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2009 Price Controls Review: First Consultation Paper

CR/E02/032

18 November 2008

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Foreword

1. This document marks the commencement of the periodic review by the Regulation and Supervision Bureau (the “Bureau”) of the price controls that apply to the following water, wastewater and electricity companies in the Emirate of Abu Dhabi:
 - (a) Al Ain Distribution Company (AADC);
 - (b) Abu Dhabi Distribution Company (ADDC);
 - (c) Abu Dhabi Sewerage Services Company (ADSSC);
 - (d) Abu Dhabi Water and Electricity Company (ADWEC);
 - (e) Abu Dhabi Company for Servicing Remote Areas (RASCO); and
 - (f) Abu Dhabi Transmission and Despatch Company (TRANSCO).

2. The present price controls for these companies are due to expire on 31 December 2009. New price controls (to be termed the “fourth price controls” or “PC4”) are therefore required to be set to take effect from 1 January 2010. This first consultation paper sets out the issues which need to be considered in setting the PC4 controls and on which the views of respondents are sought. As discussed in the paper, the Bureau intends to extend the existing price controls for RASCO, and to subject ADWEC to a different control cycle and structure. The paper therefore focuses more on network companies.

3. Written responses to the issues raised in this paper should be sent by **5 January 2009** to:

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Regulation and Supervision Bureau
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4. The Bureau proposes to make responses to the consultation exercise publicly available.

NICK CARTER

DIRECTOR GENERAL

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1. Introduction and background

Industry structure

- 1.1 The water and electricity sector in the Emirate of Abu Dhabi is characterised by the single-buyer structure whereby ADWEC purchases water and electricity from a number of production companies, both inside and outside the Emirate of Abu Dhabi, under the terms of long-term Power and Water Purchase Agreements (PWPAs). This water and electricity is then sold by ADWEC to AADC and ADDC at Bulk Supply Tariffs (BSTs) and to certain utilities outside the Emirate. ADWEC also procures natural gas for the production companies.
- 1.2 In addition to purchases from ADWEC, AADC and ADDC purchase water and electricity from RASCO's smaller production plants in remote areas. They also pay transmission charges to TRANSCO for connection and use of its transmission systems.
- 1.3 AADC and ADDC receive revenue from the sale of water and electricity to their customers and subsidy from the Abu Dhabi government. With the exception of some large customers in the Emirate and outside utilities, water and electricity tariffs in the Emirate are subsidised. The sector had a total turnover of about AED 10 billion in 2007.
- 1.4 In the wastewater sector, ADSSC took over ownership, management and operations of the sewerage system from the Abu Dhabi and Al Ain Municipalities in mid 2005 and now provides sewerage services in the Emirate of Abu Dhabi. With no sewerage customer tariffs, the entire cost of sewerage services (currently about AED 1 billion per annum) is required to be subsidised by the government.
- 1.5 At present, all the wastewater treatment capacities are wholly-owned by ADSSC. However, four new large private wastewater treatment plants in Abu Dhabi and Al Ain are planned to be developed in the next few years.

Demand growth

- 1.6 The water and electricity sector presently serves a population of about 1.5 million in the Emirate of Abu Dhabi. It has seen significant demand growth since its restructuring in 1999 and especially in recent years. Demands are

expected to continue to rise in future years particularly due to significant real estate developments in the Emirate.

- 1.7 At present, electricity generation and water desalination capacities are approximately 9,069 MW and 651 MIGD, respectively. These are expected to increase to about 15,729 MW and 969 MIGD by 2015.
- 1.8 The peak electricity demand in the Emirate increased from 2,868 MW in 1998 to 5,286 MW in 2007 – an average annual increase of 7%. Over the same period, the peak water supply increased from 207 MIGD to 559 MIGD – an average annual increase of 11.7%. In addition, there have been supplies of water and electricity to other Emirates in recent years.
- 1.9 Peak demands in the Emirate are forecast by ADWEC to increase to 14,946 MW and 934 MIGD by 2015, or by 14% a year and 6.6% a year, respectively.
- 1.10 There are currently around 313,200 electricity customers and 231,800 water customers in the Emirate of Abu Dhabi. Over 70% of these customers are served by ADDC and the remainder by AADC. Electricity and water demands are split between ADDC and AADC in similar proportions.
- 1.11 ADSSC is also forecast to see significant increase in demand for its sewerage services in future years. For its sewerage system, the average daily flow increased from 431.6 million litres per day (Ml/d) in 2005 to 524.4 Ml/d in 2007 – an increase by about 10.2% per annum. This is expected by ADSSC to increase to 861.5 Ml/d by 2013 or by 8.6% a year. There are plans to expand both network and treatment capacities to cater for this anticipated increase.

Financial performance

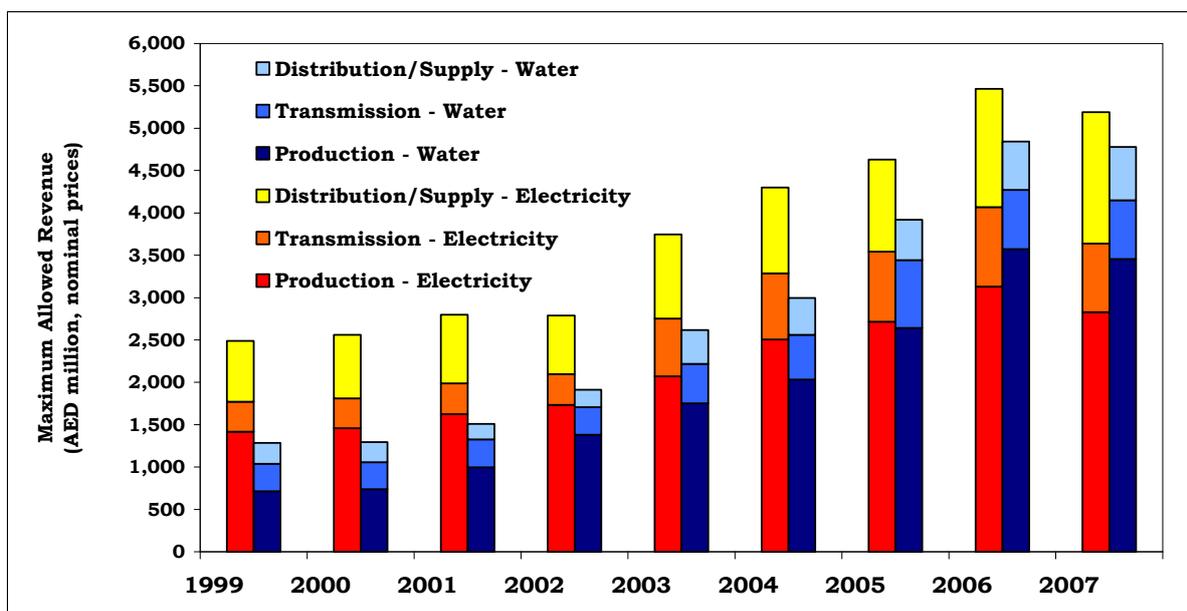
- 1.12 Costs and incomes of the sector companies have also increased over the years, due to the demand growth and changes in price level over time in the economy as a whole.

Total costs

- 1.13 As shown in **Figure 1.1** below, the total annual cost or turnover of the water and electricity sector has increased, in nominal terms, from AED 3.8 billion per annum in 1999 to about AED 10 billion per annum in 2007 – an average increase of 13% per annum over 8 years.

- 1.14 The share of production costs has gradually been increasing over time and now accounts for 63% of total sector costs. At present, transmission costs (of TRANSCO) and distribution and supply costs (of AADC and ADDC) make up 15% and 22% of total sector costs, respectively.
- 1.15 While electricity costs have historically exceeded those of water, the gap between water and electricity costs has been reducing. Currently, electricity and water account for 52% and 48% of total sector costs, respectively.

Figure 1.1: Water and electricity sector costs



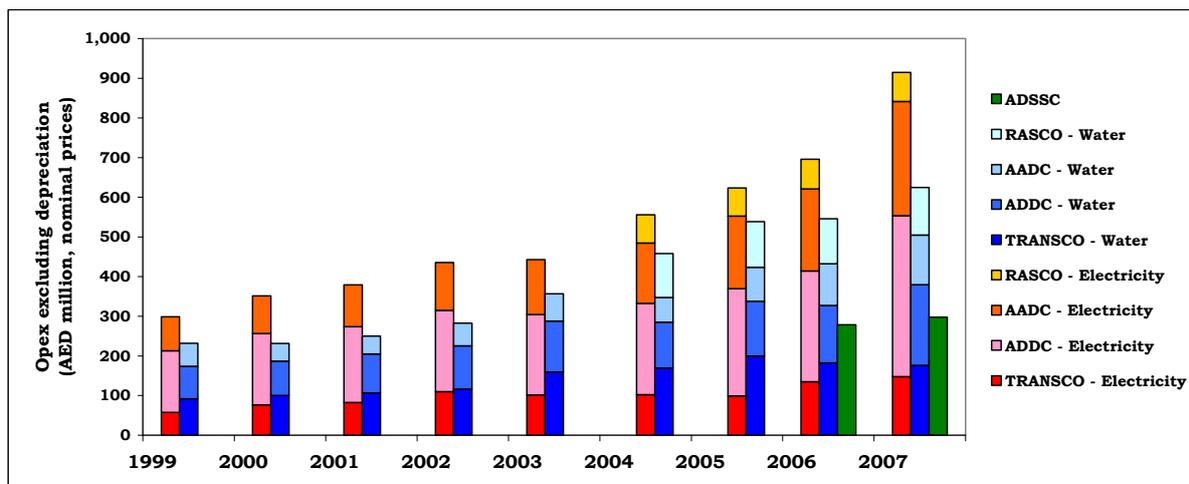
Notes: These costs relate to only licensed activities (see Section 2 for description of licensed and un-licensed activities)

- 1.16 The sewerage sector cost (of ADSSC) is about AED 1 billion per year to date. However, this is also expected to increase due to the rapid demand growth expected in the future.

Operating Expenditure

- 1.17 The total annual operating expenditure (opex) excluding depreciation for AADC, ADDC, ADWEC and TRANSCO increased from about AED 530 million in 1999 to AED 1,372 million in 2007 in nominal terms – an average increase of 12.6% per year. In 2007, electricity accounted for about 62% of such costs. The breakdown of these costs by company is shown in **Figure 1.2** below.

Figure 1.2: Opex for water, wastewater and electricity sector by company



Notes: These costs exclude depreciation and relate to only licensed activities (see Section 2 for description of licensed and un-licensed activities). For ADSSC, opex for 2006 covers 18 months period from 1 July 2005 to 31 December 2006.

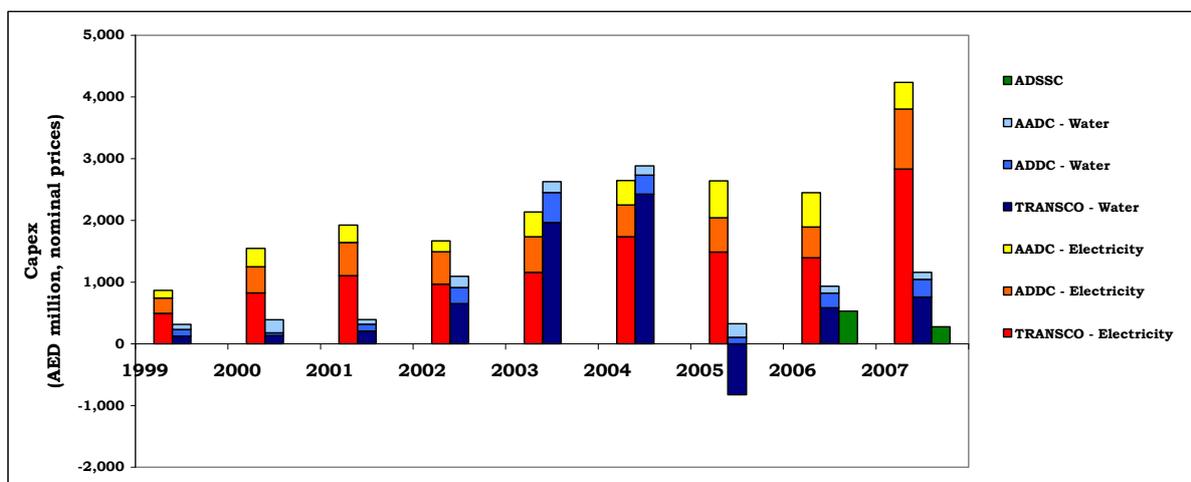
1.18 Staff costs contributed the most (61% in 2007) to the opex of these companies, followed by the cost of repair, maintenance and consumables used. The staff costs were about AED 345 million in 1999 and increased to AED 834 million in 2007 for water and electricity combined.

1.19 In 2007, ADSSC's opex stood at about AED 298 million, including staff costs of AED 104 million.

Capital Expenditure

1.20 The total annual capital expenditure (capex) for AADC, ADDC and TRANSCO increased from about AED 1,183 million in 1999 to AED 5,396 million in 2007 in nominal terms – an average increase of 21% per year. In 2007, electricity accounted for about 79% of such capex. For ADSSC, capex was about AED 276 million in 2007. **Figure 1.3** shows the breakdown of annual capex by company.

Figure 1.3: Capex for water, wastewater and electricity sector by company



Notes: These costs relate to only licensed activities (see Section 2 for description of licensed and un-licensed activities). For ADSSC, capex for 2006 covers 18 months period from 1 July 2005 to 31 December 2006. For 2005, water capex for TRANSCO is negative due to netting of various advances to contractors and prior-year adjustments.

The role and duties of the regulator

- 1.21 Law No (2) of 1998 established the Bureau as the regulatory body for the water and electricity sector in the Emirate of Abu Dhabi and defined its duties, functions and powers. Law No (17) of 2005 extended these powers to include the sewerage services sector. Any entity wishing to undertake any of the defined “regulated activities” in the Emirate requires a licence from the Bureau. It is through the licence conditions that the Bureau is able to influence the conduct of sector companies.
- 1.22 The “primary duty” of the Bureau (Article 53 of Law No (2) of 1998) is “to ensure, so far as it is practicable for it to do so, the continued availability of potable water for human consumption and electricity for use in hospitals and centres for the disabled, aged and sick”. Law No (17) of 2005 may be interpreted as implying a corresponding primary duty in respect of the essential provision of sewerage services.
- 1.23 The Bureau also has a number of “general duties” (Article 54 of Law No (2) of 1998), the most relevant of which in relation to the price control review is to “protect the interest of consumersas to the terms and conditions and price of supply (whether consumers are domestic, commercial or industrial)”.
- 1.24 The Bureau also has a number of “general functions” (Article 55 of Law No (2) of 1998), including “the regulation of prices charged to consumersand the methods by which they are charged.”

1.25 In carrying out its functions under the Law, the Bureau is under an obligation (Article 96 of Law No (2) of 1998) to act consistently, to minimise the regulatory burden on licensees, to take account of the financial position of licensees, and to give reasons for its decisions. Accountability is further reinforced by the fact that the Bureau's decisions can be challenged by licensees and ultimately made the subject of arbitration.

Regulatory framework

1.26 Many companies in the sector have significant market power. At present, the only direct competition in the sector is the competition between bidders to build new generation and desalination plant (IWPPs) or to build new wastewater treatment plants. The Bureau has therefore established a regulatory framework to constrain the market power of the other companies.

1.27 All electricity and water purchasing costs are subject to regulation via an economic purchasing obligation under ADWEC's licence. ADWEC's purchase of fuel for the production companies is subject to a similar economic purchasing obligation. Further, a similar economic purchasing obligation applies under ADSSC's licence in respect of the payments to planned private wastewater treatment works.

1.28 Other than the competitive elements mentioned above, the remaining companies are monopolies in the Emirate, being the only providers of services in their respective geographic or business areas and hence are subject to price controls set by the Bureau:

(a) For **AADC**, **ADDC**, **ADWEC** and **TRANSCO**, the first price controls (PC1) were set in 1999 to run for three years starting from 1 January 1999 and were extended for a further year; that is, a control duration of four years (1999-2002). The second price controls (PC2) were set in 2002 to apply for three years (2003-2005), followed by the currently continuing third price controls (PC3) set in 2005 for four years (2006-2009).

(b) Until 2003, some activities of **RASCO** were subject to tariffs approved by the Bureau. Following RASCO's restructuring in 2002 (when its distribution and supply businesses were transferred to AADC and ADDC), the Bureau introduced a set of price controls for RASCO's production activities (which are currently managed on its behalf by AADC and ADDC under management agreements). These price

controls applied for two years (2004-2005) and were extended in 2005 to apply for a further period.

- (c) In 2007, the Bureau set the first price control for **ADSSC** to apply from the date of establishment of ADSSC (21 June 2005) until 31 December 2009.

- 1.29 The price controls are important because they determine the cap on the annual revenue of each company. For AADC, ADDC and ADSSC, the difference between the revenue cap and the revenue from customers determines the subsidy required from the government.
- 1.30 The importance of price controls is also highlighted by the significant level of costs subject to price controls. In 2007, the price-controlled costs accounted for about AED 4.59 billion or 42% of total sector costs.
- 1.31 The price controls are described in detail in the Bureau's consultation papers published at the time of the above-mentioned price control reviews and are available on the Bureau's website (www.rsb.gov.ae).

Timetable for 2009 price control review

- 1.32 All the current price controls are due to expire by end 2009 and require new price controls to be in place to take effect from 1 January 2010.
- 1.33 This consultation paper marks the start of the process that the Bureau intends to undertake to set the new price controls (referred to as the "PC4" controls). As part of this review process, the Bureau intends to publish a number of consultation papers, to seek information from the companies and to hold meetings with the concerned parties. **Table 1.1** below presents the Bureau's proposed timetable for the review. This timetable allows the companies six weeks to respond to the consultation papers.
- 1.34 In previous price control reviews, the Bureau has specified an information request as part of the timetable. However, at the last review, the Bureau introduced the concept of Annual Information Submissions (AIS) which is submitted by licensees in September each year accompanied by a report by an independent Technical Assessor. The Bureau will review the content of the most recent AIS submissions and determine in the course of the present review whether any additional information is required from licensees.

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Table 1.1: 2007 Price Controls Review Timetable (Approximate Dates)

18 November 2008	Bureau publishes this <i>First Consultation Paper</i>
5 January 2009	Companies to respond to First Consultation Paper
5 March 2009	Bureau to publish <i>Second Consultation Paper</i>
16 April 2009	Companies to respond to Second Consultation Paper
15 June 2009	Bureau to publish <i>Draft Proposals</i>
30 June 2009	Companies to submit Audited Separate Business Accounts
30 July 2009	Companies to respond to Draft Proposals
15 September 2009	Bureau to publish <i>Final Proposals</i>

1.35 As discussed in Section 3, the Bureau intends to move ADWEC to a different price control cycle and structure than the network companies. The Bureau may therefore need to publish separate documents on the price control review for ADWEC.

Structure of this document

1.36 The remainder of this document is structured as follows:

- (a) **Section 2** describes the existing price controls;
- (b) **Section 3** assesses the possible structure, scope and duration of the new (PC4) price controls;
- (c) **Section 4** discusses the approaches available to make projections of operating costs (opex) excluding depreciation on which the new controls would be based;
- (d) **Section 5** considers approaches that the Bureau can apply to the treatment of the past and future capital expenditure (capex) and to the projection of Regulatory Asset Values (RAVs) and depreciation allowances;
- (e) **Section 6** discusses the estimation of the cost of capital;
- (f) **Section 7** assesses the possible changes to the design of the existing Performance Incentive Scheme (PIS) for the new controls; and
- (g) **Section 8** considers certain financial adjustments to the companies' future revenues at this review.

2. Current price controls

Introduction

- 2.1 This section describes the overall structure of the price controls that currently apply to the monopoly companies in the water, wastewater and electricity sector in the Emirate of Abu Dhabi.
- 2.2 The general approach that the Bureau used to date to set these price controls since 1999 is also described in this section.

Structure of current price controls

- 2.3 The current price controls are in the form of revenue caps, defining Maximum Allowed Revenue (MAR) for each company for each of year of the price control duration as follows:

$$\text{MAR} = \text{Pass through costs} + a + (b \times \text{Revenue driver 1}) + (c \times \text{Revenue driver 2}) + Q - K$$

where:

- (a) **Pass-through costs** are the costs which are subject to competition or regulation elsewhere in the sector and are allowed on an actual basis.
- (b) **'a'** is a fixed component (in UAE Dirhams).
- (c) **'b' and 'c'** are the coefficients of two revenue drivers, expressed in Dirham per unit of the respective revenue driver.
- (d) **'a', 'b', and 'c'** are set by the Bureau for the first year of the control period and are then automatically adjusted each year according to the following formula for (i) the UAE Consumer Price Index (CPI) inflation for the previous year and (ii) an 'X' factor set by the Bureau:

$$a_t = a_{t-1} \times (1 + (\text{CPI}_t - X) / 100)$$

(same formula for 'b' and 'c')

- (e) **Revenue drivers** are measures of companies' outputs or demands they meet in a year.

- (f) **‘Q’** is the revenue adjustment for performance during a year under the Performance Incentive Scheme (PIS).
- (g) **‘K’** is the correction factor adjusting any over- or under-recovery of revenue in the preceding year.

2.4 The following table summarises the specific structure of the current price controls for each company:

Table 2.1 Structure of current price controls

Company	Pass-Through	Revenue Driver 1	Revenue Driver 2
AADC / ADDC	Water and electricity purchases Transmission costs	Customer numbers	Metered units distributed
TRANSCO	Electricity ancillary service costs	Metered peak demand	Metered units transmitted
ADWEC	PWPA costs Fuel costs	None	None
RASCO	Proportion of fuel costs	Electricity generation capacity	Water annual production
ADSSC	None	None	None

Notes: ADSSC price control is currently a pure revenue cap.

Main features of current price controls

- 2.5 **CPI-X regulation:** 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.
- 2.6 **Revenue caps:** The 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 and ADSSC) in any year of the control period.
- 2.7 **Duration of controls:** The current price controls have been set to apply for four years (2006-2009) and, in the case of ADSSC, for four and half years (mid 2005-2009). The current price controls for RASCO have been applied since 2003.
- 2.8 **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 such as meeting customer demands, reducing system losses and improving system metering.

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- 2.9 **Separation of controls:** Presently, there are separate price controls for the water and electricity businesses of the companies. For the distribution companies (AADC and ADDC), the price controls (separate for water and electricity) presently cover both distribution and supply businesses. For ADSSC, a single price control covers all of its three separate businesses (sewerage, wastewater treatment and disposal).
- 2.10 **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.
- 2.11 **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. The Bureau has generally assumed that licensees can improve their operating efficiency by 5% a year, all else being equal.
- 2.12 **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 gains (in the form of extra profits) at least until the next price control review.
- 2.13 **Treatment of capex:** Calculation of depreciation and of the return on capital requires the determination of efficient capital expenditure (capex) allowances. The treatment of capex was 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).
- 2.14 **Initial regulatory asset values:** In order to ensure that companies' allowed revenues reflect economic costs, the Bureau undertook a review of reported accounting asset values while setting the first controls for the water and electricity companies in 1999. The opening regulatory asset value (RAV) of TRANSCO at 1 January 1999 was reduced by 15%, following analysis by the Bureau which suggested that the accounting valuation of TRANSCO was over-stated. No such adjustment was made to the accounting asset values of AADC and ADDC. For ADSSC, the 2005 opening RAV was set at the accounting asset value as of mid 2005.
- 2.15 **Allowed rate of return:** A real, post-tax cost of capital of 5% has been used for setting the current price controls (with some adjustments for distribution

companies). This cost of capital was estimated based on a review of capital market information in Abu Dhabi and overseas.

2.16 **Performance incentive scheme:** A Performance Incentive Scheme (PIS) has been developed to incentivise the companies to meet a range of key performance indicators:

- (a) There are a number of **“Category A”** performance indicators for each company related to the timeliness of submission of audited regulatory statements and to various measures of network and other performance. Good or poor performance on these indicators leads to an automatic upward or downward adjustment to MAR via the term “Q”. The adjustment to MAR via the Q term in any year has been capped at 4% (5%, in case of RASCO) of MAR in respect of each company’s “own costs” (ie., excluding pass-through costs) in that year.
- (b) There are also a number of **“Category B”** indicators which are monitored over the control period, with a possible financial adjustment made in respect of particularly good or poor performance at the next price control review, subject to an overall cap on such adjustments.

Framework for price control calculations

2.17 Setting the price controls means determining the values of the fixed term ‘a’, and of the coefficients of revenue drivers ‘b’ and ‘c’ in the MAR formula, and of the X-factor (see paragraph 2.3 above). The Bureau has used the following framework for its price control calculations for water, wastewater and electricity companies to date.

2.18 The revenue requirement for each year of the control period (sufficient to finance a reasonably efficient business) is calculated using the “building block approach” as follows:

$$\text{Required revenue} = \text{Operating expenditure} + \text{RAV depreciation} + \text{Return on RAV}$$

where:

- (a) Operating expenditure (opex) refers to operating costs excluding depreciation; and

- (b) RAV is the mid-year average of opening and closing Regulatory Asset Values (RAVs) in that year. For each year, the closing RAV is determined by adding the efficient capital expenditure (capex) incurred in that year to, and subtracting the depreciation from, the opening RAV.

2.19 The projected MAR for each year of the control period is calculated using the revenue driver projections, appropriate weightings for the fixed and variable terms, and an appropriate 'X' factor.

2.20 The values of 'a', 'b' and 'c' are then calculated by setting the net present value (NPV) of the projected MARs equal to the NPV of required revenues over the control period using the estimated cost of capital as the discount rate:

$$\text{NPV of projected annual MARs} = \text{NPV of required revenues}$$

2.21 All calculations are carried out in real terms (i.e., excluding the effect of inflation). For the purpose of these calculations, pass-through costs and K and Q terms are excluded.

2.22 For the PC3 calculations for water and electricity companies, the Bureau used a weighting of 70% for the fixed term and 30% for the variable terms (equally apportioned between the revenue drivers where there was more than one revenue driver). These weightings were applied to the present value of total revenue over the control period. The weightings thus varied slightly from year to year, depending on the relative movement in revenue drivers in each year. For ADWEC and ADSSC, the fixed term was set to have a weighting of 100%. That is, their MARs do not vary with any revenue drivers.

2.23 Therefore, price control calculations require the following inputs:

- (a) opex projections;
- (b) initial Regulatory Asset Value (RAV);
- (c) capex projections (to determine RAVs for each year);
- (d) assumptions for depreciation (e.g. profile and average asset life);
- (e) revenue driver projections;
- (f) appropriate X-factor;

- (g) appropriate weightings for the fixed and variable terms in the MAR formula; and
- (h) an appropriate cost of capital (to be used as the allowed rate of return on RAVs and as the discount rate to calculate NPVs).

Separate businesses

2.24 For various regulatory purposes (particularly accounting separation), the licence for each monopoly company in the sector defines its “separate businesses”, as summarised in **Table 2.2** below:

Table 2.2: Separate Businesses

Company	Separate Businesses
AADC or ADDC	Electricity Distribution Business Electricity Supply Business Water Distribution Business Water Supply Business
ADSSC	Sewerage Business Wastewater Treatment Business Disposal Business
ADWEC	Electricity Procurement Business Water Procurement Businesses
RASCO	Electricity Generation Business Water Production Business
TRANSCO	Electricity Transmission Business Water Transmission Business

2.25 For each of these companies, the respective licence requires the company to prepare and submit regulatory accounts for each of its separate businesses. At present, each separate business of ADWEC, RASCO and TRANSCO is subject to a separate price control. For AADC and ADDC, there are separate price controls for the water and electricity businesses of AADC and ADDC (distribution and supply combined).

2.26 Some companies also undertake certain un-licensed activities with the Bureau’s consent (as required by their licences):

- (a) water and electricity transmission outside the Emirate of Abu Dhabi (by TRANSCO);

- (b) water and electricity sale to utilities outside the Emirate of Abu Dhabi (by ADWEC);
- (c) “manpower services” to distribution companies (TRANSCO);
- (d) central laboratory operations (by AADC and ADDC); and
- (e) management of RASCO’s production assets (by AADC and ADDC).

2.27 These un-licensed activities are not subject to any price controls by the Bureau. However, companies are required by their licenses to maintain separate accounts for each of these un-licensed activities to avoid any cross-subsidy to or from their licensed activities.

2.28 In the case of TRANSCO, many of the assets used for its un-licensed activities are also used in supplying the Emirate of Abu Dhabi (for example, transmission assets associated with water and electricity production plant in Fujairah). Due to the difficulty of allocating such ‘common’ or ‘shared’ assets separately to licensed and unlicensed activities, the Bureau agreed during the PC3 period that the scope of TRANSCO’s price control could be expanded to include unlicensed activities using such shared assets, and to apply a common transmission charge within and outside the Emirate of Abu Dhabi, with the intention of formalising this arrangement for the PC4 period.

3. Form of controls

Introduction

- 3.1 The current price controls are due to expire by end 2009 and require new or fourth price controls (PC4) to be in place to take effect from 1 January 2010.
- 3.2 This Section 3 discusses the fundamental aspects of the new controls. These include the type of regulation, and the form, duration, and scope of the price controls for the network companies. The discussion reflects the Bureau's desire to see more incentives for these companies to improve their performance, particularly on system metering and loss reduction.
- 3.3 For RASCO, the price controls originally set for 2004-2005 were subsequently extended and continue to apply to date. This section also discusses the issue of whether these price controls should continue to apply over the PC4 period.
- 3.4 For ADWEC, given the nature of its business, the Bureau is currently minded to subject the company to a different price control cycle and structure than the network companies, in order to provide more flexibility to deal with the uncertainties faced by the company.
- 3.5 Finally, this section discusses the possibility of introducing a mechanism for reopening a price control between price control reviews in exceptional circumstances.

Type of regulation

Sector regulation to date

- 3.6 Since 1999, the monopoly companies in the sector (and recently ADSSC) have been subject to CPI-X regulation. This means that their allowed revenues are constrained to change each year by a measure of price inflation (represented by the UAE Consumer Price Index or CPI) less a factor X. The factor X is set to reflect a number of considerations particularly the profiling of the future revenue.

Main types of regulation

3.7 Economic regulation of monopoly companies can take a number of forms. However, there are two main types or models of regulation:

- (a) **Rate of return (ROR) regulation:** Under this regulatory regime, prices are adjusted frequently, often on an annual basis, to ensure that a target rate of return is earned. This reduces perceived risk, resulting in a lower cost of capital. However, this regime lacks adequate incentives for companies to reduce costs and can provide an incentive for a firm to over-invest in capital assets (referred to as “gold plating”) to increase its profits.
- (b) **Price cap or CPI-X regulation:** This regime sets prices or revenues over a medium term period (3 to 5 years), such that a well-run company can expect to earn a fair rate of return, with the opportunity to earn and retain higher profits (at least up to the next price review) if the company reduces costs. This gives the company a greater incentive for efficiency. However, by not guaranteeing a certain rate of return, this regime is perceived to be riskier than ROR regulation, resulting in a higher cost of capital.

3.8 In practice, price cap and ROR regulation are quite similar. In both the regimes, the regulator has to assess the efficient level of costs and the rate of return that a company should earn. Further, both models require the regulator to review the price controls from time to time. The main difference between the two approaches relates to the length of the “regulatory lag” – the period between the resetting of price controls.

3.9 The risk that CPI-X regulation may result in too low or too high profits for a company has given rise to some variants such as “profit sharing” and “sliding scale”. These approaches attempt to preserve the incentive properties of CPI-X while ensuring a closer link between prices and profits year-on-year. Under these mechanisms, the firm retains some fraction of its “excess” profits (ie., profits over and above the allowed or assumed returns) and rebates the remaining fraction to customers. The main practical difficulty with such an approach is in defining “profits” (to be shared) in such a way that it is not open to manipulation. In addition, these approaches weaken the incentive to reduce costs.

Bureau's current thinking

3.10 To ensure consistency in the regulatory framework established for the sector, the Bureau believes that all the network companies should remain subject to CPI-X type of regulation. The Bureau considers that the efficiency incentives inherent in this approach are consistent with its statutory duty towards an efficient and economic sector (Article 54 of Law No.2 of 1998).

3.11 As discussed later in this Section 3, ADWEC may need to be subject to a control that is more cost-reflective than CPI-X regulation, in order to address the uncertainties specific to ADWEC's business and workload.

Form of regulation

Sector regulation to date

3.12 The price controls for the sector companies have to date taken the form of revenue caps for the businesses comprising a fixed component and, generally, two components linked to "revenue drivers". These revenue caps determine the Maximum Allowed Revenues (MARs) of the companies and are constrained to change each year by CPI-based inflation rate less a factor X, and by the changes in the values of the revenue drivers. Currently, the price controls for ADWEC and ADSSC are "pure" revenue caps as they do not have any revenue driver.

Main forms for control

3.13 There are three main forms of price controls that may be considered:

- (a) ***Revenue yield control:*** This caps the revenue per unit of output for a company and is most appropriate for utility sectors subject to significant demand growth. It provides an incentive for a company to reduce unit costs below the allowed unit revenue, but also ensures the company receives additional revenue to cover the additional costs arising from demand growth.
- (b) ***Pure revenue cap:*** This places an overall lump-sum limit on total revenue without any variation for output changes. This provides an incentive for a company to reduce overall costs below the overall revenue (and hence increase its profits). However, it does not allow the company additional revenue for demand growth, thereby exposing it to demand risk if costs vary with demand.

- (c) **Hybrid approach:** This is a combination of the above two approaches in which the revenue cap consists both of a fixed component (similar to the pure revenue cap) plus one or more “revenue drivers” linking allowed revenue to defined output measures (similar to the revenue yield control). This provides an incentive for a company to provide for the growing demand for services while at the same time limiting the deviation of revenues from costs. This can be done by setting the fixed and variable revenue components, broadly speaking, to reflect the fixed and variable costs of the company. Any incentive to over-invest or to expand unnecessarily can be balanced by adopting an appropriate weighting of the ‘fixed’ term within the structure of the controls.

3.14 There are also other potential approaches, such as **tariff caps** and **tariff basket control** which focus on the customer tariffs and are used for example in the UK water industry for price regulation. However, these approaches are not suitable to the environment of subsidised tariffs in the sector in Abu Dhabi.

Bureau’s current thinking

3.15 Based on the experience to date with the use of the hybrid form of revenue cap in the sector, and to ensure consistency over time, the Bureau’s current thinking is to continue with this form of control for PC4 for AADC, ADDC and TRANSCO. In addition, consideration should be given to adopting the same form of control for ADSSC, by the identification of suitable revenue drivers. (ADWEC is discussed separately later in this Section 3).

Choice of revenue drivers

Current revenue drivers

3.16 Under the current price controls, each revenue cap (except for ADWEC and ADSSC) changes each year by a number of “revenue drivers”, set to broadly reflect each company’s cost drivers. **Table 3.1** below summarises the revenue drivers that the current price controls contain for each company or business. Each company / business has two revenue drivers linked to their outputs, such as number of customers served, units transmitted or distributed, and system peak demands.

Table 3.1 Revenue Drivers in current price controls

Company	Revenue Driver 1	Revenue Driver 2
AADC / ADDC	Customer numbers	Metered units distributed
TRANSCO	Metered peak demand	Metered units transmitted
ADWEC	-	-
RASCO	Electricity generation capacity	Water annual production
ADSSC	-	-

Potential changes to revenue drivers

- 3.17 In addition to reflecting the company's cost structure, the choice of revenue drivers may reflect other objectives – for example, to provide incentives to serve new customers and areas, and to improve network metering or reduce losses.
- 3.18 However, revenue drivers for AADC and ADDC based on units distributed have the potential of providing undesirable incentives for them to encourage excessive water and electricity consumption by their customers.
- 3.19 On the other hand, these revenue drivers, being based on *metered* units delivered to customers, have in the past provided valuable incentives to the distribution companies to improve metering or reduce losses. Thus, if the role of such revenue drivers in the price controls is removed or reduced, consideration will need to be given to others methods of providing specific incentives in relation to metering and/or losses. This could be done in one of two ways:
- (a) to introduce a new term in the MAR formulae; or
 - (b) to introduce new PIS Category A indicators.

The objective of such methods would be to provide positive incentives for metering and loss reduction while at the same time avoiding the undesirable incentives to encourage excessive water and electricity consumption which are inherent in the existing 'metered units distributed' revenue driver.

- 3.20 For example, the ratio of (a) measured water (or electricity) delivered to customers to (b) water (or electricity) received by distribution companies from the transmission system could serve to incentivise both metering and loss reduction by distribution companies. Such a ratio can be tailored to act as a revenue driver in the MAR formula or as a Category A indicator in the PIS scheme. The weight of such a revenue driver or cap on the incentives for

such a Category A indicator should be significant to provide the required incentives.

- 3.21 In addition, the Bureau would welcome any suggestions for how incentives may be incorporated into the price controls for the distribution companies to reward / encourage demand-side management initiatives.
- 3.22 While no revenue driver has been adopted for ADSSC to date, it is now appropriate to consider introducing revenue driver(s) for ADSSC's new price controls. The potential revenue drivers include customer numbers and a measure of load, such as, annual or peak flow or load, and population equivalent.

Bureau's current thinking

- 3.23 The Bureau's current thinking is to retain the existing revenue drivers for all companies for the PC4 controls with these main potential changes:
- (a) The metered units distributed-based revenue drivers for both water and electricity businesses of AADC and ADDC should be strengthened by a new revenue driver or PIS Category A indicator with significant incentives for system metering and/or losses.
 - (b) Revenue drivers such as customer numbers and a measure of load (volume) should be introduced for ADSSC.

Duration of controls

Sector regulation to date

- 3.24 Both the PC1 and PC2 controls were set for three years, although PC1 was subsequently extended for another year. The PC3 controls and the present controls for ADSSC were set for 4 and 4.5 years, respectively. The present controls for RASCO were originally set to apply for 2 years and subsequently extended.

Considerations

- 3.25 In principle, the duration of a price control needs to strike a balance between providing incentives for efficiency and reducing exposure to unanticipated outcomes.

- 3.26 There is evidence that a longer duration provides stronger incentives for companies to implement efficiency savings. A longer control duration could also reduce the efforts and costs involved both for the company and the regulator in frequent price control reviews. However, a longer duration also increases the possibility of performance being at variance with expectations at the time of setting the price control.
- 3.27 Internationally, the control period for CPI-X regulation is usually 4-5 years. In Abu Dhabi, the choice of a shorter duration in the early years was driven by a general lack of reliable and audited data on companies' performance on which to base projections of future costs. At that time, companies also generally expressed their preference for a shorter control duration due to the uncertainties within the sector.
- 3.28 However, since then, the sector has seen significant improvement in the availability of audited financial data in terms of separate business accounts (SBAs) and price control returns (PCRs). The introduction of Annual Information Submission (AIS) by companies supported by independent Technical Assessor's (TA) report has also served to improve the reliability of sector data. Furthermore, the companies' increasing costs also indicate the need for stronger incentives to reduce costs.
- 3.29 ADSSC, being a network company, has similar issues with regards to the design and calculations of price controls as AADC, ADDC and TRANSCO. All these network companies can therefore have their price controls reviewed at the same time.

Bureau's current thinking

- 3.30 The Bureau's current thinking is that the new PC4 controls should apply for four or five years (from 2010 to 2013 or 2014) for all companies (except ADWEC as discussed later in this Section 3). This represents a reasonably long duration to provide strong efficiency incentives for the companies and will be consistent with best international practice.

Scope and separation of controls

Sector regulation to date

- 3.31 Presently, there are separate price controls for the water and electricity businesses of AADC, ADDC, ADWEC, RASCO and TRANSCO. There is no such separation of controls for the sewerage, wastewater treatment and

disposal businesses of ADSSC, nor for the distribution and supply businesses of the distribution companies.

3.32 Further, the scope of the present price controls generally covers, via the definition of the term “Regulated Revenue” in the respective licences, all the income of these companies. However, the following activities or income is explicitly excluded from the Regulated Revenue:

- (a) For ADWEC, any income received from production companies in the form of damages, claims, late payments or events of default; and
- (b) For all companies, any revenues from unlicensed activities for which the concerned company has received the consent of the Bureau, as required according to the licences (referred to as “Excluded Income” in the relevant licences).¹

3.33 For AADC, ADDC and ADSSC, “Regulated Revenue” is defined in the licence to include any revenue which should be billed to and collected from their customers according to tariffs and charges approved by the Bureau (or, in case of subsidy customers, by ADWEA), rather than the revenue actually collected from the customers. This concept of “should be billed to and collected from customers” was introduced by the Bureau at the last price control review to provide incentives for companies to bill and collect customer revenues. If certain customer revenue which should have been billed and collected is not billed or collected, the intention is that such revenue lost is not to be made up by the government subsidy.

Potential changes

3.34 In principle, separation of controls enhances cost transparency between businesses and could facilitate the introduction of competition in certain activities, such as the wastewater treatment and disposal businesses of ADSSC and the supply businesses of AADC and ADDC. The current accounting separation between the separate businesses of each company could, in theory, facilitate the introduction of separate price controls for each business.

¹ However, as discussed in Section 2, TRANSCO’s unlicensed transmission activities outside the Emirate of Abu Dhabi which share the same assets with the licensed activities are included within the scope of the price controls.

- 3.35 However, at present, the Bureau does not see an urgent need for separate controls for the supply businesses of AADC and ADDC, or for the three businesses of ADSSC. In the case of ADSSC, the Bureau would like to see a more robust framework for revenue and subsidy allocation between businesses and for inter-business charging before considering separate controls for its three businesses.
- 3.36 While the Bureau is satisfied with the overall concept and scope of the term “Regulated Revenue” as defined in the licence, recent discussions with AADC and ADDC and their auditors have indicated the need for further clarity with regards to the definition. The Bureau has clarified to the concerned licensees and their auditors that the Regulated Revenue as defined in the licence and shown in the Price Control Return (PCR) can differ (and in some cases should differ) from the income from customers as shown in the accounts of the concerned company.
- 3.37 Finally, it is necessary to formalise the arrangement whereby TRANSCO’s activities relating to ‘unlicensed shared’ assets are included within the scope of the price control.

Bureau’s current thinking

- 3.38 The Bureau’s current thinking is to retain the existing scope and separation of price controls for all companies. However, necessary changes will be made to formally extend the scope of TRANSCO’s price controls to include that part of its unlicensed transmission activities outside the Emirate of Abu Dhabi which share assets with the licensed activities. The Bureau will also consider if any changes are required to the licence definition of “Regulated Revenue” in order to further clarify that such revenue includes all revenue which should have been billed to and collected from the customers as per the approved tariffs and charges, even if such revenue was not actually billed / collected.

Pass-through costs

Sector regulation to date

- 3.39 For Abu Dhabi companies, certain costs have been allowed as pass-through in the price control formulae on an actual basis. **Table 3.2** below lists the pass-through costs by company:

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Table 3.2 Pass-through costs under current price controls

Company	Pass-Through
AADC / ADDC	Water and electricity purchases Transmission charges
TRANSCO	Electricity ancillary service costs
ADWEC	PWPA costs Fuel costs
RASCO	95% of actual fuel costs (remaining 5% based on efficient benchmarks)
ADSSC	None

3.40 For ADWEC, the PWPA and fuel costs are pass-through, as they are subject to ADWEC's economic purchasing obligation.

3.41 For distribution companies, power and water purchases and transmission charges are pass-through as they are costs recharged from other licensees which are already subject to regulation (via an economic purchasing obligation or price controls).

Potential changes

3.42 The planned development of four major wastewater treatment plants by the private sector for ADSSC raises new issues for the price controls for ADSSC. It is expected that these plants would follow the model developed for the Independent Water and Power Producers (IWPPs) in the sector. That is, ADSSC will pay a capacity or availability payment as well as an output payment under a long-term Sewerage Treatment Agreement (STA), similar to the Power and Water Purchase Agreements (PWPAs) between ADWEC and the IWPPs.

3.43 Two main options are available for the treatment of such costs in ADSSC's price controls: to either forecast the efficient level of such costs, or to allow the pass-through of such costs. While the Bureau is considering a pass-through treatment of STA payments under the price control, this would be subject to ADSSC's economic purchasing obligation. That is, the Bureau would need to be satisfied that each of these new private treatment plants are required at this time in order to meet ADSSC's demands and that they were procured competitively.

Bureau's current thinking

3.44 The Bureau's current thinking is to retain all the existing pass-through items in the price controls, and to also allow ADSSC's payments to new

private wastewater treatment plants as pass-through costs, provided evidence is provided by ADSSC demonstrating efficient contracting for procurement of such plants.

Restructuring of price controls for ADWEC

Current price controls

3.45 At present, ADWEC's price controls (separately for its water and electricity procurement businesses) have a similar structure to those of the network companies and are reviewed at the same time as these companies.

Considerations

3.46 However, ADWEC's procurement business is of different nature to the network companies. ADWEC does not have the financial capability to manage uncertainties and risks such as those arising due to the following:

- (a) a small capital base;
- (b) large cash flows with production and distribution companies;
- (c) potential contractual issues relating to 'change in law' and liquidated damages payable by or to the production companies;
- (d) responsibility for forecasting, planning, procurement and charging of production capacities having significant impact on the rest of the sector;
- (e) major changes in workload and staff requirements from time to time relative to the size of its business; and
- (f) trading with other Emirates or countries.

3.47 It may therefore be appropriate for ADWEC to have a shorter control period than the network companies. This may require the Bureau to set price controls for ADWEC for, say, two years only and review them from time to time (even on an annual basis) if the circumstances warrant.

3.48 For example, the price controls for ADWEC may be adjusted each year if ADWEC requires additional staff or consultancy costs to fulfil its statutory obligations (through additional cost allowance in price controls). Conversely if it fails to prepare, for example, the BST charges leaflet or seven-year

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planning statement in a satisfactory form or timely manner as required by its licence it may be reflected in a downward adjustment to its revenue.

- 3.49 The main structure of the MAR formula for ADWEC may remain the same as at present (see Section 2). However, the notified value “A” can be adjusted on an annual basis to reflect ADWEC’s performance or requirements – rather than CPI adjustment only as at present.

Bureau’s current thinking

- 3.50 The Bureau is currently thinking to restructure the price controls for ADWEC so as to make them more flexible to cater for uncertainties in, and performance of, its obligations.

Extension of price controls for RASCO

Current price controls

- 3.51 RASCO currently undertakes electricity generation and water production activities (often on a standby basis) in remote areas of the Emirate of Abu Dhabi. AADC and ADDC purchase all water and electricity produced by RASCO at tariffs that enable RASCO to recover all of its maximum allowed revenue (MAR) under the price controls (without any subsidy requirement from the government). AADC and ADDC operate, maintain and manage all assets and activities of RASCO on its behalf under the management contracts, and charge all associated costs to RASCO.
- 3.52 As mentioned earlier, RASCO’s present price controls were originally set to apply for 2 years (2003-2004) and were subsequently extended at the last price control review. These controls allow the MAR to vary with RASCO’s generation capacity and water output, thereby reflecting the cost structure of the company. The controls also provide some incentives to reduce fuel costs by allowing pass-through of 95% of such costs and linking the remaining 5% to an efficient benchmark. RASCO is also subject to a simple Performance Incentive Scheme (PIS) with only two Category A indicators with an overall cap on bonuses/penalties equal to 4% of annual MAR.

Considerations

- 3.53 The Bureau is broadly satisfied with the operation of the current price controls for RASCO. The controls have the required incentives, although for

the PIS the overall cap and the bonuses/penalties can be argued to be on the higher side compared to other companies.

3.54 **Table 3.3** below shows RASCO's output growth and financial performance over recent years under the existing controls.

3.55 This table shows that RASCO's water business and, to some extent, its electricity business, have been declining in terms of outputs. However, total revenue has been relatively stable over years. In real terms, RASCO's MARs have declined significantly, in line with the reduction in outputs.

Table 3.3 RASCO's performance over recent years

		2004	2005	2006	2007
Output growth					
Net generation capacity	MW	258	258	294	288
Electricity units generated	MWh	74,889	75,925	67,816	65,206
Water units produced from all sources	MIG	7,721	3,818	2,097	1,470
Water units produced from desalination	MIG	2,266	789	659	505
Financial performance					
Annual revenue	AED million	246.46	244.51	244.44	289.19
Annual profit / (loss)	AED million	(111.186)	(66.362)	2.759	55.995
Annual profit / (loss) excluding exceptional items	AED million	6.742	11.787	34.051	28.873
Return on mid-year asset value	% p.a.	1.83%	2.90%	8.04%	7.44%

Notes: The exceptional items mentioned above include (a) provision for plant and equipment impairment, (b) provision for slow moving and obsolete inventory, (c) profit on sale of plant and equipment, (d) PIS bonuses or penalties.

3.56 While RASCO showed financial losses in earlier years, profits in more recent years compensate for such losses. The losses in the early years occurred mainly due to significant asset impairment recorded by RASCO. The recent profits have been the result of higher profits from asset sale and higher MAR due to PIS bonuses. The profits, and resulting return on mid-year asset value, after making adjustments for such one-off or exceptional items are at reasonable levels.

Bureau's current thinking

3.57 The Bureau is keeping under review the possibility that all of RASCO's activities may in time gravitate to other licensees. As the existing control has continued to be robust over a period of five years, the Bureau's current thinking is to continue with the present price controls for RASCO indefinitely until notification is given by the Bureau of an intention to modify the controls (or RASCO requests such controls to be reviewed).

Mechanism for reopening price control

- 3.58 During the PC3 period, a number of licensees have raised concerns about unanticipated inflationary increases in costs which had occurred since the last price controls review, which they regarded as being outside of their control.
- 3.59 While the Bureau noted that there is no mechanism at present to allow price controls to be re-opened between price control reviews, and that the additional MARs the companies had earned through the “CPI” component of price controls had more than offset such cost increases, it undertook to consider whether such a mechanism should be introduced into companies’ licences at the next price controls review.²
- 3.60 Such mechanisms are in operation in some other jurisdictions. Best practice is for price controls to be reopened only in the case of events beyond the control of licensees, and in the case of such events having a significant financial impact on the licensee, for example, due to unanticipated high costs. A reopening may also be required in the case of unreasonably ‘excessive’ profits earned by a licensee or in the case of a takeover or privatisation of a licensee.
- 3.61 Some regulators specify in advance the circumstances in which the price control may be reopened, while others leave it to their discretion at the time any such exceptional circumstances occur.
- 3.62 Ofwat, the water and wastewater regulator for England and Wales, has the most detailed approach towards reopening price controls. Price controls may only be reopened for certain events which are pre-specified in the licence, provided the impact is (cumulatively) equal to 10% or more of annual turnover. Then price controls are reset to revert the financial impact of the price controls on the licensee to that which would have prevailed in the absence of that event.
- 3.63 Such a mechanism can also have a benefit of reducing the risks to which licensees are exposed, thus lowering their cost of capital.

² Charge restriction conditions schedules to all the licences for the price-controlled companies provide for ‘disapplication’ of price controls. However, this provision has been considered lengthy and cumbersome by the companies. Another mechanism is ‘derogation’ from a certain requirement of the licence, provided the Bureau judges such derogation to be required by its statutory duties.

3.64 The Bureau would welcome views on the introduction of such a mechanism in the sector at this review.

4. Opex projections

Introduction

- 4.1 As mentioned in Section 2, the calculation of annual revenue requirements involves projections of annual operating expenditure (opex) over the control period. The term “Operating expenditure” or “opex” in this document refers to operating costs excluding depreciation. An exception to this is ADWEC, for which for convenience (few capital assets) we define opex to include capex and depreciation.
- 4.2 In view of its statutory duties and functions, the Bureau has to take into account three main considerations while assessing opex projections:
- (a) to ensure that the allowed revenue under the price controls is sufficient to enable the company to finance its business;
 - (b) to ensure the economy and efficiency of the sector, i.e., opex projections should reflect the costs expected of a reasonably efficient operator; and
 - (c) to ensure consistency in regulation, as much as possible, both over time and across the companies, for ease of understanding and prediction of future regulation by sector companies and potential investors in the sector.
- 4.3 This section discusses possible approaches to the assessment of future opex for PC4 and identifies the issues for consultation. One particular cost area that needs stronger incentives for the distribution companies is to reduce their customer debt to a reasonable level.

Possible approaches

- 4.4 There are a number of approaches available to assess opex allowances:
- 4.5 **Bottom-up approach:** Some regulators have adopted the approach of assessing or benchmarking each main item of expenditure of the company against that of similar companies in the sector or elsewhere. However, this requires the identification of suitable comparators from elsewhere and is highly data intensive. Often there is a limited amount of publicly available data on comparators, or there is variation in the way costs are categorised,

that prevents meaningful comparisons. The Bureau considers there is insufficient comparative data presently available to rely on a bottom up approach.

4.6 **Top-down approach:** An alternative (or complementary) approach is to assess the total opex of the company as a whole. This can take a number of forms:

(a) **Benchmarking:** Regulators can use benchmarking tools to assess the efficient levels of total opex for a company. Benchmarking tools vary from simple ratios of total opex to outputs (such as average total cost per customer) to more 'formal' techniques (e.g., regression analysis, data envelopment analysis) linking total opex (and capex or asset values) to multiple outputs and other factors. The Bureau used simple comparative assessments such as cost per unit of output when setting the PC1 controls in 1999 and in the past has investigated the scope for more sophisticated analysis.

(b) **Actual outturn costs with efficiency assumptions:** A regulator can also use recent or present cost levels of a company as the base level for future years, with adjustments to reflect reasonable expectations of future efficiency improvements and other factors. The Bureau applied this approach in setting PC2 and current price controls. The regulator needs to be aware of the possibility (and make adjustments where necessary) that such an approach may provide poor incentives towards the end of the price control period for licensees to reduce costs (if they think higher costs at the end of one control period will result in higher allowed opex for the next control period).

(c) **Extending previous projections with efficiency assumptions:** This approach is similar to (b) above, but uses the opex projected at the last review (instead of actual out-turn opex) as the base level for the next control period. This approach may be considered suitable if using actual out-turn costs would result, in the regulator's view, in an inefficient level of costs (for example, if the company has not achieved the assumed efficiency improvements in the previous price control period).

4.7 In practice, regulators will tend to use a combination of approaches and assess a wide range of information before forming a judgment about the opex

base level and efficiency improvement that can be reasonably expected from the company over the next control period.

- 4.8 They must also take account of any changes in demands or outputs over the next price control period, and of any significant changes expected in the real price of the main inputs used in the production process.

Bureau's approach to date

- 4.9 The Bureau has used the following top-down approach for the current controls for the sector companies:

- (a) **Base level of opex:** Determine a base level of opex by using the most recent actual level of opex;
- (b) **Adjustment for demand growth:** Adjust the base level of opex to reflect increased costs for future demand increases (a 0.75% increase in opex for each 1% increase in demand was adopted at the last price controls review);
- (c) **Adjustment for efficiency improvements:** Adjust the demand-adjusted opex for efficiency improvements expected over the control period (a 5% decrease in opex per year in real terms was used at the last price controls review); and
- (d) **Other adjustments:** Make further adjustments to opex projections which may be appropriate; for example, for one-off costs (or cost reductions) which were not observed in the past but are known about in advance for the future, or for anticipated changes in the real price of inputs used in the production process. At the last price control reviews, adjustments were made for additional opex allowance for upgrading customer's water installations (for AADC), additional responsibilities over the control period (for ADWEC), additional water pumping costs (for TRANSCO), and additional staff requirement and salary increases (for ADSSC).

Possible changes

- 4.10 The top-down approach explained above pays regards to the current levels of costs of the companies while at the same time providing strong incentives for efficiency improvement. In view of the main statutory considerations listed earlier, the Bureau favours this approach to projecting future opex and

intends to continue using it for the PC4 controls. Furthermore, the assumptions regarding demand growth and efficiency continue to be regarded as reasonable. However, the following two changes to the existing methodology will be considered:

- (a) **Base level of opex:** Generally, all sector companies continue to show increasing actual opex over time often in excess of the opex allowances made in the price controls. Some of this trend may be explained by general increases in the price level in the country or government policy (for example, towards public sector pay levels and allowances). This however requires further analysis, since using the most recent costs as the base level would increase the sector costs and subsidy. The Bureau will therefore consider the option of using (wholly or partially) the opex projected for 2009 at the last price controls review, converted into 2010 prices, as the base level of opex for the PC4 controls.
- (b) **Bad debt reduction incentive:** AADC and ADDC have continued to show increasing customer debt over time, to a level well in excess of international comparisons. While the Bureau has been discussing this issue with the companies, improvements to date have been limited. The Bureau is therefore considering introducing a direct incentive for debt reduction via assumed reductions in the bad debt provision incorporated into the opex projections. This would provide the distribution companies with a stronger incentive to reduce customer debt. However, if a company manages to lower its bad debt more quickly than the target assumed in the adjustment, it would earn higher profits than assumed in the price controls.

Bureau's current thinking

4.11 The Bureau is currently minded to use the same top-down approach, with the same adjustments for demand growth and efficiency, as used at the last price control reviews to project opex allowances for the PC4 period. However, it is for consideration whether:

- (a) for all companies, opex projected for 2009 at the last price control reviews, converted into 2010 prices, should be used (wholly or partially) as the base level of opex for the PC4 controls; and

- (b) for AADC and ADDC, an appropriate adjustment should be made to the opex allowances for the PC4 period by assuming a reduction in the bad debt provision in future.

5. Capex, asset valuation and depreciation

Introduction

5.1 For capital-intensive industries such as water, electricity and sewerage networks, capital costs account for a significant proportion of overall costs. As mentioned in Section 2, capital costs enter into the price control calculations in two ways, in the form of (i) return of capital (ie., depreciation) and (ii) return on capital (i.e., allowed profit). That is:

For network companies: Required revenue = Opex + Depreciation + Return on capital

5.2 Both of these capital-related components for each year are determined from the Regulatory Asset Values (RAVs) for that year. The RAV is updated each year for the capital expenditure in that year net of depreciation.

5.3 This Section 5 discusses the Bureau's approaches to the treatment of past and future capex, to the projection of depreciation allowances, and to the updating of RAVs for the network companies (AADC, ADDC, TRANSCO and ADSSC).

5.4 ADWEC, having negligible capital base but large turnover and associated risks, should be treated differently, as discussed in Section 3.

Treatment of past capex

5.5 The Bureau has to date adopted the "ex-post" approach towards the treatment of capex for all the sector companies subject to price controls (with provisional allowances for future capex). With this approach, the actual capex spent by a company is assessed at the end of the control period against the efficiency criteria established by the Bureau. Necessary financial adjustments are then made at the subsequent price control review to compensate (taking account of the time value of money and financing costs foregone or unduly earned) for the difference between the provisional capex allowed in the price controls and the actual efficient capex. The Bureau's efficiency criteria (as established in 1999 and applied consistently subsequently) are that the capex will be considered efficient if it:

- (a) was required to meet growth in customer demand or the relevant security standards; and

- (b) was efficiently procured (procurement to be interpreted both in relation to both the tendering process and project management).

Treatment of PC1 capex

5.6 For the PC1 period (1999-2002), provisional capex allowances for AADC, ADDC and TRANSCO were incorporated into the PC2 controls at the 2002 price control review. To finalise the assessment of actual efficient capex for the period, the Bureau undertook a review in 2004 of the efficiency of PC1 capex against the Bureau's efficiency criteria. The overall approach was to review the processes undertaken by the companies in planning, procuring and managing capex projects and to assess a number of selected projects. The findings of this review were as follows:

Table 5.1 Efficiency assessment of PC1 capex

Company	Capex efficiency
AADC	84%
ADDC	89%
TRANSCO	94%

Source: Bureau

- 5.7 These results were then applied to actual PC1 capex (accruals-based capex, including advances to contractors, taken from the cash flow statements in the audited SBAs), for both water and electricity.
- 5.8 At the 2005 price controls review, efficient PC1 capex so determined (net of accumulated depreciation) was incorporated into the RAVs for 2006 onwards for the PC3 controls. To ensure the licensees were appropriately remunerated in relation to the PC1 period, the net present values (NPVs) of the foregone financing costs (depreciation and return on capital) up to 2006 in respect of the difference between efficient and provisional capex were calculated using the cost of capital of 6% used to set PC1, and added to the opening 2006 RAVs.
- 5.9 The PC1 capex is a closed matter requiring no further adjustment at this review. Both the efficient PC1 capex and foregone financing costs included in RAVs will continue to earn depreciation and return on capital until they are fully depreciated at the end of their assumed average life.

Treatment of PC2 capex

5.10 For AADC, ADDC and TRANSCO, provisional capex allowances (of about AED 8 billion in total) for the PC2 period (2003-2005) were incorporated into

the PC2 controls at the 2002 price controls review. It was agreed at the 2005 review that:

- (a) The assessment of PC2 capex efficiency for both water and electricity businesses will be undertaken in 2006 against the Bureau's efficiency criteria by independent consultants appointed by the Bureau, when audited data for all PC2 years will become available; and
- (b) Any adjustment for differences between efficient and provisional PC2 capex (including foregone financing costs) will be incorporated at the 2009 price controls review in the same manner as used at the 2005 review for PC1 capex.

5.11 Accordingly, in September 2006, the Bureau appointed Sinclair Knight Merz (SKM) and WS Atkins as the independent consultants to undertake the efficiency review of PC2 capex for the electricity and water businesses, respectively. The consultants undertook this review over a period of about one year in close consultation with the Bureau and the companies. The consultants assessed both the capex processes and sample projects (of different types and sizes, and amounting for a majority of the capex spent) for each business, and produced several reports after considering the comments of all the stakeholders. The draft and final reports produced by the consultants for each company separately in May and November 2007 were shared with the companies.

5.12 The consultants' efficiency assessments of PC2 capex are summarised below:

Table 5.2 Efficiency assessment of PC2 capex

Company	Electricity	Water
AADC	92.6%	91.7%
ADDC	90.1%	88.0%
TRANSCO	93.6%	86.2%

Source: Bureau

5.13 The Bureau has a duty to promote sound investment processes and we would welcome the views of the respondents on precisely how the consultants' efficiency assessments should be applied. The Bureau is particularly interested in approaches that take into account the relative efficiency performance of the businesses, so as to provide an incentive to the better-performing companies.

- 5.14 Any adjustment would be applied to the actual PC2 capex (as per the audited SBAs for 2003-2005) to determine the efficient PC2 capex. Any difference between efficient and provisional PC2 capex (including foregone financing costs or unduly earned) will then be incorporated into the PC4 controls.
- 5.15 In the past, some companies suggested the recovery of foregone financing costs over a control period (as an addition to the revenue requirement) rather than through inclusion within the RAVs (over 30 years). Both approaches lead to the same remuneration in NPV terms. While the latter approach avoids large spikes in the revenue from one control period to another, the former reduces the delay in the cost recovery for the companies and causes less distortion to the RAVs. The former approach (remuneration over control period) would also reduce the complexity of the future price control calculations at future reviews.

Treatment of PC3 capex

- 5.16 At the 2005 review, provisional capex allowances (of about AED 13 billion in total) for the PC3 period (2006-2009) were incorporated into the PC3 controls for AADC, ADDC and TRANSCO and the following was agreed for the PC3 capex efficiency review:
- (a) PC3 actual capex will be assessed by independent consultants in 2010 (when the audited SBAs for all the years of the PC3 period will be available) against the Bureau's established efficiency criteria and the companies will be awarded "efficiency scores", in the same manner as that for the PC1 and PC2 capex reviews.
 - (b) However, in contrast to the PC1 and PC2 approach, the benchmark level of efficiency for PC3 capex will not be set at 100%. Rather, the benchmark level will be set such that positive adjustments for the relatively efficient companies will be offset by corresponding negative adjustments for the relatively inefficient companies.
 - (c) The resultant efficiency scores would then be subject to a further adjustment, to reflect movement in the capex efficiency frontier of the whole sector. This is to reflect improvements in capital efficiency that should be expected of the sector as a whole. The assumed movement in the capital efficiency frontier will be identified based on international evidence and best practice.

- 5.17 As a result of this approach for the PC3 capex, the most efficient company (or companies) may receive an allowance in excess of its actual spend, dependent on the extent of their relative efficiency and the relationship to the assessed movement in the efficiency frontier. Less efficient companies will receive less than their actual spend, but the shortfall can be minimised by matching the efficiency of other firms in the sector. Overall, customers would benefit from the efficiency improvement inherent within the movement of the sector's capital efficiency frontier.
- 5.18 This approach is consistent with the efficiency incentive characteristics of CPI-X regulation, and introduces a form of competition or yardstick regulation into the sector. By introducing the possibility of an upside as well as a downside in terms of remuneration of actual capex spend, the approach would reduce the perceived regulatory risk and possible impact of the efficiency review while at the same time providing a more positive incentive for capex efficiency.
- 5.19 Finally, the above assessment and resulting financial adjustment for foregone financing costs will be based on the cost of capital used to set PC3.

Treatment of ADSSC's 2005-2009 capex

- 5.20 For ADSSC, provisional capex allowances (of about AED 2.4 billion in total) for the period 2005-2009 were incorporated into its current price controls. It was agreed that, as for the other network companies:
- (a) The assessment of efficiency of actual capex over the current control period (2005-2009) will be undertaken in 2010 against the Bureau's established efficiency criteria, when audited data for all the years of the current control period will be available.
 - (b) Any adjustment to RAV for the differences between efficient and provisional capex for the current control period (including foregone or unduly earned financing costs) will be incorporated at a future price control review.
- 5.21 No adjustment is therefore required at this review for the past capex spent by ADSSC. The Bureau intends to undertake the capex efficiency review for 2005-2009 for ADSSC in 2010 along with the review for water and electricity network companies, when the audited accounts will be available for all the relevant years.

Bureau's current thinking

5.22 At this review, the Bureau intends to use the results set out in Table 5.2 above to inform the determination of efficient PC2 capex for AADC, ADDC and TRANSCO. The Bureau would welcome the views of the respondents on precisely how the consultants' findings should be used. Any difference between the efficient and provisional PC2 capex (including the foregone or unduly earned financing costs) would then be incorporated into the PC4 controls via an adjustment to the revenue allowance over the PC4 period.

Treatment of future capex at this review

5.23 The price control calculations use future capex projections (capex net of projected depreciation) to update the RAV from year to year over the control period. However, for capital-intensive industries, it is often difficult to determine upfront the amount of investment that will be required.

5.24 As with the previous price control reviews, an approach needs to be developed and agreed regarding the treatment of capex to be incurred by AADC, ADDC, TRANSCO and ADSSC over the PC4 control period. The recent Annual Information Submissions by these companies indicate significantly higher capex for future years than in the past. There are various new real estate and industrial developments being undertaken and planned in the Emirate of Abu Dhabi, which underpin these capex forecasts.

Possible approaches

5.25 There are two main approaches to the assessment and treatment of future capex while setting the price controls:

- (a) **ex ante** – includes an allowance for a forecast of future capex within the price controls, with no review (or only a limited review) subsequently of actual capex incurred; and
- (b) **ex post** – includes no allowance or only some provisional 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.

5.26 The ex-ante approach is widely used especially in developed countries and is often considered as internationally the best practice. There are also some variants of the two main approaches, especially the ex-ante approach. For

example, some UK regulators have adopted ‘menu regulation’ providing options for companies to choose from and incentives for accurate capex forecasting. However, we consider such an approach is not suitable for Abu Dhabi at present as it places a high emphasis on the accuracy of the capex ‘menu’ provided to licensees.

Assessment of approaches

- 5.27 Both ex-ante and ex-post approaches provide incentives for efficient capex but in different ways. In broad terms, the **ex ante** approach allows the companies to retain the benefits (in the form of depreciation and return on capital) of any under-spend compared to the projected capex until the next price review. The RAVs used to set the next controls are then 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.
- 5.28 The **ex-ante** approach places greater emphasis on the accuracy of the allowed capex projections included in the price controls, requiring costly and intensive preparation and assessment of the investment plans by a company and the regulator. The approach requires some ex-post assessment to ensure that any cost savings compared to allowed capex projections are the result of efficiency improvements rather than a failure to deliver anticipated outputs. It may expose the regulated company to particular risks if the future financing obligations of new capex (e.g., in respect of real estate developments) is unclear.
- 5.29 The **ex-post** approach may be regarded as more pragmatic in that it does not require an accurate forecast of future capex and can easily handle both anticipated and unanticipated investments. However, companies risk some capex already incurred being disallowed by the regulator and can (unless provisional allowances are sufficient) face cash flow problems in financing their operations due to a delay in compensation of efficient capex. To reduce risks, a set of clear-cut **efficiency criteria** are often established upfront against which the actual outturn capex incurred by a company during the control period can be assessed.
- 5.30 At the previous price control reviews, the Bureau indicated its willingness to consider the ex-ante approach to capex in future. However, the continuing lack of robustness of capex forecasts together with uncertainties associated

with new developments in the Emirate of Abu Dhabi, are likely to mean that the ex post approach remains more appropriate for the time being.

Bureau's current thinking

- 5.31 Given the uncertainty associated with capex forecasts, and the satisfactory working of the ex-post approach over the years, the Bureau is currently minded to continue with its ex-post approach. That is, provisional capex allowances for the PC4 period will be financed at this review and actual capex spent over the PC4 period will be assessed against the Bureau's efficiency criteria for any financial adjustment at the next review.
- 5.32 The provisional capex used in setting the price control is solely to facilitate the financing of capex and the smoothing of the price control revenue from one period to another, It is not intended to be indicative of the Bureau's views of the appropriate or efficient level of capex. Once the audited accounts for all the years of the PC4 period are available, the actual capex spent by all the network companies (including ADSSC) over the PC4 period will be assessed using the relative-efficiency score approach as agreed for PC3 capex for the water and electricity network companies.

Depreciation

- 5.33 Depreciation represents the return of capital invested by a company, often considered as a fund enabling the company to replace its capital assets upon the expiry of their useful life. As mentioned in Section 2, depreciation is one of the three building blocks of the revenue requirement calculations. In the price control calculations, depreciation for any year is calculated in relation to both the opening RAV for that year and the capex allowed for that year.
- 5.34 Calculation of depreciation requires assumptions about the appropriate depreciation profile and the average asset lives for the company. For all the companies, price control calculations to date have used the straight-line depreciation method both for initial RAVs and new capex.
- 5.35 As shown in **Table 5.3** below, the average asset life assumption for the price controls has varied across the companies, and between initial RAVs and new capex, reflecting the nature of their businesses and the accounting respective depreciation for the first year of the first control period:

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Table 5.3 Asset life assumptions at previous price control reviews

Business	Initial RAV			Life of New Capex	
	RAV Year	RAV	Depreciation	Implied Life	
		AEDm	AEDm	years	
AADC (E)	1999	1,516.140	78.780	19.25	30
AADC (W)	1999	129.320	3.850	33.59	30
ADDC (E)	1999	2,939.200	130.950	22.45	30
ADDC (W)	1999	845.560	57.130	14.80	30
TRANSCO (E)	1999	2,907.100	115.100	25.26	30
TRANSCO (W)	1999	2,053.187	113.645	18.07	30
ADSSC	2005	4,430.479	324.923	13.64	50

Source: Bureau

Notes: "E" stands for "Electricity" business and "W" stands for Water" business; All AED figures are expressed in price terms of the RAV Year

5.36 Once the initial RAV or the new capex is fully depreciated at the end of the respective life shown in the above table, the depreciation allowance associated with such initial RAV or new capex will be excluded (after the end of the respective life) from the revenue requirement calculations at the future price control review.

Bureau's current thinking

5.37 For the calculation of the depreciation for PC4 controls, the Bureau's current thinking is to continue with the straight-line method and asset life assumptions used to date for price controls as set out in **Table 5.3**.

Updating RAVs

5.38 To set a price control for a number of years, the opening and closing RAVs for each year need to be calculated. The closing RAV for a year is also the opening RAV for the next year. To calculate these RAVs, the Bureau intends to use the following approach (same as used at the previous price control reviews):

- (a) For all network companies other than ADSSC, the opening RAV for 2010 (i.e. the first year of the PC4 control period) is calculated from the 2009 closing RAV calculated at the last review by adding:
 - (i) the difference between efficient and provisional PC2 capex net of accumulated depreciation from the time such capex was spent up to the end of 2009; and
 - (ii) the NPV of the foregone financing costs on the differential PC2 capex in (i) above (alternatively, this amount could be

remunerated as additional revenue over the PC4 period, as described in paragraph 5.27).

- (b) For ADSSC, the opening RAV for 2010 is the closing RAV for 2009 calculated at the last review.
- (c) For all companies, the closing RAV for each year of the PC4 control period is calculated by:
 - (i) adding the provisional PC4 capex; and
 - (ii) subtracting the total depreciation for that year.
- (d) For all companies, the total depreciation for each year is calculated as the sum of:
 - (i) the depreciation on 2010 opening RAV;
 - (ii) the depreciation on the differential PC2 capex mentioned in (a)(i) above (not applicable to ADSSC); and
 - (iii) the depreciation on provisional PC4 capex for that year and earlier years.

6. Cost of capital

Introduction

- 6.1 Setting the price controls for network companies requires the determination of an allowed rate of return to be applied to the RAV each year to calculate the return on capital component of the annual revenue requirement. This allowed rate of return on capital is the regulator's estimate of the cost of capital of the companies. The cost of capital is the minimum return investors will accept for investing in a particular company, taking account of its risks.
- 6.2 This Section 6 discusses the overall approach to the calculation of the cost of capital for AADC, ADDC, TRANSCO and ADSSC.

Approach to cost of capital calculations

Conceptual framework

- 6.3 Companies are usually financed by a mixture of debt and equity. The cost of capital is therefore usually calculated as a weighted-average of the cost of debt finance and the cost of equity finance, often referred to as the Weighted Average Cost of Capital (WACC), as follows:

$$\text{WACC} = [\text{Cost of equity} \times (1 - \text{Gearing})] + [\text{Cost of debt} \times \text{Gearing}]$$

where gearing is the ratio of (i) debt to (ii) debt plus equity.

- 6.4 The Bureau's consultation papers on PC3 for water and electricity companies contain full details of the above approach. The most important features are:
- (a) The **cost of debt** is estimated by adding a suitable corporate debt premium to a risk-free rate:

$$\text{Cost of debt} = \text{Risk free rate} + \text{Debt premium}$$

- (b) The **cost of equity** is estimated by using the Capital Asset Pricing Model (CAPM):

$$\text{Cost of equity} = \text{Risk free rate} + (\text{Equity beta} \times \text{Market risk premium})$$

- (c) In addition to CAPM, there are other approaches such as Dividend Growth Model and Arbitrage Pricing Theory that can be applied to estimate the cost of equity. However, given the practical limitations to these other approaches, CAPM remains the method that is most widely used by regulators, businesses and investors.
- (d) The **risk-free rate** represents the return available from a completely riskless form of investment, typically, medium- to long-term government bonds.
- (e) **Debt premium** measures the additional return on debt required over and above the risk-free rate by a given business subject to uncertain cashflows and default risks.
- (f) **Market risk premium** is the extra return required by investors in the stock market as a whole for investment in equities (i.e. shares or stocks) compared to the risk-free rate.
- (g) The **equity beta** measures the riskiness of a given investment (i.e. buying shares of a specific business) relative to the average level of risk in the equity market.
- (h) Considering the cost advantages of debt at reasonable levels of gearing, the **gearing** needs to be set at an optimal level where overall risks and hence the WACC are at a minimum.

Calculation framework

- 6.5 The cost of capital can be expressed in different ways, for example, in real or nominal terms, and in pre-tax or post-tax form. Regulators vary in the way they express and use cost of capital. For example, some regulators use a real post-tax cost of capital, whereas others use a nominal pre-tax one or a “vanilla” form (a combination of pre-tax cost of debt and post-tax cost of equity). But it is important for the cost of capital to be consistent with the price control calculations. If a post-tax cost of capital is used, the tax payments the company is expected to make must be included as part of the costs it is allowed to recover through the price controls.
- 6.6 In Abu Dhabi, there is no corporate or business tax at present. The pre-tax and the post-tax measures of cost of capital are therefore equal. In many jurisdictions, taxation is applicable and investors are concerned with the return they receive after the deduction of taxes (i.e., the post tax cost of

capital). It is therefore the **post-tax** cost of capital that provides the relevant comparison for Abu Dhabi from other countries.

- 6.7 Further, since price controls are forward-looking, the cost of capital calculations should be based, where possible, on **forward-looking** estimates rather than simply historical data. Finally, since the Bureau's price control calculations are carried out in **real terms** (i.e. excluding inflation), the inputs to the cost of capital calculation should also be in real terms.

Bureau's current thinking

- 6.8 The Bureau intends to continue using a real, post-tax cost of capital estimated by applying the CAPM approach.

Bureau's cost of capital calculations

Bureau's use of capital market data to date

- 6.9 The cost of capital calculations require extensive capital market data on debt and equity costs and are based on stringent assumptions about the size, diversification and liquidity of capital markets. Since the establishment of the official UAE stock exchanges in 2000, along with a financial regulatory authority, there have been various positive developments in both the local and the regional capital markets. These have included listing of new companies, issue of corporate bonds, increase in trading volumes and decrease in restrictions on foreign investment. However, there remains a general lack of government bonds, public listing of utility companies and data and information required for cost of capital calculations.
- 6.10 In view of the above, the Bureau's cost of capital calculations to date have drawn heavily on the estimates of cost of capital components used by regulators of similar businesses in the UK and Australia subject to a similar regulatory regime. However, with the continuing improvements in the local and regional capital markets, these estimates were cross-checked against the information available from such markets in order to capture any particular factors that may be specific to the businesses operating in Abu Dhabi.

Bureau's cost of capital estimates to date

- 6.11 The Bureau used a real, post-tax cost of capital of 6.00% for setting the PC1 and PC2 controls for water and electricity companies. At the last price

controls review for AADC, ADDC and TRANSCO in 2005, it was noted that the interest rates on debt had fallen significantly and hence a basic cost of capital of 5.00% was used for PC3 controls (with certain additional premiums for AADC and ADDC due to risks and considerations specific to them). The Bureau also used a cost of capital of 5% for ADSSC while setting its current price controls in 2007.

- 6.12 The Bureau's cost of capital calculations adopted in late 2005 for setting PC3 controls for water and electricity companies are summarized in the following table:

Table 6.1: Bureau's cost of capital calculations for PC3 review

	Low	High
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 (real)	2.9%	3.0%
Equity Risk Premium	4.3%	4.7%
Equity Beta	0.86	1.00
Post-tax cost of equity (real)	6.5%	7.7%
Gearing	55.0%	45.0%
Post-tax cost of capital (real)	4.5%	5.6%

Source: Bureau's Final Proposals for PC3, 2005 Price Controls Review, 14 November 2005

Recent overseas regulatory decisions

- 6.13 **Table 6.2** below reproduces the recent regulatory decisions in the UK and Australia (published since January 2007) reported in the Bureau's consultation papers for the 2007 price control review for ADSSC.
- 6.14 The above table shows that the overseas regulators have recently estimated the post-tax cost of capital in the range of 3.83% - 5.20%, with a mid-point average of 4.52%.
- 6.15 In December 2007, the UK energy regulator (Ofgem) used a real, vanilla cost of capital of 4.94% for its final proposals on gas distribution price control review. This is equivalent to a real, post-tax cost of capital of 4.32%.
- 6.16 These recent overseas regulatory decisions indicate a lower cost of capital than 5% used by the Bureau in the last price control reviews. The Bureau will continue to assess overseas regulatory decisions over this price control review and its implications for the cost of capital calculations at this review.

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Table 6.2: Recent regulatory proposals in the UK and Australia on cost of capital

Regulatory proposal		Real post-tax WACC
1	Independent Pricing and Regulatory Tribunal (IPART) (May 2006), <i>Prices of water supply, wastewater and stormwater services, Gosford City and Wyong Shire Councils: final determination and report</i> , Australia	4.74%
2	Essential Services Commission (ESC) (June 2006), <i>Rural water price review: final decision</i> , Australia	5.2%
3	ESC (June 2006), <i>Water price review, southern rural water: determination</i> , Australia	5.2%
4	IPART (September 2006), <i>Bulk water prices for State Water Corporation and Water Administration Ministerial Corporation: report</i> , Australia	4.85%
5	ESC (October 2006) <i>Electricity distribution price review: final decision</i> , Australia	5.16%
6	Office of Gas and Electricity Markets (Ofgem) (December 2006), <i>Gas distribution price control review: final proposals</i> , UK	4.38%
7	Ofgem (December 2006), <i>Transmission price control review: final proposals</i> , UK	4.4%
8	Civil Aviation Authority (December 2006, confirmed in March 2007), <i>Airports price control review: initial proposals for Heathrow, Gatwick and Stansted</i> , UK	4.33% to 4.72%
9	ESC (March 2007), <i>2008 water price review: guidance paper</i> , Australia	5.1%
10	Economic Regulation Authority (March 2007), <i>Final decision on the proposed access arrangement for the South West interconnected network</i> , Australia	3.83%
Range of decisions		3.83%-5.20%
Mid-point		4.52%

Source: Bureau calculations based on various regulatory decisions in the UK and Australia

Latest capital market developments

6.17 Since the 2005 price control review, when the Bureau estimated the cost of capital of 5%, there have been two developments on the local capital markets which are of significance for the Bureau's cost of capital calculations:

- (a) Upgrading of the UAE's country rating by Moody's Investor Services by one level from A1 to Aa3, indicating a lower cost of capital for UAE companies than before.
- (b) Assigning of a credit rating of Aa3 by Moody's to Abu Dhabi National Energy Company or TAQA, a subsidiary of ADWEA holding significant ownership of the IWPPs in Abu Dhabi. This Aa3 rating is significantly higher (by 5 levels) than the minimum investment grade credit rating (i.e., Moody's Baa3) generally assumed by the regulators in the UK, Australia and the US, for businesses comparable to ADSSC and the water and electricity companies in Abu Dhabi. That is, the Abu Dhabi businesses should require a lower rate of return (by approximately 0.5 to 1 percentage points) than that estimated by the overseas regulators.

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- 6.18 More recently, there have also been important developments in the international capital markets. In particular, the markets have seen significant volatility in the equity markets and declines in the risk-free rate (as low as 2% p.a. in nominal terms) as well as the overall cost of debt³. In the UAE, the inter-bank interest rates for tenors of 3 months to one-year are presently in the range of 4%-5% p.a., implying a negative interest rate in real terms (with current UAE CPI inflation estimated in double digits).
- 6.19 These capital market developments also suggest lower cost of capital than the Bureau's estimate at the last reviews. However, a forward-looking approach is required for price control calculations. To address this, some regulators have considered linking the cost of capital to a benchmark interest rate to automatically capture the capital market volatilities over time. This approach is however complex and transfers the capital market risks from the companies to the customers, which may be not desirable. Nevertheless it may be considered if capital markets are particularly unpredictable at the time of setting the PC4 controls.

Bureau's current thinking

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

³ "Setting price limits for 2010-15 – Framework and approach", Ofwat, UK, March 2008.

7. Performance incentive scheme

Introduction

- 7.1 By effectively capping revenues for a medium term period, CPI-X price controls give companies an incentive to reduce costs. However, such price controls do not by themselves provide incentives to companies to meet service standards or improve their output performance. Regulating prices without corresponding regulation of outputs runs the risk of companies increasing profits at the expense of their service quality.
- 7.2 At the 2002 price controls review, the Bureau introduced a Performance Incentive Scheme (PIS) for the price-controlled water and electricity companies, which was further enhanced at the 2005 price controls review. RASCO and ADSSC are also subject to similar but simpler PIS schemes under their present price controls.
- 7.3 This Section 7 describes the current PIS and the potential changes for the future PIS.

Current Scheme and Indicators

- 7.4 For all the companies, there are two types of performance indicators which are incentivised under the PIS, namely Category A and Category B indicators.
- 7.5 **Category A** performance indicators are incentivised on a year to year basis through a mechanistic annual financial adjustment to MAR in the next year through the term 'Q'. To limit the financial risks for the companies, the overall adjustment to MAR for these indicators is capped at 4% of MAR each year. Most businesses have the timeliness of the audited SBAs, PCR's and AISs as Category A indicators. Except for ADSSC and RASCO, Category A also includes one or two technical indicators (incentivising their system operation such as reliability, availability and demand forecasting accuracy). The following table lists the current Category A indicators:

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Table 7.1 Current Category A Indicators

Company	Electricity	Water	Wastewater
AADC / ADDC	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS No. of Interruptions per Customer Customer Minutes Lost per Customer	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Water Quality	
TRANSCO	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Availability Energy Lost (Unsupplied)	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Water Quality	
ADWEC	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Accuracy of Peak Demand Forecast	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Accuracy of Peak Demand Forecast	
ADSSC			Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS

Notes: SBAs = Separate Business Accounts; PCR = Price Control Return; AIS = Annual Information Submission

7.6 However, not all performance indicators are suitable for linking directly to the price control. **Category B** performance indicators are monitored during the control period for a possible positive or negative financial adjustment to future revenue at the next price control review for particularly good or poor performance during the current control period. The total financial adjustment for Category B is capped at 2% of MAR each year. **Table 7.2** below lists the current Category B indicators.

7.7 Over time, the Bureau has introduced new Category A indicators or moved some indicators from Category B to Category A. However, given the automatic mechanistic adjustments to MAR, Category A indicators must meet the following objective criteria established by the Bureau at earlier price control reviews:

- (a) **Measurable:** Companies must be able to accurately measure performance outputs;
- (b) **Verifiable:** The regulator must be able to verify the company's measurement of outputs;
- (c) **Non-manipulable:** The measurement of the outputs must not be open to manipulation by the company to improve its reported performance;

- (d) **Non-distortionary:** Incentivising one aspect of performance must not unduly detract from the company's performance in other areas which are not similarly incentivised; and
- (e) **Customer-oriented:** The output must be significantly and positively valued by customers of the company or other stakeholders.

Table 7.2 Current Category B Indicators

Company	Category B Indicator
AADC / ADDC	Technical Key Performance Indicators (KPIs) Customer satisfaction (Guaranteed / Overall Standards) Interim profit & loss account timeliness Meter reading Five-Year Planning Statement timeliness
TRANSCO	Technical KPIs Settlement data accuracy and timeliness Planning data accuracy and timeliness Interim profit & loss account timeliness Five-Year Planning Statement timeliness Timeliness of Transmission Use of System Charges Statement Economic despatch
ADWEC	Generation Security Standard Desalination Security Standard Interim profit & loss account timeliness Seven-Year Planning Statement timeliness BST timeliness
ADSSC	Performance of sewerage system (e.g., availability and reliability) Customer complaints (e.g., in relation to odour and flooding) Performance against guaranteed service standards for customers Compliance with standards at treatment plants Meeting targets for recycling of treated effluent and biosolids Environmental performance Interim profit & loss account timeliness Five-Year Planning Statement timeliness

Potential changes to PIS

7.8 Given the positive results that the PIS has achieved in terms of improving companies' performance on the targeted measures, the Bureau believes it should be further expanded to other aspects of companies' performance, where possible. The following changes can be considered for further improvement of the scheme:

PIS bonuses for timeliness indicators

- 7.9 The submissions of audited PCRs, audited SBAs and AIS are requirements of the companies' licences. The companies are required by their licences to fulfil these obligations irrespective of the PIS. They were first introduced as the PIS indicators at the 2002 review in view of the unavailability of audited accounts and PCRs for any year since 1999. This introduction has served its purpose, as the companies have put in place the required systems and now submit these statements on a regular basis.
- 7.10 It is therefore questionable whether bonuses should continue to be available simply for meeting a licence requirement. It is for consideration whether the PIS bonuses for one or more of the timeliness indicators should be removed from the PC4 controls and only the penalty for delayed submission should apply in those cases.

PIS target dates for timeliness indicators

- 7.11 At present, the target dates for timeliness indicators are spread evenly over the course of the year. Audited PCRs, audited SBAs and AIS are required to be submitted by 31 March, 30 June and 30 September each year, respectively. However, the audited PCRs and audited SBAs have similar contents and require very similar work to be done by the companies and their auditors. Being prepared at different dates, the two submissions sometimes have differences or discrepancies which are difficult to explain and in any case should be avoided.
- 7.12 Furthermore, the distribution companies have expressed concern that any delays in ADWEC finalising the BST Exceptional Charges for the prior year (usually undertaken in February each year) may make it difficult for them to meet the 31 March deadline for the PCR.
- 7.13 The Bureau is therefore considering changing the target dates of both PCRs and SBAs to a common date (30 April). This date would be consistent with the requirements of the UAE Commercial Companies Law No.8 of 1984 for the companies to prepare and approve the audited accounts within four months from the end of the financial year (although there are more stringent requirements for listed companies and banks in the UAE).
- 7.14 The target date for AIS can also be changed to, say, 31 October, to address licensees' concerns that the present submission date (30 September) falls too close to the main holiday period.

Individual cap on PIS bonus/penalty for Category A

- 7.15 As mentioned earlier, there is an overall cap on the total bonus and penalty for Category A indicators (equal to 4% of MAR for the year). Each timeliness indicator is also subject to an individual cap on the PIS bonus (equal to 6 times the monthly incentive rate) and on the PIS penalty (equal to 12 times the monthly incentive rate). However, the technical indicators do not have such caps.
- 7.16 This has created issues in some cases. For example, over recent years, the Energy Lost indicator for TRANSCO has shown significant variability, which was not foreseen when the indicator was first introduced. In certain years, the resulting large bonuses and penalties for this indicator (exceeding the 4% overall cap) would have made TRANSCO indifferent to its performance on other Category A indicators. Such effects of variability of the technical indicators are undesirable and contrary to the objective of the PIS.
- 7.17 The Bureau is therefore currently minded to introduce an individual cap on the PIS bonus and penalty for each technical Category A indicator. A cap equal to, say, 1% of annual MAR seems reasonable, and is broadly consistent with the individual caps for the timeliness indicators.

Loss or leakage-related Category A indicators

- 7.18 As discussed in Section 3, it may not be appropriate to continue with the 'metered units distributed' revenue driver in its present form, as it provides no incentive for companies to encourage efficient consumption by their customers. New Category A indicators may therefore be required for AADC and ADDC to provide direct incentives for reduction in electricity losses and water leakage and for metering. However, this would require specific definitions for such indicators and reliable data to measure them, both of which may be problematic.
- 7.19 As discussed in Section 3, incentivising improvements in the ratio of (a) measured water (or electricity) delivered to customers to (b) water (or electricity) received by distribution companies from the transmission system could serve to incentivise both metering and loss reduction by distribution companies. Further, if such a ratio is selected as a Category A indicator, it should have a higher individual cap on its incentives (higher than 1% of annual MAR discussed above) to provide strong incentives.

Water network reliability / availability related Category A indicators

7.20 In line with the reliability and availability-related Category A indicators for electricity networks (measured in terms of interruptions, customer minutes lost, energy lost or otherwise), the Bureau would welcome suggestions for similar indicators for the water networks of AADC, ADDC and TRANSCO, provided the objective criteria for Category A are met.

Technical Category A indicator(s) of ADSSC

7.21 As with the other networks, one or more Category A indicators should be considered for ADSSC to provide incentives to improve technical aspects of its operations, such as network availability and reliability. Suggestions for suitable measures for ADSSC would be welcomed from respondents.

SAIFI-related Category A indicator for AADC and ADDC

7.22 The electricity businesses of AADC and ADDC currently have two technical Category A indicators, namely the number of interruptions per customer and the customer minutes lost per customer. These are similar to, but not exactly the same as, the technical KPIs of System Average Interruption Frequency Index (SAIFI) and System Average Interruption Duration Index (SAIDI), often used by the utilities. During the measurement and audit process, there was confusion between these Category A indicators and technical KPIs. In particular, the exclusion of SAIFI from the current list of Category A indicators has been questioned (an alternative measure, number of interruptions per customer, is monitored as Category A indicator). It is for consideration whether a new Category A indicator defined and measured as SAIFI is needed to provide incentives which are not provided by the existing indicators.

Water Quality Indicator

7.23 A performance indicator for overall water quality was introduced into the PIS for the first time during the PC3 period, for the distribution companies and TRANSCO. The Bureau is presently considering whether to further develop this indicator into a system of water quality indices. These indices would represent small groups of parameters that will give a measurable indication of the quality of water for that index. The indices currently under consideration are 'process control', 'disinfection control', 'transmission performance', 'reservoir integrity', and 'transmission maintenance'. Weighting would be assigned to each index based on their

relative priority for public health and an over-all score given. The Bureau is considering the practicality of introducing such changes in time for the PC4 period and will, if appropriate, bring forward specific proposals later in the review process.

Confidence grading system for all technical indicators

- 7.24 At present, the licence or the Bureau does not prescribe a confidence grading system for assessing the accuracy of the data used for measurement of the technical Category A indicators. There is however a requirement for the reasonableness of the methods and data to be assessed by the Technical Assessor. The Technical Assessor has developed and used a system for this purpose, as well as for the AIS.
- 7.25 Other regulators, such as the UK water regulator (Ofwat), prescribe a confidence grading system to grade both the methodology to collect and measure the data (the “**reliability**”) and the accuracy of such data (the “**accuracy**”). The Bureau would like to assess with the companies whether such system should be introduced for all the technical indicators under Category A.

Bureau’s current thinking

- 7.26 The Bureau’s initial thinking is to retain the existing PIS for all companies for the new controls, with the following considerations:
- (a) The PIS bonuses of the Category A timeliness indicators should be removed so that only a penalty for delayed submission should apply.
 - (b) The PIS target dates for both PCRs and SBAs should be changed to 30 April, while extending the target date for AIS to 31 October.
 - (c) The PIS bonus and penalty for each technical Category A indicator should be subject to an individual cap of 1% of annual MAR.
 - (d) New Category A indicators may be introduced for AADC, ADDC and TRANSCO to provide direct incentives for metering and for reducing electricity losses and water leakage.
 - (e) New Category A indicators may be introduced for the water networks of AADC, ADDC and TRANSCO and for the sewerage network of ADSSC to provide incentives for improved system performance.

- (f) Whether a new Category A indicator defined and measured as SAIFI is needed for the electricity businesses of AADC and ADDC to provide incentives which are not provided by the existing indicators?
- (g) For all Category A technical indicators and for the AIS, a confidence grading system may be introduced based on twin measures of reliability and accuracy.

8. Financial adjustments

Introduction

8.1 The previous sections discuss various “building-blocks” of the price control calculations, including opex projections, capex allowances, depreciation and return on capital. As discussed in Section 2, the required revenue for each year of the control period can be calculated as follows:

$$\text{Required Revenue} = \text{Opex} + \text{Depreciation} + \text{Return on Assets}$$

8.2 Annual required revenues are then discounted to determine their present values at the beginning of the control period and then summed to calculate the present value of the total required revenue for the period.

8.3 At the 2005 price control review, the Bureau made a number of additional one-off adjustments for various reasons not captured by the traditional revenue requirement calculation. Such adjustments may be required, for example, to correct errors in audited PCRs or to reward (or penalise) the companies for good (or poor) performance on Category B indicators or other aspects of their performance. Therefore, in simple terms, the required revenue formula can be re-stated as follows:

$$\text{Required Revenue} = \text{Opex} + \text{Depreciation} + \text{Return on Assets} + \text{Financial Adjustments}$$

8.4 Alternatively, certain financial adjustments may, due to their nature, need to be applied via adjustments to the RAVs, rather than applied directly to the revenue requirement calculations.

8.5 The financial adjustments that the Bureau may need to make at this review can be grouped as follows (consistent with the grouping used at the 2005 review):

- (a) **Financial adjustments for performance on PIS Category B:** These are the financial adjustments that may be required to be made to each company’s future revenue for its performance on Category B indicators under the PIS since the last price controls review.
- (b) **PCR-related financial adjustments:** These adjustments may be required for mis-statement of revenue drivers and/or regulated

revenue in the audited Price Control Returns (PCRs) since the last price controls review.

- (c) **Financial adjustments for asset transfer / disposal:** For price-controlled companies which have transferred assets to any other price-controlled company or to a third-party or have otherwise disposed of any of their assets, it may be necessary to apply appropriate adjustment to either their RAVs or revenue requirement at this review. Similarly, adjustments may be required for assets transferred to or otherwise acquired by licensed companies (but only to the extent not included within the financing of capex).
- (d) **Other financial adjustments:** This group covers certain other adjustments not covered by the above groups.

8.6 Possible financial adjustments required are discussed below in turn. Note that the groups, or the items covered by these groups, may not be an exhaustive list of all possible financial adjustments required at this review. During the course of this review, the Bureau will consult with the companies on any other financial adjustment that may be required.

8.7 Many of the adjustments relate to past years. Where appropriate, the adjustment will need to 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.

Financial adjustments for performance on PIS Category B

8.8 As discussed in Section 7, 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 company's performance on various aspects of their operations and licence compliance (see **Table 7.2** in Section 7). It was then agreed that the companies' performance on these indicators will be monitored during the present control period for a possible positive or negative financial adjustment to the future revenue at the 2009 price control review for particularly good or poor performance. Any adjustment would also cover 2005 (the last year of the PC2 price control period), since data for this year only became available after the conclusion of the 2005 price controls review.

8.9 To limit regulatory discretion, it was agreed that any such adjustment would be limited to 2% of MAR in relation to the licensees' 'own costs' (i.e. excluding pass-through items) for the year in question. Furthermore,

adjustments would only be made where performance is exceptionally good or poor, and the Bureau would expect to notify the licensee in advance if its performance on any Category B indicator was giving rise to concern sufficient to trigger a potential adjustment at the following review (as has been the Bureau's practice).

- 8.10 While the performance of some companies has not been satisfactory in respect of certain Category B indicators, for example timeliness of planning and charging statements, the Bureau has not yet conveyed to the companies its firm intention to apply any negative adjustment for such performance at this review.
- 8.11 The Bureau will continue to monitor the performance of the companies on Category B indicators during 2008-2009 before the Final Proposals for PC4 are issued in September 2009. However, any adjustments for performance in respect of 2009 may need to be deferred to the next price controls review (approximately 2013). The companies therefore have opportunity and more time before the conclusion of this review to further improve their performance to increase net rewards (reduce net penalties) under the scheme.

PCR-related financial adjustments

- 8.12 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. The PCR shows the audited MAR derived from outturn revenue drivers and the audited regulated revenue recovered during the year. In some past PCRs, some revenue drivers and/or regulated revenues were mis-stated (for example, due to the inappropriate exclusion of certain income). In some cases, this provided undue financial benefits to the companies against the intent of the then-prevailing price controls.
- 8.13 At the 2005 price control review, the Bureau restricted financial adjustments to the PCRs to the PC1 period and reserved any adjustments in respect of the PC2 PCRs to this review.
- 8.14 In some cases, where errors were identified in the PCR they were corrected in the following year's PCR. In those cases, no further adjustment at this review is required.
- 8.15 The Bureau is presently assessing such adjustments for both the PC2 period and the current control period to date. If any specific necessary adjustments

are identified, these will be discussed in future consultations papers of this review.

Financial adjustments for asset disposal or transfer

- 8.16 Since the first price controls were set for each company, the RAVs have been de-linked from the accounting values and are rolled forward for the efficient allowed capex net of depreciation.
- 8.17 Where the price-controlled companies have transferred their assets to each other, or disposed of assets otherwise, the company 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.
- 8.18 This therefore requires appropriate financial adjustment to the RAVs at this review for the assets transferred and the associated depreciation and return on capital. Alternatively, consistent with the approach applied at the 2005 price control review, the actual capex allowances to be adopted for ex-post treatment (as per Section 5) can be reduced by the income received by a company from such asset disposal, provided this reflects the value of the assets.
- 8.19 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.
- 8.20 Further adjustments may be required depending on whether or not incomes from asset sales / transfers have been included within the “regulated revenue” in the audited PCRs.
- 8.21 The Bureau is currently reviewing the PCRs since the last price controls review, together with information in the AIS, and, if necessary, will be requesting additional information on asset transfers and disposals from the companies.

Other financial adjustments

8.22 At present, the Bureau is aware of the following additional areas where a financial adjustment at this review may be necessary:

Implementation of Bureau's approved large customer tariff

8.23 Under Condition 30 of their licences, the distribution companies are required to offer special tariffs to large users. One such tariff has been determined (in 2006) for TRANSCO, which requires large amounts of electricity for water pumping purposes. However, while the Bureau understands that ADDC has implemented this special tariff, the Bureau understands that AADC has yet to do so.

8.24 The Bureau is therefore currently minded to apply a negative financial adjustment to AADC's future revenue equal to the amount billed by AADC to TRANSCO in excess of the approved special tariff.

Impact of transmission system constraints

8.25 At the 2005 price control review, the Bureau determined that an adjustment would be calculated and applied to TRANSCO's future revenue at the 2009 price control review - equal to 50% of the availability payments unnecessarily incurred by ADWEC under the PWPA for the Shuweihat (S1) project - as a result of the delays in the completion of the associated water transmission system. The Bureau therefore intends to implement this adjustment at this review.

8.26 In 2007, the Bureau announced its intention to introduce a similar incentive mechanism for TRANSCO to remove other water network transmission constraints, particularly in relation to water supplies to AADC which are subject to transmission constraints for a number of years.

8.27 In April 2008, the Bureau confirmed that, from 1 January 2009, TRANSCO will bear a cost equal to 50% of the available payments paid by ADWEC to production companies under PWPAs in respect of water which is made available by producers but which cannot be supplied to final customers due to transmission constraints. This equals to about AED 4 for each thousand imperial gallons (TIG) of water unsupplied by TRANSCO.

8.28 The Bureau will therefore monitor TRANSCO's performance on transmission constraints from 2009 onwards, and the required financial adjustment will

be made at the next price control review. TRANSCO is therefore provided with a very strong incentive to minimise any further delays in addressing constraints in its transmission system.

Delay in customers' water asset installations

- 8.29 At the 2005 price controls review, the Bureau allowed in the PC3 controls for AADC an additional opex allowance of AED 25 million spread evenly across 2006 and 2007 for costs associated with the upgrading of customers' water installations to facilitate the completion of a 24-hour water supply in AADC area. This was based on AADC undertaking a survey of all of its water customers and an assumption that, of these, 15,000 will require minor works and 5,000 will require significant works.
- 8.30 However, only about half of customer properties had been surveyed by the end of 2007 and the survey was still not completed by mid 2008. Furthermore, 'significant works', for which an allowance of AED 14 million (within the total allowance of AED 25 million) was allotted in PC3 controls, had amounted to only AED 0.6 million by mid 2008.
- 8.31 In August 2008, the Bureau wrote to AADC stating that it would not be appropriate for AADC to receive financial benefit from any failure to expend the allotted funds, or from any delay in expending the allotted funds. A financial adjustment would therefore be required at this review to ensure AADC is remunerated only for expenditure which it has incurred, at the time that it was incurred. Further, on AADC's request, the Bureau granted an 18-month extension for completion of this program up to 30 June 2009 so that the appropriate adjustment can be made to the PC4 controls.
- 8.32 Accordingly, the Bureau intends to make appropriate financial adjustment at this review for AADC based on the actual costs and actual timings of costs incurred by 30 June 2009. The Bureau may require this data to be independently audited before confirming the level of expenditure to be remunerated.

Delay in water interface metering

- 8.33 As described in Section 3, metered peak demands and metered units transmitted are revenue drivers for TRANSCO. 'Metered' in this case refers to the interface meter between the transmission and distribution systems. Delays in completing the interface metering to the standards required by the Metering and Data Exchange Code (MDEC) has meant that TRANSCO has

received a lower MAR during PC3 than projected when the price controls were set.

- 8.34 While TRANSCO has an obligation under its licence to ensure that appropriate metering is installed at these interfaces, the interface meters themselves are owned by the distribution companies. In practice, the procurement of the meters has been undertaken in part by TRANSCO and in part by the distribution companies. TRANSCO has argued that as the delays in completing the interface metering are attributable in some degree to the distribution companies, then they should share some of the financial (MAR) impact borne by TRANSCO associated with such delays.
- 8.35 The Bureau is presently assessing sector performance in 2008 on this matter and will consider TRANSCO's arguments as part of that review.

Bureau's current thinking

- 8.36 The Bureau is presently assessing the need for any potential financial adjustments at this review for:
- (a) companies' performance on PIS Category B indicators;
 - (b) any mis-statement of revenue drivers and/or of regulated revenue in the PCRs since the last review;
 - (c) disposal or transfer of assets by companies since the last review; and
 - (d) distribution companies' share in the responsibility for delays in the water interface metering programme.
- 8.37 At this review, the Bureau intends to make financial adjustments for:
- (a) AADC's failure to implement the Bureau's approved large customer tariff for electricity supply to TRANSCO (based on the resulting excess billing to TRANSCO);
 - (b) delays in completion of transmission system by TRANSCO for S1 production plant (based on 50% of PWPA availability payments unnecessarily incurred by ADWEC); and
 - (c) delays in completion of customers' water asset installations by AADC for which an additional opex allowance was made in the PC3 controls

(based on actual progress and timings of cost incurred up to 30 June 2009).

8.38 Finally, the Bureau intends to introduce a further mechanism to provide incentives for TRANSCO to remove water transmission constraints. Under this mechanism, a financial adjustment would be made at the next price control review for any transmission constraints remaining after early 2009 for water supplies to AADC or elsewhere.