PRICEWATERHOUSECOOPERS

Horizon Energy Distribution Limited

Electricity Lines Business ODV Valuation as at 31 March 2004

2 December 2004

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1 Introduction

1.1 As requested, PricewaterhouseCoopers has determined the Optimised Deprival Value ("ODV") of Horizon Energy Distribution Limited's ("Horizon") Electricity Lines Business ("ELB") system fixed assets as at 31 March 2004.

1.2 The valuation covers the Horizon network located in the eastern Bay of Plenty inclusive of subtransmission, distribution and low voltage assets. In the subtransmission network Horizon operates assets at 33 kV. These assets include lines and cables from Transpower's points of supply to Horizon's zone substations, the substation buildings and associated land, transformers and switchgear. Horizon has four points of supply with Transpower located at Edgecumbe, Kawerau, Waiotahi and Te Kaha and 11 major zone substations. Embedded generation exists within two parts of the Horizon system fed from separate Transpower points of supply. On the Edgecumbe supplied system there is a 10 MVA co-generation facility owned by Bay of Plenty Electricity ("BOPE") on the Fonterra Milk Factory site. The generation facility is primarily to feed the site and islands at any time of system interruption. Excess generation from the site is exported through the Horizon system to other BOPE customers. Also on the Edgecumbe system is a 24 MVA hydro station owned by BOPE and located at Aniwhenua. The 33 kV system that connects the Galatea and Kaingaroa substations to the Edgecumbe point of supply is usually run open with the normal supply coming from the Aniwhenua station. Excess generation from Aniwhenua is exported via a 110 kV line to Matahina and then into the Transpower grid system. On the Kawerau system there are two small geothermal generation stations again owned by BOPE with a total capacity of about 5 MVA. These two systems operate as base load with a high load factor and supply into the surrounding Horizon system.

1.3 The distribution network operates at medium voltage - 11 kV, and low voltage - 400V. Distribution assets consist of lines and cables, distribution substations inclusive of transformers, switchgear and low voltage connections with consumers. Horizon's distribution network also includes street lighting assets. The system supplied 27,488 connections at valuation date.

1.4 The ODV valuation has been calculated in accordance with the Handbook for Optimised Deprival Valuation of System Fixed Assets of Electricity Lines Businesses ("the Handbook"). The Handbook was issued by the Commerce Commission on 30 August 2004.

1.5 Part 4 of the Commerce Act (Electricity Information Disclosure) Requirements ("the Requirements") requires that:

- ELBs publicly disclose various financial performance measures;

- these financial performance measures be based on the ODV of the ELB's system fixed assets; and

- the ODV be calculated in accordance with the Handbook.

1.6 We stress that the valuation derived using the ODV methodology in the Handbook is intended for regulatory purposes and may not necessarily represent the fair market value of the ELB's system fixed assets.

1.7 In determining the ODV valuation we have relied on advice from Maunsell Limited ("Maunsell"). In particular, Maunsell has reviewed the replacement costs, asset lives and optimisation of the system fixed assets.

2 Valuation methodology

2.1 The ODV of an asset is the minimum of the Optimised Depreciated Replacement Cost ("ODRC") and Economic Value ("EV"). The ODRC is a measure of the cost of replicating the network in the most efficient way possible, from an engineering perspective, given its service capability and the age of the existing assets. The EV is the earnings based value of the network, and is obtained by calculating the Net Present Value ("NPV") of the future cash flows of the least cost equivalent service not using system fixed assets. EV is used to value uneconomic parts of the network, which are not able to fully recover their costs (including their cost of capital), with assets valued at ODRC. This equates to the value of the assets if they were (hypothetically) replaced today, with their modern equivalent assets , and any excess or uneconomic assets removed.

2.2 The key steps in the application of the ODV approach to valuing the system fixed assets of an ELB are summarised below in simple terms:

- prepare a valuation asset register;
- determine Modern Equivalent Asset ("MEA") replacement costs of each asset to determine the Replacement Cost ("RC");
- optimise the asset base to determine the Optimised Replacement Cost ("ORC");
- depreciate the RC to determine the Depreciated Replacement Cost ("DRC");
- depreciate the ORC to determine the ODRC;
- apply the EV test; and
- determine the ODV being the minimum of ODRC or EV for each segment of the system.

2.3 For the purposes of this valuation, there are no assets where the valuation rules included in the Handbook are insufficiently prescriptive to require an alternative approach to be applied.

2.4 The Handbook requires the valuation report to contain the information listed below. References to the relevant information contained in this report are noted against each requirement:

a) the asset quantities in the valuation asset base, excluding stores and spares. This information shall be broken down into asset classes consistent with the asset classes contained in the tables in Appendix A of the Handbook (Appendix A);

b) the RC, ORC, DRC, ODRC and ODV for each asset class and for the valuation asset base as a whole. This information shall be shown separately for each geographically distinct, non-contiguous network. Stores and spares should be disclosed separately as separate line items and need not be disaggregated into asset classes (Appendix A);

c) a description of the method used for the valuation of any assets where the ELB considers that the valuation method is not specifically prescribed by the valuation rules in the Handbook (2.3);

d) a schedule of asset classes where asset quantities and/or asset ages have been estimated. For each such asset class the valuation report shall describe the methodology used to derive the estimates (4.5);

e) a schedule of asset classes and asset quantities to which multipliers or other adjustments have been made to the standard replacement costs given in the tables in Appendix A of the Handbook. In cases where a range of multipliers or other adjustments is allowed, the valuation report shall show the actual multiplier applied and describe the basis for the selection of a particular multiplier or other adjustment within the range (4.9 – 4.10, Appendix C);

f) a schedule of replacement costs and asset lives used as the basis for valuing non-standard assets where standard replacement costs or asset lives are not provided in Appendix A, and a general description of the basis for determining the replacement costs or lives of those assets. This information shall include, where appropriate, the basis for selection of MEAs and the methodology used to determine the current replacement cost of the MEA (4.12 – 4.15, Appendix D);

g) a schedule of asset classes and quantities for which standard asset lives have been extended or reduced in accordance with the provisions of clauses A.32-A.44 of the Handbook, together with the actual lives used, and a schedule showing the date of return to service and remaining life applied to individual assets that have been refurbished since the last valuation (4.31, Appendix H);

h) a general description of the evidence forming the basis for any change in the date of commissioning of assets from that used in the previous ODV valuation, except where this change is due to the replacement of assets (4.33);

i) details of assets to which a reduction in standard lives is applied due to routine replacement as part of the evolution of the network (4.34);

j) a general description of the methodology used to optimise the network (4.16 – 4.25);

k) a general description of the analysis and assumptions used where life cycle cost analysis is relied upon to avoid the use of an asset with a lower replacement cost in an optimised network (4.21);

l) the existing loads and the load growth forecast used as a basis for optimisation. This information shall be disaggregated by point of connection, zone substation and high voltage distribution feeder (4.20, Appendix F);

m) forecast new loads or load increases required to be separately disclosed in the valuation report (4.20);

n) a description of the quality of supply criteria used as the basis for optimisation (4.17, Appendix E);

o) a schedule of all network optimisations and details of the valuation impact of each optimisation, including details of the assets removed as stranded assets (4.26, Appendix G);

p) the justification for the inclusion of underground circuits in the optimised system fixed assets base (4.24);

q) details of any separate network segments with non-coincident peak loads where the distribution transformer capacity was optimised separately from the balance of the network or adjustments for transformer redundancy provided for in non-standard customer contracts (4.24);

r) where an ELB does not undertake a comprehensive EV test on any of its system fixed assets in accordance with the provisions of clause 2.59(i) of the Handbook a statement stating that it has reviewed its system fixed asset base and identified assets that may be potentially uneconomic, and (ii) a statement stating that it is satisfied that an Economic Valuation of those assets would not have resulted in a material reduction of the ODV of its system fixed assets, and a description of the basis on which that conclusion was formed (5.1 – 5.9) and;

s) where a comprehensive EV test is undertaken as part of the valuation process, (i) a description of the methodology used to identify the potentially uneconomic system fixed assets to which the comprehensive EV test was applied (ii) a description of the EV test methodology, and (iii) the ODRC and calculated EV of the assets tested, broken down for each geographically separate, non-contiguous network (n/a).

3 Sources of Information

3.1 The ODV valuation and conclusions contained in this report are based on the following information:

- The ODRC asset register of the system fixed assets as at 31 March 2004 compiled by Horizon.
- Maunsell's confirmation of asset replacement costs, asset lives and asset optimisation applied in the ODRC register.
- Discussions and meetings with Peter Dwyer and Ian Robertson of Horizon and Don Lewell and Graeme Mahoney (external consultants).
- Horizon's 2004 Asset Management Plan ("AMP") to 2014.
- Statistical data, including customer details, electricity consumption loads and load forecasts.
- Security standards, reliability targets and quality of supply information.
- Operational statistics and diagrams.
- Construction policies and practices and project costings.
- Local authority requirements.

3.2 PricewaterhouseCoopers has not, in the course of this assignment, conducted anything in the nature of an audit of the information provided. Accordingly, we do not express an opinion as to the reliability, accuracy or completeness of the information upon which this valuation is based.

3.3 No reconciliation has been undertaken between the valuation database and Horizon's historical accounting fixed asset records. The responsibility for the completeness and accuracy of the data lies with Horizon. We have reviewed the valuation methodology and performed sample checks on the ODRC asset register as described below.

3.4 Horizon assembled an ODRC register of their ELB system fixed assets as at 31 March 2004. Our check as to the completeness and accuracy of the ODRC asset register focused on the detailed registers and the Geographic Information System ("GIS") that underlie the summarised ODRC asset register. Representative portions of the data records were checked on a sample basis. Testing primarily focused on asset categories of a material nature although samples were tested from all asset categories. In addition,

reasonableness tests were performed on asset groups to ensure the completeness and accuracy of the summary schedules.

3.5 Horizon provided information necessary for defining the customer details, costs of supply and other information required for the EV tests for the ODV calculation.

3.6 In carrying out the assignment we have relied upon the engineering expertise of Maunsell and Horizon staff.

4 Optimised Depreciated Replacement Cost

4.1 Horizon produced an ODRC asset register of the system fixed assets as at 31 March 2004. This information formed the basis of our valuation. For the purposes of this asset valuation, the components of Horizon's electricity system were separated into a number of distinct asset categories (as specified in Table A.1 of the Handbook). A summarised version of this register is included as Table 1 overleaf. Appendix A includes an asset register for each category of asset replacement costs and lives used. More detailed information concerning asset categories is contained in Appendices B, C and D of this report.

4.2 The total RC of the system fixed assets of Horizon is $132,324,866. After charging depreciation of $58,875,639 to reflect the age of the assets, a DRC of $73,449,227 has been derived, and finally, following a review of system optimisation by Maunsell, an ODRC of $73,151,436 has been determined.

Table 1: Summary ODRC asset register for Horizon as at 31 March 2004

ASSET CLASS	Unit	Total Units	Std Life years	RC $	ORC $	DRC $	ODRC $
Subtransmission							
33kV Lines - concrete	km	128	60	5,915,945	5,681,644	3,350,342	3,209,793
33kV Lines - wooden	km	32	45	1,476,484	1,418,007	836,168	801,090
33kV Cables - xlpe	km	3	45	496,191	496,191	298,040	298,040
33kV Isolation and Surge Arrestors	No.	30	35	270,000	270,000	124,089	124,089
33 kV OD Circuit Breaker	No.	2	40	90,000	90,000	26,392	26,392
Zone Substations							
Land	Lot		-	137,000	137,000	137,000	137,000
Site Development and Buildings	No.	32	50	456,300	456,300	272,380	272,380
Transformers - 55 Years	No.	14	55	80,000	80,000	46,404	46,404
Transformers - 60 Years	No.	21	60	3,035,000	3,035,000	1,599,562	1,599,562
Switchgear Cubicles and Indoor Switchgear - Extended Life	No.	44	55	1,281,000	1,281,000	837,774	837,774
11 kV Surge Arrestor set	No.	72	35	346,500	346,500	108,850	108,850
Incoming (Outdoor) Switchgear, Protection and Controls	No.	193	45	1,234,900	1,234,900	645,759	645,759
Outdoor Structure Concrete	No.	20	60	244,000	244,000	139,805	139,805
SCADA and Communications Equipment	No.	131	15	589,950	589,950	249,551	249,551
Ripple Injection Plant	No.	14	20	670,900	670,900	200,341	200,341
Zone Substation Ring Main Unit	No.	1	40	16,000	16,000	9,496	9,496
L.V and D.C Supplies	No.	24	20	50,400	50,400	20,277	20,277
Power Cabling	km	15	45	124,000	124,000	88,968	88,968
Other items	No.	39	40	283,700	283,700	165,578	165,578
Distribution							
11kV Lines - concrete	km	1,403	60	36,710,515	36,536,230	18,685,290	18,595,390
11kV Lines - wooden	km	117	45	3,060,446	3,045,916	1,557,737	1,550,242
11kV Cables - xlpe	km	116	45	10,284,081	10,265,197	6,525,679	6,515,845
11kV Cables - pilc	km	26	70	2,416,161	2,408,235	1,574,014	1,568,892
Disconnectors, Load Break Switches, Dropout Fuses	No.	3,403	35	8,596,050	8,596,050	3,583,762	3,583,762
Sectionalisers, Reclosers, Circuit Breakers, Ring Main Units, Switches	No.	228	40	3,702,000	3,702,000	2,412,754	2,412,754
Distribution Transformers Extended Life	No.	2,991	55	18,478,300	18,451,300	10,680,660	10,670,847
Distribution Substations Extended Life	No.	2,991	55	4,593,914	4,593,914	3,051,094	3,051,094
LV Lines - concrete	km	296	60	7,267,650	7,267,650	3,662,518	3,662,519
LV Lines - wooden	km	25	45	605,882	605,882	305,333	305,333
LV Cables - xlpe	km	262	45	12,071,288	12,071,288	7,687,697	7,687,697
Streetlight Cables - xlpe	km	16	45	420,927	420,927	236,527	236,527
Link Pillars	No.	317	45	758,000	758,000	610,436	610,436
Customer Service Connections							
LV Overhead	No.	11,640	45	1,533,086	1,533,096	865,796	865,796
LV Underground	No.	15,848	45	3,964,650	3,964,650	2,395,955	2,395,955
Other System Fixed Assets							
Mobile Substation Equipment - 15 Years	No.	2	15	7,700	7,700	7,572	7,572
Mobile Substation Equipment - 20 Years	No.	2	20	241,500	241,500	187,801	187,801
Mobile Substation Equipment - 30 Years	No.	1	30	29,000	29,000	18,927	18,927
Mobile Substation Equipment - 55 Years	No.	1	55	16,000	16,000	15,887	15,887
SCADA and Communications (Central Facilities)	Lot		15	676,950	676,950	177,637	177,637
Strategic spares	Lot		-	92,497	92,497	49,373	49,373
Total				132,324,866	131,789,473	73,449,227	73,151,436

Note: Tables may not add due to rounding

Preparing a detailed asset register

4.3 The first step in the ODV methodology is to prepare an asset register of system fixed assets. The summary asset register has been derived from three databases containing details of assets of the Horizon network. These databases are known as the 'lines and cables database', the 'non lines and cables database' and the 'ICP details database'.

- Lines and Cables Database – The lines and cables database was constructed by an external organisation on behalf of Horizon. All data, with the exception of the locations, location conditions and configurations was extracted electronically from the GIS system. Within the GIS, each feeder is broken down into a number of segments, bound together by either switchgear or a termination. Each segment is identified using a unique identification number and is further divided into subsegments based on changes in attributes (for example, trench profiles for cables). Each subsegment has been assigned a unique equipment identification number. Data within the GIS system comes from a number of sources. Historical information in relation to lengths was uploaded from digitised computer measurements from maps, Electricity Supply Applications (ESAs) and construction drawings. Other information, such as conductor type and age, were taken from ESAs, construction records and asset registers for previous valuations. Information for amendments since the commissioning of the GIS system is input into the GIS from ESAs, work orders and asset modification or movement sheets.

- Non Lines and Cables Database – All other assets, including transformers, distribution substations, zone substations, switchgear and poles are recorded in the non lines and cables database. This database is maintained on the basis of work orders and asset modification or movement sheets.

- ICP Details Database – This database contains details about customer connections including ICP identification numbers, phases for non-domestic connections and the associated distribution substation. All of this data has been extracted directly from Horizon's billing system.

Estimating asset data

4.4 In compiling the asset register the following estimates and judgements were made where complete and accurate information about certain classes of asset was not available.

4.5 33kV and 11kV Overhead Lines – Lives are determined by the pole installation dates as recorded in the lines and cables database. The recorded dates are either actual installation dates or, if unknown, installation dates assessed upon individual pole inspection. A network-wide pole inspection was performed in the mid 1990s to capture these unknown pole installation dates.