2005 Price Controls Review

Second Consultation Paper

February 2005

DOCUMENT NO.:	APPROVED BY:	NO. OF CONTROLLED DOCUMENT ISSUED.
CR/E02/021	DIRECTOR GENERAL	1. AADC 2. ADDC 3. ADWEA 4. ADWEC 5. RASCO 6. TRANSCO 7. Bureau's Library Total: 7

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Foreword

In August 2004, the Regulation and Supervision Bureau (the "Bureau") commenced a review of the price controls that apply to the following companies:

1. Al Ain Distribution Company (AADC);
2. Abu Dhabi Distribution Company (ADDC);
3. Abu Dhabi Water and Electricity Company (ADWEC);
4. Abu Dhabi Company for Servicing Remote Areas (more commonly known the Remote Area Services Company, or "RASCO"); and
5. Abu Dhabi Transmission and Despatch Company (TRANSCO).

The present price controls for all five companies are due to expire on 31 December 2005. New price controls are therefore required to be set to take effect from 1 January 2006. These new controls are termed the "third price controls", or "PC3". The Bureau is due to publish Draft Proposals for PC3 in June 2005, and Final Proposals in August 2005.

The First Consultation Paper published in August set out the important issues which need to be considered in setting the PC3 controls. The Bureau received detailed responses to that paper, which has helped it develop its thinking on these issues. This Second Consultation Paper summarises these responses and sets out the Bureau's current thinking on the issues.

Written responses to the issues raised in this paper should be sent by **16 March 2005** to:

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The Bureau proposes to make responses to the consultation exercise publicly available.

Nick Carter
Director General
Regulation and Supervision Bureau

1 Summary

1.1 Introduction

AADC, ADDC, ADWEC, RASCO and TRANSCO are subject to price controls set by the Bureau to protect customers and to promote efficiency:

- The first price controls (PC1) for AADC, ADDC, ADWEC and TRANSCO were set to run for three years starting from 1 January 1999 and were later extended for a further year up to 31 December 2002. The second price controls (PC2) for these companies were set in 2002 to apply for three years (2003-2005).

- A set of price controls was established for RASCO in 2003 to apply for two years (2004 and 2005). Previously, some activities of RASCO were subject to tariffs approved by the Bureau.

All of the present price controls are of the CPI-X type and act as annual revenue caps for the relevant businesses. With the exception of ADWEC, there are presently separate price controls for the water and electricity businesses of each company. The present price controls are accompanied by a Performance Incentive Scheme (PIS).

The present price controls are due to be replaced by new or third price controls (PC3) with effect from 1 January 2006. The Bureau therefore commenced a review of the price controls in August 2004 by publishing the First Consultation Paper. That document set out the issues which need to be considered in setting the PC3 controls and on which the views of respondents were sought. Important issues raised in the paper related to the form, structure, scope, separation and duration of PC3 controls, to incentives within the new controls, and to the key inputs to the price control calculations. The Bureau has received detailed responses from AADC, ADDC, ADWEC and TRANSCO to the First Consultation Paper.

The Bureau now publishes this Second Consultation Paper to set out its current thinking on the issues taking into account the responses to the First Consultation Paper. The Bureau intends to publish the Draft and Final Proposals on the PC3 controls in June and August 2005, respectively.

1.2 Main Features of Bureau's Current Thinking on PC3

The Bureau's current thinking on various issues relating to the PC3 controls discussed in this Second Consultation Paper is summarised below. These and other proposals are summarised in more detail at the end each section of the document.

Form and Structure of Controls

- Continuation of CPI-X controls with a hybrid of a pure revenue cap and revenue driver approach (fixed term only for ADWEC).

- A control duration of 4 years for all companies (2006 – 2009 inclusive).

- Separate controls for the distribution and supply businesses of ADDC and AADC, and for the water and electricity businesses of ADWEC.

- Some refinements to the definitions of revenue drivers and of regulated income, and to the weights of revenue drivers.

- Pass-through of production costs for ADWEC to be capped at the level implied by the previous year's unit production costs.

Operating and Capital Efficiency

- Improvements in operating efficiency of 3 – 7 per cent a year in real terms.

- Following review of audited PC1 capex, upward revision of PC1 capex allowances from 75% to 84% – 94% (depending on company).

- Review of PC2 capex deferred to the next price control review once audited data for the whole period is available.

- Continuation of the "ex post" approach to the financing of capital expenditure for PC3. This involves a provisional allowance being set in advance and capex actually spent is reviewed after the event against the Bureau's efficiency criteria.

Cost of Capital / Profit Margin

- A real, post-tax cost of capital in the range 4.5 – 5.6 per cent for the network businesses and RASCO. A higher return may be considered for the distribution businesses.

- A return on turnover of 0.019 – 0.023 per cent for ADWEC and a similar return for the supply businesses, consistent with the cost of capital for other businesses.

Performance Incentive Scheme (PIS)

- New Category A performance indicators will be introduced for performance on (1) a set of technical performance indicators (see Table 8.4) and (2) timely submission of the Annual Information Submission.

- Increase in the overall cap on Category A adjustments for PC3 (up to +/- 5% of MAR in relation to companies' "own costs") to reflect the increase in the number of Category A indicators.

- The Bureau will make adjustments at this review for Category B indicators where performance during PC3 to date has been particularly good or bad, and for companies' performance in respect of the provision of information to the Bureau.

Respondents are invited to submit to the Bureau by **16 March 2005** their views on any of the issues discussed in this document.

1.3 Progress on the 2005 Price Controls Review

The First Consultation Paper in August 2004 set out the timetable for the remainder of the review. **Table 1.1** below sets out the progress to date against that timetable.

Table 1.1: Progress to Date on 2005 Price Controls Review		
First Phase – Issues and Data		
Target Date	**Task**	**Actual Date**
30 August 2004	Bureau published First Consultation Paper	30 August 2004
15 September 2004	Bureau made presentation to Companies	15 September 2004
15 September 2004	Bureau issued First Information Request	15 September 2004
13 October 2004	Responses to First Consultation Paper: AADC ADDC ADWEC RASCO TRANSCO	 13 October 2004 13 October 2004 19 October 2004 No response 16 October 2004
10 November 2004	Responses to First Information Request: AADC ADDC ADWEC RASCO TRANSCO	 17 January 2005 (partial) 18 December 2004 (partial) No response No response 5 December 2004 (partial)

The Bureau has received detailed, and generally supportive, responses to its First Consultation Paper. The Bureau had meetings in early December separately with AADC, ADDC and TRANSCO to discuss their respective responses. A meeting was also offered to ADWEC.

These responses are discussed in the relevant sections of this paper. The Bureau agrees with many of the suggestions put forward by the respondents. In other cases, where the Bureau does not presently agree to the responses, or where it proposes changes or refinements to the respondents' suggestions, then this paper explains the reasons or seeks more information.

While the responses to the First Consultation Paper were generally received in a timely manner, the companies have been slow to respond to the First Information Requests. However, responses have now been received from AADC, ADDC and TRANSCO. The Bureau is in the course of a series of meetings with these companies to discuss their responses. ADWEC, by contrast, has declined to respond to the First Information Request before the end of May 2005. The Bureau has informed ADWEC that this is not acceptable.

More positively, the Bureau has now received audited Separate Business Accounts (SBAs) and audited Price Control Returns (PCRs) from all monopoly companies for each year of the period

1999-2003. However, the audited accounts for RASCO are not separated between its water and electricity businesses and the audited PCRs for ADWEC are incomplete.

Table 1.2 below sets out the timetable for the remainder of the review.

Table 1.2: Remaining Timetable for 2005 Price Controls Review	
Second Phase – Analysis and Assessment	
2 February 2005	Bureau published ***Second Consultation Paper***
16 February 2005	Bureau to make presentation to Companies
16 February 2005	Bureau to issue ***Second Information Request*** to Companies
16 March 2005	Companies to respond to Second Consultation Paper
31 March 2005	Audited Price Control Returns (PCRs) for 2004 due from Companies
13 April 2005	Companies to respond to Second Information Request
Third Phase – Proposals and Implementation	
1 June 2005	Bureau to publish ***Draft Proposals***
30 June 2005	Audited (Separate Business) Accounts for 2004 due from Companies
16 July 2005	Companies to respond to Draft Proposals
31 August 2005	Bureau to publish ***Final Proposals***
1 January 2006	PC3 controls to take effect

1.4 Structure of this Document

The remainder of this document is structured as follows:

– **Section 2** provides background information on the regulatory framework of the Abu Dhabi water and electricity sector.

– **Section 3** discusses the form of the controls including their type, duration, and scope.

– **Section 4** discusses the structure of the controls, including revenue drivers and pass-through items.

– **Section 5** discusses assumptions for the future level of operating expenditure (opex).

– **Section 6** discusses the treatment of past and future capital expenditures (capex) and the calculation of Regulatory Asset Values (RAVs).

– **Section 7** sets out the Bureau's current thinking on the cost of capital for the network businesses and RASCO, and on the profit margin for non-network businesses.

– **Section 8** discusses the design of the Performance Incentive Scheme (PIS) for the PC3 control period and discusses possible financial adjustments to the PC3 calculations for past performance of the companies under the scheme.

– **Section 9** describes various other financial adjustments which will be required to the PC3 calculations.

Each section discusses the responses to the First Consultation Paper and describes how the Bureau's current thinking on the various issues has developed in view of these responses.

2 Present Regulatory Framework

2.1 Sector Structure

The First Consultation Paper described the new structure of the Abu Dhabi water and electricity sector following the passage of Law No (2) of 1998. A main feature has been the ongoing privatisation of Generation and Desalination Companies (GDs), previously wholly-owned by the Abu Dhabi Water and Electricity Authority (ADWEA) but increasingly replaced by Independent Water and Power Producers (IWPPs). In addition, the following five sector companies were created and have been subject to some form of controls on their prices set by the Bureau:

- The "single buyer", ADWEC, which is responsible for planning and contracting for new production capacity for the sector, for the purchase of fuel for the GDs, and for the sale of bulk supplies of water and electricity to the distribution companies.
- TRANSCO, responsible for the transmission and despatch of both electricity and water.
- ADDC and AADC, which undertake the distribution and supply of water and electricity in the municipality areas of Abu Dhabi and Al Ain, respectively.
- RASCO, which undertakes electricity generation and water production in remote areas.[1] While RASCO has contracted out the operation of these activities to the two distribution companies, they remain RASCO's legal responsibility, and so RASCO is subject to price controls on its production activities as described in this document.

The main interactions between the sector companies are as follows:

- ADWEC purchases capacity and output from GDs under the terms of Power and Water Purchase Agreements (PWPAs). ADWEC also purchases fuel for supply to GDs.
- ADWEC then sells bulk supplies of water and electricity to the two distribution companies at the Bulk Supply Tariffs (BSTs).
- In addition to purchases from ADWEC, distribution companies purchase some water and electricity from RASCO.
- The distribution companies also pay Transmission Use-of-System (TUoS) charges to TRANSCO.
- The distribution companies receive revenue from final customers and subsidy from the Government.

Law No (2) of 1998 also established the Bureau as the sector's independent regulatory body.

[1] RASCO's distribution and supply assets were transferred to the two distribution companies in 2001.

2.2 Price Controls

2.2.1 The Overall Framework

The regulatory framework for the sector was discussed in detail in the First Consultation Paper. Its main features are summarised in **Table 2.1** below:

Table 2.1: Regulatory Framework for Abu Dhabi Water and Electricity Sector

Activity or Cost	**Framework**
Production (by IWPPs)	ADWEC's economic purchasing obligation (via competition to build)
Production (by other GDs)	ADWEC's economic purchasing obligation (via benchmarking against IWPPs or other modern plant)
Fuel Purchases (by ADWEC)	ADWEC's economic purchasing obligation
ADWEC's Procurement	CPI-X Price Control
TRANSCO's Transmission	CPI-X Price Control
ADDC / AADC's Distribution and Supply	CPI-X Price Control
RASCO's Production	CPI-X Price Control

Table 2.2 below summarises the projected costs for each sector company or activity:

Table 2.2: Estimated Sector Costs or Revenues for 2003-2005

AED million	**2003**	**2004**	**2005**
Production Costs (AEDm in nominal terms)			
ADWEC's PWPA Costs	2,263.00	2,752.12	3,604.00
ADWEC's Fuel Costs	1,409.07	1,514.87	1,466.61
Projected MARs as per PC2 controls (AEDm in 2003 prices)*			
ADWEC Procurement	10.72	10.72	10.72
TRANSCO Electricity	725.77	800.96	895.94
TRANSCO Water	513.01	535.59	559.07
ADDC Electricity	659.41	681.49	701.59
ADDC Water	281.61	302.95	330.08
AADC Electricity	355.75	362.75	370.06
AADC Water	135.90	142.18	150.83
Projected MARs for RASCO (AEDm in 2004 prices)**			
RASCO Electricity		88.80	89.83
RASCO Water		171.99	169.40

Sources: Bureau's Final Proposals for PC2 and RASCO; ADWEC's 2004 and 2005 BSTs
Note: * Excludes pass-through costs. ** Includes fuel costs

2.2.2 Main Features of Current Price Controls

The main features of the current price controls are discussed below. A fuller discussion is included in the First Consultation paper.

1. ***CPI-X Regulation:*** The price controls are of a "CPI-X" type which constrains changes in the companies' overall revenue to a measure of price inflation (CPI) less an amount "X" set to take into account factors such as expected efficiency improvements, demand growth and revenue profiling over the control period.

2. ***Revenue Caps:*** The CPI-X price control for each company or business acts as an annual revenue cap which defines the "Maximum Allowed Revenue" (MAR) that it recovers from its customers (or from government subsidy, in the case of distribution companies) in any year of the control period.

3. ***Structure of Controls:*** The MARs include a fixed term but are also partly determined by "revenue drivers" (such as peak demands, metered units transmitted or distributed, number of customers, etc.) set to reflect the cost structure of the companies and to provide desirable incentives.

4. ***Separation of Controls:*** Presently, there are separate price controls for the water and electricity businesses of all the companies, except ADWEC, which is subject to a single price control. For the distribution companies, the price controls (separate for water and electricity) presently cover both distribution and supply activities.

5. ***Pass-Through Costs:*** Price controls apply directly to companies' "own costs", which are considered to be within their control. Costs which are subject to competition, or to regulation elsewhere in the supply chain, are treated on a pass-through basis.

6. ***Efficient Levels of Costs:*** The price controls have been set to allow the companies to recover an efficient level of costs, comprising allowances for operating expenditure, depreciation and a return on capital.

7. ***Incentives for Cost Efficiency:*** By virtue of their medium-term revenue cap nature, the price controls provide strong incentives for companies to reduce costs since they are allowed to retain the benefit of any unforeseen efficiency gain (in the form of extra profits) until the next price control review.

8. ***Treatment of Capex:*** With the exception of RASCO, allowances for capex have been set on the basis of *'ex-post'* assessment – i.e., allowed capital expenditure is determined after the event (based on efficiency criteria established by the Bureau).

9. ***Cost of Capital:*** A real post-tax cost of capital of 6% was used in setting the price controls for all the companies. In the case of ADWEC, which has few physical capital assets, the return was expressed as a return on turnover (profit margin) .

10. ***Performance Incentive Scheme:*** A Performance Incentive Scheme (PIS) was introduced as part of the present price controls (PC2) and for RASCO to incentivise the companies to improve their performance on various aspects of their operations.

2.3 Second Price Controls (PC2)

2.3.1 PC2 Structure

The controls that apply to AADC, ADDC, ADWEC and TRANSCO for 2003-2005 are summarised below:

ADWEC

MAR = PWPA Costs + Fuel Costs + A + Q – K

TRANSCO (separate water and electricity price controls)

MAR = a + (b × Peak Demand) + (c × Metered Units Transmitted) + A + Q - K

ADDC & AADC (separate water and electricity price controls)

MAR = Electricity or Water Purchase Costs + Transmission Charges + DSR + Q - K

DSR = a + (b × Number of Customers) + (c × Metered Units Distributed)

Where:

‘A’ for ADWEC means its maximum allowed procurement cost;

‘A’ for TRANSCO means its allowed ancillary services costs;

‘a’ is the notified value for the fixed amount;

‘b’ is the notified value for the co-efficient of the first revenue driver;

‘c’ is the notified value for the co-efficient of the second revenue driver;

‘DSR’ is the allowed distribution and supply revenue for ADDC and AADC;

‘K’ is the correction factor adjusting any over or under-recovery in the preceding year; and

‘Q’ is the revenue adjustment for performance under the PIS in the previous year.

2.3.2 PC2 Notified Values

The notified values of, ‘a’, ‘b’ and ‘c’, and of ‘A’ for ADWEC, were determined for the first year of the control period (2003). They are then automatically adjusted by CPI-X for each subsequent year of the period (to 2005), according to the following formula:

$$a_t = a_{t-1} \times (1 + (CPI_t - X) / 100))$$
(same formula for 'b' and 'c', and 'A' for ADWEC)

Here, CPI_t reflects the UAE inflation in the previous year (ie, in year t-1).

Table 2.3 below shows the values that were notified by the Bureau for PC2 controls following its price control calculations and consultations with the companies:

Table 2.3: Notified Values for PC2

	Notified Values			
	X	**A or a**	**b**	**C**
ADWEC Procurement	0.0	10.72 AED m		
TRANSCO Electricity	0.0	522.77 AED m	44.28 AED/kW	1.05 fils/kWh
TRANSCO Water	0.0	347.75 AED m	305.57 AED/TIG	0.44 AED/TIG
ADDC Electricity	0.0	442.01 AED m	761.40 AED/customer account	0.45 fils/kWh
ADDC Water	0.0	197.56 AED m	382.74 AED/customer account	0.69 AED/TIG
AADC Electricity	0.0	235.68 AED m	1,028.83 AED/customer account	0.57 fils/kWh
AADC Water	0.0	92.74 AED m	586.50 AED/customer account	1.75 AED/TIG

While 'X' was set at zero (to ensure an appropriate profiling of revenue over the price control period), the underlying allowed revenue calculations included assumed opex efficiency improvements of 5% a year in real terms.

2.3.3 Treatment of Capex in PC2

A particularly important issue in setting the PC1 and PC2 controls was the treatment of capital expenditure (capex). As described in the First Consultation Paper, the PC1 controls made no allowance for capex over 1999–2002. The Bureau agreed to remunerate companies for efficient PC1 capex at the 2002 price controls review. However, in the continuing absence at the 2002 price controls review of audited data on past capex, the Bureau made a *provisional* capex allowance for 1999-2002, as summarised in **Table 6.2** in Section 6 of this paper.

A similar approach was adopted at the PC2 review for future capex. While the Bureau wished to include the full allowance for future efficient capex (2003-2005), companies' capex projections for 2003–2005 made available to the Bureau at that time were subject to considerable uncertainty. The Bureau therefore also adopted *provisional* projections of companies' capex for 2003-2005, also summarised in **Table 6.2** in Section 6 of this document.

There was thus a significant increase in the MARs for the companies from the PC1 period (when there had been no capex allowance) to the PC2 period (when provisional amounts were financed for both PC1 and PC2 capex).

It was agreed at the 2002 price controls review that once the Bureau receives audited data on actual capex over 1999-2002 and 2003-2005, it will be reviewed against its efficiency criteria.

Any difference between efficient past capex and the provisional allowances will be reflected in a financial adjustment (to future revenues) at the next price controls review.

For ADWEC, capex is very small and for the purposes of the PC2 control was treated in the same manner as opex (see Section 5 of this document for further details).

2.3.4 Inheritance of RASCO's Former Distribution and Supply Activities

With effect from 1 January 2001, the distribution and supply activities of RASCO have been transferred to ADDC and AADC in their respective authorised areas and hence are subject to the PC1 and PC2 controls for these companies for 2001 onwards.

While operating expenditures relating to these activities for 2003 onwards have been taken into account while setting PC2 for ADDC and AADC, such expenses incurred during 2001-2002 have not yet been remunerated, necessitating an appropriate adjustment to the future price controls of ADDC and AADC at this review.

Further, if the distribution companies made a payment for the distribution and supply assets inherited from RASCO, an appropriate adjustment will be required at this review for ADDC and AADC for capital costs (both return on capital and depreciation) they have incurred since 2001 associated with these assets.

The above issues are discussed in full in Section 9.

2.3.5 PC2 Performance Incentive Scheme (PIS)

A Performance Incentive Scheme (PIS) was introduced in PC2 to provide a stronger incentive for companies to improve their performance.

There are two "Category A" performance indicators for each separate business of the companies related to:

(i) the timeliness of audited separate business accounts (SBAs), and

(ii) the timeliness of audited price control returns (PCRs).

Good (poor) performance on these indicators leads to an automatic upward (downward) adjustment to MARs via a new term "Q" in the price control formulae. There are precise targets and incentive rates for these indicators stated in each company's licence and, to reduce risk for the companies, the adjustment to MAR via the term "Q" in any year has been capped at 2% of MAR in respect of companies' "own costs" in that year.

A number of "Category B" performance indicators have also been introduced which have been monitored over the PC2 period, with a possible financial adjustment made in respect of significantly good or poor performance at the present review (see Section 9). These indicators are set out in Appendix F of the Bureau's PC2 Final Proposals of November 2002.

2.4 Economic Regulation of RASCO

2.4.1 Present Price Controls for RASCO

Following the restructuring of RASCO in 2001, RASCO's business is now solely that of electricity generation and water production. Although the operation of these activities is sub-contracted to ADDC and AADC, they remain RASCO's legal responsibility and the revenues which RASCO can earn from the sale of water and electricity to ADDC and AADC need to be regulated.

During 2003, the Bureau reviewed the framework for economic regulation that applies to RASCO's production activities. This process resulted in the establishment of price controls for RASCO to apply for two years (2004-2005). The duration of the controls was chosen so that RASCO's price controls expire at the same time as the price controls for other sector companies, enabling all controls to be reviewed concurrently at the present review.

Broadly speaking, the form of the controls for RASCO is similar to that for other monopoly companies in the sector. There are two incentive-based CPI-X revenue caps for RASCO, separately for its electricity generation and water production businesses. These controls cap the Maximum Allowed Revenues (MARs) which RASCO can recover from its sales of electricity and water respectively. Once reflected in RASCO's charges to the distribution companies, they remove the need for RASCO to receive subsidy (all sector subsidy can be paid directly to the distribution companies).

The structure of RASCO's present price controls can be summarised as follows:

$$\mathbf{MAR = a + (b \times Revenue\ Driver) + F + Q - K}$$

Where:

a is the notified value for the fixed amount (expressed in AED million);

b is the co-efficient of the revenue driver (expressed in AED/kW for electricity or AED/TIG for water);

F is the allowed fuel cost, as defined below;

K is the correction factor adjusting any over or under-recovery of revenue in the preceding year. For the first year of control period (i.e. 2004), K has been set to zero; and

Q is the revenue adjustment for performance under the PIS in the preceding year.

The notified values 'a' and 'b' were determined for the first year of the control period (2004) and are adjusted by CPI-X factor for the following year (2005) using the same formula as applied under PC2 for other companies (see Section 2.3.2 above). The notified values for RASCO are given in **Table 2.4**:

Table 2.4: Notified Values for RASCO Price Controls (2004-2005)

	Values for 2004		
	X	**a**	**b**
Electricity Generation Business	0.0	32.57 AED m	62.76 AED/kW
Water Production Business	0.0	79.35 AED m	3.89 AED/TIG

To incentivise RASCO to improve its fuel consumption efficiency, the allowed fuel cost 'F' for any year of the control period for each business is calculated as a weighted average of actual fuel costs and a benchmark level of fuel costs, as follows:

$$\mathbf{F = (0.95 \times AF) + (0.05 \times Z \times BUF)}$$

Where:

AF = Actual fuel costs of RASCO for electricity or water in the relevant year (AED million)

$\mathbf{Z_t}$ = For the electricity business, means the quantity of electricity produced from any source in the relevant year (expressed in kWh) and for the water business means the quantity of water produced from distillers only in the relevant year (TIG)

BUF = The benchmark unit fuel costs for electricity and water (20 fils/kWh and 8 AED/TIG, respectively), set by the Bureau based on realistically achievable levels of fuel consumption efficiency by RASCO.

Some important features of RASCO's price controls are as follows:

- In contrast to the price controls for the network companies, the price controls for RASCO were set with firm (not provisional) allowances for capital expenditure with no further review at a later stage. If actual capex is less than projected, RASCO will retain any benefit for the duration of the price control period, before the actual capex and depreciation are incorporated into the RAV at this review. If actual capex is more than projected, there will be no adjustment to the RAV of RASCO. See Section 6.4 for more details.

- A PIS similar to other companies has been introduced for RASCO with two "Category A" indicators for the timelines of audited Separate Business Accounts (SBAs) and Price Control Returns (PCRs) for the water and electricity businesses. In addition there are a number of "Category B" indicators as set out in Table 10.2 of the Bureau's Final Proposals of November 2003 for RASCO. However, for RASCO, the adjustment to MAR via the term "Q" in any year has been capped at 5% of MAR in that year (rather than 2% cap presently for the other companies). This followed experience with the other companies that suggested it was necessary to strengthen the incentive to improve the sector's performance.

2.4.2 Adjustments for Past RASCO Subsidy Shortfall

During 1999-2003, the water and electricity production assets of RASCO "dedicated" to specific customers were subject to tariffs approved by the Bureau.[2] However, certain activities, such as "non-dedicated" production activities and distribution and supply activities, were not subject to any specific regulation by the Bureau during this period. In respect of these latter activities, the Bureau considers that the following arrangement can be applied to calculate subsidy requirements for RASCO:

- **1999 – 2000 (all RASCO activities).** It is understood that RASCO's costs during 1999-2000 have been taken into consideration by the consultants (NERA) appointed by ADWEA in their sector subsidy requirement calculations for 1999-2000.

- **2001 onwards (ex-RASCO distribution and supply activities).** The distribution and supply activities of RASCO have been transferred to ADDC and AADC and hence are subject to PC1, PC2 and subsequent controls for the two distribution companies, together with the adjustment described in section 2.3.4 above.

- **2001 onwards (RASCO production activities).** The Bureau has agreed with ADWEA to make a one-off adjustment at this review to remunerate RASCO, to the extent necessary, for the subsidy shortfall in 2001 – 2003 in accordance with the present price controls applied retrospectively to that period.

These matters are further discussed in Section 9 of this paper, along with the Bureau's current estimate of the required adjustments.

[2] See the Bureau's First Consultation Paper for PC3 published in August 2004 for definitions of "dedicated" and "non-dedicated" production activities of RASCO.

3 Form of Controls

3.1 Introduction

In establishing a framework for the new price controls for the companies, the Bureau needs to consider a number of fundamental aspects of regulation. These include the type of regulation, and the form, duration, separation and scope of price controls. These were discussed in detail in the First Consultation Paper, which raised the following issues for consultation:

1. *"The Bureau's current thinking is to continue with CPI-X type of regulation for the new price controls.*

2. *The Bureau's current thinking is to continue with a hybrid of a pure revenue cap and revenue driver approach for the form of the price controls.*

3. *Should the duration of the PC3 controls be three years as at present, or be extended to, say, four years?*

4. *Should separate water and electricity businesses be defined for ADWEC's activities, allowing separate controls for the two businesses?*

5. *Should there be separate price controls for the supply and distribution businesses of ADDC and AADC? (That is, four controls in total for each company: (i) electricity distribution, (ii) electricity supply, (iii) water distribution, and (iv) water supply.)*

6. *Do you agree that income associated with licensed activities but collected from parties other than customers should count towards "regulated revenue" in determining compliance with the price controls?"*

The Bureau has received detailed responses to these issues from the companies. These are discussed in the following sections, which also explain the Bureau's current thinking on the above issues in the light of these responses.

3.2 Type of Regulation

Since the sector restructuring in 1999, the monopoly companies in the sector (and RASCO more recently) have been subject to CPI-X price controls set by the Bureau. This means that their allowed revenues are constrained to change each year by a measure of price inflation (represented by the Consumer Price Index, CPI) less a factor, X.

The First Consultation Paper discussed a number of factors that need to be taken into consideration in assessing the continuing suitability of CPI-X regulation for the sector for the PC3 period. These included strong efficiency incentives of CPI-X regulation, sector experience to date in reducing the costs, expected privatisation of the distribution companies, and the Bureau's statutory duties for efficient sector and consistency of its decisions.

Overall the First Consultation Paper favoured the continuation of the CPI-X regulation for all the monopoly companies in the sector.

All the respondents to the First Consultation Paper also supported the continuation of CPI-X regulation. Two respondents raised certain additional points, which are summarised below:

- AADC highlighted the need for the regulatory arrangement to take account of: (1) the practical considerations arising from the operational environment of AADC, in particular the nature of supervision and control by government strategy and policy; (2) the expected privatisation of AADC; (3) any plans for the introduction of competition in the supply businesses; and (4) the relative immaturity and high growth of the sector/AADC. AADC also suggested that some features of rate of return regulation, particularly a trigger mechanism, or floor and ceiling type arrangement, may be considered for PC3 controls should a more ex ante form of regulation is adopted.

  AADC has raised important issues, and the Bureau would welcome any detailed suggestions for adjustment to the regulatory arrangement for the above factors. However, it considers that the CPI-X regulation and other aspects of the PC3 controls considered in this paper do take account of the above factors:

  - The definitions and projections of the revenue drivers used for the price controls would take account of the maturity and high growth factors of the sector.

  - The overall CPI-X form of regulation and the approach to the cost of capital estimation in this paper remains valid after the expected privatisation of AADC and in the early phase of any competition in the supply businesses until such a market is sufficiently competitive.

  - The regulatory arrangement would be fully consistent with the government strategy and policy as set out in Law No.2 of 1998. Any material change in law during the control period, such as imposition of a tax, can be taken into consideration at the subsequent price controls review or via a licence amendment, unless taken care of by the licence – for example, the licence definition of "regulated revenue" which is the revenue after deduction of any tax on such revenue. As far as the role of government or ADWEA as a shareholder of AADC is concerned, the Bureau has explained in detail in the consultation papers on the previous price controls reviews that there is no statutory provision for it to distinguish between the company and its shareholder. Any decision with regards to the operations and management of the company undertaken by the company or its shareholder, if relevant, would automatically be reflected in the profits of the company. This incentivises the company and its shareholder to make informed decisions.

  With regards to a possible trigger mechanism, or a ceiling and floor arrangement, the Bureau's current thinking is that such a mechanism will unnecessarily increase the complexity of the regulatory regime and weaken the efficiency incentives of CPI-X regulation. The Bureau considers that the risks can be reduced by the companies paying adequate attention to the accuracy and completeness of data provided to the Bureau.

- ADWEC did not agree to the comment in the First Consultation Paper that there are not yet indications that the Abu Dhabi companies have been able to reduce their costs.

ADWEC considered that a discussion in the paper reporting that ADWEC's costs increased by 50% from about AED 6 million in 1999 to about AED 9 million in 2002 is misleading. According to ADWEC, such cost increases should be seen in the context of increases in generation capacity by 48%, in desalination capacity by 98%, and in the responsibilities of ADWEC during the same period.

As discussed in Section 3.3 of this document, ADWEC has suggested a "responsibility-based" approach for its price controls that will allow the Bureau to make a financial adjustment to its price controls at the end of the PC3 period according to the level of responsibilities acquired during the PC3 period. In principle, the Bureau prefers an approach whereby future responsibilities are identified and costed in advance. However, the Bureau understands that there may be some activities or developments which are uncertain and difficult to forecast accurately. The Bureau will therefore consider making appropriate adjustment at the future price controls review based on appropriately justified costs (over and above those financed by the PC3 controls) incurred by licensees during the PC3 period for such additional responsibilities or workstreams.

Such a mechanism has been adopted by the Bureau in the past where needed – for example, to finance the cost of RASCO distribution and supply activities inherited by distribution companies during the PC1 price control period – but would only be expected to be applied in exceptional circumstances. Furthermore, ADWEC in particular needs to demonstrate improvement in its functions and fulfillment of its statutory obligations. Particularly, it has to improve on its poor performance on timely provision of accurate information, both audited and un-audited, to the Bureau.

While the Bureau is willing to consider an appropriate allowance in the price controls for ADWEC's genuine staff requirements and for expected increases in their workload, the Bureau did not see a significant increase in ADWEC's workload over the recent past as indicated by ADWEC in its response. Rather, the Bureau over the recent years has streamlined a number of workstreams relating to ADWEC's statutory obligations, such as preparation of the BST, annual review of PWPAs for ADWEA-owned GDs, and preparation of seven-year planning statement, resulting in significant reductions in ADWEC's workload.

With regards to ADWEC's comparison of its costs with the production capacities, this seems inconsistent with ADWEC's position at the last review restated in its response to the First Consultation Paper that production capacities are not appropriate drivers for its costs.

Overall, the Bureau's current thinking is that CPI-X regulation is appropriate for the sector companies in view of its strong efficiency incentives, the consistency of regulation and supportive views from all the respondents to the First Consultation Paper. The Bureau is confident that the companies, with improved management and operational systems, and with the expected privatisation of distribution companies, will be able to respond positively to the efficiency incentives of CPI-X regulation.

3.3 Form of Controls

The CPI-X regulation of all the monopoly companies in the sector has to date taken the form of revenue caps for the businesses comprising a fixed component and one or two components linked to "revenue drivers". The exception to this is ADWEC whose revenue cap, at its request, comprises only a fixed term. These revenue caps are constrained to change each year by CPI- X and by the changes in the values of the revenue drivers.

The First Consultation Paper considered three main forms for the PC3 controls:

- A **revenue yield control**, which caps the revenue per unit of output which a company can recover;
- A **pure revenue cap**, which caps the overall revenue which a company can recover in any year;
- A **hybrid approach**, which is combination of the above.

The First Consultation Paper identified the following main objectives which should be considered in designing the form of control for Abu Dhabi:

- Providing incentives to meet growing sector demands and customer numbers;
- Providing incentives for metering and loss/leakage reduction;
- Minimising unproductive demand risk;
- Ease of understanding for sector participants so that they can respond to incentives provided;
- Facilitating calculation of subsidy requirements;
- Allowing flexibility in setting individual tariffs (in view of ADWEA's responsibilities in respect of subsidised tariffs).

The Bureau's initial assessment was that the continuation of the existing form of control – i.e., a hybrid of the pure revenue cap and the revenue yield approach – would continue to be the best way of meeting these objectives. The approach is now well understood by sector participants and has provided a clear and universally accepted methodology for calculating the subsidy requirement.[3] By appropriate weighting of the fixed term and the revenue drivers, cost risks arising from demand growth can be limited while preserving the incentive to meet growing demands. It also provides strong incentives to increase metering and to reduce losses.

[3] As clarified in the licence amendments giving effect to the PC2 controls, subsidy is calculated by subtracting from (i) the Maximum Allowed Revenues (MARs) of the distribution companies derived from the price controls (ii) the income which the distribution companies should have collected from their customers according to the ADWEA-prescribed tariffs (regardless of whether they did actually collect that income or not).

All the respondents to the First Consultation Paper supported in principle the continuation of hybrid form of the PC3 controls. ADWEC however rejected the hybrid form involving revenue drivers for its controls and justified the use of single fixed term for its controls, especially given the likely separation of its businesses. ADWEC identified a number of workstreams which are uncertain at this stage but would increase its staff and funding requirements over the PC3 period. ADWEC therefore suggested a responsibility based approach for price controls that will allow the Bureau to make a financial adjustment to its price controls at the end of the PC3 period according to the level of responsibilities acquired during the PC3 period. It however expressed its willingness to consider revenue drivers as part of the future price control review (PC4) at which time ADWEC anticipated virtually all capacity will be provided by IWPPs and interconnection issues will be well advanced.

The Bureau is currently minded to accept ADWEC's suggestion for the use of a form of controls based on fixed terms only (i.e. pure revenue cap form of controls). The Bureau's current thinking is to base the PC3 controls on a pure revenue cap for ADWEC's costs and to finance all such activities which are certain and can be forecasted with reasonably accuracy based on the past experience. With regards to some activities or developments which are uncertain and very difficult to forecast accurately, the Bureau will, for all licensees, consider making appropriate adjustment at the future price controls review based on appropriately justified costs (over and above financed by the PC3 controls) incurred during the PC3 period for such additional responsibilities or workstreams. Only efficiently-incurred and necessary costs will be considered, to provide an incentive to minimise costs. This is consistent with the Bureau's approach to date.

AADC, while agreeing to the continuation of a hybrid form of controls, suggested that the Bureau may also consider the following additional objectives in developing the precise form of controls:

- Price controls should be within the control of the business.
- They should maintain the financial viability of the business.
- They should not provide for perverse incentives.
- They should be progressive (that is, consistently applied across control periods and new incentives be implemented gradually having regard to long term lives of the assets).
- They should provide for efficient solutions for customers.

The Bureau considers the above objectives reasonable. Indeed, the Bureau's overall approach to setting the price controls to date and for the future recognises all the above objectives. Of course, the Bureau has to strike an appropriate balance between sometimes conflicting objectives. While the Bureau does not fully agree with the explanation or examples put forward by AADC for some of the above objectives, the Bureau will make efforts to ensure that both the objectives suggested by the Bureau and AADC are met while setting the PC3 controls. Particularly, the Bureau intends at this review to assess in more detail the impact of the PC3 controls on the financial viability of the businesses.

Overall, the Bureau's current thinking is therefore to continue with the present form of controls for the PC3 period; that is, pure revenue caps with fixed terms only for ADWEC and the hybrid form with revenue drivers for other companies.

3.4 Duration of Controls

Both the PC1 and PC2 price controls were set for three years, although the PC1 controls were subsequently extended for a further year. The present price controls for RASCO have a duration of two years. The main considerations in setting the duration of these controls were (1) a general lack of reliable, and particularly audited, data on companies' performance on which to base projections of future costs, and (2) the companies' preference at the time for a control of shorter duration, on the grounds of the uncertainties within the sector. The RASCO controls were set for two years to allow all companies to be considered concurrently at the present review.

In principle, the duration of a price control must strike a balance between providing incentives for efficiency and reducing exposure to unanticipated outcomes. The longer the duration, the stronger would be the efficiency incentives for companies but also the higher would be the possibility of performance being significantly at variance with expectations at the time that a control is set. Another important factor for consideration is the efforts and costs involved both for the companies and the regulator in reviewing the price controls frequently. A longer control duration would reduce these costs.

As mentioned in the First Consultation Paper, the Bureau is highly encouraged by the appointment of auditors for the Separate Business Accounts (SBAs) and price control returns (PCRs) for the price-controlled companies. As a result of this work, all the companies have now submitted audited SBAs and PCRs back to 1999. The improvement in sector data combined with the longer 'track record' of company performance available at this review means that the companies and the Bureau should be able to develop more accurate projections of future costs to set PC3 controls. This in turn reduces the risks from setting PC3 controls for a longer duration. The companies' performance to date in reducing costs, as discussed earlier, also indicates the need for stronger incentives to reduce costs.

In view of the above, the First Consultation Paper suggested that the duration of the PC3 controls may be extended, to, say, four years.

In general, the respondents to the First Consultation Paper supported a longer duration of PC3 controls than 3 years. The following is a summary of the responses:

- Given the information available, AADC suggested a 4 to 5 year control period based on the following reasons: (1) stronger incentives for efficiency; (2) lower cost of regulation; (3) facilitating an improved level of understanding of the regulatory incentives and the ability of the business to respond to these incentives; and (4) expected privatisation of AADC. However, AADC also highlighted important factors to be considered while going for a longer control period: (1) a trigger mechanism, with some "floor and ceiling" arrangement, to allow adjustments to price controls for unforeseen circumstances (for example, for increased risks for supply businesses in case of separation of controls

between distribution and supply); and (2) whether an ex post or ex ante approach to the assessment and treatment of capex is adopted.

- ADDC expressed willingness to consider an even longer control period of 5 years due to the resulting: (1) reduced regulatory burden; (2) more stable environment; (3) stronger efficiency incentives; and (4) facilitation of effective response to the continuing development experienced throughout the region. However, ADDC, recognizing the increase in potential risk and reward for both the customers and the company, suggested that the Bureau consider a floor and ceiling mechanism for the protection and benefit of both the customers and the company.

- ADWEC considered that it has to take up various new responsibilities during the PC3 period which involve significant uncertainties and on which robust information is not presently available. ADWEC therefore favoured a 3-year control duration for the PC3 controls, plus appropriate financial adjustments at the next review for increased responsibilities.

- While supporting a 4-year control duration in view of the stronger incentives for efficiency, TRANSCO highlighted the increased difficulties in forecasting future investment needs of the company if the Bureau moves more towards an ex-ante approach to the treatment of capex for PC3 controls. In view of the likely changes in the sector over the next few years, TRANSCO suggested that there must be sufficient regulatory flexibility to accommodate the likely expansion, additions and reshaping of the business as they occur without there being the need for undue retrospective adjustments, irrespective of whether the control duration is increased beyond 3 years.

Overall, given the support for a longer duration, the Bureau's current thinking is to implement a 4-year control duration for PC3 controls for all companies. The Bureau is also willing to consider a 3-year duration for ADWEC and the supply businesses of the distribution companies given the uncertainties highlighted by ADWEC and AADC. Such uncertainties may adversely affect the financial position of ADWEC and the supply businesses due to the small operating costs or paid-up capital for these businesses as compared to their total cash flows or turnover.

However, with an appropriate adjustment mechanism at the next review for increased responsibilities in place, it may be argued that a 4-year duration for ADWEC can work as well as a 3-year duration. Similarly, if, as expected, an ex post approach to the treatment of capital expenditure is retained at this review (see Section 6), and if it can be shown that separation of controls will not necessarily or significantly increase risks for the supply businesses, it may not be appropriate to consider a shorter control period for supply businesses. The Bureau's first preference would be to set the control period for all the businesses on a consistent basis to avoid complexity in the regulatory regime and to reduce workload and costs for all the parties in the sector in relation to regular price control reviews.

With regards to a trigger mechanism for interim adjustments to price controls during the control period, the Bureau's initial thinking is that such a mechanism will increase the complexity of the regime and will weaken the efficiency incentives of CPI-X regulation for the companies. It will be very difficult to develop a definite and clear-cut list of factors that can trigger such a

mechanism. However, the following should provide sufficient comfort to AADC without a trigger mechanism:

- The Bureau would be willing to consider the effect of materially significant external factors, such as any imposition of business taxes during the control period (unless captured by the licence definition of regulated revenue – see Section 3.2 above), at the next review for appropriate adjustment to the future price controls.

- AADC has also highlighted the need for a trigger mechanism to address its concerns regarding the increased risks for supply businesses due to what it regarded as potentially large K-factors. The Bureau sees that large K-factors can be avoided by the present approach used in the sector, whereby subsidy is given to the supply businesses approximately equal to the difference between the MAR and revenue from customers (the supply business K-factor should be zero in all years).

- To some extent, the effect of uncertain demand forecasts (i.e., revenue driver forecasts) can be offset by a higher weight for the fixed term in the structure of PC3 controls, as discussed further elsewhere in this document.

- Finally, a price-controlled company facing certain unforeseen factors, which perhaps may adversely affect its financial position, is entitled under the charge restriction conditions schedule of its licence to request disapplication, and/or modification, of the price controls in operation at any time.

- As discussed later in this document, the Bureau's current thinking is to retain the ex post assessment and treatment of capex for the PC3 controls due to the poor quality of information available. This will reduce the forecasting difficulties faced by the companies in case of a 4-year duration, as there is less emphasis on the accuracy of forecasts with an ex post approach than with an ex ante approach.

The Bureau's current thinking is therefore for a four year PC3 control period for all companies.

3.5 Separation of Controls

Presently, there are separate price controls for the water and electricity businesses of TRANSCO, ADDC, AADC and RASCO. There is no such separation of controls for the water and electricity procurement activities of ADWEC, nor for the distribution and supply businesses of the distribution companies.

In principle, separation of controls enhances cost transparency between businesses and can help to facilitate the introduction of competition in certain activities. The First Consultation Paper therefore discussed two further separations for the PC3 controls:

(a) Separate Controls for ADWEC's Water and Electricity Activities:

Presently there is no separation of ADWEC's accounts or business or controls between water and electricity. However, the Bureau has the power to define separate businesses for the purposes of

Condition 6 of the licence ("Separate accounts for separate businesses"). Furthermore, ADWEC is already required by its licence to provide certain PWPA and associated costing information to the Bureau separately for water and electricity (as part of the audited PCRs), and to produce separate Bulk Supply Tariffs (BSTs) for water and electricity.

ADWEC is unique among the price-controlled licensees in not having separate water and electricity businesses, even though it is responsible for more than half of the sector's costs. This creates a problem in terms of accurately calculating the sector's economic costs separately for water and electricity, which is required in order to accurately calculate the sector's subsidy requirements separately for water and electricity. It is therefore desirable that the separation of costs between water and electricity costs is audited, which requires the formal separation of ADWEC's water and electricity businesses.

The First Consultation Paper expressed the Bureau's intention to explore the possibility of formally introducing separate businesses (and hence separate accounting requirements) for ADWEC's water and electricity businesses and to develop separate PC3 controls for these businesses.

The Bureau has received supportive responses (but with some caveats) to this suggestion from the respondents to the First Consultation Paper, as summarised below along with the Bureau's comments:

- AADC, considering that ADWEC's costs are very small (less than 1%) as compared to the total delivered price of water and electricity, suggested that separate price controls should be defined for ADWEC keeping in view the materiality and practicalities of undertaking such separation.

  The Bureau would like to clarify that it is not only ADWEC's direct procurement costs that is suggested to be apportioned for setting separate controls for ADWEC, but also the PWPA and fuel costs managed by ADWEC (which account for more than half of the total sector costs). Therefore, separate controls for ADWEC have more significance than any other company or business in the sector.

- ADDC supported the suggestion in view of greater transparency within the sector but highlighted the inherent difficulty in identifying suitable drivers and the basis of allocation and apportionment to truly reflect the movement of costs between water and electricity. It suggested that cost of allocation and apportionment should not outweigh the associated benefit and therefore a simple apportionment approach should not be discounted.

  The Bureau agrees with ADDC's comments and, as mentioned in the First Consultation Paper, is willing to consider a simple basis of cost allocation as long as it is verifiable and considered reasonable by the auditors. ADWEC already separates electricity and water costs for the purposes of forecasting the BST.

- ADWEC highlighted the difficulties in relation to apportionment of its costs, particularly the fuel costs, but wished to discuss the matter further with the Bureau to reach a

mutually agreeable solution. ADWEC stated it did not fully understand why separate accounts for ADWEC are needed to accurately calculate the sector's subsidy requirements since the BST already allocates costs between electricity and water and is presently used to calculate separate costs and subsidy requirements for water and electricity. It also pointed to difficulties due to its small number of staff and the absence of staff dedicated to water and electricity businesses separately, which ADWEC contrasted with the other sector companies.

The Bureau would like to clarify that while the BSTs are reviewed thoroughly by the Bureau, the manner in which ADWEC allocates certain costs between water and electricity is presently not subject to independent audit. Although, the sector's subsidy requirements are presently calculated separately for water and electricity based on ADWEC's BST invoices, that allocation is not audited.

The First Consultation Paper therefore suggested separation of accounts, businesses and price controls for ADWEC between water and electricity to allow future subsidy requirements to be based on more accurate, cost-reflective, audited data. As that paper indicated, the Bureau does not anticipate any significant hurdle in introducing separate businesses and separate price controls for ADWEC's water and electricity activities. This is because ADWEC already allocates all its costs between water and electricity for various purposes (as discussed above) although often based on engineering assumptions or past experience.

The Bureau however recognises the need for more robust information systems, perhaps with the recruitment of additional staff, to develop separate accounts for water and electricity that can be verified by the external auditors.

In view of the above, the Bureau's current thinking is to introduce separate price controls for ADWEC's water and electricity businesses, along with appropriate definitions of these businesses and requirements for separate accounts and price control returns. However, the Bureau is willing to consider simple measures or methods as the basis of cost allocation and separation of controls, as long as they are verifiable by the auditors and truly reflect the associated costs.

(b) Separate Controls for Distribution and Supply Businesses:

ADDC and AADC each have four separate businesses (with a licence requirement for separate accounts): electricity distribution, electricity supply, water distribution, and water supply. During the 2002 price controls review, the Bureau provided the distribution companies an appropriate definition of the boundaries between distribution and supply, which is further discussed in the First Consultation Paper.

The Abu Dhabi water and electricity sector has been restructured so as to accommodate competition in the supply activity, which, if realised, would be likely to exert downward pressure on the costs of AADC and ADDC to the benefit of customers. As discussed in the First Consultation Paper, transactions in such a competitive supply market require separate charging mechanisms for supply and distribution. However, each distribution company presently has only

two price controls: one for electricity (covering both electricity distribution and electricity supply), and one for water (covering both water distribution and water supply). In other words, for both water and electricity there is a single price control covering both distribution and supply activities.

However, the present availability of separate audited accounts and existence of an internal charging mechanism between distribution and supply businesses provide a much firmer foundation for having separate controls for distribution and supply than was previously the case.

The First Consultation Paper also discussed the possibility of introducing a single supply control covering both water supply and electricity supply in view of the organisational structure of the distribution companies, which each have a single 'Sales' division covering both electricity and water but separate 'Network' divisions for electricity and water. However, the Bureau does not support this option in view of the reduced transparency required to produce calculations of sector costs separately for water and electricity. Further, the distribution companies already allocate supply costs between water and electricity for the purposes of producing separate accounts.

The respondents to the First Consultation Paper generally supported the suggestion for separate price controls (in total, four controls) for the supply and distribution businesses of ADDC and AADC, mainly in view of the potential improvement in the transparency of the sector costs, different drivers or focus of these businesses and potential improvement in readiness of the sector to introduce retail competition. AADC and ADDC however highlighted certain factors that need consideration while developing separate controls for supply and distribution:

- AADC suggested that separate regulatory drivers would be required for supply and distribution businesses which should take into consideration certain practicalities: (1) difficulty in forecasting for separate businesses due to the structural separation of businesses within the organisation; (2) dominance of a business by fixed costs due to further segregation of an already small company like AADC; (3) need for the development of a more robust basis of DUoS charges allowing day to day management and monitoring of financial management of separating businesses against the separate controls; and (4) inadequate response of AADC to date to price controls and the increased complexity of controls due to their separation.

  While the Bureau understands these issues, it considers companies themselves have to improve further upon their staff's understanding of the regulatory regime, their response to the regulatory regimes and other areas of their working. The Bureau also considers it inconsistent for AADC to suggest that the Bureau introduce more complex schemes (like a rolling scheme and trigger mechanism for unforeseen circumstances) while arguing that the concept of separate price controls for distribution and supply would increase the complexity of the regulatory regime.

  Nevertheless, the Bureau welcomes AADC's positive response for separation of controls and will endeavour to ensure simplicity while developing separate controls. As explained in Section 3 and Section 4 of this document, the Bureau is presently thinking to retain the same overall form of controls and similar revenue drivers in general for both supply and

distribution businesses as the current price controls so as to reflect the cost drivers of the business and in order to aid simplicity.

- ADDC highlighted the need to carefully construct the separate price controls for distribution and supply businesses having regard to: (1) the appropriateness of revenue drivers; (2) risks associated with the businesses; and (3) treatment of various common services provided by the businesses. ADDC suggested that the revenue drivers should be reflective and provide stability avoiding any movements between the supply and distribution businesses due to the operation of separate price controls. It also considered that price control separation will move certain risks to different businesses, increasing the specific risk in certain circumstances whilst mitigating it in other areas. For example, it expects higher over- or under-recovery risks and PIS risks due to separation (supply businesses being dependent on delivery of financial statements from the upstream businesses). ADDC also felt the need for further discussion on how the treatment of common services could be better reflected within the controls which depend on where the relevant work is undertaken and how inter-business recharging might be required. Such items of work include maintenance of billing systems and records for both distribution and supply, complaint handling, energy and water efficiency improvements, call handling, and guaranteed and overall security standards. ADDC also indicated the need for a review of the structure of its licence especially in view of the proposed separation of controls.

  The Bureau acknowledges the above comments but does not expect higher risks of over- or under-recovery. In line with its response to ADDC/AADC's recent request for a derogation to waive the PIS penalty for the delay in submission of audited financial statements, the Bureau considers that any dependency of ADDC's financial statement on the delivery of financial statements of other sector companies can be managed.

Overall, based on the generally supportive responses to the First Consultation Paper, the Bureau is currently minded to develop separate price controls for distribution and supply at this review.

3.6 Scope of Controls

Broadly speaking, with the exception of ADWEC, each company's existing price controls cover all revenue received in respect of licensed activities. Effectively, the revenue caps work as a "single till" – the overall level of revenue required by the company is determined via the price control review process (based on a forecast of total cost), and any revenue that is recovered from one group of customers of the licensed business is automatically deducted from the revenue which can be recovered from other customers of the licensed business. This approach was developed on the grounds that:

- There was no evidence of effective competition in any area which would justify the narrowing of the scope of the control.

- Cost data provided by the companies was not sufficiently reliable to enable the control to focus on a narrower subset of any company's cost.

The First Consultation Paper discussed the scope of the present price controls in some detail. **Table 3.1** summarises the scope of the existing price controls from the point of view of companies' income:

Table 3.1: Scope of Present Price Controls

Company	Income within MAR	Income outside of MAR
ADWEC	Any BST income from the distribution companies	Any income received from production companies in the form of damages, claims, late payments or events of default
TRANSCO	TUoS charge and any connection charge incomes	Income from unlicensed activities i.e. "Manpower services" to third parties
ADDC	Any income from customers, insurance claims from insurers and subsidy from the government	Income from unlicensed activities i.e. "Management of RASCO's Production Activities", and "Central Laboratory Services for third parties"
AADC	Any income from customers, insurance claims from insurers and subsidy from the government	Income from unlicensed activities i.e. "Management of RASCO's Production Activities"
RASCO	Any income from customers, insurance claims from insurers and subsidy from the government	None

With regards to the scope of the PC3 controls and based on the recent work on the audit of the companies' price control returns (PCRs) for 1999 onwards, the First Consultation Paper categorised the activities (and hence associated costs and revenues) of the companies into four classes, as shown in **Table 3.2** below:

Table 3.2: Issues for Scope of PC3 Controls – Four Classes of Activities as per the First Consultation Paper

Activities	Description or Examples	First Consultation Paper's Suggestion for PC3
Licensed activities not subject to competition	• For ADWEC, procurement of water, electricity, ancillary services and fuel • For TRANSCO, provision of connection and use of transmission system services, and procurement of ancillary services • For ADDC and AADC, all activities relation to distribution and supply of electricity and water • For RASCO, all generation and water production activities	All income from each company's customers in respect of these activities should be within the scope of PC3 controls, except for ADWEC's amounts for damages, claims, late payments or events of default in relation to GDs which are excluded from MAR (as per the existing licence).
Licensed activities subject to competition	No activity is presently subject to direct competition. The only partial exception is ADWEC's procurement of water and electricity from IWPPs, for which competition to enter market exists and whose costs are not directly subject to price controls but treated as pass-through subject to ADWEC's economic purchasing obligation	Unless competition for a licensed activity can be demonstrated to be effective, and its costs can be robustly ring-fenced from the company's other costs, the PC3 controls will cover all licensed activities, as at present.
Unlicensed activities	These activities do not fall within the definitions of "regulated activities" according to the Law and require Bureau's consents under respective licences:	These activities should not be within the scope of PC3 controls. The revenue from these activities should not be considered part

	• Management of RASCO's production assets by ADDC and AADC on behalf of RASCO; • ADDC's central laboratory services for third parties; • TRANSCO's manpower services for third parties; • Procurement by ADWEC of water and electricity from UWEC for sale to third parties outside the Emirate of Abu Dhabi; and • Transmission by TRANSCO of water and electricity produced by UWEC for third parties outside the Emirate of Abu Dhabi. • Other possible arrangements to which licensees may be party to in future in connection with the Emirates National Grid and/or GCC Interconnection.	of "regulated revenue" and MARs. The assets and costs associated with these activities should not be financed by the PC3 controls. This requires the relevant companies to establish sound and transparent principles and mechanisms for allocation of assets and costs between the regulated businesses and these activities and to exclude them from the past and future projections of data to be submitted in response to the Bureau's information requests for this review. Consents for the first three activities have been issued and for other activities are under consideration. All these consents contain conditions which ensure appropriate accounting data is made available to the Bureau.
Other activities indirectly related to licensed activities	There are incomes (or losses) that the price-controlled companies receive from parties other than their customers, such as: • Insurance claims from insurers in relation to the licensed businesses; • Penalties from the general public for affecting or damaging the assets of licensed businesses; • Penalties, liquidated damages, claims or late payment interest from contractors working for a licensed business; • Interest income on bank deposits or return on investments made out of the cash flows or incomes from the licensed businesses; and • Foreign exchange gains or losses on amounts held by the companies in foreign currency for payments to third parties in relation to the licensed businesses.	Since these incomes arise only because the companies are undertaking regulated businesses and the costs associated with these incomes are financed via the price controls, these incomes should fall within the scope of PC3 controls or MARs and should be treated as "regulated activities". The definition of "regulated revenue" needs to be further improved to avoid any ambiguity for future.

The respondents to the First Consultation Paper raised some concerns on the suggested treatment of the last two activities of the above table, as summarised below with the Bureau's comments:

- ADWEC expressed concern on what it interpreted as an implication in that paper that the export/import of power via ENG/GCC grids will not be financed within the PC3 controls. In ADWEC's view, purchasing power from another Emirate or country via these grids is no different in principle from purchasing electricity from an IWPP. With regards to cost allocation or accounting separation between licensed and unlicensed activities, ADWEC suggested such allocation or separation may be difficult or costly to achieve. However, ADWEC showed its willingness to discuss this matter at the future review when more accurate information would be available on the relevant issues and efforts to achieve such allocation or separation.

  The Bureau would like to clarify, in response to the first concern of ADWEC, that any costs and income associated with the procurement of electricity or water from any other Emirate or country for onward sale to ADDC and AADC for supplies within the Emirate of Abu Dhabi should be within the scope of the PC3 and future price controls. (The

same applies to TRANSCO in relation to its activities - any asset or cost associated with the transmission system within or outside the Emirate of Abu Dhabi owned by TRANSCO to transmit water or electricity for supplies in the Emirate of Abu Dhabi would be financed by the PC3 and future price controls for TRANSCO.)

With regards to the second issue raised by ADWEC, the Bureau firmly believes that cost allocation and accounting separation between licensed and unlicensed activities is necessary for truly-reflective tariffs, transparency, and fairness for the customers in the Emirate of Abu Dhabi (as well as for other Emirates).

These matters have already been clarified with ADWEC and TRANSCO in detail by the Bureau in relation to water supplies from UWEC's production plant located in Fujeirah.

- AADC, ADDC and TRANSCO expressed concerns on the indications in the First Consultation Paper that all income from activities indirectly related to the licensed activities should be treated as "regulated revenue". They argued that this treatment will weaken the incentives for the companies to make efforts to collect such income and will not be in the best interest of the companies as well as their customers. In this regard, they particularly highlighted the income from contractors in the form of penalties, liquidated damages, claims or late payment interest receipts.

  The Bureau sees some merits in these concerns and is therefore willing to consider that incomes from certain activities indirectly related to licensed activities be excluded from regulated revenue. The Bureau's current thinking is to define a new term "Excluded Income" for income (other than income from unlicensed activities) which will be excluded from the regulated revenue. The Bureau's starting point is to include all income (from activities indirectly related to licensed activities) within the regulated revenue and then discuss and justify exclusion of any such incomes from such revenue. At present, the Bureau considers that incomes from contractors justifies exclusion from regulated revenue (defined within the Excluded Income).

The Bureau is also considering amending the definition of "regulated revenue" for RASCO to remove the reference to the government subsidy. This matter was discussed during consultation in 2003 while setting 2004-2005 price controls for RASCO. At that time it was proposed that the management contracts between RASCO and AADC/ADDC (which presently provide for electricity and water purchases from RASCO at average BST rates) should be amended for 2004 onwards to allow electricity and water purchases from RASCO at such tariffs through which RASCO can recover its MAR fully. The Bureau also identified the possible structure of such tariffs for consideration of the related parties.

This proposal, if implemented, would eliminate the need to provide any subsidy to RASCO and hence simplify the annual audit of the sector subsidy requirements. RASCO would therefore be regulated like ADWEC or TRANSCO which also do not receive any direct subsidy from the government. However, the management contracts have not yet been amended as proposed.

To incentivise the concerned parties to amend the management contracts as proposed, the Bureau is presently minded to limit the definition of "regulated revenue" in the licence for RASCO to its

revenue from AADC and ADDC for the sale of water and electricity and remove the direct provision of the government subsidy to RASCO for 2006 onwards. If the management contracts are not amended as proposed and the said amendment is made to the licence, RASCO will not be able to fully recover its MAR for 2006 onwards.

3.7 Summary of Current Thinking

The Bureau's current thinking on the main aspects of the form of PC3 controls is as follows:

1. The price controls should remain of the form CPI-X.

2. With the exception of ADWEC, the price controls should continue to have a hybrid form of a pure revenue cap and revenue driver approach. The price controls for ADWEC should continue to be in terms of a fixed revenue cap.

3. The duration of the PC3 controls should be four years for all companies.

4. In line with ADWEC's suggestion, any unforeseen responsibilities acquired by any company during the PC3 period would, if having a material impact on costs, and considered by the Bureau to be a legitimate activity of the company, be financed at the subsequent price review, consistent with the Bureau's approach to date.

5. There should be separate controls for water and electricity businesses of ADWEC, RASCO and TRANSCO, which would require separate water and electricity businesses to be defined for ADWEC.

6. There should be separate price controls for the supply and distribution businesses of ADDC and AADC. That is, four controls in total for each company: (i) electricity distribution, (ii) electricity supply, (iii) water distribution, and (iv) water supply.

7. In general, all income associated with licensed activities whether collected from customers or other parties should be treated as the "regulated revenue" in determining compliance with the price controls. There may be a limited number of exceptions to this, such as income from contractors, which will be explicitly defined in advance and will be termed "Excluded Income".

8. The licence definition of 'regulated revenue' for RASCO should be amended to exclude any provision of the government subsidy to RASCO so that RASCO's MAR is recovered in full from the distribution companies.

4 Structure of Price Controls

4.1 Introduction

Section 3 sets out the Bureau's current thinking on the overall design of the PC3 controls. These suggestions would mean that the precise structure of the PC3 price controls would be as follows:

ADWEC (separately for water and electricity)

MAR = PWPA Costs + Fuel Costs + A + Q – K

TRANSCO (separately for water and electricity)

MAR = a + (b × Peak Demand) + (c × Metered Units Transmitted) + A + Q - K

ADDC & AADC distribution businesses (separately for water and electricity)

MAR_D = a + (b × Revenue $Driver_{D1}$) + (c × Revenue $Driver_{D2}$) + Q_D – K_D

ADDC & AADC supply businesses (separately for water and electricity)

MAR_S = Electricity or Water Purchase Costs + Transmission Charges + Distribution Charges + SR + Q_S - K_S

SR = a + (b × Revenue $Driver_{S1}$) + (c × Revenue $Driver_{S2}$)

RASCO (separately for water and electricity)

MAR = a + (b × Revenue Driver) + F + Q – K

F = (0.95 × AF) + (0.05 × Z × BUF)

(Where all terms are as defined as in Section 2 of this document for the present price controls (but separately for water and electricity businesses), and subscripts "D" and "S" mean that the concerned term relates to the distribution business and supply business, respectively. Further, the precise definitions of the revenue drivers for all companies, and the weights appearing in the formula for allowed fuel costs for RASCO, remain subject to consultation for the PC3 controls.)

Setting the price controls means, for each business, determining the values of the co-efficients on the fixed term and the variable terms in the MAR formulae (i.e. presently 'A' for ADWEC, and 'a', 'b' and 'c' for other companies); the 'X' factor; and (for RASCO only) the benchmark unit fuel costs ('BUFs') and the weights of actual and benchmark fuel costs.

As described in the First Consultation Paper, the values of 'A', 'a', 'b' and 'c' are determined by setting the MAR equal to the required revenue (sufficient to finance an efficient business) over the control period. In turn, the estimation of annual allowed revenue requires: (1) setting an appropriate value for the 'X' factor; (2) making reasonable projections of the revenue drivers for the control period; and (3) deciding the appropriate proportions of the allowed revenue which

should be recovered from, respectively, the fixed term 'a' and the variable terms involving the revenue drivers with co-efficients 'b' and 'c'.

Price control setting therefore requires establishing the precise structure of controls (including pass-through treatment of certain costs), revenue driver definitions and projections, and the weights attached to fixed and variable terms in the MAR formulae. The First Consultation Paper raised the following issues for consultation on these matters:

1. *"Should the revenue drivers (and/or the present definitions of existing revenue drivers) be reviewed? If so, which alternative revenue drivers or what changes to the definitions of existing revenue drivers should be considered?*

2. *The Bureau's current thinking is that the TRANSCO peak demand revenue drivers, and the RASCO revenue drivers, should be amended so that they are based solely on metered units.*

3. *If there are to be separate price controls for distribution and supply businesses, what should be the revenue drivers for each business?*

4. *Should one or more revenue driver(s) be introduced into ADWEC's price control (whether or not there is a separation of control into water and electricity businesses)?*

5. *Should the treatment of PWPA and fuel costs on a pass-through basis for ADWEC be reviewed? If so, what alternative approaches may be considered?*

6. *Do you agree that the cap on the PIS-related MAR adjustment via the term "Q" for Category A performance indicators should be increased to, say, 5% or 10%?*

7. *How should the weights for the fixed term and variable terms (involving revenue drivers) in the price controls be set?"*

This section discusses the companies' responses to these issues and sets out the Bureau's current thinking on them.

4.2 Revenue Drivers for PC3

The structure of price controls set out in Section 4.1 means that revenue cap for each company (except for ADWEC) changes each year by a number of the company's output measures called "revenue drivers", which are set to broadly reflect each company's cost drivers. However, the choice and calibration of revenue drivers can have objectives other than cost-reflectiveness, such as:

– incentives to improve metering on the systems;

– incentives to reduce system losses;

– incentives to meet growing demand; and

– incentives to serve new customers and new areas.

Table 4.1 sets out the present licence definitions of the revenue drivers for the various companies.

Table 4.1: Present Definitions of Revenue Drivers

Company	Revenue Driver	Present Definition
ADDC/AADC	**Electricity Customer Accounts**	The number of electricity customer accounts registered with the Licensee as of 31 December of relevant year t for the supply of electricity by the Licensee in that relevant year.
	Metered Electricity Units Distributed	The aggregate quantity of electricity units distributed (expressed in kilowatt-hours) through the Licensee's electricity distribution system in relevant year t metered at exit points on leaving the Licensee's distribution system.
	Water Customer Accounts	The number of water customer accounts registered with the Licensee as of 31 December of relevant year t for the supply of water by the Licensee in that relevant year.
	Metered Water Units Distributed	The aggregate quantity of water units distributed (expressed in imperial gallons) through the Licensee's water distribution system in relevant year t metered at exit points on leaving the Licensee's distribution system.
ADWEC		Fixed term
RASCO	**Water Annual Production**	The aggregate amount of water (expressed in thousand imperial gallons per year) produced by the Licensee in relevant year t (a) as measured or reasonably estimated net of auxiliary or internal consumption of the production facility, (b) whether produced from desalination units or ground water wells (in each case, owned by the Licensee), and (c) whether the production facility is connected to the water distribution or transmission systems of a licensed distribution or transmission operator or connected directly to one or more customers of such operator.
TRANSCO	**Peak Electricity Demand**	The maximum average electricity demand in an hour (expressed in kilowatts) as metered or otherwise measured at exit points on leaving the Licensee's electricity transmission system in relevant year t.
	Metered Electricity Units Transmitted	The aggregate quantity of electricity units transmitted (expressed in kilowatt-hours) through the Licensee's electricity transmission system in relevant year t metered (in compliance with the Metering and Data Exchange Code) at exit points on leaving the Licensee's transmission system.
	Peak Water Demand	The maximum average water demand in a day (expressed in imperial gallons per day) as metered or otherwise measured at exit points on leaving the Licensee's water transmission system in relevant year t.
	Metered Water Units Transmitted	The aggregate quantity of water units transmitted (expressed in imperial gallons) through the Licensee's water transmission system in relevant year t metered (in compliance with the Metering and Data Exchange Code) at exit points on leaving the Licensee's transmission system.

The First Consultation Paper indicated that a number of issues needed to be considered at this review in relation to the definitions of the revenue drivers. These issues are discussed in turn for each company or business in the following sub-sections along with the companies' responses and the Bureau's current thinking.

4.2.1 Revenue Drivers for AADC and ADDC

The present price controls which apply to the combined distribution and supply businesses of AADC and ADDC have two revenue drivers: customer accounts and metered units distributed (separately for water and electricity). The First Consultation Paper indicated that if the price controls for distribution companies are to be split further between separate controls for distribution and supply businesses at this review, making four controls for each company in line with the separate businesses defined in the licences, such separate controls need to contain appropriate revenue drivers. The paper identified the following possibilities:

- same revenue drivers for both distribution and supply businesses as presently apply to the single control (i.e. customer accounts and metered units distributed);
- one revenue driver (say metered units distributed) for distribution business controls and one revenue driver (say customer accounts) for supply business controls; and
- some combination of the above, or additional revenue drivers.

Distribution Businesses

None of the respondents to the First Consultation Paper suggested any change in the existing revenue drivers for the distribution businesses. The responses supporting continuation of these revenue drivers are summarised below:

- AADC considered that it has not responded well to the existing drivers during the PC1 and PC2 periods and that some of these drivers are outside of its control. AADC considered that any new revenue driver should meet the objectives that AADC identified for the overall form of controls (i.e. controllable, business financial viability, no perverse incentives, progressive, and enabling efficient solutions for customers – see Section 3.3 of this document for more details). However, it also suggested that the existing revenue drivers broadly reflect the cost drivers of the business as well as provide incentives for better performance.
- ADDC stated that it believes the current revenue drivers (i.e. metered units distributed and customer accounts) remain appropriate for the distribution functions.

In view of the above, the Bureau's current thinking is to retain the existing revenue drivers for ADDC and AADC in respect of the PC3 controls for their distribution businesses. However, as discussed in the First Consultation Paper, the definitions of customer account-related revenue drivers need to be improved to precisely define which customer categories are to be included or excluded. The Bureau's current thinking on customers accounts for the distribution businesses is as follows:

- The water and electricity customer account-related revenue drivers should include only those customers which are connected to the networks of the distribution companies and will exclude those which are supplied by other means. In the case of water, this will incentivise the distribution companies to minimise the usage of tankers as an alternative to distribution via their pipeline network; and

- In line with the intent (and application) of the present definition, the definition of the water customers revenue driver will explicitly state that it covers all water customers connected to the network including customers who are charged a fixed monthly amount.

Supply Businesses

With regards to the new controls for the supply businesses, the Bureau has received the following two responses:

- ADDC suggested two revenue drivers: (1) customer accounts including large customers connected directly to the transmission system (i.e. not connected to the distribution system but involving the distribution company as a supplier); and (2) the number of units metered or the number of meters read, to incentivise the supply business to read the meters. However, ADDC acknowledged that, with metered units distributed as a revenue for the distribution business, a meter reading revenue driver may not be necessary at present since both the distribution and supply businesses are under the same ownership or management and thus will already have an incentive to read meters.

- While AADC wished to comment on this matter later as the consultation process progresses, it generally required that the revenue drivers should meet certain objectives (see above) and should be easily understood.

Based on the above, the Bureau's current thinking is that customer accounts, defined to include all customers supplied, should be the single revenue driver for the supply businesses of AADC and ADDC. Note that the definition of customer accounts for the supply businesses would thus be different from the definition of customer accounts for the distribution businesses.

The above suggestions would mean that the separate price controls for distribution and supply businesses will have the following structure, with customer accounts related revenue drivers defined separately for distribution and supply businesses:

Distribution Businesses (separately for water and electricity)

MAR_D = a + (b × Distribution Customer Accounts) + (c × Metered Units Distributed) + Q_D – K_D

Supply Businesses (separately for water and electricity)

MAR_S = Electricity or Water Purchase Costs + Transmission Charges + Distribution Charges + SR + Q_S - K_S

SR = a + (b × Supply Customer Accounts)

4.2.2 Revenue Drivers for ADWEC

ADWEC's control presently consists solely of a constant term for its own procurement cost which is subject to a CPI-X formula. During the last price control review in 2002, the Bureau proposed that ADWEC's control should also include a measure of its "activity" or workload to reduce ADWEC's exposure to risks associated with potential increases to its own costs arising from unexpected increases in its workload. A number of measures, such as installed electricity and/or water capacity, and the number of IWPPs, were considered as the possible activity-based revenue drivers. However, the proposal was rejected by ADWEC.

No respondent to the First Consultation Paper suggested any change in the present fixed term form of the price controls for ADWEC. AADC and ADDC did not consider it appropriate to introduce a revenue driver for ADWEC in view of the materiality of the procurement cost of ADWEC in the context of overall sector costs. ADWEC also supported the continuation of a fixed term nature of its controls, especially given the likely separation of its businesses. It however expressed its willingness to consider revenue drivers as part of the future price control review (PC4) at which time ADWEC anticipated virtually all capacity will be provided by IWPPs and interconnection issues will be well advanced.

ADWEC also suggested a "responsibility-based" approach for its price controls to take into account potential new workstreams which are uncertain and hence may require appropriate adjustment at the future price control review when more information will be available. As discussed in Section 3, the Bureau intends to adopt this proposal but expects its impact to be reduced if an accurate forecast of future costs is made at this review.

In view of the above, the Bureau's current thinking is to continue with the fixed term without any variable revenue driver for the new controls of ADWEC. However, the separation of controls between the electricity and water businesses of ADWEC means separate fixed terms would be required to set PC3 controls for ADWEC. This would result in the following formula structure:

ADWEC's electricity business:

$$MAR_E = \text{PWPA Costs}_E + \text{Fuel Costs}_E + A_E + Q_E - K_E$$

ADWEC's water business:

$$MAR_w = \text{PWPA Costs}_w + \text{Fuel Costs}_w + A_w + Q_w - K_w$$

Where subscripts "E" and "W" denote ADWEC's electricity and water businesses, respectively.

4.2.3 Revenue Drivers for RASCO

The existing price controls for RASCO's electricity generation and water production businesses have only one revenue driver for each business: electricity generation capacity, and water annual production, respectively. No arguments were put forward to suggest alternative drivers and so the Bureau intends to retain the existing drivers for the PC3 controls, subject to a review of the definitions.

Both the revenue drivers presently are allowed to be estimated if meters do not exist. This is in contrast to most other revenue drivers for other companies which require units transmitted or distributed to be measured by a meter compliant with the Metering and Data Exchange Code (MDEC). The First Consultation Paper considered that the sector is now sufficiently mature that all revenue drivers including the revenue drivers for RASCO should now be defined in terms of metered units.

In response to the First Consultation Paper, AADC and ADDC argued against basing the RASCO revenue drivers solely on metered units, due to the fact that many of RASCO's assets are used for standby generation. These arguments mainly relate to the electricity generation business of RASCO. The Bureau agrees that the concept of metering may be difficult to apply to the generation capacity and so is minded to accept AADC and ADDC's arguments that the revenue driver for RASCO's electricity business (electricity generation capacity) can continue to be estimated where metering does not exist.

The Bureau is also considering possible models to separate the standby generation activities of RASCO from the continuous running generation activities. In particular, the Bureau's view is that standby generation should be transferred to the distribution companies. The Bureau would welcome any views on this issue and its implications for RASCO's price controls for PC3.

However, the Bureau does not see any difficulty in metering the water business revenue driver (annual water production) and does not find the arguments of AADC and ADDC for not metering to be convincing in the case of water production. Therefore, the Bureau's current thinking is that the definition of the water production-related revenue driver for RASCO should be modified for the PC3 controls to require measurement through MDEC-compliant meters. To allow a reasonable period for RASCO to install meters at presently unmetered water production sites, the Bureau is willing to consider a "glide-path" approach in making projections of this revenue driver for the PC3 period. However, the Bureau is open to further views on this subject.

Based on the above, the structure of PC3 controls for RASCO would become as follows (the treatment of fuel costs for RASCO is discussed in Section 5):

RASCO electricity business

$MAR_E = a_E + (b_E \times \text{Electricity Generation Capacity}) + F_E + Q_E - K_E$

RASCO water business

$MAR_W = a_W + (b_W \times \text{Metered Water Annual Production}) + F_W + Q_W - K_W$

4.2.4 Revenue Drivers for TRANSCO

The present price controls for TRANSCO have two revenue drivers for both water and electricity businesses: peak demand and metered units transmitted. In the absence of any objection or suggestion for alternatives, the Bureau intends to retain these revenue drivers.

Both the peak demand revenue drivers for TRANSCO presently do not have strict requirements of metering and allow estimation if meters do not exist. As discussed above for RASCO, this is in contrast to other demand-related revenue drivers, all of which require demand or units transmitted or distributed to be measured by a meter compliant with MDEC. The First Consultation Paper therefore considered that all revenue drivers including the peak demand related drivers should now be defined in terms of metered units.

AADC and ADDC supported the metering requirement for TRANSCO's revenue drivers but also highlighted the need for glide-path targets for metering as complete metering by the start of 2006 appears unlikely. ADDC and TRANSCO highlighted the need for revenue drivers to mainly reflect TRANSCO's cost structure in addition to providing correct incentives. While TRANSCO acknowledged the importance of fully MDEC-compliant metering and its statutory obligations to maintain a settlement system, it was concerned that the use of fully MDEC-compliant metered peak demands could lead to the introduction of additional errors in the MAR calculation that are contrary to the intention. TRANSCO desired that the calibration of the peak demand revenue drivers would not unfairly penalise it for meters that were either not yet in place or were not yet MDEC-compliant.

In view of the above, the Bureau's current thinking for PC3 remains that peak demand related revenue drivers for TRANSCO should be based solely on metered units. The Bureau has been informed by TRANSCO that its metering programme is expected to be complete by early 2006. However, the Bureau would welcome further information so that appropriate projections of the revenue drivers are made at the review.

The above would lead to the following structure of PC3 controls for TRANSCO:

TRANSCO electricity business

$MAR_E = a_E + (b_E \times \text{Metered Peak Demand}) + (c_E \times \text{Metered Units Transmitted}) + A_E + Q_E - K_E$

TRANSCO water business

$MAR_W = a_W + (b_W \times \text{Metered Peak Demand}) + (c_W \times \text{Metered Units Transmitted}) + Q_W - K_W$

4.3 Pass-Through Terms

The following costs are presently treated on a pass-through basis in the price control formulae:

- For ADWEC, PWPA[4] and fuel costs;
- For TRANSCO, allowed ancillary services costs; and
- For ADDC and AADC, power and water purchases and transmission charges.[5]

[4] The definition of the "PWPA" term in ADWEC's licence includes ancillary services costs.

[5] Note that prices of (i) power and water purchases and (ii) transmission charges for the distribution companies are regulated at the levels of ADWEC / RASCO and TRANSCO, respectively. Note also that

Each of these costs are discussed in turn in the following sub-sections:

4.3.1 PWPA and Fuel Costs for ADWEC

The PWPA and fuel costs of ADWEC are presently passed through to the distribution companies, although subject to an economic purchasing obligation. Pass-through of ADWEC's PWPA and fuel costs has been considered appropriate to date since indexing these costs to movements in demand or general price inflation or other measures (as has been used in some circumstances in other countries) would increase the business risk for ADWEC. However, while the Bureau endeavours to keep ADWEC's economic purchasing obligation in relation to PWPA and fuel costs under review, there have been difficulties for the Bureau in monitoring such costs due to the unavailability, or delay in availability, of the requisite data from ADWEC.

The First Consultation Paper highlighted that since 1999, the unit cost of electricity and water procured by ADWEC has increased substantially. This is at a time when cost reductions should have been expected, due to efficiency improvements and economies of scale. The paper therefore sought suggestions as to other forms of price control which may be considered for ADWEC. The paper indicated a possibility of adopting an approach for ADWEC similar to that adopted for fuel costs for RASCO. This approach would involve pass-through of only a proportion of actual costs with the remainder linked to an index set by the Bureau, hence providing a better incentive for ADWEC to minimise purchase costs.

In response to the First Consultation Paper, AADC considered it appropriate to the benefits of the customers that the costs of water and electricity should be procured as efficiently as possible. However, ADDC and ADWEC suggested to maintain the pass-through treatment of PWPA and fuel costs. ADWEC highlighted that any approach other than the pass-through treatment of these costs can endanger ADWEC's financial position. According to ADWEC, any approach which would disallow even 1% of the fuel costs (a proportion equal to approximately AED 15 million in 2004) would expose ADWEC to large financial risks.

ADWEC also identified a number of factors that it said had caused an increase in the unit costs of water and electricity. These include the timing of production capacity, the power-to-water ratio, the type of plant, valuation and selling prices of production assets, and over-or stand-by capacity. ADWEC also anticipated increase in fuel costs in the future due to the switch of certain plant to more expensive fuel from a new fuel supplier. In addition, ADWEC stated that despatch of plant by TRANSCO, which is beyond ADWEC's control, can result in non-economic production of water and electricity and hence increase the unit costs of production. ADWEC therefore suggested that instead of any change in its price controls, the Bureau may consider ways and means to control the economic despatch of TRANSCO.

While the above may be true, the poor quality of information provided by ADWEC has made it difficult to distinguish between factors which are within and outside ADWEC's control. Given

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the terms 'electricity transmission system charges (ETC)' and 'water transmission system charges (WTC)' used in the MAR formulae for distribution companies are not specifically defined in the respective licences, but are generally understood to include both TUoS charges and connection charges payable by the distribution companies to TRANSCO.

the continuing lack of good quality information submitted on a timely basis, a stronger incentive is required.

As for economic despatch, the Bureau has made significant efforts in recent years to review TRANSCO's economic despatch performance. However ADWEC has until recently opposed efforts by the Bureau to require TRANSCO to base despatch on the rates and fuel equations/models in the PWPAs, despite this being a licence and transmission code requirement for TRANSCO. We do not therefore agree that uneconomic dispatch can be used by ADWEC to excuse its rising unit procurement costs.

With regard to the financial position of ADWEC, the Bureau acknowledges the concerns of ADWEC with regards to the potential effect of the automatic indexation or benchmarking of PWPA and fuel costs. At the same time, the Bureau remains concerned about the upward trend for unit costs in the sector and lack of timely and accurate information from ADWEC.

The Bureau's current thinking is to continue with the pass-through treatment of PWPA and fuel costs for the PC3 control period as long as the unit production costs of electricity and water in any year are equal to or less than those in the previous year. If the unit costs in a year are higher than the previous year, the pass-through of PWPA and fuel costs will be capped at the level which would maintain unit costs constant at the previous year's level. The Bureau would welcome views of all interested parties on this proposal.

To the extent that the above proposal may impact on the financial viability of ADWEC, this can be addressed by ADWEC by the adoption of an appropriate capital structure for a company of its nature – ie, by ensuring the business is sufficiently capitalised to absorb potential risks.

4.3.2 Ancillary Service Costs for ADWEC and TRANSCO

The present price controls allow both TRANSCO's electricity business (through the term 'A') and ADWEC (within the term 'PWPA') to recover their costs of ancillary services.[6] While the mechanism to recover such costs existed since 1999 for ADWEC, the term 'A' was introduced in the price control for TRANSCO at the 2002 price controls review. For both ADWEC and TRANSCO, the ancillary service costs are allowed on pass-through basis subject to their economic purchasing obligations under the respective licences. In addition, TRANSCO is required to demonstrate through an annual statement as part of the audited price control returns (PCRs) that ancillary services were procured on an economic basis and were necessary for system security and stability and/or resulted in a reduction in overall transmission costs.

The introduction of this new term 'A' in TRANSCO's price control does not prevent ADWEC from procuring ancillary services as necessary in accordance with its licence. However, TRANSCO and ADWEC must coordinate with each other on the procurement of ancillary services, as required by their licences. To date, TRANSCO has not procured any ancillary services. At the same time, TRANSCO has expressed concern at the lack of clarity in the PWPAs in respect of the coverage of ancillary services.

[6] Ancillary Services are defined in the licences for ADWEC and TRANSCO as the services which may be required from time to time for reasons of system security and stability as identified in the Electricity Transmission Code.

During 2003, there were discussions among the Bureau, ADWEC and TRANSCO on matters relating to the procurement of ancillary services. TRANSCO requested ADWEC to provide a clear explanation of the ancillary services covered by the PWPAs. The First Consultation Paper indicated that the retention of the term 'A' in the price controls for TRANSCO's electricity business will allow TRANSCO to procure in future necessary ancillary services (to the extent not covered by the PWPAs or separate ancillary service agreements of the GDs with ADWEC) in coordination with ADWEC.

In response to the First Consultation Paper, ADWEC proposed that the term 'A' be removed from TRANSCO's price control (which would in effect prevent TRANSCO from procuring any ancillary services necessary for system security and stability). ADWEC argued that ancillary services are already covered in its long-term PWPAs with GDs and TRANSCO can expect that these services are being provided by the GDs within the technical limits of the plant. ADWEC suggested that TRANSCO should define its requirements for more or additional ancillary services (according to ADWEC, no such information is available from TRANSCO at present) for consideration by ADWEC for future PWPAs or amendments to the existing PWPAs.

In view of the statutory provisions for procurement of ancillary services by both ADWEC and TRANSCO and of the ongoing lack of clarity as to the coverage of the ancillary services in the PWPAs, the Bureau's current thinking is to retain the ancillary services procurement arrangements for both the companies in the present form of terms 'PWPA' and 'A', respectively in the PC3 price controls.

4.3.3 Power and Water Purchases and Transmission Charges for AADC and ADDC

At present, the cost of power and water purchases and transmission charges are pass-through for the distribution companies as they are costs recharged from ADWEC / RASCO and TRANSCO which have already been subject to regulation (via the economic purchasing obligation / price controls in the case of power and water purchases from ADWEC / RASCO, and via the price controls on TRANSCO's transmission businesses).

The Bureau intends to continue with the pass-through treatment of these costs during the PC3 period.

Also, with separate controls for the distribution and supply businesses, distribution charges will be an additional pass-through item for the supply businesses.

4.4 Performance Incentive Scheme Term 'Q'

The present price control formulae for all the companies contain a term 'Q' to provide an incentive to improve their performance against "Category A" performance indicators as part of the Performance Incentive Scheme (PIS).

The First Consultation Paper indicated that, to increase the number of Category A indicators and/or to provide stronger incentives for improved performance, the present annual caps on the term 'Q' may need to be increased to say 5% or 10% of MAR in respect of a companies' own costs.

While AADC, ADDC and ADWEC suggested the Bureau should retain the 2% cap for Q term for the PC3 controls, TRANSCO cautiously supported any increase in the cap. These responses and the Bureau's assessment of them are discussed in detail in Section 8.3 of this document. In essence, the Bureau's current thinking is that the expected increase in the number of Category A indicators at this review may justify a higher cap on Q term in PC3 of up to 5% .

4.5 Correction Factor

The correction factor "K" in all the price control formulae is intended to adjust the MAR for one year ('t') for any over or under-recovery of MAR in the preceding year ('t-1') along with interest accrued. This under- or over-recovery (in year 't-1') needs to be recovered from, or paid back to, the customers of the company in the following year ('t') with interest via a correction factor calculated as follows:

$$K_t = (\text{Actual Revenue}_{t-1} - MAR_{t-1}) \times (1 + i_t / 100)$$

Where "i_t" means that interest rate which is equal to:

- the "average specified rate" (the average one-year inter-bank deposit rates published by the UAE Central Bank for the year 't-1') when there is over-recovery by 2% or less of MAR or when there is any under-recovery; and

- the average specified rate plus a 3% 'penalty' rate if there is over-recovery by more than 2% of MAR.

Such an over or under-recovery arises mainly due to actual or out-turn demands or revenue driver values being different from those forecast at the beginning of a year while estimating MAR.

The main objective of the above mechanism is to allow the return in the following year of any under-recovery (or over-recovery) in the preceding year *with interest* so as to keep the company (or customers) indifferent in terms of the time value of money. Further, the additional 3% 'penalty' over and above the average specified rate in case of over-recovery by more than 2% is intended to provide the companies with incentives to improve their forecasting; in particular, to ensure that they do not over-recover significantly in any year.

However, the above mechanism caused undesirable volatility in the financial performance of ADWEC from year to year. Given the financial structure of ADWEC, and in contrast to other licensees, such volatility can have serious implications for ADWEC's financial position. The Bureau and ADWEC therefore agreed for the 2004 and 2005 BSTs to adjust any over- or under-recovery of BST revenue during the previous year in the same previous year in the form of exceptional charges payable by ADWEC to the distribution companies (or vice versa, depending upon whether there was an over- or under-recovery) without any interest accrued. This approach has led to zero correction factors and zero interest payments for the 2004 and 2005 BSTs and hence eliminated the risk associated with over-recoveries for ADWEC for these years.

The First Consultation Paper highlighted that, if such an approach for ADWEC is continued in future years, the incentive for ADWEC to forecast demands accurately may need to be enhanced

via the PIS. In its response to that paper, ADWEC proposed introducing electricity and water demand forecasting accuracies as new Category A indicators for PC3 provided that the bonus and penalty provisions are reasonable and ADWEC is allowed to decide on its forecasts independently. The Bureau is sympathetic to this idea which is further discussed in Section 8 of this paper in relation to the PIS.

4.6 Revenue Driver Projections

Calculation of the notified values 'a', 'b', 'c' and 'X' to set the new controls requires projections to be made of revenue driver data at this review. The First Consultation Paper highlighted that these assumptions have important implications for the accuracy of the price controls and therefore require careful consideration:

- Setting revenue drivers 'too high' can unreasonably understate the relevant notified value (being expressed in a payment per unit of the revenue driver) and hence can result in lower future allowed revenue than the correct value, to the disadvantage of the company. Conversely, projections that are 'too low' will overstate the notified value.
- The accuracy of the revenue driver projections, and hence the actual revenues and profits of the companies, also depends on the companies' reaction to the incentives provided by the revenue drivers. If the companies have responded positively to an incentive provided by the design of revenue drivers (such as to improve metering) then it is reasonable for them to make additional profits.
- Revenue driver projections should be made on the same basis as the actual revenue driver would be measured in the future. For instance, if the units used in the price control calculations are assumed to be metered in the future, the units assumed when calibrating the revenue drivers must also be metered units.
- Further adjustments to the projections may be necessary to reflect stronger incentives for performance and/or to reflect realistic achievable targets for performance, for example, in relation to the extent of metering and reductions in system losses.

Revenue drivers for the PC1 period (1999 – 2002) have been provided by all companies in their audited PCRs and are summarised in **Table 4.2** below:

Combined with the audited figures for 2003 reported in Table 4.3, TRANSCO's figures indicate that the compound annual growth rates for peak electricity demand and peak water demand over the period between 1999 and 2003 were 7.4% a year and 13.8% a year respectively.

Table 4.2: Revenue Drivers (Audited) for PC1 Period

TRANSCO	1999	2000	2001	2002
Electricity peak demand (MW)	2,759	2,998	3,334	3,614
Electricity units transmitted (GWh)	14,576	16,678	17,687	18,992
Water peak demand (MIGD)	227	241	273	326
Water units transmitted (MIG)	75,359	79,895	90.035	107,349

ADDC	1999	2000	2001	2002
Electricity customer accounts	164,369	174,169	182,339	187,793
Electricity metered units distributed (GWh)	8,699	9,751	10,170	11,751
Water customer accounts	74,718	82,451	90,935	96,122
Water metered units distributed (MIG)	8,466	11,505	12,129	12,486
AADC	**1999**	**2000**	**2001**	**2002**
Electricity customer accounts	67,961	70,989	76,300	81,029
Electricity metered units distributed (GWh)	4,815	4,457	4,925	5,365
Water customer accounts	39,597	39,383	41,150	43,155
Water metered units distributed (MIG)	438	920	815	1,314

Note: ADDC's water customers accounts revised significantly for the purposes of PCR audit as described in section 9.4.1.

For PC2, companies' projections of revenue drivers for 2004 and 2005 as per the responses to the First Information Request are shown in **Table 4.3** below, together with actual audited data for 2003. Note that between PC1 and PC2, the definition of TRANSCO's 'units transmitted' revenue driver was amended to include only metered units.

Table 4.3: Companies' Revenue Driver Projections for PC2 Period

	2003	2004	2005
TRANSCO			
Electricity peak demand (MW)	3,672	3,800	3,900
Electricity metered units transmitted (GWh)	0	-	-
Water peak demand (MIGD)	380	420	511
Water metered units transmitted (MIG)	0	-	-
ADDC			
Electricity customer accounts	191,556	196,621	203,988
Electricity metered units distributed (GWh)	11,172	12,086	14,191
Water customer accounts	164,757	168,964	177,514
Water metered units distributed (MIG)	24,436	51,665	57,296
AADC			
Electricity customer accounts	84,051	87,346	90,418
Electricity metered units distributed (GWh)	5,619	5,508	7,006
Water customer accounts	42,894	47,242	48,714
Water metered units distributed (MIG)	1,880	6,550	9,550
RASCO			
Electricity generation capacity (MW)	n/a	-	-
Annual water production (MIG)	n/a	-	

Note: '-' means not provided by the company in its Information Submission

Based on the discussion in this Section, companies' projections of the proposed revenue drivers for the PC3 period are shown in **Table 4.4** below:

Table 4.4: Companies' Revenue Driver Projections for PC3 Period

	2006	2007	2008	2009
TRANSCO				
Electricity metered peak demand (MW)	4,018	4,132	4,246	4.360
Electricity metered units transmitted (GWh)	-	-	-	-
Water metered peak demand (MIGD)	526	557	587	622
Water metered units transmitted (MIG)	-	-	-	-
ADDC				
Electricity customer accounts	205,488	209,679	214,222	218,863
Electricity metered units distributed (GWh)	15,571	17,295	18,220	20,563
Water customer accounts	178,814	180,284	184,223	188,248
Water metered units distributed (MIG)	61,311	66,067	71,103	77,537
AADC				
Electricity customer accounts	94,052	97,387	100,238	102,921
Electricity metered units distributed (GWh)	7,655	8,251	8,812	9,298
Water customer accounts	50,538	52,124	53,342	54,406
Water metered units distributed (MIG)	19,550	34,550	37,936	40,522
RASCO				
Electricity generation capacity (MW)	-	-	-	-
Annual metered water production (MIG)	-	-	-	-

Note: '-' means not provided by the company in its Information Submission

Due to the late submissions by the companies, the Bureau has not yet assessed the data in the required detail and hence is not in a position to make suggestions on the revenue driver projections for PC3. The Bureau will review these data and any update received from the companies and will include its assessment in the Draft Proposals due in June this year. In addition, the Bureau will compare projections to the demand forecasts contained in the latest 7 year and 5 year planning statements of ADWEC and TRANSCO respectively, taking account of differences in definitions (where relevant).

4.7 Weights of Revenue Drivers in Price Control Calculations

The price control calculations require a decision on the appropriate proportions of the allowed revenue which should be recovered from the fixed term 'a' and the variable terms involving the revenue drivers with co-efficients 'b' and 'c'. At the last price control reviews for all the businesses, an overall break-up of 65:35 was used for the split of allowed revenue between the fixed term and the variable components (except for ADWEC, which had full 100% weight for the fixed term). These weights were applied to the present value of total revenue over the control period. The weights thus vary slightly from year to year, depending on the relative movement in revenue drivers in each year.

The decision on these weights needs to strike a suitable balance between (1) the cost structure of the company, and (2) the incentives for the company to perform well against the objectives of the revenue drivers (for example, to improve metering or to meet new demand). A higher weight for a variable term means a greater incentive for performance on that revenue driver. However, a higher weight for the fixed term means greater surety for companies to earn revenue irrespective of the outturn demand or revenue driver performance.

The First Consultation Paper sought views on the need for a review of these weights for the PC3 controls; for example, to strengthen the incentives for improved performance via revenue drivers (by increasing the weights for the variable terms); or, alternatively, to increase the weight of fixed terms to better reflect the cost structure of the companies. The respondents to that paper generally supported the retention of the same weights or a higher weight for the fixed revenue term for the PC3 controls:

- AADC considered that it has been adversely affected under the PC1 and PC2 controls due to factors associated with its small capital base, high demand growth and the relative immaturity of its businesses. AADC therefore proposed to retain the same weights or assign a higher weighting to the fixed revenue term.

- ADDC proposed to increase the weight of the fixed term to 70% and equal weights of 15% for the variable revenue terms for the distribution businesses provided no change to the present definitions of the drivers and reasonable forecasts are made for the drivers. ADDC justified a higher weight for the fixed term on the basis of the more capital-intensive nature of its distribution businesses than the supply businesses. For the supply businesses, ADDC suggested a lower weight for the fixed term and higher weights for the variable terms based on the cost of establishing separate supply businesses and on the assessment against appropriate revenue drivers, respectively.

  The Bureau would welcome clarification of the reference of ADDC to the cost of establishing separate supply businesses. The separation of distribution and supply business controls will simply bring the price controls in line with the separate accounts for these businesses which are already prepared by ADDC, and thus we do not envisage the separation of controls will necessitate any further ‘physical’ separation of the businesses.

- ADWEC recommended continuation of its price controls as a single fixed revenue term, i.e., 100% weight for the fixed term.

- TRANSCO highlighted the need to strike a balance between cost-reflectivity and performance incentives based on some understanding, which may be qualitative but pragmatic, of the value of the performance improvement to customers or the sector.

In view of the above responses, and in consideration of a uniformity among price controls for simplicity as much as possible, the Bureau is currently minded to increase the weight of the fixed term for all businesses except ADWEC to 70%, as summarised in the following table:

Table 4.5: Weights of Revenue Terms at 2002 and 2003 Price Control Reviews			
Business	**Revenue Term or Revenue Driver**	**Current Weights**	**Bureau's Current Thinking for PC3**
ADWEC Electricity	Fixed Amount	100%	100%
ADWEC Water	Fixed Amount	-	100%
TRANSCO Electricity	Fixed Amount	65%	70%
	Metered Peak Electricity Demand	25%	15%
	Metered Electricity Units Transmitted	10%	15%
TRANSCO Water	Fixed Amount	65%	70%
	Metered Peak Water Demand	25%	15%
	Metered Water Units Transmitted	10%	15%
ADDC / AADC	Fixed Amount	65%	70%
Electricity Distribution	Electricity Customer Accounts	25%	15%
	Metered Electricity Units Distributed	10%	15%
ADDC / AADC	Fixed Amount	65%	70%
Water Distribution	Water Customer Accounts	25%	15%
	Metered Water Units Distributed	10%	15%
ADDC / AADC	Fixed Amount	-	70%
Electricity Supply	Electricity Customer Accounts	-	30%
ADDC / AADC	Fixed Amount	-	70%
Water Supply	Water Customer Accounts	-	30%
RASCO Electricity	Fixed Amount	65%	70%
	Electricity Generation Capacity	35%	30%
RASCO Water	Fixed Amount	65%	70%
	Metered Annual Water Production	35%	30%

4.8 Summary of Current Thinking

The current thinking of the Bureau is as follows:

1. The present revenue drivers should be retained. Assuming separate PC3 controls for the distribution and supply businesses of AADC and ADDC, customer accounts and metered units distributed should be adopted as revenue drivers for each distribution business, and customer accounts as the only revenue driver for each supply business.

2. The present definitions of the revenue drivers should be modified as follows:

    a. Customer accounts for the distribution businesses should be defined to include only customers connected to distribution networks ("Distribution Customer Accounts").

b. Customer accounts for the supply businesses of should be defined to explicitly include all customers whether connected to the distribution or transmission networks or supplied by tankers (“Supply Customer Accounts”).

c. Water and electricity peak demands for TRANSCO and water production for RASCO should be amended to be based solely on metered units only.

3. The treatment of PWPA and fuel costs should be continued on a pass-through basis for ADWEC as long as the unit production costs of electricity and water in any year are equal to or less than those in the previous year.

4. With the establishment of separate price controls for the supply businesses of AADC and ADDC, distribution charges levied by the distribution businesses will be introduced as a new pass-through item in the price controls for supply businesses.

5. The cap on the PIS-related MAR adjustment via the term “Q” for Category A performance indicators should be increased to up to 5%, depending on how many such indicators are adopted at this review for PC3.

6. The weight for the fixed term for both water and electricity businesses of ADWEC should be 100%. For all other businesses, the weight for the fixed term should be 70% and that for the variable terms should be 30%, equally apportioned between revenue drivers whenever there are two revenue drivers for the business.

5 Assessment of Operating Expenditures

5.1 Introduction

The Bureau's approach to setting the PC3 controls will be based, broadly speaking, on setting the allowed revenues for each business to recover an efficient level of its costs – that is, operating expenditure (opex) and capital costs (depreciation plus a return on capital). Using the "building-block" approach discussed in the First Consultation Paper, the annual revenue requirement for each business can be calculated as follows:

Required Revenue = Operating Expenditure + Depreciation + Return on Assets

Projections of operating expenditures (opex) are therefore one of the main inputs to the price control calculations. In line with the present practice as discussed in the First Consultation Paper, the term "operating expenditure", or "opex", in this document generally refers to operating costs excluding depreciation. Exceptions to this are: (1) ADWEC, which has few capital assets and for which opex includes capex and depreciation; and (2) RASCO, for which opex excludes fuel costs as the latter accounts for a significant part of RASCO's costs and hence needs to be treated and incentivised separately, as discussed later in this Section 5.

Further, based on the suggestions made for the scope of the price controls in Section 3.6, all opex relating to the licensed activities, including activities indirectly related to licensed activities, will be accounted for in the opex projections for the relevant businesses. It is proposed that the only exclusion will be opex related to unlicensed activities for which the company has received the Bureau's consent. This will mirror the definition of "regulated revenue" used for monitoring compliance with the price control.

The First Consultation Paper assessed possible approaches to the assessment of future opex for PC3 keeping in view two main considerations: (1) the sufficiency of allowed revenue to enable the companies to finance their businesses, and (2) ensuring the economy and efficiency of the sector requiring the opex projections be set on reasonably efficient levels. The First Consultation Paper set out an overall approach to making opex projections for PC3, consistent with the approach used at the last price control reviews, which is summarised below:

1. **Determine a base level of opex** by using the recent actual level of opex or the level of opex projected at the last review;

2. **Adjust the base level of opex to reflect increased costs for future demand increases**;

3. **Adjust the demand-adjusted opex for efficiency improvement expected over the PC3 period**; and

4. **Make further adjustments** to opex projections which may be appropriate – for example, for one-off costs (or cost reductions) which are known about in advance, or for anticipated changes in the real price of inputs used in the production process.

This approach pays regard to the reasonable levels of opex of the companies while at the same time providing strong incentives for efficiency improvement. The First Consultation Paper also discussed the possible use of benchmarking of overall or individual components of opex to set the base level, and the possibility of introducing a 'rolling' incentive scheme to ensure consistency of efficiency incentives within and between price control periods. The fuel costs for RASCO were discussed separately in the paper indicating possible ways for strengthening the fuel efficiency incentives for RASCO.

The following **Table 5.1** reports out-turn opex (excluding depreciation) for 1999 – 2003 for all companies as per the audited Separate Business Accounts.

Table 5.1: Audited Out-turn Operating Expenditure (excluding depreciation)

AED m, nominal prices	1999	2000	2001	2002	2003
ADWEC	6.219	7.794	8.364	8.976	9.215
TRANSCO					
Electricity	57.573	76.887	82.822	109.867	101.548
Water	91.672	100.524	106.488	116.734	159.418
ADDC					
Electricity Distribution	136.243	156.853	165.023	175.099	168.480
Electricity Supply	19.122	22.603	25.920	30.158	34.101
Water Distribution	65.491	76.452	84.508	96.807	114.437
Water Supply	17.140	20.565	23.055	26.087	28.905
AADC					
Electricity Distribution	67.162	73.737	79.954	90.560	103.024
Electricity Supply	18.324	21.502	25.091	29.885	35.636
Water Distribution	53.747	68.493	74.328	75.886	72.456
Water Supply	4.082	3.499	4.479	8.029	10.046
RASCO	208.427	242.928	198.120	164.275	166.927

Notes: Opex (excluding depreciation) calculated from the audited accounts as the sum of (1) 'Staff costs', (2) 'Repairs, maintenance and consumables used', (3) 'Administrative and other operating expenses' and (4) 'Tanker hire cost' (ADDC and AADC water distribution businesses from 2001 only). For RASCO opex includes distribution and supply costs in 1999 and 2000 and, in addition to the above, includes fuel for all years. For ADWEC, opex includes depreciation.

Table 5.2 below shows companies projections for 2004 – 2009 as per their Information Submissions (no responses have been received from ADWEC and RASCO). It can be seen that opex (excluding depreciation) for the network companies combined is forecast to increase by more than 50% in real terms (reaching in excess of AED 1.4 billion in 2004 prices) by 2009. In the Bureau's view the rise in opex projected by the companies is excessive in view of the rate of growth in revenue drivers reported in Section 4, the existence of a significant proportion of fixed costs, and the scope for efficiency improvements.

Table 5.2: Companies' Projections of Operating Expenditure (Excluding Depreciation)							
AED m, 2004 prices	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**CAGR**
TRANSCO							
Electricity	112.274	146.625	153.806	161.553	169.840	178.832	9.8%
Water	193.230	260.717	273.085	286.220	300.179	315.028	10.3%
TRANSCO Total	305.504	407.342	426.891	447.773	470.019	493.860	10.1%
ADDC							
Electricity Distribution	174.502	218.677	228.096	237.833	247.879	258.433	8.2%
Electricity Supply	50.969	66.845	68.851	70.916	73.044	75.235	8.1%
Water Distribution	96.926	122.875	127.214	132.987	138.966	145.160	8.4%
Water Supply	37.982	45.610	46.978	48.387	49.839	51.334	6.2%
ADDC Total	360.379	454.007	471.139	490.123	509.728	530.162	8.0%
AADC							
Electricity Distribution	115.629	128.348	142.467	158.138	175.533	187.820	10.2%
Electricity Supply	35.746	39.320	43.252	47.577	49.956	52.454	8.0%
Water Distribution	80.844	89.736	99.607	110.564	118.304	126.585	9.4%
Water Supply	10.869	11.956	13.152	14.467	15.913	17.505	10.0%
AADC Total	243.088	269.360	298.478	330.746	359.706	384.364	9.6%
Total all network businesses	**908.971**	**1130.709**	**1196.508**	**1268.642**	**1339.453**	**1408.386**	**9.2%**

ADWEC	**NO RESPONSE RECEIVED**
RASCO	
Electricity	**NO RESPONSE RECEIVED**
Water	**NO RESPONSE RECEIVED**

Note: CAGR denotes compound annual growth rate 2004 – 2009.

The First Consultation Paper raised the following specific issues for consultation on these matters:

1. *"The Bureau favours a "top-down" approach to the assessment of efficient levels of opex. With such an approach, what should be the base level of opex?*

2. *What role should benchmarking play in the assessment of opex efficiency?*

3. *What is the scope for opex efficiency improvements over the PC3 period?*

4. *To what extent can opex be expected to vary with increases in demand over the PC3 period?*

5. *What other factors should be taken into account in assessing future opex requirements (e.g., capital substitution, movements in real input prices, one-off events)?*

6. *Should a 'rolling' scheme be introduced to allow companies to retain the benefits of out-performance of efficiency assumptions for a period of fixed duration?*

7. *How should the incentives for fuel efficiency for RASCO be improved?"*

The following sections discuss the companies' responses to the above issues and the Bureau's current thinking in light of these responses.

5.2 Assessment of Base Level of Operating Expenditure

In the four-step approach to set opex projections for PC3 summarised in Section 5.1 above, the first step is to set the base level of opex. The First Consultation Paper identified a number of approaches to do so, which are summarised in **Table 5.3** below:

Table 5.3: Possible Approaches to set the Base Level of Opex for PC3

Approach	Main Features
1. Bottom-Up Approach	• Involves assessing each main item of opex against that of comparator companies in the sector or elsewhere • Main difficulty is to find suitable comparators and publicly available data on comparators • May involve the regulator in the "second-guessing" of detailed operational decisions which are usually best left to the management of the company
2. Top-Down Approaches	
2(a) Use of Benchmarking Tools	• Assesses the overall level of opex of a company against that of comparator companies in the sector or elsewhere • Cost data for the overall business is more likely to be available publicly but difficulty is to find suitable comparators • The approach was used by the Bureau to set the PC1 controls
2(b) Actual Outturn Costs	• Use the recent cost of the company as the base level for the next control period • Ensures price controls sufficient to finance business • May provide poor efficiency incentives towards the end of the control period • The approach was used by the Bureau to set the present price controls
2(c) Extending Previous Projections	• Use the opex projected at the last review as the base level for the next control period • May not provide sufficient revenue given rise in sector costs

In practice, regulators will tend to use a combination of approaches and assess a wide range of information before forming a judgment about the reasonable level of opex for the company over the next control period.

While the use of benchmarking in the bottom-up approach requires the identification of suitable comparators from elsewhere in the country or overseas, and is highly data intensive, the First Consultation Paper indicated that the Bureau would like during the course of the present review to undertake investigation of certain cost components which are particularly significant or which give cause for concern. Such components may include fault repair costs, vehicle costs, staff

costs, and general overhead expenses. The First Consultation Paper also invited the companies to share the results of any benchmarking analysis they have undertaken, either at the level of the business/company as a whole or for individual components of cost, and to make a case as to how the results of its benchmarking analysis can be used at this review. No company submitted any such studies.

The First Consultation Paper also indicated that the Bureau favours placing most emphasis on a top-down approach to projecting future opex. The paper requested views on whether the base level can be the actual outturn cost levels for the latest year prior to the next control period (2b above) or the cost levels projected at the last price control review for the last year of the present control period (2c above), or perhaps some combination of the two. The decision on which approach is to be used was to be made once the Bureau is in receipt of and has assessed the required data from the companies. The First Consultation Paper suggested that where companies have not responded adequately to efficiency incentives included in the PC2 controls, the Bureau would be reluctant to fully reflect this in higher opex allowances in the PC3 period than those the Bureau considers should have been achievable.

It should be noted that the top-down approach to projecting future opex using the latest actual outturn cost data as the base level was used by the Bureau in setting the present price controls for the companies. At the 2002 review, in view of the absence at that time of audited financial data for 2001, the Bureau used the average of 2000 and 2001 opex (adjusted to 2003 prices) as the base level for future opex projections. In the case of RASCO, the Bureau at the 2003 review used 2003 opex (adjusted for 2004 prices) as the base level of opex for 2004-2005.

The Bureau has received generally supportive responses to the First Consultation Paper in relation to the use of top-down approach with the current level of opex as the base level. These are summarised below:

- AADC stated that it was assessing its ongoing opex based on the audited separate business accounts for 1999-2003, which it would like to share with the Bureau during the course of this review. AADC proposed that the Bureau should review all available comparable opex with particular attention to AADC's audited accounts. AADC considered that the current level of opex is below long run costs. It also considered that benchmarking has a minor role to play in the assessment of opex efficiency due to the problems associated with finding suitable comparators given different environments and other factors in Abu Dhabi. AADC therefore suggested that the benchmarking data should be used as a very rough indicator and that more emphasis should be placed on the companies' own historical costs and opex forecasts. AADC also indicated that a report detailing the future levels of efficient opex will be available from its independent consultants during the course of this review.

- ADDC specifically stated its preference for the use of the current level of opex (based on audited accounts and current year budget) as the base level – that is, approach 2(b) above. The company highlighted that while benchmarking is a useful tool it should be treated with care due to significant differences between ADDC and potential comparators, such as: oncosts for staff, topography, demographic changes, migratory

customer base, environmental differences, load/customer growth, and the relative immaturity of its networks.

- ADWEC generally argued against the top-down approach, and particularly preferred to discuss with the Bureau how to determine the base level of opex in the first instance before efficiency improvements, benchmarking and other issues. ADWEC showed its preference to first accurately define the scope of its price control, and to agree on its likely new responsibilities with possible financial adjustments at the next review for higher or lower responsibilities than that envisaged at this review.

- TRANSCO supported the top-down approach for PC3 with the current opex data as the base level – that is, approach 2(b) above. It considered that the PC2 controls were based on opex data that has proved to be inaccurate and therefore using the PC2 projected opex as the base level might result in perpetuating existing inaccuracies. In relation to the use of benchmarking, TRANSCO cautioned that the benchmarking results should be treated with care, particularly for water businesses, because of the relatively unique operating conditions of TRANSCO and the sector and the scarcity of data on other similar companies in the region.

The Bureau generally concurs with the views of the respondents, particularly in relation to the care required for the application of any benchmarking. With regards to ADWEC's views, the Bureau does not consider them to be opposed to the overall top-down approach. Rather they relate to how the overall opex projections, particularly in relation to any new responsibilities for ADWEC, should be set.

While the Bureau may undertake some benchmarking analysis to assess the efficiency or otherwise of Abu Dhabi companies at this review, the results would be used as a complementary to, rather than as an alternative to, other approaches. Similarly, the Bureau agrees with the respondents to use the current costs as the base level for PC3 – that is, approach 2(b) above. Specifically, the Bureau's current thinking is to use audited opex for 2003 (the most recent audited data available) as the base level of opex for PC3.

The Bureau will make appropriate adjustments to the base level for any additional costs that are reasonably expected to be incurred in undertaking new responsibilities. The responsibility-based approach suggested by ADWEC is also discussed in Section 3 in relation to the overall form of the PC3 controls.

5.3 Adjustment to Base Level of Opex for Demand Increases

Section 5.2 above discusses how the base level of opex can be set for PC3 using the latest audited data. This base opex level may not necessarily be sufficient to meet future higher demands. In Abu Dhabi, water and electricity demands have been typically growing by 5 – 10 % a year, although the rate of increase appears now to be slowing in the case of electricity. It is therefore necessary to make adjustments to the base level of opex to reflect increased opex associated with meeting increases in demand. However, since a proportion of opex is fixed in nature, or only semi-variable, opex can be expected to increase at a slower rate than demand. The effect of such

"economies of scale" is to lead to reductions in unit opex in industries where demand is expanding, even if there is no underlying improvement in the efficiency of operations.

At the 2002 price control review, the Bureau assumed that the anticipated demand growth for the sector of about 10% a year would lead to an increase in opex of about 5 % a year, all else being equal. This was based on evidence from academic literature and other regulators which suggested that, in capital-intensive industries, each 1% a year increase in demand could be expected to lead to an increase in opex of about 0.5% a year. The First Consultation Paper sought the views of respondents on the appropriate assumption for opex increases due to demand growth during the PC3 period.

The respondents to the First Consultation Paper did not support the assumption of a 0.5% opex increase for a 1% demand increase. The responses are summarised below:

- AADC referred to a study undertaken by consultants for Ofwat which it said concluded that there are material diseconomies of scale for water utilities and that a 1% increase in scale is associated with a 1.7% increase in long run costs. AADC suggested that, given its small size, significant demand growth and unpredictability of the planning environment for both opex and capex, the diseconomy of scale is much larger for AADC. It promised to provide the Bureau with an analysis to support this based on their recently audited accounts.

- ADDC also referred to the Ofwat study and argued that system load in terms of MW has less relevance to the lower levels than higher levels of distribution (levels meaning voltage or pipe diameter) and less relevance to the distribution system than the transmission system. ADDC also argued that continuing growth in customer numbers, connections and average demand per customer as well as the continuing demand for more secured and continuous supplies will require increases in opex.

- ADWEC considered that the assumption of 0.5% opex increase for each 1% demand increase is not appropriate for the UAE where water and electricity are being supplied to new areas and hence require the addition of new infrastructure.

- TRANSCO also considered that new assets (e.g. Fujeirah and Shuweihat transmission systems) are built on the basis of forecast demand and result in significant opex often before the full forecast demand is realised.

The Bureau would make the following comments:

- The responses relating to new assets and connections seem more relevant to capex than opex. While it is reasonable to argue for an increase in opex due to an increase in new assets and connections, such a relationship should be captured by that between opex and demand.

- A business should ensure a suitable time scale for addition of new assets to meet new demand and hence should not expect a significant gap between the increase in opex associated with the new assets and the realisation of the expected demand.

- The Bureau has reviewed the study undertaken for Ofwat, quoted by both ADDC and AADC, in some detail. We note that the result quoted relates to combined water and sewerage companies (not relevant to Abu Dhabi). In the case of water-only businesses, Ofwat's consultants found evidence of *economies* of scale. Further, the study was undertaken in the context of prospective mergers of large-scale water and sewerage businesses operating in discrete geographic areas in England and Wales. The results are thus unlikely to be applicable to organic growth of much smaller businesses in Abu Dhabi.

  In contrast to the Ofwat study, a recent World Bank[7] study finds evidence for economies of scale for water service providers. The study uses cost and size related data from 270 water and sanitation providers in 33 countries. The size of provider is measured in four ways: population served, connections or customers, volume of water, and length of network. The study concludes that the evidence of scale economies is most consistent across data sets when volume of water is used as the measure of size. But strong economies of scale also show up for some data sets when the measure of size is the number of connections or population served, though the results are more varied. In general, for small providers, the study reports increase in operating costs by 63% - 86% for 100% increase in the volume of water.

In view of the respondents' comments, and the evidence cited above, the Bureau's current thinking is that while some economies of scale are to be expected, a less demanding assumption than that adopted at the last review may be appropriate. We therefore propose to assume that **opex will rise by the order of 0.6 – 0.9 % for each 1% increase in demand**, all else being equal.

5.4 Adjustment to Demand-Adjusted Opex for Efficiency Improvements

While the steps discussed in Sections 5.2 and 5.3 above set the base level of opex and adjust it for increases in demand, it is also necessary to take account of the assumed efficiency improvement over the duration of the PC3 controls. At the 2002 price controls review, the Bureau presented evidence which demonstrated that efficiency improvements of 3 – 7 per cent a year seemed a reasonable expectation in the light of the efficiency improvements made by similar firms in comparable circumstances. On this basis, the Bureau adopted an opex efficiency improvement of 5% a year while setting the present price controls.

The First Consultation Paper indicated that the Bureau will also attempt to analyse the efficiency improvements made by the companies over the PC2 period. In other regulatory environments, efficiency assumptions in price limits have tended to reduce over time as companies have responded to the incentives provided by the price controls, reducing the scope for future improvements. As shown by Tables 5.1 and 5.2, there is little evidence of this effect yet; indeed, there may be a case for finding means to further strengthen the efficiency incentives.

[7] "Optimal Size for Utilities? Returns to Scale in Water: Evidence from Benchmarking", Note Number 283, Public Policy for the Private Sector, The World Bank, January 2005.

The First Consultation Paper sought details from the sector companies as to specific efficiency initiatives that have been taken by the companies during PC2 or which they plan to undertake during PC3.

Generally, the respondents to the First Consultation Paper could not identify precise opex efficiency improvements in the sector and argued for the necessity of an increase in opex levels in view of the demand growth. The responses to the paper are summarised below:

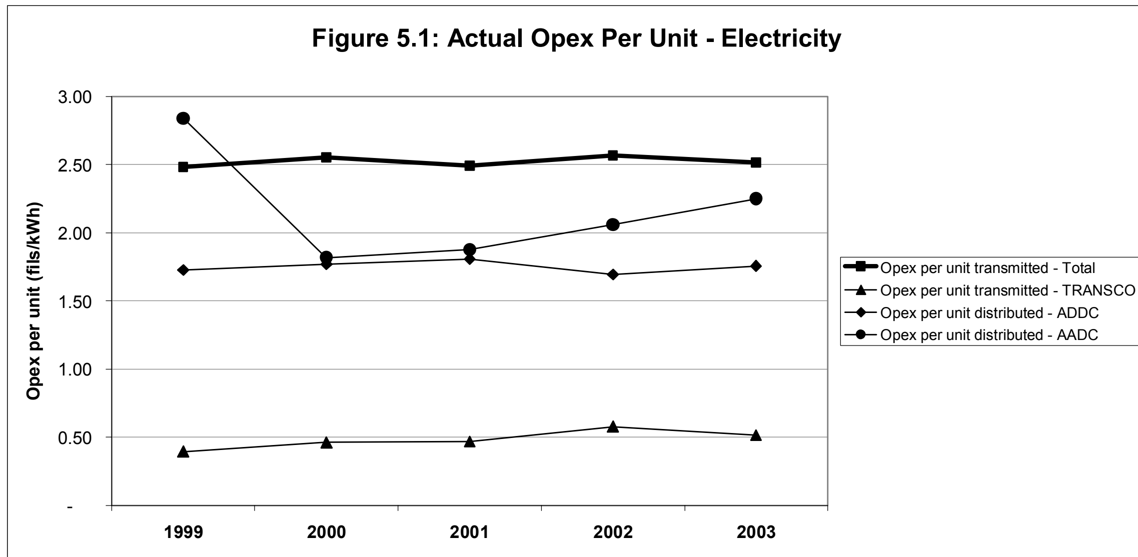
- AADC suggested that the Bureau was in error in holding opex steady in real terms when the small business faced a significant growth. It proposed that a better measure of opex efficiency is opex as a percentage of final delivery costs and that there should be an increase in the absolute value of opex moving forward.

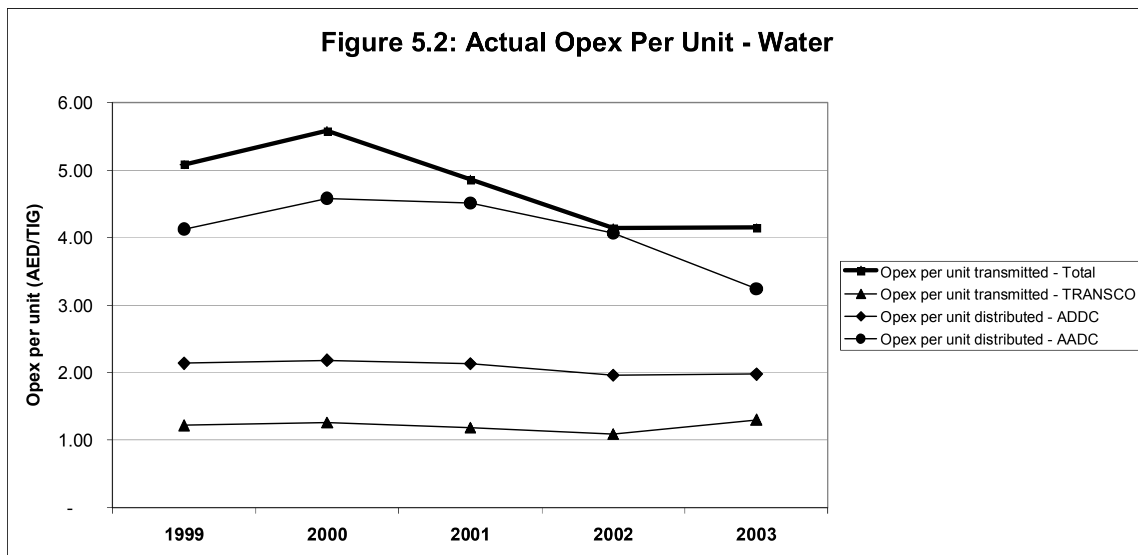
- ADDC believed that significant efficiencies have been made during the current control period as evidenced by the increase in customer numbers and metered supplies, improvement in regulatory and system performance, and what it said was a reduction in overall sector costs due to the transfer/contracting out of RASCO activities to ADDC. The company therefore disagreed that there is a case for further strengthening of efficiency incentives. ADDC however also considered that further efficiencies are achievable and necessary in the future – though these efficiencies may not be transparent and easy to assess due to the effect of increasing quality, performance and growth requirements on the company. It also indicated that the cost to meet increasing demand is likely to continue if not increase.

- ADWEC considered that efficiency improvements may be possible during the initial years of restructuring of organisations such as AADC, ADDC and TRANSCO, although whether they lie in the range of 3%-7% is debatable. However, for ADWEC being a new company, such expectation is unrealistic and has not been supported by experience. ADWEC also explained how outsourcing of certain IT and plant testing activities and undertaking certain publication activities internally have been able to reduce ADWEC's costs. However, ADWEC highlighted increases in housing costs / rents as a major concern and expressed doubts on whether the UAE CPI captures increases in such costs.

- TRANSCO argued that the there is an overall trend of declining opex per unit of water and electricity over the period 1999-2004 and that it has been under-funded with respect to opex under PC2 due to inaccuracies in data submitted by TRANSCO at the time. It also suggested that the reductions in opex achieved in the UK may not be achievable in the same time frame in Abu Dhabi due to the differences in operating conditions and local constraints.

The Bureau believes that there is more room for efficiency improvements in the Abu Dhabi companies than achieved in the UK. The following two charts show, separately for water and electricity, the trends in opex (in nominal terms) per unit transmitted or distributed since 1999 for AADC, ADDC, and TRANSCO, as well as on a total basis for all companies subject to price controls, based on cost data from audited accounts and unit data from information submissions:





The above graphs clearly show an overall increasing trend for TRANSCO's opex per unit, for both water (from 1.22 AED/TIG in 1999 to 1.30 AED/TIG in 2003) and electricity (from 0.39 fils/kWh in 1999 to 0.52 fils/kWh in 2003). ADDC has shown a declining trend for water and an increasing trend for electricity. AADC has shown an overall decline in opex per unit since 1999 but the company's opex per unit has always been quite high compared to ADDC or TRANSCO and hence affecting the overall trend of total opex per unit for all the companies which are subject to price controls.

In response to ADWEC, the Bureau acknowledges that efficiency improvements achieved by capital-intensive network utilities may not be the best comparator for ADWEC (which is highly staff oriented), and the need for ADWEC to increase staff to meet new workstreams and improve on the existing ones. Nevertheless, ADWEC still needs to demonstrate the application of efficient purchasing throughout its business. With respect to ADWEC's concerns related to the UAE CPI,

the details on the composition of the CPI can be seen at the website of the UAE Ministry of Planning which shows that housing costs account for a significant part (more than 30%) of the CPI.

Since the 2002 price control review, the research on opex efficiency improvements achieved by utilities in the UK has been updated by several UK regulators in their most recent price reviews.

Europe Economics, in a report[8] for the water regulator Ofwat, concluded that:

"…the evidence from analysis of the UK regulated infrastructure firms suggests that savings of the order of 3 to 5 per cent per annum in real unit operating expenditure have been achieved since privatisation"

Cambridge Economic Policy Associates (CEPA) in a report[9] for the electricity and gas regulator Ofgem estimated that UK electricity distribution companies had improved their opex productivity by 7.7 per cent a year on average over the last ten years, that the National Grid Company had achieved corresponding improvements of 5.2 per cent a year, and water and sewerage companies had achieved 5.0 per cent a year.

OXERA in a report[10] for the rail regulator, ORR, concluded that:

"The analysis shows a general reduction in real unit operating expenditure for all industries, and suggests that, on average, and excluding some of the extreme observations, annual reductions in RUOE [real unit operating expenditure] of 2.5 – 5.5% have been achieved since privatisation".

Based on the above research, on evidence of unit cost movements in the sector to date, and on the comments of respondents, the Bureau's current thinking is that the Abu Dhabi companies can be expected to **reduce their real unit operating expenditure by 3 – 7 per cent a year in real terms** over the PC3 period, before taking account of the impact of demand growth and other factors.

5.5 Further Adjustment to Opex Projections for Other Factors

The First Consultation Paper discussed the need for the Bureau to consider any further adjustments for other factors not adequately dealt with by the previous three steps. These include:

- In most network businesses, one would expect an **ongoing substitution of capital for operating costs**. New capital equipment sometimes reduces the number of people or the quantity of materials employed, whether in productive or administrative functions. As a

8 Europe Economics (2003), *Scope for Efficiency Improvement in the Water and Sewerage Industries*, March 2003, page 44.

9 CEPA (2003), *Productivity Improvements in Distribution Network Operators*, November 2003, page 55.

10 OXERA (2003), *Operating Cost Reductions in Regulated Network Industries*, June 2003, page iv.

result, the stock of capital tends to increase in relation to other inputs, and opex tends to reduce more rapidly (or increase less rapidly) than costs overall.

- Adjustments to opex projections would be required where increases or decreases in **real input prices** faced by the sector companies are expected (i.e., other than movements reflected in the changes in the UAE CPI already accounted for in the CPI-X indexation formula). In principle, such an adjustment could be upwards or downwards (depending on whether real input prices were expected to rise or fall).

- Certain costs may be argued to be **outside the direct control of the companies**. For example, corporate income tax (which is not presently imposed in Abu Dhabi) imposed during a control period after the new controls are set would truly be beyond the control of a company. However, the pass-through treatment of such costs which are identified as being outside companies' control is not necessarily the appropriate regulatory treatment, especially in view of the companies' performance to date in providing audited information on a timely basis. A better alternative may be to make due allowance for such prospective costs when setting the price controls, or to exclude such costs from the controls and make an appropriate adjustment for any outturn costs at the subsequent price control review.

No adjustment was made for the above effects at the last reviews. The First Consultation Paper sought views of the respondents on whether any such adjustments are appropriate for PC3.

In their responses to the First Consultation Paper, the companies identified a number of factors which may deserve adjustments to the opex projections for PC3. However, none of the responses identified the magnitude of the required adjustments. These responses are summarised below:

- AADC indicated the need for adjustment to the opex (and capex) for the costs required to meet any service level target agreed at this review for the PC3 period. The company is developing a forward looking opex programme which will take account of a range of factors faced by the business. The company suggested its opex projections expected to be developed by its independent consultants should be the most dominant data to be used to set the PC3 controls.

- ADDC supported the treatment of certain costs or risks via adjustments to opex projections and identified a number of costs being out of its control, such as the Bureau's licence fee, industry / ADWEA governance costs, excavation charges (to purchase road or public access right from a relevant authority for its activities), costs associated with any new regulations and initiatives to be agreed for future, one-off costs associated with its potential privatisation, increasing fuel prices, and increasing insurance costs.

- ADWEC also indicated a number of costs being out of its control. These include housing costs for staff, ADWEA recharges, contracts led by ADWEA and other costs introduced by ADWEA or a change in the law.

- TRANSCO, while supporting the approach to adjusting opex projections for unforeseen costs, proposed the approach used by Ofwat in the UK to log-up additional costs which

are not forecast at the time of setting price controls but later allowed by the regulator following audit by the regulator's consultants of the company's evidence that such costs are legitimate. TRANSCO indicated that lane rentals, chlorine handling systems, and variations in fuel oil and cable costs due to changes in market prices, as the potential unforeseen costs which should be remunerated at the next price control review.

The Bureau, in principle, agrees to the treatment of unforeseen and genuinely legitimate costs via adjustment to opex projections providing that precise estimates of these adjustments along with evidence and justification are submitted by the companies. However, we are doubtful as to the extent to which all of the potential additional cost items cited by the licensees will materialise. Furthermore, certain costs, such as housing cost allowances (see earlier discussion) and ADWEA recharges, should already be covered by the Bureau's overall approach of basing future opex projections on the recent audited data (i.e., they will already be included in the cost base). Further, as discussed earlier, if a company faces a significant cost unforeseen at the time of price control setting, the company can either (a) request disapplication of price controls or amendment to the licence to modify price controls at any time in the future, or (b) seek appropriate financial adjustment to the revenue requirement at the future price control review for remuneration of such costs.

The Bureau is therefore currently minded to make adjustment to the opex projections for PC3 for costs for which companies provide reasonable estimates and explanation.

5.6 Possible "Rolling" Incentive Scheme

The First Consultation Paper discussed in detail the issue with the way the CPI-X price controls are set and reset, which results in lower efficiency incentives towards the end of the control period than at the start of the control period.

To address this issue, some regulators have proposed or employed an approach whereby the efficiency benefits achieved in one control period are retained by companies for a "rolling" period of fixed duration, say 5 years, irrespective of whether lower opex occurred early or late in the price control period. The purpose of such a rolling scheme is to ensure consistency of incentives within and between price control periods.

The First Consultation Paper also mentioned more sophisticated rolling schemes, such as: (a) a rolling approach to both opex and capex (in view of the potential trade-off between the two) adopted by some regulators by using a rolling allowance for opex and a rolling RAV for the capital costs; and (b) the concept of "regulatory reserve" proposed by some researchers for efficiency out-performance to be returned to customers progressively over a relatively long period, such as network asset life, to provide complete consistency of incentives between opex and capex and to avoid undue variations in price limits.

A rolling scheme approach could have benefits in Abu Dhabi, by ensuring consistency of efficiency incentives over time. However, the First Consultation Paper indicated that given the complexity of the approach it may be premature to introduce it at this review.

While the respondents to the First Consultation Paper generally supported, in principle, the introduction of a rolling scheme, AADC suggested that it would be premature to introduce a rolling scheme at this time and proposed that such a scheme should be fully discussed in future for consideration for the fourth price controls (PC4).

The Bureau also presently considers that a rolling scheme is not appropriate to be introduced for PC3 due to its complexity which may adversely affect the increasing familiarity and recognition of the current form and incentives of the price controls in the sector. However, such a scheme could be considered for future reviews.

5.7 RASCO's Fuel Costs

Fuel costs make up to significant part of the total operating costs of RASCO. Further, the unit fuel costs for RASCO's water and electricity are significantly higher than those of the distillers and generators selling water and electricity to ADWEC and higher than the average unit fuel costs under the BSTs (Bulk Supply Tariffs) charged by ADWEC to the distribution companies.

Although there may be legitimate reasons for RASCO to have somewhat higher fuel costs than the sector as a whole, at the last price control review the Bureau considered it important to establish incentives for RASCO to manage its fuel consumption more efficiently. The mechanism introduced for the present price controls for RASCO requires that the allowed fuel costs for any year 't' of the control period (2004-2005) are calculated by using the following formula, separately for water and electricity:

$$F_t = (W_A \times AF_t) + (W_B \times Z_t \times BUF)$$

Where:

AF_t = Actual fuel costs of RASCO for electricity or water in year t (AED)

Z_t = Quantity of electricity or water produced in year t (kWh or TIG) as defined below.

BUF = Benchmark unit fuel cost for electricity or water (fils/kWh or AED/TIG) as set by the Bureau based on expected levels of fuel consumption efficiency which could be achieved by RASCO over the control period.

W_A = Weight of the actual fuel costs of RASCO in year 't' in the allowed fuel costs.

W_B = Weight of the allowed fuel costs for RASCO in year 't' which should be based on the unit fuel cost benchmark.

This formula allows RASCO to recover a proportion (at the 2003 review: 95%) of its actual fuel costs and the remaining fuel costs are based on the benchmark fuel unit costs. This provides RASCO with the incentive to improve its fuel consumption efficiency and earn additional revenue if it reduces its unit fuel cost below the benchmarks. The above formula requires the Bureau to establish the values of the weights W_A and W_B and the benchmark unit fuel cost (BUF), separately for electricity generation and water production businesses of RASCO.

At the 2002 review, the data submissions on RASCO indicated that the average fuel unit costs for RASCO's electricity and water production were in the range of 22 – 31 fils/kWh and 11 – 13 AED/TIG, respectively - significantly higher than the average BST unit fuel costs and higher than any station in ADWEC's system. The Bureau therefore set 20 fils/kWh and 8 AED/TIG as the benchmark unit fuel costs (BUFs) for RASCO's electricity and water price controls, respectively, for 2004-2005. These were also significantly higher than the average BST unit fuel costs and other comparators and were intended to make allowances for the different operating environment for RASCO (such as differences in fuel types, in plant locations, in technologies, and in plant loadings) compared to the networked generators.

The First Consultation Paper indicated the need for the Bureau to strengthen the incentive for RASCO to reduce its fuel costs. The three options identified in the paper to further strengthen the incentives for fuel efficiency were:

1. Reduce the benchmark unit fuel costs (BUFs);

2. Increase the weight of the benchmark fuel costs (W_B) in the formula for allowed fuel costs – presently this weight is 5% for both water and electricity businesses; or

3. an appropriate combination of the above two options.

The First Consultation Paper also indicated the possibility of reviewing the definitions of the 'Z' terms. These terms, in essence, are presently defined as the net quantity of electricity or water produced in a year from any generator (whether continuous, emergency or standby) or any water production plant (excluding water well-fields and reverse osmosis distillers) as metered or reasonably estimated. These definitions may be reviewed, for example, as to whether the quantities should be allowed to be "reasonably estimated" or whether should be require to be "metered".

No response to the consultation paper was received from RASCO.

Both AADC and ADDC argued that the incentives for RASCO to improve fuel efficiency are not appropriate and not effective. They argued that many production units of RASCO are used as stand-by units and as the only source of supplies when the network supplies are not available, which result in lower fuel efficiencies compared to the benchmarks set on the basis of efficient fully operational generators. Further, the companies argued that the only way for RASCO to improve fuel efficiency is to replace old or fully depreciated plant with new, more efficient plant which may not be economic and reasonable in view of the growing networks of the two distribution companies. ADDC also understands that RASCO does not have the power to diversify either its source of fuel or the fuel price. AADC also stated that all RASCO sites are connected to the electricity network and hence their fuel costs are dictated by stand-by operation and test requirements and are negligible.

In response, it is important to note that the benchmarks set at the last review for RASCO were not based on the unit fuel costs for efficient fully operational production units in ADWEC's system. Indeed, the benchmarks set for RASCO were significantly higher than the unit fuel costs experienced in ADWEC's system and were very close to the actual fuel costs reported for

RASCO at that time. These benchmarks were set with due regard to the unique operating modes and environment for RASCO production units. Further, the Bureau considers that most of the respondents' arguments relate to electricity generation rather than water production.

The Bureau also considers that any procurement of new plant by RASCO, the demands for which could be more economically met by existing plant or by ADWEC plant, would be inconsistent with RASCO's economic purchasing obligation.

However, the Bureau also recognises the limitations on RASCO as identified by the respondents. The Bureau therefore currently does not propose to further strengthen the fuel efficiency incentive for RASCO. However, the Bureau's current thinking is to retain the present incentives for RASCO to manage fuel costs efficiently for PC3 in view of the significance of magnitude of fuel costs for RASCO relative to its other operating costs. The Bureau would however welcome specific suggestions from respondents as to an alternative means to incentivise efficient fuel use by RASCO.

5.8 Summary of Current Thinking

The Bureau's current thinking on assessment of the operating expenditure for the PC3 controls as discussed in this Section 5 is summarised below:

1. The four-step 'top-down' approach to opex projections used at the last review (approach 2(b) from Table 5.3), with limited application of potential benchmarking of overall or individual costs, should be retained for the assessment of opex for PC3.

2. The base level of opex for each business should be set based on the actual outturn opex for the latest year for which the audited accounts are available.

3. The base level of opex should be increased by 0.6 – 0.9% a year for each 1% a year increase in demand.

4. The demand-adjusted base level of opex should be reduced by 3 - 7% a year for assumed efficiency improvement.

5. The opex projections for PC3 derived from the above three steps should further be adjusted for expected but legitimate costs arising from new risks or events over the PC3 period for which companies provide reasonable estimates and explanation.

6. A 'rolling incentive scheme' should be deferred for consideration at the next review.

7. The present form, benchmarks, and related weights for fuel efficiency incentives for RASCO should be retained for PC3, but further views are welcome on this issue from RASCO.

6 Treatment of Capital Expenditure and Asset Valuation

6.1 Introduction

As highlighted in Section 5.1 of this document, the Bureau's approach to setting the PC3 controls will involve the calculation of the annual revenue requirement for each business using the building-block approach as follows:

Required Revenue = Operating Expenditure + Depreciation + Return on Assets

The allowances for capital expenditure (capex) affect the regulatory asset values (RAVs) and hence two of the three main inputs to the calculation of the future revenue requirements, that is, depreciation and return on assets. For capital-intensive industries, capital costs account for a significant proportion of overall costs and hence of charges to customers.

As discussed in Section 2 of this paper, the treatment of capital expenditure varied between PC1 and PC2, but was essentially based on an approach of *'ex-post'* assessment – i.e., allowed capital expenditure is determined after the event (based on efficiency criteria established by the Bureau). While the PC1 controls were set assuming no capex for the PC1 period (1999-2002), the PC2 controls were set with a provisional capex allowances for both the PC1 period and the PC2 period (2003-2005).

It was agreed at the 2002 price controls review that once audited data on actual PC1 and PC2 capex is received, it will be reviewed against the efficiency criteria established by the Bureau. Any difference between efficient past capex and the provisional allowances will be reflected in a financial adjustment (to future revenues) at the 2005 price controls review - or at the subsequent review when the audited data becomes available. In 2004, the Bureau commenced a review of PC1 capex.

The 2004-2005 price controls for RASCO were, by contrast, set on the basis of an *'ex-ante'* assessment of capital expenditure – i.e., the capital expenditure allowance was set in advance and is not subject to review.

The First Consultation Paper briefly indicated the initial findings of the ongoing review by the Bureau of the PC1 capex against the Bureau's efficiency criteria. The paper also expressed the Bureau's preference to adopt an ex ante approach at this review to the assessment and treatment of PC3 capex with limited scope for an ex post review at the future price control review. The First Consultation Paper raised the following issues for consultation in relation to the treatment of past and future capex in the PC3 controls:

1. *"Do you agree with how the Bureau proposes to apply the results of the PC1 capex review?*

2. *Should the assessment of PC2 capex be undertaken at this price control review for those PC2 years for which audited data becomes available or deferred completely to the next price control review (when audited data for all PC2 years will be available)?*

3. *To the extent that PC2 capex is assessed at this price control review, can the findings of PC1 capex review also be applied to PC2 capex or should PC2 capex be reviewed separately?*

4. *The Bureau wishes to, if possible, adopt more of an ex ante approach to the regulation of PC3 capex. How can the scope of any ex post review of capex at the next price review be limited?"*

The Bureau has received responses from the companies to the above issues, which are summarised in the following sections along with the Bureau's current thinking.

6.2 Bureau's Approach at the Previous Reviews

The First Consultation Paper discussed in detail the approaches used by the Bureau at the previous price control reviews to the assessment and treatment of capex. While the Bureau adopted an ex ante approach for RASCO with firm allowances of future capex (2004-2005), the approach for network companies (AADC, ADDC and TRANSCO) has been to date an ex post one: the PC1 controls were set assuming no capex in the PC1 period, and the PC2 controls were set with provisional allowances for both the PC1 and the PC2 periods. This ex post approach was adopted due to the unavailability of reliable projections for future capex and of audited data for past capex at the time.

It was then agreed that, when setting the PC3 and future controls, the Bureau would take account of capex incurred during the PC1 and the PC2 periods (along with its associated foregone financing costs), provided that capex carried out could be shown to be in accordance with the "efficiency criteria" established by the Bureau at the time of setting the PC1 controls. These criteria are that the expenditures:

- were required to meet growth in customer demand or the relevant security standards; and
- were efficiently procured.

The following table summarises the main features of the Bureau's approaches to assessment and treatment of capex, RAVs and depreciation at each of the previous price control reviews:

Table 6.1: Bureau's Approaches to the Assessment of Capex, RAVs and Depreciation at the Previous Reviews

Review	Main Features of the Bureau's Approach
1999 Price Control Review	• Ex post approach with no capex allowance for PC1 period • Approach adopted due to unavailability of reliable projections of capex for PC1 period • Approach resulted in lower than otherwise required allowed revenue • PC2 controls to take account of actual efficient PC1 capex along with its associated foregone financing costs (both depreciation and return on capital) • TRANSCO's opening accounting asset values reduced by 15% to set opening RAVs for PC1 for both water and electricity businesses. No adjustment to RAVs for AADC and ADDC • Depreciation using straight-line method and 30-year average asset life

2002 Price Control Review	• Ex post approach with provisional capex allowances for PC1 and PC2 periods • Approach adopted due to unavailability of reliable projections of capex for PC1 and PC2 periods • Approach resulted in higher allowed revenues in PC2 period than PC1 period • Provisional allowances for TRANSCO and ADDC set to: o 75% of draft audited 1999 and 2000 capex (assuming appropriate split between water and electricity) for respective years; and o 75% of unaudited or forecast capex (separately for water and electricity) for 2001-2005 • Provisional allowances for AADC for all years based on reported levels of 1999 capex • PC3 or future controls to take account of actual efficient PC1 and PC2 capex along with its associated forgone financing costs (both depreciation and return on capital) when audited data for PC1 and PC2 capex will be available • Depreciation using straight-line method and 30-year average asset life
2003 RASCO Review	• Ex ante approach with firm (not provisional) allowances for future capex (2004-2005) with no further review • If actual capex is less than projected, RASCO to retain any benefit before the actual capex and depreciation are incorporated into the RAVs at this 2005 review • Capex allowances equal to 3.54% of opening RAV for electricity and zero for water based on projected demand or output growth rates • Approach adopted due to expectation of no introduction of significant assets in RASCO and due to growing networks of AADC and ADDC • No adjustment to opening accounting asset values based on benchmarking • Depreciation using straight-line method and 20-year average asset life

The following table summarises for TRANSCO, ADDC and AADC the provisional capex allowances at the last price controls review:

Table 6.2: 2002 Price Control Review – Provisional Capex Allowances

	PC1 Period (AED million, 1999 prices)				**PC2 Period (AED million, 2003 prices)**		
	1999	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
TRANSCO – Electricity	344.172	533.792	795.288	1,222.498	1,267.791	730.378	346.036
TRANSCO – Water	118.735	123.456	92.110	289.037	1,261.103	1,280.087	243.243
ADDC – Electricity	196.511	300.858	398.342	389.889	461.876	484.969	509.218
ADDC – Water	69.105	44.923	130.471	380.707	151.420	158.991	166.941
AADC – Electricity	188.675	188.675	188.675	188.675	205.796	205.796	205.796
AADC – Water	66.350	66.350	66.350	66.350	72.370	72.370	72.370

Note: For TRANSCO and ADDC, allowances were set at 75% of the estimated capex submitted by the companies for the respective years. For AADC, allowances for each year were set at the reported levels of capex in 1999.

This resulted in the following regulatory asset values (RAVs) used in setting the PC2 controls:

Table 6.3: 2002 and 2003 Price Control Reviews - Opening RAVs

AED m, 2003 prices	2003	2004	2005	2006
TRANSCO - Electricity	6,150.55	7,149.01	7,585.72	7,626.55
TRANSCO - Water	2,480.35	3,555.19	4,606.34	4,612.53
ADDC - Electricity	4,180.40	4,440.40	4,707.32	4,981.52
ADDC - Water	1,408.11	1,470.82	1,535.81	1,603.18
AADC - Electricity	2,237.50	2,324.91	2,405.47	2,479.17
AADC - Water	455.90	512.24	566.16	617.67
RASCO - Electricity*		150.550	148.219	145.621
RASCO - Water*		344.570	327.342	310.113

Source: Bureau
* RASCO RAVs are in AED m, 2004 prices

6.3 Bureau's Review of Past Capex

6.3.1 Need for Review of PC1 and PC2 Capex

As mentioned in the previous section, the PC2 controls were set with *provisional* allowances for *efficient* capex undertaken during the PC1 period (1999-2002) and to be undertaken during the PC2 period (2003-2005). The full assessment and remuneration of *efficient* capex for both the PC1 and PC2 periods were therefore deferred to the future pending the availability of reliable information on such capex.

Audited out-turn figures for PC1 capex are now available from the companies' accounts. These are summarised in **Table 6.4:**

Table 6.4: Audited Out-turn Capital Expenditure

AED m, nominal prices	1999	2000	2001	2002	2003
TRANSCO – Electricity	493.218	824.299	1,103.281	968.596	1,159.419
TRANSCO – Water	124.268	133.328	205.189	650.695	1,967.181
ADDC – Electricity	247.612	424.309	539.044	523.333	575.461
ADDC - Water	106.543	36.789	113.651	262.780	486.311
AADC - Electricity	125.344	298.981	282.270	177.084	402.908
AADC - Water	86.133	212.185	74.557	181.567	175.91
Total	1,183.118	1,929.891	2,317.992	2,764.055	4,767.190

This suggests there has been a substantial increase in annual capex undertaken by the combined network businesses, of over 300% from 1999 to 2003, which highlights the importance of ensuring such expenditure is undertaken efficiently.

Table 6.5 below shows the differences between the provisional capex allowances (from **Table 6.2** above, adjusted to nominal prices) and the out-turn capex (from **Table 6.4** above) for the PC1 period in nominal terms – a total difference of about AED 1,495 million for all the companies over the PC1 period (a simple sum of all differences without present value adjustments):

Table 6.5: Difference Between Out-turn Audited Capex and Provisional Capex Allowances for PC1

AED m, nominal prices	1999	2000	2001	2002
TRANSCO - Electricity	149.046	279.022	279.723	-332.805
TRANSCO - Water	5.533	7.216	109.805	343.003
ADDC - Electricity	51.101	116.978	126.542	108.280
ADDC - Water	37.438	-9.101	-21.458	-142.499
AADC - Electricity	-63.331	106.247	86.888	-23.769
AADC - Water	19.783	144.407	5.848	110.935

Note: PC1 provisional capex allowances were set in 1999 prices. For this Table 6.5, these have been corrected to nominal prices using CPI data given in Table 9.1 in Section 9 of this paper. Negative signs indicate that the actual out-turn capex is lower than the provisional capex allowance.

A review of capex for the network companies (TRANSCO, ADDC and AADC) was therefore required to be carried out by the Bureau to assess how much of the capex undertaken during the PC1 and PC2 periods was in compliance with the efficiency criteria earlier established by the Bureau. [11] The outcome of such a review will determine the adjustment to the future revenue requirement at this price control review (or at the future price control review as discussed later in this section) for the difference between the provisional capex allowed at the 2002 review and the capex which is found to be *efficient*. Such an adjustment can be upward or downward depending on whether the efficient capex (as assessed) is greater or lower than the provisional capex.

6.3.2 Initial Indications of PC1 Capex Review

In 2004, the Bureau initiated a review of capex undertaken by the network companies during the PC1 period. The overall objective of the review was to assess the PC1 capex against the efficiency criteria established at the 1999 price control review; that is, whether the capex:

– was required to meet growth in customer demand or the relevant security standards; and

– was efficiency procured.

The overall approach of this capex review was to review the processes undertaken by the companies in planning, procuring and managing capex projects and to assess a number of selected projects.

[11] No such review is required for ADWEC and RASCO. This is because ADWEC has insignificant capex which has already been allowed *ex ante* via the opex allowance in the PC1 and PC2 controls. Similarly, firm *ex ante* capex allowances for RASCO have been made at the 2003 review for its 2004-2005 price controls, without ex post review.

The First Consultation Paper highlighted that the initial indication is that the ongoing capex review will overall show a total amount of *efficient* capex for the PC1 period, while less than the capex actually spent, in excess of the *provisional* capex allowance made at the 2002 price control review and hence will result in a positive or upward adjustment to the revenue requirement at this price control review.

The respondents to the First Consultation Paper generally reserved their comments on the findings pending the receipt of more information on the review. A summary of the responses is as follows:

- AADC considered that all of its PC1 (and PC2) capex followed the efficiency criteria since it was aware that an ex post review was to be undertaken by the Bureau. Hence AADC suggested that all its PC1 (and PC2) capex should be rolled into the RAVs. AADC also stated that it has been spending capex to meet large and dynamic customer growth, to supply remote rural areas, to improve the security of supply and to remove the present intermittent water supplies.

- ADDC also considered that it has always been as efficient as possible at the time of undertaking capex with the knowledge then available by employing thorough and transparent processes within the local market. According to ADDC, while certain 'inefficiencies' may be identifiable with hindsight, the reality is that these were not foreseeable.

- TRANSCO also anticipated that a total amount of capex in excess of the provisional allowances in the PC2 controls would be found efficient by the Bureau.

The Bureau would welcome further comments in response to the Bureau's report on the review of PC1 capex now that the companies are in receipt of that report.

6.3.3 Further Progress on PC1 Capex Review

Subsequent to the publication of the First Consultation Paper, the Bureau has forwarded its reports on the PC1 capex review to the respective network companies. These reports explain the methodology and specific criteria used by the Bureau to assess the efficiency of the processes that the companies undertook for their capex. The reports also list the selected capex projects that were reviewed.

The following **Table 6.6** summarises the high-level findings of the Bureau's PC1 capex review in the form of scores awarded according to the methodology explained in the review reports. The Bureau intends to apply the results to both electricity and water capital expenditure, as the review was process-focused.

Table 6.6: High-Level Findings of Bureau's PC1 Capex Review

Company Efficiency Scores	Planning	Procurement	Management	Overall
AADC	83%	85%	84%	84%
ADDC	87%	96%	85%	89%
TRANSCO	95%	92%	94%	94%

The Bureau is currently considering how the above findings should be translated to appropriate percentages that should be applied to the outturn audited PC1 capex to determine the efficient PC1 capex for each business. The three broad possibilities for this are as follows:

1. Consider the above scores without any further adjustment as the portion of the outturn capex to be treated and allowed as efficient capex; or

2. Adjust the above scores downwards appropriately to allow for the fact that only a sample of projects for which information was readily available from the companies were assessed; or

3. Adjust the above scores upwards appropriately for the earlier years of the PC1 period to allow the newly established sector companies some time to adjust to the new regulatory environment.

Based on the first option above, the differences between the provisional capex allowance (from **Table 6.2** above, adjusted to nominal prices) and the final capex allowance (from **Table 6.4** above, adjusted by the efficiency scores summarised in **Table 6.6** above) for the PC1 period would be as summarised in **Table 6.7** below in nominal terms – a total increase of about AED 747 million for all the companies over the PC1 period (a simple sum of all differences without present value adjustments)

Table 6.7: Increase in PC1 Capex Allowances Based on Efficiency Scores

AED m, nominal prices	1999	2000	2001	2002
TRANSCO - Electricity	119.453	229.564	213.526	-390.921
TRANSCO - Water	1.923	-0.784	97.493	303.961
ADDC - Electricity	23.864	70.304	67.247	50.713
ADDC - Water	25.718	-13.147	-33.959	-171.405
AADC - Electricity	-83.386	58.410	41.725	-52.102
AADC - Water	6.002	110.458	-6.081	81.884

Note: PC1 provisional capex allowances were set in 1999 prices. For this Table 6.7, these have been adjusted to nominal prices using CPI data given in Table 9.1 in Section 9 of this paper. The actual out-turn capex from Table 6.4 have been adjusted by the efficiency scores given in Table 6.6 and then provisional capex allowances have been subtracted from them to calculate the differences as reported in this Table 6.7. Negative signs indicate that efficient capex determined by the first option is lower than the provisional capex allowance.

The additional allowed PC1 capex (determined according to the agreed option from the above three options or otherwise) will be rolled into the RAVs along with the foregone financing costs as agreed at the previous price control reviews. The foregone financing costs for the efficient PC1 capex in excess of the provisional allowances made at the 2002 review will be calculated on the basis of the assumptions for depreciation (i.e. straight-line method with 30-year average asset life) and for cost of capital (6% real, post-tax) applicable at that time.

6.3.4 Review of PC2 Capex

The First Consultation Paper discussed that a view may also need to be taken at this review on the capex incurred during the PC2 period (for which only a provisional allowance has, to date, been made). By the time of publication of the Draft Proposals for PC3 in June 2005, the Bureau can be assured only that audited data for the 2003 financial year will be available (audited accounts for the 2004 and 2005 financial years are not due until 30 June 2005 and 2006, respectively). Thus, the time available to undertake a review of PC2 capex is very limited. The First Consultation Paper therefore identified three options for assessing PC2 efficient capex at this price control review:

1. Separately review PC2 capex for those years in the PC2 period for which audited data is available at the time of finalizing the PC3 controls, and defer consideration of other years to the subsequent price control review; or:

2. Apply the PC1 capex assessment outcome to those years in PC2 period for which audited data is available at the time of finalizing the PC3 controls, and defer consideration of other years to the subsequent price control review; or:

3. Defer consideration of all PC2 capex to the next price control review, when audited data for all years of the PC2 period will be available.

The First Consultation Paper also raised the issue of whether, in any case, the magnitude of water capex undertaken by TRANSCO during 2003 and 2004 requires separate assessment.

In response to the First Consultation Paper, AADC and TRANSCO proposed that all, or as much as possible, of PC2 capex should be assessed and remunerated at this price control review. Both the companies argued that all of their PC2 actual capex is based on the Bureau's established efficiency criteria. AADC suggested that the Bureau allow the capex for each year of the PC2 period at this review based on the audited data, where available, or appropriate estimated/forecast amounts where audited data is not available. According to AADC, any difference between the audited outturn data and the estimated/forecast amounts should be reviewed at the future price control review (in 2009 for PC4). TRANSCO also preferred to minimise the time lag between any capex being incurred and its impact on the price controls. ADDC found it difficult to comment on the possible options identified by the First Consultation Paper for the assessment of PC2 capex in the absence at that time of information on the results of the PC1 capex review.

The Bureau has reviewed the issues relating to the assessment of PC2 capex further and has considered the following main factors:

- In general, the performance of the companies in responding to the Bureau's First Information Request has not been satisfactory. In particular, the quality of data received from the companies on capex (including from AADC) is such that AADC's suggestion above is impracticable.

- Any partial or ad hoc assessment of PC2 capex (for example, in relation to the years such as 2003 where audited data on capex is available) or any interim adjustment to the provisional allowances for PC2 capex at this review pending the final assessment at the future review (in 2009 for PC4) will significantly increase the complexity of the regulatory arrangement and will not, in any case, close the matter at this review. There is insufficient time left before the publication of the Draft or Final Proposals for PC3 for a robust process of review and consultation on the PC2 capex even if audited data for 2004 becomes available in time.

In view of the above, the Bureau's current thinking is to not make to any assessment of PC2 capex at this price control review. The Bureau is therefore currently minded to defer the assessment of PC2 capex to the next price control review when audited data on all of the years of the PC2 period will be available well in advance of the review.

6.4 Treatment of Future Capex at this Review

The First Consultation Paper highlighted that, in addition to an assessment and remuneration of past capex, a decision has to be made at this price control review on the approach to the assessment and treatment of capex to be undertaken during the course of the PC3 period (2006 onwards).

The difficulty in determining beforehand the future investment required for capital-intensive industries, such as water and electricity networks, emphasises the need to put in place a clear regulatory regime that provides an environment within which investment can occur. There are a number of mechanisms that have been used by other regulators for the treatment of future capex. As discussed in detail in the First Consultation Paper, any regulatory framework for investment has to be assessed against a number of criteria, such as:

- incentives for efficiency;

- certainty / risk to companies or their investors;

- timing and accuracy requirements of the data; and

- complexity and administrative cost of implementation.

The incentive for efficiency or cost minimisation is often considered to be the most important criterion for assessing any approach. However, information asymmetries (between the regulator and the regulated company) can make it difficult for the regulator to assess the efficiency of investment decisions.

The First Consultation Paper highlighted two broad approaches to the assessment and treatment of future capex while setting the price controls:

1. ***Ex Ante*** approach which includes an allowance for a forecast of future capex within the price controls with no (or limited) review subsequently of actual capex incurred; and

2. ***Ex Post*** approach which includes no (or only some) allowance for the forecast of future capex in the price controls and then makes an ex-post adjustment at the subsequent price control review for the capex judged by the regulator to have been efficiently incurred.

The *ex post* approach has been used by the Bureau at the 1999 review (assuming no future capex) and at the 2002 review (with provisional allowances for future capex). The *ex ante* approach has been adopted at the 2003 review for RASCO.

Both approaches provide incentives for efficient capex but in different ways. The e*x ante* approach allows the companies to retain benefits (depreciation and return on capital) of any under-spend on capex until the next price control review when the RAVs used to set the next controls are adjusted for the actual outturn capex spent during the control period. The *ex post* approach provides incentives for companies to undertake efficient capex as any capex found by the regulator in the ex post assessment to be inefficient will be disallowed at the next review.

The First Consultation Paper contained a detailed assessment of the two approaches and indicated that the Bureau preferred to move towards an *ex ante* approach of assessment and treatment of future capex. The paper however highlighted that this would in turn require the companies to submit robust projections of future capex and to demonstrate to the Bureau that:

- the projects underlying these projections are required to meet demand or security standards; and

- the estimated costs are efficient.

The expected longer duration of PC3 controls than previous controls would further increase the requirement for the Bureau to have more information on the companies' future capex and to undertake a more detailed review of future capex than previous reviews before it makes any capex allowances. The paper stated that, after six to seven years of sector restructuring and after two price control reviews, the companies should be able to make robust plans for their capital projects over a medium term period.

The First Consultation Paper also highlighted that, in practice, an ex ante approach would still require an ex post assessment for certain factors such as for any unanticipated investment obligations, for under-spends against the allowed capex and for output performance.

The paper also discussed in some detail which specific cases would require an ex post assessment and how RAVs should be adjusted for different cases following the ex post assessment. It followed that a detailed ex post review by the Bureau would only be required if the company is unable to demonstrate that any significant underspend is due to efficiency improvements or that any significant overspend is due to additional investment obligations.

The respondents to the First Consultation Paper expressed mixed views on the approach for the assessment and treatment of future (PC3) capex and highlighted a number of issues to be taken into consideration, as summarised below:

- AADC, while supporting the ex ante approach and clarity on the efficiency criteria, suggested that further work was needed to be undertaken by all parties and that it may be premature for the sector to introduce an ex ante approach at this review.

- ADDC also supported the ex ante approach but considered that it may be difficult to apply this approach in Abu Dhabi due to significant ongoing growth. The company also highlighted the need for an ex post assessment even if the ex ante approach is adopted and proposed that the Bureau may consider a “floor and ceiling mechanism” to limit the need for ex post assessment. ADDC also suggested that any ex post assessment accompanying the ex ante approach should not take back innovation and efficiencies by assessing capex as ‘inefficient’ after the fact and in hindsight. The regulator or the customers therefore have to accept some of the risks that the businesses would also be accepting. A floor and ceiling mechanism should take care of the level of risk to which the company or the customers should not be exposed.

- TRANSCO informed the Bureau of its ongoing work to enhance its capability on strategic asset management which should enable more accurate forecasts of future capex requirements and hence would fully support the movement towards an ex ante approach. However, these systems are not expected to be sufficiently developed in time to provide the capex forecast at this review. In view of the expected longer control duration of PC3 and the associated increase in uncertainty and risk inherent in the approach, TRANSCO therefore indicated that it may be prudent to make an ex ante assessment for a shorter period, say 2 years. However, TRANSCO wished to avoid an overly intrusive capex monitoring process.

The Bureau acknowledges the difficulties and risks highlighted by the above responses in relation to the ex ante approach. The Bureau is also aware of the possible complexities associated with ADDC’s suggested floor and ceiling mechanism and TRANSCO’s suggestion of a split of the PC3 period between the ex ante and ex post approaches. More importantly, the Bureau is concerned with the quality of capex forecasts provided by companies in their information submissions, which do not seem to be robust enough to allow an ex ante approach to be adopted at this review.

The Bureau’s current thinking is therefore to continue with the ex post approach, with provisional allowances, for the PC3 capex at this review. This approach is regarded as more pragmatic in that it does not require a highly accurate forecast of future capex requirements and can easily handle both anticipated and unanticipated investment. The inclusion of provisional allowances for future capex at this review should address the cash flow problems of the company in financing its operations due to the delay in compensation of efficient capex, and should minimise the undesirable step changes in the prices or revenue requirement between control periods.

While the Bureau's current efficiency criteria for ex post review of capex is already designed to incentivise the companies to ensure *efficiency* of capex incurred, the Bureau would welcome the respondents to this paper to identify any improvements in these efficiency criteria to reduce the perceived risks for the companies.

The Bureau will be considering in detail the capex projections provided by the companies in their information submissions to see whether they make a suitable basis for the 'provisional' projections required under the ex post approach. If not, the Bureau will substitute alternative figures. One possible source of alternative data is to base forward-looking capex projections on unit capex spent in the past, adjusted for anticipated efficiency improvements.

In addition, in its response, ADDC suggested that the Bureau should review the asset life assumptions in respect of depreciation for different businesses. The Bureau would welcome any evidence that companies are able to provide concerning the asset life assumptions that should be adopted.

6.5 Updating of Regulatory Asset Values (RAVs)

As mentioned in the First Consultation Paper, the Bureau intends to employ an approach to updating the RAVs for the next control period similar to the one used at the previous reviews. Broadly this will involve the following steps:

1. The opening RAVs for each network company at 1 January 2006 will be calculated from the closing RAVs at 31 December 2005 as used in setting the PC3 controls by (a) adding the difference between the *efficient* capex for PC1 period (as determined by the ongoing review of PC1 capex) and the *provisional* capex for PC1 period allowed at the 2002 review, and (b) subtracting the difference between the depreciation on *efficient* capex for PC1 period and the depreciation on *provisional* capex for PC1 period allowed at the 2002 review.

   The First Consultation Paper indicated that a similar adjustment would have been required for PC2 capex if the Bureau's review of PC2 capex efficiency could have been completed at this price control review. However, this is not required at this review since, as the earlier sections indicate, the Bureau's current thinking is to defer the assessment of PC2 capex efficiency to the future price control review when the audited data on all the years of the PC2 period will be available.

   For RASCO, the closing RAVs at 31 December 2005 as used in setting the 2004-2005 price controls will be used as the opening RAVs at 1 January 2006, unless actual capex is less than the projected capex (in which case the RAVs at 1 January 2006 will be adjusted downwards to reflect the actual capex and depreciation).[12]

2. To the opening RAVs at 1 January 2006 calculated in the previous step, the net present value of the foregone financing costs (both return on capital and depreciation) associated

[12] This adjustment will need to be effected at the next price control review as audited data for 2005 will not be available at the time of finalizing the PC3 controls.

with the difference between the *efficient* capex for PC1 period and the *provisional* capex for PC1 period will be added.

A similar adjustment would have been required for PC2 capex if the Bureau's review of PC2 capex efficiency could have been completed at this price control review. However, as mentioned above, this is not now required at this review.

No such adjustment is required for RASCO as it was allowed capex on *ex ante* basis at the last review.

3. The resulting opening RAVs at 1 January 2006 will then be rolled forward for future capex allowances (net of depreciation) to derive the RAVs for each year of the PC3 period.

All the above calculations will be converted into 2006 prices.

In view of the expected introduction of separate price controls for distribution and supply, a suitable method for allocating the distribution companies' RAVs between their separate businesses will need to be identified – for example, in proportion to the relative accounting asset values of the two businesses.

6.6 Summary of Current Thinking

The Bureau's current thinking on capex and associated issues can be summarised as follows:

1. The Bureau intends to use the findings of its review of PC1 capex efficiency as the basis for the firm levels of efficient PC1 capex for the network companies. The difference between the efficient PC1 capex so determined and the provisional PC1 capex allowances included within PC2 will be rolled forward into the RAVs along with the foregone financing costs.

2. The assessment of PC2 capex efficiency should be deferred completely to the next price control review (when audited data for all PC2 years will be available).

3. Similar to the previous price control reviews, an ex post approach to the regulation of future capex should be adopted for PC3, with some provisional allowances for PC3 capex at this review.

7 Cost of Capital and Profit Margin

7.1 Introduction

The cost of capital is the minimum return investors will accept for investing in a particular company, taking account of its risks. Since the cost of capital is applied to the regulatory asset value (RAV) to calculate the return on capital element of the revenue requirement, it is a key input to setting price controls for capital intensive businesses such as the network businesses in Abu Dhabi.

The regulator's estimate of the cost of capital for price control calculations is also important because it can incentivise or otherwise a business to make an investment. If the cost of capital is set too low the business may experience difficulties in financing its investment programs and will be discouraged from undertaking desirable investments. If it is set too high, shareholders may earn excessive returns and may over-invest in unneeded projects.

This section sets out the Bureau's current thinking on the appropriate cost of capital for the network businesses and on the profit margin for ADWEC and the supply businesses of the two distribution companies.

The First Consultation Paper raised the following issues for consultation in relation to the cost of capital and profit margin for PC3 controls:

1. *"The Bureau intends to continue to apply the Capital Asset Price Model (CAPM) approach to calculate the real, post-tax cost of capital.*

2. *The Bureau intends to draw upon estimates of the cost of capital for overseas companies similar to Abu Dhabi businesses with the same regulatory regime, and to cross-check these estimates against the information available from the local / regional capital markets to capture local risks.*

3. *Is it reasonable to assume the same cost of capital for RASCO as for the network companies?*

4. *Do you agree that the profit margin approach to calculate allowed return for ADWEC at the 2002 review remains appropriate at this review?*

5. *How should the rate of return for ADDC/AADC's supply businesses be calculated / applied?"*

In developing its current thinking, the Bureau has taken into consideration the responses to the First Consultation Paper. Overall, the Bureau accepts many of the suggestions made in these responses. There is a need for further development and refinement of the Bureau's approach to fully address the responses. For this, the Bureau looks to the respondents to clearly set out how different areas of its calculations can be further improved. In particular, this relates to suggestions made by respondents that calculations should take account of specific factors such as company size and the nature of its business.

The overall approach the Bureau has taken for its initial cost of capital calculations in this document is summarised below:

- The cost of capital is calculated as the weighted average cost of capital (WACC) using standard models for the cost of debt and equity, such as the CAPM.
- The Bureau's cost of capital calculations draw on the cost of capital components recently estimated by regulators of similar businesses in the UK and Australia.
- The Bureau has cross-checked these estimates against the information available on various components of the cost of capital from local and regional capital markets in order to capture any particular factors that may be specific to businesses operating in Abu Dhabi.

The Bureau's current thinking is that a cost of capital in the range of **4.5% - 5.6%** (real, post-tax) is, in general, appropriate. However, there may be some justification for a higher cost of capital for the distribution businesses, for the following reasons:

- relatively small capital size, which may make it more expensive to raise capital;
- risks associated with dealing with final customers, including those associated with income collection / subsidy; and
- uncertainties surrounding the future of these businesses.

In contrast to the network businesses, ADWEC and the supply businesses of the two distribution companies have relatively few capital assets but are exposed to risks associated with large financial flows. A profit margin on turnover, rather than a cost of capital applied to asset value, therefore seems more appropriate for these businesses, consistent with the approach developed for the PC2 controls. The Bureau's initial view is to set a profit margin in the range of **0.019% - 0.023%** on turnover for ADWEC and a similar return for the supply businesses, consistent with the cost of capital for other companies.

7.2 Overall Approach to Cost of Capital Calculations for Network Businesses

The cost of capital has been calculated as a weighted-average of the cost of debt finance and the cost of equity finance, known as the weighted average cost of capital (WACC), as follows:

Real Post-Tax WACC = [Real Cost of Equity × (1-Gearing)] + [Real Cost of Debt × Gearing × (1-Tax Rate)]

The above formula calculates a real cost of capital by using estimates of costs of debt and equity in real terms, since the price control calculations carried out by the Bureau are in real terms.

The cost of capital calculation requires estimation of the **cost of debt**, the **cost of equity**, and the **gearing** (the ratio of debt to the sum of debt and equity). The important points in relation to these components discussed in detail in the First Consultation Paper are summarised below:

Cost of Debt

- The cost of debt is estimated by adding a suitable corporate debt premium to a risk-free rate. That is:

  Cost of Debt = Risk Free Rate + Debt Premium

- The **risk-free rate** represents the return available from a completely riskless form of investment, typically, medium- to long-term bonds issued by the UK or US Governments.

- The **debt premium** measures the additional return required over and above the risk-free rate by a given business subject to uncertain cashflows and default risks. The lower the credit rating awarded to a business by an international credit rating agency (such as Moody's Investors Services and Standard & Poor's), the higher will be the default risk and hence the higher the debt premium.

Cost of Equity

- The standard method to estimate the cost of equity is the Capital Asset Pricing Model (CAPM). In principle, this model assumes that the return on any asset is equal to the risk-free rate of return, plus an equity risk premium to reflect that returns to shareholders (equity holders) are much riskier. The equity risk premium for a specific business is determined by multiplying the market risk premium (see below) by the "equity beta" for the business. That is:

  Cost of Equity = Risk Free Rate + [Equity Beta × Market Risk Premium]

- The **market risk premium** is the extra return required on average for investment in equities (i.e. shares or stocks) compared to the risk-free rate.

- The **equity beta** measures the riskiness of a given investment (buying shares of a specific business) relative to the average level of risk in the market. A beta of one indicates that a company is perceived as having average risk; a lower figure suggests lower than average risk; and a higher figure indicates higher than average risk. Monopoly utilities with their guaranteed cash flows are generally regarded as comparatively low risk investments (ie, a beta of one or less). If the regulated company is not quoted on a liquid stock market, or is only quoted as part of a much larger group, betas for comparator listed businesses can be used to estimate a proxy beta for the regulated business.

Gearing and Weighted Average Cost of Capital

- The risks that an investor in a company faces are influenced by its gearing (the ratio of debt to debt plus equity). While debt usually has tax and cost advantages over equity, increasing levels of debt increase the shareholders' risks and hence the cost of equity.

The optimal level of gearing is where overall risks and hence the WACC are at a minimum.

- In line with the overall objective to set price controls based on an efficient level of costs, an optimal gearing (irrespective of the actual capital structure of the companies) is often assumed by regulators when assessing the cost of capital – thus giving incentives for companies to achieve an optimal gearing over the medium to long term.

- Price controls are forward-looking and so regulators and researchers often prefer cost of capital calculations on a forward-looking basis rather than simply based on historical data. However, historical data are often used to set forward-looking estimates of future cost of capital components if there is an absence of reliable alternative sources.

All the respondents have broadly supported the above approach. In addition, the following points have been raised by the respondents:

- AADC highlighted the need to take into account the declining size of RASCO and the size, location and uncertainties faced by AADC to justify a higher cost of capital.

- AADC has also suggested that the Bureau make the methodology clearly transparent, to provide consistency for investors moving forward, and that the Bureau err on the side of the businesses as the risk of an under-estimate of the cost of capital outweighs in the long run an over-estimate of the cost of capital.

- ADDC has suggested that CAPM calculations should be undertaken separately for each of the individual businesses of ADDC and should take account of size and local factors.

- ADDC has also suggested that reliance on overseas estimates may not fully take into account factors specific to Abu Dhabi, such as: the immature nature of the networks and the resulting risk for capex against forecast demand growth; separation of price controls; development of regulatory and commercial environment; potential shift from ex post to ex ante approach to capex treatment; and potential impact on business valuation by investors in case of privatisation.

- AADC and ADDC supported margin on turnover as a return for their supply businesses.

- ADWEC suggested that the cost of capital should be sufficient to encourage investment.

- ADWEC has also suggested that the profit margin approach for PC3 should take into account the risks for ADWEC identified by it during the 2002 price controls review.

The Bureau in general agrees to the above comments and, as in the past, will continue to ensure the transparency of its calculations and sufficiency of the cost of capital.

Respondents' comment with regards to separate calculations or additional refinements for individual businesses are discussed in detail in Section 7.4.6. The Bureau also notes that its initial calculations set out in this document are based on a wide range of businesses (including

water and electricity, transmission and distribution, etc.) of different sizes. In addition, the Bureau's initial calculations are assessed against the local and regional capital market data on an even wider range of businesses. Notwithstanding the foregoing, the Bureau would welcome proposals from the respondents for precise and realistic estimates of separate betas or adjustments for factors like the nature and size of businesses provided they are accompanied by supporting justification and explanation.

7.3 Bureau's Cost of Capital Calculations at Previous Reviews

The Bureau's cost of capital calculations for the Abu Dhabi companies at the previous price control reviews were based on the estimates of the cost of capital of network businesses in the UK, USA, and Australia. Equity markets in these countries are well developed and are subject to robust regulation. Information issued to the markets by quoted companies must meet stringent standards of disclosure. Trading is active with high ratios of turnover and liquidity, and there is wide diversity in respect of sector coverage. These factors provide a degree of confidence that statistical analyses of information from these markets, such as those used in cost of capital calculations, are reliable.

In contrast to the developed markets overseas, there were no official and regulated UAE stock markets until March 2000. In preparation for the 2002 price controls review, the Bureau assessed the size and liquidity of the UAE market against the developed markets. The coverage and liquidity of the UAE capital markets were such that the Bureau was reluctant to specifically reference its cost of capital calculations to them at the 2002 review.

In view of the lack of information on the cost of capital from the UAE capital markets at the previous reviews, the Bureau's cost of capital calculations drew heavily on estimates of the cost of capital of network businesses in the UK, USA, and Australia. These calculations are summarised in **Table 7.1** below.

On the basis of these estimates, the Bureau at the 2002 review used a cost of capital of 6% (real, post-tax). The Bureau also highlighted a number of examples at that time where overseas regulators had adopted estimates of the cost of capital towards the lower end of the Bureau's proposed range.

Table 7.1 Bureau's Estimates of the Cost of Capital at 2002 Review

	Low	**High**
Real Risk-free rate	3%	4%
Debt premium	1%	2%
Real Cost of debt	4%	6%
Real Risk-free rate	3%	4%
Equity risk premium	3.5%	5%
Equity beta	0.6	0.8
Real Cost of equity	5.1%	8%
Debt proportion	50%	70%
Real (Post-tax) WACC	**4.55%**	**6.6%**

Source: Bureau's Draft Proposals for PC2, August 2002

7.4 Bureau's Initial Cost of Capital Calculations for PC3

7.4.1 Use of Recent Overseas Regulators' Calculations

The Bureau views overseas' calculations of the cost of capital as relevant because of the developed capital markets and readily available information in those countries, and because the regulatory regime in Abu Dhabi has drawn deliberately on best practice in the UK and elsewhere.

Furthermore, as the UAE has a Moody's A2 country rating, the Emirate of Abu Dhabi - being the wealthiest emirate - can be expected to have an even higher rating, and so the rate of return required by the Abu Dhabi water and electricity companies should not be significantly different from that required by comparable businesses in the UK, Australia and the US, for whom the regulators generally assume an investment grade credit rating (ie, Moody's Baa or higher).[13]

7.4.2 Summary of Overseas Regulators' Proposals in 2003-2004

The Bureau has reviewed the recent regulatory decisions or proposals in the UK and Australia for water and electricity network businesses subject to CPI-X regulation. **Tables 7.2** and **7.3** set out the cost of capital components estimated by the UK and Australian regulators, respectively.

Table 7.2: Regulatory Proposals in the UK in 2004

	Ofwat's Draft Determination			**Ofgem's Initial Proposal**		
	Low	**High**	**Proposal**	**Low**	**High**	**Proposal**
Risk free rate (nominal)	5.00%	5.50%	5.50%	4.75%	5.50%	5.25%
Risk free rate (real)	2.50%	3.00%	3.00%	2.25%	3.00%	2.75%
Debt premium	0.80%	1.40%	1.30%	1.00%	1.80%	1.35%
Tax rate	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
Post-tax cost of debt (nominal)	4.06%	4.83%	4.76%	4.03%	5.11%	4.62%
Post-tax cost of debt (real)	2.31%	3.08%	3.01%	2.28%	3.36%	2.87%
Equity risk premium	4.00%	5.00%	4.70%	2.50%	4.50%	4.50%
Equity beta	1.00	1.00	1.00	0.60	1.00	1.00
Post-tax cost of equity (nominal)	9.00%	10.50%	10.20%	6.25%	10.00%	9.75%
Post-tax cost of equity (real)	6.50%	8.00%	7.70%	3.75%	7.50%	7.25%
Gearing	55.00%	55.00%	55.00%	50.00%	60.00%	60.00%
Post-tax WACC (nominal)	6.28%	7.38%	7.21%	5.14%	7.07%	6.67%
Post-tax WACC (real)	**4.2%**	**5.3%**	**5.1%**	**3.0%**	**5.0%**	**4.6%**

Sources: (1) Electricity Distribution Price Control Review, Background information on the cost of capital, Ofgem, March 2004. (2) Electricity Distribution Price Control Review: Initial Proposals, Ofgem, June 2004. (3) Future Water and Sewerage Charges 2005-10, Draft Determinations, Ofwat, 5 August 2004.

Notes: A 2.5% UK inflation rate in line with Ofgem's estimate has been added to Ofwat's and Ofgem's estimates of the real risk-free rates to estimate nominal costs of debt, equity and overall capital. Further, the "Proposal" columns for both Ofwat and Ofgem contain certain component estimates which, being not available from these regulators, have been estimated by the Bureau from "Low" and "High" columns such that the resulting "Proposal" estimates for costs of equity, debt and overall capital are the same as proposed by these regulators.

[13] On 22 December 2004, Moody's upgraded the UAE country rating further by one level from A2 to A1 and the Bureau is currently assessing the impact of this upgrading on the cost of capital.

Table 7.3: Regulatory Proposals in Australia in 2003 and 2004

	IPART NSW		ACCC TransGrid	ACCC EnergyAustralia	IPART Sydney Water	
	Low	High	Proposal	Proposal	Low	High
Risk free rate (nominal)	5.90%	5.90%	5.89%	5.89%	5.10%	5.10%
Risk free rate (real)	3.30%	3.30%	3.45%	3.45%	2.90%	2.90%
Debt premium	1.03%	1.23%	0.87%	0.87%	0.70%	1.00%
Tax rate	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
Post-tax cost of debt (nominal)	4.85%	4.99%	4.73%	4.73%	4.06%	4.27%
Post-tax cost of debt (real)	3.03%	3.17%	3.02%	3.02%	2.52%	2.73%
Equity risk premium	5.00%	6.00%	6.00%	6.00%	5.00%	6.00%
Equity beta	0.78	1.11	1.00	1.00	0.65	0.90
Post-tax cost of equity (nominal)	9.80%	12.56%	11.89%	11.89%	8.35%	10.50%
Post-tax cost of equity (real)	7.20%	9.96%	9.45%	9.45%	6.15%	8.30%
Gearing	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
Post-tax WACC (nominal)	6.10%	7.10%	7.03%	6.84%	5.20%	6.30%
Post-tax WACC (real)*	**4.7%**	**5.9%**	**5.6%**	**5.6%**	**4.0%**	**5.0%**

Sources: (1) New South Wales Electricity Distribution Pricing 2004/05 to 2008/09, Final Report, IPART, June 2004. (2) NSW and ACT Transmission Network Revenue Caps – TransGrid 2004/05 – 2008/09, Draft Decision, ACCC, 28 April 2004. (3) NSW and ACT Transmission Network Revenue Caps –EnergyAustralia 2004/05 – 2008/09, Draft Decision, ACCC, 28 April 2004. (4) Sydney Water Corporation, Prices of Water Supply, Wastewater and Stormwater Services (from 1 July 2003 to 30 June 2005), IPART, May 2003.
Notes: * Post-tax WACC (real) has been calculated by the Bureau based on the component estimates of the regulators using standard formula for WACC. Post-tax WACC (nominal) is that calculated by the respected regulator.

Nominal (as well as real) figures are shown in the above tables for the purposes of assessment or comparison in Section 7.6 against the local capital market data which are usually in nominal terms.

In the case of the Australian decisions, the real post-tax cost of capital has been calculated by the Bureau from the individual components estimated by the Australian regulators using the standard formulae for CAPM and WACC (in contrast to the modified formulae used by the regulators concerned which were used by them to take account of specific taxation issues not applicable to Abu Dhabi).

The above overseas regulatory estimates show an overall range of 3.0% - 5.9% for the real post-tax cost of capital and 5.1%-7.4% for nominal post-tax cost of capital. **Table 7.4** below analyses these estimates (for both UK and Australian examples) by looking at the mid-point average of the minimum and maximum values of individual components. The mid-point costs of debt, equity and overall capital are then calculated from mid-point average values of their components.

The table shows that the minimum and maximum of the UK and Australian regulators' estimates of individual components result in a wide range of (2.91% - 6.25%) for the real post-tax cost of capital. However, this range is not realistic, as it is highly unlikely that all the individual

components will have minimum (or maximum) values at the same time. This is why the range is wider than the actual range of the regulators' estimates of 3.0% - 5.9%. The mid-point averages of these extremes give a real post-tax WACC of **4.5%**.

Table 7.4: Analysis of Recent UK and Australian Regulators' Estimates

	Minimum	Maximum	Mid-Point
Risk free rate (nominal)	4.75%	5.90%	5.33%
Risk free rate (real)	2.25%	3.45%	2.85%
Debt premium	0.70%	1.80%	1.25%
Tax rate	30.00%	30.00%	30.00%
Post-tax cost of debt (nominal)*	3.82%	5.39%	4.60%
Post-tax cost of debt (real)*	2.07%	3.68%	2.87%
Equity risk premium	2.50%	6.00%	4.25%
Equity beta	0.60	1.11	0.86
Post-tax cost of equity (nominal)*	6.25%	12.56%	8.96%
Post-tax cost of equity (real)*	3.75%	10.11%	6.48%
Gearing	50.00%	60.00%	55.00%
Post-tax WACC (nominal)*	5.03%	8.26%	6.56%
Post-tax WACC (real)*	**2.91%**	**6.25%**	**4.50%**

Note: Values for each of the terms marked '*' have been calculated by the Bureau from the other data contained in the same column of this table.

7.4.3 Latest UK Regulators' Decisions

Both Ofwat and Ofgem have more recently issued final proposals for the cost of capital, as summarised in **Table 7.5** below:

Table 7.5: Latest UK Decisions

	Ofgem's Latest Decision	Ofwat's Latest Decision
Cost of Debt (pre-tax)	4.1%	4.3%
Tax	30.0%	30.0%
Cost of Debt (post-tax)	2.9%	3.0%
Cost of Equity (post-tax)	7.5%	7.7%
Gearing	57.5%	55.0%
WACC (real, post-tax)	**4.8%**	**5.1%**

Sources: (1) "Electricity Distribution Price Control Review", Final Proposals, Ofgem, November 2004. (2) "Future Water and Sewerage Charges 2005-10", Final Determinations, Ofwat, December 2004.

However, the final proposal documents do not provide as much detail on the individual components of the cost of capital, so the earlier figures have been retained for the component-based analysis in **Table 7.4**. It is noted in any case that the overall figure is in Ofwat's case are unchanged, and in Ofgem's case little changed, from the earlier figures.

7.4.4 *Bureau's Initial Calculations for PC3*

The Bureau proposes to adopt the mid-point estimate of 4.5% from the UK and Australian examples (Table 7.4) as the "Low" case scenario for its cost of capital calculations for PC3, and the highest of the latest UK decisions - ie Ofwat's latest decision reported in Tables 7.2 and 7.5 - can form the basis of a "High" case scenario. However, for its "High" scenario, the Bureau also considers it appropriate to assume a lower gearing (of 45%) than that assumed by Ofwat (of 55%), to allow some time for the Abu Dhabi companies to adjust their gearing to an optimal level.[14] This produces a "High" scenario cost of capital of 5.6% (compared to Ofwat's 5.1%).

Taking into consideration all the above discussion, the Bureau's current thinking is that a cost of capital in the range of **4.5% to 5.6%** (real, post-tax) is generally appropriate for the PC3 controls. The corresponding range of nominal cost of capital is 6.6% - 7.8%.

The Bureau's initial cost of capital calculations are shown in Table **7.6**, showing a range of estimates for each component based on (1) the mid-point estimates from UK and Australian examples ("Low" scenario) and (2) the highest of the latest UK final decisions, with a lower gearing of 45% ("High" scenario).

Table 7.6: Bureau's Initial Cost of Calculations

	LOW SCENARIO	**HIGH SCENARIO**
	Based on Latest UK and Australian Decisions (mid-point)	**Based on Latest UK Decision with Lower Gearing**
Risk-free rate (nominal)	5.3%	5.5%
Risk-free rate (real)	2.9%	3.0%
Debt premium	1.3%	1.3%
Corporation Tax	30.0%	30.0%
Post-tax cost of debt (nominal)	4.6%	4.8%
Post-tax cost of debt (real)	2.9%	3.0%
Equity Risk Premium	4.3%	4.7%
Equity Beta	0.86	1.00
Post-tax cost of equity (nominal)	9.0%	10.2%
Post-tax cost of equity (real)	6.5%	7.7%
Gearing	55.0%	45.0%
Post-tax WACC (nominal)	6.6%	7.8%
Post-tax WACC (real)	**4.5%**	**5.6%**

[14] In principle, a decrease in gearing should be accompanied by a decrease in the equity beta, all else equal, as the risk to equity holders is reduced. That is, in the present case, a decrease in gearing from 55% to 45% should increase the equity beta from 1.00 to 0.82 using the following formula:

New Beta = Original Beta x (1-Original Gearing) / (1 – New Gearing)

This would in turn lower the cost of equity below that shown in the "High" scenario.

7.4.5 Comparison with Bureau's Estimates at the Previous Price Control Reviews

The following table compares the Bureau's initial cost of capital calculations for PC3 with the Bureau's calculations for PC1 and PC2:

Table 7.7: Bureau's Initial Calculations for PC3 against Bureau's Calculations for PC1 and PC2

	Bureau's Estimates for PC1 and PC2	**Bureau's Initial Estimates for PC3**
Real Risk-free rate (%)	3 – 4	2.9 – 3.0
Debt premium (%)	1 – 2	1.3
Real, post-tax cost of debt (%)	**4 – 6**	**2.9 – 3.0**
Equity risk premium (%)	3.5 – 5	4.3 – 4.7
Equity beta	0.60 – 0.80	0.86 – 1.00
Real, post-tax cost of equity (%)	**5.1 – 8**	**6.5 – 7.7**
Gearing (%)	50 – 70	45 - 55
Real, post-tax WACC (%)	**4.55 – 6.6**	**4.5 – 5.6**

The following points can be made on the above comparison:

- The Bureau's estimates of the cost of debt is lower than its previous estimates. This is reflective of the reduction in interest rates worldwide since the previous estimation was made and consistent with the recent estimates of overseas regulators.

- The Bureau's estimate of the cost of equity is towards the higher end of the range of its previous estimates (largely due to a higher equity beta).

- The Bureau's initial estimate of gearing for PC3 is towards the lower end of the range of the previous low and high estimates.

The dominant factor is the lower cost of debt due to lower interest rates worldwide. Therefore, despite the higher cost of equity assumed at this review, the Bureau's initial estimate of the overall cost of capital for PC3 is towards the lower end of the previously estimated range.

The Bureau would welcome any company-specific estimates of the above factors based on companies' own experience of raising funds in capital markets.

7.4.6 Consideration of Business-Specific Calculations

The Bureau's calculations of the cost of capital are based on a wide range of businesses in terms of their nature and size. It can be seen the UK regulators have not distinguished between water and electricity businesses as far as business-specific parameters (such as debt premium and equity beta) are concerned – both water and electricity regulators have estimated almost the same debt premiums (1.3% and 1.35%, respectively) and the same equity beta (both 1.00).

With regards to the issue raised by AADC and ADDC, that RASCO (and perhaps AADC and ADDC) should be allowed a higher cost of capital due to its smaller size, it may be interesting to

note that Ofwat in its final determination of December 2004 allowed a “small company premium” on the cost of capital. This ranged from 0.3% to 0.9% post-tax for water-only companies, depending upon the RAV of the company. Ofwat’s decision[15] to allow this premium is based on the small company effect on the cost of capital in terms of three components:

- an equity return premium to compensate for higher trading costs;
- an interest rate premium on the cost of debt finance; and
- premiums on the costs of raising capital (for both debt and equity).

Generally speaking, small companies can be argued to face more difficulties (and hence higher costs) in accessing various sources of funds and raising financing than large companies.

To assess the issue further, the Bureau has analysed the sizes of the overseas companies (for which the regulatory decisions on cost of capital have been taken into account in this paper) in comparison with the sizes of the Abu Dhabi companies. **Table 7.8** shows such analysis in terms of RAVs of the businesses:

Table 7.8: Comparison between Abu Dhabi and Overseas Companies in terms of Size (RAV)

	RAV (AED m)	Notes
Abu Dhabi Companies		
TRANSCO	12,239	2005 closing RAV based on provisional capex
ADDC	6,585	2005 closing RAV based on provisional capex
AADC	3,097	2005 closing RAV based on provisional capex
RASCO	456	2005 closing RAV
Ofwat Assessment of UK Water Companies		
Range 1 (premium 0.9%)	<490	RASCO lies in this range
Range 2 (premium 0.7%)	490 – 980	
Range 3 (premium 0.6%)	980 – 1,960	
Range 4 (premium 0.3%)	1,960 – 4,900	AADC lies in this range
Ofgem Assessment of UK Electricity Companies		
Range	3,907 – 9,990	Comparable to AADC/ADDC, lower than TRANSCO
Australian Regulators' Assessment of Electricity Companies		
Sydney	19,614	Higher than all
TransGrid	8,185	Higher than all but TRANSCO
EnergyAustralia	1,760	Lower than all but RASCO
NSW Distribution Cos.	182 – 11,525	Comparable to all

[15] “Future Water and Sewerage Charges 2005-10”, Final Determinations, Ofwat, December 2004.

The above table shows that the Bureau's initial cost of capital calculations are based on a wide range of different size businesses – larger than, smaller than, and comparable to, the Abu Dhabi companies. While Ofwat has allowed a special premium for companies having sizes similar to RASCO and AADC, other regulators have not done so. One should also consider the fact that the businesses in Abu Dhabi are presently wholly-owned by a common shareholder (ADWEA) and hence a comparison based on individual business size to assess difficulties or additional costs in raising financing may not be appropriate while all the businesses remain wholly-owned by ADWEA.

Nevertheless, while the cost of capital estimated by overseas' regulators is clearly relevant to a company the size of TRANSCO, there may be some justification for a distinction in the case of the smaller companies in Abu Dhabi. In particular, the Bureau is willing to consider company-specific cost of capital calculations if specific risks or differences can be identified for AADC/ADDC and RASCO which can be shown to materially impact on their actual cost of capital in practice.

In addition to costs associated with the relatively small size of these businesses, factors may be identified relating to risks associated with dealing with final customers (including those associated with income collection / subsidy), and uncertainties surrounding the future of these businesses.

However, in the case of RASCO, the Bureau is concerned that a higher cost of capital could incentivise the owner of RASCO to make unnecessary investment in RASCO system when the related demand can be more efficiently met by the growing networks of ADDC and AADC.

7.5 Assessment against Overseas Capital Markets Data

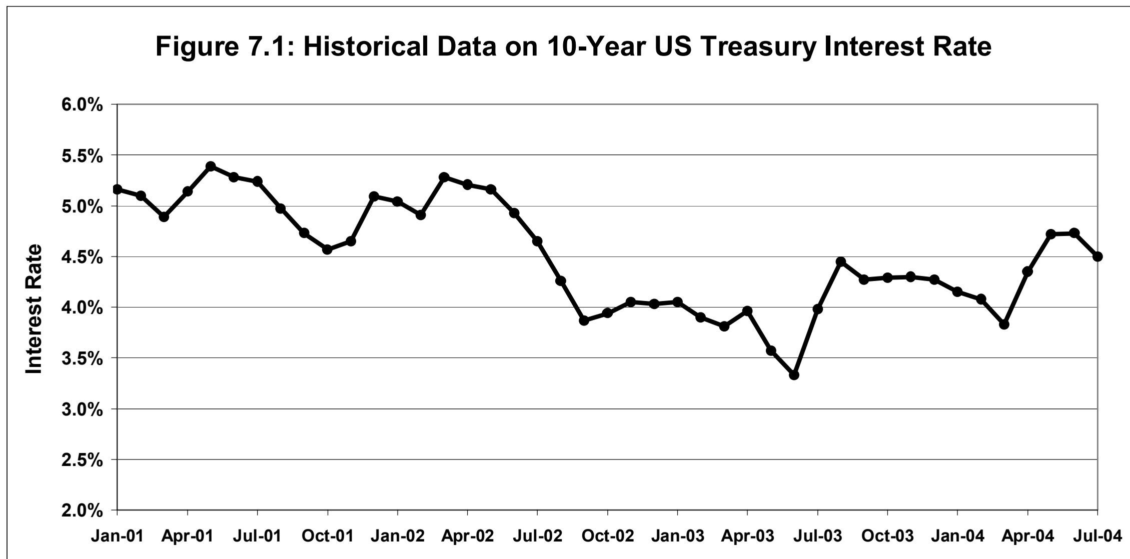
The Bureau has assessed its initial estimates of certain cost of capital components (see **Table 7.7** above) against the readily available recent data from overseas capital markets. This assessment is summarised below:

Risk Free Rate

In order to assess the risk-free rate, the Bloomberg website accessed on 27 November 2004 shows the following current yields on 10-year treasury bonds for the US, UK and Australia:

- Current yield on 10-year US treasury bond: 4.24%
- Current yield on 10-year UK government bond: 4.58%
- Current yield on 10-year Australian government bond: 5.25%

Figure 7.1 shows the monthly average interest rate on the 10-year US treasury bond for the period from 1 January 2001 to 1 July 2004. The Bureau's estimate of nominal risk free rate (5.3% - 5.5%) is somewhat higher than the range (3.33%-5.39%) reflected by this graph.



Source: US Federal Reserve System data

The average yields on 10-year US treasury bond for 2001, 2002 and 2003 are 5.02%, 4.61% and 4.01%, respectively.

These yields can be taken to represent the current levels of the nominal risk free rate in these countries. Clearly, the Bureau's estimate of 5.3% - 5.5% for nominal risk free rate is somewhat higher than these levels. However, as interest rates have been increasing over time around the world recently, and may increase further in the near future, the Bureau's estimate may constitute a reasonable forward looking estimate for the PC3 period. It also allows for some additional 'country-specific' risk for the UAE compared to, in particular, the US and the UK.

The Bureau's estimate for the real risk free rate (2.9% - 3%) is also significantly higher than the inflation-indexed (i.e. real) average yield on a 10-year US treasury bond for 2003 (which was 2.062%). The Bureau's estimate for real risk free rate is also significantly higher than the inflation indexed current yield on 10-year treasury bonds (which is 1.63% according to the Bloomberg website accessed on 27 November 2004). Both comparisons emphasise the forward-looking nature of the Bureau's initial estimate of the risk free rate.

Cost of Debt

The risk-free rate is only one component of the cost of debt, which must take into account company-specific risks. Ideally, any estimate for the cost of debt for the businesses operating in the Abu Dhabi water and electricity sector should be compared against the cost of debt of another entity with comparable credit rating. However, the limitation of availability of comparable data makes it difficult.

Nevertheless, based on the available information, the closest overseas comparator identified by the Bureau to date is the triple A-rated 10-year US national municipal bond. While this bond has a higher rating than the Abu Dhabi companies, the current yield for such a bond is 3.74% according to the Bloomberg website accessed on 27 November 2004, compared to the Bureau's nominal cost of debt estimate (4.6% - 4.8%).

Equity Beta

The Bloomberg website accessed on 27 November 2004 shows the following equity beta values for different utility companies or groups in the UK:

- United Utilities Plc: 0.621
- Scottish Power Plc 0.642
- Scottish & Southern Energy Plc: 0.521
- Vodafone Group Plc: 0.948
- Cable & Wireless Plc: 0.715
- BT Group Plc: 1.063
- BAA Plc: 0.732

These show a higher beta value for communication businesses (Vodafone, Cable & Wireless, BT) than water or electricity utilities, reflecting the higher risk of the former. The Bureau's estimate of beta (0.86 - 1.00) is significantly higher than the actual beta values for the above listed water and energy utilities and comparable to the highest beta value of 1.063 for a UK telecommunication group. However, such a comparison should be considered with care for various reasons: the period, frequency and methodology used to estimate the betas usually vary from source to source; and the above betas are on a group, rather than individual business, basis.

7.6 Assessment against Local Capital Markets Data

Since the 2002 price controls review, there have been a number of positive developments in local and regional capital markets. As detailed in the First Consultation Paper, these developments include the establishment of a regulated stock exchanges in the UAE, a significant increase in the size, liquidity and coverage of these stock markets, and the issuance of sovereign and corporate bonds in the local and regional markets.

The above developments have led to various research work on the cost of capital in the local / regional markets; for example, equity research for new equity issues and research reports on bond yields. Furthermore, the recently established Bahrain Telecommunications Regulatory Authority (TRA) has supported its cost of capital calculations for Bahrain Telecommunications Company (Batelco) drawn from overseas developed markets by cross-checking them against regional estimates.

Accordingly, while the Bureau's initial cost of capital calculations set out in this document are mainly based on the recent regulatory decisions in the UK and Australia, the Bureau has also assessed its initial estimates of various cost of capital components against the data gathered through extensive research into the local and regional capital markets.

This information has been gathered from a wide range of sources, such as daily newspapers, business magazines, publications and websites of brokerage houses, investment analyst firms, central banks, and other organisations. The data mainly relates to the UAE, Kuwait, Qatar, Bahrain and Oman. The three main publications used are:

- Emirates Securities' equity research reports on Emaar Properties (a real estate company based in the UAE) published in March and November 2004;

- The equity research reports of Global Investment House on Kuwait Mobile Telecommunication Company, Burgan Bank and Gulf Insurance Company published in July 2004; and

- Bahrain TRA's reports on the cost of capital for Batelco published in May and August 2003.

In the following sub-sections, each cost of capital component as estimated by the Bureau earlier in this paper is assessed in turn against the information from the local and regional capital markets.

7.6.1 Risk Free Rate

Ideally, the risk-free rate for the cost of capital calculations for Abu Dhabi businesses should be determined from the debt instruments issued by the Abu Dhabi or UAE government. However, the UAE or Abu Dhabi government does not presently issue such instruments. The Bureau has therefore assessed the interest rates on the bonds issued by other regional governments with similar (but generally lower) credit rating to the UAE. The Bureau has also made use of the estimates provided by the local and regional analysts for the risk free rate.

Table A1 in Appendix A presents the data collected from the local and regional capital markets on the nominal risk free rate. The data reflects either the actual yields on government bonds or analysts' estimates of the risk free rates. In certain cases, where the source shows a rate relative to a benchmark interest rate, such as London Inter Bank Offered Rate (LIBOR) or US treasury bond, it has been converted into a figure by the Bureau by using the latest value of such benchmark rate.

The table shows that the Bureau's initial estimate of risk free rate for PC3 (5.3% - 5.5% <u>in nominal terms</u>) is on the higher side of the regional range. In fact, the regional range includes the interest rates for government which have lower credit rating than the UAE and hence the above range regional range may be overstated for the purposes of the UAE risk free rate. However, the Bureau's initial estimate is very similar to the Bahrain telecom regulator's estimate (5.54%).

The only source for a <u>real</u> risk free rate in the region is the Bahrain telecom regulator's determination which gives an estimate of 2.74% (in mid-2003) compared to the Bureau's initial estimate of 2.9% - 3%.

7.6.2 Cost of Debt

The international practice (followed by the Bureau and other regulators) is to calculate the cost of debt by adding a default or credit risk premium to the risk-free rate. However data on the debt premium is not directly available from local or regional capital markets; instead only data on the overall cost of debt is available. Many corporate bonds, both rated and unrated, have been issued in the region and project-related or otherwise syndicated loans have been raised.

The information on yields or interest rates on such debt from various sources are summarised in **Table A2 in Appendix A**. The Bureau's initial estimate of nominal cost of debt (4.6% - 4.8%) lies within the range observed in the regional markets (2.11% - 6.35%) and is above the regional mid-point average of 4.23%.

The Bahrain telecom regulator's estimate of 6.35% is significantly higher than the Bureau's initial estimate. This reflects the use of data older than the recent overseas regulatory decisions and the fact that Bahrain's credit rating (Moody's Ba1) is five-levels lower than that for the UAE (until recently, Moody's A2).

In contrast, two electricity companies in the region, namely UAE's Arabian Power Company and Saudi Arabia's Jubail Electricity Company, have been able to raise debt with a much lower cost in the range of 3.24%-3.89% and 3.24%-3.64%, respectively.

7.6.3 Cost of Equity

There is a shortage of data available on market risk premium, equity beta and the cost of equity from the regional capital markets. The available data are summarised **Table A3 in Appendix A**, which shows that:

- For the market risk premium, the Bureau's initial estimate (4.3% - 4.7%) is slightly lower than the regional range (5% - 6.5%) as well as that estimated by researchers' estimate for the UAE (5%) and by the telecom regulator for Bahrain (5.18%).

- For equity beta, the Bureau's initial estimate (0.86-1.00) is towards the centre/higher end of the regional range (0.55-1.48) and is higher than the Bahrain telecom regulator's estimate for monopoly network businesses (0.55-0.79) and is similar to its estimate for the telecom company as a single entity (1.05).

- For the cost of equity, the Bureau's initial estimate (9% - 10.2%) is higher than the minimum value for the region (8.39%), higher than the researchers' estimates for the UAE (8.83% - 10.1%) and higher than the Bahrain telecom regulator's estimate for the monopoly network businesses (8.39% - 9.63%).

7.6.4 Gearing

Again, there is little local / regional data available on this parameter. The Bahrain telecom regulator assumed a gearing of only 5% for the company. However, this is based on the actual capital structure of the company and is not consistent with international best practice in incentive-based regulation, which requires a forward looking assumption of an optimal level of gearing.

Strictly speaking, with a definition of gearing which takes into account only long-term debt, the Abu Dhabi monopoly companies also have negligible gearing, as the assets are mainly financed by equity. However, if current payables or liabilities (which are substantial) are taken into account, the Abu Dhabi companies are already highly geared. Further, the Bureau is aware that all the IWPPs in Abu Dhabi and in the region have a very high level of gearing, of up to 80%.

The Bureau's initial estimate of 45% - 55% is significantly lower than this figure and is based on a forward-looking approach to incentivise the companies to move towards an optimal gearing.

7.6.5 Overall Cost of Capital

Again, there is little information available on the overall cost of capital from the regional capital markets. Comparisons with the Bahrain telecoms regulator may be of limited relevance, due to the different risk profile of telecoms operators compared to monopoly water and electricity utilities. The Bahrain telecoms regulator's estimates of the overall cost of capital (nominal) for monopoly network businesses is 8.4%-9.63%. However, as mentioned above, this is based on a very low gearing of the company. If gearing of 55% is applied, consistent with overseas' practice, the Bahrain cost of capital estimates for network businesses would be of the order of 7.27%-7.83%, comparable to the Bureau's initial estimate of 6.6% - 7.8% (nominal).

7.7 Profit Margin for Non-Network Businesses

7.7.1 Overall Approach

In contrast to the network companies, ADWEC and the supply businesses of the distribution companies have few capital assets but are exposed to risks associated with large financial flows. Therefore, the application of a cost of capital to an asset value may not be the best means of estimating the allowed returns for non-network businesses.

At the 2002 price controls review, the Bureau expressed ADWEC's allowed return in the form of a margin on its maximum allowed revenue. This involved analyzing the risks to which ADWEC is exposed and which it cannot mitigate (or which it would be costly to mitigate).

Broadly speaking, the Bureau adopted a methodology which calculated the amount of hypothetical capital that would be required by a standalone company exposed to ADWEC's risks, and then calculated the profit margin that would be consistent with the application of the cost of capital to this hypothetical capital base.

Such an approach has been used in the UK to determine the appropriate profit margin for regulated energy trading businesses and may therefore also be appropriate for the supply businesses of ADDC and AADC if separate distribution and supply controls are adopted.

The above issues were discussed in the consultation papers for the 2002 price controls review and in the First Consultation Paper for this review. In general, the respondents to the First Consultation Paper have supported this profit margin approach for both ADWEC and the supply businesses. The respondents have also highlighted the need for the approach to take into account certain specific risks and factors.

7.7.2 Bureau's Calculations for ADWEC for PC2

As mentioned in the First Consultation Paper, the following steps were involved in calculating an appropriate profit margin for ADWEC for PC2:

- Identify the risks to which ADWEC is exposed;

- Calculate ADWEC's potential exposure to these risks;
- Calculate the capital that would be required by a standalone company in order to "back" these risks;
- Apply the cost of capital to this hypothetical capital value; and
- Express the resulting return in the form of a margin on BST turnover.

The Bureau's actual calculations for ADWEC's profit margin are discussed in detail in the Draft and Final Proposals for PC2.

Based on these calculations, and a cost of capital at that time of 6%, the Bureau adopted a profit margin for ADWEC of **0.025%** of its projected allowed turnover.

7.7.3 Bureau's Current Thinking for PC3

In view of the supportive responses to the First Consultation Paper (as summarised in Sections 7.2 and 7.7.1 above), the Bureau presently intends to adopt a methodology similar to that adopted for PC2 for profit margin calculations for ADWEC and the supply businesses at this review. There are however certain specific issues that need be considered in relation to the profit margin calculations for PC3, as discussed below:

ADWEC

For (at least) 2004 and 2005, the Bureau and ADWEC have agreed upon a change in the approach to the treatment of any over- or under-recovery of ADWEC's BST revenue, which has removed the risk of ADWEC receiving a penalty for excessive over-recovery (see Section 4.5 of this document for more details on this approach).

If such an approach continues for the BSTs during the PC3 period, ADWEC will be subject to lower risks than were assumed for the PC2 calculation of the profit margin of 0.025%.

On the other hand, ADWEC has suggested the introduction of a new indicator under the PIS in order to retain an incentive for ADWEC to accurately forecast demand (see Section 8).

In any case, a lower profit margin would be justifiable in view of the expected lower cost of capital allowed for PC3 than PC2. The calculation of 0.025% profit margin was based on the cost of capital of 6% adopted for PC2. A reduction in the cost of capital to 4.5% - 5.6% for PC3 would lead to a proportional reduction in the profit margin to **0.019% - 0.023%**.

Supply Businesses

In view of the positive responses to the First Consultation Paper, the Bureau is currently minded to also apply the profit margin approach to setting PC3 controls for the supply businesses of the two distribution companies.

Either the same profit margin as previously calculated for ADWEC can be applied to the supply businesses or separate calculations can be undertaken for the supply businesses based on analysis of their specific risks.

However the Bureau also recognises that the supply businesses have more assets than ADWEC and are subject to specific risks in relation to their relationship to final consumers and the receipt of subsidy. The Bureau is therefore currently assessing the impact of using the RAVs of the supply businesses, rather than the hypothetical capital approach, to calculate the profit margin. Initial indications are that the capital-to-turnover ratio of the supply businesses is about 2-3 times that assumed for ADWEC at the last review, reflecting the higher capital-intensity of the supply businesses compared to ADWEC.

7.8 Summary of Current Thinking

This Section 7 reports the Bureau's current thinking on cost of capital and profit margin for PC3 controls as follows:

1. Using the CAPM approach, the Bureau's initial calculations based on the recent overseas regulatory estimates cross-checked against the available information from the local, regional and overseas capital markets show a real, post-tax cost of capital in the range of **4.5% to 5.6%**.

2. The Bureau is however open minded to consider any adjustments to its initial cost of capital calculations to address business specific risks, particularly for the distribution businesses, such as due to the nature and size of the businesses.

3. The Bureau intends to retain the profit margin approach adopted for ADWEC at the 2002 review to calculate the allowed return for ADWEC and the supply businesses. Based on the Bureau's initial estimate of 4.5%-5.6% for cost of capital, this approach is expected to result in profit margin of the order of **0.019% - 0.023%** on annual turnover for ADWEC and a similar return for the supply businesses.

8 Performance Incentive Scheme

8.1 Introduction

The price controls of CPI-X form give companies an incentive to reduce costs. However, the CPI-X price controls do not by themselves provide sufficient incentives to companies to meet service standards or improve their output performance. Regulating prices without corresponding regulation of outputs runs the risk that companies will be able to increase profits at the expense of service quality.

The Bureau therefore introduced a Performance Incentive Scheme (PIS) at the last price control review, linking important aspects of each company's performance to its price controls. Companies are rewarded via the scheme for improved output performance and penalised for deteriorating output performance. The current PIS for all businesses has two types of performance indicators: Category A indicators with precise definitions, targets, incentive rates and automatic annual revenue adjustment for performance, subject to a cap; and Category B indicators, less precisely defined but subject to a possible financial adjustment at this review for especially good or poor performance.

While the Bureau intends to retain the overall regulatory framework of the present PIS for the PC3 controls, it is necessary to review the operation of the scheme and modify certain aspects of the framework. The First Consultation Paper therefore raised the following issues for consultation in relation to the design of the PIS for PC3:

1. *"The Bureau proposes to continue with the existing Category A indicators. What additional performance indicators should be included in Category A for the future PIS?*

2. *How should the performance targets and incentive rates for Category A indicators for PC3 be set?*

3. *Given that the existing Category A indicators reflect licence obligations, does it remain appropriate to reward companies via bonuses for meeting their licence obligations or can the same regulatory objectives be met in these cases by simply applying penalties for late or non-submission?*

4. *Should the overall cap on annual incentives (i.e. cap on Q term) for Category A indicators be increased in PC3 to, say, 5% or 10% of each business' MAR (in relation to business' own costs, that is excluding any pass-through costs)?*

5. *What additional performance indicators should be included in Category B for the future PIS?*

6. *How should performance against Category B indicators be assessed and incentivised?*

7. *What cap, if any, should be applied to the overall financial adjustment made at the subsequent price control review in respect of Category B indicators?"*

8.2 Current Performance Incentive Scheme (PIS)

8.2.1 Main Features of the Current PIS

The current PIS has two types of performance indicators, Category A and Category B:

<u>Category A Indicators</u>

Category A performance indicators are incentivised on a year on year basis through a mechanistic annual financial adjustment to the company's maximum allowed revenue (MAR) in the next year via the term 'Q' in the price control formula (see Sections 2.3 and 2.4 of this paper for the price control formulae). There are presently two Category A indicators, each of which measures the company's performance in a year on the submission of an audited accounting statement for the previous year:

1. Audited Accounts Timeliness; and

2. Audited Price Control Return (PCR) Timeliness.

There are separate Category A indicators for the separate price controls of all the monopoly companies. Each has been precisely defined along with a clear-cut target date and incentive rate, as summarised in **Table 8.1** below.

Table 8.1: Incentive Rates for Category A Indicators

Company / Business	Performance Indicator	Incentive Rate (AED / month)	PIS Target Submission Dates for Financial Years*		
			2002	2003	2004
ADWEC	Audited Accounts	18,000	31-Dec-03	30-Sep-04	30-Jun-05
	Audited PCR	18,000	30-Sep-03	30-Jun-04	31-Mar-05
TRANSCO Electricity	Audited Accounts	1,335,000	31-Dec-03	30-Sep-04	30-Jun-05
	Audited PCR	1,335,000	30-Sep-03	30-Jun-04	31-Mar-05
TRANSCO Water	Audited Accounts	893,000	31-Dec-03	30-Sep-04	30-Jun-05
	Audited PCR	893,000	30-Sep-03	30-Jun-04	31-Mar-05
ADDC Electricity	Audited Accounts	1,136,000	31-Dec-03	30-Sep-04	30-Jun-05
	Audited PCR	1,136,000	30-Sep-03	30-Jun-04	31-Mar-05
ADDC Water	Audited Accounts	505,000	31-Dec-03	30-Sep-04	30-Jun-05
	Audited PCR	505,000	30-Sep-03	30-Jun-04	31-Mar-05
AADC Electricity	Audited Accounts	605,000	31-Dec-03	30-Sep-04	30-Jun-05
	Audited PCR	605,000	30-Sep-03	30-Jun-04	31-Mar-05
AADC Water	Audited Accounts	237,000	31-Dec-03	30-Sep-04	30-Jun-05
	Audited PCR	237,000	30-Sep-03	30-Jun-04	31-Mar-05
RASCO Electricity	Audited Accounts	370,000		30-Sep-04	30-Jun-05
	Audited PCR	370,000		30-Jun-04	31-Mar-05
RASCO Water	Audited Accounts	717,000		30-Sep-04	30-Jun-05
	Audited PCR	717,000		30-Jun-04	31-Mar-05

* The target dates relate to audited statements for the financial years 2002, 2003 and 2004. The target dates however fall within the years 2003, 2004 and 2005, respectively (the performance years) and affect the MAR via Q terms for the years 2004, 2005 and 2006, respectively (the "formula years").

Some important features are summarised as follows:

– Performance on both measures is assessed as the difference (in months) between the actual date of submission and the target date for submission to the Bureau.

– While the licences set out the due dates for the submission of audited accounts and audited PCRs (30 June and 31 March, respectively), the target dates for the purposes of the PIS have been set on a "glide-path" basis. This initially allowed the companies more time to submit these audited statements than required by the licence but by the end of the current control period (i.e. by end 2005) the PIS target dates coincided with the due dates stated in the licences.

– Incentive rates have been defined as the amount expressed in AED per month of delay or earliness and were set in proportion to the size of each business and varied from AED 18,000 per month to AED 1,335,000 per month.

The term Q_t, the performance adjustment for year t, is calculated in AED terms according to the following formula:

$$Q_t = Q1_t + Q2_t$$

where

$Q1_t$ is the revenue adjustment in respect of the timeliness of submission of the audited accounts; and

$Q2_t$ is the revenue adjustment in respect of the timeliness of submission of the audited price control return (PCR).

In essence, the PIS for Category A indicators is operated for the present control period as follows:[16]

- For any delay beyond the glide-path target date in any year, the company will receive a **penalty** calculated as follows:

  Q Term = Incentive Rate × (Glide-path target date – Actual month of submission)

- For any submission in advance of the glide-path target date, the company will receive a **reward** calculated as follows:

  For 2004 Formula Year[17]:

  Q Term = Incentive Rate × (Glide-path target date - Actual month of submission)

[16] These details of the precise operation of the current PIS have been incorporated into the licences through modifications following the conclusion of the previous price control reviews.

For 2005 Formula Year:

Q Term = $2 \times$ Incentive Rate $\times$ (Glide-path target date - Actual month of submission)

For 2006 Formula Year:

Q Term = $6 \times$ Incentive Rate

- The total reward or penalty under the PIS for any business (the "Q" term in its price control formula) for performance in any year (say 't') is capped at 2% (5% for RASCO) of the MAR in relation to its 'own' cost in that year ('t'). "Own" costs means procurement cost for ADWEC, transmission costs for TRANSCO, distribution and supply costs for ADDC/AADC, or whole MAR for RASCO.

Category B Indicators

There are a number of Category B performance indicators within the current PIS, which are monitored during the current control period. This is so that they can be ready for consideration as Category A indicators at this price control review, and also for a possible financial adjustment at this review for exceptionally good or poor performance during the current control period.

In contrast to Category A indicators, the performance against the Category B indicators is not subject to an automatic or mechanistic annual revenue adjustment for good or poor performance. This is because the measures did not yet meet all the criteria for inclusion as a Category A indicator (see Section 8.3.1 below). In particular, in some cases there were concerns over the quality of data held by the companies. It was therefore agreed at the previous reviews that these indicators will be monitored during the present control period with the objective to make some financial adjustment at this review for good or poor performance during the PC2 period and to develop certain indicators for consideration for including them in Category A in future.

The present Category B indicators are listed in **Table 8.2** overleaf:[18]

The Bureau is currently assessing the performance of the companies on Category B indicators. A number of other areas of companies' operations have also been identified which need to be incentivised for better performance (e.g. timely submission of information required by the Bureau). Possible financial adjustments at this review for performance against the present Category B indicators and other performance areas are discussed in Section 9 of this document.

[17] The term "Formula Year" means the year in which the revenue adjustment via the Q term is applied. For example, the Formula Year is 2004 for the submission of 2002 audited statements due on 30 June 2003.

[18] For definitions of these Category B indicators, see *"2002 Price Controls Review – Final Proposals for PC2"*, Bureau, November 2002, and *"Review of Economic Regulation of RASCO from 2004 – Final Proposals"*, Bureau November 2003.

Table 8.2: Present Category B Performance Indicators by Company

S. No.	ADWEC	TRANSCO	ADDC/AADC	RASCO
1.	Generation Security Standard	Electricity Transmission Security	Electricity Distribution Security	Water Quality
2.	Desalination Security Standard	Electricity Average Incident Duration	Energy Lost	Generation Availability
3.	Interim P&L Account Timeliness	Energy Lost	Customer Minutes Lost	Water Capacity Availability
4.	PWPA Timeliness	Water Transmission Security	Electricity Meter Reading	Interim P&L Account Timeliness
5.	Seven-Year Planning Statement Timeliness	Water Average Incident Duration	Electricity Distribution Loss	Environmental Incidents
6.	BST Timeliness	Water Quality	Water Distribution Metering	Safety Incidents
7.	Economic Purchase Indicator	Electricity Transmission Loss	Water Meter Reading	
8.		Water Transmission Loss	Low Pressure	
9.		Economic Despatch	Water Supply Method	
10.		Settlement Data Accuracy and Timeliness	Water Quality	
11.		Planning Data Accuracy and Timeliness	Customer Satisfaction	
12.		Statement of Connection and Use of System Charges Timeliness	Interim P&L Account Timeliness	
13.		Interim P&L Account Timeliness		
14.		Five-Year Planning Statement Timeliness		

8.2.2 Assessment of Experience to Date

The experience with the present PIS has shown some positive results. In particular, the Category A indicators have been able to influence the companies to initiate and furnish to the Bureau the audited separate accounts and audited PCRs for 2003 and earlier years in a more timely manner.

Table 8.3 below summarises the performance of the companies on Category A indicators to date in two ways. First, the table lists the submission dates to the Bureau of the audited accounts and audited PCRs for the financial years 2002 and 2003 (correct as of 31 January 2005) which can be used to apply the penalties/rewards against the glide-path target dates using the PIS incentive rates (see **Table 8.1**). Second, the table also shows the penalties/rewards of each company for 2002 and 2003 audited accounts and PCRs (to be applied to adjust the MARs for years 2004 and 2005, respectively). For those companies whose audited accounts and PCRs have not been (to date) submitted to the Bureau, no incentive has been calculated. Also note that the 2% or 5% overall cap on the total incentives for each business has been ignored in these calculations.

Table 8.3: Performance of Companies on Category A Indicators

Company / Business	Performance Indicator	Financial Year 2002 / Formula Year 2004		Financial Year 2003 / Formula Year 2005	
		Submission Date	Reward / (Penalty) AED million	Submission Date	Reward / (Penalty) AED million
ADWEC	Audited Accounts	26 May 2004	-0.09	6 October 2004	0.00
	Audited PCR	N/C	-0.162	N/C	tbd
TRANSCO Electricity	Audited Accounts	7 April 2004	-4.005	11 May 2004	+8.010
	Audited PCR	7 April 2004	-8.010	14 April 2004	+8.010
TRANSCO Water	Audited Accounts	7 April 2004	-2.679	11 May 2004	+5.358
	Audited PCR	7 April 2004	-5.358	14 April 2004	+5.358
ADDC Electricity	Audited Accounts	7 December 2004	-10.224	7 December 2004	-2.272
	Audited PCR	11 August 2004	-10.224	13 October 2004	-3.408
ADDC Water	Audited Accounts	7 December 2004	-4.545	7 December 2004	-1.010
	Audited PCR	11 August 2004	-4.545	13 October 2004	-.1515
AADC Electricity	Audited Accounts	13 December 2004	-5.445	14 December 2004	-1.210
	Audited PCR	5 December 2004	-5.445	5 December 2004	-3.025
AADC Water	Audited Accounts	13 December 2004	-2.133	14 December 2004	-0.474
	Audited PCR	5 December 2004	-2.133	5 December 2004	-1.185
RASCO Electricity	Audited Accounts	N/A	N/A	N/C	tbd
	Audited PCR	N/A	N/A	N/A	N/A
RASCO Water	Audited Accounts	N/A	N/A	N/C	tbd
	Audited PCR	N/A	N/A	N/A	N/A

Notes: 'N/R' denotes 'not received' by the Bureau.
'N/C' denotes 'not complete' (incomplete statement received by the Bureau).
'N/A' denotes 'not applicable'.
'tbd' denotes 'to be determined' – indicates date for maximum penalty not yet reached.

It can be seen that those companies who have performed well will receive bonuses while those companies that have performed poorly will receive negative financial adjustments.

ADWEC expressed concern in response to the First Consultation Paper that the Bureau considers ADWEC's audited PCR for 2002 incomplete. However, the Bureau's position remains that the Bureau has not been provided with confirmation that the earlier missing information submitted later has been audited. The same applies to ADWEC's PCR for 2003.

In the case of RASCO, the company provided audited accounts for the 2003 financial year to the Bureau in December 2004 but did not submit its accounts separately for water and electricity as required by the licence modification agreed for the 2004-2005 price controls. The submitted audited accounts for RASCO are also therefore classified as 'not complete'.

8.3 Performance Incentive Scheme (PIS) for PC3

All the respondents in principle supported the continuation of a PIS for PC3, with some modifications or reservations on certain issues in some cases.

8.3.1 Future Category A Indicators

The First Consultation Paper set out the Bureau's intention to retain the overall concept of Category A indicators incentivised through automatic adjustment to annual revenue via the terms 'Q' in the MAR formulae for the businesses. As at present, there will be separate Q terms for the businesses which have separate price controls. That is, with the further separation of controls, separate Q terms for the electricity and water businesses of ADWEC, RASCO and TRANSCO, and separate Q terms for the four separate businesses of each of AADC and ADDC. Accordingly, separate Category A indicators will need to be defined for each such business. Further, in line with the present price controls, the Category A indicators must meet the objective criteria established at the previous review. That is, Category A indicators must be measurable, verifiable, non-manipulable, non-distortionary and customer-oriented.

The First Consultation Paper discussed in some detail which specific measures should be considered for Category A indicators for the future PIS:

1. **Present Category A Indicators:** Given the importance of audited separate accounts and audited PCRs, the First Consultation Paper indicated the Bureau's intention to retain the present Category A indicators. The paper also indicated the Bureau's thinking to continue for the PC3 period, broadly-speaking, with the scheme in operation in 2006 Formula Year – i.e. to remove the 'glide-path' concept and link performance directly to the licence target dates. However, the paper raised the issue of whether the incentive rates for these indicators should be reassessed.

2. **Possible New Category A Indicators:** The First Consultation Paper indicated that there are other areas of companies' operations which may need stronger incentives by treating them as Category A indicators. The new Category A indicators can come from the present list of Category B indicators or can be fresh candidates. Presently, both the Category A indicators relate to the timeliness of audited statements. There is presently no indicator in the Category A which assesses the companies' performance on technical matters. The factors that the Bureau should take into account while assessing an indicator for Category A must include the importance of the indicator and its compliance with the objective criteria mentioned above. The First Consultation Paper suggested that the candidates for new Category A indicators may include: timeliness of charging and planning statements for ADWEC and TRANSCO, respectively; and technical performance indicators, e.g., measures of network performance. However the paper indicated some doubts on whether these candidates meet the objective criteria for Category A indicators.

The responses to the First Consultation Paper on the above issues are summarised as follows:

- AADC considered that the present Category A indicators are not directly relevant to final customers of water and electricity and hence suggested that the Bureau considers customer-focused measures of efficiency for Category A indicators based on robust data and the criteria suggested by AADC (see Section 3.3 of this document). AADC suggested that the current arrangements be continued in a modified form.

- ADDC supported the need for, and recognised the benefits of, Category A indicators. However, the company suggested that any Category A indicator should meet the standard regulatory requirements; that is, be stable from one price control to the next; provide predictable incentives for good or poor performance; be reflective of costs and benefits; provide an objective and transparent incentive mechanism; be independent of performance of third parties and other performance indicators; and be auditable (including the starting point for performance). ADDC considered, based on its experience, that the present Category A indicators and particularly their target dates are not achievable because of interdependent licence requirements and third party performance and hence need modification appropriately. The company also informed the Bureau of its ongoing work on the development of a series of key performance indicators as an essential management and internal reporting tool. Since these indicators will not require any audit for internal use, any additional burden and process of audit of such indicators if adopted for the PIS will have to be allowed for in the price controls. ADDC also suggested that an extension of the PIS will require a lead time and trial run before introduction.

- ADWEC reiterated its concern expressed during the consultation on PC2 that the preparation of audited accounts to a timetable was not fully within its own control and suggested that the Bureau should consider the completion of its accounts (and hence any reward or penalty) from the time of their readiness for audit rather than from completion of the audit itself. ADWEC suggested the demand forecasting process, both the timeliness and accuracy, under the Transmission Code as Category A indicators for itself, AADC, ADDC and TRANSCO. The company also proposed the movement of timeliness of the seven and five year planning statements, and the BST and TUoS charges statement for ADWEC and TRANSCO from Category B to Category A indicators.

- TRANSCO supported the concept and continuation of Category A indicators and suggested that any new Category A indicator should meet the objective criteria established by the Bureau. However, while discussing a water quality indicator as an example and indicating support for including as a Category A indicator successful water quality testing (where TRANSCO considered its performance to be good), TRANSCO questioned the benefit of including water quality sampling frequency (where TRANSCO's performance has been below the statutory requirements).

The Bureau welcomes the above responses but would also like to clarify some of the issues in line with the discussions during the consultation on PC2 or during the consideration of these issues more recently with the concerned companies:

- The Bureau considers that the licence requirements are independently achievable provided they are prioritised and addressed promptly upon completion of the previous financial year. With regards to dependence on other parties, there are standard, internationally-accepted accounting procedures for dealing with delays or uncertainties relating to invoices from suppliers in a way that does not delay the completion of an audit. Furthermore, the companies concerned are under common ownership, so it is difficult to regard this as an external factor.

- The Bureau considers that ADWEC's concerns on delays on audited statements due to third parties are also addressed by the above clarification. The objective of the PIS is to incentivise the company, irrespective of whether the operational control of the company or its audit lies with the company's management. In law, and as far as the regulator and customers are concerned, it is 'the company' that performs its licensed activities. Further, the impact of a company's performance on PIS indicators will clearly be seen in its profits. If the company's performance is adversely affected by the actions or decisions of its owner or management, lower profits than assumed when setting the price controls will signal to owner and management the need to review their actions or decisions and take appropriate steps to improve performance. The experience to date shows that the performance of the companies on the audited statements has improved significantly with the introduction of the PIS.

- With regards to AADC's concern on the relevance of present Category A indicators to customers, the Bureau clarified during the PC2 consultation that until the subsidy is removed the final customers will not see any benefit from the Category A indicators. However, there will be reduced subsidy payments if there is poor performance. For the present Category A indicators for which the Bureau is effectively a 'customer', the final customers and the government will see the benefit in terms of more effective regulation of the sector which is directly dependent on the timely provision of audited data on the performance of the companies.

- Regarding TRANSCO's comments on a possible water quality-related Category A indicator, the Bureau considers that both the sampling frequency and the sample testing are important. Otherwise, if TRANSCO's suggestion is followed, and only successful water quality testing is included in Category A, a company could show a good performance on testing by taking few samples.

In view of the above and the statutory requirements for the timely provision of audited statements, the Bureau believes that the present Category A indicators should be retained. Furthermore, based on the responses and the Bureau's discussions with the companies, the Bureau considers that the following additional indicators should be included in Category A:

- **Timeliness of Annual Information Submission for all companies:** The experience to date and particularly during the consultations for PC2 and PC3 highlighted the poor performance of the companies, particularly AADC and ADWEC, on their submission of requested information to the Bureau. The quality of the information provided by other companies has also not been satisfactory. While the provision of any information

requested by the Bureau is a licence obligation of each company, the Bureau's current thinking is to include the timeliness of an annual information submission, in a format prescribed by the Bureau, as a new Category A indicator for all separate businesses. The Bureau has to date used standardised pro-formas for its information requests and the companies are well aware of our information requirements. The Bureau thinks that 30 September of each year is an appropriate target date for this new Category A indicator. Given the precise and clear nature of this indicator and the experience to date with the PIS, the Bureau is hopeful that the companies will respond positively to the incentive for this new Category A indicator.

- **Accuracy of Annual Peak Demand Forecasts for ADWEC:** As discussed in Section 4.5 of this document, the present practice of retrospective adjustment to the previous year's BST resulting in a zero correction factor has highlighted the need for appropriate incentives for ADWEC to forecast demands for the forthcoming year as accurately as possible. The Bureau's current thinking is therefore to introduce, separately for water and electricity, accuracy of annual peak demand forecasts as new Category A indicators for ADWEC. Therefore, by 31 December each year, ADWEC will be required to formally submit to the Bureau its peak electricity and water demand forecasts for the coming year. The accuracy of these forecasts will be measured against the actual outturn peak demands. ADWEC will be rewarded if its forecasting accuracy is better than a target accuracy (and the higher the forecasting accuracy, greater will be the reward) or penalised if its forecasting accuracy is lower than the target accuracy (the lower the forecasting accuracy, greater will the penalty) through pre-defined incentive rates. The target accuracy can be set in line with ADWEC's licence, as discussed in the Section 8.3.2 below.

- **Water Quality Indicators for Water Production, Transmission and Distribution Businesses:** Production, transmission and distribution businesses have statutory obligations to comply with the Bureau's Water Quality Regulations. These businesses include the water production business of RASCO, the water transmission business of TRANSCO, and the water distribution businesses of AADC and ADDC. The Bureau is currently minded to introduce new Category A indicators for these businesses to incentivise them to improve on their performance regarding compliance with the Water Quality Regulations.

  The treatment of performance on this indicator due to factors outside the companies' control is discussed in Section 8.3.4 below.

- **Number of Interruptions Indicator for Electricity Transmission and Distribution Businesses:** To improve security of electricity supplies to customers, the Bureau's current thinking is to introduce new Category A indicators to incentivise the electricity transmission business of TRANSO and the electricity distribution businesses of AADC and ADDC to reduce the number of incidents or events resulting in interruption of electricity supplies. One particular issue to be addressed will be whether it is appropriate to distinguish between planned and unplanned outages for this new indicator.

The treatment of interruptions due to factors outside the companies' control is discussed in Section 8.3.4 below.

In view of the nature of water, which can be stored, such an indicator may not be appropriate for water network businesses.

- **Energy Lost Indicator for Electricity Transmission and Distribution Businesses:** While the preceding indicator is designed to promote the reduction of the number of network outages, it will not directly incentivise the relevant businesses to reduce the scale of the effect of such outages. The Bureau is therefore minded to propose a further new indicator to incentivise the businesses to reduce the total energy lost in a year due to network interruptions. Another alternative is to define this indicator in terms of the total duration of the interruptions in a year – although this would not necessarily take into account the scale of the interruption in full. The Bureau would welcome the views of the companies on these possible measures.

  As for the preceding indicator, such an indicator may not be appropriate for water network businesses at present. Further, the treatment of energy lost due to factors outside the companies' control is discussed in Section 8.3.4 below.

- **Severe or Significant Safety Incidents for Transmission and Distribution Businesses:** Among the general duties of the Bureau under Article 54 of Law No (2) is an obligation to "ensure the operation and development of a *safe*, efficient and economic…sector…" (emphasis added). The Bureau is presently developing its Health, Safety and Environmental (HSE) Regulations to prescribe measures for compliance by all licensees. The Bureau is therefore minded to introduce a new Category A indicator for each of the water and electricity transmission or distribution business of AADC, ADDC and TRANSCO to incentivise these businesses to reduce the occurrence of significant safety incidents (to be defined by the Bureau in its new HSE Regulations or elsewhere).

The Bureau has also considered the possibility of introducing new Category A indicators for the water and electricity supply businesses of AADC and ADDC to incentivise them to improve performance on customer meter reading. However, in the absence of any precise statutory targets and the lack of information on any optimal or desirable target, the Bureau is presently thinking not to introduce such an indicator as Category A at this review.

The above proposals on the Category A indicators for PC3 are summarised in the following table:

Table 8.4: Category A Indicators – Bureau's Current Thinking for PC3

AADC and ADDC			
Electricity Supply	**Electricity Distribution**	**Water Supply**	**Water Distribution**
1. Audited Accounts 2. Audited PCR 3. Information Request	1. Audited Accounts 2. Audited PCR 3. Information Request 4. Number of Interruptions 5. Energy Lost 6. Significant Safety Incidents	1. Audited Accounts 2. Audited PCR 3. Information Request	1. Audited Accounts 2. Audited PCR 3. Information Request 4. Water Quality 5. Significant Safety Incidents

ADWEC Electricity Business	**ADWEC Water Business**
1. Timeliness of Audited Accounts 2. Timeliness of Audited PCR 3. Timeliness of Information Request 4. Accuracy of Annual Peak Demand Forecast	1. Timeliness of Audited Accounts 2. Timeliness of Audited PCR 3. Timeliness of Information Request 4. Accuracy of Annual Peak Demand Forecast
RASCO Electricity Business	**RASCO Water Business**
1. Timeliness of Audited Accounts 2. Timeliness of Audited PCR 3. Timeliness of Information Request	1. Timeliness of Audited Accounts 2. Timeliness of Audited PCR 3. Timeliness of Information Request 4. Water Quality Indicator
TRANSCO Electricity Business	**TRANSCO Water Business**
1. Timeliness of Audited Accounts 2. Timeliness of Audited PCR 3. Timeliness of Information Request 4. Number of Interruptions Indicator 5. Energy Lost Indicator 6. Significant Safety Incidents Indicator	1. Timeliness of Audited Accounts 2. Timeliness of Audited PCR 3. Timeliness of Information Request 4. Water Quality Indicator 5. Significant Safety Incident

The actual performance data for some of the above Category A indicators will require auditing, as discussed in Section 8.3.4 below. Where targets are based on the previous year's performance, the previous year's performance will also need to be audited.

8.3.2 Future Performance Targets for Category A Indicators

The First Consultation Paper discussed the important question of how the future performance target for any indicators should be set. In theory, the target for any performance indicator can be set on the basis of:

– The 'optimal' level of performance (i.e. the level where the difference between the total benefits and the total costs – that is, the net benefit - of performance or service quality is maximised);

– The company's recent performance (such as its performance on the corresponding indicator in the previous year);

– Recent performance of comparable companies in similar circumstances; or

– Statutory targets (such as target dates specified in the licence or the Law).

The paper however identified a number of practical problems in setting performance targets based on optimal levels or by comparison with similar companies elsewhere in the world. The paper therefore suggested the following options to set the performance targets for Category A indicators:

1. **Performance Targets for Present Category A Indicators:** The due dates for submission of audited statements are specified in the companies' licences. While 'glide-path' target dates were considered appropriate at the previous review, they were structured such that they become the same as the licence due dates by the end of the present control period (i.e. by end 2005). As the companies have made significant progress on the audit of these statements and the PIS target dates already (from 2005) coincide with the licence due dates, the First Consultation Paper suggested that the licence due dates should be the target dates for the audited accounts and audited PCRs for the future PIS (i.e. 30 June and 31 March, respectively).

2. **Performance Targets for Possible New Category A Indicators:** There are certain performance indicators, for example water quality indicators and information submission timeliness, for which the benchmarks or targets have already been set (or where the Bureau is given discretion to set) by the Law, the licences or the relevant regulations. In the case of other indicators, particularly technical indicators, the targets for any new Category A indicators could be set based on the companies' recent performance.

The Bureau received the following responses relating to the setting of performance targets for Category A indicators:

- AADC suggested a survey to be undertaken by the Bureau and supply businesses to determine existing customer preferences on service levels. The survey results along with the information AADC expected to be available on marginal cost of service improvements as a result of AADC's ongoing review of its businesses should help determine the optimal levels of service.

- ADDC offered the same comments as summarised in the previous section in relation to the selection of Category A indicators. In essence, ADDC advocated a stable regulatory environment and argued that the target dates for the present Category A indicators are not achievable independently.

- ADWEC suggested that the target dates for any 'timeliness' indicator should take account of any public holidays, including any special timing allowances for Ramadan or Eid holidays.

- TRANSCO suggested that the targets should be precise, linked to the existing levels of performance, and relevant to the service provided to customers. Accordingly, TRANSCO did not consider a water quality sampling frequency Category A indicator appropriate as relevant to the service as compared to the results of water quality sample tests.

The First Consultation Paper's suggestion is in line with TRANSCO's views for the targets to be based on the existing levels of performance for those indicators where there is no statutory target. With regards to ADWEC's suggestion for special allowances for public holidays, the Bureau considers that the timeliness indicators operate on an annual basis and allow sufficient time for the companies to plan in advance of the scheduled public holidays. The Bureau welcomes AADC's suggestion in respect of a customer survey.

In view of the above, the Bureau is currently thinking to proceed, broadly, with the suggestions of the First Consultation Paper on how the performance targets for Category A indicators should be set. That is:

- For the present Category A indicators, the targets should be the licence due dates for submission of audited statements. That is, 31 March for audited PCRs and 30 June for audited accounts.

- For the new annual information submission related Category A indicator, the target date should be 30 September each year (to be incorporated into the licence) - this will spread the companies' workload over the year.

- For certain new Category A indicators, such as water quality indicators (for the network businesses and RASCO) and demand forecast accuracy indicators (for ADWEC), the targets should be set on the levels as prescribed by the licenses and regulations. In relation to ADWEC's peak demand forecast accuracy, the threshold of 2% used by the licence for application of the additional 3% penalty interest rate on over-recovery of revenue, for the purposes of calculation of correction factor, is relevant. However, the 2% threshold in the licence is one-sided in nature as it is applied to only penalise ADWEC for over-recovery or over-forecasting of revenue and is not applied to reward ADWEC for forecasting accuracy below this threshold. It therefore seems appropriate under the two-sided PIS to set the accuracy target at 1% (either plus or minus) for the demand forecast accuracy indicator.

- For other new Category A indicators, the targets should be set keeping in view the companies' recent reasonable performance.

These proposals are summarised in the following **Table 8.5**.

Table 8.5: Performance Targets for Category A Indicators – Bureau's Current Thinking for PC3

Category A Indicator	Businesses	Bureau's Current Thinking on Targets
Audited Accounts Timeliness	All	30 June each year
Audited PCR Timeliness	All	31 March each year
Information Submission Timeliness	All	30 September each year
Water Quality Indicator	All water businesses, except ADWEC	100%
Peak Demand Forecast Accuracy	ADWEC's water and electricity businesses	Accuracy target of +/- 1.0% (the difference between ADWEC's forecast and actual outturn demand for the next year as a proportion of the actual outturn demand for the next year)
Significant Safety Incidents	All transmission and distribution businesses of AADC, ADDC and TRANSCO	Zero, as no such incident should be tolerated
Energy Lost	Electricity transmission and distribution businesses of AADC, ADDC and TRANSCO	To be based on companies' recent performance, if reasonable
Number of Interruptions	Electricity transmission and distribution businesses of AADC, ADDC and TRANSCO	To be based on companies' recent performance, if reasonable

8.3.3 Future Incentive Rates for Category A Indicators

While the First Consultation Paper sought any estimates from the companies on the marginal cost of performance improvements and results of any market research (or similar analysis) of the companies on the requirements of their customers for service improvements, the paper indicated that the Bureau may have to rely on the approach it used at the previous price control reviews for establishing incentive rates. That is:

– First, the Bureau may decide the total amount "at risk" or the maximum penalty or reward for the companies based on the agreed cap on the Q term (2% to 5% of forecast MAR for 2006 in relation to "own costs" as discussed below) of each business.

– Second, the resulting amount may be equally apportioned between all the Category A indicators of the business concerned. However, the Bureau may need to consider higher incentive rates (i.e. higher allocation of amount at risk) for certain indicators than others.

– Third, the incentive rate for each indicator can be derived by dividing the relevant amount apportioned as above by (a) for timeliness Category A indicators, the variance between target performance and performance of a 6 month delay beyond the glide-path target date; and (b) for other indicators, the variance between the target performance and the worst expected performance.

The above approach effectively allows the Bureau to objectively judge the appropriate incentive, taking account of relevant objectives and available data. This seems particularly suitable for those performance indicators where the Bureau is the 'customer', such as the timeliness of audited statements.

The First Consultation Paper also raised the issue of whether it remains appropriate to reward companies with a bonus in the event of audited accounts and audited PCRs being submitted on time. As timely submission of such audited statements is a licence obligation and the costs associated with their preparation are already financed within the price controls, the paper sought views of the respondents on whether the PIS should be amended for PC3 to simply penalise companies in the event of non-compliance for these indicators.

The respondents to the First Consultation Paper in general opposed the suggestion to remove any reward or bonus for the existing Category A indicators, i.e., timeliness of the submission of audited accounts and audited PCRs . The responses are summarised as follows:

- AADC, ADDC and TRANSCO suggested that the current arrangement involving both the reward and penalty should be retained for PC3, mainly based on their argument for stable and fair regulatory environment.
- ADDC did not consider the current levels of revenue (or the incentive rates) associated with the Category A indicators reasonable and argued for lower incentive rates being reflective of a lower 'willingness to pay' and 'value addition'.
- ADWEC suggested retaining the maximum reward, being Q = 6 x incentive rate, with the penalty applied gradually and maximum penalty only after 6 months.

The Bureau concurs with the above responses on retention of the two-sided nature of the incentives (i.e. both reward and penalty) for the existing Category A indicators. However, due to the lack of any information on the benefits (willingness to pay) and costs of performance, the Bureau's current thinking is to adopt the approach used at the previous review (and outlined above) to set the incentive rates – that is, calculate the amount at risk for PIS based on the cap and forecast MAR for 2006 and allocate this amount between all the Category A indicators. However, the Bureau has yet to make a proposal or decision on whether all the Category A indicators should be given equal importance or weighting, or more importance be given to some Category A indicators over others.

For the existing Category A indicators, there may be a case (for simplicity) for leaving the incentive rates the same as already apply for the 2006 formula year.

8.3.4 Other Issues related to the new Category A Indicators

The First Consultation Paper identified that a number of issues will arise if technical performance indicators are included in Category A for the future PIS. These issues were discussed in detail in the Bureau's consultation papers on the 2002 price control review (particularly in the Draft Proposals for PC2) as certain technical indicators were being considered at that time. These issues will again need to be discussed during the course of this review. In essence, the Bureau would require the companies to have their annual performance data on technical Category A indicators audited by an independent, suitably-qualified professional firm approved by the Bureau. Further, a company should not be penalised or rewarded for certain exceptional events if such events are material and outside the company's control.

The Bureau's current thinking is therefore to introduce the following arrangements for PC3 in relation to certain specific new Category A indicators which are the Energy Lost, Number of Interruptions and Water Quality indicators for the transmission and distribution businesses of AADC, ADDC and TRANSCO. The following arrangements will not be applicable to any other indicator for any business:

Exceptional Events

The companies' performance on the above specified Category A indicators should be excused for certain exceptional events and such events should be excluded from the PIS if they meet the necessary criteria. More specifically, a company should not be rewarded or penalised under the PIS for an event where it can be clearly demonstrated that: it was outside the control of the company, the company was unable to mitigate the impact of the event, and it had a material impact on the company's performance.

However, any action or inaction of the management or shareholder of the company or the impact thereof would not be considered an 'exceptional event'.

A company wishing to exclude the impact of a certain event from the operation of the PIS would need to address the above criteria, and support its submission with the opinion of an independent, suitably-qualified professional firm approved by the Bureau.

Performance Audit

The companies should provide their annual performance data for each year for the above specified Category A indicators by the end of first quarter of the following year, as part of the audited PCR, accompanied by an unqualified statement from an independent, suitably-qualified professional firm approved by the Bureau.

If a company fails to provide the Bureau with such a statement for its reported performance by 31 March, the company will be penalised to the full extent for the performance indicators to which such statement is related.

The audit statement in relation to performance in each year of the period commencing from 2006 will be required to be submitted as part of the audited PCRs for the respective years (which are due by 31 March of the next year). However, the related adjustments to MARs via the Q terms will be made in the year following the year in which the due dates for the said PCRs fall. That is, the performance in 2006 will be rewarded or penalised via the Q term in 2008, in line with the overall design of the existing PIS for all Category A indicators.

In case the performance target for each year is based on the previous year's performance, there will be an additional requirement for the companies in 2006 to provide audited data for performance in 2005 on the above specified performance indicators, so as to determine the target benchmark for 2006 performance on these indicators.

8.3.5 Future Operation of the PIS Scheme for Category A Indicators

The First Consultation Paper summarised the operation of the present scheme of applying reward and penalty for Category A indicators for the PC2 period. The Bureau's current thinking for PC3 is to adopt the same scheme of operation for timeliness related Category A indicators as applies for the last year of the PC2 scheme. However, introduction of new Category A indicators requires some modifications, as suggested below:

The term Q_t, the performance adjustment for year t, is calculated in AED terms according to the following formula:

$$Q_t = Q1_t + Q2_t + Q3_t + \ldots + QN_t$$

where $Q1_t$ …. QN_t are the revenue adjustments in respect of the Category A indicators 1, 2, …., N, respectively. In essence, the PIS for Category A indicators will be operated for the PC3 period as follows:

<u>Timeliness Category A Indicators</u>

For audited accounts, audited PCRs and information submission related timeliness indicators:

- For any delay beyond the target date in any year, the company will receive a **penalty** calculated as follows:

  Q Term = Incentive Rate × (Target date – Actual month of submission)

- For any submission in advance of the target date in any year, the company will receive a **reward** calculated as follows:

  Q Term = 6 × Incentive Rate

<u>Other Category A Indicators</u>

- For all other indicators for any company, the reward or penalty in any year will generally be calculated as follows:

  Q Term = Incentive Rate × (Target performance – Actual performance)

- However, in the case of Water Quality, Significant Safety Incidents and Peak Demand Forecasting Accuracy indicators, the concerned company will receive the maximum reward in a year if its performance matches the target (100%, zero, +/-1%, respectively), as calculated below:

  Q Term = Appropriate Multiple x Incentive Rate

The above formulae are so structured that the Q term will automatically take a positive sign if a reward is required (i.e. actual performance is better than the target) and a negative sign if a penalty is required (i.e. actual performance is below the target).

Caps on Individual Q Terms

- The **maximum delay** in any timeliness related Category A indicator should be capped at the penalty that would be incurred if the audited accounts or PCRs or information submissions (as the case may be) are submitted on the target date for the same indicator for the following year. Such a cap would be required for administration purposes in order to finalise the Q terms for these indicators in a timely manner well in advance of the due dates of the relevant PCRs. Furthermore, in any case, the audited data or information required for one year will also be required for audited data or information for the next year and hence will automatically be reflected in the audited data or information submission for the next year.

- There should not be any cap on individual Q terms for any other Category A indicators, except for the above.

- In line with the present scheme, the total reward or penalty under the PIS for any business (the overall "Q" term in the price control formula) for performance in any year (say 't') is capped at a percentage (as discussed below) of the MAR in relation to its 'own' cost in that year ('t'). "Own" costs means procurement cost for ADWEC, transmission costs for TRANSCO, distribution and supply costs for ADDC/AADC, or whole MAR for RASCO.

8.3.6 Future Cap on Incentives for Category A Indicators

In carrying out its functions, the Bureau has a duty under the Law (Article 96) to take into account the need for licensees to finance and plan their businesses with a reasonable degree of assurance.

At the previous price control reviews, the Bureau therefore capped the total incentive and penalty for Category A under the PIS for each year at 2% of MAR (5% of MAR for RASCO) in relation to their 'own costs' (i.e. excluding pass-through items). This was in addition to the caps that at present apply separately to individual Category A performance indicators.

The Bureau intends to continue with the concept of an overall cap on annual incentive amounts for the Category A indicators in the future PIS. However, the First Consultation Paper suggested that, to accommodate an increase in the number of Category A indicators and/or to provide stronger incentives for improved performance, the present annual caps on the term 'Q' may need to be increased to say 5% or 10% of MAR in respect of companies' own costs. The First Consultation Paper indicated that the experience with past operation of the scheme should allow the cap to be increased for all companies at this review.

The respondents to the First Consultation Paper in general opposed any increase in the cap on the Q term for PC3 and suggested retaining the 2% cap for the Q term for the PC3 controls. A summary of the respondents' comments is as follows:

- While arguing against any increase in the cap for the Q term above 2%, AADC considered that current Category A indicators are unattainable and outside its control.

- ADDC considered that the 2% cap remains a significant incentive and is expected to grow in absolute Dirham terms. The company argued that with the PIS in operation for a short period and with the possible introduction of new Category A indicators, companies should be allowed time to establish their base and processes for these indicators and hence the current 2% cap should be reflective across a wide range of indicators.

- ADWEC also considered that the 2% cap is sufficient (in view of its impact on the behaviour of the companies) and any increase can risk a company's financial position if the company fails to perform or can increase the burden to customers which must partly be financed via higher government subsidies to the sector. ADWEC suggested that the Bureau should consider an increase in the cap in the future review (PC4) when some experience with a wider group of Category A and B indicators would have been gained.

- In view of the risks for the company's financial position associated with the higher cap for the Q term, TRANSCO cautiously supported any increase in the cap for the Q term while highlighting that the ongoing development of its strategic asset management capability (though having long term goals) should start providing benefits during the PC3 period via the Q term. It also highlighted the need for more information on the new Category A indicators and the new incentive rates before supporting a significant increase in the level of risk for the company.

While the Bureau considers that the present Category A indicators are within the companies' control, it also acknowledges the potential risks associated with a higher cap on the Q term for the companies' financial position as well as for customers or the government. The Bureau presently considers that the 2% cap on the Q term may remain appropriate for the PC3 controls only if just the existing two Category indicators are maintained. To ensure consistency, this would apply to all companies or businesses including RASCO. However, the Bureau's current thinking is that the expected significant increase in the number of Category A indicators at this review may justify a higher cap of up to **5%** for PC3. This range is similar to the 4% limit on penalties for performance adopted by the UK energy regulator, Ofgem, in its recent determination for the electricity distribution companies.

8.3.7 Future Category B Indicators

As mentioned earlier, there are various Category B indicators in the present PIS which, in contrast to Category A indicators, are not subject to an automatic incentive adjustment to annual MAR via the term 'Q'. Rather, these Category B indicators are monitored during the present control period for the possibility of appropriate financial adjustment to the future revenue requirement calculations at this review and for consideration to include some of them in the Category A for the future PIS.

The First Consultation Paper indicated the Bureau's intention to retain this concept of Category B indicators in the PIS for PC3, but raised some issues for respondents' consideration:

– **Review of Present Category B Indicators:** It is for consideration whether all of the present Category B indicators remain appropriate or should some of them be removed and/or some new ones be added to the lists.

– **Precise Definitions:** To provide clarity and certainty for the companies, it may be appropriate to the extent possible to develop and agree on more precise definitions of Category B indicators.

– **Basis of Performance Targets:** While it may not be possible to agree on precise performance targets for all the indicators for all years, it may be practicable and desirable to agree on a broad basis (such as the performance in the preceding year) to determine suitable targets for some of the indicators to be used at the next review for financial adjustments.

– **Cap on Financial Adjustment at Next Review:** To provide further certainty for the companies, it may be necessary to set an overall cap on the financial adjustments to be made at the next review for each company's performance on Category B indicators (similar to the present cap on overall adjustment for Category A indicators).

The First Consultation Paper indicated that the Bureau's assessment of companies' performance on the present Category B indicators at this review should address the above issues.

In general, the respondents to the First Consultation Paper did not specifically propose any new Category B indicator and suggested only positive or no financial adjustment for Category B indicators. These responses are summarised below:

- AADC suggested that any indicator or its assessment need to be based on auditable, consistent and robust processes and information, which are presently lacking. Unless the underlying processes are fully developed and accuracy of the data is established, there should be only positive financial adjustments for Category B indicators without any cap. AADC noted that there is currently a lot of work being undertaken on the development of key performance indicators (KPIs) by the Bureau and the companies. AADC was hopeful that this work will be completed during this consultation process for PC3 and through discussion a more robust and clear set of indicators can be adopted.

- ADDC and TRANSCO considered that the present Category B indicators do not meet the objective criteria for Category A or best practice regulatory requirements and hence should not be subject to any financial adjustment. Rather, they proposed that appropriate Category B indicators should be identified, developed, and tested during the PC3 period for their inclusion in Category A for future price controls.

- ADWEC proposed including its annual demand forecasting report in Category B.

The Bureau agrees with the respondents that many of the present Category B indicators had not been precisely defined for PC2 and do not meet the objective criteria established for Category A. However, this was precisely the distinction between the two categories. The companies were aware that their performance during the PC2 period would be monitored and rewarded or

penalised at this review. However, to address some of the above concerns, the Bureau's current thinking, as discussed in Section 9 of this paper, is to make financial adjustments at this review for only those Category B indicators where the performance of the companies has been particularly good or poor during the PC2 period. Further, the First Consultation Paper also indicated the need for a cap on the overall financial adjustments for Category B indicators for both the PC2 and PC3 periods. This was in contrast to no discussion at the previous price control review and aims at addressing concerns with regards to the significant impact on the financial position of the companies.

Therefore, the Bureau's current thinking is that it is appropriate to retain the concept of Category B for monitoring and further development during the PC3 period and a possible financial adjustment at the next price control review for good or poor performance during the PC3 period but subject to an overall cap of 2% - 5% in line with the cap for Category A.

Further, as highlighted by AADC, the Bureau has taken up the development of companies' technical and network performance indicators as a separate workstream to establish agreed KPIs for the network businesses – this work does not relate to ADWEC and RASCO. The Bureau is hopeful that this ongoing work will result in more robust KPIs than the present Category B indicators. However, there is a need to avoid any duplication or confusion in the future to enable companies to clearly understand and respond positively to the target performance indicators. Therefore, the Bureau's current thinking is to split Category B indicators for AADC, ADDC and TRANSCO between two groups: (i) all technical and network related performance indicators under KPIs to be agreed between the Bureau and the respective companies outside of this review; and (ii) other economic and information related indicators. This is shown in the following table:

Table 8.6: Proposed Category B Performance Indicators for PC3 Period

S. No.	ADWEC	TRANSCO	ADDC/AADC	RASCO
1.	-	Technical KPIs	Technical KPIs	-
2.	Generation Security Standard	Settlement Data Accuracy and Timeliness	Customer Satisfaction	Generation Availability
3.	Desalination Security Standard	Planning Data Accuracy and Timeliness	Interim P&L Account Timeliness	Water Capacity Availability
4.	Interim P&L Account Timeliness	Interim P&L Account Timeliness		Interim P&L Account Timeliness
5.	Seven-Year Planning Statement Timeliness	Five-Year Planning Statement Timeliness		
6.	BST Timeliness	Statement of Connection and Use of System Charges Timeliness		
7.	Economic Purchase Indicator	Economic Despatch		
8.	PWPA Timeliness			

With respect to the "Customer Satisfaction" indicator for ADDC/AADC, the Bureau intends to investigate whether the Overall Standards Scheme (OSS) already under discussion between the companies and the Bureau can provide a suitable basis for assessment.

8.4 Summary of Current Thinking

The Bureau's current thinking as developed in this section on various aspects of the PIS for the PC3 controls is summarised below:

1. The overall concept of Category A and Category B indicators should be retained.

2. In addition to retaining the existing two Category A indicators (timeliness of audited accounts and audited PCRs) for all businesses, the following new measures should be included in Category A for PC3:

   - timeliness of annual information submissions for all businesses;
   - "significant safety incidents" for all transmission and distribution businesses;
   - energy lost and number of interruptions for all electricity transmission and distribution businesses;
   - water quality for all water businesses except ADWEC; and
   - annual peak demand forecast accuracy for water and electricity businesses of ADWEC.

3. The performance targets for Category A indicators for PC3 should be set as follows:

   - all timeliness indicators: as per licences (31 March for audited PCRs, 30 June for audited accounts, and 30 September for information submission – to be incorporated into licences);
   - annual peak demand forecast accuracy: +/- 1%, in line with the licence
   - water quality: 100% of samples required to be taken passing test, as per the Bureau's Water Quality Regulations
   - significant safety incidents: as per regulations being developed by the Bureau
   - all other indicators: based on recent performance, where reasonable

4. Rewards and penalties should be retained for the existing timeliness Category A indicators for PC3.

5. The overall cap on annual incentives (i.e. cap on Q term) for Category A indicators should be 2% - 5% of each business' MAR (in relation to business' own costs; that is, excluding any pass-through costs), depending on the number of Category A indicators.

6. While the existing Category B indicators should be retained for PC3, Category B for network businesses should group all technical and network-related performance

indicators into an overall group of KPIs being developed separately by the Bureau and the respective businesses.

7. The overall financial adjustment made at the subsequent price control review in respect of Category B indicators should be capped at 2%-5% of the overall revenue requirement for the subsequent price control period.

9 Financial Adjustments

9.1 Introduction

The First Consultation Paper discussed the following financial adjustments that the Bureau intends to make at this review:

1. **RASCO-related financial adjustments for AADC and ADDC:** required for (i) the opex incurred by the distribution companies in 2001 and 2002, and for (ii) any capital costs from 2001 onwards, in both cases associated with the distribution and supply assets transferred from RASCO to the distribution companies in 2001.

2. **Financial adjustments for performance on PIS Category B:** required to be made to each company's future revenue for its performance on Category B indicators under the PIS during the PC2 period, as agreed at the previous review.

3. **PCR-related financial adjustments:** required for AADC and ADDC for over-statement of revenue drivers in their audited PCRs for 1999-2002. Adjustments may also be required for under-statement of regulated revenue in the same period.

4. **Financial adjustments for asset transfer / disposal:** required for any assets transferred from any company or disposed of otherwise. Similarly, adjustments may be required for assets transferred to or otherwise acquired by companies (but only to the extent not included within the financing of capex).

5. **Other financial adjustments:** This group covers certain other adjustments not covered by the above groups, such as those for failure to provide information and for exclusion of certain unlicensed income.

In addition to the above, a further adjustment is required following the finalisation of audited accounts for RASCO for 2003:

6. **Financial adjustment for RASCO's Past Revenue or Subsidy Shortfall:** As mentioned in Section 2, the Bureau has agreed to apply 2004-2005 RASCO price controls retrospectively to 2001-2003 for the production activities of RASCO to determine its revenue requirement for 2001-2003. An adjustment is required at this review to make up for the shortfall faced by RASCO during 2001-2003 in comparison with the subsidy and income actually received for those years as shown in its audited accounts.

The First Consultation Paper mentioned that, where appropriate, the adjustment will be made in the same NPV terms as if it had been made at the time of occurrence of the event to which it relates.

The First Consultation Paper raised the following general issues for consultation in relation to the financial adjustments at this review:

1. *"Do you agree with the financial adjustments described in this section?*

2. *Are there any additional financial adjustments which are necessary at this review?*

3. *Should the adjustments be applied to the companies' allowed revenues over the PC3 period, or to their RAVs (to spread their effect over a longer period)?"*

The respondents to the First Consultation Paper, while highlighting practical difficulties, generally supported the adjustments discussed in that paper. They also sought more information on these adjustments. The respondents generally preferred adjustments to be made directly to the PC3 revenue requirement in NPV terms. However, they considered that these adjustments if significant can be applied to the RAVs.

Given the scale and the number of adjustments, the Bureau is currently minded to apply all the financial adjustments to the RAVs, both to spread the effect over a longer term and to treat them consistently (which would also result in less complex calculations). The exception to this is ADWEC (and perhaps the supply businesses of AADC and ADDC) where the concept of RAV does not exist and hence any adjustments would need to be applied to the allowed revenue over the PC3 period.

The following sections discuss the financial adjustments in some more detail and highlight the Bureau's current thinking on the related issues keeping in view the responses received. In relation to the certain adjustments, the Bureau has also attempted to set out its calculations for such adjustments based on the available information.

For many of the calculations requiring present values of past amounts, the Bureau has used a **cost of capital of 6% (real, post-tax)** as the discount rate to take account of time value of money in line with the assumption used for the present and earlier price controls. Further, for many calculations requiring adjustment of the price base to 2006 prices, the Bureau has used the following outturn and forecast data for the UAE inflation:

Table 9.1: UAE CPI Inflation Data

Actual as per UAE Ministry of Planning	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
UAE CPI (1995=100)	106.9	109.2	110.7					
UAE CPI (2000=100)			100.0	102.8	105.8	109.1		
UAE Inflation (includes assumptions for 2004 & 2005)		2.15%	1.37%	2.80%	2.92%	3.12%	3.00%	3.00%

9.2 RASCO-Related Financial Adjustments

The transfer of the distribution and supply activities of RASCO to ADDC and AADC with effect from 1 January 2001 in their respective authorised areas has given rise to the need for certain financial adjustments at this review:

1. While opex relating to these activities for 2003 onwards has been taken into account while setting PC2 for ADDC and AADC, such expenses incurred by ADDC and AADC during 2001-2002 may need to be remunerated through appropriate adjustment at this review.

2. If the distribution companies paid for the distribution and supply assets inherited from RASCO, it would be appropriate to make an adjustment at this review for ADDC and AADC for capital costs (both return on capital and depreciation) since 2001 associated with these assets.

These adjustments were discussed during the previous price control reviews. In response to the First Consultation Paper, AADC agreed to the Bureau's approach but suggested that the capital costs should include the additional network connectivity and augmentation for security of supply to the customers on the RASCO assets. The Bureau considers that such capital costs if incurred by AADC, should be treated (and hence financed) in the same manner as the overall capex for the distribution and supply businesses and, if incurred by RASCO, should have already been treated (and financed) by the present price controls for RASCO.

The following sub-sections describe the Bureau's initial calculations, based on the available information, of the above adjustments:

9.2.1 RASCO-related Financial Adjustment for Operating Expenditure

In the absence of any other reliable information, the Bureau has referenced the audited accounts for RASCO for 2000 and 2001 to see the impact of the transfer of distribution and supply assets on opex. These accounts show a decrease in RASCO's opex (excluding depreciation) from about AED 242.93 million in 2000 to about AED 198.12 million in 2001 – that is, by about AED 44.81 million.

The Bureau has therefore assumed that the combined additional opex incurred by AADC and ADDC during 2001 and 2002 was about AED 44.81 million per annum (2001 prices).

The following table shows the Bureau's initial calculation of the financial adjustment required at this review for such an increase in opex along with price base changes and remuneration for the time value of money.

Table 9.2: Financial Adjustment for Opex due to RASCO Asset Transfer

		2001	2002	2006
Additional Opex incurred by AADC and ADDC	AED, 2001 prices	44,808,000	44,808,000	
Real, post-tax rate of return (as applied for PC1)	6.00%			
Discount Factor (mid-year basis)		0.9713	0.9163	
Discounted Additional Opex incurred	AED, 2001 prices	43,521,377	41,057,903	
Present Value in 2001 of Additional Opex incurred	AED, 2001 prices	84,579,280		
Multiplicative Factor for time value of money for 5 years		1.3382		
Present Value in 2006 of Additional Opex incurred	AED, 2001 prices			113,186,155
Present Value in 2006 of Additional Opex incurred	AED, 2006 prices			131,006,399
Financial Adjustment Required at this Review - AADC	**AED, 2006 prices**		**13.52%**	**17,713,557**
Financial Adjustment Required at this Review - ADDC	**AED, 2006 prices**		**86.48%**	**113,292,842**

The financial adjustment is allocated between AADC and ADDC based on the ratio between the net book values of the assets transferred to them as per the management agreements between RASCO and ADDC/AADC respectively (i.e. 13.52% : 86.48%).

The Bureau is therefore currently minded to adjust the 1 January 2006 RAVs of AADC and ADDC by **AED 17.714 million** and **AED 113.293** (2006 prices), respectively, for the opex they incurred during 2001-2002 on distribution and supply activities inherited from RASCO.

The Bureau's current thinking is to use the RAVs (before the above adjustments) for the respective businesses as the basis for allocation of the above adjustments between the water and electricity businesses and distribution and supply businesses of AADC and ADDC.

9.2.2 RASCO-related Financial Adjustment for Capital Costs

The management agreements between RASCO and the distribution companies in their attached Tables 3 show the net book values of about AED 37.64 million and AED 240.73 million for the assets transferred to AADC and ADDC, respectively. (Incidentally, the total of these values (AED 278.36 million) is lower than the value calculated from the audited accounts for RASCO for 2001 (AED 326 million) by about AED 47.4 million.)

However, an assessment is required to confirm whether the net book values require any adjustment since the list of assets in the attached tables of these agreements seem to include certain assets which relate to production and hence are not relevant to the distribution companies. Further, confirmation is required as to whether the distribution companies have actually paid for these assets. The distribution companies should be remunerated only if the distribution companies have incurred any cost in acquiring these assets and their RAVs should be increased only by the price they paid for these assets or the net book values of these assets (whichever is less). It may also be necessary, again depending on the accounting treatment, to ensure that the capital costs in relation to these assets are not double-counted in implementing the outcome of the review of PC1 capex for ADDC and AADC discussed in Section 6.

The Bureau has reviewed the audited accounts of ADDC and AADC for 2001, the year that RASCO's production assets were transferred to these companies. In the cash flow statements for both companies, the acquisition of assets from RASCO is listed under the category "significant non-cash transaction". This suggests that ADDC and AADC have not been required to pay for the assets which they have received, which would mean that no adjustment for foregone financing costs is required at this review.

9.3 Financial Adjustments for Performance on PIS Category B during PC2 Period

9.3.1 Background on Category B Indicator Adjustments

As discussed in Section 8, at the previous price control reviews, a number of Category B performance indicators were introduced for each company as part of the PIS to incentivise the companies' performance on various aspects of their operations and licence compliance (see **Table 8.2** in Section 8.2). In contrast to Category A indicators, these indicators are not subject to an automatic or mechanistic annual revenue adjustment for good or poor performance. However,

it was agreed at the previous review that a company will be rewarded or penalised for exceptionally good or poor performance during the current control period via financial adjustment to the future revenue requirement at this review.

The First Consultation Paper indicated that the Bureau is presently assessing the performance of the companies on Category B indicators. Since the full assessment required actual outturn data for the previous years, particularly on the technical indicators, the Bureau requested such data from the companies via their information submissions. However, the Bureau's initial review of the information submitted shows that either such data has not been provided by the companies or, if provided, does not seem sufficient to provide a basis for any financial adjustment.

The First Consultation Paper also indicated that the Bureau will continue to monitor the performance of the companies on Category B indicators during 2004 (and 2005) before the financial adjustments are finalised in the Final Proposals for PC3 which are due in August 2005. Adjustments for performance on certain indicators in respect of 2005 may need to be deferred to the next (2009) price controls review.

The First Consultation Paper also raised a number of issues which need to be addressed in order to decide any financial adjustment for Category B indicators at this review:

1. What should be the performance targets for each Category B indicator?

2. Whether there should be an overall cap on the total financial adjustment under Category B for each company or business?

3. What should be the amount of incentive for each Category B indicator?

9.3.2 Responses to the First Consultation Paper

In response to the First Consultation Paper, TRANSCO opposed any adjustment for Category B indicators because of what it regards as a lack of transparency on targets and objectivity of the indicators. AADC, while opposing any ex post adjustment for Category B indicators due to a lack of transparency, suggested that the Bureau should only reward (and not penalise) the companies for their performance on these indicators. ADDC and ADWEC have not specifically opposed these adjustments.

In Section 8 of this paper the Bureau discussed the above comments in relation to the future and the Bureau's views are similar insofar as they apply to the current control period. In essence, the Bureau considers that the companies were aware that their performance would be monitored during the control period on Category B indicators and could be rewarded or penalised via financial adjustments at this review. The companies have also been reminded of this from time to time since 2002.

Some of the companies have started to respond positively to the Category B indicator concept. It is therefore important for regulatory certainty and commitment to apply these adjustments at this review as agreed in the past. This arrangement is consistent with the approach used by many regulators around the world – for example, the recent final determinations of Ofgem, for the

electricity distribution companies in Great Britain, include provisions for an ex post "discretionary reward scheme" for performance which can not be objectively measured.

9.3.3 Bureau's Current Thinking on Category B Indicator Adjustments

As mentioned in the First Consultation Paper (and in line with certain suggestions for PC3 as set out in Section 8 of this paper), the Bureau's current thinking is to limit the impact of Category B related financial adjustments at this review, as follows:

- Total adjustments under Category B will be capped at 2% of the forecast PC3 revenue requirement, consistent with the cap on the total Category A adjustment for most companies. This will address concerns on the robustness of Category B indicators and limit the impact on the companies' financial position.

- Further, these adjustments should apply only in relation to those indicators where the companies' performance has been significantly good or poor. This approach is similar to Ofwat's approach of rewarding or penalizing only the 'best' and the 'worst' performers and not the companies with 'average' performance.

The Bureau is also currently minded not to apply these adjustments for those Category B indicators, particularly the network-related indicators, where performance data has not been audited.

The Bureau's current assessment of the companies' performance to date on the remaining Category B indicators for the period 2003-2005 is summarised in **Table 9.3**. For this assessment, three broad scoring or ranking measures have been used: ***Good***, ***Poor*** and ***Adequate***.

Table 9.3: Bureau's Initial Assessment of Performance on Category B Indicators during 2003 – 2005

S. No.	Category B Indicator	AADC	ADDC	ADWEC	RASCO	TRANSCO
1.	Interim P&L Account Timeliness	Adequate	Good	Good	Poor	Good
2.	Seven or Five-Year Planning Statement Timeliness	-	-	Adequate	-	Adequate
3.	BST or TUoS Charges Statement Timeliness	-	-	Adequate	-	Adequate
4.	Economic Despatch Indicator	-	-	-	-	Poor
5.	Economic Purchasing Indicator	-	-	Adequate	-	-
6.	PWPA Timeliness	-	-	Good	-	-
7.	Generation Security Standard	-	-	Adequate	-	-
8.	Desalination Security Standard	-	-	Adequate	-	-
9.	Customer Satisfaction Indicator	Poor	Adequate	-	-	-

Notes:'-' means the specific indicator is not relevant to the company.

The basis of assessment in the above table is explained below:

- ***Interim Profit and Loss Account Timeliness:*** All the companies except RASCO have improved their performance on submission of interim (unaudited) profit and loss accounts to the Bureau. In general, these companies have submitted these accounts well in time for 2003 and 2004.

- ***Planning and Charging Statements Timeliness:*** While the performance of both ADWEC and TRANSCO on adherence to the timetable for the respective planning and charging (BST/TUoS) statements was good during 2003, it was not satisfactory in 2004.

- ***Economic Despatch Indictor:*** Despite the lapse of more than a year, and a number of meetings and reminders, TRANSCO has not to the Bureau's knowledge yet implemented any of the recommendations of the consultant (IPA) appointed by the Bureau to review the economic dispatch process of TRANSCO during 2003. In addition, the Bureau informed TRANSCO via its letter of 8 December 2003 that a financial adjustment of minus AED 2.487 million (in 2003 prices) will be made at this review to offset the additional cost incurred by the sector in 2003 due to out-of-merit dispatch of a specific plant without prior notice being given to the Bureau.

- ***Economic Purchase Indicator:*** As the First Consultation Paper and this paper indicate, the Bureau is concerned with the unit cost of electricity and water produced in the sector. While there may be genuine reasons for some increases, a full and robust assessment has been difficult due to ADWEC's refusal to date to provide the Bureau with detailed information on production and costs.

- ***PWPA Timelines:*** This indicator has become less important than at the time of setting PC2, as the annual review of PWPAs for ADWEA-owned GDs has been discontinued and medium-term PWPAs have been put in place with effect from 1 January 2004. Nevertheless, generally the performance of ADWEC in signing and providing PWPAs to the Bureau, for the existing GDs as well as the new plants, has improved. However, ADWEC has not yet responded to the Bureau's suggestion for it to summarise the main features of, and changes from year to year in, PWPAs to enable informed dispatch by TRANSCO.

- ***Generation Security Standard (GSS) Indicator:*** The sector has witnessed significant increases in generation capacity beyond that required by the approved GSS. However, the Bureau is aware of the reasons for this, some of which may be outside of ADWEC's direct control.

- ***Desalination Security Standard (DSS) Indicator:*** The DSS has been under discussion between ADWEC and the Bureau for some time, to avoid excess water production capacity in the sector. With the completion of the Bureau-commissioned study on water system management, the Bureau anticipates that ADWEC will implement the recommended DSS in 2005.

- ***Customer Satisfaction Indicator:*** Since the 2002 review, the Bureau has been monitoring and coordinating the performance of AADC and ADDC on the handling of customer complaints. The lack of data makes it difficult to make a definitive assessment but the Bureau considers there is scope for ADDC/AADC to further improve their performance in this area. We are pleased to note, however, that more information has been forthcoming of late in this regard, particularly from ADDC. By contrast, AADC was slower to respond to the Bureau's request to place the Bureau's contact details on its customer bills. For PC3, the Bureau intends to investigate whether the Overall Standards Scheme (OSS) already under discussion between the companies and the Bureau can provide a suitable basis for assessment of this indicator.

The Bureau's current thinking is that appropriate positive and negative adjustments should be made for the above indicators where the performance of the companies during PC2 has been **particularly good or poor**, and within an overall cap of 2% of MAR. Views would be welcomed on objective means of quantifying the appropriate level of adjustments for the individual indicators concerned.

9.4 PCR-Related Financial Adjustments for PC1 Period

Each price-controlled company is required by its licence annually to submit an audited Price Control Return (PCR) for each of its price-controlled businesses showing the audited MAR derived from revenue drivers and the audited regulated revenue recovered. The Bureau is very much encouraged by the recent initiative and progress to date on the audit of PCRs for all the previous years back to 1999.

The First Consultation Paper identified certain issues which arose during the course of the audit of PCRs for AADC, ADDC and TRANSCO in relation to the revenue drivers and the regulated revenue due to some ambiguity in the definitions of certain terms in the licences and due to general data problems.

In order to progress the work on the audited PCRs for 1999-2002, and pending the availability of certain information, the Bureau accepted certain assumptions for the purposes of completing the audits. However, these assumptions may not be fully consistent with the licences and/or the intent of PC1 controls. The Bureau therefore indicated to the companies and/or auditor that such assumptions will be revisited at this review.

The First Consultation Paper identified the need for two main types of PCR-related financial adjustments at this review:

- Financial adjustments for revenue drivers:
  - for water customer accounts for AADC;
  - for metered units distributed for ADDC; and
- Financial adjustments for 'other' income for AADC, ADDC and TRANSCO.

The respondents to the First Consultation Paper generally supported the above adjustments. These adjustments are further discussed below, along with the Bureau's current estimates of the adjustments required:

9.4.1 Financial Adjustments for Revenue Drivers for PC1 Period

For ADDC and AADC, there are issues with regards to the definitions and data availability for certain revenue drivers, as discussed below:

Financial Adjustment for AADC 'Water Customer Accounts'

The audited PCRs submitted by AADC for the years 1999 – 2002 contained significantly higher figures for the water customer numbers revenue driver than assumed when setting the PC1 price control, as follows:

Table 9.4: AADC Water Customer Numbers

	1999	2000	2001	2002
PC1 Assumption	27,320	33,920	39,720	n/a
Audited out-turn figure	39,597	39,383	41,150	43,155
Difference	**12,277**	**5,463**	**1,430**	**-**

It transpired that the reason for this was that AADC submitted inaccurate information, being based on an old billing system (WANG), to the Bureau at the time of setting the PC1 price control (by letter dated 1 August 1999). The Bureau has been assured that AADC's current billing system (OMNIX) contains correct information but cannot be reconciled to the old WANG system.

If left uncorrected, the use of incorrect figures in setting AADC's PC1 price control would lead to an inappropriate 'windfall' gain for AADC. A similar issue arose for ADDC, but this was resolved by it, with the approval of the Bureau, effectively 're-setting' the figures reported in its PCRs to the base figure for water customer numbers for 1999 used in setting the PC1 controls. The Bureau indicated its preference for AADC to make the same adjustment but informed AADC that if no adjustment was made to the AADC PCRs (as has turned out to be the case) an adjustment would be made at the present price control review instead.

Based on the notified value of the customer numbers revenue driver of AED 866.24 per customer (in 1999 prices), the gain to AADC (in 1999 prices) can be calculated as per **Table 9.5** below:

Table 9.5: AADC Financial Adjustment for PC1 Water Customer Accounts

	1999 prices	1999	2000	2001	2002	PV of Adjustment in 2006 (2006 prices)
Difference in Customers Numbers		12,277	5,463	1,430	n/a	
Notified Value	AED/customer	866.24	866.24	866.24	866.24	
Adjustment required	**AED million**	10.635	4.732	1.239	n/a	**28.361**

To effect the necessary financial adjustment at this review, the above individual year adjustment figures have been converted to 2006 prices and carried forward to 1 January 2006 in NPV terms, as shown in the last column of the above table. The detailed calculations are shown in **Appendix B** to this document.

The overall adjustment of **AED 28.361 million** (in 2006 prices) will be deducted from the 1 January 2006 RAV of AADC at this review. In view of the expected separate price controls for water distribution and supply businesses for AADC, the relevant adjustments will be split between distribution and supply businesses in proportion to the respective RAVs.

Financial Adjustment for ADDC 'Metered Units Distributed' in PC1

During the course of preparing the audited PCRs for 1999 – 2002, ADDC alerted the Bureau to the possibility that ADDC's estimates of metered water and electricity units distributed may include, for 1999 and 2000, some units that were produced and distributed by RASCO and not distributed via ADDC's distribution system, contrary to the licence definition of the revenue driver. This would result in a higher MAR than justified. This concern did not arise for 2001 onwards, as RASCO distribution and supply businesses were formally transferred to the distribution companies in 2001.

While the Bureau agreed to allow such treatment for the purposes of the audit of the PCRs, it has advised ADDC (by letter of 27 June 2004) of the necessity of making a financial adjustment at this review to remove the additional MAR.

The required adjustments estimated by ADDC at that time are reported in the table below:

Table 9.6: ADDC Financial Adjustment for Metered Units Distributed

AED million	1999 (nominal prices)	2000 (nominal prices)	PV of Adjustment in 2006 (in 2006 prices)
Adjustment for Electricity	0.297	0.643	**1.559**
Adjustment for Water	0.108	0.295	**0.666**

In the absence of any further information, the above individual year adjustment figures have been converted to 2006 prices and carried forward to 1 January 2006 in NPV terms, as shown in the last column of the above table. The detailed calculations are shown in **Appendix B** to this document.

Financial adjustment amounting to **AED 1.559 million** and **AED 0.666 million** will be deducted from the 1 January 2006 electricity and water RAVs of ADDC, respectively, at this review. In view of the expected separate price controls for distribution and supply businesses for ADDC, the relevant adjustments will be split between distribution and supply businesses in proportion to the respective RAVs.

The Bureau requests confirmation from AADC that a similar adjustment is not required for AADC.

9.4.2 Financial Adjustments for "Other Income" in PC1 Period

The audit work has identified a number of income streams for **TRANSCO**, **ADDC** and **AADC** which the companies variously argue may fall outside the definition of "regulated revenue" during the PC1 period. Such income includes compensation, claims, penalties and damages from the general public, contractors and insurers, interest on deposits and foreign exchange loss or gains. (This is in addition to income from unlicensed activities for which the Bureau has issued consents, which is unambiguously outside "regulated revenue").

The Bureau is considering making financial adjustments at this review to remove the gains earned due to the exclusion of such incomes from the regulated revenue in the audited PCRs, where such exclusion is not in line with the licence definition for the PC1 period and the consultation papers issued in 1999 for the PC1 controls. "Other income" of each of the companies concerned shown in their audited PCRs for 1999 – 2002 is reported in **Table 9.7** below:

Table 9.7: "Other Income" Reported in Audited PCRs

AED million, nominal prices	1999	2000	2001	2002	PV of Adjustment in 2006 (2006 prices)
AADC Electricity	4.702	5.642	10.116	7.609	**43.076**
AADC Water	0.934	1.287	11.401	7.541	**31.279**
ADDC Electricity	3.473	4.793	19.855	12.642	**61.152**
ADDC Water	1.714	2.113	4.623	1.572	**15.542**
TRANSCO Electricity	11.274	22.002	13.404	-7.311	**65.375**
TRANSCO Water	0.560	0.693	0.818	0.897	**4.570**

Note: Where specifically identified in the audited PCR, the above figures exclude income derived from unlicensed activities for which a consent has been obtained from the Bureau.

The above individual year "other income" figures have been converted to 2006 prices and carried forward to 1 January 2006 in NPV terms, as shown in the last column of the above table for each business separately. (The detailed calculations are shown in **Appendix C** to this document.)

These overall adjustments shown in the last column of the table would be deducted from the 1 January 2006 RAVs of the respective businesses at this review. In view of the expected separate price controls for distribution and supply businesses for AADC and ADDC, the relevant adjustments would be split between distribution and supply businesses in proportion to the respective RAVs.

However, the Bureau recognises the above figures may over-state the required adjustments in view of the unlicensed activities for which the Bureau has issued consents. In the case of ADDC, the PCRs clearly identify income received from unlicensed activities (Management of RASCO Production Assets) and so this income has been excluded from the figures reported in the table above. In the cases of AADC and TRANSCO, it is not clear from the audited PCRs how income received from unlicensed activities has been accounted for (unlicensed activities being 'Manpower Services' for TRANSCO and 'Management of RASCO Production Activities' for

AADC). The companies concerned should review the above figures and advise the Bureau of any necessary amendment for such incomes (based on audited figures).

The above discussions relate to the PC1 period for which the Bureau considers that only the income from unlicensed activities should have been excluded from regulated revenue.

9.5 Financial Adjustments for Asset Disposal or Transfer

Since 1999, when the RAVs for network companies were set on the basis of accounting asset values, these RAVs have been de-linked from the accounting values and are rolled forward for the efficient allowed capex net of depreciation. While the acquisition or disposal of an asset will automatically be reflected in the accounting values, the RAVs need to be reviewed accordingly.

The First Consultation Paper indicated that where the price-controlled companies have transferred their assets to each other or disposed of assets otherwise, the company from which the assets are transferred should not earn any return on asset and depreciation under the price controls from the date of the transfer. Irrespective of the prices received by the transferring company for the assets, to the extent such assets have a residual value they should be removed from the RAVs of that company. This therefore requires appropriate financial adjustment to the RAVs at this review for the asset transferred and the associated depreciation and return on capital.

Further adjustments may be required depending on whether or not income from asset sales / transfers have been included within "regulated revenue" in the audited PCRs. For example, both ADDC and AADC included some income from asset disposals within their analysis of "other income" (sent to the Bureau on 29 February 2004 and 27 July 2004 respectively), but it is not clear whether these figures would be the appropriate ones to use for the purposes of making any adjustment.

In contrast, with respect to the company which acquires an asset (from any party within or outside the sector), where the purchase of any such asset is reflected in the capex in the audited accounts for that company, the RAV for that company should automatically be updated by the efficient capex allowance, and so no additional analysis/adjustment will be required.

To make the adjustment to RAV for assets transferred or disposed of by a company, the Bureau requested information from the network companies on asset transfers and disposals via the First Information Request for PC3. The information submissions received by the Bureau so far do not yet provide adequate information to confirm the required adjustment.

9.6 Other Financial Adjustments

The First Consultation Paper indicated that the Bureau is aware of certain additional areas where a financial adjustment at this review may be necessary. These are discussed below:

9.6.1 Failure to Submit Required Information

The First Consultation Paper expressed the Bureau's concern about the unavailability (or delay in availability) of data from certain companies, particularly ADWEC. A number of points raised in the paper are summarised below:

- All the companies, except ADWEC, responded positively to the Bureau's information request in 2003 and provided the requisite information such as opex, capex, demand and revenue as per a standard pro-forma (though the Bureau was not fully satisfied with the accuracy and completeness in certain cases). Despite the Bureau's numerous requests, clarifications and offers to reduce the information requirement, ADWEC did not provide any response to that request.

- The Bureau recognises that companies' data, due to delays in the audit of the accounts, is subject to uncertainties and changes significantly from time to time. For example, ADWEC's data shown in audited statements differs significantly from data earlier provided by ADWEC to the Bureau. These changes necessitate the updating by the licensee of information previously provided to the Bureau.

- The provision of accurate and timely information to the Bureau is necessary if the Bureau is to carry out its duties effectively. The First Consultation Paper therefore showed the Bureau's intention to make an adjustment at this review to ADWEC's future allowed revenues to reflect past poor performance on the provision of information. Such an adjustment will be based on the Bureau's estimate of the detriment to effective regulation resulting from ADWEC's failure to provide information.

- Since almost all of ADWEC's costs are presently not subject to any controls and are treated on a pass-through basis subject to ADWEC's economic purchasing obligation under its licence, it is important for the Bureau to keep ADWEC's costs under regular review (which requires regular submission of updated information to the Bureau).

The above considerations have also prompted the Bureau to review whether pass-through of production costs remains appropriate for ADWEC – see Section 4 of this document.

AADC also performed less well than is to be expected in responding to the Bureau's requests for information in the past.

In response to the First Consultation Paper, ADWEC put forward the following arguments for its performance on the annual information submission:

- The Bureau's request for previously provided data and for provision of data in a particular format is a regulatory burden on ADWEC. The use of ADWEC staff to

provide such information is unacceptable. The annual licence fee paid to the Bureau should be used by the Bureau to collect and/or compile previously provided data.

- With no specific licence obligation, ADWEC published for all interested parties its statistical report covering the period 1990-2003.

- The changes in ADWEC data from time to time reflect a number of factors. The difference of AED 160 million for the 2002 BST income highlighted by the First Consultation Paper between ADWEC's BST submission and audited figure was, ADWEC argued, previously agreed with the Bureau so as to allow any over-recovery of the BST revenue in a year to be refunded to the distribution companies in the same year rather than via the correction factor in the next year. ADWEC stated that other differences between audited and unaudited accounts were also clarified to the Bureau.

The Bureau's views on the above arguments are as follows:

- The Bureau has been using broadly the same format for information submissions from year to year. Therefore, updating of information should not be difficult. Further, the Bureau's information request is far less demanding than other regulators' requirements when viewed in an international context.

- The function of the regulator is not to collect or compile information on behalf of the companies. The provision of information to the regulator is one of the key requirements of all licences and the cost allowance included in the price controls is intended to finance such workstreams.

- While the publication of a statistical report by ADWEC without any statutory obligation is appreciated, it does not include all the information required by the Bureau (particularly cost data), and so cannot be regarded as a substitute for compliance with a specific statutory obligation.

- The First Consultation Paper already acknowledged certain genuine reasons for changes in data from time to time. However, the main point is that such changes need to be reflected in regular information submissions so as to enable a review at any time based on updated data. With regards to the difference in BST income for 2002, the Bureau did not agree to the treatment of over-recovery of BST revenue for 2002 as argued by ADWEC. In fact, such a treatment was only agreed later in 2004 after submission of the related information and can only applied to 2003 onwards via exceptional charges with the prior approval of the Bureau.

At this time, the performance of ADWEC on its submission of information has not shown any improvement. The Bureau sent the First Information Request for PC3 on 15 September 2004 to all the companies for information submission by 10 November 2004. While AADC, ADDC and TRANSCO have submitted substantially complete information, ADWEC has not yet responded. The Bureau requested ADWEC for its information submission by the end of December 2004 at the latest, failing which the Bureau will consider more punitive measures against ADWEC.

Given the seriousness of this matter, the Bureau's current thinking is to apply a negative adjustment to the PC3 revenue requirement for ADWEC at this review for its overall performance on information submissions during recent years. The actual figure is yet to be determined.

The Bureau will continue to monitor the performance of all the companies on the provision of information during the course of this review in 2005 and may propose appropriate financial adjustments for performance in 2005.

9.6.2 Exclusion of TRANSCO 'Manpower Services' Income from Regulated Revenue:

The First Consultation Paper discussed certain services - what TRANSCO terms "manpower services" - which TRANSCO has been providing to AADC and ADDC (and perhaps other parties in the sector) outside of its licensed activities, for which the Bureau has recently issued a consent to TRANSCO taking effect retrospectively from 1999.

While the manpower services constitute an unlicensed activity, the costs associated with these services (though relatively small compared to TRANSCO's overall costs) have erroneously been financed within the PC1 and PC2 price controls (as the price controls were set on the basis of costs which, unknown to the Bureau at that time, included the costs of these services).

Furthermore, in the audited PCRs for TRANSCO, the income from these services has been treated as 'other' income and excluded from the regulated revenue of TRANSCO. Thus, the costs have been fully-financed within the price controls plus TRANSCO has retained the revenue outside of regulated revenue.

The First Consultation Paper indicated the Bureau's intention to make a financial adjustment to TRANSCO's future revenue requirement at this review to remove this double counting. In future, such costs and revenues will be outside the price controls.

The Bureau has undertaken an analysis to estimate the adjustment required at this review to remove the impact of the double counting discussed above. For this purpose, the Bureau has calculated the present value of the income that TRANSCO has received from manpower services during the PC1 period (1999-2002).

However, the Bureau at present has two sources of data on TRANSCO's income from manpower services: TRANSCO's letter of 25 February 2004 to the Bureau, and the audited separate business accounts. Both sources provide separate data for water and electricity. While TRANSCO's letter specifically provides income data for manpower services, the notes to audited accounts regarding 'Related Party Transactions' provide data on 'other income' from related parties without referring specifically to manpower services.

For the reasons given below, the Bureau considers that the 'other income' in the notes to the audited accounts may represent the income from manpower services:

- All other possible income from related parties, except for manpower service income, seem to appear separately in the notes to the accounts.

- For 1999 and 2000, the amounts for manpower service income mentioned in TRANSCO's letter are almost the same as the amounts for 'other income' in the accounts notes, for both water and electricity (for later years, they are different).

- It may be the case that, at the time TRANSCO wrote the letter, audited data on manpower service income was not available.

The Bureau's calculations of adjustments required at this review in relation to manpower services based on both sources are summarised in **Table 9.8**.

The Bureau would welcome TRANSCO's comments on the calculations and requests TRANSCO to provide, in its response to this paper, audited data on manpower service income for 1999-2002. In the absence of any further information, the Bureau is currently minded to apply an adjustment for manpower services based on the data from the notes to the audited accounts. This means adjustments of **AED 17.141 million** and **AED 1.891 million** for electricity and water, respectively (both in 2006 prices).

The Bureau will await further information on the level of income received by TRANSCO from 'manpower services' for the PC2 period before considering any adjustment for that period.

Table 9.8: Financial Adjustment for TRANSCO Manpower Service Income during 1999-2002

AED million		**1999**	**2000**	**2001**	**2002**	**2006**
1. Based on TRANSCO Letter of 25 Feb 2004:						
1(a) Electricity:						
Income from Manpower Services	Nominal prices	3.260	1.980	0.110	0.760	
Income from Manpower Services	2006 prices	3.907	2.323	0.127	0.856	
PV of Income in 1999 using 6% discount rate (mid-year)	2006 prices	6.732				
Multiplicative factor for time value of money for 7 years		1.5036				
PV of Income in 2006 (i.e. Required Adjustment)	2006 prices					**10.122**
1(b) Water:						
Income from Manpower Services	Nominal prices	0	0.090	0.240	0.080	
Income from Manpower Services	2006 prices	0	0.106	0.278	0.090	
PV of Income in 1999 using 6% discount rate (mid-year)	2006 prices	0.410				
PV of Income in 2006 (i.e. Required Adjustment)	2006 prices					**0.617**
2. Based on TRANSCO Audited Accounts:						
2(a) Electricity:						
Income from Manpower Services	Nominal prices	3.262	1.982	2.468	3.270	
Income from Manpower Services	2006 prices	3.910	2.326	2.857	3.682	
PV of Income in 1999 using 6% discount rate (mid-year)	2006 prices	11.400				
PV of Income in 2006 (i.e. Required Adjustment)	2006 prices					**17.141**
2(b) Water						
Income from Manpower Services	Nominal prices	0	0.085	0.511	0.713	
Income from Manpower Services	2006 prices	0	0.100	0.591	0.803	
PV of Income in 1999 using 6% discount rate (mid-year)	2006 prices	1.257				
PV of Income in 2006 (i.e. Required Adjustment)	2006 prices					**1.891**

9.6.3 Requirement for Accurate Information on Category B Indicators:

As discussed earlier, the Bureau needs to assess companies' performance on Category B indicators during the PC2 period and to make necessary financial adjustments at this review for the companies' good or poor performance. Accordingly, as part of the PC3 First Information Request, the Bureau requested data from licensees regarding their performance against the Category B technical indicators. The First Consultation Paper suggested that if such information is not forthcoming, or not considered reliable, a separate financial adjustment may be made to the future revenue requirement of the concerned company to reflect the resulting detriment to effective regulation.

As discussed in Section 9.3 above, the Bureau's current thinking is not to make any adjustment (positive or negative) at this review for technical or network performance related Category B indicators for which no audited performance data is available. (This does not apply to other indicators where the scope, targets or Bureau's requirements were clearly set out.) This thinking makes the requirement for the companies to provide data on such Category B indicators less important at this review.

In view of this, the Bureau does not intend to make any financial adjustment for shortcomings of the companies in providing reliable information on their performance against Category B indicators. It should be noted, however, that the Bureau is proposing to move a number of technical indicators from Category B to Category A for the PC3 period, which will increase the requirement for accurate data in future.

9.6.4 Incentive for Income Collection by Distribution Companies

It is important that the distribution companies are provided with an incentive to collect the income to which they are entitled from their customers. For this reason, the licence modifications issued to ADDC and AADC with the new PC2 controls clearly set out that the subsidy paid by the Government to the sector should be calculated as the difference between (i) the audited MARs (including pass-through costs) of the distribution companies and (ii) the revenue they should have collected by customers as per ADWEA's approved tariffs (otherwise, any failure to collect revenue would simply be made up by a corresponding increase in the subsidy). The First Consultation Paper therefore indicated that for the PCRs relating to the 2003 financial year (which were due to be received by the Bureau by 31 March 2004) the auditors would be required to take a view as to potential revenue not collected as well as to revenue actually collected. Accordingly, the paper indicated that the Bureau will review the audited PCRs for AADC and AADC relating to the 2003 financial year for the collected and non-collected revenue, to ensure that the subsidy requirement is not over-stated.

Subsequent to the publication of the First Consultation Paper, the Bureau received the audited PCRs for AADC and ADDC relating to the 2003 financial year. These PCRs show the same revenue from the sale of electricity and water in 2003 as the audited separate business accounts for supply businesses of AADC and ADDC. That is, the PCRs are based on the actual revenue collected rather than the revenue which the distribution companies should have been collected. This could have resulted in overstatement of subsidy requirement for 2003 if the distribution companies did not collect all the income to which they are entitled.

The Bureau will continue to monitor this matter via the audited PCRs for the financial years 2004 and 2005 (remaining years of the PC2 period to which the above distinction between actual revenue and revenue that should have been collected applies) and will consider necessary adjustments at the future price controls review to offset any overstatement of the subsidy requirement during the PC2 period. No adjustment is proposed, however, at this review.

9.7 Financial Adjustment for RASCO's Subsidy Shortfall during 2001-2003

During 1999-2003, water and electricity production assets of RASCO dedicated[19] to specific customers were subject to tariffs approved by the Bureau. However, certain activities, such as non-dedicated production activities and distribution and supply activities, were not subject to any specific regulation by the Bureau during this period.

It is understood that the costs relating to 1999-2000 have been taken into account by the consultants (NERA) appointed by ADWEA in their sector subsidy requirement calculations for 1999-2000.

In relation to production activities undertaken by RASCO during 2001-2003, the Bureau has been in discussion with ADWEA to apply the present price controls for RASCO retrospectively to 2001-2003. With the finalisation of the audited accounts for this period, it now seems more appropriate for the Bureau to make a one-off adjustment at this review to remunerate RASCO for the subsidy shortfall in accordance with the present price controls applied retrospectively to 2001-2003.

The Bureau has undertaken an analysis to determine the one-off adjustment required at this review to remunerate RASCO for the subsidy shortfall by applying the 2004-2005 price controls to 2001-2003. Initial analysis based on data provided by AADC, ADDC and ADWEA was shared by the Bureau with these parties. **Appendix D** to this paper sets out the Bureau's updated analysis based on the audited accounts of RASCO for 2001-2003 recently received by the Bureau. This analysis is briefly described below:

1. The 'a' and 'b' values for RASCO's present price controls (see Section 2.5 of this paper for the precise form of these controls), appropriately adjusted for the relevant price base, are applied to the values of RASCO revenue drivers for 2001-2003 (received from AADC and ADDC) to calculate the revenue requirement (excluding allowed fuel costs) for each year.

2. The allowed fuel costs are calculated for each year based on (i) the benchmark unit fuel costs as set for the present price controls and (ii) data on actual production and on actual fuel costs received from AADC and ADDC.

3. The total revenue requirement, including the allowed fuel costs, so calculated for each year is compared against RASCO's revenue from sales and subsidy to calculate the subsidy shortfall for each year.

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[19] See the Bureau's First Consultation Paper for PC3 published in August 2004 for definitions of "dedicated" and "non-dedicated" production activities of RASCO.

4. The total revenue requirement is adjusted to 2006 prices and a present value in 2001 of the revenue requirement over 2001-2003 is calculated.

5. The present value in 2001 so calculated is multiplied by factor representing the time value of money (due to the delay of five years in remuneration of subsidy shortfall) to determine the present value in 2006, which is the overall financial adjustment required at this review to make up for the subsidy shortfall for RASCO.

6. The present values and adjustment for time value of money have been calculated by using a cost of capital of 6% in line with the assumption for the present price controls for RASCO.

7. To the extent possible, the above calculations have been carried out separately for water and electricity. However, since audited accounts for RASCO for 2001-2003 do not provide separate data on revenue and subsidy for water and electricity, the calculations of subsidy shortfall and financial adjustment have been applied to water and electricity together. The resulting financial adjustment is then split between water and electricity based on the average ratio between water and electricity revenue requirement for RASCO over 2001-2003 - that is, 73%: 27%. By way of a cross-check, this split is similar to the basis of cost allocation (71% : 29%) for RASCO used by ADDC in its information submission to the Bureau in connection with the last review of RASCO which resulted in the present price controls (ADDC's letter of 8 July 2003 refers).

Note that the data received from AADC and ADDC on RASCO's actual fuel costs for 2001-2003 could not be verified from the audited accounts for these years as the accounts do not provide data separately on fuel costs for water and electricity. However, the Bureau draws comfort from the fact that the total actual fuel costs used in the above calculations do not exceed the 'direct costs charged by related parties' amounts (which the Bureau understands include, among others, fuel costs) mentioned in the audited accounts for each year of 2001-2003 and are comparable to the fuel costs for 1999-2000 reported in the relevant audited accounts for RASCO.

The resulting financial adjustment covers all production activities of RASCO during 2001-2003. The above calculations do not distinguish between dedicated and non-dedicated production activities of RASCO because the present price controls which are applied retrospectively to 2001-2003 also do not make such a distinction.

The Bureau has also assessed the impact of the subsidy shortfall and the above financial adjustments on the financial performance of RASCO. As shown in Appendix D, the subsidy shortfall during 2001 – 2003 has resulted in significant losses during these years. The retrospective application of the present price controls to these years (which results in the financial adjustment discussed above) has the effect of turning these losses into reasonable profits.

The important results of the above calculations are summarised in **Table 9.9.**

Table 9.9 Financial Adjustment for RASCO's Subsidy Shortfall during 2001-2003					
AED million		**2001**	**2002**	**2003**	**2006**
MAR including allowed fuel costs – Electricity	Nominal prices	70.46	66.12	68.70	
MAR including allowed fuel costs – Water	Nominal prices	201.45	173.21	172.83	
MAR including allowed fuel costs – Total	Nominal prices	271.91	239.33	241.52	
Actual income from sales – Total	Nominal prices	152.96	131.31	138.76	
Actual subsidy received – Total	Nominal prices	28.51	34.37	36.37	
Shortfall in subsidy – Total	Nominal prices	90.44	73.66	66.39	
Shortfall in subsidy - Total	2006 prices	104.67	82.93	72.63	
PV of subsidy shortfall in 2001 – Total	2006 prices	240.44			
PV of subsidy shortfall in 2006 - Total	2006 prices				321.77
Financial Adjustment – Electricity	**2006 prices**				**87.74**
Financial Adjustment – Water	**2006 prices**				**234.02**

Based on the above calculations, the Bureau is currently minded to apply a one-off positive adjustment to the respective RAVs of **AED 87.74 million** and **AED 234.02 million** (both in 2006 prices) for electricity and water businesses of RASCO at this review (total AED 321.77 million in 2006 prices) to remunerate RASCO for the shortfall in its revenue or subsidy during 2001-2002.

9.8 Summary of Current Thinking

This Section 9 shows the Bureau's current thinking on various one-off financial adjustments at this review as follows (based on the information presently available to the Bureau, all figures in 2006 prices):

1. Financial adjustments for costs incurred by AADC and ADDC during 2001-2002 in relation to distribution and supply assets transferred from RASCO:

   - For capital costs: no adjustment unless evidence received that the distribution companies paid for these assets

   - For opex: AADC (+AED 17.714 million) and ADDC (+AED 113.293 million).

2. Financial adjustments for certain Category B indicators where the performance of the companies has been particularly good or poor during the PC2 period, subject to an overall cap of 2% of the PC3 revenue requirement.

3. Financial adjustments relating to audited PCRs for the PC1 period:

   - For AADC's water customer account related revenue driver: -AED 28.361 million

   - For ADDC's metered units distributed revenue driver: -AED 1.559 million (electricity) and -AED 0.666 million (water)

- Possibly, for other income erroneously excluded from licensed revenue: as per Table 9.7, subject to confirmation by licensees of the appropriate figures to use as the basis for any adjustment.

4. Financial adjustment for ADWEC's failure to provide information will result in a reduction of its PC3 revenue requirement (figure to be determined).

5. Financial adjustment for exclusion of TRANSCO's manpower services income from licensed revenue during the PC1 period: -AED17.141 million (electricity) and –AED 1.891 million (water).

6. Financial adjustment for RASCO's subsidy shortfall during 2001-2003: +AED 87.74 million (electricity) and +AED234.02 million (water).

7. The financial adjustments should be applied to the RAVs of the network businesses and RASCO, and to the allowed revenues of ADWEC and supply businesses over the PC3 period.

Appendix A: Local Capital Markets Data

Table A1: Risk Free Rate (Nominal) from Local and Regional Capital Markets

S.No.	Description	Nominal Risk Free Rate
1	Global Investment House' estimate for Burgan Bank analysis	3.50%
2	Global Investment House' estimate for Gulf Insurance Co analysis	3.25%
3	10-year Benchmark Islamic bond (Bahrain government listed bond)	5.13%
4	5-year Bahrain Government issued in 2003 (ditto)	4.00%
5	5-year Islamic leasing bond 2001 (ditto)	5.25%
6	3-year Islamic leasing bond 2002 (ditto)	4.25%
7	5-year Islamic leasing bond 2002 (ditto)	4.00%
8	3-year Islamic leasing bond 2002 (ditto)	3.00%
9	3-year Islamic leasing bond 2003 (ditto)	3.00%
10	5-year Islamic leasing bond 2003 (ditto)	3.75%
11	5-year Islamic leasing bond 2003 (ditto)	2.18%
12	3-year Islamic leasing bond 2003 (ditto)	1.53%
13	5-year Islamic leasing bond 2004 (ditto)	2.32%
14	5-year Citibank issued BMA Ijara Sukuk	2.69%
15	5-year Oman government development bond	4.50%
16	10-year BMA new sukuk plan	5.13%
17	10-year Qatar government securities	4.57%
18	Emirates Securities estimate for Emaar Properties analysis (March 2004)	6.10%
19	Emirates Securities estimate for Emaar Properties analysis (Nov 2004)	5.33%
20	Qatar Government A3 bond maturity June 2030	4.80%
21	Qatar Government A3 bond maturity May 2009	3.21%
22	5-year Bahrain sovereign sukuk	4.74%
23	7-year Qatar sovereign sukuk	2.64%
24	5-year Dubai government bond	2.71%
25	BMA sukuk	2.69%
26	Bahrain TRA determination for Batelco	5.54%
	Minimum	1.53%
	Maximum	6.10%
	Mid-point	3.82%
Bureau's Initial Estimate for PC3		**5.3% - 5.5%**

Source: Various

Table A2: Cost of Debt (Nominal) from Local and Regional Capital Markets		
S.No.	**Description**	**Nominal Cost of Debt**
1	BCFC (No.3) Bahrain listed bond	5.00%
2	BCFC (No.3) Bahrain list bond	5.00%
3	Alba Bahrain listed bond	2.11%
4	United Finance Co Bahrain listed bond	6.00%
5	Malaysia Global Sukuk Bahrain listed	3.19%
6	United Gulf Bank Bahrain listed bond	3.12%
7	National Industries Group Bahrain listed bond	3.14%
9	KAMCO BBB+ 5-yr bond	5.00%
10	KAMCO BBB+ 5-yr bond	4.31%
11	Shuaa Capital 3-yr bond	3.99%
13	Emirates Bank Bond closed in Jan 2004	2.67%
15	Abu Dhabi Power Bond 4, 7 and 10 year tranches	2.69%, 2.99%, 3.09%
21	Bank Muscat 10-yr Baa2/BBB bond	6.25%
22	Shuaa Capital 3-year Bond	3.62%
25	Bank Muscat Oman 5-yr Bond	3.79%
26	Ras Laffan LNG Company Qatar project bond 5-yr	3.99%
27	National Industries Group Kuwait corporate bond 5-yr	4.21%
28	Emirates Airline UAE corporate bond 7-yr	3.04%
29	First Islamic Investment Bank Bahrain sukuk 3-yr	3.74%
30	United Gulf Bank Bahrain paper 5-yr	3.49%
31	Arab Real Estate Co Kuwait bond 5-yr	6.00%
32	Kuwait Projects Co bond 3-yr	4.56%
33	Gulf Investment Corp Kuwait paper 5-yr	2.64%
34	Kuwait Projects Co bond 5-yr	5.75%
35	Ras Laffan LNG Company Qatar project bond 5-yr	4.62%
36	Ras Laffan LNG Company Qatar project bond 7.3-yr	4.09%
37	Alliance Housing Bank Oman BBB bond 7-yr	5.50%
38	Commercial Bank of Qatar syndicated loan 5-yr	2.72%
39	National Industries Group Kuwait corp bond 5-yr	3.14%
40	Union National Bank of UAE syndicated loan 3-yr	2.74%
41	Dubai Govt Bond 5-yr	3.11%
42	British Bank Abbey National by NBAD bond 5-yr	2.57%
43	United Finance Co. of Oman BBB bond 3-yr 2004	4.24%
44	Dubai Dept of Civil Aviation 5-yr sukuk	2.69%
45	Aluminum Bahrain 10-yr project related finance	3.04%, 3.29%, 3.24%
46	Sohar Refinery Co, Oman 12-yr project related finance	3.29%, 3.84%, 3.14%
47	Qatar Vinyl Co 10-yr project related finance	3.24%, 3.54%,
48	Qatar Oryx GTL 14-yr project related finance	2.99%, 3.74%
49	Jubail electricity Co, KSA, 15-yr project related finance	3.24%, 3.64%
50	Saudi Petrochemical Co 7-yr project related refinancing	2.99%
51	Arabian Power Co, UAE, 20-yr project related finance	3.24%, 3.89%
52	National Central Cooling Co, UAE, 12-yr project finance	3.74%
53	Bank of Bahrain & Kuwait 3-yr loan	2.73%
54	Commercial Bank of Kuwait 3-yr loan	2.64%
55	Emirates Bank Int'l 3-yr loan	2.66%
56	Union National Bank of UAE syndicated loan 3-yr	2.66%
57	Al-Ahli Bank of Kuwait 3-yr loan	2.69%
58	Islamic Development Bank sukuk, regional, 5-yr bond	2.94%
59	Bahrain Commercial Facilities Co, 4-yr bond	3.19%
60	Damas Jewellery Dubai 3-yr loan	4.240%
61	Bahrain TRA determination for Batelco	6.35%
	Minimum	2.11%
	Maximum	6.35%
	Mid-point	4.23%
Bureau's Initial Estimate for PC3		**4.6% - 4.8%**

Source: Various

Table A3: Cost of Equity (nominal) related data from Local and Regional Capital Markets			
	Market Risk Premium	**Equity Beta**	**Cost of Equity (Nominal)**
Global Investment House estimates for:			
Burgan Bank	6.50%	1.00	10.00%
Gulf Insurance Company	6.00%	1.00	9.25%
Mobile Telecommunication Co Kuwait business			9.50%
Mobile Telecommunication Co Bahrain business			10.00%
Emirates Securities estimates for Emaar research in:			
March 2004	5.00%	0.80	10.10%
November 2004	5.00%	0.70	8.83%
Bahrain Telecom Regulator 2003 Determination for:			
Access Network Services	5.18%	0.55	8.39%
Core/Fixed Network Services	5.18%	0.79	9.63%
Mobile Services	5.18%	1.21	11.81%
ISP/VAS Services (unregulated)	5.18%	1.48	13.21%
Batelco as a single entity	5.18%	1.05	10.98%
Minimum	5.00%	0.55	8.39%
Maximum	6.50%	1.48	13.21%
Mid-Point Average	5.75%	1.02	10.80%
Bureau's Initial Estimate for PC3	**4.3% - 4.7%**	**0.86-1.00**	**9.0% - 10.20%**

Source: Various

Appendix B: PCR-Related Financial Adjustments for Revenue Drivers

Common Data		1999	2000	2001	2002	2003	2004	2005
UAE CPI Inflation	%	2.15%	1.37%	2.80%	2.92%	3.12%	3.00%	3.00%
Discount Rate	%	6.00%						
Discount Factor (mid-year)		0.9713	0.9163	0.8644	0.8155			

PCR Related Financial Adjustments for AADC for PC1 Period

Adjustment for AADC Water		1999	2000	2001	2002
PC1 Assumption	customers	27,320	33,920	39,720	n/a
Audited out-turn figure	customers	39,597	39,383	41,150	43,155
Difference	customers	12,277	5,463	1,430	0
Notified Value	AED/customer, 1999 prices	866.24	866.24	866.24	866.24
Adjustment required	AEDm, 1999 prices	10.635	4.732	1.239	0
Adjustment required	AEDm, 2006 prices	12.747	5.672	1.485	-
Discounted Adjustment required	AEDm, 2006 prices	12.381	5.197	1.283	-
PV of Adjustment required in 1999	AEDm, 2006 prices	18.862			
Multiplicative Factor for time value of money for 7 years		**1.5036**			
PV of Adjustment required in 2006	**AEDm, 2006 prices**	**28.361**			

PCR Related Financial Adjustments for ADDC for PC1 Period

Adjustment for ADDC Metered Units Distributed

Electricity		1999	2000
Adjustment required	AEDm, nominal prices	0.297	0.643
Adjustment required	AEDm, 2006 prices	0.356	0.754
Discounted Adjusted required	AEDm, 2006 prices	0.346	0.691
PV of Adjustment required in 1999	AEDm, 2006 prices	1.037	
Multiplicative Factor for time value of money for 7 years		**1.5036**	
PV of Adjustment required in 2006	**AEDm, 2006 prices**	**1.559**	

Water		1999	2000
Adjustment required	AEDm, nominal prices	0.108	0.295
Adjustment required	AEDm, 2006 prices	0.129	0.346
Discounted Adjusted required	AEDm, 2006 prices	0.126	0.317
PV of Adjustment required in 1999	AEDm, 2006 prices	0.443	
Multiplicative Factor for time value of money for 7 years		**1.5036**	
PV of Adjustment required in 2006	**AEDm, 2006 prices**	**0.666**	

Appendix C: PCR-Related Financial Adjustments for 'Other Income'

Common Data		1999	2000	2001	2002	2003	2004	2005
UAE CPI Inflation	%	2.15%	1.37%	2.80%	2.92%	3.12%	3.00%	3.00%
Discount Rate	%	6.00%						
Discount Factor (mid-year)		0.9713	0.9163	0.8644	0.8155			

PCR Related Financial Adjustments for 'Other Income' for PC1 Period

AADC - Electricity		1999	2000	2001	2002
Other Income	AEDm, nominal prices	4.702	5.642	10.116	7.609
Other Income	AEDm, 2006 prices	5.636	6.620	11.709	8.567
Discounted Other Income	AEDm, 2006 prices	5.474	6.066	10.121	6.987
PV of Other Income in 1999	AEDm, 2006 prices	28.648			
Multiplicative Factor for time value of money for 7 years		**1.5036**			
PV of Other Income in 2006	**AEDm, 2006 prices**	**43.076**			

AADC - Water		1999	2000	2001	2002
Other Income	AEDm, nominal prices	0.934	1.287	11.401	7.541
Other Income	AEDm, 2006 prices	1.119	1.510	13.196	8.491
Discounted Other Income	AEDm, 2006 prices	1.087	1.384	11.407	6.924
PV of Other Income in 1999	AEDm, 2006 prices	20.802			
Multiplicative Factor for time value of money for 7 years		**1.5036**			
PV of Other Income in 2006	**AEDm, 2006 prices**	**31.279**			

ADDC - Electricity		1999	2000	2001	2002
Other Income	AEDm, nominal prices	3.473	4.793	19.855	12.642
Other Income	AEDm, 2006 prices	4.163	5.624	22.981	14.234
Discounted Other Income	AEDm, 2006 prices	4.043	5.153	19.866	11.608
PV of Other Income in 1999	AEDm, 2006 prices	40.670			
Multiplicative Factor for time value of money for 7 years		**1.5036**			
PV of Other Income in 2006	**AEDm, 2006 prices**	**61.152**			

ADDC - Water		1999	2000	2001	2002
Other Income	AEDm, nominal prices	1.714	2.113	4.623	1.572
Other Income	AEDm, 2006 prices	2.054	2.479	5.351	1.770
Discounted Other Income	AEDm, 2006 prices	1.995	2.272	4.625	1.443
PV of Other Income in 1999	AEDm, 2006 prices	10.336			
Multiplicative Factor for time value of money for 7 years		**1.5036**			
PV of Other Income in 2006	**AEDm, 2006 prices**	**15.542**			

TRANSCO - Electricity		1999	2000	2001	2002
Other Income	AEDm, nominal prices	11.274	22.002	13.404	-7.311
Other Income	AEDm, 2006 prices	13.513	25.816	15.514	(8.232)
Discounted Other Income	AEDm, 2006 prices	13.125	23.655	13.411	(6.713)
PV of Other Income in 1999	AEDm, 2006 prices	43.478			
Multiplicative Factor for time value of money for 7 years		**1.5036**			
PV of Other Income in 2006	**AEDm, 2006 prices**	**65.375**			

TRANSCO - Water		1999	2000	2001	2002
Other Income	AEDm, nominal prices	0.560	0.693	0.818	0.897
Other Income	AEDm, 2006 prices	0.671	0.813	0.947	1.010
Discounted Other Income	AEDm, 2006 prices	0.652	0.745	0.818	0.824
PV of Other Income in 1999	AEDm, 2006 prices	3.039			
Multiplicative Factor for time value of money for 7 years		**1.5036**			
PV of Other Income in 2006	**AEDm, 2006 prices**	**4.570**			

Appendix D: Financial Adjustments for RASCO Subsidy Shortfall

Retrospective Application of Price Controls - Electricity

		2001	2002	2003
UAE CPI	Base 2000 = 100	102.8	105.8	109.1
Inflation in previous year	%	2.80%	2.92%	3.12%
Fixed Term (a)	AEDm, 2004 prices	32.57	32.57	32.57
Variable Term (b)	AED/kW, 2004 prices	62.76	62.76	62.76
Fixed Term (a)	AEDm, nominal prices	29.85	30.69	31.58
Variable Term (b)	AED/kW, nominal prices	57.53	59.14	60.86
General Capacity - AADC	kW	50,521	70,184	71,704
General Capacity - ADDC	kW	164,000	165,000	170,000
General Capacity - Total	kW	214,521	235,184	241,704
MAR excluding Allowed Fuel Costs	AEDm, nominal prices	42.19	44.60	46.30
Actual Fuel Cost - AADC	AEDm, nominal prices	0.12	0.17	0.09
Actual Fuel Cost - ADDC	AEDm, nominal prices	28.33	21.56	22.50
Actual Fuel Cost - Total	AEDm, nominal prices	28.45	21.73	22.59
Electricity Generation - AADC	kWh	94,305	126,990	267,942
Electricity Generation - ADDC	kWh	123,979,600	88,007,000	93,763,100
Electricity Generation - Total	kWh	124,073,905	88,133,990	94,031,042
Benchmark Fuel Costs	fils/kWh, nominal prices	20.00	20.00	20.00
Allowed Fuel Cost - Total	AEDm, nominal prices	28.26	21.52	22.40
Total MAR	**AEDm, nominal prices**	**70.46**	**66.12**	**68.70**

Retrospective Application of Price Controls - Water

		2001	2002	2003
UAE CPI	Base 2000 = 100	102.8	105.8	109.1
Inflation in previous year	%	2.80%	2.92%	3.12%
Fixed Term (a)	AEDm, 2004 prices	79.35	79.35	79.35
Variable Term (b)	AED/TIG, 2004 prices	3.89	3.89	3.89
Fixed Term (a)	AEDm, nominal prices	72.73	74.77	76.95
Variable Term (b)	AED/TIG, nominal prices	3.57	3.67	3.77
Water Production - AADC	TIG	9,198,966	6,851,535	6,011,848
Water Production - ADDC	TIG	4,953,034	4,642,488	4,283,494
Water Production - Total	TIG	14,152,000	11,494,023	10,295,342
MAR excluding Allowed Fuel Costs	AEDm, nominal prices	123.19	116.90	115.79
Actual Fuel Cost - AADC	AEDm, nominal prices	0.00	0.00	0.00
Actual Fuel Cost - ADDC	AEDm, nominal prices	81.28	58.17	58.96
Actual Fuel Cost - Total	AEDm, nominal prices	81.28	58.17	58.96
Water Produciton (Distillers only) - AADC	TIG	-	-	-
Water Produciton (Distillers only) - ADDC	TIG	2,603,800	2,638,700	2,574,180
Water Produciton (Distillers only) - Total	TIG	2,603,800	2,638,700	2,574,180
Benchmark Fuel Costs	AED/TIG, nominal prices	8.00	8.00	8.00
Allowed Fuel Cost - Total	AEDm, nominal prices	78.26	56.32	57.04
Total MAR	**AEDm, nominal prices**	**201.45**	**173.21**	**172.83**

Total Subsidy Shortfall and Total Financial Adjustment Required at this Review

		2001	2002	2003	2004	2005	2006
Total MAR (water and electricity)	AEDm, nominal prices	271.91	239.33	241.52			
Total Income from sales - as per audited accounts	AEDm, nominal prices	152.96	131.31	138.76			
Implied Subsidy Requirement (water and electricity)	AEDm, nominal prices	118.94	108.02	102.76			
Actual Subsidy Provided - as per audited accounts	AEDm, nominal prices	28.51	34.37	36.37			
Shortfall in Subsidy (water and electricity)	**AEDm, nominal prices**	**90.44**	**73.66**	**66.39**			
					Assumed		
UAE CPI Inflation	%	2.80%	2.92%	3.12%	3.00%	3.00%	
Shortfall in Subsidy (water and electricity)	AEDm, 2006 prices	104.67	82.93	72.63			
Real Rate of Return (post-tax)	6.00%						
Discount Factor (mid-year)		0.9713	0.9163	0.8644			
Discounted Subsidy Shortfall (water and electricity)	AEDm, 2006 prices	101.67	75.99	62.79			
Present Value of Subsidy Shortfall (water and electricity)	AEDm, 2006 prices	240.44					
Adjustment for time value of money for 5 years (2001-2005)	AEDm, 2006 prices	81.32					
Total Financial Adjustment required at this 2005 review	**AEDm, 2006 prices**						**321.77**

Allocation of Financial Adjustment Required at this Review between Electricity and Water

			2006
In line with ratio of MAR between water and electricity for RASCO (average over 2001-2003)			
Amount of Financial Adjustment allocated to Electricity	AEDm, 2006 prices	27%	**87.74**
Amount of Financial Adjustment allocated to Water	AEDm, 2006 prices	73%	**234.02**
			321.77

Verifying Financial Viability of RASCO

		2001	2002	2003
Profit / (Loss) - as per audited accounts	AEDm, nominal prices	-82.456	-72.227	-47.916
Shortfall in Subsidy - as calculated above	AEDm, nominal prices	90.44	73.66	66.39
Implied Profit / (Loss)	AEDm, nominal prices	7.98	1.43	18.48
Opening Asset Value - as per audited accounts	AEDm, historical prices	461.71	623.055	590.644
Closing Asset Value - as per audited accounts	AEDm, historical prices	623.055	590.644	537.786
Implied Rate of Return on Capital	%	1.28%	0.24%	3.44%