient price, as discussed in the following sections.

4.1. Transmission Regulation Requires Unique Consideration

The lumpy nature of capital expenditure and its implications for developing an appropriate regulatory regime are more significant for transmission as distinct from distribution businesses. Although distribution investment also exhibits economies of scale, the magnitude of capital expenditure is significantly less and investment patterns are somewhat less lumpy than for transmission. It follows that the appropriate regulatory approach for a transmission business may not be the same as for distribution.

Despite these clear differences, the Commission has to some extent adopted a ‘one size fits all’ approach to regulating electricity lines businesses. Although the Commission has seemingly considered Transpower separately from other ELBs throughout the development of the threshold regime, the underlying reasons for those differences and their implications for transmission regulation have not been fully taken into account.

In particular, the adoption of a price threshold based on throughput, in line with other ELBs, does not appear to have been a carefully considered decision. Transpower submitted that a revenue path would be preferable to a price path for transmission because a simple revenue path would be closest in its effect to meeting the requirements of the Purpose Statement.⁵ However the Commission argued that a price path threshold “provides incentives to improve capacity utilisation (whereas a revenue path does not)”.⁶ The Commission does not appear to have weighed the advantages of increased capacity utilisation with the other implications of a price threshold for transmission, and impact of efficient, large-scale investment. In particular, a price cap implies:

- a large level of risk for the business, because near or medium term investment decisions are not strongly correlated to “utilisation”; and
- an incentive to undertake small, incremental investments even where larger investments may be more efficient.

⁴ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Intention to Declare Control, Transpower New Zealand Ltd*, 31 January 2006, p.11

⁵ Transpower, *Submission to the Commerce Commission on the proposed regulation of Electricity Lines Businesses*, May 2002, p.46

⁶ Commerce Commission, *Regulation of Electricity Lines Businesses: Targeted Control Regime - Implementation Details: Draft Decisions*, 31 January 2003, p.22

As discussed in section 3, discrete changes in capacity, rather than incremental changes, are often more efficient in the case of transmission, and so it is both common and reasonable for there to be significant excess capacity in the system, particularly following new investment. Under these circumstances, where fixed costs are prevalent, a volume-based driver for revenue introduces an artificial and unhelpful degree of risk to the business, because of the consequent revenue uncertainty. Investors in transmission are likely to require a greater return in recognition of that risk. Failing to provide sufficient returns will jeopardise continued investment in transmission, with associated implications for dynamic efficiency.

For these reasons, the building blocks approach to calculating revenue requirement is generally considered a more appropriate form of regulation for transmission businesses than price-based controls (or thresholds). The building blocks approach, or some alternative form of cost-based approach to determining an annual revenue cap, is common to regulatory regimes for transmission around the world. For example, revenue caps are a feature of transmission regulation in Australia, the UK, Norway and Sweden. As far as we are aware, only Singapore and New Zealand deviate from this trend.⁷

The Australian electricity transmission regulator has recently confirmed its position supporting the use of a revenue cap for transmission in its Rule Proposal Report for the regulation of electricity transmission, in which it recognises the increased risks placed on a business regulated under a price cap:⁸

The Commission considers that revenue for Prescribed Transmission Services should continue to be regulated through the revenue cap (building block) form of regulation. TNSP costs of service do not vary significantly with the quantity of services provided, especially during the term of a regulatory review, and therefore a revenue cap minimises, largely unmanageable, volume risk for TNSPs.

A price cap (or threshold) based on throughput cannot take account of the financial implications of large-scale, step-changes in investment - even where that is most economic - without breaching the threshold, unless those large scale investments are specifically acknowledged and incorporated into the cap or threshold. We note that, theoretically, large-scale investments could fall outside the price cap. However this division between types of investment is difficult to implement in practice, as discussed in section 5. Consequently a price cap will provide Transpower with an incentive to undertake small, incremental investments. The Commission has argued that this is an intended outcome which will help increase capacity utilisation. However it will also have the unhelpful effect of reducing incentives to undertake large-scale investments where those investments are more efficient.

This incentive is at odds with the Electricity Commission's Grid Investment Test (GIT). The GIT assesses the net economic benefits of grid investments and proposed transmission alternatives (TA), whilst the threshold regime limits expenditure and is intended to promote

⁷ Note that Singapore Power owns and operates both the high voltage and low voltage networks, which are collectively defined as the 'transmission system'. The Electricity Market Authority regulates the transmission system as a whole under a single price cap.

⁸ Australian Energy Market Commission, Review of the Electricity Transmission Revenue and Pricing Rules, *Transmission Revenue: Rule Proposal Report*, February 2006, p. 35

capacity utilisation. In other words, the threshold regime encourages small (potentially inefficient) incremental investments, whilst the GIT process may recommend step changes.

Furthermore, the Electricity Commission noted, in the context of discussing options for promoting TAs, that:⁹

A key issue in achieving the right balance between grid and TA investment revolves around the view that a constraint-free grid is necessary to have a competitive electricity market. This implies transmission should be built even if a TA produces larger net market benefits. The GIT addresses this issue because it includes “competition benefits”...

The EC clearly recognises that transmission is not just about transporting electricity, but is also important as a platform for competition. However a viewpoint that advocates building enough transmission such that sufficient capacity exists for the purpose of promoting a well-functioning, competitive electricity market is somewhat at odds with a regulatory regime that encourages Transpower to undertake small, incremental changes.

Whilst a price cap based on long run marginal cost (‘LRMC’) may be a theoretical solution to mitigating the inherent risks associated with a volume-based revenue driver and the disincentive to undertake step-change investment even where that is more efficient, there are many difficulties associated with the use of LRMC-based pricing to determine constraints on transmission revenues. LRMC is a principle that should be applied to price structure decisions, and not one that is readily applicable to determine efficient revenues (whether this is evaluated directly through a revenue cap or indirectly by means of a price cap). In any case, prices that reflect the LRMC of supply are inconsistent with the short run marginal cost principles that apply under Transpower’s locational marginal pricing arrangements, reducing the effectiveness of price signals to customers.

Furthermore, the use of LRMC to set a price cap hinges upon an accurate calculation of LRMC. Commission’s threshold was designed as a ‘screening mechanism’, and no analysis was undertaken on whether the price threshold would provide for a step-change in investment.

Another potential solution to this problem is to allow ‘additional investment’ to fall outside of the price threshold. However this solution is problematic in itself, as discussed in section 5.

The Commission may hold concerns that if Transpower operates under a revenue path it will not have the appropriate incentive to make smaller, incremental investments and so avoid inefficient levels of spare capacity may exist in the system. However the GIT is designed to identify where smaller levels of investment, or alternatives to grid investment, may be appropriate. In other words, a different regulatory tool is already in existence that addresses this incentive.

⁹ Electricity Commission, *Consultation Paper: Options for Enabling Transmission Alternatives*, 31 May 2005, p.4 para. 8

4.2. Building blocks are Inconsistent with Thresholds

The Commission's decision to use the price threshold as a proxy for an efficient price creates an inconsistency with Transpower's historical use of a building block approach to a weighted average price cap.

Under a building block approach the price path for ELBs would reflect the expected cost of providing transmission services. That is, prices would be based on the expected operating and tax costs, depreciation, and an appropriate return on the depreciated value of transmission assets. In contrast the Commission's price threshold regime effectively fixes an ELB's average price level at a given point in time then adjusts this over time for expected future efficiency gains, but without any regard to the specific circumstances or future expenditure requirements of that business.

The two approaches would only be consistent when a business' costs move in close alignment with changes in demand for its goods or services. Under these circumstances as a firm's output increases, its revenues would increase to match the additional costs. Only businesses with a relatively small proportion of fixed costs exhibit these features. As discussed above, this is not a characteristic of an ELB, and especially not of a transmission network where capital (fixed) costs are a significant proportion of total costs. Rather than being related to the level of demand, Transpower's costs are more closely correlated to the depreciated value of assets and will fluctuate with the requirement to make infrequent, high-valued investments.

When a capital intensive business builds up its revenue requirements by reference to expected capital and operating costs, its prices will generally reflect the depreciated value of its assets.¹⁰ As a result, the average price level will mirror the replacement cycle of assets, such that when assets are almost completely depreciated the level of prices will be relatively low compared with a business where the same assets have not been depreciated.

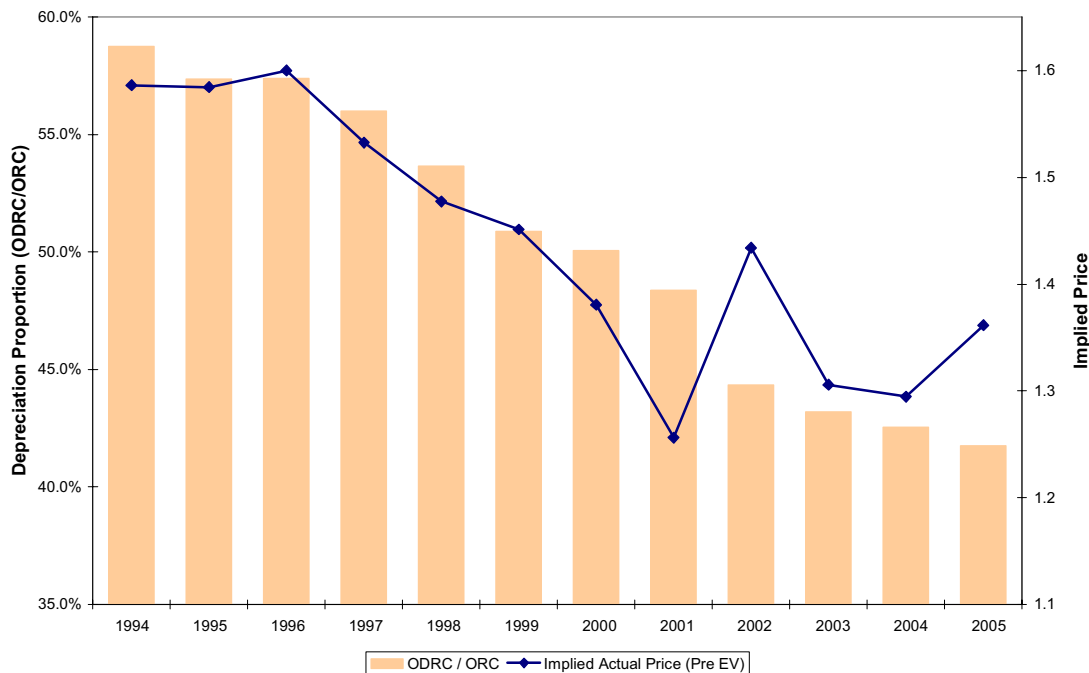
Figure 4.1 below compares the age of Transpower's fixed assets – measured as the ratio of the depreciated value (ODRC) to the replacement cost of assets (ORC) - and the implied price of transmission services for the years 1994 to 2005.¹¹

The implied price spike in 2002 is attributed to two factors. First, Transpower had been under-recovering between 1999 and 2001 as a result of bills being underpaid. The dispute was resolved in 2002, and so Transpower received additional revenue that year. In other words, revenue from 1999 to 2001 is understated, to the extent that Transpower's bills were not paid, and 2002 revenue is overstated due to the recovery of some of that revenue. Second, 2002 was a dry year. Consequently forecast increases in demand did not eventuate to the extent expected. The combination of these two factors served to 'spike' Transpower's implied price that year.

¹⁰ Note that in a perfectly competitive market, a firm has no control over market prices and instead bases its investment decision on whether the net present value of revenues generated from an investment justifies the cost.

¹¹ Note that if all of Transpower's assets were new the ODRC to ORC ratio would be equal to 1, as the average age of the assets increases the ODRC to ORC falls, while a ratio of zero would indicate that all assets would need to be replaced.

Figure 4.1
Proportion of Transpower's Depreciated
and Implied Price¹²



Source: Data provided by Transpower

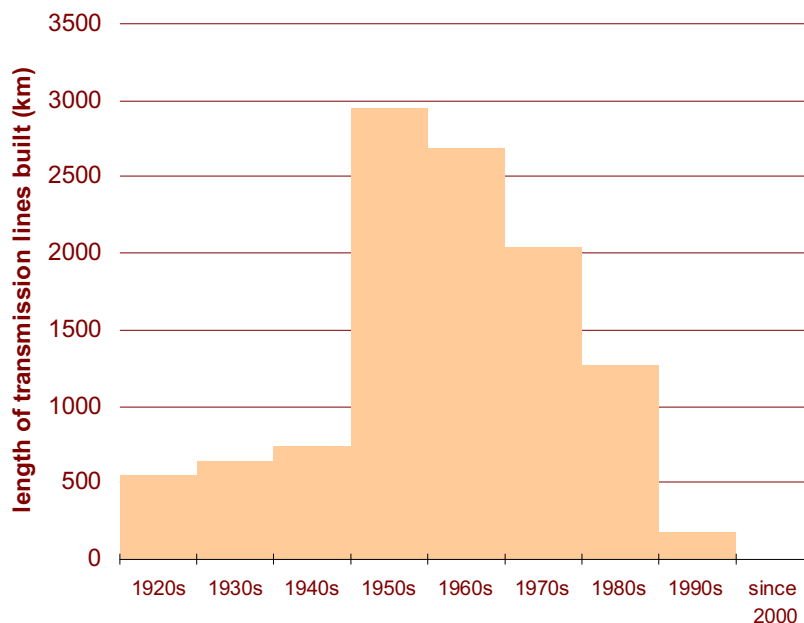
Figure 4.1 highlights that Transpower’s implied price has generally fallen in line with its asset replacement cycle.¹³ However, over the next decade Transpower has forecast a requirement for significant new investment. Given Transpower’s record of transmission investment, as indicated in Figure 4.2, it is reasonable to expect that the required expenditure will be to replace transmission lines that are coming to the end of their standard 55 year life as well as for the purpose of building capacity.¹⁴

¹² Implied price is calculated by dividing Transpower’s transmission revenue (pre EV) as per its annual report by throughput (GWh).

¹³ These prices are in nominal terms. The real fall in price would be greater.

¹⁴ Commerce Commission of New Zealand, Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Businesses, 30 August 2004, page 49.

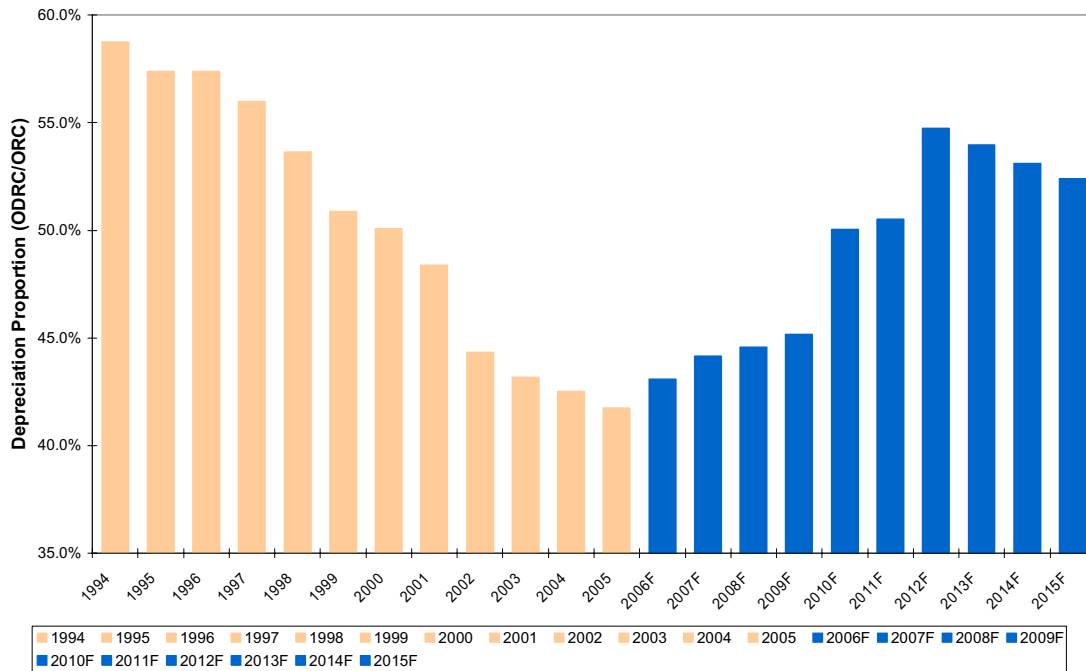
Figure 4.2
Historic Transmission Lines Investment
(up to 2002)



Source: Data provided by Transpower

The impact of the large capital expenditure program that Transpower is intending to undertake is that the ratio of the depreciated value to the replacement cost of Transpower’s fixed transmission assets is expected to rise from 41.7% in 2005 to a peak of 54.8% in 2012 before falling to 52.4% in 2015, as seen in Figure 4.3. The change in the age of the assets represents a combination of replacing old assets and increasing capacity. It is difficult to distinguish between the two, as much of the investment program comprises elements of both.

**Figure 4.3
Transpower's Forecast Depreciated
Asset Value**



Source: Data provided by Transpower

Figure 4.3 illustrates that Transpower is coming towards the end of a capital replacement cycle and that the future capital expenditure program, comprising both replacement and capacity increasing investment, will increase the ratio of depreciated assets to replacement cost. Under a building block approach to revenues it is reasonable to expect that a business would have to increase its prices to ensure that the appropriate rate of return on assets is maintained into the future.

One implication of these significant changes in capital costs over time is that imposing a price threshold at an effectively arbitrary point in time is unlikely to deliver returns that bear any resemblance to either its efficiency performance or its underlying costs. For example, consider a business that has just built all its assets and has historically been setting its prices in accordance with a building block approach. Its prices would at that time be relatively high. If a threshold regime then uses these prices as a base for future prices, other things being equal, the business would never breach the threshold even if it was earning above average returns. The reason that the business is able to earn above average returns is that the price threshold (assuming unchanged demand) would lead to a constant level of revenue which would now be servicing a diminishing value of depreciated assets. This leads to ever increasing returns to the business until assets need to be replaced or significant expenditure is required to increase capacity.

On the other hand, the price threshold for a business whose assets are almost fully depreciated would be relatively low if a building block approach had been adopted. A business that continued with its threshold level of prices (again assuming unchanged demand)

after undertaking significant capital expenditure would have to accept lower rates of return on assets. For a business to earn its required rate of return, holding other things constant, it must breach the price threshold and would continue to do so until the assets are again almost fully depreciated.

In either case, the threshold cannot be said to represent an efficient price; in the first case it is inefficiently high, in the second inefficiently low. A business operating under the first scenario could earn excess profits for a period of time without breaching the threshold. In this second scenario, a breach of the threshold would not be caused by a business extracting excess profits, but by the nature of the regime which failed to establish an efficient price on which to start the threshold.

The only starting price at which the change from a building blocks methodology to a price threshold would not impact a business' returns, either positively or negatively, is where the net present value of future returns under each method are equal. This point is likely to be somewhere towards the middle of the capital replacement cycle. In practice, however, it is not practicable to determine when this point has even been reached.

Note that if such a price threshold was in fact binding (ie, a price cap) a business would only invest in replacement assets, assuming other obligations such as system security were ignored, if it were confident that:

- the threshold was sufficient to ensure that the initial lower rates of return would be fully compensated through higher rates of return in the future;¹⁵ or
- the investment would fall outside the scope of the price threshold.

4.3. Timing of the Implementation of the Thresholds

Transpower has been subject to three threshold notices that have anchored its average price threshold to the minimum prices that occurred during the period 8 August 2001 to 6 June 2003.¹⁶ Since this period the following adjustments have been made to Transpower's average price level:

- from 7 June 2003 to 30 June 2004 the average price level was not allowed to change;¹⁷
- from 1 July 2004 to 30 June 2005 the average price level was allowed to increase by the change in the consumer price index less 1%;¹⁸ and
- from 1 July 2005 to 1 July 2006 the average price level was allowed to increase by the change in the consumer price index less 1%.¹⁹

¹⁵ A common practice is for businesses to analyse the net present value on investments and to only invest when the net present value of future revenues (discounted by the appropriate cost of capital) from an investment equals (or is greater than) the cost of the investment.

¹⁶ Clause 5(1)(a), *Commerce Act (Electricity Lines Thresholds) Notice 2003*, 6 June 2003.

¹⁷ Op. Cit. Clause 5(1)(b).

¹⁸ Clause 5(1)(a), *Commerce Act (Transpower Thresholds) Notice 2004*, 30 June 2004.

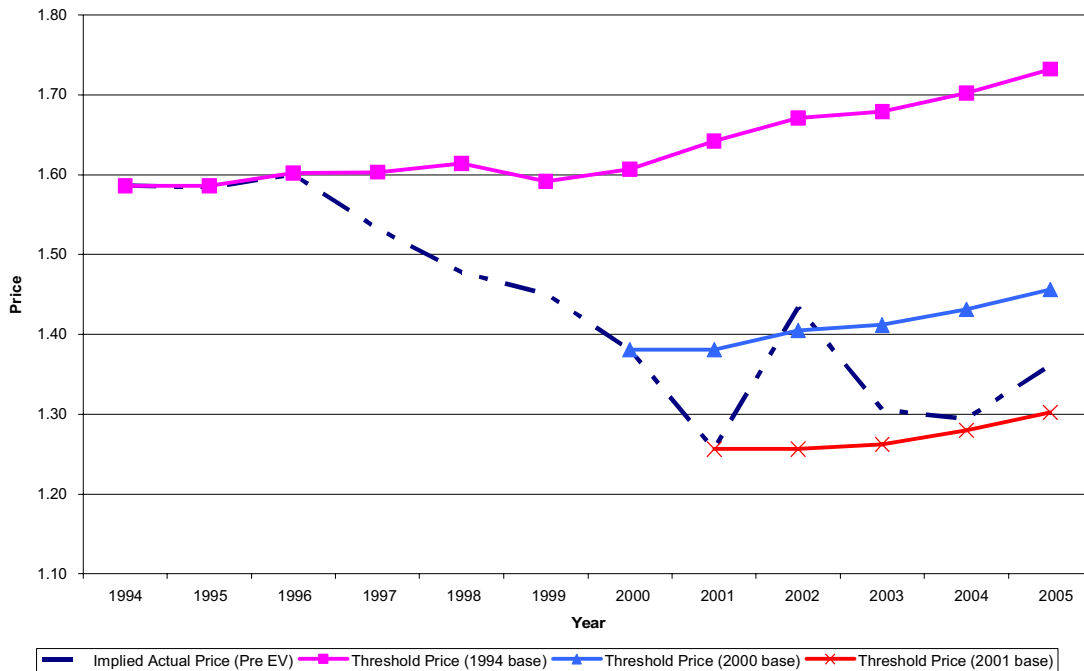
¹⁹ Clause 5(1)(a), *Commerce Act (Transpower Thresholds) Notice 2005*, 29 June 2005.

In determining that the base price should be the *lowest* price during the period starting 8 August 2001 and finishing at 6 June 2003 the Commission did not provide any analysis on whether the ensuing revenues would be sufficient for Transpower to finance its ‘business as usual’ capital expenditure program.

The arbitrariness of the Commission’s threshold starting point, and hence the inappropriateness of using it as a proxy for an efficient price, can be illustrated by considering whether Transpower would be in breach of a threshold if different base prices had been adopted.

Figure 4.4 provides an illustrative example of alternative threshold prices for Transpower, using different base dates from those adopted by the Commission. Note that Figure 4.4 is only indicative since the data does not perfectly replicate the Commission’s price threshold. A lack of time to perform an accurate analysis necessitated the use of high level financial data obtained for Transpower’s July to June financial year, rather than the April to March pricing and compliance year considered by the Commission. However this example is primarily for comparative illustration and in that regard it serves our purpose.

**Figure 4.4
Transpower’s Implied Price and
Alternative Threshold Prices**



Source: Data provided by Transpower.

Note that the alternative thresholds are estimated by holding average price level constant for the first year after the base year, for each subsequent year the average price level was allowed to increase by $(1+\Delta CPI)(1-X)$ where X is equal to 1%.

Figure 4.4²⁰ illustrates that if the Commission had imposed its price threshold using the average price level in 1994, Transpower could potentially raise its actual prices (in nominal terms) without triggering a review by the Commission for breaching the threshold. That is Transpower would be able to earn additional profits from 1997 onward. The primary reason that Transpower would be able to increase its average price level is that the threshold does not account for the fall in value of Transpower's aging transmission assets (as seen in figure 4.1, the ODRC to ORC ratio falls from 58.8% in 1994 to 41.7% in 2005).

The 1994 year is particularly useful as a comparator, since this was the first financial year following Transpower's conversion to a state owned company, the administrative form under which it currently operates. Furthermore, 1994 is closer to the middle of the asset life cycle. As discussed in the previous section, changing from a building block to a price threshold regime is more likely to provide similar returns if the price threshold is implemented closer to the middle of the capital replacement cycle, although note that the essential requirement is that the threshold and building block methods are equivalent in NPV terms.

By way of a further example, if the initial average price level of the threshold regime was set in 2000, Transpower would have only just breached the threshold in 2002. Instead the Commission has adopted a period that effectively fixes Transpower's price threshold to the average level of prices in 2001. Given the need to replace a significant portion of its transmission assets combined with the need to earn a reasonable rate of return on invested assets, Transpower will almost always be in breach of its threshold.

4.4. Use of TFP to Set X-factor

Transpower's existing X-factor was set on the basis of an estimate of expected efficiency improvements for distribution, derived using total factor productivity (TFP) analysis. The resulting X-factor applied to Transpower's future average price level is inappropriate for two principal reasons:

- first, the use of TFP analysis for the purpose of setting an X-factor for transmission is itself inappropriate; and
- second, even if TFP was appropriate for estimating productivity gains for transmission, it is inappropriate to base potential gains on those estimated for distribution.

Consequently Transpower's X-factor cannot be relied upon to provide a reasonable estimate of expected efficiency improvements, compounding the problems associated with setting an effectively arbitrary starting point for the price threshold and using it as a proxy for an efficient price.

Total factor productivity (TFP) analysis is derived by reference to estimates of the industry-wide long term historical average rate of total factor productivity growth. Because TFP is backward looking, it is more appropriate for businesses that are characterised by relatively stable circumstances, as determined by the underlying costs of supply. To some extent distribution businesses may be said to exhibit such characteristics (with some qualifications).

²⁰ Recall that the spike in revenue in 2002 is caused by a combination of recovering revenues from unpaid accounts between 1999 and 2001, and a dry year. Refer to p. 12 for further details.

However it is difficult to include transmission in this category because of the lumpy nature of capital expenditure, as explained in section 3 above.

Where it is unreasonable to assume that costs follow a stable path, for reasons such as lumpy and uncertain investment, then an historically-based TFP analysis is by no means indicative of future costs, or achievable efficiency gains. This is clearly the case for Transpower, where the regulatory value of its assets and its profile of investments has varied significantly, as demonstrated in Figure 4.2.

It is for these reasons that, although TFP estimates are used in several countries for the purpose of regulating distribution businesses, including the US, TFP is not used to set X-factors for transmission anywhere else in the world that we are aware of. The Australian Energy Market Commission recently considered the use of TFP for electricity transmission regulation, but concluded:²¹

the uniqueness of TNSPs' costs mean that the use of industry-wide benchmark approaches (such as DEA or TFP) to set efficient costs or expected efficiency improvements is not likely to be appropriate.

Even if TFP was a reasonable approach to determining future productivity gains, basing transmission productivity on that derived for distribution is unlikely to produce a reasonable estimate of potential transmission efficiency gains because of very different investment and cost profiles. In its draft decision on the implementation details of the threshold regime, the Commission recognised that Transpower exhibits different characteristics from distribution businesses, and indicated that these differences would be acknowledged in determining an X-factor for Transpower:²²

Because Transpower is unique in many respects among the lines businesses, the Commission does not intend to include Transpower in the comparative analysis to determine its X factor classification.

Transpower also argued that its productivity factor should be considered distinct from the distribution businesses on the basis that transmission and distribution are fundamentally different businesses.²³

Yet in its final decision the Commission adopted the same productivity factor as for distribution on the basis that:²⁴

- TFP analysis of Transpower's performance did not cover a sufficiently long period;
- Transpower's price path threshold is only set for one year; and

²¹ Australian Energy Market Commission, Review of the Electricity Transmission Revenue and Pricing Rules, *Transmission Revenue: Rule Proposal Report*, February 2006, p. 35

²² Commerce Commission, *Regulation of Electricity Lines Businesses: Targeted Control Regime - Implementation Details: Draft Decisions*, 31 January 2003, p.3

²³ Transpower, *Supplementary Submission on Resetting the Price Path Threshold for Transpower*, 18 November 2003, p.2

²⁴ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Threshold Decisions (Regulatory Period Beginning 2004)*, 1 April 2004, p.55

- a “lack of strong evidence to the contrary” suggests an X-factor based on distribution productivity is appropriate.

As discussed in section 4.1 and recognised by the Commission itself, these businesses exhibit different characteristics and it is by no means certain that they will experience similar changes in costs, or achieve similar changes in productivity on a year to year basis. Whilst the Commission initially acknowledged this, in its final decision it appears to advocate that given the lack of a better estimate and the short period that the price path is in use, the TFP estimate derived from distribution businesses is appropriate. We strongly disagree.

While the Commission’s threshold decision may have been acceptable as a screening mechanism, the approach undertaken by the Commission to determine Transpower’s X-factor was inappropriate as, and cannot be relied upon to give, a reasonable estimate of the expected efficiency improvements achievable by Transpower. It follows that Transpower’s price threshold does not and cannot provide an accurate reflection of the actual efficient price path Transpower could reasonably be expected to follow.

Transpower’s current price threshold is unlikely to represent an efficient price because:

- the price cap does not provide for the implications of lumpy nature of grid investment;
- the building blocks methodology historically used by Transpower is inconsistent with a price threshold;
- the timing of the thresholds was essentially arbitrary and no analysis was undertaken of whether the existing prices were efficient; and
- the efficiency factor applied to Transpower’s price path cannot be relied upon to give a reasonable estimate of the expected efficiency improvements achievable by Transpower.

5. 'Business as Usual' versus 'Additional' Investment

The issues highlighted in the section above imply that the threshold does not represent an efficient price, yet the Commission is essentially assuming that the threshold is efficient in its calculation of excess profits. The Commission then attempts to reconcile Transpower's breaches with the threshold by investigating any potential 'mitigating factors'. The level of any breach that cannot be reconciled is assumed to represent excess profits.

One of the potentially 'mitigating factors' considered by the Commission is Transpower's investment in tactical transmission upgrades ('TTU'). The Commission's preliminary view is that the TTU does not qualify as a mitigating factor for the breach on the basis that this expenditure represents 'business as usual', which it contends should be catered for within the price threshold. Although the Commission does not clearly articulate a division between 'business as usual' investment, which it argues should fall within the threshold, and 'additional' investment, which presumably may qualify as a potential mitigating factor for a threshold breach, its stated view on the TTU investment implicitly makes this distinction.

The Commission is of the view that the adoption of a price threshold instead of a revenue threshold is designed to provide for capital expenditure that is undertaken for the purpose of 'business as usual', such as meeting ongoing demand growth.²⁵ The corollary is that investment in 'additional' capital works, such as replacement expenditure, may justify a price threshold breach.

This distinction between different categories of investment appears to have been adopted from the Electricity Commission's role in approving interim grid expenditure where the proposed expenditure "is additional to Transpower's normal ongoing grid expenditure".²⁶ These provisions have been designed for transitional purposes to allow the Electricity Commission to improve grid investment prior to the first Grid Upgrade Plan being approved. The Commission appears to be using this transitional framework, set up for the purpose of one regulatory process, for an entirely different regime and purpose.

The Commission's division between types of investment is inappropriate in the context of the thresholds regime because:

- 'business as usual' investment may itself be lumpy; and
- the threshold is unlikely to provide a reasonable return on 'business as usual investment'.

The Commission's argument that 'business as usual' investment falls within the price cap relies on the assumption that all investment intended to cater for growth in demand can be added incrementally. However, as discussed in section 3, transmission investment is lumpy and it is frequently more efficient to add capacity in large step-changes. This applies equally to 'business as usual' investment as it does to replacement and other types of investment, and

²⁵ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Intention to Declare Control, Transpower New Zealand Ltd*, 31 January 2006, para 188

²⁶ Electricity Governance Rules, Rule F: III: 16.2.2

may therefore also provide an explanation for a breach of threshold. Consequently even investment for the purpose of 'business as usual' may cause a threshold breach.

Irrespective of the 'lumpy investment' issue, whether 'business as usual' investment is allowed for within the price threshold hinges upon the assumption that the price threshold was set at a level that provides sufficient return on that investment. As discussed in section 4 there are several reasons why this assumption is unlikely to hold for Transpower.

Furthermore, attempting to distinguish between different types of investment is difficult in practice, particularly where lumpy capital expenditure implies new works may comprise a combination of both 'business as usual' and 'additional' investment.

The practical difficulties with such a division have been considered before in the context of a review of price regulation of Australian airport services undertaken by the Productivity Commission (PC). Before airports were largely deregulated, the regulatory framework allowed the ACCC to permit aeronautical price increases above the price cap in certain circumstances. The most significant exception to the price cap was for recouping the costs of 'necessary new investment' ('NNI'). The NNI scheme encountered significant difficulties in practice and 'appears to have created significant regulatory hurdles for aeronautical investments'.²⁷

In its final review the PC noted:²⁸

As well as considering the meaning of the term NNI, decisions on whether particular investment should be covered by NNI procedures are also linked to what was included when calculating the Xs in each airport's CPI-X formula. If the starting prices and/or the calculation of the X factors included an allowance for certain types of investment, then there is a clear case for their exclusion from NNI.

In addition to definitional issues, there was a concern that to the extent that starting prices were not based on efficient prices, airport operators would not be able to earn sufficient returns on their investment:²⁹

To the extent that the single-till starting prices of the current regime did not allow for a sufficient return on replacement investment, the exclusion of replacement investment from the interpretation of new investment means that the current NNI process could never generate aeronautical prices that covered full aeronautical costs.

The PC also noted that all airport operators had been critical of the scheme.³⁰

The PC's findings with respect to NNI were:³¹

²⁷ Productivity Commission, *Price Regulation of Airport Services: Inquiry Report*, 23 January 2002, p.245

²⁸ *Ibid*, p.237

²⁹ *Ibid*, p.244

³⁰ *Ibid*, p.241

[T]he observed difficulties...point to some fundamental problems. In particular:

- the lack of transparency regarding what investment was considered to be included in the base aeronautical prices and what was to be covered by necessary new investment, with resultant effects on incentives to invest;*
- the incentives for some participants to approach the regulator rather than achieve commercially-negotiated solutions;*
- the high costs of complying with the regime; and*
- the regulatory risk due to the uncertainty and delays introduced by the need to have every investment-related price increase vetted by the regulator.*

These are all pertinent issues that the Commission needs to address should it choose to adopt this division between 'business as usual' and 'additional' investment. Of particular relevance to Transpower is the regulatory risk associated with uncertainty about whether its costs will be recoverable and, as identified above, the risk that its prices will not provide sufficient return even on 'business as usual' investment.

Compounding the difficulties identified above, investment in transmission is important not only for meeting growth in demand, but for ensuring and improving service reliability and providing a platform for competition. As quoted in section 4, the Electricity Commission acknowledged "a constraint-free grid is necessary to have a competitive electricity market". Distinguishing which of these factors constitute 'business as usual' versus 'additional' investment, or what percentage/part of a particular investment is for that purpose, is inherently problematic.

³¹ *Ibid*, p.245

6. The Commission's Assessment of Excess Profits

The basis on which the Commission has attributed excess profits to Transpower is fundamentally inappropriate. The Commission has used Transpower's price threshold to estimate excess profits by assuming that the level of any breach that cannot be "reconciled" must represent excess profits.

Implicit in the claim that Transpower has earned excess profits is an assumption that the threshold represents a reasonable proxy for an efficient price, and therefore that any revenues above this level that cannot be reconciled must necessarily be excess profits. The Commission provides no evidence that the threshold may be indicative of an efficient price, and does not appear to have justified why this may be an appropriate interpretation of the threshold.

The Commission has consistently referred to the thresholds as:³²

a screening mechanism for the Commission to identify lines businesses whose performance may warrant further examination, and if necessary, control...[underlining added]

The Commission itself emphasises that a breach of threshold does not in itself imply that control is warranted, but simply that the performance of an ELB *may* require further examination.

As far as we are aware, the Commission has made no pretences about the fact that the thresholds do not, and are not intended to, represent an efficient price. In its *Assessment and Inquiry Guidelines*, the Commission states that it will "judge the behaviour of a lines business that has breached the thresholds against an 'efficient prices' standard" (p.27). The Commission goes on to say:³³

There are two broad approaches the Commission could consider in determining efficient prices. The first involves benchmarking the lines business' prices against those of comparable services. The other is to construct efficient prices using theoretical models.

Neither of these approaches includes using the price threshold as a reference point for the measure of excess profit, nor have they been applied in assessing the extent of any excess profits that Transpower may have earned. In fact, the Commission has made no attempt to calculate an efficient price for Transpower, arguing that it is not possible to undertake a building blocks analysis until the outcomes of the investment approval process are known. Irrespective of whether a building blocks assessment can reasonably be undertaken, it is inappropriate for the Commission to claim that Transpower has been earning excess profits based on a price that has not been established as efficient.

³² See, for example, Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Intention to Declare Control, Transpower New Zealand Ltd*, 31 January 2006, p.3

³³ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Assessment and Inquiry Guidelines*, 19 October 2004, p.36

There are several reasons why the threshold price cannot be assumed to be efficient, as discussed in section 4.

Perhaps most importantly, no analysis was undertaken to determine the appropriate starting point for the price path threshold. The starting point for the threshold was based on an essentially arbitrary date, coinciding with the “lowest average price at any time between 8 August 2001 and the publication date of the Gazette notice”,³⁴ on 6 June 2003. No analysis was undertaken on whether the initial price represented a level sufficient to provide the business with enough revenue to finance its medium- or long-term capital costs.

Had that analysis been undertaken, it would have been necessary to have factored into the price an estimate of the long run costs of transmission, thereby requiring consideration of the lumpy nature of grid expenditure. In practice it is difficult to set a price threshold (or cap) that accurately reflects the need for lumpy, uncertain capital expenditure. Furthermore, price caps based on throughput place an unhelpful level of risk on a business characterised by extensive fixed costs. For this reason a revenue threshold (or cap), which provides greater certainty for transmission investors, is generally considered preferable for transmission.

The price threshold as a measure of an efficient price is inconsistent with the building blocks methodology that Transpower has historically used. Without an initial adjustment to ensure the price threshold reflects efficient costs, a capital intensive business will either earn consistently increasing returns or consistently falling returns, depending on the level of depreciation of its assets at the time the threshold was implemented. Given that Transpower appears to be nearing the end of its capital expenditure cycle and the large investment program that is being contemplated, the latter is likely to be the case. Had the threshold been implemented earlier in the capital expenditure cycle, Transpower would have been less likely to breach its threshold.

Compounding the problems associated with setting an effectively arbitrary starting point for the thresholds, Transpower's expected efficiency improvements cannot be relied upon to give a reasonable estimate of the efficiency improvements achievable by Transpower. The backward-looking nature of TFP analysis does not provide a reasonable basis for estimating the potential for short term efficiency improvements for a business with large, uncertain costs such as transmission. In any case, Transpower's X-factor was estimated on the basis of the productivity of the electricity distribution industry and, given the different expenditure profiles of the two, cannot be assumed to have the same expected productivity.

Excluding 'business as usual' capital expenditure as a potential mitigating factor on the basis that the price threshold already allows Transpower to make a return on such investments may be reasonable as a matter of principle, where it is established that the price threshold does in fact provide for such a return. However, this is not the case in the current inquiry. For the reasons outlined above, there is no guarantee that the existing threshold provides sufficient returns for 'business as usual' expenditure. Furthermore, attempting to distinguish between expenditure used for the ongoing normal grid investment and other forms of investment is inherently problematic.

³⁴ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Threshold Decisions*, 6 June 2003, p.4

To the extent that the Commission has assumed the threshold represents a proxy for efficient prices in determining Transpower's excess profits, the problems identified above imply that this methodology is fundamentally inappropriate. Basing an assessment of excess profits, which then feed into the 'benefits of control', on an essentially arbitrary price does not provide a reasonable basis for determining whether control is warranted. Before making a decision on whether to control Transpower, the Commission should undertake an analysis of the appropriateness of the existing price threshold, so as to be confident of its estimate of any excess profits.

7. Timing of Cost Recovery

The Commission contends that one of the benefits of control is that Transpower will be prevented from pre-funding its unapproved capital expenditure program. The Commission has expressed concerns that the timing of Transpower's recovery of its efficient investments is not in itself efficient and consequently control will provide benefits through a more efficient pricing profile.

Further, the Commission states that Transpower's intention to pre-fund investment is inappropriate because:³⁵

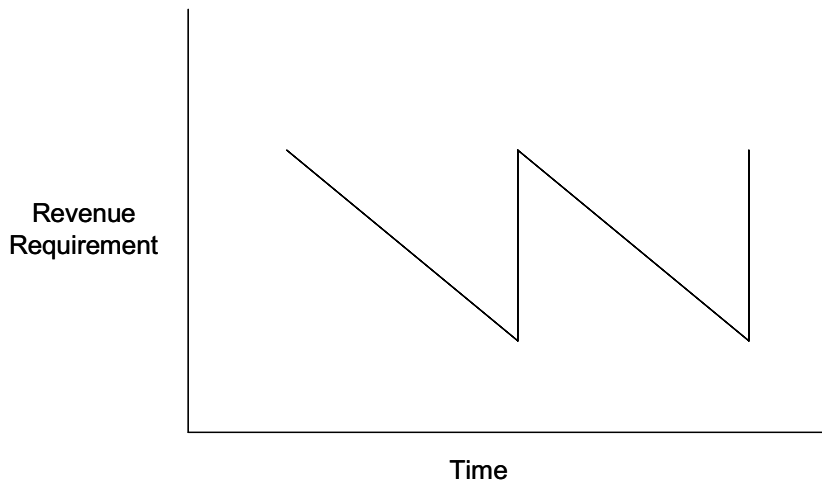
- businesses operating in a workably competitive market are not able to pre-fund investment except by use of returns on existing capacity;
- Transpower is pre-empting the investment approval process, and price rises may allow it to proceed with inefficient investments; and
- Transpower's incentives to minimise the costs of investment will be reduced and will transfer risk from the business to consumers.

This section discusses the appropriate timing of cost recovery for transmission investment.

7.1. The Timing of Cost Recovery

The lumpy nature of transmission investment implies that the annual revenue requirements derived under a building block approach will be relatively high at the time grid upgrades are being put in place, and will tend to fall over time as asset values depreciate.

Figure 7.1
Revenue Requirements over Time



³⁵ Commerce Commission, *Regulation of Electricity Lines Businesses, Targeted Control Regime: Intention to Declare Control, Transpower New Zealand Ltd*, 31 January 2006, p. 60-61

Financing this lumpy expenditure requires careful consideration of timing issues. There is an important distinction between pricing to recover expenditure as it is incurred and pricing to recover costs once the new asset is commissioned.

Our understanding is that Transpower is not seeking to obtain financing in advance of capital expenditure, but to earn a return on investment it has already undertaken but is yet to be commissioned, ie, to recover its costs on an as-spent basis. This is a move away from its existing approach where Transpower does not recover its costs until the asset is commissioned.

In principle, application of the building block approach to the determination of transmission business revenue and prices should allow a business to earn the same return, irrespective of the timing of the recognition of the costs of its investment. If the costs of investment are not included in a building block calculation of required revenue until it is commissioned, there needs to be an allowance for the time value of the investment costs incurred during the construction phase. Providing the regulatory arrangements applying to a transmission entity allow for the consistent recovery of costs (as most such regulatory arrangements seek to do), the two financing options should be NPV-equivalent, ie, they should result in identical economic outcomes.

As noted, this principle relies upon a regulatory framework under which a business can be reasonably assured that if it earns lower returns in earlier years it will be compensated for those low returns by means of increased returns in later years. A five year regulatory period assists in smoothing out such timing issues and provides a framework for giving timing issues appropriate consideration such that NPV-equivalency hold.

The Commission has argued that competitive businesses cannot pre-fund investment, other than by use of returns on existing capacity. Whilst an objective of many regulatory regimes is to provide a platform for competitive outcomes, regulation cannot flawlessly mimic the competitive process. Indeed, the large, lumpy nature of investment requirements and scale economies is one of the important reasons why electricity transmission requires regulation, and why - by definition - it does not and cannot fit into a competitive provision model. It follows that “this wouldn’t be achievable in a competitive market” is neither a necessary nor sufficient reason to reject the financing of investment on an as spent basis.

Furthermore, there are limits on the nature and extent of conclusions can be drawn from the competitive market for the purpose of designing optimal regulation. Competitive models primarily inform on the relationship between costs and prices. In contrast, it is not clear whether any useful principles can be derived from the competitive market in relation to the financing of investment. The extent of timing differences between costs being incurred and revenues earned varies greatly from one market circumstance to another. The implication of these timing differences for the relative roles of debt and “retained earnings” (a form of equity) is an issue that ought to be informed by reference to finance theory. It follows that the way in which Transpower’s investments are funded should be guided by the learnings from optimal regulation, rather than by reference to the competitive model.

If the Commission is to look for lessons from the competitive market paradigm, in our opinion it should give more weight to the principle that investments in services provided in

competitive markets are not made at all unless there is a reasonable assurance of cost recovery. Transpower does not currently have a reasonable level of assurance in this regard.

The Commission is also concerned that allowing earlier recovery of investment costs may weaken the incentives for prudent investment. However, the design of regulatory incentives and constraints on investment decisions is an issue that can and generally should be developed separately from decisions on the timing of their financing. Our understanding is that the Electricity Commission's oversight of Transpower's GUP is developing in precisely this way.

To the extent that any investment is undertaken and subsequently not approved by the Electricity Commission, any over-recovery should be netted off Transpower's Economic Value (EV) account.³⁶ We note that, even though a planned grid upgrade may not ultimately be approved by the Electricity Commission, all prudent preliminary costs associated with new investment should be recoverable regardless of whether or not the investment occurs. This is discussed in greater detail in the following section.

Regulators may hold some concerns that allowing planned expenditure to be financed on an 'as spent' basis may cause today's consumers to bear the cost of a benefit that may not be fully realised until some time in the future. However, given the relatively short lead-in time compared with the standard life of transmission assets this should not be a material concern.

The Commission is also concerned that Transpower will have a reduced incentive to minimise the costs of investment. Under a building block approach, prices are set by reference to the *forecast* costs of investment and are therefore independent of the outturn costs. Incentives under a building block methodology arise from the promise of retained efficiency gains through achieving lower costs over the long term. In other words, businesses have the incentive to reduce costs where they can retain the difference between forecast and actual costs for a period of time. Where costs are recovered ex-post, or after commissioning, a regulated entity is likely to have *less* incentive to minimise costs because its prices simply increase in line with its spending.

Although the two financing options referred to above should be equivalent in net present value terms (noting, again, that this is by no means certain under the threshold regime) they each have different implications for the cash flow of a business. Where cost recovery is on an as-commissioned basis, cash flows are initially low in the construction phase then high following the commissioning of the asset.

Transpower is currently recovering its expenditure on an as-commissioned basis, but would prefer to move to an as-spent basis.³⁷ Provided these two cash flows are NPV equivalent, then allowing Transpower to include works under construction (WUC) in the derivation of its prices is appropriate because:

³⁶ The Economic Value account essentially nets off any over-recovery (under-recovery) above (below) the targeted return. Any positive amounts are rebated to consumers, whilst any negative amounts are clawed back from customers via higher prices.

³⁷ See, for example, Transpower, *Submission to the Commerce Commission on Regulation of ELBs: Valuation of the Regulatory Asset Base*, November 2005, p.17

1. increased prices during the construction phase will provide better signals to consumers of the cost of capacity than where expenditure is recovered following commissioning; and
2. including WUC will help to smooth prices over time.

In many regimes, transmission prices provide an important signal for the cost of investment. When capacity constraints become binding, the short run marginal cost of transmission becomes the price at which demand is curtailed so as to equate it with supply, which is typically high. Allowing prices to reflect WUC will assist in conveying these increased costs as the network becomes constrained. In contrast, waiting until the asset is commissioned to recover the cost of the investment will tend to skew price signals, since prices will be low when capacity is constrained and higher when excess capacity exists immediately after investment.

In New Zealand the cost of capacity constraints and requirements for new investment is partly signalled through locational marginal pricing. The average level of transmission prices or revenues is therefore a relatively less important signal for investment. However, to the extent that congestion charges and transmission prices should be moving together to provide consistent signals, then including WUC in transmission prices will assist in achieving this goal.

A WUC allowance would also assist in smoothing prices over time, particularly where new investment has long lead times, since prices increase gradually over the construction period rather than spiking at the time the investment is commissioned.

Allowing ELBs a return on their WUC is an uncontroversial issue in Australia. The Australian Competition and Consumer Commission, Essential Services Commission of Victoria, Essential Services Commission of South Australia and the Independent Pricing and Regulatory Tribunal in New South Wales all allow ELBs to earn a return on capital on an as-spent basis, as does Ofgem in the United Kingdom. See Appendix A for further details.

7.2. Recovery of Preliminary Costs Associated with New Investment

Transpower's capital investment program is subject to oversight by the Electricity Commission and includes a process for the evaluation of transmission alternatives prior to the approval of grid upgrades. This process necessarily entails significant costs, as Transpower's investment plans are developed and evaluated.

The costs associated with investigating and evaluating potential grid upgrades are a necessary cost of Transpower's business and, on that basis, should be recoverable, provided they are efficiently incurred. Such costs include scoping studies, feasibility studies and those costs associated with the process of obtaining investment approval from the Electricity Commission. Where costs are necessarily incurred in the course of investigating potential grid upgrades, Transpower should not be penalised if those potential investment options are subsequently not approved.

No regulatory regime can expect businesses to have perfect foresight, particularly in the case of transmission where the precise timing of investment is frequently subject to uncertainty. It follows that businesses should not be penalised for costs that are incurred in the normal course of investigating and assessing investment options that may or may not be approved.

Should Transpower's ability to recover such costs be limited to those incurred for approved investments, its incentive to incur any costs associated with potential grid upgrades will be much reduced. Transpower would be likely to limit its investigations to those investments that it believes have a very high chance of gaining approval. This would likely preclude potentially efficient and/or necessary investments or, at the extreme, jeopardise future investment altogether.

It is also important to note that such costs are primarily incurred in the course of assessing large new capital expenditure programs. Consequently these costs are likely to follow the capital investment cycle, ie, they are themselves likely to exhibit a lumpy pattern over time.

Finally, businesses in a competitive industry would expect to recover costs associated with investigating and evaluating investment opportunities and would be unlikely to undertake such investigations if there was a reasonable risk that those costs would not be recoverable. Transpower is restricted to earning no more than its weighted average cost of capital, and will not achieve that return if it cannot recover these costs. In contrast, competitive businesses can earn higher returns on some investments to balance any lower returns in other areas that will average out to their targeted return.

8. Conclusion

Throughout the development of its threshold and control regime the Commission has not accounted for the unique characteristics of transmission businesses that imply transmission regulation warrants different considerations from those of distribution. Consequently a threshold regime has been established that does not take account of the unique nature of transmission. This can be accommodated within the regime if the role of the threshold is limited to that of a screening mechanism, and the requisite detailed inquiry undertaken before any decision to impose control is taken. However, the Commission is now using an inappropriately-designed and developed threshold to establish whether Transpower has been earning excess returns and warrants control.

Implicit in the claim that Transpower has earned excess profits is an assumption that the threshold represents a reasonable proxy for an efficient price and therefore that any revenues above this level that cannot be reconciled must necessarily be excess profits. However there is no reason to expect that the existing threshold for Transpower is consistent with what could be expected to be an efficient price.

No cost analysis was undertaken prior to the establishment of the thresholds. Instead, the starting point was set on an essentially arbitrary date, and decided by reference to the lowest average price over a period of approximately two years. Transpower was required to move from its historical building blocks methodology for establishing revenue requirements to a price threshold at a time when it was approaching the end of its capital expenditure cycle and consequently prices had for the most part been falling. Now that Transpower is intending to implement a major capital expenditure program, it is likely that it faces a choice between breaching the threshold and earning unsustainably low returns.

The efficiency factor applied to Transpower's price path cannot be relied upon to give a reasonable estimate of the expected efficiency improvements achievable by Transpower. TFP is not an appropriate form of analysis to apply to transmission because of the unique nature of its costs. Even if it were appropriate, an efficiency factor based on productivity in the distribution industry does not provide an appropriate benchmark for the efficiencies achievable by Transpower.

Finally, the Commission's distinction between 'business as usual' investment and other types of investment is problematic because of definitional issues, the risk that expenditure will not be recoverable, and the risk that the initial starting price was not sufficient to allow a reasonable return on 'business as usual' investment in any case.

The Commission's approach to assessing the benefits of control, and in particular its approach to assessing the extent of any excess profits, is seriously flawed. The implicit assumption that the threshold is efficient is not justified and is unlikely to hold in practice, yet it is a crucial assumption for the claim that Transpower has been earning excess profits. To verify this assumption and be confident of its assessment of excess profits would require analysis of the appropriateness of the existing threshold.

The Commission believes that Transpower's preferred timing of cost recovery is inappropriate. The Commission's reference to the competitive market on this issue is neither necessary nor sufficient to reject Transpower's proposed timing for financing its investment

on an as-spent basis. To the extent that any investment is undertaken and subsequently not approved, then any over-recovery should be netted off the Economic Value account. In contrast to the Commission's concern that Transpower will have reduced incentives to minimise the costs of investment where costs are recovered on an as-spent basis, Transpower is likely to have less incentive to minimise costs where its costs are recovered ex-post. Furthermore, there are additional benefits to pricing on an as-spent basis, including smoother prices and signals that are consistent with locational marginal pricing.

Appendix A. Australian and UK Treatment of WUC

The treatment of works under construction ('WUC') is an uncontroversial issue among Australian and UK regulatory authorities. All Australian and UK electricity regulators have recognised that regulated business require an appropriate return on capital works in progress and have incorporated this requirement into their regulatory decisions.

The South Australian regulator, ESCOSA,³⁸ in a recent electricity distribution decision considered the treatment of assets that are partly constructed.³⁹

There are two options for treating the time at which assets are reflected in the regulatory asset base:

- *at the time the regulated entity incurs expenditure on an asset; and*
- *at the time at which the asset enters into service.*

The first option would imply including capital works in progress. Under the second option, capital works in progress would be excluded, but the financing cost prior to the asset being commissioned would need to be included in the regulatory asset base. These should have an identical financial effect on ETSA Utilities [the South Australian electricity distributor].

ESCOSA has adopted the first option which is to recognise capital expenditure at the time the expenditure occurs. ESCOSA's approach is consistent with that adopted by the following regulators:

- the Australian Competition and Consumer Commission (now the Australian Energy Regulator) in its most recent electricity transmission revenue determination;⁴⁰
- the Essential Services Commission of Victoria (ESC) when regulating electricity distributors;⁴¹
- the Independent Competition and Regulatory Commission of the ACT (ICRC) in its recent reset of electricity distribution prices;⁴²
- the Queensland Competition Authority's (QCA) regulation of electricity distributors;⁴³

³⁸ Essential Services Commission of South Australia (ESCOSA)

³⁹ ESCOSA, *2005-2010 Electricity Distribution Price Determination: Part A - Statement of Reasons*, April 2005, page 117.

⁴⁰ ACCC, *NSW and ACT Transmission Network Revenue Cap TransGrid 2004/05 to 2008/09: Decision*, 27 April 2005, page 66.

⁴¹ See ESC, *Electricity Industry Guidelines No.3 Issue No. 4*, January 2004, page 34, which requires that any expenditure of a capital nature must be included in its regulatory accounts. The regulatory accounts form the basis of the regulatory asset bases roll forward.

⁴² ICRC, *Prices for Electricity Distribution Services in the ACT: Final Decision*, March 2004, page xviii.

⁴³ See QCA, *Regulation of Electricity Distribution: Final Determination*, May 2001, page 209.

- the Independent Pricing and Regulatory Tribunal (IPART) of NSW in its recent reset of electricity distribution prices;⁴⁴ and
- the Office of Gas and Electricity Markets of the United Kingdom regulation of electricity distribution.⁴⁵

The treatment of assets that are partly constructed is not a controversial issue, since regulators generally accepted the approach proposed by the regulated firm.

⁴⁴ See Figure 3.1 of IPART, *NSW Electricity Distribution Pricing 2004/05 to 2008/09: Final Report*, page 14, which sets out the construction of the building block approach to notional revenue requirements.

⁴⁵ See Ofgem, *Price Control Cost Reporting Rules: Instruction and Guidance*, April 2005, page 44, which sets out that capital expenditure is any expenditure of a specific capital nature.

Appendix B. NERA Credentials

NERA Economic Consulting is an international firm of economists who understand how markets work. Our clients include corporations, governments, law firms, regulatory agencies, trade associations and international agencies. Our global team of 500 professionals operates in 16 offices across North and South America, Europe, Asia and Australia. Founded in 1961 as National Economic Research Associates, our more than 40 years of practical experience in creating strategies, studies, reports, expert testimony and policy recommendations reflects our specialisation in industrial and financial economics.

NERA is at the forefront of the continuing transformation of energy industries worldwide. We have pioneered approaches for introducing competition in industry segments such as power generation where competition is workable, and for improving the regulation of sectors where it is not. We understand well the challenges arising at the interface between regulation and competition.

NERA's work in the Asia Pacific region principally revolves around the activities of the Australian Competition and Consumer Commission, the New Zealand Commerce Commission and other regulatory and antitrust agencies, many of whom also number amongst our clients.

Our current work in energy regulation includes:

- part of an expert panel advising the Ministerial Council on Energy on achieving harmonisation of the approach to regulation of electricity and gas transmission and distribution infrastructure in Australia;
- advising the Australian Energy Markets Commission on its review of the Electricity Rules relating to transmission revenue determination and pricing; and
- advising the Essential Services Commission on its successful response to appeals by four of the five electricity distribution businesses in Victoria regarding its 2006-10 Pricing Determination.

NERA

Economic Consulting

NERA Economic Consulting
Darling Park Tower 3
201 Sussex Street
Sydney NSW 2000
Tel: +61 2 8864 6500
Fax: +61 2 8864 6549
www.nera.com

NERA Australia Pty Ltd, ABN 34 092 959 665