



Northern Territory Government

**OFFICE OF THE
INTERIM UTILITIES COMMISSIONER**

**CALCULATING PAWA's INITIAL
NETWORK REVENUE CAPS**

Discussion Paper

January 2000

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Definitions

"Access Code"	means Electricity Networks (Third Party Access) Code attached as a schedule to the Electricity Networks (Third Party Access) Bill 1999
"Commission"	means the Utilities Commission to be formed in accordance with the Utilities Commission Bill 1999 when that Bill becomes law
"Interim Commissioner"	means the person appointed by the Treasurer to fulfil the role of the regulator under the Access Code until such time as the Commission is formally established
"Network User"	means any person who has been granted access to the electricity network by PAWA Networks in order to transport electrical energy to or from a particular point
"Regulatory Minister"	means the Minister of the Northern Territory Government responsible for Part 3 of the Electricity Reform Bill 1999
"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****PURPOSE OF DISCUSSION PAPER****Introduction**

1.1 Clause 69 of the Access Code requires that the revenue cap to apply during any part year preceding the first full year of a regulatory control period is to be calculated using the methodology set out in Schedule 6 to the Access Code.

1.2 This Discussion Paper identifies the main issues to be addressed in applying Schedule 6, and seeks comments on the main options. To assist interested parties, each chapter from Chapter 4 onwards concludes with a list of issues on which comments are invited. These lists are provided for guidance only, and interested parties should not feel limited to commenting only on the nominated issues.

Provisional nature of conclusions

1.3 To assist interested parties, a preliminary indication is provided of the Interim Commissioner's preferred treatment with regard to each of the issues identified. The focus of the paper is therefore on identifying options and indicating initial preferences, in order to seek the views of interested parties prior to a final determination being made.

1.4 The contents of this Discussion Paper are also 'provisional' in the sense that it is assumed that the Access Code will remain as currently drafted.¹ Amendments to the Access Code as a result of negotiations between the Government and the National Competition Council—to ensure that the Access Code is certified as 'effective' under Part IIIA of the Commonwealth *Trade Practices Act 1974*—may require consequential amendments to the proposals and conclusions contained in this Discussion Paper.

Role of Interim Commissioner

1.5 Under the regulatory arrangements envisaged by the Government, the Commission is to be assigned the role of the regulator under the Access Code.

1.6 It is recognised that the period between formal establishment of the Commission (expected in early March) and 1 April will be insufficient for all processes to be gone through from scratch and still ensure commencement of competition on time. An Interim

¹ In following the Access Code, this Discussion Paper makes allowance for certain (minor) technical amendments that will be necessary to the Code to correct certain typographical and cross-reference errors.

Commissioner has therefore been appointed to undertake the duties envisaged for the regulator under the Access Code prior to establishment of the Commission. Also, the Treasurer has announced that the Government considers the policy intent of the Code to be in operation from the date of the introduction of the enabling legislation into the Legislative Assembly (on 25 November 1999).

1.7 With respect to the network cap determination function of the regulator under the Access Code, the Interim Commissioner's role will be to progress determination of the revenue cap (and the consequent setting of network tariffs) with the involvement of all interested parties such that matters are sufficiently progressed by the time the Commission is formally established to ensure commencement of competition as required by the Government on 1 April 2000.

1.8 Against this background, the Interim Commissioner has advised both PAWA Networks and potential network users of the following indicative timetable with regard to determining network revenue caps:

Due week beginning Monday	Event
10/1/00	Interim Commissioner to issue a discussion paper on 'Determining Network Revenue Caps' to all registered 'potential new suppliers' and to PAWA; the paper will include a draft determination of the weighted-average cost of capital (WACC)
7/2/00	deadline for submissions from interested parties on issues raised in the 'Revenue Caps' discussion paper (and draft 'Parameters' determination)
14/2/00	possible roundtable to discuss nominated network revenue cap issues, open to those making submissions
21/2/00	Interim Commissioner to issue a 'Network Revenue Caps' Determination

Submissions and possible roundtable

1.9 Submissions on matters raised by this Discussion Paper are to be lodged with the Office of the Interim Utilities Commissioner by 4pm, Friday, 11 February 2000.

1.10 Submission should be provided both in hard copy and electronic form. If any information provided in a submission is considered to be commercial-in-confidence, an edited electronic version of the submission, excising such commercial-in-confidence information, should also be provided. All submissions received will be loaded onto the Utilities Commission's website on Monday, 14 February.

1.11 Depending upon the responses received, and the issues raised, a roundtable might be held on the afternoon of Friday, 18 February. If the Interim Commissioner decides that it is appropriate to hold a roundtable in the circumstances (or if he decides otherwise), interested parties will be advised of details on Monday, 14 February.

CHAPTER**2****SCOPE OF THIS PAPER****Requirements of Code regarding initial revenue caps**

2.1 Clause 66(1) of the Access Code makes the regulator responsible for determining the annual revenue cap to apply to a network covered by this Code. Furthermore, clause 69(3) requires that the values of the key parameters used for the purpose of determining the revenue cap themselves are to be determined by the regulator at least 90 days before the commencement of the first full financial year in each regulatory control period. No timing is stated with regard to determining these parameters with respect to any initial part year such as the 1 April to 30 June 2000 period.

2.2 Clause 15(1) of the Electricity Networks (Third Party Access) Bill 1999 requires that, before making a determination required by the Access Code, the regulator must give a draft determination to the parties affected and may take into account representations that any of them make on the proposed determination.

2.3 This Discussion Paper is intended solely to satisfy the requirement that determinations be the subject to consultation prior to any final determination. In particular, this Discussion Paper relates solely to determinations with regard network revenue caps and the associated parameters to be used in determining the revenue caps.

2.4 As such, this Discussion Paper does not nominate a \$ million amount for the revenue cap itself, but instead only canvasses the key determinants of the cap. The timetable envisaged for finally determining the \$ million figure for PAWA Network's revenue cap for the period 1 April to 30 June 2000 was set out in Chapter 1.

Matters to be dealt with separately and later

2.5 Against this background, interested parties should note that certain 'pricing' matters are not dealt with here (and are to be dealt with separately and later). The key access pricing matters subject to the determination or approval of the regulator under the Access Code which are not dealt with in this paper are as follows:

- (a) the determination of the X factor(s) to be used for the CPI-X adjustments to the revenue cap commencing with effect from 1 July 2001—this matter will be a major part of the Commission's work program during 2000-01;
- (b) the approval of the actual reference network tariffs to be charged by PAWA Networks (in accordance with Chapter 7 of the Access Code)—this will be dealt with according

to the following timetable, subject to the pre-requisite determination of the revenue cap:

Due week beginning Monday	Event
21/2/00	Interim Commissioner to issue a provisional approval of PAWA Network's "Network Pricing Principles" statement
6/3/00	deadline for Commission approval of PAWA Network's reference network tariffs and charges to apply between 1 April and 30 June 2000
6/3/00	publication of PAWA Network's approved reference network tariffs and charges to apply between 1 April and 30 June 2000

- (c) the approval of out-of-balance energy charges to be applied by PAWA Generation (in accordance with Chapter 9 of the Access Code)—this matter will be dealt with by the Interim Commissioner and subsequently by the Commission on the following timetable:

Due week beginning Monday	Event
6/3/00	deadline for Commission approval of PAWA Generation's posted out-of-balance energy prices to apply between 1 April and 30 June 2000
6/3/00	publication of PAWA Generation's approved out-of-balance energy prices to apply between 1 April and 30 June 2000

- (d) the approval of system control charges (in accordance with clause 39 of the Electricity Reform Bill 1999)—this matter will be dealt with at the same time as consideration and approval of the out-of-balance energy prices.

CHAPTER

3

ROLE OF COMMISSION IN SETTING REVENUE CAPS

Measuring a revenue cap

3.1 Under the Access Code, a revenue cap is required for each geographically distinct network operated by the network providers covered by the Code. Initially, the Access Code only applies to the networks operated by PAWA Networks.

3.2 Schedule 6 of the Code requires the regulator to determine the revenue cap (CAP) for a financial year as follows:

$$\text{CAP} = (\text{CAPITAL} * \text{WACC}) + \text{DEP} + \text{OMA} \quad \dots(1)$$

where:

CAPITAL= the network's capital base (\$M);

WACC = the pre-tax weighted-average cost of capital (%);

DEP = the expected depreciation charge for the financial year on the network's assets (\$M); and

OMA = the expected operations, maintenance and administration expenditure for the financial year by the network business.

3.3 The regulator is directly responsible for determining the WACC. The other values are to be determined from data supplied to the regulator by PAWA Networks.

General requirements of the Code

3.4 In applying the formulation in equation (1), the regulator is guided by specific requirements of the Access Code as set out in Chapter 6 and in Schedules 6 and 8, and—where choices or judgments have to be made—by the objectives set out in clause 63:

"Price regulation under this Part of the Code must be administered to achieve the following outcomes –

(a) *an efficient and cost-effective regulatory environment;*

(b) *an incentive-based regulatory regime which:*

(i) *provides an equitable allocation between network users and network providers of efficiency gains achieved by the network providers; and*

- (ii) *fosters efficient operating and maintenance practices within the network sector, efficient use of existing infrastructure and an efficient level of investment within the network itself, and upstream and downstream of the network;*
- (c) *prevention of monopoly rent extraction by network providers;*
- (d) *promotion of competition in upstream and downstream markets and promotion of competition in the provision of network services where economically feasible;*
- (e) *regulatory accountability through transparency and public disclosure of regulatory processes and the basis of regulatory decisions;*
- (f) *reasonable certainty and consistency over time of the outcomes of regulatory processes; and*
- (g) *an acceptable balancing of the interests of network providers, network users and the public interest."*

3.5 Also, clause 7(2) of the Utilities Commission Bill, requires the Commission, in performing any of its functions, to have regard to the need –

- "(a) to promote competitive and fair market conduct;*
- (b) to prevent misuse of monopoly or market power;*
- (c) to facilitate entry into relevant markets;*
- (d) to promote economic efficiency;*
- (e) to ensure consumers benefit from competition and efficiency;*
- (f) to protect the interests of consumers with respect to reliability and quality of services and supply in regulated industries;*
- (g) to facilitate maintenance of the financial viability of regulated industries; and*
- (h) to ensure an appropriate rate of return on government assets."*

CHAPTER

4

SPECIAL REQUIREMENTS FOR THE 'INITIAL YEAR'

4.1 The revenue cap required prior to commencement of access to PAWA's networks relates to the period 1 April to 30 June 2000. This three month period gives rise to a number of issues.

Proposed approach

4.2 The revenue cap for the period 1 April to 30 June 2000 ($CAP_{APR-JUNE}$) needs to be calculated by using an appropriate proportion of an annual revenue cap. The following general formulation is proposed:

$$CAP_{APR-JUNE} = CAP_{FULL\ YR} * Q * P \quad \dots(2)$$

where:

$CAP_{FULL\ YR}$ = revenue cap for a full financial year

Q = apportionment factor; and

P = price adjustment factor.

Full year cap

4.3 There are two options available for deriving the annual cap ($CAP_{FULL\ YR}$):

- (a) directly derive an annual revenue cap using 1999-00 financial year data; or
- (b) derive the annual cap to apply in 2000-01 (the first full financial year), and then adjust ('backcast') that annual cap onto an appropriate 1999-00 basis.

4.4 To apply (b) would require application of the following formula:

$$CAP_{99-00} = CAP_{00-01} * (1 - \Delta PI - \Delta GST) \quad \dots(3)$$

where:

CAP_{00-01} = annual revenue cap applying to the 2000-01 financial year, derived by applying information directly relevant to that year to equation (1);

ΔPI = the percentage² increase in the an appropriate price index (PI) expected between 1999-00 and 2000-01; and

ΔGST = the percentage net increase in PAWA's average network tariffs expected between 1999-00 and 2000-01 purely on account of introduction of the GST from 1 July 2000.

4.5 The formulation in equation (3) makes no allowance for efficiency improvements. Effectively, this involves assuming 2000-01 efficiency levels are also achieved in 1999-00. The Interim Commissioner does not consider this to be a material issue given the short period (three months) involved.

4.6 The Interim Commissioner's preference is to use the approach suggested in (b) of para 4.3. The advantages of this approach include:

- (a) in the abbreviated time available until a determination is required for the revenue cap to apply in 2000-01 (required by 1 May 2000), it would allow all parties to focus on the relevant financial data for a single year (that is, 2000-01); and
- (b) it would reduce the scope for any 'price shock' between the two years in question, and so ensure a relatively stable base in the first 15 months of the new access arrangements.

4.7 The Interim Commissioner proposes to measure the expected annual inflation rate (ΔPI) in equation (3) by using the lower of Westpac's and NAB's June to June forecasts of CPI inflation abstracting from direct (first round) GST effects.

4.8 The GST adjustment factor (ΔGST) in equation (3) is a factor which PAWA is required to provide, based upon a generally accepted methodology and subject to audit by the Commission.

4.9 The apportionment factor (Q) and the price adjustment factor (P) in equation (1) would be dependent upon the method used to measure the annual cap (CAP_{FULLYR}).

Apportionment factor

4.10 The apportionment factor (Q) could be determined by either:

- (a) the number of days in the 1 April to 30 June period (91) as a percentage of the number of days in the full year in question; or
- (b) the quantity of electricity expected to be transported over the networks in the 1 April to 30 June period as a proportion of the quantity expected to be transported during the (relevant) year as a whole.

4.11 The Interim Commissioner's preference is to use (b), as this would allow for different levels of network activity between the two years in question.

Price adjustment factor

4.12 The Interim Commissioner proposes to measure the price adjustment factor (P) by the ratio between the April 2000 and June CPI index numbers as forecast by the same

² In applying equation (3), and in all following equations, the values of all variables specified as percentages are substituted into the equation in the form of a fraction (base of 1) rather than a true percentage (base of 100).

forecaster as relied upon for measuring the expected annual inflation rate in the case of equation (2).

Geographically distinct networks

4.13 The Code applies in principle to PAWA Network's four main distribution networks from 1 April 2000, namely:

- (a) Darwin;
- (b) Katherine;
- (c) Tennant Creek; and
- (d) Alice Springs.

4.14 Revenue caps are only required for geographically-distinct networks. Such a network can be defined as a directly inter-connected network system and connection assets under single ownership and operation.

4.15 The issues arising here are two-fold:

- (a) whether the Darwin and Katherine distribution systems are truly separate (and so require separate revenue caps (and separate pricing schedules)) or whether they should be treated as being inter-connected (sharing some common costs) justifying a joint revenue cap (and a joint pricing schedule); and
- (b) whether there are any genuinely contestable customers requiring access to the smaller networks on 1 April 2000 (if not, there would be no use for a revenue cap for these networks).

Darwin-Katherine

4.16 The Interim Commissioner proposes to treat Darwin and Katherine as separate networks for the revenue cap exercise, which would result in all relevant costs being allocated either to the Darwin network or to the Katherine network.

Smaller networks

4.17 The Interim Commissioner proposes to only determine a revenue cap for a network where both:

- (a) there are identifiable customers connected to the network who are reasonably expected to become contestable during the year in question; and
- (b) licenced third-party generators and/or retailers foreshadow to the Commission their intention to enter into negotiations with those contestable customers.

4.18 Unless requested otherwise by licenced third-party generators and/or retailers, or those intending to become licenced, the Interim Commissioner proposes only to determine April to June 2000 revenue caps for PAWA's Darwin and Katherine networks.

Issues for comment

4.19 The Interim Commissioner seeks comments on:

- A. the proposal to base the 1999-00 revenue cap on a revenue cap derived using 2000-01 data, with the 2000-01 cap so derived then being adjusted back onto an appropriate 1999-00 basis;
- B. the use of the lower of Westpac's and NAB's latest forecasts of underlying (direct GST effects excluded) CPI inflation as a measure of expected inflation between 1999-00 and 2000-01;
- C. the use of electricity transported (in kWh) to derive the apportionment factor in equation (1);
- D. the treatment of Darwin and Katherine networks as separate for the purposes of determining revenue caps; and
- E. the proposal to determine revenue caps applying to the April-June 2000 period only for the Darwin and Katherine networks operated by PAWA Networks.

CHAPTER**5****NETWORK SERVICES INCLUDED IN THE CAP**

5.1 Clause 72(1) of the Code recognises that certain costs and services may be excluded from the revenue cap arrangements (to be recovered separately by unregulated prices or charges).

5.2 Excluding specified services from the revenue cap will require consequential adjustments to the data used to estimate the revenue cap, specifically with regard to:

- (a) fixed assets; and
- (b) operating costs.

Proposed approach

5.3 To minimise adjustments necessary to the data, the Interim Commissioner proposes to limit the services excluded to the following:

- (a) services (including metering, electric lines or electric plant) for the specific benefit of any third party (and requested by the third party) and not made available by PAWA Networks as a normal part of standard services to all customers including –
 - charges for moving mains, services or meters forming part of PAWA's network system to accommodate extension, re-design or re-development of any premises; and
 - the provision of electric plant for the specific purpose of enabling the provision of standby supplies or sales of electricity;
- (b) the provision of connection equipment to a standard in excess of a standard associated with the "least overall cost, technically acceptable" assets; and
- (c) power system (but not network system) control costs directly associated with the activities of a system controller licenced under the Electricity Reform Bill 1999.

Issues for comment

5.4 The Interim Commissioner seeks comments on:

- A. the proposal to limit excluded network services to those listed in para 5.3 above.

CHAPTER

6

WEIGHTED-AVERAGE COST OF CAPITAL

Proposed approach

6.1 In line with para. 11(1) of Schedule 8 to the Access Code, a real-terms WACC is required as a basis for measuring the allowed rate of return. As evident in Chapter 7 of this Discussion Paper, the capital base to which the allowed rate of return is applied is subject to periodic revaluation including for the effects of price increases.

6.2 In accordance with Schedule 8 to the Access Code, the *real* pre-tax weighted-average cost of capital ($WACC_r$) is to be calculated using the following formula:

$$WACC_r = \{(1 + WACC_n)/(1 + \Delta PI)\} - 1 \quad \dots(4)$$

where:

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

ΔPI = expected annual inflation rate (%).

6.3 As also specified in Schedule 8, the *nominal* pre-tax weighted-average cost of capital is to be calculated using the following formula:³

$$WACC_n = [R_e / (1 - T * (1 - G))] * (1 - D/C) + (R_d * D/C) \quad \dots(5)$$

where:

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

T = the effective 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.

³ The use of equation (5) is specified in the Access Code, and is in general use among interstate regulators. For further background on the conceptual and measurement issues associated with this equation, interested parties are referred to the following material published by IPART and the ACCC:

Independent Pricing and Regulatory Tribunal of New South Wales (IPART), *Pricing for Electricity Networks and Retail Supply*, June 1999, Attachment 3, pp. 201-219

Australian Competition and Consumer Commission (ACCC), *Draft Decision: NSW and ACT Transmission Network Revenue Caps 1999/00 – 2003/04*, May 1999, pp. 10-25

6.4 Schedule 8 defines R_e and R_d as follows:

$$R_e = R_f + (\beta_e * ERP) \quad \dots(6)$$

where:

R_f = risk-free rate of return on capital;

β_e = equity beta; and

ERP = equity risk premium

and

$$R_d = R_f + DRP \quad \dots(7)$$

where:

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

DRP = debt risk premium.

6.5 Schedule 8 does not propose a specific formulation for β_e , the equity beta term. Of the choices available, it is proposed that the following be used:⁴

$$\beta_e = \beta_a * [1 + (1 - T * (1 - G)) * D/E] \quad \dots(8)$$

where:

β_a = asset beta;

T = the effective tax rate;

G = the imputation factor; and

D/E = the debt-to-equity ratio, which is equal to the debt-to-capital ratio (D/C) expressed as a ratio of the equity-to-capital ratio ($= 1 - D/C$).

6.6 From the above, the parameters required to determine the WACC are as follows:

economy-wide parameters:

R_f = risk-free rate of return on capital;

ERP = equity risk premium;

ΔPI = expected annual inflation rate;

'specific' parameters:

β_a = asset beta;

D/C = debt-to-capital ratio;

T = effective tax rate;

G = imputation factor; and

DRP = debt risk premium.

⁴ Based on the Steering Committee on National Performance Monitoring of Government Trading Enterprises, *An Economic Framework for Assessing the Financial Performance of Government Trading Enterprises*, July 1996, p.105.

6.7 Under the Access Code, it is the Commission's role to determine each of these values and so the value of the WACC parameter.

Measuring the economy-wide components

Risk-free rate of return on capital

6.8 Two sets of issues need to be addressed in measuring the risk-free rate of return, namely:

- (a) the choice of the benchmark bond; and
- (b) the method of averaging.

Benchmark bond

6.9 There are two main options for selecting the bond that most closely approximates a risk-free investment:

- (a) a 10 year Commonwealth Government bond, the choice apparent in most recent regulatory decisions; or
- (b) a 5 year Commonwealth bond, on the basis that it corresponds more closely to the length of a typical regulatory review period.

6.10 The Interim Commissioner's preference is to use the rate on a 10 year Commonwealth Government bond, including because most estimates of the equity risk premium (see below) are based on use of bonds of this maturity and there is little difference between the real-term 5 and 10 year bond rates.

Method of averaging

6.11 Also at issue is the extent to which the bond rate should be averaged to reduce excessive short term volatility. The options available range from:

- (a) a relatively short period to smooth daily variations (IPART recently used the average rate for a 20 day trading period while the ACCC recently used a 40 day period); and
- (b) a medium-term period of up to 12 months.

6.12 The Interim Commissioner's preference is average the 10 year Commonwealth bond rate over the 30 trading days period prior to the date of the determination, broadly in line with the approach generally followed by regulators elsewhere in Australia.

Equity risk premium

6.13 The equity risk premium (ERP), often referred to as the 'market risk premium', is the difference between the expected return on a market portfolio and the return on a risk-free asset.

6.14 An extensive review of the empirical estimates of the ERP was provided in a recent report by IPART.⁵ While independent experts have tended to advocate use of premia in the range of 5-7% with a median of 6%, estimates used by interstate regulators in recent pricing decisions have fallen in the 5.0% to 6.0% band.

⁵ June 1999, pp. 206-208

6.15 The Interim Commissioner proposes to use a figure of 5.5%, on the basis that this is the median figure typically applied recently by interstate regulators.

Expected inflation

6.16 Two different types of approach are apparent when it comes to measuring expected inflation:

- (a) the difference in yields on nominal and indexed 10 year Commonwealth bonds, being an indicator of the market's assessment of inflation expected over the relevant period.⁶ IPART and ACCC derive inflation expectations on this basis; and
- (b) the use of an average of key private and public forecasts.

6.17 The Interim Commissioner's preference is to follow the approach taken by IPART and the ACCC, including because it would yield an estimate which is likely to be more directly consistent with methods used to estimate the risk-free rate and the equity risk premium.

Measuring the 'specific' components

PAWA-specific or industry-wide parameters

6.18 A threshold issue revolves around whether the values used for the 'specific' parameters (β_a , D/C , T , G and DRP) should be PAWA-specific or instead be as generally observed among network providers in Australia.

6.19 Industry regulators elsewhere in Australia typically use industry-wide (not company-specific) values for each of the 'specific' parameters. The reasoning underlying this approach is three-fold:

- (a) The 'competitive neutrality' argument: that regulated returns available to government-owned businesses should be no more or no less than typically available to private operators—If the regulated rate of return were typically lower than the cost of capital to private operators, this would discourage entry of private operators into the industry. If the regulated rate of return were higher, the final consumer of services would end up paying a higher price thereby providing governments as owners of regulated businesses with higher returns than available to private investors for no underlying efficiency reason.
- (b) The 'incentive compatible' argument: that only an industry-wide approach would ensure that inefficient funding or operating choices were not rewarded or efficient ones not penalised.
- (c) The 'opportunity cost' argument: that the cost of capital is best measured by the cost of opportunities foregone as proxied by risk-adjusted returns typically earned in the private sector over time—with market mechanisms being such that differences in risk-adjusted rates of return tend to be eliminated over time.

6.20 In line with the practice adopted generally by regulators elsewhere in Australia, the Interim Commissioner is inclined to use industry-wide (not PAWA-specific) parameter values—and to apply this approach consistently for all relevant parameters. This approach

⁶ Inflation expectations are not the exact difference in yields, but are estimated using the so-called 'Fisher Equation': $(1 + \text{nominal return}) = (1 + \text{real return}) * (1 + \text{inflation rate})$.

is also consistent with the advocacy of the WACC approach in the Access Code (para. 5(2) of Schedule 6) on the grounds that it will ensure:

"...government-owned network providers operate under the same financial conditions as network providers in the private sector and will ensure returns in the public sector are equal to the opportunity cost of capital in the private sector."

6.21 For the same reasoning, the Interim Commissioner proposes to use uniform values for all geographical networks.

Which industry-wide values?

6.22 The choice is between the values adopted by IPART and those adopted by the ACCC—both with regard to electricity networks. The Interim Commissioner's preference is to use the IPART parameters, as these were applicable to low-voltage (distribution) networks as well as high-voltage (transmission) networks, whereas the ACCC's values were derived with transmission networks only in mind. By and large, the differences between the two are not great.

	IPART ^a	ACCC ^b
Asset beta	0.43	0.45
Debt-to-capital ratio	60%	60%
Effective tax rate	36%	36%
Imputation factor	40%	50%
Debt risk premium	1.0%	1.0%

^a IPART, June 1999, p. 217

^b ACCC, May 1999, p. 23

6.23 The only complication here is that the statutory company tax rate, which is currently 36%, is due to move to 34% from 1 July 2000 and to 30% from 1 July 2001. However, given that the purpose of the initial use of the WACC is to derive a revenue cap applicable to the final quarter of the 1999-00 financial year, the Interim Commissioner proposes to use the 36% statutory rate. The lower rates will be used when determining the WACC to apply directly in 2000-01.

Draft WACC Determination

6.24 Based upon the values suggested above, the Interim Commissioner's draft determination of the real-terms pre-tax WACC is 7.4%. The calculations are summarised in the Table on the next page.

6.25 The final determination will be recalculated using values applicable at the time with regard to the risk-free rate as well as any modifications agreed to in response to submissions from interested parties regarding the appropriate treatment in contentious areas, especially those listed below.

Issues for comment

6.26 The Interim Commissioner seeks comments on:

- A. the appropriateness of equation (8) for estimating the equity (or levered) beta;

- B. the use of the 10 year Commonwealth bond rate as a proxy for the risk-free rate of return;
- C. averaging the 10 year bond rate over the 30 trading days before the date of determination, to remove any short-term variability;
- D. the proposed use of a 5.5% equity (or market) risk premium;
- E. the use of the differential between the yields on nominal and indexed Commonwealth bonds to measure expected inflation;
- F. using industry-wide (rather than PAWA-specific) values for each of the 'specific' parameters (β_a , D/C , T , G and DRP);
- G. using IPART's June 1999 electricity networks values for these 'specific' parameters; and
- H. using a rate of 36% for the company tax rate, notwithstanding the scheduled reductions to the statutory rate to commence on 1 July 2000.

DRAFT WACC DETERMINATION

Risk-free rate	6.84%
Equity risk premium	5.5%
Asset beta	0.43
Beta (levered)	0.936
Cost of equity before dividend imputation	12.0%
Imputation factor	0.40
Cost of equity (post-tax)	9.8%
Tax rate	36%
Cost of equity (pre-tax)	15.3%
<hr/>	
Risk-free rate	6.8%
Debt risk premium	1.0%
Cost of debt (pre-tax)	7.9%
<hr/>	
Equity-to-capital ratio	40%
Debt-to-capital ratio	60%
Nominal pre-tax WACC	10.9%
<hr/>	
forecast CPI	3.16%
Real pre-tax WACC	7.4%

CHAPTER

7

MEASURING THE CAPITAL BASE

Proposed approach

7.1 Over 70% of costs borne by network providers in Australia are said to involve returns *on* and returns *of* capital. Appropriate measurement of the capital base is therefore a crucial issue.

7.2 The Interim Commissioner proposes to use the following formula to measure the capital base (CAPITAL) for a particular network:

$$\text{CAPITAL} = [\text{WC} + (\text{ODV} - \text{CAPCON}) + 0.5 * (\text{CAPEX} - \text{DECOM}) * (1 + \Delta\text{PI})^{-1/2}] \dots (9)$$

where:

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

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

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

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

7.3 The rationale for equation (9) is explored below.

Data requirements

7.4 Aside from the ΔPI value (where the Interim Commissioner proposes to use the same value as used for adjusting the revenue cap between 2000-01 and 1999-00 as per equation (3)), all data for estimating the network capital base is to be sourced from PAWA. The definitions to be observed by PAWA in providing the information sought by the Commission follow.

Working capital (WC)

7.5 While most capital is tied up in a network's fixed assets, recognition is required of the funds held to finance the day-to-day operations of the network business.

7.6 The Interim Commissioner proposes to measure the working capital employed in a particular network by estimating the average monthly difference between current liabilities and current assets in the previous financial year for PAWA as a whole and then allocating that amount in proportion to the network's relative share of PAWA's total operating costs.

Depreciated optimised deprival value of the network assets (ODV)

7.7 Schedule 7 of the Access Code requires the use of 'optimised deprival values' of a network's fixed assets to measure the value of capital tied up in those assets.

7.8 The figure required is the net depreciated optimised deprival value of network assets as determined at the commencement (1 July) of the financial year in question.

7.9 The optimised deprival value of an asset is the depreciated value of the lower of the optimised replacement cost of the asset and the economic replacement value of the asset, where:

- (a) the depreciated optimised replacement cost (DORC) of the asset is the cost of meeting current (and projected future) supply needs with the most technically efficient design and configuration of the asset based on the existing system configuration; and
- (b) the economic replacement value of an asset is the minimum cost of replacing the asset with a more economic alternative that still achieves the same result.

7.10 These tests are to be applied directly to network assets, and network asset classes. In providing the necessary data for appropriate classes of assets, PAWA is required to:

- (a) outline the methodology and assumptions used to project ODV values forward to 1 July 2000 from the date of the last revaluation;
- (b) identify any asset or group of assets where the economic replacement value of assets is judged to be less than the optimised replacement cost, and an explanation for why this might be the case; and
- (c) identify any asset or group of assets where the optimised value is judged to be less than the book value, and an explanation for why this might be the case.

Net capital contributions received (CAPCON)

7.11 A network provider is only entitled to a return on the capital invested by owners of the business, not on that capital contributed by customers in the form of gifted assets or capital contributions made towards the cost of constructing or acquiring otherwise uneconomic assets.

7.12 Where records may be deficient, regulatory arrangements elsewhere in Australia acknowledge that only partial allowance for historical capital contributions may be possible. PAWA advises that its records do not permit allowance for capital contributions made before 1 July 1998. The Interim Commissioner does not propose to make an estimate of the unrecorded capital contributions, provided PAWA substantiates that data

on such contributions is unreliable prior to 1 July 1999 and an estimate is not feasible in the circumstances.

7.13 On this basis, the figure required is of the capital contributions received since 1 July 1998 net of the amount amortised since then, to the extent that the resultant assets constructed increase the total ODV. In particular:

$$\text{CAPCON} = (\text{CONCUR} - \text{AMORT}) + \text{CONNEW} \quad \dots(10)$$

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.

7.14 PAWA is required to provide the estimates of CONNEW for the financial year in the context of a three-year series, together with an indication of the methodology and assumptions used to forecast this series.

Expected capital expenditure (CAPEX)

7.15 Working capital and the ODV asset values reveal the *initial* capital base only, that is the capital employed at 1 July. The final term in equation (9), namely:

$$0.5 * (\text{CAPEX} - \text{DECOM}) * (1 + \Delta\text{PI})^{-1/2} \quad \dots(11)$$

involves an estimate being made of the additional capital being employed during the year in question.

7.16 Effectively, equation (11) involves an estimate of additional capital in place at the mid-point of the year (31 December), expressed in prices applicable at this mid-point.

7.17 Integral to this calculation is an estimate of the expected expenditure on the construction or acquisition of new network-related fixed assets during the year.

7.18 PAWA is required to provide the estimates:

- (a) for the financial year in the context of a three-year series, together with an indication of the rigor of the evaluation processes underlying this series; and
- (b) by asset class (to the same level of disaggregation as for the ODV figures).

Value of network assets expected to be decommissioned (DECOM)

7.19 Capital employed during the year will be reduced wherever assets are decommissioned in the financial year before the end of their economic life. The figure required is of the ODV of any such network assets.

Issues for comment

7.20 The Interim Commissioner seeks comments on:

- A. the proposed method for estimating the working capital employed in a network operation;
- B. the proposal to discount the impact of capital contributions prior to 1 July 1998, provided PAWA is able to provide substantiation that data on such contributions is unreliable prior to 1 July 1999 and an estimate is not feasible in the circumstances; and
- C. the method proposed (in equation (11)) for rolling the capital base forward from 1 July to 31 December each year.

CHAPTER

8

MEASURING THE ANNUAL DEPRECIATION CHARGE**Proposed approach**

8.1 Depreciation is the mechanism by which invested capital is returned to the owners of the network business over the anticipated economic life of depreciable assets. The central issue is not whether capital should be returned to investors, but the pattern of, and period over which, the invested capital should be returned.

8.2 Assuming that assets are typically acquired or decommissioned at the mid-year point and using the straight-line depreciation method, the Interim Commissioner proposes to calculate that the annual depreciation charge (DEP) as follows:

$$\text{DEP} = \text{DCUR} + 0.5 * (\text{DNEW} - \text{DDEC}) \quad \dots(12)$$

where:

DCUR = depreciation charge for the year based on the assets in service at the start of the year

$$= \text{ODV} * 1/L_C$$

where:

L_C = average remaining economic life (in years) of current assets;

DNEW = depreciation on new assets added during the financial year

$$= \text{CAPEX} * 1/L_N$$

where:

L_N = average economic life (in years) of new assets; and

DDEC = the adjustment to depreciation for assets decommissioned during the financial year

$$= \text{DECOM} * 1/L_D$$

where:

L_D = average remaining economic life (in years) of assets being decommissioned.

Data requirements

8.3 PAWA is therefore required to provide data, not directly on the depreciation charge, but on its (weighted-average) estimates—for the same asset classification and

disaggregation as it provides the information on ODV, CAPEX and DECOM—of the following three asset lives (in years):

L_C = the average remaining economic life of current assets;

L_N = the average economic life of new assets; and

L_D = the average remaining economic life of assets being decommissioned.

8.4 The Commission will calculate the resultant depreciation charge.

Issues for comment

8.5 The Interim Commissioner seeks comments on:

- A. the use of the straight-line method for calculating annual depreciation; and
- B. the basing of depreciation on the ODV of depreciable assets.

CHAPTER

9

MEASURING ALLOWABLE OPERATING COSTS**Requirements of Code**

9.1 Under clause 68 of the Access Code, the regulator must, in setting a revenue cap, take into account the revenue requirements of the network provider during the relevant financial year or years having regard to, among other things:

“(c) the potential for efficiency gains to be realised by the network provider in expected operating, maintenance and capital costs, taking into account the expected demand growth and service standards...”.

9.2 Furthermore, clause 69(2) provides that:

“The revenue cap set by the regulator is to provide a fair and reasonable risk-adjusted rate of return to the network provider on efficient investment given efficient operating and maintenance practices on the part of the network provider...”.

9.3 Finally, para.7(3) of Schedule 6 states that:

“As one of the objectives of the regulation of network prices is to provide the network provider with incentives to utilise efficient operating and maintenance practices, the operating expenditure to be included in the calculation of a revenue cap is to be based on costs facing an efficient operation in Territory circumstances.”

9.4 The major issues here are:

- (a) assessing PAWA Network's degree of efficiency; and
- (b) the extent to which allowance should be made for a progressive phasing-in of available efficiencies.

9.5 The Interim Commissioner proposes to use the efficiencies assessed as available in the Northern Territory context by the Government's 1998 strategic review of the Power and Water Authority and as revealed in the savings target set by the Government. In effect, the operating cost savings element of the \$30 million financial target approved by the Government in November 1998 amounts to a reduction of around 18% in PAWA's operating cost structure as it stood in 1997-98. This target was based on the maximum savings available under continuing government ownership, and related to the whole of PAWA.

The Interim Commissioner also proposes to allow the phasing-in of such efficiencies equally over a three year period concluding in 2001-02.

Data requirements

9.6 The figure required is an estimate of the network's operations, maintenance and administration expenditure (OMA) expected during the financial year.

9.7 PAWA is required to provide estimates of OMA for the financial year in the context of a three-year series, and in a form which shows the breakdown between major components, including:

- (a) direct expenditures (staffing, systems, maintenance, etc); and
- (b) administrative overheads.

9.8 In providing the required information, PAWA will also need to document the following:

- (a) the efficiency assumptions factored into the OMA estimates provided, against the targeted improvements targeted for PAWA by the Government;
- (b) the methodology and assumptions underlying the apportionment of administrative overheads across the various lines of business including the network business;
- (c) the method used to estimate the GST payments included in the OMA figures; and
- (d) the treatment of the Darwin-Katherine transmission line (DKTL) costs, and the basis of any apportionment of those costs between Darwin and Katherine network users.

Issues for comment

9.9 The Interim Commissioner seeks comments on:

- A. the use of a 'glide path' approach to efficiency adjustment in PAWA Networks, based upon the cost savings target set by the Government and a three year phasing-in period.