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18 April 2005

Network Performance Group
Commerce Commission
PO Box 2351
WELLINGTON

By e-mail

Dear Paolo

Cross-submission on Implementing Valuation Choice for System Fixed Assets

Introduction

This letter is Transpower's cross-submission by way of follow-up to the Commerce Commission ("the Commission") conference on the review of the information disclosure regime and implementing valuation choice for system fixed assets ("the Conference"). It contains the additional information formally requested by the Commission and Transpower's response to a number of matters raised by the Commission and other submitters.

Specifically the letter contains Transpower's response on:

- Meridian Energy's concerns and the Commission's queries on the optimisation of the HVDC Pole at Benmore (information formally requested by the Commission);
- Vector's suggestion that the Grid Investment Test (GIT) is analogous to engineering and economic assessments carried out in normal business practice and that Transpower's capital expenditure should not be excluded from the optimisation process (or by inference other ex post prudence reviews if IHC were adopted);
- the treatment of revaluation gains; and
- the appropriate index for the indexed depreciated historic cost (IHC) valuation methodology.

Optimisation of the HVDC Pole at Benmore

Optimisation

Transpower is required under the Commission's Electricity Information Disclosure Requirements 2004 to prepare an Optimised Deprival Value (ODV) of its system

fixed assets in accordance with the Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses (ODV Handbook).

As part of preparing the ODV, Transpower determines the optimal configuration of the transmission system, subject to the optimisation rules set out in the ODV Handbook, by taking into account load, security, reliability and other relevant criteria and the overall system integrity. The optimised configuration of the system is the one that satisfies the above criteria in the most cost efficient manner.

In determining the optimal configuration of the system it may become apparent that certain assets or groups of assets have become excess to requirements, resulting in a lower or nil value, while other new assets may need to be notionally brought into the asset base.¹ For example it may be necessary to replace an existing asset with one or more notional assets to obtain the optimal system configuration. The transmission system that results from the optimisation process and is therefore valued needs to be operational and provide a level of service, in any particular area, equivalent to the lesser of the optimal configuration or the currently supplied level of service, within a reasonable set of credible contingency events.

Issues Raised by Meridian

Meridian's submission² to the Commission raised a number of concerns with Transpower's optimisation of the HVDC Pole at the Benmore converter stations. Transpower's understanding of the issues raised by Meridian is set out below.

- The optimisation of the Benmore converter stations has resulted in the existing 16kV bus being replaced by a (notional) 220kV connection. The change to 220kV creates a (notional) constraint in the grid that is overcome by including an additional (notional) interconnection transformer at the Benmore converter stations;
- Meridian's annual transmission charges include payment for these two notional assets (the 220kV connection and the additional interconnection transformer);
- The optimisation of the Benmore converter stations has resulted in the optimised replacement cost of those assets being \$2.5 million or 8.2% higher than the replacement cost. In contrast the ODV philosophy implies that the optimised replacement cost would be less or equal to the replacement cost; and
- If the 2004 ODV valuation forms the starting point for Transpower's opening historic cost valuation Meridian would be required to pay for the two notional assets on an ongoing basis.

These points are discussed below.

Optimisation of the Benmore Converter Stations

The Benmore converter stations referred to in the Meridian submission are located at the interface between the HVDC and AC systems of the transmission grid. In

¹ Commerce Commission, *Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses*, 30 August 2004.

² Meridian Energy, *Consultation on Implementing Valuation Choice*, 23 February 2005.

determining the optimal configuration of the system at Benmore, Transpower considers it is required to determine the most cost efficient solution for the combined HVDC and AC systems.

The optimal configuration, determined by Transpower, for the Benmore converter stations is to connect the Benmore Pole 1 HVDC converters to the HVAC grid using a notional 220kV connection and an additional interconnection transformer rather than the existing 16kV connection. This configuration is considered the most cost effective solution as it avoids transformer losses and extremely high current and fault ratings on the 16kV bus as well as additional spare transformer requirements for dual voltage connections.³ Therefore, the existing 16kV connection has been replaced by two notional assets, being the 220kV connection and an additional interconnection transformer. Without the additional interconnection transformer there would be a notional constraint at Benmore. Both of the notional assets are required to ensure the notional (optimal) system has the same capability as that required by the physical system.

Replacement Cost and Optimised Replacement Cost of the Benmore Converter Stations

As noted by Meridian, the optimisation process results in the optimised replacement cost of the AC substation assets at Benmore being \$2.5 million higher than the actual replacement cost of those AC substation assets. This appears to be at odds with the overall philosophy of the optimisation process. However, in the optimisation process Transpower has determined what it considers to be the most cost efficient solution for the combined HVDC and AC systems as opposed to treating these systems independently. The optimised replacement cost for the combined HVAC and HVDC systems at Benmore is \$16 million lower than the replacement cost for those combined systems. Therefore, the optimised configuration results in a lower combined optimised replacement cost, when considering the HVAC and HVDC systems together.

Opening HC Valuation

The approach used to reapportion the ODV of notional assets and the ODV in aggregate will be determined as part of the progression to the historic cost valuation approach. However, in the event Transpower changes from an ODV to historic cost valuation approach, the closing ODV of the notional assets will be reapportioned across the actual physical assets. Notional assets used for the determination of the current ODV will not exist under the historic cost valuation.

Compliance with the ODV Handbook

In addition to the points raised by Meridian, the Commission has requested clarification that the optimisation of the Benmore converter stations complied with the requirements set out in paragraphs 2.24(d) and 2.26 of the ODV Handbook.⁴ These paragraphs state:

³ Transpower, *2003 Report of the Optimised Deprival Valuation of Transpower's Fixed Assets as at 30 June 2003*, 28 November 2003.

⁴ Commerce Commission email to Transpower, *Consultation Package on Information Disclosure and Asset Valuation Choice*, 12 April 2005.

2.24(d) The optimised network should only use the voltage levels used on the existing network.⁵

2.26 The maximum capacity of any part of the optimised network shall be determined by the allowed future load growth, which is the maximum forecast load on the relevant part of the network under contingency operating conditions over the allowed planning period. However, in no case shall optimised capacity exceed existing capacity.

Transpower interprets paragraph 2.24(d) to mean that assets can be optimised to any voltage that is in use within the existing network. Whether or not it is appropriate to use a higher voltage⁶ than the physical system is informed by paragraph 2.18, which states:

2.18 Under the deprivation approach to asset valuation an optimised network would use the most cost-efficient design that would provide the required service level.

In Transpower's view the optimisation approach for Benmore detailed above is consistent with the requirements of the 2.24(d) of the ODV Handbook as it provides the most cost efficient solution,⁷ utilising voltages already in use within the network.

With respect to paragraph 2.26, Transpower notes that the Handbook refers to 'part of the optimised network' without providing a definition for this. Transpower's interpretation of this paragraph is that the optimised system capacity at Benmore is no higher than the relevant physical system capacity. If paragraph 2.26 is defined more narrowly than Transpower has interpreted it, Transpower would be required to consider capacity at an individual asset level, rather than at a system or sub-system level. Transpower considers that such an approach would limit the effectiveness of optimisation, and more specifically, the ODV Handbook clauses requiring the reconfiguration of the system, and contemplating the use of notional assets (2.38-2.39) would be redundant.

Conclusion

Transpower considers the optimisation approach undertaken at the Benmore converter stations complies with the ODV Handbook and provides the optimal configuration at this time, and therefore lowest overall ODV, when considering the combined HVDC and AC requirements.

Approval of Transpower's Capital Expenditure

At the Conference Vector suggested the Grid Investment Test (GIT) undertaken by the Electricity Commission and Transpower is analogous to engineering and economic assessments carried out in normal business practice by other infrastructure

⁵ ODV Handbook footnote states – 'This does not preclude existing equipment being optimised down to a lower standard network voltage. However, there is no requirement to optimise down to a non-standard voltage level.'

⁶ The use of a higher voltage does not in and of itself imply a higher overall capacity.

⁷ The optimal configuration for the HVDC equipment at Benmore was based on a separate valuation report prepared by Teshmont Consultants, Canada.

companies and therefore Transpower's capital expenditure should not be excluded from the optimisation process (or by inference other ex post prudency reviews if IHC were adopted).

Transpower considers the combination of the GIT and Part F of the Electricity Governance Rules sets Transpower's capital expenditure approval process apart from the capital expenditure approval process used by the electricity distribution businesses and exposing Transpower's Electricity Commission approved capital expenditure to subsequent optimisation or ex post prudency reviews would be inefficient. These points are discussed below.

Transpower considers the GIT provides a means of ensuring that any investment undertaken by Transpower within the framework of Part F of the Electricity Governance Rules⁸ has been subjected to due process and thorough analysis of the best available data at the time of the decision. In addition to the GIT, Part F creates a division of responsibilities between the Electricity Commission and Transpower with respect to investment decisions. With respect to approval of new transmission investments the Electricity Commission states:⁹

the [Electricity] Commission's role is to provide the kind of 'checks and balances' on the supplier of services that would be provided in normal markets

and

The regulator acts on consumers' behalf to ensure new investment occurs only where consumers, in aggregate, value that investment sufficiently to pay the price proposed. The GIT is used to make those decisions in a transparent fashion to minimise regulatory risk.

Although some or all of the components of the GIT may be used by electricity distribution businesses to determine efficient capital expenditure, distribution businesses do not require approval of their capital expenditure from the Electricity Commission.

With respect to Vectors suggestion that Transpower's Electricity Commission approved investments be exposed to subsequent optimisation or ex post prudency reviews, Transpower reiterates the view expressed in its original submission that:¹⁰

The application of "optimisation" after the GIT is completed (and the asset constructed) exposes past investment decisions (which were deemed efficient at the time) to on-going stranding risk, without providing any benefit in terms of improving the original investment decision.

It does not serve any purpose to reappraise a past investment decision using new information, and to redistribute wealth between infrastructure users and owners on the basis of an ex post review of past investment decisions. Indeed, in the context of a regulatory regime where there is a linkage between asset values and revenues, ex

⁸ In principle, investment may occur outside of the framework of Part F. However, this is unlikely and in any event would be subject to bilateral contractual agreement that would (with appropriate contractual provisions) sit outside of the ambit of the Commission's threshold and related regulatory regime.

⁹ Electricity Commission, *Explanatory Paper Grid Investment Test*, 3 December 2004.

¹⁰ Transpower, *Submission to the Commerce Commission on Implementing Valuation Choice for System Fixed Assets Draft Decisions and Discussion Paper*, February 2005, para 47 & 48 p.12

post "optimisation" unduly exposes investors to an unmanageable risk of capital loss; hence it provides a disincentive to investment

Treatment of Revaluation Gains

At the Conference the Commission questioned Transpower on its asset valuation methodology preference. As result of this questioning Transpower considers that further clarification on this matter is required.

In its submission Transpower noted that, from a theoretical perspective, both unindexed depreciated historic cost (DHC) and IHC would provide revenue streams with equivalent present values over the life of the asset base. Transpower did not, therefore, contest the Commission's draft decision that lines businesses choices of valuation methods be limited to ODV and IHC.

As stated at the Conference,¹¹ Transpower's primary concern with valuation choice relates to exposing Transpower's Electricity Commission approved capital expenditure to ex post reviews. Any approach that revisits investment decisions approved by the Electricity Commission would expose investors to unmanageable risk and affect their ability and willingness to invest. As such Transpower considers that the ODV methodology with its built in optimisation process is unsuitable for Transpower going forward. Transpower considers the correct approach for Transpower is to move to an historic cost based methodology that does not involve prudence reviews. Both the DHC and IHC approaches, without prudence tests, would be compatible with the regulatory regime Transpower's operates under.

Transpower acknowledges that, to the extent that asset values drive revenue requirements, it is probably reasonable to assert that prices are likely to be more allocatively efficient if the historic cost value is indexed to inflation (IHC methodology), although allocative efficiency is probably influenced more by the structure of charges rather than the overall revenue recovered. However, the use of an index and the treatment of the resulting revaluations as income will provide a lower cash flow, compared to DHC, in the early years of the assets life (see figure 2 on page 37 of the Commission's draft decision). The reduced cash flow early in the assets life could raises some important issues. For instance:

- Transpower is currently embarking on a period of significant investment in the transmission grid. The reduced cash flow in the early years of an assets life could impact on Transpower's approach to funding its immediate capital expenditure programme. As such Transpower may be required to raise additional debt to cover the capital expenditure programme under a regime that treats revaluations as immediate income. The possible gearing increase could lead to an increase in Transpower's cost of debt and equity; and
- Delaying the recovery of the revenue lost in the early years to a future period increases the regulatory risk and operating risk faced by the business as it will take the life of an asset (on average 50 years) to achieve revenue neutrality.

¹¹ Commerce Commission, *Conference Transcript - Review of the Information Disclosure Regime/Implementing Valuation Choice for System Fixed Assets Conference*, March 2005, pg 24

In not contesting the Commission's draft decision Transpower is assuming the issues related to the treatment of revaluation gains arising from indexation will be addressed in a manner that ensures financial capital maintenance and the adoption of appropriate regulatory mechanisms to mitigate these risks. In summary, the implementation of IHC will need to occur in a way that ensures lines businesses adopting IHC are not exposed to unnecessary commercial risk or asymmetric risk of value loss to changes of the regulatory regime over time, as well as ensuring customers are not overcharged for lines services.

Asset Valuation Index

At Conference the Commission questioned Transpower on its recommendation that the CPI be used as the index in the IHC valuation approach. As a result of this questioning Transpower considers that further clarification on this matter is required.

Escalating the asset base by CPI has the effect of protecting an investor's returns against the effect of economy-wide price movements (or, putting it another way, changes in the purchasing power of a dollar over time). In contrast, the application of a capital price index only protects investors against price movements in the asset class covered by the index, for instance transmission network assets. From the perspective of the investor, standard investment appraisal techniques assess investment performance against economy-wide price movements rather than price movements in a particular asset class. In other words, investors will have regard to real rates of return in their investment decisions. CPI escalation of the transmission capital base value would be consistent with the delivery of a rate of return to investors that accords with their real cost of capital.

One potential conceptual benefit of applying a capital price index is that it may provide a "better" valuation of the capital stock employed at a particular point in time. This may be useful in ensuring that aggregate revenues collected by a transmission company are allocatively efficient – in the sense that they reflect the efficient cost of a notional new entrant. Having said that, in transmission networks there is not an active market in second-hand assets, so periodically re-valuing the capital stock to reflect changes in capital prices is something of a 'thought experiment'. In reality, assets employed in transmission are 'sunk' – there is little prospect of new entry and almost no prospect of new entry using second-hand assets. In these circumstances, the investment is best valued by the regulatory compact that is struck rather than by reference to asset price movements. Moreover, there needs to be a degree of pragmatism applied in determining the regulated revenue requirements of transmission businesses; rational investors simply will not build new assets if revenue streams are truncated as a result of applying re-valuations which ultimately cause achieved real rates of return, on average, to fall below the real cost of capital. In our view, there is unlikely to be any efficiency loss in escalating assets by the CPI. Indeed, allocative efficiency is probably influenced much more by the structure of transmission charges, as distinct from the overall revenue requirement recovered by the transmission company.

In summary, Transpower submits that escalating assets by CPI has the benefit of providing investors with greater certainty that they will recover their real cost of capital. In contrast, the potential benefit of a capital price index, in terms of setting allocatively efficient prices, is likely to be negligible.

Closing Comment

If you have any further queries or require further explanation, please do not hesitate to contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'H. Cattermole', written in a cursive style.

Howard Cattermole
Regulatory Strategy Manager