REVENUE DETERMINATIONS, 2000-01 TO 2002-03

June 2000

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Definitions

"Act"	means the *Utilities Commission Act 2000*
"Code"	means *Electricity Networks (Third Party Access) Code* attached as a schedule to the *Electricity Networks (Third Party Access) Act 2000*, as amended
"Commission"	means the Utilities Commission formed on commencement of the Act
"first regulatory control period"	means the period between commencement of the Code (on 1 April 2000) and 30 June 2003
"Initial Determination"	means the relevant Determination made for the period 1 April 2000 to 30 June 2000
"Initial Determinations Paper"	means the explanatory paper issued by the Commission following the Initial Determination
"PAWA Networks"	means the business division of the Power and Water Authority (PAWA) of the Northern Territory with operating responsibility for the electricity networks owned by PAWA

CHAPTER 1

INTRODUCTION

Requirements of the Code

1.1 With respect to the revenue caps to apply to the regulated network provider (Chapter 6 of the Code), the Commission is required to make three determinations prior to commencement of the first full year of the (first) regulatory control period, that is prior to 1 July 2000:

(1) the fair and reasonable rate of return to apply during the remainder of the regulatory control period, in accordance with Schedule 8 to the Code (clause 69(2)(b));

(2) the revenue cap to apply to 2000-01, in accordance with Schedule 6 to the Code (clause 69(1)); and

(3) the efficiency gains factor (or "X factor") to apply when calculating the revenue caps for 2001-02 and 2002-03, in accordance with Schedule 10 (clause 70).

1.2 The determination for (1) was made on 1 April 2000, and the determinations for (2) and (3) on 26 May 2000.

Requirements of the Act

1.3 Section 22(1) of the Act requires that, before making a determination, the Commission may give a draft determination to the parties affected and may take into account representations that any of them make on the proposed determination.

1.4 The Commission did not undertake any specific consultations regarding these determinations. Instead, the issues involved were canvassed during the consultations undertaken prior to the Initial Determinations, particularly in response to the *Calculating PAWA's Initial Network Revenue Caps* Discussion Paper issued by the Commission in January 2000.

1.5 Section 22(2) of the Act requires that a final determination is to include a summary of the information on which the determination is based and a statement of the reasons for making the determination.

1.6 This report sets out the reasoning underlying the Commission's final determinations as they apply to the financial year or years commencing 1 July 2000. The final determinations themselves are reproduced in the following Chapters of this report:

- Chapter 4: the determination of a "fair and reasonable rate of return", as required by clause 69(2)(b) of the Code;
- Chapter 8: the determination of the "network revenue caps" to apply in 2000-01, as required by clause 69(1) of the Code; and
- Chapter 11: the determination of the "efficiency gains factors" (or X factors) to apply in 2001-02 and 2002-03, as required by clause 70 of the Code.

PART I

WACC DETERMINATION

2000-01 TO 2002-03

CHAPTER 2

Measuring the WACC

Framework

2.1 As provided for by paragraph 11(1) of Schedule 8 to the Code, the weighted-average cost of capital (hereafter "WACC") is required as a basis for measuring the allowed rate of return.

2.2 Schedule 8 of the Code requires the real-terms pre-tax WACC ($WACC_r$) to be calculated using the following formula:

$$WACC_r = \{(1 + WACC_n)/(1 + \Delta PI)\} - 1 \quad \ldots(1)$$

where:

$WACC_n$ = nominal pre-tax weighted-average cost of capital (%); and

ΔPI = expected annual inflation rate (%).

2.3 Schedule 8 also specifies that the nominal pre-tax WACC ($WACC_n$) is to be calculated using the following formula:

$$WACC_n = [R_e / (1 - T^*(1-G))] * (1 - D/C) + (R_d * D/C) \quad \ldots(2)$$

where:

R_e = the required post-tax rate of return on equity;

T = the corporate tax rate;

G = the imputation factor (measuring the value of franking credits);

D/C = the ratio of debt to capital employed; and

R_d = the pre-tax cost of debt.

2.4 Schedule 8 defines R_e as follows:

$$R_e = R_f + (\beta_e * MRP) \quad \ldots(3)$$

where:

R_f = risk-free rate of return on capital;

β_e = equity beta; and

MRP = market risk premium.

2.5 In the Initial Determination, the Commission chose to measure the equity beta (β_e) as follows (using the Monkhouse formula):

$$\beta_e = \beta_a + (\beta_a - \beta_d) * [(1 - R_d/(1+R_d)*T*(1-G)) * D/E \quad \ldots \quad \ldots(4)$$

where all the terms are as defined above except:

β_a = asset beta.

2.6 Schedule 8 defines R_d as follows:

$$R_d = R_f + DRP \quad \ldots(5)$$

where:

R_f = risk-free rate of return on capital; and

DRP = debt risk premium.

Parameters

2.7 The real-terms pre-tax WACC for the first full regulatory period was determined by the Commission on 1 April 2000.

2.8 All parameters used in calculating the WACC were discussed in some detail in the Initial Determinations Paper.

2.9 There has been no change to the following parameter values used:

G	imputation factor	50%
D/C	ratio of debt to capital employed	50%
β_a	asset beta	.50
MRP	market risk premium	6.50%
DRP	debt risk premium	1.00%

2.10 Only the following parameter values have changed, being time related or reliant on current market interest rates. These revised parameters are discussed in Chapter 3.

R_f	risk-free rate of return on capital
ΔPI	expected annual inflation rate (%)
T	corporate tax rate

CHAPTER 3

Revisions to Initial Determination

3.1 The real-terms pre-tax WACC for the first full regulatory period was determined by the Commission on 1 April 2000.

Risk-free rate of return on capital

3.2 In line with the Initial Determination, the September 2009 Commonwealth bond rate was used as a proxy for the risk-free rate of return, averaged over the 30 trading days prior to the date of determination of the WACC.

3.3 Based on the yield data provided by Northern Territory Treasury Corporation as at 30 March 2000 for the 15 September 2009 Commonwealth Government bond (see Table on next page), a figure of 6.65% has been derived from yields between 17 February 2000 and 29 March 2000 inclusive.

Expected inflation

3.4 As decided in the Initial Determination, the Commission measures expected inflation as the difference in yields on nominal and indexed 10 year Commonwealth Bonds. This measure is an indicator of the market's assessment of inflation expected over the relevant period.

3.5 Using the 'Fisher Equation'[1], the Commission has averaged the difference between the Commonwealth 2009 bond yield and the 2008 capital Indexed Bond yield from 17 February 2000 and 29 March 2000. This results in an implicit expected inflation rate of 3.03% over 10 years.

Corporate tax rate

3.6 As the statutory company tax rate is due to move from 36% to 34% from 1 July 2000, the lower rate has been used by the Commission in determining the WACC to apply during 2000-01.

[1] Inflation expectations are not the exact difference in yields, but are estimated using the 'Fisher equation': (1 + nominal return) = (1 + real return) * (1 + inflation rate).

Commonwealth Government Bond, 15/09/2009

Date	yield (%)
17 February 2000	7.070
18 February 2000	7.050
21 February 2000	7.050
22 February 2000	6.800
23 February 2000	6.780
24 February 2000	6.750
25 February 2000	6.540
28 February 2000	6.540
29 February 2000	6.620
1 March 2000	6.660
2 March 2000	6.580
3 March 2000	6.580
6 March 2000	6.640
7 March 2000	6.720
8 March 2000	6.690
9 March 2000	6.690
10 March 2000	6.710
13 March 2000	6.780
14 March 2000	6.700
15 March 2000	6.700
16 March 2000	6.550
17 March 2000	6.520
20 March 2000	6.520
21 March 2000	6.430
22 March 2000	6.370
23 March 2000	6.405
24 March 2000	6.430
27 March 2000	6.555
28 March 2000	6.505
29 March 2000	6.535
Average over 30 Trading Days	**6.649**

CHAPTER 4

WACC Determination

4.1 The Commission's determination of the required WACC to apply to PAWA Networks during the period 1 July 2000 to 30 June 2003 is as follows:

WACC DETERMINATION

Risk-free rate	6.65%
Equity risk premium	6.00%
Asset beta	0.50
Debt beta	0.06
Beta (levered)	0.935
Cost of equity before dividend imputation	12.26%
Imputation factor	0.50
Cost of equity (post-tax)	9.75%
Tax rate	34%
Cost of equity (pre-tax)	**14.77%**
Risk-free rate	6.65%
Debt risk premium	1.00%
Cost of debt (pre-tax)	**7.65%**
Equity-to-capital ratio	50.00%
Debt-to-capital ratio	50.00%
Nominal pre-tax WACC	**11.21%**
Expected inflation rate	3.03%
Real-terms pre-tax WACC	**7.94%**

PART II

REVENUE CAP,

2000-01

CHAPTER 5

Framework

5.1 With respect to the network revenue cap to apply in the first full financial year of the (first) regulatory control period (2000-01), Schedule 6 of the Code specifies the methodology to be used by the Commission.

5.2 The Commission determined the network revenue caps for 2000-01 on 26 May 2000.

5.3 In contrast with the Initial Determination, the Commission has decided to establish network revenue caps for PAWA Networks' Tennant Creek and Alice Springs networks as well as for the Darwin and Katherine networks. While actual third-party use of these smaller networks may be some way off, the availability of information of the revenue caps applying to these networks will assist potential entrants to take into account the likely network usage costs, thereby allowing third-party generators and/or retailers to make informed decisions on whether to contest the market.

5.4 In all other respects, the 2000-01 revenue cap differs from the annual cap previously determined by the Commission in the Initial Determination for two sets of reasons:

- on account of any changes in methodology, or corrections to the underlying data, used by the Commission in the Initial Determination; and
- because of the rolling forward of the data used by the Commission from 1999-00 to 2000-01.

5.5 Chapter 6 discusses the modifications to methodology and data used in the Initial Determination.

5.6 Chapter 7 discusses issues arising from the rolling forward of the data used by the Commission from 1999-00 to 2000-01.

CHAPTER 6

Revisions to 'Initial' Methodology and Data

Additional capital contributions

6.1 The regulated capital base (CAPITAL) for a particular network was calculated in the Initial Determination using the following formula:

$$CAPITAL = [WC + (ODV + 0.5*(CAPEX - DECOM)*(1 + \Delta PI)^{-½} \quad \ldots(6)$$

where:

WC = the funds ('working capital') required to finance operations ($M);

ODV = the depreciated optimised deprival value of the network's fixed assets at the beginning of the financial year ($M);

CAPEX = the capital funds that are expected to be expended in the financial year in connection with the creation or upgrade of network fixed assets ($M);

DECOM = the ODV of those network assets expected to be decommissioned in the financial year before the end of their economic life ($M);

ΔPI = the forecast change in an appropriate price index for the financial year (%); and

CAPCON = the capital contributions received net of any amount amortised, to the extent that the resultant assets constructed have increased the gross ODV ($M).

with:

$$CAPCON = (CONCUR - AMORT) + CONNEW \quad \ldots(7)$$

where:

CONCUR = total capital contributions made since 1 July 1998 towards new network assets to the extent that each contribution increased the optimised deprival value;

AMORT = the amount amortised from the capital contributions since 1 July 1998 up to the commencement of the financial year in question; and

CONNEW = capital contributions expected to be made towards new asset during the financial year.

6.2 On reviewing this methodology, the Commission acknowledges that equations (6) and (7) together imply a different treatment of internally funded new assets (CAPEX) and gifted assets (CONNEW). In effect, within-year price movements are allowed to impact upon CAPEX but not CONNEW.

6.3 Treating CAPEX and CONNEW on a similar basis requires the formula used to measure the regulated capital base for the 2000-01 year being revised as follows:

$$CAPITAL = [WC + (ODV + 0.5*(CAPEX - CONNEW - DECOM)*(1 + \Delta PI)^{-\frac{1}{2}} - CAPCON] \quad \ldots(8)$$

with:

$$CAPCON = CONCUR - AMORT \quad \ldots(9)$$

Depreciation charge

6.4 The Initial Determination used the following formulae for the depreciation charge (DEP):

$$DEP = DCUR + 0.5*(DNEW - DDEC) \quad \ldots(10)$$

where:

$$DCUR = ODV * 1/L_C \quad \ldots(11)$$

$$DNEW = CAPEX * 1/L_N \quad \ldots(12)$$

$$DDEC = DECOM * 1/L_D \quad \ldots(13)$$

6.5 The effect of these formulae is to allow a return on capital on contributed assets as well as on PAWA-funded assets. Besides lining up its treatment with practice in other jurisdictions, the Commission considers denying PAWA a return of capital contributed by others (not its shareholders or creditors) as being appropriate on two grounds:

- the building block approach focus is on the 'return of capital', which is retrospective in nature, ie a return of capital from a previous investment,

and not prospective, ie relating to the funding of anticipated future expenditure; and

- as there has been no allowance for capital contributions prior to 1 July 1998, PAWA already benefits from a windfall by earning a return on, and of, capital previously contributed.

6.6 On both these bases, PAWA Networks should not be receiving a return of capital contributed by someone else. To do so would come close to customers paying twice for the same asset.

6.7 The treatment consistent with practice in other jurisdictions involves substituting the following replacement formulae into (10):

$$DCUR = (ODV\text{-}CAPCON) * 1/L_C \quad \ldots(14)$$

$$DNEW = (CAPEX\text{-}CONNEW) * 1/L_N \quad \ldots(15)$$

Network assets

6.8 The Commission has also agreed to revise figures used in the Initial Determination relating to the 'opening period' asset values.

6.9 On 18 May 2000, PAWA Networks advised the Commission that some items classified as generation assets at the time of the Initial Determination were not properly an asset of PAWA Generation. While not all of these assets have been reclassified to Networks, those that were are listed below:

Darwin - The Channel Island 132 kV switchyard had been included as a generation asset. More properly, assets beyond the 132 kV terminals of the generator step-up transformers provide network functions. This yard connects this generation to the network, and major 132 kV lines run towards Katherine, at Hudson Creek. (The generator transformers remain a generation asset, and one of the circuit breakers at Channel Island is the property of NT Power.)

Katherine – The "Old power station" no longer provides generation, but some of the facilities allow connection of networks to the new power station, and other facilities provide network workshops etc. Further, the standby generation equipment at Larrimah and Mataranka is regarded as a Network asset. These units are to be the responsibility of networks, being installed to provide some form of alternative supply against the failure of the very long single supply lines to those locations. It was a preferable solution to any consideration of duplicated lines or alternative connection.

6.10 As well as the additional network assets listed above, PAWA also identified further specific assets which were excess to requirements, and so should be excluded from the asset base. These were:

Darwin - Radio Australia optimisation, mentioned in the Initial Determinations Paper, but omitted by PAWA Networks from the data provided.

Katherine - Goodall tee, identified as stranded, and the revaluation of Moline line by voltage.

6.11 The effect of these changes, as they would have applied to the Initial Determination, are shown below:

ODV ($M) as at 1 July 1999	February Data	April Data
Darwin	214.048	220.354
Katherine	35.455	35.320

6.12 After examination, the Commission has accepted the revised data provided by PAWA Networks as a basis for the ODV of the network asset base as at 1 July 2000 as follows:

Location	ODV ($M) as at 1 July 2000
Darwin	224.458
Katherine	37.131

Regional energy sales

6.13 The working capital component of the regulated asset base is distributed between the various regions on the basis of energy sales.

6.14 Closer examination of energy amounts by PAWA revealed that the regional energy sales allocation used in the data provided by PAWA for the Initial Determination with respect to the Darwin Region contained the following errors:

- it included consumption at the Union Reef mine, although the energy for the nearby Brocks Creek and Cosmo Howley loads were included in the Katherine Region; and
- it included energy associated with the Woodcutters mine which has since ceased operation.

6.15 The effect of excluding the Woodcutter mine amount and transferring the Union Reef mine amount to Katherine upon the working capital calculation is shown below:

1999-00	February Data			April Data		
	Energy Sales (GWh)	% of Sales	Working Capital ($M)	Energy Sales (GWh)	% of Sales	Working Capital ($M)
Darwin	998.170	64%	5.299	897.275	59%	4.933
Katherine	126.895	8%	0.674	172.313	11%	0.947
All Others	440.401	28%	2.338	441.821	29%	2.429
TOTAL	1,565.466	100%	8.310	1,511.410	100%	8.310

Comparison with initial determination

6.16 The impact of the changes in methodology discussed above, as well as the effect of PAWA's revisions to asset values and energy sales, is illustrated in the Table on the following page.

1999-00	**Darwin**		**Katherine**	
	Initial	**Revised**	**Initial**	**Revised**
Working Capital	**5.140**	**4.933**	**0.654**	**0.947**
ODV	214.048	220.354	35.455	35.320
CAPCON= (CONCUR – AMORT) + CONNEW	10.526		2.768	
CAPCON= (CONCUR – AMORT)		4.194		0.954
ODV –CAPCON	**203.522**	**216.160**	**32.687**	**34.366**
CAPEX	15.237	14.715	4.608	3.369
CONNEW		5.755		0.610
DECOM	0.345	0.345	0.069	0.049
=0.5 * (CAPEX-DECOM) *(1 + ΔPI)$^{-½}$	**7.358**		**2.243**	
=0.5 * (CAPEX-DECOM-CONNEW) *(1 + ΔPI)$^{-½}$		**4.255**		**1.338**
REGULATED CAPITAL BASE	**216.020**	**225.348**	**35.584**	**36.651**
ODV	214.048		35.455	
L_C	14.882		18.244	
ODV – CAPCON		216.160		34.366
Revised L_C		14.477		16.974
DCUR	**14.383**	**14.931**	**1.943**	**2.025**
50% CAPEX	7.619		2.304	
L_N	35.000		35.000	
50% CAPEX – CONNEW		4.480		1.379
Revised L_N		35.000		35.000
DNEW	**0.218**	**0.128**	**0.066**	**0.039**
50% DECOM	0.172	0.173	0.035	0.024
L_D	14.882		18.244	
Revised L_D		14.477		16.974
DDEC	**0.012**	**0.012**	**0.002**	**0.001**
TOTAL DEPRECIATION CHARGE	**14.613**	**15.071**	**2.011**	**2.065**
Regulated Capital Base	216.020	225.348	35.584	36.651
WACC	*7.95%*	*7.95%*	*7.95%*	*7.95%*
Return on Regulated Capital	17.174	17.915	2.829	2.914
Less implied interest on cash	0.246	0.236	0.031	0.045
Return on Capital	16.928	17.679	2.798	2.869
Return of Capital	14.612	15.071	2.011	2.065
Return of Costs	14.322	14.322	3.200	3.200
Maximum Allowable Revenue 1999-00	**45.862**	**47.072**	**8.009**	**8.134**

CHAPTER 7

Rolling Forward the Data

Introduction

7.1 The revenue caps determined by the Commission for 2000-01 also reflect the rolling forward of the data used from 1999-00 to 2000-01.

7.2 In rolling forward the data used to 2000-01, PAWA Networks has gone some way towards addressing the Commission's concerns regarding inadequate documentation canvassed in the Initial Determinations Paper. Accordingly, the following discussion focuses on areas where the Commission has found it necessary to modify the data provided by PAWA Networks or where concerns remain about the data that has had to be used.

Amortisation of capital contributions

7.3 In the Initial Determination, the Commission accepted PAWA's advice that no data was available on the amortisation of capital contributions since 1 July 1998 (AMORT). This is not to say that amortisation of capital contributions was zero, but rather that figures provided by PAWA were for the capital contributions received net of any amount amortised (CAPCON), rather than for the component parts (CONCUR and AMORT).

7.4 However, as allowance for additional contributions over the regulatory period has been incorporated into the formulae for calculation of the regulated asset base, some provision for amortisation of these assets must now also be incorporated. Consistent with assumptions for other components of capital, the Commission has assumed that new assets contributed by persons other than the owners of the business have an average life of 35 years, and have been purchased evenly over the financial year.

7.5 Applying these assumptions and the data provided by PAWA, the Commission has estimated capital contributed to network assets as at 1 July 2000 to be as follows:

2000-01	Darwin $M	Katherine $M	Alice Springs $M	Tennant Creek $M
CONCUR	10.054	1.588	0.020	0.000
AMORT	0.082	0.009	0.000	0.000
CAPCON	**9.972**	**1.579**	**0.020**	**0.000**

Capital expenditure

7.6 The Commission notes that PAWA Networks has not adjusted its capital expenditure estimates for the impact of the GST. On seeking clarification of this matter from PAWA, the Commission was advised that GST adjustment on capital expenditure had not been included due to its marginal significance on the final revenue cap amount. The Commission has accepted PAWA's argument of materiality.

7.7 The Commission has used the following values for capital expenditure in the 2000-01 financial year:

2000-01	Darwin $M	Katherine $M	Alice Springs $M	Tennant Creek $M
Normal Capex	10.188	2.445	3.333	0.380
Plus gifted assets and recoverable works	6.049	0.657	0.192	0.017
CAPEX	**16.237**	**3.102**	**3.525**	**0.397**

Decommissioned assets

7.8 As in the Initial Determination, PAWA again indicated that it did not yet have a firm basis in place for evaluating this figure. The Commission has accepted the following estimates proposed by PAWA:

Location	DECOM ($M)
Darwin	0.342
Katherine	0.049
Alice Springs	0.049
Tennant Creek	0.010

Annual inflation rate

7.9 The capital base calculation requires that estimates of additional capital being employed during the year in question should be expressed in 1 July dollars for the year in question. An expected inflation rate of 2 ½% for 2000-01 (excluding GST effects) has been used by the Commission, in line with general expectations (including in the Commonwealth Budget of 9 May 2000).

Regulated asset base

7.10 Based upon the data provided by PAWA and the adjustments discussed above, the Commission has derived the regulated capital base 2000-01 for each regulated network as follows:

2000-01	**Darwin $M**	**Katherine $M**	**Alice Springs $M**	**Tennant Creek $M**
Working Capital	5.111	0.981	1.057	0.227
plus opening fixed assets	224.458	37.131	41.228	12.675
plus 50% of net new fixed assets in July 2000 $'s	4.744	1.162	1.610	0.183
less capital contributions	9.972	1.579	0.020	0.000
***equals* Regulated Capital Base**	**224.341**	**37.695**	**43.875**	**13.085**

Depreciation charge

7.11 Applying the revised methodology discussed in Chapter 6 and the other rolled-forward data provided by PAWA, the Commission has estimated the depreciation charge in 2000-01 as follows:

2000-01	**Darwin $M**	**Katherine $M**	**Alice Springs $M**	**Tennant Creek $M**
ODV – CAPCON ($M)	214.486	35.551	41.209	12.675
L_C (years)	14.057	15.233	16.077	16.767
DCUR	**15.259**	**2.334**	**2.563**	**0.756**
50% of (CAPEX – CONNEW) ($M)	4.974	1.201	1.654	0.190
L_N (years)	35.000	35.000	35.000	35.000
DNEW	**0.142**	**0.034**	**0.047**	**0.005**
50% of DECOM ($M)	0.171	0.025	0.025	0.005
L_D (years)	14.057	15.233	16.077	16.767
DDEC	**0.012**	**0.002**	**0.002**	**0.000**
TOTAL DEPRECIATION CHARGE	**15.413**	**2.370**	**2.612**	**0.762**

Operating and maintenance costs

7.12 The numbers provided by PAWA Networks for the level of operations, maintenance and administration costs (or "opex" in the Table below) in 2000-01 imply that—GST effects aside—PAWA Networks plans to achieve sizeable improvements in operating efficiency savings in that year.

OPEX ($M) (before GST)	**1999-00**	**2000-01**	**% change**
Darwin	14.322	13.520	-5.60
Katherine	3.200	2.208	-31.00
Alice Springs	4.385	3.723	-15.10
Tennant Creek	0.803	1.258	56.66
Total Regulated Networks	**22.710**	**20.709**	**-8.81**

7.13 While some difference in regional classification between the two years seems also to have an effect, overall an 8.8% reduction in PAWA Networks operating expenditure is planned in 2000-01.

7.14 A target of around 18% operating cost turnaround over a three-year period for the whole of PAWA was set by Government following the 1998 strategic review of PAWA. On the assumption that this target is being applied equally across all business units of the Authority, the above table indicates that PAWA Networks is on track to make its contribution to financial improvement task.

7.15 On this basis, the Commission is prepared to accept this data notwithstanding what it still considers to be inadequate documentation by PAWA of the basis of allocation of common costs both between the various PAWA businesses (water, sewerage, electricity networks, electricity generation, etc) and between the regions of operation.

CHAPTER 8

Revenue Cap Determination

8.1 Based on the financial data provided by PAWA Networks, adjusted as discussed in Chapter 7, the revenue caps applying to PAWA's regulated networks with respect to the 2000-01 financial year are determined as follows:

DRAFT REVENUE CAP DETERMINATION*

$ million	**Darwin**	**Katherine**	**Alice Springs**	**Tennant Creek**
Regulated Asset Base	$219.230	$36.714	$42.818	$12.858
Plus Working Capital	$5.111	$0.981	$1.057	$0.227
Regulated Capital Base	$224.341	$37.695	$43.875	$13.085
Return on Capital	$17.813	$2.993	$3.484	$1.039
Less potential interest income on cash component of Working Capital	$0.245	$0.047	$0.051	$0.011
Return on Capital (net)	$17.568	$2.946	$3.433	$1.028
Plus Return of Capital (Annual Depreciation)	$15.413	$2.370	$2.612	$0.762
Plus Return of Costs (Operations, Maintenance & Administration)	$13.318	$2.175	$3.668	$1.238
Maximum Allowable Revenue 2000-01	**$46.299**	**$7.491**	**$9.713**	**$3.028**

* Exclusions are any revenue related to the Darwin-Katherine Transmission Line and items shown in the Excluded Services Determination for 1 April to 30 June 2000.

Correction and passthrough factors

8.2 The determined revenue caps are fixed in all respects except for:

(1) a correction for any discrepancy between the actual value of capital expenditure and the forecast value used; and

(2) cost passthrough effects on account of the GST and associated tax charges from 1 July 2000.

Under's and over's

8.3 If the actual revenue collected differs from the nominated maximum amount (or cap), the Commission intends to adopt an Under's and Over's Account, similar to that used by the NSW regulator, IPART.

8.4 Any variation between the maximum allowable revenue (MAR), as determined by the Commission, and the actual revenue collected by the network provider is to be monitored in the under's and over's account. The under's and over's account is cumulative from year to year. A notional interest charge, or an interest credit as appropriate, will be applied on the cumulative balance at the end of each financial year. The rate of interest to be applied will be the 3-year Commonwealth Bond rate, as at the first business day of the new financial year, as sourced from the Australian Financial Review.

8.5 The following tolerance margins for variance between MAR and actual revenue will be allowed by the Commission for the 2000-01 financial year:

Tolerance	**Action Required by Network Provider**
less than +/- 4 %	Must notify Commission within 30 days of year end with action plan to resolve balance within the regulatory period.
between +/- 4% and +/- 7 %	Must notify Commission within 30 days of year end with action plan for rectifying the balance at the first subsequent change to network tariffs
over recovery greater than 7%	Must provide a rebate to retailers on the first bill of the subsequent year to reduce the under's and over's account balance to zero.
under recovery of greater than 7%	Under's and over's account will be reduced to under recovery of 7%.

8.6 These tolerances are slightly higher than those currently allowed by other regulators, reflecting the newness of the regulatory regime in the Territory. The Commission will adjust these tolerance levels down over time, to bring them in line with those applying in other jurisdictions.

PART III

X FACTORS,

2001-02 and 2002-03

CHAPTER 9

Methodology

Framework

9.1 To determine the 'X' factors to be used to calculate the revenue caps to apply to the 2001-02 and 2002-03 financial years, the Commission has chosen to exercise the option provided for in paragraph (3) of Schedule 9 to the Code, namely use of a single cost driver related to the quantity of energy transported over the network and allowed revenues per additional unit equal to average per MWh revenues.

9.2 In effect, this formulation involves the use of what is termed a 'revenue [2]. The revenue yield approach involves a cap specifically on a network business's average revenue per unit. The allowed revenue received from each additional unit sold varies with the average tariff. The average revenue is calculated by dividing total revenue by total output measured in kWh. In effect, allowed revenue is a product of the average revenue cap and actual output.

9.3 As there is a systematic link between revenues and costs under the revenue yield approach, the danger of the network provider suffering sustained losses, or making sustained profits, due to changes in output under a 'fixed cap' approach is reduced. The revenue yield approach also avoids the complexities and cost of developing an effective cost tracking formula as required under the 'variable (or hybrid) cap' approach, which is the approach envisaged in paragraph (2) of Schedule 9.

9.4 The Commission considers these advantages to exceed the disadvantages of the revenue yield approach, namely:

- to reduce the profit and volume risks it faces, the regulated network provider may have the incentive to increase volumes, since the cost structures of such organisations typically exhibit reducing average costs as output increases; and
- as all volumes receive the same average revenue cap, there may be an incentive to lower prices for more profitable customers and raise prices for less profitable customers.

[2] See the discussion of the options in IPART, *Regulation of Electricity Network Service Providers –Price Control Issues and Options*, Discussion Paper No. 34, March 1999

9.5 The Commission intends to deal with the former by focussing on trend—not seasonal or short-term—increases in volumes, and with the latter through its regulation of individual network tariffs themselves.

9.6 In particular, the Commission has chosen to apply the following formula:

$$MAR_1 = [MAR_0 + b_0*B_1] * [1 + (CPI_1-X)] \quad \ldots(16)$$

where:

MAR_0 is the revenue cap established by the regulator for the preceding financial year (in $);

b_0 is average price of transporting electricity in the previous year, calculated by dividing the previous year's MAR by the total amount of electricity transported in that year (in cents per KWh);

B_1 is the total amount of *additional* electricity which it is forecast (on a trend basis) will be transported by the network provider over the network during financial year compared with the amount transported in the previous year (in KWh);

CPI_1 is the forecast annual percentage change in the consumer price index for the year in question; and

X is the adjustment factor (as a percentage) determined by the regulator at the beginning of the regulatory control period in accordance with Schedule 10.

Calculating the 'X' factor

9.7 Consistent with recent work in other jurisdictions, the 'CPI–X' component that has been determined for 2001-02 and 2002-03 does not represent the impact solely of efficiency gains. As noted by IPART[3] :

> *"The 'CPI – X' factor is used to achieve the desired revenue path, resulting in end-year revenues consistent with the building block/pricing and financial analysis/glide path outcomes. The building block components are indexed and the efficiency gains are built into the operating and maintenance expenditure."*

9.8 Accordingly, the Commission has used the building block approach to calculate a notional cap for each of the subsequent financial years in the regulatory period, and then a value for 'X' has been derived based upon those MAR values.

9.9 Re-expressing equation (16) above so that 'X' is the subject, gives the following:

[3] Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Determination and Rules Under the National Electricity Code*, December 1999, pp. 13

$$X = 1 + CPI_1 - [MAR_1 / [MAR_0 + b_0 * B_1]] \quad \ldots(17)$$

where:

CPI_1 is the forecast annual percentage change in the consumer price index for the year in question;

MAR_1 is the revenue cap calculated for the financial year in question using the building block methodology;

MAR_0 is the revenue cap established by the regulator for the preceding financial year (in $);

b_0 is average price of transporting the electricity in the previous year, calculated by dividing the previous year's MAR by the total amount of electricity transported in that year (in cents per KWh); and

B_1 is the total amount of additional electricity which it is forecast will be transported by the network provider (on a trend basis) over the network during financial year compared with the amount transported in the previous year (in KWh).

9.10 Estimating values for X requires estimates of MAR_0, MAR_1, CPI_1, B_1 and b_0. These requirements are discussed in Chapter 10.

CHAPTER

10

Measuring the X Factor

Maximum allowable revenue

10.1 Except as noted below, the data used to calculate notional Maximum Allowable Revenues (MAR) for the out-years are consistent with those applied when calculating the 2000-01 revenue cap.

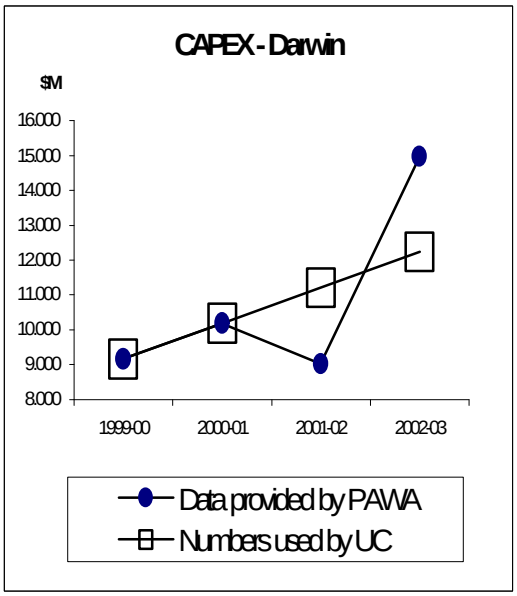
Capital expenditure

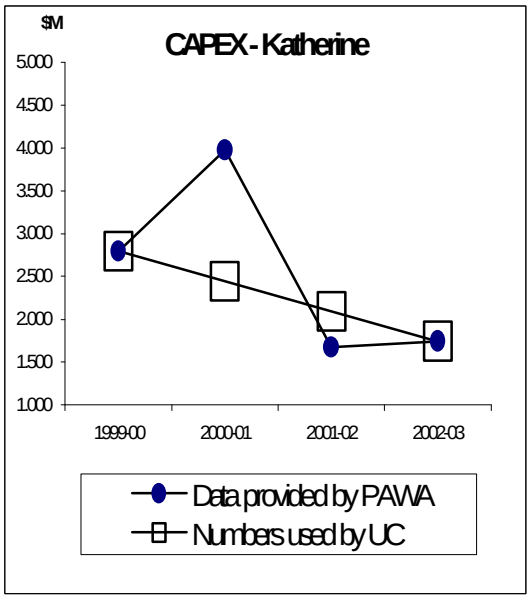
10.2 Comparison of the data provided by PAWA Networks with respect to expenditure in 1999-00 prior to the Initial Determination with the data provided for the same year for the purpose of the determination of the 2000-01 revenue cap indicates a significant shortfall in capital expenditure against the planned amount.

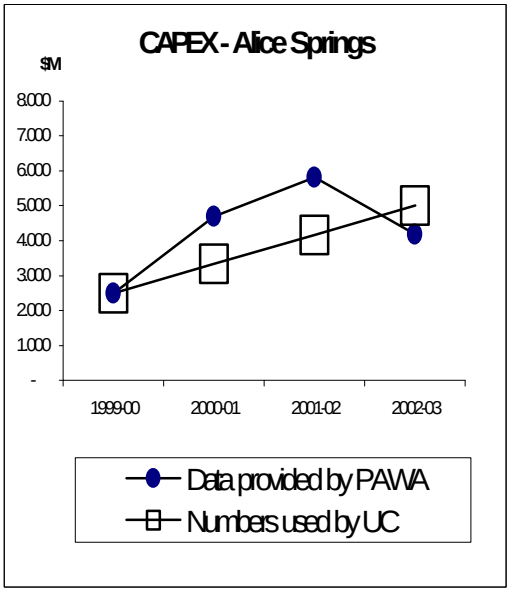
CAPEX ($M) 1999-00	February estimate	April estimate
Darwin	15.237	14.715
Katherine	4.608	3.369
Alice Springs	n.a.	2.500
Tennant Creek	n.a.	1.200

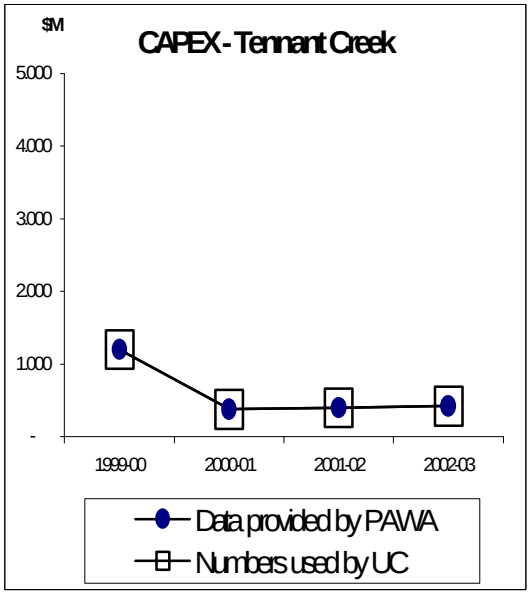
10.3 Planned capital expenditure in the future years of the regulatory period also displays a degree of 'lumpiness'.

10.4 Accordingly, the Commission has chosen to apply a smoothed path over the regulatory period to the component of capital expenditure attributable to PAWA Networks (ie the proportion of capital expenditure which will not be recovered in the form of gifted assets or recoverable works). The smoothing applied by the Commission is illustrated in the charts below. Actual variations around the smoothed trend will be recognised by the Commission as a possible basis for a reset of the determined 'X' factors (see Chapter 11).









Operations and maintenance costs

10.5 While the operating cost data provided by PAWA Networks for 2000-01 implies sizeable efficiency gains in that year (the second of three years in which PAWA as a whole is striving to meet an efficiency improvement target set by the Government), the data provided for 2001-02 and 2002-03 imply a return to increasing costs. While such cost increases may reflect activity and input price increases in the years in question, these factors are assumed to exceed any productivity gains that may still be either possible against benchmarks or required to achieve the Government's three-year efficiency target.

10.6 PAWA Networks has not provided sufficient justification for this upward trend. In the circumstances, the Commission has only allowed recovery of operations, maintenance and administration costs in the 2001-02 and 2002-03 financial years equal to the estimated 2000-01 dollar value.

Summary

10.7 The notional MAR for each year, taking into account the above adjustments to the data provided by PAWA Networks, has been calculated using the building block approach as follows:

2001-02	**Darwin**	**Katherine**	**Alice Springs**	**Tennant Creek**
Working Capital	**5.278**	**1.014**	**1.092**	**0.235**
ODV	229.383	38.572	43.059	12.600
CAPCON= (CONCUR – AMORT)	16.252	2.291	0.234	0.017
ODV – CAPCON	**213.130**	**36.281**	**42.825**	**12.582**
CAPEX	17.311	2.762	4.368	0.417
CONNEW	6.337	0.707	0.226	0.018
DECOM	0.342	0.049	0.049	0.010
=0.5 * (CAPEX-DECOM-CONNEW)	5.316	1.002	2.047	0.195
Adjusted to 1 July 2001 $'s	**5.251**	**0.990**	**2.021**	**0.192**
REGULATED CAPITAL BASE	**223.659**	**38.285**	**45.939**	**13.010**
ODV –CAPCON	213.130	36.281	42.825	12.582
L_C	13.656	14.937	15.805	16.046
DCUR	**15.607**	**2.429**	**2.710**	**0.784**
50% CAPEX – CONNEW	5.487	1.027	2.071	0.200
L_N	35.000	35.000	35.000	35.000
DNEW	**0.157**	**0.029**	**0.059**	**0.006**
50% DECOM	0.171	0.025	0.025	0.005
L_D	13.656	14.937	15.805	16.046
DDEC	**0.013**	**0.002**	**0.002**	**0.000**
TOTAL DEPRECIATION CHARGE	**15.776**	**2.460**	**2.770**	**0.790**
Regulated Capital Base	223.659	38.285	45.939	13.010
WACC	*7.94%*	*7.94%*	*7.94%*	*7.94%*
Return on Regulated Capital	17.759	3.040	3.648	1.033
Less implied interest on cash	0.253	0.049	0.052	0.011
Return on Capital	17.506	2.991	3.596	1.022
Return of Capital	15.776	2.460	2.770	0.790
Return of Costs	13.318	2.175	3.668	1.238

Maximum Allowable Revenue 2001-02	**46.600**	**7.626**	**10.034**	**3.050**

2002-03	Darwin	Katherine	Alice Springs	Tennant Creek
Working Capital	**5.446**	**1.046**	**1.126**	**0.424**
ODV	234.639	39.564	45.603	12.512
CAPCON= (CONCUR – AMORT)	22.548	3.006	0.456	0.035
ODV – CAPCON	**212.091**	**36.558**	**45.147**	**12.477**
CAPEX	18.343	2.412	5.202	0.439
CONNEW	6.343	0.708	0.227	0.018
DECOM	0.342	0.049	0.049	0.010
=0.5 * (CAPEX-DECOM-CONNEW)	5.829	0.828	2.463	0.206
Adjusted to 1 July 2002 $'s	**5.757**	**0.181**	**2.433**	**0.203**
REGULATED CAPITAL BASE	**223.294**	**38.422**	**48.706**	**12.922**
ODV –CAPCON	212.091	36.558	45.147	12.477
L_C	13.274	14.541	15.658	15.337
DCUR	**15.978**	**2.514**	**2.883**	**0.813**
50% CAPEX – CONNEW	6.000	0.853	2.488	0.211
L_N	35.000	35.000	35.000	35.000
DNEW	**0.171**	**0.024**	**0.071**	**0.006**
50% DECOM	0.171	0.025	0.025	0.005
L_D	13.274	14.541	15.658	15.337
DDEC	**0.013**	**0.002**	**0.002**	**0.000**
TOTAL DEPRECIATION CHARGE	**16.163**	**2.540**	**2.956**	**0.820**
Regulated Capital Base	223.294	38.422	48.706	12.922
WACC	*7.94%*	*7.94%*	*7.94%*	*7.94%*
Return on Regulated Capital	17.730	3.051	3.867	1.026
Less implied interest on cash	0.261	0.050	0.054	0.012
Return on Capital	17.469	3.001	3.813	1.014
Return of Capital	16.163	2.540	2.956	0.820
Return of Costs	13.318	2.175	3.668	1.238
Maximum Allowable Revenue 2002-03	**46.949**	**7.716**	**10.437**	**3.072**

Rate of general price increases (CPI_1)

10.8 2 ½% per annum has been used for each of the out-years, in line with general expectations (including in the Commonwealth Budget of 9 May 2000).

Expected additional energy sales (B_1)

10.9 In its submission, PAWA Networks used a general forecast of 2.0% growth in energy sales across all regulated networks.

10.10 The Commission considers it more appropriate to apply a region-specific sales growth factor to each network. Following analysis by the Commission of recent sales experience on a region-by-region basis, a growth factor of 2.5% has been applied to each of Darwin and Katherine, 0.5% to Alice Springs, and zero to Tennant Creek.

10.11 Using the energy sales for the 1999-00 financial year provided by PAWA as a base, including adjustments as detailed in the discussion of working capital in Chapter 6 above, energy sales have been projected as follows:

Expected Total Energy Sales (GWh)	**Darwin**	**Katherine**	**Alice Springs**	**Tennant Creek**
1999-00	897.275	172.313	185.573	39.883
2000-01	919.707	176.621	186.501	39.883
2001-02	942.700	181.036	187.433	39.883
2002-03	966.267	185.562	188.371	39.883
(B_1)				
2001-02	22.993	4.416	0.933	0.000
2002-03	23.567	4.526	0.937	0.000

Average network charge (b_0)

10.12 As required, the average charge has been calculated by dividing the previous year's MAR by the total amount of electricity transported in that year (as estimated on the adjusted basis just described).

(b_0)	**Darwin**	**Katherine**	**Alice Springs**	**Tennant Creek**
2001-02	5.03	4.24	5.21	7.59
2002-03	4.94	4.21	5.35	7.65

Annual 'X' factors

10.13 Equation (17) can be applied to each year's data, thereby deriving a value of X for each year. The results are as follows:

Darwin	**2001-02**	**2002-03**
MAR previous year (MAR_0)	46.299	46.600
Value of additional energy sales (B_1*b_0)	1.157	1.165
New Base MAR ($MAR_0 + B_1*b_0$)	**47.456**	**47.765**
MAR as per building block approach (MAR_1)	46.600	46.949
1 + CPI	1.025	1.025
MAR_1 / $MAR_0 + b_0*B_1$	0.982	0.983
X Factor	**4.30%**	**4.21%**

Katherine	**2001-02**	**2002-03**
MAR previous year (MAR_0)	7.491	7.626
Value of additional energy sales (B_1*b_0)	0.187	0.191
New Base MAR ($MAR_0 + B_1*b_0$)	**7.678**	**7.817**
MAR as per building block approach (MAR_1)	7.626	7.716
1 + CPI	1.025	1.025
MAR_1 / $MAR_0 + b_0*B_1$	0.993	0.987
X Factor	**3.18%**	**3.79%**

Tennant Creek	**2001-02**	**2002-03**
MAR previous year (MAR_0)	3.028	3.050
Value of additional energy sales (B_1*b_0)	0.000	0.000
New Base MAR ($MAR_0 + B_1*b_0$)	**3.028**	**3.050**
MAR as per building block approach (MAR_1)	3.050	3.072
1 + CPI	1.025	1.025
MAR_1 / $MAR_0 + b_0*B_1$	1.007	1.007
X Factor	**1.77%**	**1.78%**

Alice Springs	**2001-02**	**2002-03**
MAR previous year (MAR_0)	9.713	10.034
Value of additional energy sales (B_1*b_0)	0.049	0.050
New Base MAR ($MAR_0 + B_1*b_0$)	**9.762**	**10.084**
MAR as per building block approach (MAR_1)	10.034	10.437
1 + CPI	1.025	1.025
MAR_1 / $MAR_0 + b_0*B_1$	1.028	1.035
X Factor	**-0.29%**	**-1.00%**

Darwin	4.26%
Katherine	3.48%
Alice Springs	-0.65%
Tennant Creek	1.77%

CHAPTER 11

Determination of 'X' Factors

11.1 Based on the above methodology and rounding to one decimal place, the 'X' factors to apply in 2001-02 and 2002-03 to PAWA's regulated networks are determined as follows:

DRAFT 'X' FACTOR DETERMINATION	
	'X'
Darwin	4.3%
Katherine	3.5%
Alice Springs	-0.7%
Tennant Creek	1.8%

Contingent factors

11.2 At least 90 days before the commencement of each financial year, PAWA Networks is to submit to the Commission for endorsement its estimate of each network's revenue cap for the coming financial year derived by applying the determined 'X' factors to equation (16).

11.3 In the 60 days before PAWA Networks submits its estimates of the next financial year's revenue caps, the Commission will consider resetting the 'X' factors to be used for this purpose on application by PAWA Networks only if, for an individual network:

(1) PAWA Networks planned capital expenditure in the relevant financial year is expected to be outside a limit of plus or minus 10% of the amount used by the Commission to estimate the determined 'X' factors; and

(2) the expected annual energy sales growth factor underlying the calculation of the determined 'X' factors diverges by more than one percentage point from the values used by the Commission.

11.4 Such a reset will only take place:

(1) after the Commission has had the opportunity to examine PAWA Networks' capital expenditure plans and satisfied itself that the expected capital over- or under-spend is warranted; and

(2) the Commission is satisfied that the energy sales rate growth variations are due to trend variations in the amount of electricity transported (that is, seasonal variations will not be taken into consideration, with only underlying (and on-going) differences being considered).