# **NETWORKS PRICING:** 2004 REGULATORY RESET

# DRAFT DETERMINATION: 2004-05 TO 2008-09

**JANUARY 2004** 



Level 9, 38 Cavenagh Street Darwin NT 0800 GPO Box 915, Darwin NT 0801 utilities.commission@nt.gov.au www.utilicom.nt.gov.au

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# **Call for submissions**

Submissions are invited from interested parties concerning the issues raised in this Paper and related matters. The closing date for submissions is **Friday 13 February 2004**.

Submissions or inquiries should be directed to:

Executive Officer	Telephone:	(08) 8999 5480
Utilities Commission	Fax:	(08) 8999 6262
GPO Box 915		
DARWIN NT 0801	Email: utilities	s.commission@nt.gov.au

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To facilitate publication on the Commission's website, submissions should be made electronically by disk or email. However, if this is not possible, submissions can be made in writing.

Information about the role and current activities of the Commission, including copies of reports, papers and submissions, can also be found on the Commission's website.

# CHAPTER

# **EXECUTIVE SUMMARY**

1.1 The Commission's draft determinations of each of the parameters necessary to give practical effect to its decision to apply a tariff basket form of price cap regulation in the second regulatory control period (the five years commencing 1 July 2004) are as follows:

Z factor	7.9%
X <sub>1</sub> factor	2.0%
X <sub>2</sub> factor	0.3%
S factor	12.9% in 2004-05; 5.0% thereafter

1.2 The **Z factor** implies that the weighted average of network access tariffs (*inclusive* of streetlighting access tariffs) at the end of the first regulatory control period is **7.9%** below a full cost recovery level. Before moving to a tariff basket form of regulation, current tariffs therefore need to be increased by this amount on a weighted average basis. However, about one half of this increase is explained by an asset reclassification from Power Generation to Power Networks, being a change which the Commission agrees is appropriate to correct a previous misclassification. As a consequence, the Commission expects the resultant step-up in network access tariffs to be offset to a significant degree by reductions in the generation component of retail tariffs paid by end-use customers, thereby moderating the effect on retail tariffs as a result.

1.3 The general effect of these draft parameter values is illustrated in the following chart.





Note: For simplicity, network access tariffs are assumed to account for 40% of the total retail price of electricity, with generation accounting for all the rest. Also, generation tariffs are assumed to be maintained in line with the CPI. An ongoing annual inflation rate of 2.5% is also assumed. Retail tariffs (franchise) are assumed to be held constant in nominal terms reflecting Government policy.

1.4 The chart shows tariff movements relative to CPI movements. A downward sloping line indicates that the relevant tariff is expected to fall *relative to the CPI* (i.e., the chart shows relative movements in tariffs over time, not relative tariff levels). The retail price refers to the total price paid by customers on average under the assumed illustrative conditions (see the footnote to the chart).

1.5 The proposed up-front increase in network access tariffs is under one-half of the 20% increase implied were the Commission instead to incorporate the cost data supplied by Power and Water without any amendments or adjustments and to continue unchanged its June 2000 methodology for determining capital costs. This cutback reflects the following approaches and judgments now proposed by the Commission:

- compared with its 2000 Determination, the Commission proposes a substantial reduction in the allowance for working capital, to bring this allowance into line with treatments adopted by other regulators in Australia;
- the Commission proposes continuing application of a general optimisation factor (of 2¼%) applying to Power and Water's pre-2000 network assets in its 2000 Determination, despite Power and Water's desire to discontinue use of such a factor;
- given doubts in the Commission's mind about whether the Government as purchaser of community service obligation ("CSO") services would be prepared to pay a full commercial rate of return on the current DORC asset valuation in the prices it pays for such services irrespective of whether the electricity supplier in the Territory was government-owned or not *and* the absence of records regarding which of Power and Water's pre-2000 network assets were in effect funded by capital grants by the NT Government, the Commission proposes adopting an allowance of 7<sup>3</sup>/<sub>4</sub>% (bringing its discounting of Power and Water's pre-2000 network assets up to a total of 10%); and
- with Power and Water's network operations and maintenance ("O&M") costs being assessed by an independent consultant in 2002 as 20% above electricity industry best practice even in the NT context, the Commission proposes to attribute one-half of such inefficiencies to government policies continuing to constrain the board and management from adopting operating policies and practices available to electricity networks businesses elsewhere in Australia, the cost of which should be borne by taxpayers rather than network users or end users of electricity.

1.6 The Commission does not consider that such a paring back of the Z factor would adversely affect Power and Water's financial viability. Rather, the Government as shareholder – instead of network users and end-use customers – is being asked to bear the cost of certain past and present policy decisions impacting on the commercial value of assets owned by Power and Water. Moreover, the incentives facing Power and Water regarding future investment in network augmentations and extensions will be unaffected, as all post-2000 investments will be able to earn a full commercial return (on an efficient operating cost basis) on the actual cost of such investments.

1.7 The  $X_1$  factor implies that the weighted average of network access tariffs (*after* the Z factor adjustment) should annually *decrease* by **2.0 percentage points** in real terms (i.e., relative to the corresponding percentage movement in the CPI) even were Power and Water already an efficient network service provider. Power and Water's network revenue will also increase in proportion to its sales of network access services. This proposed X<sub>1</sub> value of 2.0% is towards the lower end of a range of estimates by regulators elsewhere as to the annual movement in an efficient network service provider's costs relative to annual movements in the costs of providers of goods and services generally. A positive X<sub>1</sub> value reflects the capital intensive nature of such networks businesses. The Commission prefers a value at the lower end of the range in light of the smaller size and dispersed nature of Power and Water's network activities.

1.8 The  $X_2$  factor implies that, in addition to annually decreasing by 2.0 percentage points in real terms, Power and Water's weighted average network access tariffs should additionally *decrease* by **0.3 percentage points** per annum relative to the CPI given the scope existing for efficiencies to be achieved within Power and Water relative to an already-efficient network service provider. The Commission considers that the 10% excess in per unit O&M costs which it attributes to management (not government) policies and practices should be capable of elimination over a 10 year period, i.e., by 1% per annum. As O&M costs are approximately 30% of the total cost of providing network access services, the Commission considers a reasonable annual 'stretch factor' for incorporation into network access tariffs to be 0.3%.

1.9 Together, the sum of these two X factors (of 2.3%) is less than the weighted average of the equivalent X factors used during the four years of the first regulatory control period of  $3\frac{1}{2}$ %.

1.10 Finally, the **S factor** sets a constraint on the annual *increase* in each individual network user's weighted average network access tariff. Generally, the Commission proposes use of a **5.0%** side-constraint on annual increases in an individual's network access tariff. However, because of the impact the Z factor will have in 2004-05, the Commission proposes that the S factor to apply to 2004-05 tariffs (only) be **12.9%**.

1.11 The Commission will finalise its determination by the end of February, after considering submissions received and once checks on the accuracy and completeness of the data underlying its draft determination have been completed.

# CHAPTER

2

# BACKGROUND

# **Requirements of the Code**

2.1 Prices paid by network users for the conveyance of electricity through prescribed electricity networks in the Northern Territory are regulated under the Electricity Networks (Third Party Access) Code ("the Code")<sup>1</sup> which is a schedule to the *Electricity Networks (Third Party Access) Act 2000* ("the Act").

2.2 Granting third-party access to an electricity network involves an unbundling of electricity supply into:

- *generation* services (relating to the production of electricity);
- *retail* services (relating to the sale of electricity to end-use customers); and
- *network* services (relating to the transportation of electricity from generators to end-use customers).

2.3 The network service provider occupies a strategic position in the electricity system, since a generator or retailer can only supply electricity to its customers if it can transport this electricity via the network. For effective competition in upstream and downstream markets with a transportation requirement, all parties – irrespective of their affiliation with the network service provider – must have access to the network.

2.4 Part 3 of the Code specifies the price regulation framework to be observed by the Commission and by the network service provider when setting the prices to be paid by network users for the conveyance of electricity through the electricity network. The Commission has been undertaking such regulation using a price regulation methodology that has been constant during the first regulatory control period that is due to end on 30 June 2004.<sup>2</sup>

2.5 While the Code set out in some detail the determinations that were required to be made by the Commission in the first regulatory control period (the period from the commencement of the Code on 1 April 2000 to 30 June 2004), with respect to the second regulatory control period (the period from 1 July 2004 to 30 June 2009), clause 66(3) of the Code provides that:

"The revenue or price caps that are to apply during the second and subsequent regulatory control periods are to be determined by the regulator in a manner that:

(a) in the regulator's opinion, most effectively achieves the desired outcomes set out in clause 63; and

(b) is consistent with generally accepted regulatory practice at the time."

<sup>&</sup>lt;sup>1</sup> The Code can be viewed on the legislation page of the Commission's website (www.utilicom.nt.gov.au).

 $<sup>^{2}</sup>$  A regulatory control period is defined in clause 3 of the Code as the period between major price reviews (or 'resets') during which time the price regulation methodology used in setting prices is held constant.

2.6 In the lead-up to the commencement of the second regulatory control period (the five-year period commencing 1 July 2004), the Code therefore requires the Commission as regulator – in consultation with interested parties – to review the price regulation methodology used in the first regulatory control period. The Commission is referring to this review as the "2004 Regulatory Reset".

# **Processes to date**

2.7 The 2004 Regulatory Reset has two stages:

- in stage 1, the methods used to regulate prices are reviewed and, if necessary, changed; and
- in stage 2, new price controls for the second regulatory control period are implemented using the revised methods from stage 1.

2.8 Stage 1 of the reset was initiated by an Issues Paper published in July 2003, followed by the publication of a Draft Decision on price regulation methodology issues in September 2003.

2.9 Following its consideration of submissions received in response to both the Issues Paper and the Draft Decision, the Commission's final decision on the methodology to be adopted for the regulation of network access prices in the second regulatory control period was published in November 2003.

2.10 Since November 2003, the Commission has been considering how most appropriately to determine the parameters involved in implementing its methodology decision.

# Purpose of this Paper

2.11 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. Section 22(2) 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.

2.12 This paper constitutes the draft determination required under section 22(1) of the Act and provides an indication of the reasoning underlying the Commission's final determinations as they apply to the financial year or years commencing 1 July 2004.

# Structure of this Paper

2.13 Chapter 3 identifies the parameters to be determined in order to give practical effect to the Commission's final methodology decision, together with certain underpinning features of the decision which have implications for quantifying those parameters.

2.14 Chapters 4 and 5 set out the Commission's considerations and calculations underlying its draft determinations of each of the parameters necessary to give practical effect to its decision to apply a tariff basket form of price cap regulation.<sup>3</sup>

 $<sup>^{3}</sup>$  As explained in the next chapter, these are the Z, X1, X2 and S factors.

# Timetable

2.15 The Commission's timetable for the remainder of the 2004 Regulatory Reset is as follows:

Target	Event
13 February 2004	Submissions on the Draft Determination due
20 February 2004	Submission of Power and Water's Draft Pricing Principles Statement and Draft Capital Contribution Principles Statement due
end February 2004	Publication of the Commission's Final Determination of the numerical value of the parameters required by the price regulation methodology applying in the second regulatory control period
mid March 2004	Power and Water to submit proposed tariff schedules for 2004-05 to the Commission for approval *
end March 2004	Publication of the Commission's approval of Draft Pricing Principles Statement and Draft Capital Contribution Principles Statement
	Publication of the Commission's approval of the tariff schedules for 2004-05

\* The Commission notes that this requires tariffs to be formulated before the Draft Pricing Principles are formally approved. The Commission is of the view that there will be ample informal dialogue between Power and Water and the Commission between submission of the Draft Pricing Principle Statement on 20 February and submission of tariff schedules on 12 March so that the tariff schedules submitted will conform to the Pricing Principles subsequently approved by the Commission

# CHAPTER

3

# **IMPLICATIONS OF NOVEMBER 2003 DECISION**

# Methodology for the second regulatory control period

3.1 Price regulation methodology involves the practical and technical detail for the administration of price regulation over which the Commission as regulator has a degree of discretion.

3.2 The Commission has decided to adopt a **price cap** form of regulation based upon a **tariff basket** in the second regulatory control period (rather than continue with the revenue cap approach used in the first regulatory control period). Hence, the Commission will base its price regulation on a calculation of each year's weighted average network access tariffs.

3.3 Fundamentally, in the second regulatory control period, the Commission has decided, for the regulated networks combined:

- with respect to 2003-04 ("year 0"), to undertake a cost-based 'base year' adjustment of the weighted average of network access tariffs at the end of the first regulatory control period reflecting an updated building blocks analysis of the most recently available actual data; and
- then to allow the adjusted weighted average of network access tariffs to be escalated year by year (i.e., years 1 through 5) during the second regulatory control period using a CPI-X price path that is based on relative efficiency improvements that are reasonably expected to be achieved rather than on forecasts of the network service provider's own costs.

3.4 Having decided on the form of regulation, since November 2003 the Commission has been considering how most appropriately to determine the parameters involved in implementing its tariff basket approach. In particular, that decision involves the determination of a number of parameters.

# Components of price control methodology

#### Base period adjustment

3.5 The Commission's November 2003 final methodology decision ("November 2003 Decision") entails the base year (year 0) adjustment being made to update the existing (i.e., 2003-04) tariffs, thereby deriving a revised weighted average of network access tariffs for 2003-04 ( $P_0$ "), as follows:

$$P_0^{"} = P_0 * (1 + Z)$$
 ... (1)

where:

 $P_0$  = the weighted average of approved individual network access tariffs being applied in 2003-04 (based on the first regulatory control period revenue cap); and

Z = a factor determined by the Commission prior to commencement of the second regulatory control period which indicates the extent to which the weighted average of network access tariffs applying in the first regulatory control period requires adjustment in order to form an appropriate basis for network access tariffs in the second regulatory control period.

#### Escalation arrangements

3.6 Once the updated base year weighted average tariff  $(P_0")$  has been determined by applying equation (1), the November 2003 Decision then requires the network service provider annually to develop tariff schedules during the second regulatory control period that conform with the following constraint on weighted average tariffs:

$$P_{t} \leq \left[ P_{t-1} * \left( \frac{CPI_{t-1}}{CPI_{t-2}} \right) * \left( 1 - (X_{1} + X_{2}) \right) \right] \qquad \dots (2)$$

where:

the "t" subscript denotes a particular financial year, with t denoting the forthcoming year, t-1 the current year and t-2 the previous year;

and:

 $P_{t-1}$  = the weighted average of approved individual network access tariffs in the current year (i.e. the year preceding the year for which tariffs are being submitted for approval) measured in index form where, when t = 1,  $P_{t-1} = P_0$ " (calculated using equation (1));

CPI = a 100 based index, being the all capital cities headline CPI index published by the Australian Bureau of Statistics ("ABS");

 $X_1$  = a factor determined by the Commission prior to commencement of the second regulatory control period which reflects the difference between annual movements in consumer prices on average and in electricity network access prices on average in Australia, to be based on X factors typically applying to comparable *best practice* (i.e., efficient) network service providers in other jurisdictions; and

 $X_2$  = a factor determined by the Commission prior to commencement of the second regulatory control period which reflects the difference between annual movements in electricity network access prices applied on average by comparable best practice network service providers in other jurisdictions in Australia and by the network service provider in the Northern Territory, on the basis that any remaining O&M inefficiencies reasonably assessed to be within the control of management are eliminated by the end of the third regulatory control period.

3.7 In applying equation (2), the November 2003 Decision requires the measurement of the  $CPI_{t-1}$  term by reference to the most recently published quarterly index at the time.<sup>4</sup> The  $CPI_{t-2}$  term in equation (2) involves the published index value in respect of the equivalent quarter in the previous year.

<sup>&</sup>lt;sup>4</sup> This will likely be the December quarter CPI.

#### Measuring the weighted average tariff index

3.8 The November 2003 Decision established the basis by which the network service provider is to calculate the index representing the weighted average of individual network access tariffs for the year "t":

$$P_{t} = \sum_{i=1...n} [p^{i_{t}} * q^{i_{t-2}}] / \sum_{i=1...n} [p^{i_{t-1}} * q^{i_{t-2}}] \dots (3)$$

where:

p = the proposed or approved price (or price component) for an individual network access tariff item as the case may be; and

q = the quantity weight associated with the price (or price component) for the individual network access tariff item;

and:

the "i" superscript denotes an individual network access tariff item, or a component of an individual network access tariff item where a multi-part tariff is involved;

the " $\Sigma$ " symbol denotes the summation of all relevant values across all individual network access tariff items, or components of such items; and

the "t" subscript denotes a particular financial year, with t denoting the year in question, t-1 the year preceding the year in question and t-2 the year prior to the year preceding the year in question.

#### Individual network access tariffs

3.9 Each year within the second regulatory control period, the November 2003 Decision involves the Commission approving the annual schedule of individual network access tariffs submitted by the network service provider only if:

- the weighted average of tariffs included in the schedule complies with the constraint in equation (2);
- in conjunction with the submission of the schedule of annual network access tariffs for approval, the network service provider also submits to the Commission a statement of reasons for any modifications proposed to the structure of network access tariffs that is consistent with the approved Pricing Principles Statement and capable of publication (with the Commission only intervening where it considers the proposed change in structure is not consistent with the approved Pricing Principles Statement); and
- the resultant impact on the weighted average tariff for each individual customer does not breach a CPI+S side constraint, where S is a factor applying to a particular year or years to be determined by the Commission.

# Factors to be determined

3.10 To apply equations (1), (2) and (3), together with the side constraint on individual tariffs, requires the Commission to determine values for each of the Z,  $X_1$ ,  $X_2$  and S factors.

3.11 When determining the Z,  $X_1$ ,  $X_2$  and S factors, the November 2003 Decision also involves the following requirements which are important to bear in mind when determining these factors:

- a single weighted average network price is required combining the regulated networks (Darwin/Katherine, Tennant Creek and Alice Springs);
- the tariff basket is only to include network access tariffs (involving prices for use of system, connection/standby and common services) but not capital contributions; and
- the Darwin to Katherine Transmission Line (DKTL) and streetlighting tariffs are to be included in the regulated tariff basket in the second regulatory control period, so that the Z factor must be determined on a basis inclusive of the associated costs and revenues.<sup>5</sup>

<sup>&</sup>lt;sup>5</sup> A draft amendment to the Excluded Services Determination to this effect will be published with the final determination.

# CHAPTER

4

# BASE PERIOD ADJUSTMENT: THE Z FACTOR

# Background

4.1 Before applying the tariff basket form of price cap, the November 2003 Decision requires a re-examination of the current costs of Power and Water's network business (hereafter referred to as "Power Networks") to ensure that the opening weighted average tariff used is at least recovering the forward-looking and efficient costs of supply of regulated network access services.

4.2 The required cost-based adjustment to opening tariffs is measured by the *Z* **factor**. This factor is the percentage adjustment determined by the Commission prior to commencement of the second regulatory control period indicating the extent to which the weighted average of network access tariffs actually applying in 2003-04 (the year prior to the first year in the second regulatory control period) needs to be changed in order to form an appropriate basis for network access tariffs in the second regulatory control period.

4.3 The Commission considers that the Z factor is most appropriately measured as follows:

Z = (A - B) / B

where:

A is an updated estimate of the total cost (in \$ millions) in 2003-04 of supplying the network access services whose tariffs are to be included in the tariff basket in 2004-05; and

B is an updated estimate of the total revenue (in \$ millions) in 2003-04 derived from the existing tariffs applying to the network access services to be included in the tariff basket in 2004-05.

# Updating total costs of supply in 2003-04

4.4 The first value required to estimate the Z factor is an updated estimate of the total cost (in \$ millions) in 2003-04 of supplying the network access services whose tariffs are to be included in the tariff basket in 2004-05.

#### Building blocks approach

4.5 The Commission has again used the building blocks approach to derive an updated estimate of the network service provider's efficient costs. The building blocks formula can be expressed as follows:

(CAPITAL\* WACC) + DEP + O&M

where:

CAPITAL represents an efficient level of capital employed by the network service provider (expressed in \$ millions);

WACC represents the network service provider's risk-adjusted weightedaverage cost of capital (expressed as a percentage);

DEP represents depreciation expenses on capital employed (expressed in \$ millions); and

O&M represents efficient operating and maintenance costs (expressed in \$ millions).

4.6 The Commission used the building blocks approach in its 2000 Determination.

4.7 The November 2003 Decision requires the building blocks analysis to be undertaken with respect to the 2002-03 year, being the most recently available actual data. In order to obtain a Z factor to be applied to 2003-04 tariffs, a separate methodology is therefore required to escalate the efficient costs estimates derived from 2002-03 data one year to 2003-04.

#### 2000 Methodology

4.8 For its 2000 Determination, the Commission applied the building blocks approach using methodologies outlined in both:

- Revenue Determinations: April to June 2000, published in March 2000; and
- *Revenue Determinations: 2000-01 to 2002-03*, published in June 2000.

Both these paper are available for viewing on the Commission's website. The methodologies outlined in these reports together are hereafter referred to as the "2000 Methodology".

4.9 Set out later in this chapter are all variations to the 2000 Methodology considered or implemented by the Commission other than certain technical modifications due to the application to historical rather than forecast data.<sup>6</sup> With these technical exceptions and unless otherwise stated, the methodology underlying this Draft Determination is as contained in the 2000 Methodology.

ASSETS =  $\left[ (DORC - CAPCON)_{1 \text{ July 2002}} + [DORC - CAPCON]_{30 \text{ June 2003}} \right]_{/2}$ 

where:

DORC = the depreciated optimised replacement cost of the network's fixed assets; and

<sup>&</sup>lt;sup>6</sup> For example, where the calculation of the revenue requirement for each year is a forward-looking exercise, it is necessary to estimate each of the components of the asset base. The 2000 Methodology calculated the value for average capital in accordance with the following formula:

ASSETS =  $(DORC - CAPCON) + 0.5*(CAPEX - CONNEW - DECOM)*(1 + \Delta PI)^{-\frac{1}{2}}$ 

As no forecast rolling forward of the regulated capital base is required with respect to 2002-03, the Commission is able to calculate the average level of capital employed in that year by simply using the following:

CAPCON = the capital contributions received net of any amount amortised, to the extent that the resultant assets constructed have increased the gross DORC.

#### Power Networks' 2004 data

4.10 In response to a series of requests over the November 2003 to January 2004 period, Power Networks, as the network service provider, provided to the Commission a range of data required to implement the building blocks approach with respect to the 2002-03 year. In some instances, the Commission has found it necessary to interpret or extrapolate the data provided in order to complete this Draft Determination. In that regard, the Commission has used its best endeavours to preserve the integrity of the original data. [Any adjustments the Commission has undertaken to reflect its own preferences have been undertaken separately, and labeled according.] The complete data set provided by Power Networks (or estimates that the Commission considers to be fully consistent with partial information provided by Power Networks) is hereafter referred to as "Power Networks' 2004 data".

4.11 Set out later in this chapter are the considerations underlying all variations to Power Networks' 2004 data implemented by the Commission as part of this Draft Determination. Unless otherwise stated, the data used for this Draft Determination is Power Networks' 2004 data.

#### Variations to the 2000 Methodology

#### (1) Treatment of working capital

#### Issue

Should an allowance for working capital be included in the regulated capital base and, if so, to what extent?

#### Background

4.12 Working capital is that capital that a business maintains in liquid assets to ensure that it can cover any short-term mismatches in cashflow.

4.13 In the 2000 Determination, the Commission measured the working capital employed in the regulated networks business by estimating the average monthly difference between current liabilities and current assets in the previous financial year for Power and Water as a whole and then allocating that amount in proportion to the networks business' relative share of Power and Water's total operating costs.

4.14 However, in applying the WACC to determine the rate of return on the regulated capital base (a real-terms WACC was used), the Commission calculated the potential (not actual) interest income on cash balances, using the income based upon Northern Territory Treasury Corporation's average cash rate over 1998-99 and then subtracted this potential annual interest income on the cash balances involved from the return on capital based upon full allowance for working capital to allow explicitly for these earnings (and so as to not double count income).

#### Commission's analysis

4.15 Neither the Victorian regulator nor the ACCC provide for working capital. Nor does the UK energy regulator. Generally, these regulators are persuaded that applying the building blocks approach to average asset values with respect to a year may overstate the cost of *financing* capital expenditure, thereby more than offsetting the cost of *financing* operating expenditure.

4.16 Nevertheless, the NSW and Queensland regulators continue to include an allowance for working capital.

4.17 Those regulators that do include working capital have moved away from the balance sheet concept of working capital relied upon by the Commission in its 2000 Methodology.

4.18 A direct estimate of debtors and creditors could be made, with creditors proxied by O&M costs at an assumed lag and debtors proxied by efficient costs based on the building blocks analysis at an assumed lag. However, such an approach overlooks that fact that around 70% of revenue received by network service providers reflects capital-related costs. Furthermore, all of Power Networks' income is from its associated retailer. Network users and end-use customers need to share in the economies of scope associated with retention of Power and Water's vertically-integrated structure.

4.19 The allowance for working capital needs to relate only to the cost of *financing* operating expenditure. The calculation needs to reflect benchmark assumptions about the timing of cash flow in order not to compensate for imprudent or inefficient activities.

4.20 Such an approach is consistent with that being considered by the SA regulator, involving assumptions about the extent to which revenue is received with a lag and about the extent to which operating expenditure is incurred after an activity has been performed (a lead). The SA regulator's formula is:

WC = 
$$((C - D) / _{365}) * O \& M$$

where:

C = the number of days lag; and

D = the number of days lead.

4.21 The SA regulator proposes to use a net lag of 39 days which comprises an unbilled consumption lag of 45 days (i.e., half of the standard three month meter reading cycle) and average lag between meter reading and bill payment of 28 days and an expense lead of 34 days. The net lag of 39 days implies a required stock of financial assets of around 10.7% of operating expenditure. Using data for 2002-03 from the 2000 Determination (and adding relevant DKTL and streetlighting O&M) and applying this formulation to Power Networks' annual O&M – as measured for that determination – would amount to around \$2.5 million. This compares with the \$8 million figure included in the 2000 Determination for the regulated networks at the time (excluding the DKTL and streetlighting).

#### Draft decision

4.22 The Commission proposes to retain an allowance for working capital despite the force of arguments of some that any overstatement of the cost of financing capital expenditure caused by applying the building blocks approach to average asset values with respect to a year may more than offsets the cost of financing operating expenditure.

4.23 Allowing for working capital is common in the US, and continues to be the practice of several jurisdictional regulators in Australia. The Commission is mindful of the need for regulatory consistency, and that it allowed for working capital in its previous determination.

4.24 Nevertheless, the Commission acknowledges trends in regulatory practice, and clear indications that its previous allowance was too generous. At the very least, the formulation used in the 2000 Methodology did not see network users and end-use customers sharing in the economies of scope associated with retention of Power and Water's vertically-integrated structure.

4.25 The Commission's draft decision is to adopt the SA regulator's formula and benchmark of a net lag of 39 days.

4.26 The appropriate allowance in the revenue requirement is a nominal return on that amount, compared with the use of a real return with respect to capital employed in plant and equipment.

# (2) Modifications to WACC formula

# Issue

Should changes be made to any part of the formula or any parameter value used in calculating the WACC in the 2000 Methodology?

#### Background

4.27 Schedule 8 of the Code required the WACC applying in the first regulatory control period to be applied in a real-terms pre-tax form. Regulatory practice in Australia currently involves the use of the WACC expressed in a nominal post-tax form.

4.28 Among other things, Schedule 8 defines the pre-tax cost of debt (R<sub>d</sub>) as:

$$R_d = R_f + DRP$$

where:

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

DRP = debt risk premium.

The Commission used a 100 basis points value for the debt risk premium in the 2000 Determination. Regulatory practice now sees a debt risk premium of at least 120 basis points as well as recognition in some instances of debt issuance costs.

#### Commission's analysis

4.29 Had the Commission continued with a revenue caps form of price regulation methodology, the arguments would have been finely balanced between the pre-tax real and post-tax nominal formulations of the WACC. While private sector practice is more akin to the post-tax nominal form, where the network service provider is government owned (as in the Northern Territory) the benefits of changing to this form may be relative small especially in relation to the implementation costs involved.

4.30 As to debt costs, the Commission considers it appropriate to be guided by recent practice in other jurisdictions.

#### Draft decision

4.31 The Commission's draft decision is to continue with the pre-tax real form of the WACC. As the WACC is only being used for one year, the costs involving in changing over to the post-tax nominal form would overwhelm any benefits of doing so.

4.32 As to the debt cost parameters, the draft decision is to include an allowance for debt issuance costs of 12.5 basis points and to raise the debt risk premium to 120 basis points, reflecting recent changes to generally accepted regulatory practice in other jurisdictions.

4.33 The WACC calculation underlying the Draft Determination is detailed in Appendix A. While these changed parameters push the WACC up a little in their own right, movements in the risk-free rate since 2000 see the WACC fall in real-term from 7.94% to 7.42%.

#### (3) Allowance for future capital expenditure

#### Issue

#### Should the Commission's methodology somehow be extended to ensure that the regulated asset base reflects normalised levels expected during the second regulatory control period?

#### Background

4.34 The Commission has been advised that Power Networks has analysed its capital expenditure requirements, net of customer contributions, for the seven years to 30 June 2009, and has separately identified capital expenditure, such as that necessary to improve system security, which does not comprise system augmentation, or otherwise facilitate load growth. The chart below discloses the results of this analysis.



Chart 2

#### 4.35 According to Power Networks, the chart shows that:

- 2002-03 non-load related capital expenditure is \$6.05 million;
- average capital expenditure for the five years to 30 June 2009 is \$8.92 million; and
- 2004-05 capital expenditure is higher than the average due to the installation of a number of zone substations in that year.

4.36 Power Networks has advocated that the Commission's methodology should somehow be extended to increase the regulated asset base to reflect levels expected during the second regulatory control period. Power Networks has expressed concern that system security could be at risk if the base year is not adjusted to facilitate this expenditure.

#### Commission's analysis

4.37 While capital expenditure on assets associated with system augmentation or otherwise to facilitate load growth must of necessity be funded from the associated growth in network revenue (otherwise the investment would not satisfy commercial criteria), capital expenditure associated with asset replacement or improving system security needs to be funded either from existing tariffs or from borrowings capable of being serviced out of the future revenue stream generated from existing customers.

4.38 While Power Networks has established that its capital spending levels on replacement and system security are expected to be higher in the second regulatory control period than in 2002-03, the extent to which this justifies an additional component to the building blocks methodology has not been established because of uncertainties about:

- whether all the capital expenditure involved will materialise; or
- whether such a rise is just a reflection of the normal asset replacement cycle, and that past periods of low spending have seen tariffs effectively providing for future capital spending (with Power and Water's balance sheet being reasonably liquid).

4.39 Existing tariffs (through the return of capital component) result in high levels of retained earnings from which to fund capital spending on the current system. Currently annual depreciation expense is well in excess of twice the average capital expenditure on replacement and improving system security.

#### Draft decision

4.40 The Commission's draft decision is to make no allowance for future capital spending increases at this time. The Commission has yet to be convinced that the funding generated from either existing tariffs or the future revenue stream generated from existing customers is insufficient, thereby requiring tariff increases.

4.41 Also, the issue can be addressed further prior to the next regulatory reset, by which time a clearer picture would have emerged as to Power Networks' ability to fund such spending based on existing tariffs.

#### (4) Escalating the 2002-03 revenue requirement to 2003-04

#### Issue

How should the results of the building block analysis for 2002-03 be escalated into relevant values for 2003-04?

#### Background

4.42 The Commission's past application of the building blocks approach has been on a forward-looking (i.e., forecast) multi-year basis, whereas the November 2003 Decision requires the building blocks approach to be applied (directly) only against known data (i.e., for 2002-03, the most recent completed year). As the Z factor is intended to adjust the weighted average of 2003-04 network access tariffs, to be up-to-date for this purpose the Z factor must be based – directly or indirectly – on an assessment of costs in 2003-04.

#### Commission's analysis

4.43 The approach to escalating costs most consistent with the November 2003 decision involves a CPI-X adjustment of unit costs, implying the following formulation:

$$R_{0304}^{*} = R_{0203}^{*} (\frac{CPI_{0304}}{CPI_{0203}}) * (1 - X) * (\frac{Q_{0304}}{Q_{0203}})$$

where:

 $\mathsf{R}^*$  is the annual revenue requirement consistent with the building blocks approach;

CPI is the all capital cities headline CPI index published by the ABS;

X is a factor reflecting the difference between annual movements in the costs of providing consumer goods and services generally in Australia and in providing network access prices at an efficient level;

Q is a measure of the quantum of network access services *provided* during the year; and

the 0203 and 0304 subscripts denote values for the 2002-03 and 2003-04 financial years respectively.

- 4.44 This approach requires:
  - forecast of the annual movement in the CPI between 2002-03 and 2003-04;
  - a value for X; and
  - a measure of the Q variable as well as a forecast of the annual movement in the measure of Q between 2002-03 and 2003-04.

#### Draft decision

4.45 The Draft Determination uses a forecast of the annual movement in the CPI between 2002-03 and 2003-04 of 2.1%. This will be revised at the time of the final determination to take into account the latest consensus forecasts.

4.46 The Draft Determination proxies the X factor by using the  $X_1$  value determined later in this Paper.

4.47 The Draft Determination involves the Commission's weighting of various indicators of Power Networks' output, with the weights reflecting the Commission's judgment (which may be modified in light of further advice from Power Networks prior to the final determination), as follows:

Cost drivers	2002-03	2003-04	weight	% increase
length of line	7,643	7,718	78%	0.98%
distribution substations	3,700	3,710	10%	0.27%
132kV substations	6	6	1%	0.00%
zone substations	10	10	1%	0.00%
customers	74,981	76,106	10%	1.50%
			100%	<b>0.92</b> %

#### Weighted Average Cost Drivers

#### Variations to Power Networks' 2004 data

#### (1) Technical optimisation of asset values

#### Issue

Should the inclusion of a global technical optimisation allowance in the DORC value of Power Networks' assets, as applied in the 2000 Determination, be continued?

#### Background

4.48 The 2000 Determination involved two types of optimisations:

- the first involved the exclusion of some specifically identified assets which were excess to requirements; and
- the second was an overall optimisation of total network assets, based on adjustments typical in other networks. Rather than applying individual factors

to each asset group, a weighted average of such factors was used, which resulted in a weighted average factor of 2.24% being applied for this purpose.

4.49 Power Networks has advised the Commission that it has reduced the list of assets subject to the first type of optimisation and no longer considers the second type to be appropriate.

4.50 Paragraph 6 of schedule 7 of the Code requires that, in valuing network assets for second and subsequent regulatory control periods:

"Subsequent revaluation of assets brought into service after 1 July 1999 and subsequent valuation of existing assets generally in service on 1 July 1999 (for use during the second or subsequent regulatory control periods, where the revaluations are to be used for regulatory purposes) are to be undertaken on a basis to be approved by the regulator."

#### Commission's analysis

4.51 Under the Code, the basis of any optimisation procedures is a matter to be approved by the Commission.

4.52 The optimisation process is an important part of the DORC valuation methodology. Without it, the depreciated replacement cost is likely to overstate the current market value of the assets, and the resultant tariffs paid by network users and end users of electricity are likely to be in excess of the tariffs that would be sustainable in an equivalent competitive market.

#### Draft decision

4.53 In light of its draft decision dealing with the consequences of the deprival value concept (see below), the Commission has accepted the shortened list of identified assets excess to requirements involved in the Power Networks' 2004 data as the reversal of the longer list of optimisations in the 2000 Determination.

4.54 However, the Commission's draft decision is to continue application of the global technical optimisation adjustment factor (of 2.24%) given it has no reason to believe that all technical and engineering aspects of the design of the network system would be repeated by a modern equivalent system, as observed in systems elsewhere in Australia.

#### (2) Discounting values of non-commercial sunk (pre-2000) assets

#### Issue

Does the DORC valuation of Power Networks' assets, even after the technical optimisations included by the Commission, meet the requirements of the deprival value concept required to be applied under the Code?

#### Background

4.55 Schedule 7 of the Code states the requirements for valuing network assets for second and subsequent regulatory control periods in the following terms.

#### "5. Valuing network assets for first regulatory control period

(1) Sunk assets (assets in place before the commencement date of the Code) are to be valued at available book values underlying the published and audited financial accounts at the end of the preceding financial year (30 June 1999) provided those values do not exceed the assets' optimised deprival value, as defined in this Schedule.

(2) Deprival value is the minimum loss that would result if the business were deprived of the asset.

(3) For example –

(a) if the asset can and should be replaced – the deprival value of the asset is its replacement cost; or

(b) if the asset would not be replaced – the deprival value of the asset is the greater of the net present value of expected cash flows from its continued use or the net realisable value of disposing of the asset (its economic value).

(3A) Optimised deprival value is a variant of the deprival value approach and takes account of the most efficient method of providing the asset's services if the asset is to be replaced.

(4) For example, if the asset can and should be replaced – the optimised deprival value of the asset is its optimised replacement cost.

(5) During a regulatory control period, assets acquired after commencement of that period are to be valued at cost.

# 6. Valuing network assets for second and subsequent regulatory control periods

(1) Subsequent revaluation of assets brought into service after 1 July 1999 and subsequent valuation of existing assets generally in service on 1 July 1999 (for use during the second or subsequent regulatory control periods, where the revaluations are to be used for regulatory purposes) are to be undertaken on a basis to be approved by the regulator.

(2) In approving the basis of asset valuation to be used, the regulator must have regard to –

(a) the agreement of the Council of Australian Governments of 19 August 1994 that deprival value should be the preferred approach to valuing network assets;

*(b)* any subsequent decisions of the Council of Australian Governments regarding the valuation of public sector assets; and

(c) generally accepted regulatory practice at the time.

4.56 The Council of Australian Governments has not modified its position of 19 August 1994 that deprival value should be the preferred approach to valuing public sector assets.

4.57 DORC is generally used by regulators in Australia in valuing electricity network assets, as it both avoids the circularity involved in the deprival value test and because the market assumptions associated with its use closely correspond with circumstances observed in most electricity markets.

4.58 The Productivity Commission, in its recent reviews of the national access regime, has acknowledged that reliance on DORC valuations irrespective of the circumstances can sometimes give rise to perverse outcomes. This may be the beginning of a challenge in policy circles to the routine use of DORC for regulatory purposes.

#### Commission's analysis

4.59 When it initially received Power Networks' data set for implementing the November 2003 Decision, the Commission expressed alarm at the dramatic increases in the regulated asset base DORC valuation relative to the equivalent year's values used in the 2000 Determination.

4.60 The latest asset values for 2002-03 were based on:

- 30 June 2001 replacement cost valuations conducted by Sinclair Knight Merz ("SKM"), a reputable independent asset valuation consultant; and
- desktop optimisations, additions, roll-forwards, transfers and escalations by Power Networks.

	DORC values, 30 June 2003 (\$M)	% contribution to increase
2000 Determination	315.484	
assets transferred	70.946	38.3%
additional capital expenditure	40.440	21.8%
optimisation reductions	18.012	9.7%
additional indexation effect	15.106	8.2%
other *	40.839	22.0%
2004 reset data	500.819	

4.61 A comparison of Power Networks' DORC asset values for 2002-03 used in the 2000 Determination with those put forward in Power Networks' 2004 data is set out in the following table:

The "other" category is largely made up of the impact of a change in asset lives resulting in a lower depreciation expense. The Commission will continue to explore this issue.

4.62 Considerable interaction between the Commission and Power Networks (and its advisers) after receipt of Power Networks' asset data has given the Commission comfort that the replacement cost values, additions, roll-forwards, transfers and escalations are generally consistent with good regulatory and electricity industry practice.

4.63 While the Commission accepted a valuation of Power Networks' assets as at 31 January 1999 carried out by a consortium of Sinclair Knight Merz and Deloitte Touche Tohmatsu ("1999 SKM valuation") based on the DORC valuation approach as a basis for calculating the regulated asset base for the first regulatory control period, it did so because:

- this valuation was in fact the value of those assets underlying the published and audited financial accounts at 30 June 1999 (i.e., the book value); and
- that valuation (by definition) did not at the time *exceed* the assets' optimised deprival value.

4.64 In the first regulatory control period, the Code required that sunk assets be valued at available book values – *provided that* those values did not exceed the assets' optimised deprival value. The optimised deprival value (ODV) was defined as follows:

"...if the asset can and should be replaced – the deprival value of the asset is its replacement cost; or

if the asset would not be replaced – the deprival value of the asset is the greater of the net present value of expected cash flows from its continued use or the net realisable value of disposing of the asset (its economic value)."

4.65 At the time of the 2000 Determination, the recorded book value was equal to the associated DORC value of the assets.

4.66 As network access tariffs (i.e., the expected cash flows) are derived in part on the value of the asset base, the latter part of this definition leads to problems of circularity. Accordingly, in the first regulatory control period, consistent with the first part of the above definition, the Commission assumed that ODV was equal to DORC.

4.67 Because records were deficient, only partial allowance for historical capital contributions was possible in the 2000 Determination.

4.68 The gap that has opened up between the available book values of those assets as evident in the balance sheet in Power and Water's latest statutory accounts brings to the fore whether all assets would be replaced and/or the extent to which such values exceed the net realisable value of disposing of the assets. These matters are primarily an issue with regard to the sunk assets at commencement of the Code (hereafter referred to as "pre-2000 assets"), as assets constructed or acquired since

then have been undertaken in conjunction with the regulatory regime as well as with enhanced shareholder governance arrangements.

4.69 Given the non-commercial status of Power and Water prior to 2000, and government involvement in determining system augmentations and extensions, it is highly doubtful that all pre-2000 assets can or would be replaced solely on commercial grounds.

4.70 An alternative view of the past role of government is that it funded non-commercial asset investment by Power Networks without expecting that such assets would subsequently earn a full commercial rate of return. The capital that it employed in such assets in part was in effect a capital grant (or contribution). Just as a network service provider is not entitled to a return on capital contributed by customers in the form of gifted assets or capital contributions made towards the cost of constructing or acquiring otherwise uneconomic assets, neither should it now be expected that network users and end users of electricity should pay tariffs that incorporate a full commercial return on capital contributed by the government that at the time was not expected to earn a full commercial rate of return.

4.71 Power Networks has only provided data on past capital contributions by developers and end users, but not by the Government.

4.72 The net realisable value of such assets is most likely well short of their DORC values.

4.73 The doubts that the Commission has in these various regards could only be dismissed were the Government to confirm that it would be prepared to pay a full commercial rate of return on assets in the prices it pays for CSO services it purchases from Power and Water, and that it would do so irrespective of whether the electricity supplier in the Territory was government-owned or not. This would imply that the Government would be prepared itself to pay for services supplied by a *private* electricity supplier based on an amount of capital employed *equal to* the current DORC valuation, thereby not taking exception to Territory consumers and business doing likewise. Only on these grounds would the net realisable value of Power Networks' pre-2000 assets not fall short of the current DORC valuation of those assets.

#### Commission's draft decision

4.74 The Commission is not prepared to validate the full DORC valuation of Power Networks' assets in the absence of evidence to the contrary of the Government's position on the matters outlined above.

4.75 In the Commission's view, the DORC values of the pre-2000 asset (only) need to be discounted by around 10% (including the technical optimisation discussed in the previous issue) for network access tariff increases to stay within sustainable bounds.

4.76 The Commission acknowledges that this 10% value is based on the exercise of its judgment. In the absence of any confirmation from the Government that it is prepared *in future* to purchase tax-funded services from Power and Water inclusive of a risk-adjusted commercial rate of return on the current (pre-optimised) value of Power and Water's pre-2000 assets, the Commission is prepared to embark on a more detailed study of the market value of Power Networks' assets early in the second regulatory control period – including by engaging independent experts on such matters. The purpose of this study would be to assess whether the extent of any discounting of pre-2000 assets in the final determination represents a material error sufficient to trigger a mid-period recalculation of tariffs in accordance with clause 71 of the Code.

#### (3) Adjustment of O&M to efficient levels

#### Issue

What should be the extent, if any, of the adjustment to the 2002-03 O&M expenditure levels on account of operating inefficiencies within Power Networks?

#### Background

4.77 In the 2000 Determination, the Commission agreed to allow Power Networks to phase in operating efficiencies then targeted by the Government over a three-year period, consistent with a phasing-in approach being used by other regulators where the adjustment task is substantial.

4.78 The Commission estimates that these efficiencies targeted around a 20% reduction in Power Networks' O&M costs. The Government has since abandoned these efficiency targets.

4.79 In 2002, the Commission agreed to the engagement by Power Networks of independent consultants (Meyrick & Associates) to evaluate Power Networks' operating performance against other relevant electricity networks businesses in Australia.

#### 4.80 Meyrick's general conclusion was as follows:

"After allowing for differences in functional coverage and factors beyond management control, [Power Networks'] current unit O&M costs would have to be reduced by around 20 per cent to reach best practice. Ten years appears to be a reasonable timeframe for removing the performance gap implying a reduction in the current unit O&M cost of two per cent per annum." (Report (confidential), p.vi.)

Commission's analysis

4.81 When it initially received Power Networks' data set for implementing the November 2003 Decision, the Commission was also alarmed at the dramatic increases in the O&M expenses implied over the equivalent year's values used in the 2000 Determination.

4.82 A comparison of Power Networks' O&M expenditure for 2002-03 used in the 2000 Determination with that put forward in Power Networks' 2004 data is set out in the following table:

	\$M
2000 Determination	
Power Networks' original	21.360
adjusted figure used	20.399
in 2000 Determination	
2004 reset data	32.912

4.83 Considerable interaction between the Commission and Power Networks' (and its advisers) after receipt of Power Networks' O&M data has given the Commission comfort that the O&M estimates for 2002-03 used in the 2000 Determination were considerably under-reported at that time by Power Networks. This seems to have occurred for a number of reasons, the most important of which was the reliance then on a top-down desktop allocation of overheads and other costs to the networks' line of business within Power and Water – now replaced with a more systematic bottom-up allocation of costs embedded in a new financial information system.

4.84 The Commission is therefore satisfied that the actual O&M data for 2002-03 reflects an appropriate *starting point* for the estimating of the Z factor.

4.85 Under of the Code, the Commission must have regard to, among other things:

"...the potential for efficiency gains to be realised by the network provider in expected operating, maintenance and capital costs..." (clause 68(c)); and

"...(the degree of) efficient operating and maintenance practices on the part of the network provider..." (clause 69(2)).

4.86 Moreover, paragraph 7(3) of schedule 6 of the Code states that:

"...the operating expenditure to be included in the calculation of a revenue [or price] cap is to be based on costs facing an efficient operation in Territory circumstances."

4.87 O&M costs are to be based on efficient cost so that network users and end users of electricity are not paying for management inefficiency because they do not have a choice of network service provider.

4.88 The O&M inefficiencies identified by Meyrick could reflect either:

- the operating policies and practices of the board and management; and/or
- government- (i.e., shareholder-) imposed constraints on managerial discretion.

4.89 The difficulties which management has experienced since 1998 in achieving any significant reductions in its per unit O&M costs are to some (indeterminate) extent indicative of constraints experienced by management in implementing policies and practices aimed at reaching Australian best practice O&M levels.

#### Draft decision

4.90 Based on the Meyrick report, the Commission accepts that Power Networks' O&M expenses are around 20% above industry best-practice levels even in the Northern Territory context. This finding broadly accords with the findings of a similar exercise for the Government in 1998.

4.91 The Draft Determination is based on the Commission's assessment that one-half of the 20% inefficiencies observed by Meyrick against best practice in the Northern Territory context are attributable in one way or another to the Government as shareholder, which sees this amount of O&M excluded from the building blocks calculation.

4.92 As confirmed by the limited efficiency gains achieved by management since 1999, such constraints are intended by the Government to deliver certain social benefits (as arise from a no-redundancy policy and a continuing apprenticeship scheme, for example).

4.93 If network users and end-use customers contribute towards the cost of providing these social benefits (which they would not be expected to do if electricity was privately supplied in the Northern Territory or governance arrangements were similar to those generally applying in the NEM States), this is equivalent to a tax imposed on electricity consumption.

4.94 The draft decision will result in the return to shareholders being below the WACC. Likewise, this treatment will see the Government as shareholder retaining in full the benefit of any decisions it (or the board and management) make *in future* to remove the policy-imposed impediments to efficiency. This is fully consistent with incentive-based regulation. It also ensures competitive neutrality in upstream and downstream markets.

4.95 As to the remaining one-half of the 20% inefficiencies observed by Meyrick, by necessity this amount must be attributed to the board and management. On this occasion, the Commission prefers to opt for a more practical phase-in period of 10 years (which is the basis of the  $X_2$  factor determination in the next chapter).

#### Resultant estimates of efficient total costs of supply in 2003-04 (A)

4.96 By applying the above variations to the 2000 Methodology in conjunction with Power Networks' 2004 data, the Commission is able to estimate efficient total costs of supply in 2003-04 as follows:

2002-03	\$M
Non-financial assets net of contributed capital	
(Power Networks' 2004 reset data)	500.819
adjusted by technical optimisation factor	2.24%
equals Pre-2000 non-financial assets	
(Power Networks' 2004 data)	421.871
adjusted by deprival value adjustment factor	7.76%
<u>equals</u> Total regulated asset base	456.864
real WACC	7.42%
<u>equals</u>	
efficient return on capital employed in non-financial assets	33.919
Working capital	3.096
nominal WACC	9.67%
equals	0.000
efficient return on capital employed in financial assets	0.299
Total efficient return on capital employed	34.218
Efficient return of capital employed	22.756
O&M (Power Networks' 2004 data)	32.192
adjusted by efficiency adjustment factor	9.57%
equals Efficient return of operating costs	29.111
Required revenue	86.086
adjusted hu	00.000
output escalation factor	0.92%
CPI	2.10%
X factor	2.00%
2003.04 required revenue (A)	86 024

# Updating total revenue raised from tariffs in 2003-04

4.97 The second value required to estimate the Z factor is an updated estimate of the total revenue (in \$ millions) in 2003-04 derived from all the existing tariffs for the network access services included in the tariff basket in 2004-05.

#### Methodology

4.98 This step was not part of the 2000 Methodology. Hence, a methodology is now required for this purpose.

4.99 As with the estimation of costs, the November 2003 Decision requires the Commission to base its analysis wherever possible on actual data with respect to the 2002-03 year, being the most recently available actual data. A separate methodology is therefore required to escalate the resultant efficient revenue estimate from 2002-03 to 2003-04.

4.100 The Commission has decided to adopt an approach, similar to the approach used to escalate costs, based on the following formulation:

$$R"_{0304} = \sum_{j=1...n} \left[ R^{j}"_{0203} * (CPI_{0304} / CPI_{0203}) * (Q^{j}_{0304} / Q_{0203}) \right]$$

where:

 $R^{l_{y}}$  are annual revenue collections associated with tariffs applying to the j<sup>th</sup> service in the tariff basket being used in the second regulatory control period based on efficient revenue-raising practices and, where applicable, the relevant price control (revenue cap), and where:

j = 1 is the annual sales revenue associated with the regulated network access services that were regulated services during the first regulatory control period based on both efficient revenue-raising practices and the relevant price control (revenue cap), which includes the DKTL tariff but not the system control charge;

j = 2 is the annual sales revenue associated with the network access tariff associated Power Networks' streetlighting activities; and

j = 3 is the annual revenue collections associated with all other (non-regulated) business activities undertaken by Power Networks employing the capital and operating cost bases used in the building blocks analysis;

CPI is the all capital cities headline CPI index published by the ABS;

 $Q^{\rm J}$  is a measure of the quantum of the  $j^{\rm th}$  service  $\mbox{\it charged}$  for during the year; and

the  $0203\ and\ 0304\ subscripts$  denote values for the  $2002\text{-}03\ and\ 2003\text{-}04\ financial\ years\ respectively.}$ 

4.101 The issues confronting the Commission in this task are less complex than those with respect to estimating efficient costs, but they are important nevertheless.

#### (1) Inclusion of non-sales revenue

#### Issue

Should certain items of non-sales revenue be included in the estimation of efficient revenue collections (B)?

#### Background

4.102 In the 2000 Determination, the revenue items to be counted against the revenue cap were not explicitly defined, but the Commission's practice during the first regulatory control period was to limit these amounts to sales revenue only.

#### Commission's analysis

4.103 Generally, the annual revenue collections from all business activities undertaken by Power Networks employing the capital and operating cost bases used in the building blocks analysis should be *included* in assessing the extent to which a regulatory control is being complied with. Where the regulatory control is based on the building blocks analysis (as is the case in the second regulatory control period, albeit only through the Z factor adjustment), all revenue derived from the costs – both capital and operating – included in that building blocks analysis should be included in the associated annual revenue collections notwithstanding that the associated charges are unregulated for whatever reason. If this were not the case, any charging for such costs in addition to the regulated tariff would give rise to "double-dipping" on the part of the regulated service provider.

4.104 The non-sales revenue network items that should be excluded from measuring the efficient revenue collections (B) are those that recover costs aside from those included in the building blocks analysis.

#### Draft decision

4.105 The Draft Determination involves the inclusion of all *on-going* non-sales revenues which are clearly a substitute for sales revenues, including:

- revenues from recoverable works; and
- revenues from other 'miscellaneous charges'.

4.106 Non-sales revenues excluded from the Draft Determination are:

- annual capital contributions (with the associated assets not earning a return for Power Networks);
- interest receipts (with the associated financial assets not in the regulated capital base); and
- all other items in the "non-sales revenue" category of Power and Water's statutory accounts attributable to the networks' line of business that are not on-going (i.e., are once-off) in nature.

#### (2) Use of regulated networks' 2003-04 revenue cap

#### Issue

Should the 2002-03 regulated networks' revenue collections be escalated to 2003-04, or should the 2003-04 revenue collections be directly based on the determined 2003-04 revenue cap?

#### Background

4.107 2003-04 network revenue collections are regulated by the Commission. Prior to the commencement of the year, a revenue cap was determined in accordance with the 2000 Determination.

#### Commission's analysis

4.108 In contrast with the earlier years of the first regulatory control period, the Commission expects that 2003-04 network revenues will accord closely with the revenue cap.

#### Draft decision

4.109 The Draft Determination involves the direct use of the 2003-04 revenue cap. This is the most straight-forward approach and avoids many of the difficulties that would be associated with escalation of 2002-03 revenues.

4.110 In the absence of any indications to the contrary, the Commission has not included any allowance for an over-recovery of the revenue cap in 2003-04 (or an under-recovery for that matter).

#### (3) Escalating other sales revenue and non-sales revenue

#### Issue

How should collections of sales revenue in addition to regulated access services (streetlighting) and non-sales revenue observed in 2002-03 be escalated to 2003-04?

#### Background

4.111  $Q^{j}$  is a measure of the quantum of the j<sup>th</sup> service charged for during a year, for which it is necessary to forecast the percentage annual movement between 2002-03 and 2003-04.

#### Commission's analysis

4.112 The Draft Determination only requires escalation of streetlighting revenue and non-sales revenues for such quantity changes between 2002-03 and 2003-04.

4.113 The quantum of streetlighting services and the services for which revenue is classified as non-sales revenues in the statutory accounts is difficult to estimate.

#### Draft decision

4.114 Because of the difficulties involved in estimating the quantum of streetlighting services and the services for which revenue is classified as non-sales revenues in the statutory accounts, the Draft Determination makes no allowance for escalation of these items. The same nominal value of revenue is factored-in for 2003-04 as observed in 2002-03. Not only is no allowance made for quantity changes, but no allowance is also made for any CPI-linked price escalation.

#### Resultant estimates of efficient revenue collections in 2003-04 (B)

4.115 By applying the above variations to the 2000 Methodology in conjunction with Power Networks' 2004 data, the Commission is able to estimate efficient total network revenue collections in 2003-04 as follows:

<b>\$M</b>
0.641
4.579
0.00%
4.579
75.353
0.00%
75.353
80.573

# Estimate of Z factor

4.116 Having derived estimates of the component "A" and "B" values, the Commission has calculated the Z factor for the Draft Determination as follows:

	\$M
2003-04 required revenue (A)	86.924
2003-04 expected revenue (B)	80.573
Z factor ((A-B)/B)	7.90%

4.117 Accordingly, the Commission's draft determination regarding the Z factor is as follows:

# DRAFT DETERMINATION

That the Z factor for application at the commencement of the second regulatory control period be 7.9%.

# CHAPTER

# 5

# YEAR-BY-YEAR ESCALATION: THE $X_1$ , $X_2$ AND S FACTORS

# The $X_1$ factor

#### Background

5.1 The November 2003 Decision defined the  $X_1$  factor as a factor determined prior to commencement of the second regulatory control period which reflects the difference between annual movements:

- in consumer prices on average; and
- in the electricity network access prices of comparable *best practice* (i.e., efficient) network service providers in other jurisdictions.

5.2 Regulators elsewhere determine X values in a variety of ways, many of them complex in concept and costly to measure.

5.3 Given the small nature of the Northern Territory jurisdiction, the Commission decided in the November 2003 Decision to derive the  $X_1$  factor by piggybacking on the estimates derived and used by larger regulators. This is a valid approach as the parameter being measured is not NT-specific, but relates to characteristics evident in other jurisdictions.

Commission's analysis

5.4 The Commission has used the following sources to scope the range of values for  $X_1$ :

- X factors applied by the Victorian regulator in its 2001 Electricity Distribution *Price Review* (2001-2005);
- the implied X factors in the Queensland regulator's 2001 Regulation of Electricity Distribution Final Determination (2001-2005);
- X factors applied by Ofgem to UK distributors from 2000-2004;
- TFP estimates for the NZ electricity distribution sector for 1996-2003 prepared by the NZ Commerce Commission; and
- X factors employed by the Dutch regulator DTe in setting price caps for electricity distribution and transmission for the period 2004-2006.

5.5 The Commission has also been influenced by the arguments put forward by Meyrick & Associates in their advice to the NZ Commerce Commission in September 2003.<sup>7</sup>

5.6 The relevant data are summarised in the following table, where the  $P_0$  value refers to a year 1 price adjustment:

Regulator:	Po	Year 2 onwards	Trend efficiency component
Victorian <sup>(a)</sup>	18%	1%	2.1%
Queensland <sup>(b)</sup>	0.5%	0.5%	1.8-2.8%
Ofgem 2000 <sup>(c)</sup>	20%+	3%	3%
New Zealand <sup>(d)</sup>	n.a.	n.a.	2.6-3.2%
Dutch <sup>(e)</sup>	7.2%	7.2%	3%

(a) ORG, 2001 Electricity Distribution Price Review, May 2000. Tables 9 and 10, pp21-22.

(b) QCA, Regulation of Electricity Distribution, Final Determination, May 2001, pp 126-134

(c) Ofgem, Distribution Price Control Review, Final Proposals, December 1999.

(d) Commerce Commission, Regulation of Electricity Lines Businesses, Targeted Control Regime, Draft Decisions, Resetting the Price Path Thresholds, 5 September 2003, pp 35-38.

(e) DTe, Methodebesluit Tenne T, 23-09-2003, 101155, Methodebesluit, regionale netbeheerders elektricteit, 15-09-2003, 100947.

5.7 The Commission also notes that, more recently:

- the ACT regulator (November 2003) has proposed an X factor (combining  $X_1$  and  $X_2$ ) of 5.4%; and
- the NSW regulator (January 2004) has proposed X factors (again combining  $X_1$  and  $X_2$ ) for the network service providers it regulates ranging from 1.1% for Integral Energy to 6.5% in the first year and 2.5% in each year thereafter for Country Energy.

5.8 With regard to the X values in the above table, the following points can be made:

- The Victorian regulator applied a large  $P_0$  of 18% (averaged across the network service providers using revenue weights) and a trend X factor for later years of 1.0%. The weighted average contribution of expenditure reductions to the 2001 X factors, combined with the trend X factors applied from year 2 onwards gives a weighted average trend efficiency factor of 2.1%. This overall average efficiency improvement of 2.1% represents a long term average, which the regulator elected to front-load for other reasons. The Victorian data therefore provides a possible range of trend efficiency X factors of between 1.0 and 2.1%.
- The Queensland regulator used consultants to analyse trends in efficiency and identify best practice O&M efficiency levels in Australia and internationally. While the implied efficiency X factor in the draft determination was 2.8%, the final determination reduced the implied efficiency X factor to 1.8%. The Queensland data therefore provides a possible range of 1.8 to 2.8% for trend efficiency X factors.
- In the UK, the energy regulator applied large  $P_0$  adjustments to the distribution businesses combined with a later period X factor of 3.0%. In a similar manner to the case in Victoria, this may be interpreted as the regulator considering 3.0% to represent an appropriate long term trend rate of improvement and the  $P_0$  adjustment a short term gap closure.
- The New Zealand regulator has adopted an approach to X factors comparable to the Commission's, by splitting X into two components representing trend industry efficiency and business-specific factors. Trend industry efficiency was

<sup>&</sup>lt;sup>7</sup> "Regulation of Electricity Lines Businesses: Resetting the Price Path Threshold – Comparative Option" (available on the NZCC website), especially pages 4-9 and 66-67.

estimated using total factor productivity "(TFP)" analysis. Trend TFP for the electricity distribution sector of 3.2% has been identified. After adjusting for productivity and input price differences relative to the economy as a whole, the regulator has proposed using a trend efficiency X factor of 2.6%.

• In the Netherlands, a similar approach has also been applied by the regulator. In setting an overall X factor for distribution and transmission, the regulator has incorporated a trend industry efficiency component of 3.0%.

5.9 From this data, it would appear that European regulators are prepared to set trend efficiency factors that are approximately 0.5% *above* those employed by regulators in New Zealand and 1.0% above those employed by regulators in Australia. Scale effects may be at work in this regard.

#### Draft decision

5.10 On balance, the Commission considers that a trend efficiency factor in the range of  $1\frac{1}{2}\%$  to 3% is appropriate for the purposes of setting the price cap for network charges in the Northern Territory. The upper limit is comparable with trend efficiency identified in the relatively small New Zealand sector, and with the Queensland analysis. At the lower limit, additional weight would be placed on the small scale of the Northern Territory network, and the possible limiting effect that this may have on the opportunities for future efficiencies.

5.11 The Commission considers that a factor of 2.0% represents a reasonable balance.

5.12 The Commission notes that the weighted average X factor applying across the regions to average revenue in the first regulatory control period was in the order of  $3\frac{1}{2}\%$ . This included a large 'stretch' (or X<sub>2</sub>) factor, which the Commission estimates to have been around  $1\frac{1}{2}\%$  (based on eliminating 20% excess in per unit O&M costs over a three year period combined with O&M costs being approximately 30% of the total cost of providing network access services). Hence, the Commission's choice of an X<sub>1</sub> factor of 2.0% in the second regulatory control period is consistent with the value in use in the first regulatory control period.

5.13 Accordingly, the Commission's draft determination regarding the  $X_1$  factor is as follows:

#### DRAFT DETERMINATION

That the  $X_1$  factor for application each year during the second regulatory control period be 2.0%.

# The X<sub>2</sub> factor

#### Background

5.14 The November 2003 Decision defined the  $X_2$  factor as a factor determined prior to commencement of the second regulatory control period which reflects the difference between annual movements:

- in electricity network access prices applied on average by comparable best practice network service providers in other jurisdictions in Australia; and
- by the network service provider in the Northern Territory, on the basis that any remaining O&M inefficiencies reasonably assessed to be within the control of management are eliminated by the end of the third regulatory control period.

Commission's analysis

5.15 The value approach for  $X_2$  is Northen Territory specific.

5.16 As mentioned previously, in 2002 Meyrick & Associates concluded in relation to Power Networks' operating performance against other relevant electricity networks businesses in Australia as follows:

"After allowing for differences in functional coverage and factors beyond management control, [Power Networks'] current unit O&M costs would have to be reduced by around 20 per cent to reach best practice. Ten years appears to be a reasonable timeframe for removing the performance gap implying a reduction in the current unit O&M cost of two per cent per annum." (Report (confidential), p.vi.)

5.17 Based on the Meyrick report, the Commission's draft determination of the Z factor involves one-half of the 20% inefficiencies observed by Meyrick against best practice in the Northern Territory context being attributable in one way or another to the Government as shareholder, which sees this amount of O&M excluded from the building blocks calculation. The Commission attributes the remaining one-half of the 20% inefficiencies observed by Meyrick to the board and management.

#### Draft decision

5.18 Consistent with the Draft Determination of the Z factor, the Commission considers that one-half of the 20% inefficiencies observed by Meyrick against best practice in the Northern Territory context should be the basis for determining an appropriate 'stretch factor'.

5.19 Compared with the 2000 Determination which involved a three year phase-in period for the elimination of such inefficiencies, on this occasion the Commission prefers to opt for a more practical phase-in period of 10 years.

5.20 Eliminating the 10% excess in per unit O&M costs over a 10 year period averages out at 1% per annum. As O&M costs are approximately 30% of the total cost of providing network access services, the Commission considers a reasonable annual stretch factor for incorporation into Power Networks' tariffs to be 0.3% per annum.

5.21 Together, the sum of the  $X_1$  and  $X_2$  factors of 2.3% proposed for the second regulatory control period is less than the implied sum of the  $X_1$  and  $X_2$  factors used during the four years of the first regulatory control period of  $3\frac{1}{2}$ %.

5.22 Accordingly, the Commission's draft determination regarding the  $X_2$  factor is as follows:

# DRAFT DETERMINATION

That the  $X_2$  factor for application each year during the second regulatory control period be 0.3%.

# The S factor

#### Background

5.23 The November 2003 Decision defined the S factor as the factor to constrain the annual movement in the weighted average tariff proposed for each individual customer.

5.24 In applying such side constraints to network access tariffs, the main issues and options are:

- coverage: applying them to all end users (as in Victoria), or to residential customers (as in NSW), or to contestable/non-contestable customers (as in Queensland);
- form: applying them at the individual customer level (as in NSW and Queensland) or at a customer group level (as in Victoria); and
- quantification: specifying the constraints either as a maximum real-terms percentage change, that is, relative to CPI movements, or as a maximum nominal percentage change, or as a maximum dollar amount change.

5.25 Currently in NSW, the side-constraint used is CPI + 2% pa or \$30 pa for standard periodic bills (excluding fees for miscellaneous and monopoly services and charges for higher service standards) for the same pattern and volume of electricity consumption for residential customers.

5.26 Currently in Victoria, the side-constraint used is CPI + 2% pa for average network accesstariffs for any customer class for years 2 to 5. with CPI flat applying in year 1.

5.27 Currently in Queensland, the side-constraint used is CPI + 5% pa for individual contestable customers, and CPI + 2% pa for individual non-contestable customers (including those eligible for contestability but electing to remain within the franchise).

#### Commission's analysis

5.28 Network access is a monopoly service, irrespective of the size or nature of the customer. For this reason, it is logical to provide all customers with the protection afforded by side constraints.

5.29 The case for a differential constraint between customer types depends on the extent to which particular customers are assessed as in need of more or less protection. This may be because they are considered to be at greater risk of large price increases, for example because they are heavily subsidised at present prices, or because they are considered to be more sensitive to price increases. An example of the latter would be low income households. However, in the Commission's view, this objective (of protecting sensitive customers) is better addressed through measures applied to retail rather network prices. As retail price constraints are being applied to franchise retail tariffs, the relevance of additional network price side constraints is questionable.

5.30 Regulatory practice is moving towards application of side constraints to movements in individual customer bills, for the same pattern and volume of electricity consumption. Although the constraint would apply to each individual customer bill, compliance testing of proposed tariffs is assessed based on standard customer usage profiles. Once defined, these can easily be built into compliance spreadsheets.

5.31 The value of the constraint needs to be considered in the context of the level of the Z factor adjustment as well as the X factors. The constraint must accommodate these adjustments.

#### Draft decision

5.32 In light of regulatory-sourced hangover from the first regulatory control period for some rebalancing, the Commission considers a 5.0% real-terms weighted average price constraint *after* the first year - being at the higher end of regulatory practice elsewhere – will provide both encouragement to Power Networks to apply a medium-term perspective to its price structuring decisions and protect network users from price shocks.

5.33 The S factor needs be set at the higher level of 12.9% in the first year (i.e., 2004-05) to allow for the effect of the 7.9% Z factor as well as the rebalancing pressure built up during the first regulatory control period.

5.34 Hence, the Draft Determination involves use of a 5.0% side-constraint on annual increases in an individual's network access tariff on an on-going basis during the second regulatory control period, with the constraint to apply to 2004-05 tariffs (only) being 12.9%.

5.35 Accordingly, the Commission's draft determination regarding the S factor is as follows:

# DRAFT DETERMINATION

That the S factor for application during the second regulatory control period be as follows:

- in relation to the proposed tariffs in 2004-05: 12.9%
- in relation to proposed tariffs in each of the four years after 2004-05: 5.0%

# APPENDIX



# WEIGHTED AVERAGE COST OF CAPITAL (WACC)

#### WACC (2002-03 year-average parameters)

Risk-free rate *	5.37%
Equity risk premium	6.00%
Asset beta	0.50
Debt beta	0.10
Beta (levered) **	0.896
Cost of equity before dividend imputation	10.75%
Imputation factor	0.50
Cost of equity (post-tax)	8.85%
Tax rate	30%
Cost of equity (pre-tax)	1 <b>2.64</b> %
Risk-free rate	5.37%
Debt risk premium	1.20%
Debt issuance costs	0.125%
Cost of debt (pre-tax)	6.70%
Equity-to-capital ratio	50.00%
Debt-to-capital ratio	50.00%
Nominal pre-tax WACC	9.67%
Forecast CPI ***	2.09%
Deal tarma and tar WACO ****	<b>7 0 4</b> 0/

Notes:

\* Average of 10 year Commonwealth Bond rate for 1 July 2002 to 30 June 2003, taken from Reserve Bank Bulletin statistical tables (www.rba.gov.au).

\*\* The Monkhouse formula is used to derive the equity beta.

\*\*\* The forecast CPI is measured as the difference between in yields on nominal and indexed 10 year Commonwealth Bonds, taken from Reserve Bank Bulletin statistical tables. \*\*\*\* real pre-tax WACC calculated using a market transformation to adjust pre-tax nominal WACC.