

Valuation Principles for Electricity Lines Businesses in the Context of the Targeted Control Regime

Prepared on behalf of :

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1. Introduction

The Commerce Commission released an issues paper¹ (the Issues Paper) on 11 September 2003 to commence the consultation process regarding the development of an optimised deprival value (ODV) handbook to be used in the proposed regulatory regime for electricity lines businesses. The Issues Paper is narrowly focussed on a review of the ODV handbook only, and provides little guidance, from a valuation perspective, of the purpose of the ODV valuations and the criteria that should be applied to the review.

Asset valuation is an important component of the regulatory regime that is under development for electricity lines businesses. It is therefore cause for concern when, as is currently the case, comments are invited on a key facet of asset valuation, but without providing a clear and definite description of the purposes to which valuation may be put or what the desired attributes of a valuation methodology should be. It is not sensible to provide feedback on the ODV or any other valuation methodology in isolation – it has to be viewed within the larger context of valuation under the targeted control regime.

In this light, the Electricity Networks Association (ENA) has requested me to expand on the context and criteria for the development of valuation guidelines for valuing electricity lines businesses within a targeted control regime. This review is to occur in parallel to the ENA's direct response to the Issues Paper, which will be submitted separately.

In appendix 1, my qualifications and experience relevant to this topic are set out.

2. Background and context

As part of the development of the regulatory regime for electricity lines businesses, the Commission has released a number of documents and draft decisions for review and comment. Updating the ODV handbook is only one component of a much larger process, and the manner in which assets are to be valued may affect the outcome or impact on a number of the other draft decisions.

When valuing assets, it is essential to have a clear understanding of the purpose to which the valuation is to be put. I therefore consider it essential to review the proposals for an ODV handbook in the wider regulatory context, specifically in terms of its intended use.

It is noted that the Commission also approved the depreciated historic cost (DHC) asset valuation method. The principles discussed below would apply equally to any historic cost-based or replacement cost-based methodology (ODV or ODRC²) – it is not the purpose of this paper to comment on the appropriateness of any particular valuation methodology.

The following recent draft decisions published by the Commission are interrelated, or potentially interrelated, with the manner in which assets are valued and the quantum of such valuations.

¹ Commerce Commission publication, "Regulation of Electricity Lines Businesses : Development of a Handbook for Optimised Deprival Valuation of Electricity Lines Business System Fixed Assets – Issues Paper", 11 September 2003

² Optimised Depreciated Replacement Cost

2.1 Draft decisions on valuation methodology

Following the Commission's review of the valuation methodologies pursuant to subpart 4 of Part 4A of the Commerce Act (1986) (the Act), as outlined in its October 2002 discussion paper³, the Commission made the following draft decisions⁴. Lines businesses are required to :

- a) derive opening values for their system fixed assets based on the ODV methodology; and
- b) commit to consistently using either ODV or Depreciated Historic Cost (DHC) for the valuation of their system fixed assets in their regulatory accounts going forward.

These decisions are the basis for the Commission's decision to release the Issues Paper and to proceed with the development of an ODV handbook.

2.2 Assessment and Inquiry Guidelines

In its 7 August 2003 paper⁵, the Commission highlighted its guidelines of how it intends to make assessments against thresholds and carry out investigations into breaches of thresholds to determine whether to declare control or not. In essence, the Commission proposed the following steps.

- a) The current price and quality thresholds against which the performance of lines businesses are assessed will be replaced at 1 April 2004 by a new set of price thresholds. These thresholds are proposed to be established through comparative benchmarking and as such, will not depend on the valuation of assets.⁶
- b) If a lines business is found to be in breach of the thresholds, it may be investigated. For this purpose, the Commission may again use a comparative benchmarking approach, or it may decide to use a cost building block approach (or both).
- c) The Commission, after investigation, may from an intention to declare control and if so, must publish that intention and invite comment on it. If a business is subsequently placed under control, the level of efficient prices for that business will be determined. The Commission may again use a comparative benchmarking approach or a building-block approach (or both) to establish efficient prices.

The Commission's building block approach involves determining⁷ :

³ Commerce Commission publication, "Review of Asset Valuation Methodologies : Electricity Lines Businesses' System Fixed Assets, Discussion Paper", 1 October 2002.

⁴ Commerce Commission publication, "Regulation of Electricity Lines Businesses : Targeted Control Regime, Draft Decisions", 23 December 2002

⁵ Commerce Commission Publication, "Regulation of Electricity Lines Businesses : Targeted Control Regime, Draft Assessment and Inquiry Guidelines (Process and Analytical Framework)", 7 August 2003

⁶ Although it has decided not to adopt a profit threshold, the Commission has left open the prospect of such a threshold if a satisfactory price and quality path threshold cannot be established in time for application by 1 April 2004. I also understand that the setting of the "C-factor" for the thresholds may involve the use of ODV values.

⁷ Supra note 5, par 149 to 151

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

These building blocks are used to calculate the efficient revenue in a period, as follows :

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

where : R_t is the efficient revenue in period t

A_t is the efficient asset value at the end of period t

D_t is the efficient depreciation in period t

O_t is the efficient operating cost (including tax)

$WACC_t$ is the weighted average cost of capital in period t

Should a lines business' revenue exceed its efficient costs, the business will be considered to have earned excessive profits.

It is therefore obvious that the asset value is a key component in the building block approach. The Commission notes⁸ that in general the asset value used in this approach is the value of all fixed assets and net working capital. For lines businesses, this amount is generally dominated by the value of lines business system fixed assets.

2.3 Weighted average cost of capital

The weighted average cost of capital (WACC) to be applied to the regulation of electricity lines businesses is discussed in the 4 August 2003 paper by the Commission's adviser in this regard, Associate Professor Martin Lally (Lally 2003). The WACC is another integral component of a cost building block regulatory approach.

There will be some degree of interdependence between the WACC and the valuation method. It is for example noted by Lally that the WACC figure may have to be adapted to account for the optimisation risk that is inherent to the a replacement cost-based valuation methodology, but does not feature in a historic cost-based methodology.

In addition, there are further factors that could be addressed by the addition of a margin over WACC⁹ to compensate investors for company specific risks that cannot be diversified away, or by adjustment to the valuation. For example, the value of certain intangible assets or real options could be included with the system fixed assets to make up the total regulatory asset base or could be addressed through the cost of capital.

⁸ Supra note5, par 154

⁹ See for example van Zijl and Verster (2003) and Boyle (2003)

2.4 Resetting the Price Path Threshold

In its 5 September 2003 publication¹⁰, the Commission described the manner in which it intends to determine the price and quality thresholds for electricity lines businesses after 1 April 2004.

The proposed thresholds themselves focus on price and quality metrics and do not require the use of a valuation. However, I understand the proposed method for setting the threshold (i.e. the C-factor) may require the use of ODV values.

2.5 Expected purpose of the asset valuation

It should be noted that all the decisions referred to above still have draft status. This implies that they may still be changed and that the analysis that follows may need to be changed accordingly. However, for the purposes of the rest of the discussion, I assume that the decisions will in fact be ratified in their present form.

In the Issues Paper¹¹, the Commission indicates that an ODV handbook is required to :

- meet the purpose of Part 4A regulatory regime to establish robust opening asset valuations and for the purpose of ongoing asset valuations;
- accommodate any potential requirement for lines businesses to prepare asset valuations in relation to targeted control and information disclosure regimes, under Part 4A; and
- accommodate any potential requirement for lines businesses to prepare asset valuations in relation to the possible imposition of control under Part V of the Act.

The Issues Paper also noted that the proposed ODV handbook contrasts with the Ministry of Economic Development's ODV handbook, which exists solely for the purpose of supporting the information disclosure regime prescribed by the Regulations.

This purpose statement is in accordance with the other draft decisions listed above and I therefore assume this to be the full and only purpose of the asset valuation methodology.

The important implication of this purpose is that under the targeted control regime, asset valuation may become a critical component in determining, or limiting, the returns deemed acceptable for a lines company. While not relevant to the initial comparative threshold measure, at an investigative or control stage, under a cost building block approach, asset valuation would be used in determining acceptable returns or setting efficient prices.

Lines businesses can be expected to be acutely aware of the possible threat of being investigated and placed under control. I believe that this awareness will influence their behaviour as they try to avoid control. The danger therefore exists that asset valuations may become a de facto regulatory constraint, inhibiting lines businesses' actions, in spite of this not being the intention of the threshold regime. It is therefore essential that the development of any valuation methodology by the Commission should be approached with great care, as wrong and overly restrictive decisions in this regard could have very negative outcomes.

¹⁰ Commerce Commission publication, "Regulation of Electricity Lines Businesses : Targeted Control Regime, Draft Decisions - Resetting the Price Path Threshold", 5 September 2003

¹¹ Par 6

3. Asset Valuation Principles

As noted above, any review of asset valuation methodologies requires a clear specification of the context within which they are intended to be used. The more direct the link between valuations and prices, the greater is the concern whether the valuation methodology and associated regulatory pricing procedures are designed in a way that is consistent with the stated purpose of the regime, which I understand can be summarised as

“to promote the efficient operation of markets directly related to electricity distribution and transmission services through targeted control for the long-term benefit of consumers”¹²

By expanding the purpose of asset valuation from information disclosure to also becoming part of the targeted control regime, the impact of asset valuation on prices will be much greater than in the past. It is noted that some lines businesses already use their disclosed information¹³ when determining their revenue requirement and electricity tariffs. Under a targeted control regime, all lines businesses will in effect be forced to adopt this approach in parallel to their price-setting under the proposed threshold regime. Results from the asset valuation would, at the very least, be used as a test to avoid (what may be deemed as) excessive earnings, potentially resulting in investigation and control. Achieving maximum economic efficiency should be the primary background driver when designing an asset valuation methodology. The Commission appears to accept this view, especially with regard to dynamic efficiency. In its discussion of the relationship between various forms of economic efficiency and valuation, the Commission notes¹⁴:

“the Commission considers that for both opening and future valuations, allocative and productive efficiency considerations are less important than dynamic efficiency in assessing the methods under the efficiency criterion” (page 10).

The implication is that maximising dynamic efficiency should be a goal when designing an asset valuation methodology.

I concur with this view. In the following section I discuss principles for an efficient valuation methodology, which in all cases should promote dynamic efficiency.

3.1 Well specified

It is important that a valuation methodology is specified clearly and in sufficient detail to leave little need for assumptions or special interpretations. Any assumptions or interpretations that have to be made will make the implementation of the valuation methodology more complex and increase the associated costs. Furthermore, it creates a situation where different companies may value similar assets differently.

3.2 Accurate

A valuation methodology should be accurate in its determination of the value of an asset. This implies that it should be reliable in reflecting the quantum of the value involved as well as valid in reflecting the correct assessment of the quantum.

¹² Section 57E

¹³ In particular their average funds employed, which are largely based on their ODV values, and a suitable WACC figure

¹⁴ Supra note 3, par 3.7

In addition, the valuation methodology should also reflect with reasonable accuracy the true economic life of an asset. It is recognised that the lifespan of an asset cannot be exactly determined in advance and that any standard figure used for valuation purposes would be the average value for a number of similar assets. However, average lifespan figures should be regularly tested and, where necessary, adapted to reflect actual ageing profiles of assets in the field.

3.3 Comprehensive

A valuation methodology has to be comprehensive, addressing all the assets likely to be used by an electricity lines business in conducting its (lines) business, and providing a clear valuation methodology also for those unusual assets not identified at the outset.¹⁵

I am concerned that current valuation methodologies, in particular the current ODV handbook, almost exclusively address physical network assets only. This ignores many other assets, generally classed as intangible assets, that are equally essential for the efficient operation of an electricity distribution network, such as :

- databases, including GIS systems;
- in-house developed software, systems and procedures;
- easements and other rights to non-owned property;
- customer, supplier and maintenance contracts; and
- brands, trademarks and other reputational aspects.

These assets are expensive to create and maintain, are legally defined and subject to ownership, are essential for the operation of companies and, to the extent that they are present, add greatly to the value of businesses. The value of intangible assets is increasingly recognised in general markets, where these assets are being sold, licensed for use by others, or even used as collateral security for loans. Excluding such assets from the valuation, ignores the investments made in them and the expectation of investors to achieve a return on such investments. It also ignores one of the key areas where efficient and innovative lines businesses can distinguish themselves from others.

As a starting point, the application of Generally Accepted Accounting Practice (GAAP) to value non-standard assets and non-system fixed assets, could be considered.

3.4 Stable and consistent

The stability and consistency of a valuation methodology is critical, and the risk of it changing should be minimised. There are a number of reasons for this, including :

- Significant changes in a valuation methodology during the course of its application, where that methodology has a bearing on pricing, may give rise to wider price instability. Passing this instability through to end-users would increase general economic uncertainty, with potentially wider negative implications. Expecting investors in lines businesses to absorb the changes on the other hand, could lead to lowered returns, creating negative investment incentives.

¹⁵ This would normally apply to the ODV methodology only. It is however conceivable that the Commission may decide to implement schedules of "acceptable" initial costs and life-span for the DHC approach as well, to ensure consistency of application. To date no guidelines in this regard have been made available by the Commission.

- Consistency through time is crucial to any performance measuring system, as otherwise trends are obscured.
- Future predictability of a valuation methodology is important to lines businesses, as it removes an unnecessary risk from their planning horizon that would otherwise raise the costs of investing in the sector.

In designing an asset valuation methodology, great care therefore has to be taken that it is not only robust under present circumstances, but can also be carried forward for extended periods.

3.5 Transferability

To avoid duplication and the associated unnecessary cost and complexity, it is highly desirable that asset values derived from a valuation methodology can be used for other related business applications as well. Ideally, an asset valuation should therefore be suitable as a base for inclusion in a company's general financial statements and reports. Where the methodology requires a high level of detail, it should also be linked to the company's asset register and/or geographical information system and other databases.

The implication is that ideally, wherever possible and practical, asset valuation techniques should conform to the requirements of the GAAP, for at least valuing non-standard assets, non-system fixed assets and for conducting revaluations, where applicable.

3.6 Low incremental cost to implement

Any significant change to the valuation methodology will involve costs on the part of lines businesses to implement. In designing a valuation method, it is therefore important to take into account what valuation methods lines businesses are familiar with and what their information technology systems and processes are set up for.

3.7 Ability to adapt methodology over time

Balanced against the requirements for stability, stands the need for an effective valuation methodology to be adaptable over time, as technological, price, environmental and other changes occur. This implies that such a methodology should, where appropriate, incorporate an efficient mechanism for regular updates, particularly of asset schedules, if used, but also to incorporate technological changes or innovative procedures.

3.8 Flexibility to incorporate non-standard assets or installations

The situation may occur from time to time that assets are installed as part of a network that are unusual, that were not envisaged during the development of a valuation methodology or cannot be installed in "average" conditions. We see three areas especially where this may occur :

- In certain circumstances the installation of similar assets in different environments can lead to major cost variations¹⁶. A sound valuation methodology therefore has to be able to recognise and compensate for these variations.

¹⁶ A typical example would be the substantial increase in cost to install underground cables in the central business areas of large cities, as opposed to installing similar cables in low-density, residential areas.

- Certain categories of customers increasingly require higher than average quality of supply levels. This means that lines businesses have to expand their networks to address this requirement, in excess of what may be considered optimal for conventional consumers. Far from discouraging such investments because they are non-standard and risk being “optimised” to a lower level, an efficient valuation methodology should be able to accommodate these types of installations.
- Lines businesses are increasingly in a position to provide alternative solutions to demand problems.¹⁷ In some cases this may involve alternative technology and in others an innovative approach or change in the distribution philosophy. These approaches would generally require less physical assets in comparison to a “conventional” distribution approach to achieve the same outcome. Valuation methods need to be able to incorporate an “equivalence” approach where recognition is given to these (and other potential) mechanisms in terms of the conventional network assets they replace. Failure to do so will not only reduce the incentive to innovate or improve, but may also “punish” lines businesses in the sense that their allowed revenue will be reduced as compared with situations where additional network assets were installed to achieve the same effect.

3.9 Reflect appropriate planning horizons

Distribution network assets frequently have very long economic lives. During installation of such assets, this creates the need or provides the opportunity to size assets to accommodate load growth well into the future. Assets are therefore often installed to cater for future expected demand, rather than just to meet present demand. In the majority of cases this would be an economically preferable decision over the alternative, which is to expand at a later stage the capacity of the original asset or to replace it (when the asset is still within its useful economic life).

The overall cost-benefit of installing a higher capacity asset (or collection of assets) initially as opposed to its later upgrading or replacement, depends on the:

- degree of excess capacity built into the new asset,
- extent and rate of the load growth foreseen and the increased use of the asset that would result from it,
- total cost of the initial installation of the asset (including design, procurement and construction costs),
- price path foreseen (revenue that would be derived directly or indirectly through the asset),
- time value of money to the lines business,
- loss of flexibility and the value of the associated real option due to the irreversibility of the investment decision,
- practicality and total cost of extending or replacing the installation at a later stage,
- implications of future loss of supply during the future upgrade of the asset,
- duration of the planning horizon used.

¹⁷ Typical solutions would include increased use of distributed generation, load shedding agreements or a probabilistic rather than deterministic quality of supply approach.

In maximising the potential cost benefit from an asset investment, the planning horizon over which the investment decision is evaluated plays an important role – a too short horizon could prevent economically optimal decisions. An efficient valuation methodology should therefore reflect or allow an appropriate horizon for asset planning decisions.

4. Recommendations

To conclude, I recommend the following actions by the Commission.

- a) It is essential that the Commission provide a clear and definite context for asset valuation under the targeted control regime. At present, in the absence of such a clear context, any submission made on an asset valuation methodology will have to rely on a number of assumptions, which may or may not borne out in future. This places a severe limitation on the value of the submissions and may give rise to the need for a further round of submissions once the context is finalised.
- b) The ODV handbook is only one component of asset valuation and focuses on only one part of lines businesses' assets. The Commission failed to provide sufficient information on how this methodology will fit under the broader umbrella of asset valuation under the targeted control regime. This shortcoming has to be addressed.
- c) At present, a number of draft decisions have been published by the Commission with regard to the targeted control regime. Some of these would impact on the manner in which asset valuation is applied and how it will be used. These decisions, especially where relating to the use of the ODRC/ODV or DHC methodologies and the possible implementation of a building block approach to setting efficient prices, have to be confirmed.
- d) To allow a reasoned evaluation of an asset valuation methodology, it is essential to establish a set of desired attributes for the methodology. In the absence of any guideline in this regard, I have developed a set of general attributes that should apply to any valuation methodology and that can be used by lines businesses when preparing their submissions. These were developed against a background of maximising dynamic efficiency. It is recommended that the Commission adopt these, or provide a similar set of attributes for general consideration. In summary, the suggested attributes for an efficient valuation method are:
 - Well specified – limiting the need for assumptions or case-specific interpretations.
 - Accurate – allocating a reliable and valid value to assets, as well as an accurate economic lifespan
 - Comprehensive – addressing all assets required by electricity lines businesses for the efficient operation of the electricity networks, including the later inclusion of assets not initially identifiable.
 - Stable and consistent – avoiding changes in the valuation methodology, thereby limiting unnecessary revenue or prices fluctuations and allowing efficient long-term planning and operations.
 - Transferability – striving, where practical, for a single, consistent asset valuation for use throughout the company on all related aspects.

- Low incremental cost to implement - avoiding major methodology changes that would involve significant set-up or longer term operational costs.
- Ability to adapt over time - accommodating technology changes or different businesses approaches, as these develop over time.
- Flexibility to incorporate non-standard assets or installations - allowing for differences between regions, or innovative network solutions.
- Reflect appropriate planning horizons - recognising that assets are often installed with higher capacity than directly required, to allow it to meet future demand.

Appendix I : Qualifications and Experience

Tony van Zijl

I am Professor of Accounting & Financial Management at Victoria University of Wellington. At present my teaching is mainly in financial reporting and my research interests include capital markets, valuation, financial reporting, and performance measurement and reporting.

My academic qualifications are PhD (Finance), BSc (Mathematics), BCA(Hons) (Economics) and DipAcc (Accounting). My PhD thesis dealt with theoretical aspects of the Capital Asset Pricing Model (CAPM) and my academic publications include a number of papers on that topic.

I am a member of the Institute of Chartered Accountants of New Zealand (Fellow Chartered Accountant) and also a member of the Institute of Finance Professionals of New Zealand (Certified Securities Analyst Professional).

In February 2002 I was appointed Chairman of the ICANZ Financial Reporting Standards Board, having earlier been a member of the Board from 1989 to 1999. I was a member of the Accounting Standards Review Board from 1991 to 2001 and I was Director of Research for the Institute of Chartered Accountants of New Zealand from 1985 to 1988.

I have served on a number of government working parties, including on securities law reform, capital charging for tertiary education institutions, and value-based reporting for state-owned enterprises. I have been a member of the Valuation & Property Standards Board of the New Zealand Property Institute since 1998.

I am a Director of LECG and provide consulting advice and litigation support in the areas of financial reporting, financial management, capital markets and cost of capital and valuation. I have given expert evidence on these matters in High Court proceedings and arbitrations.

References

Boyle, G., 2003 (September), Some thoughts on the cost of capital proposed for the Regulation of Electricity Lines Businesses, 21pp.

Lally, M., 2003 (August), The Weighted Average Cost of Capital for Electricity Lines Businesses, 88pp.

Van Zijl, T. and Verster, R., 2003 (September), Review of the Weighted Average Cost of Capital as proposed for the Regulation of Electricity Lines Businesses, LECG, 18pp.