

TRANSGRID'S ESTIMATED REMAINING ASSET LIVES AT 1 JULY 2004

A Report for TransGrid

Prepared by NERA

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1. INTRODUCTION

TransGrid has requested that NERA advise on an appropriate value for the average remaining asset life of each asset category in TransGrid's regulatory asset base (RAB) as at the 1 July 2004. These values will be used to estimate regulatory depreciation of the initial RAB during the 2004/09 regulatory period.

In a regulatory context, depreciation represents a return to owners of funds invested in the regulated firm. Depreciation has a mirror effect on a regulated firm's allowable revenues and RAB, ie, as depreciation is a return *of* capital in allowable revenues these funds are then removed from the asset base on which the return *on* capital is earned.

2. INITIAL REMAINING ASSET LIVES

The ACCC's current approach to establishing regulatory depreciation during a regulatory period is to divide regulatory depreciation into two components:

- depreciation of new capital expenditure; and
- depreciation of the initial RAB.

Depreciation on new capital expenditure is determined by the ACCC's standard asset lives, while depreciation on the initial RAB is calculated by straight-line depreciation over the average remaining asset life in each asset category at the beginning of the regulatory period.

The adoption of average asset lives simplifies the calculation of depreciation but will not always give precisely the same value as if every asset is individually tracked and depreciated according to its standard life. This is because assets older than the average are depreciated over a period longer than their remaining economic life, while assets younger than the average are depreciated over a period shorter than their remaining economic life. It is not possible to derive a simple formula for 'average remaining' life that ensures these two effects always exactly cancel out.

However, in a regulatory framework aimed at delivering the maintenance of the financial value of capital this need not be of any particular concern. On the proviso that the regulator always sets an appropriate risk adjusted rate of return, then if allowed depreciation is reflected in a lower RAB the business will be indifferent to the depreciation profile. However, if there is an expectation that the allowed return on capital may fall below an appropriate rate in the future then the regulated business has an incentive to maximise the returns of capital.

2.1. NERA Methodology

We have estimated the average asset life at the beginning of each year using the depreciated values to weight the average asset lives.

For consistency with the regulatory asset base roll forward we have referenced support documentation provided by the ACCC on their 1999 decision for opening 1999 asset lives and values, standard asset lives of new capital expenditure, and allowed depreciation.¹

¹ Initial average asset life for transmission assets acquired from the Snowy Mountains Hydro-Electric Authority (SMHEA) is calculated from the ACCC decision on SMHEA's opening RAB at 1 July 1999, allowed economic depreciation in 1999/2000 and the inflation assumption of 2.35 percent. It follows that average remaining asset lives for the SMHEA assets at 1 July 1999 is equal to

$$ARAL_{SMHEA} = (ORAB + \text{CPI adjustment}) / (\text{Eco Depreciation} + \text{CPI adjustment})$$

However, we have incorporated actual inflation outturns and actual capital expenditure in our calculations.

Average remaining asset live as at the 1 July 1999 are rolled forward each year so that the average remaining asset life at the beginning of each year is calculated by the following formulae:

$$(1) \quad ARAL_{t+1} = [(ARAL_t - 1) * (ORAB_t - Dep_t + CPI_t) + Capex_t * SAL] / (ORAB_t - Dep_t + CPI_t + Capex_t)$$

where:

$ARAL_{t+1}$ average remaining asset life at the beginning of period t+1;

$ARAL_t$ average asset life at the beginning of period t;

$ORAB_t$ opening regulatory asset base in period t;

Dep_t depreciation allowed in the 1999 ACCC decision in period t adjusted for actual inflation outcomes;

CPI_t CPI allowance in the 1999 ACCC decision in period t adjusted for actual inflation outcomes;

$Capex_t$ capital expenditure in period t, as used by TransGrid to calculate the opening regulatory asset base for, 1 July 2004; and

SAL is the ACCC standard lives for the 1999-2004 regulatory period.

That is equation (1) calculates the average remaining asset life of all assets in a category as the weighted average of the standard (equals remaining) life of new assets and the remaining life of pre-existing assets. The weights used are the inflation adjusted depreciated values of assets. For example, if pre existing assets have an average remaining asset life of 25 years, new capex has a standard life of 50 years and new capex comprises one 10th of the depreciated value of assets in that category then the average remaining life of all assets will be calculated as 27.5 years (=50*0.1+25*0.9).

where:

$ORAB = \$62.45$ million;

$Eco Dep = \$2.9$ million; and

$CPI adj = \$62.45mil * 2.35\% = \$1.47mil$

Therefore:

$$ARAL_{SMHEA} = (\$62.45mil + \$1.47mil) / (\$2.9mil + \$1.47mil) \\ = 14.63 \text{ years}$$

Appendix A tabulates average asset lives calculated for each asset class at the beginning of each regulatory year for the period 1999/00-2004/05. Table 2.2, below lists NERA's estimates of the average remaining lives of TransGrid's assets at 1 July 2004.

**Table 2.1: NERA's estimate and an alternative estimate of average remaining asset lives
1 July 2004**

Asset Class	NERA's estimate of average remaining lives	Alternative approach to estimate average remaining lives
Lines	28.4 yrs	26.12 yrs
Underground lines	44.1 yrs	41.08 yrs
Substations	26.0 yrs	18.20 yrs
SCADA	7.2 yrs	6.15 yrs
Non-network	8.0 yrs	7.11 yrs
Non depreciating assets	n/a	n/a
Southern NSW	13.1 yrs	10.44 yrs

The table also shows the average remaining lives as at 1 July 2004 based on an alternative approach that TransGrid also considers as valid.

It should be noted that there is no single 'right' answer to the calculation of average remaining life. As already noted, an appropriate return on capital, will leave TransGrid indifferent to the depreciation profile adopted. However, if there is an expectation that the allowed return on capital may fall below an appropriate rate, then TransGrid has an incentive to adopt a depreciation profile, which allows it a faster return of capital.

APPENDIX A – NERA ESTIMATES OF INITIAL AVERAGE ASSET LIVES 1999-2004

Regulatory Asset Base and Lives		Years ended 30 June				
		1999/00	2000/01	2001/02	2002/03	2003/04
Opening RAB						
Lines	<i>Opening inputs</i>	1,032.72	1,033.85	1,090.98	1,192.91	1,215.61
underground cables	(at 1 July 1999)	38.43	38.06	38.82	49.73	100.76
Substations		461.56	482.21	547.55	609.34	720.53
SCADA		15.55	20.28	33.92	55.87	54.74
Non network		57.13	68.37	76.70	82.15	85.71
Non depreciable assets		329.15	344.02	371.74	388.42	409.37
Southern NSW		62.45	59.81	60.07	59.11	59.01
Total opening assets		1,996.99	2,046.59	2,219.79	2,437.53	2,645.73
			<i>ok</i>	<i>ok</i>	<i>ok</i>	<i>ok</i>
Add actual CPI						
Lines		28.83	61.93	32.06	41.04	27.53
underground cables		1.07	2.28	1.14	1.71	2.28
Substations		12.88	28.89	16.09	20.97	16.32
SCADA		0.43	1.21	1.00	1.92	1.24
Non network		1.59	4.10	2.25	2.83	1.94
Non depreciable assets		9.19	20.61	10.93	13.36	9.27
Southern NSW		1.74	3.58	1.77	2.03	1.34
		55.75	122.60	65.24	83.87	59.92
Depreciation as per decision adjusted for actual CPI						
Lines		- 38.42 -	- 40.71 -	- 42.38 -	- 46.96 -	- 50.12
underground cables		- 1.44 -	- 1.52 -	- 1.52 -	- 1.63 -	- 1.63
Substations		- 30.84 -	- 33.40 -	- 35.26 -	- 39.77 -	- 41.36
SCADA		- 3.62 -	- 5.79 -	- 8.53 -	- 11.41 -	- 12.26
Non network		- 6.76 -	- 7.70 -	- 8.30 -	- 9.40 -	- 9.85
Non depreciable assets		- - -	- - -	- - -	- - -	- - -
Southern NSW		- 4.39 -	- 4.60 -	- 4.65 -	- 4.46 -	- 4.55
		- 85.46 -	- 93.71 -	- 100.65 -	- 113.62 -	- 119.77

Regulatory Asset Base and Lives	Years ended 30 June				
	1999/00	2000/01	2001/02	2002/03	2003/04
Add decision Capex at actual CPI					
Lines	10.72	35.91	112.25	28.61	24.20
underground cables	-	-	11.29	50.94	50.50
Substations	38.61	69.85	80.96	130.00	97.76
SCADA	7.91	18.22	29.48	8.35	3.16
Non network	16.40	11.94	11.50	10.13	10.00
Non depreciable assets	5.68	7.12	5.75	7.58	3.93
Southern NSW	-	1.28	1.92	2.33	1.89
	79.32	144.31	253.15	237.95	191.44
Total value to be capitalised in to asset base at end of period					
Lines	-	-	-	-	70.30
underground cables	-	-	-	-	39.98
Substations	-	-	-	-	81.99
SCADA	-	-	-	-	0.45
Non network	-	-	-	-	52.00
Non depreciable assets	-	-	-	-	25.37
Southern NSW	-	-	-	-	-
	-	-	-	-	270.08
Closing RAB					
Lines	1,033.85	1,090.98	1,192.91	1,215.61	1,287.52
underground cables	38.06	38.82	49.73	100.76	191.89
Substations	482.21	547.55	609.34	720.53	875.24
SCADA	20.28	33.92	55.87	54.74	47.32
Non network	68.37	76.70	82.15	85.71	139.80
Non depreciable assets	344.02	371.74	388.42	409.37	447.94
Southern NSW	59.81	60.07	59.11	59.01	57.68
	2,046.59	2,219.79	2,437.53	2,645.73	3,047.40

Regulatory Asset Base and Lives		Years ended 30 June					
		1999/00	2000/01	2001/02	2002/03	2003/04	
New Capex asset lives							
Lines		50	50	50	50	50	
underground cables		50	50	50	50	50	
Substations		40	40	40	40	40	
SCADA		10	10	10	10	10	
Non network		10.41	10.41	10.41	10.41	10.41	
Non depreciable assets	na	na	na	na	na	na	
Southern NSW		40	40	40	40	40	
Asset lives as at 1 July 1999							
Lines		27.82					
underground cables		27.69					
Substations		15.62					
SCADA		5.75					
Non network		9.12					
Non depreciable assets							
Southern NSW		14.63					
Weighted average asset lives at the beginning of year							
		1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Lines		27.82	27.06	26.85	28.12	27.66	28.4
underground cables		27.69	26.69	25.69	30.44	39.83	44.1
Substations		15.62	16.65	18.76	20.71	23.37	26.0
SCADA		5.75	6.80	8.06	8.61	7.97	7.2
Non network		9.12	8.67	8.10	7.56	7.01	8.0
Non depreciable assets							
Southern NSW		14.63	13.63	13.21	13.12	13.22	13.1