



مكتب التنظيم و الرقابة  
Regulation & Supervision Bureau

Consultation Document

## 2013 Price Controls Review

### PC5 First Consultation Paper

4 April 2012

CR/E02/040

[www.rsb.gov.ae](http://www.rsb.gov.ae)

water, wastewater and electricity sector of the Emirate of Abu Dhabi

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# 2013 Price Control Review

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## Foreword

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1. This document marks the commencement of the periodic review by the Regulation and Supervision Bureau of the price controls that apply to the following four water, wastewater and electricity network 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); and
  - (d) Abu Dhabi Transmission and Despatch Company (TRANSCO).
2. The present price controls for these companies are due to expire on 31 December 2013. New price controls (to be termed the fifth price controls or PC5) are therefore required to be set to take effect from 1 January 2014. This first consultation paper sets out a number of high-level issues which need to be considered in setting the PC5 controls and on which the views of respondents are sought.
3. Written responses to the issues raised in this paper should be sent by **6 June 2012** to:

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

**NICK CARTER**  
Director General



# Executive Summary

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## Introduction

1. This first consultation paper sets out the high-level issues which need to be considered in setting new price controls for AADC, ADDC, TRANSCO and ADSSC. The views of respondents are sought by **6 June 2012**.
2. We intend to publish our second consultation paper in September 2012. Our draft and final proposals on PC5 are scheduled for publication in March 2013 and September 2013, respectively.

## Objectives of the review and the main incentives (Section 2)

3. The management and operation by licensees of the electricity, water and wastewater networks (and their regulation by the Bureau) faces a number of challenges in terms of:
  - (a) ensuring that spending on operating and capital costs is efficient;
  - (b) achieving best international practice in the management and operation of networks that provide essential services; and
  - (c) meeting rapid growth in the demand for services.
4. In the light of these challenging circumstances, it is for consideration how best to regulate the sector and what should be the priorities and main incentives that the Bureau should seek to put in place for the next price control period. Key issues for consultation include the following:
  - (a) Are the six core activities and incentives as discussed in paragraph 2.4 - capital efficiency, asset management and performance, availability/security/quality of supply, high quality information, adequate funding and Emiratisation/efficiency programmes - those that this price control review should focus on?
  - (b) How can the performance incentive scheme or other price control incentives be improved to encourage licensees to perform better on the core activities mentioned above? Are there better and/or more direct ways of incentivising best practices in these core activities through the price controls? Are there other steps that the Bureau should take to improve licensees' performance in these areas?
  - (c) Whether the sector is willing to drive forward restructuring with a view to improving efficiency and effectiveness and if so how this should be taken account of at this price control review?
  - (d) Would it be appropriate to set PC5 controls for ADSSC for 3 years (2014-2016) and for AADC, ADDC and TRANSCO for 5 years (2014-2018), thereby creating a more robust and focused timetable for future price control reviews, and, allowing for changes to ADSSC's price control following decisions on the possible development of a non-drinking water licensee?

## Operating and capital costs (Section 3)

5. It is important that the price controls make appropriate allowances for both operating expenditure (opex) and capital expenditure (capex), to encourage efficiency and make sure there are sufficient funds to allow for the development of secure and robust networks, consistent with the delivery of critical utility services.
6. This price control review provides an opportunity to strengthen the incentives on licensees for operating and capital efficiency and to ensure that where practicable licensees have in place best international practice for managing these costs. A number of steps have already been taken to address the issues including:
  - (a) plans of more effective and timely review of PC4 capex (covering the period from 2010 to 2012); and
  - (b) appointment of consultants to review the recent opex increases and the existing accounting arrangements and advise reasonable opex allowances and robust regulatory accounting arrangements for future.
7. Key issues for consultation include the following:
  - (a) How can the assessment of opex be best improved from the approach adopted by the Bureau in PC4? How should the approach deal with any relationship between opex and capex and key drivers of future operating costs and enhance the incentives to manage operating costs more efficiently?
  - (b) How can the price controls and related incentives be best enhanced so they are consistent with the Government's Emiratisation policy?
  - (c) Whether the planned support from external consultants to establish the provisional allowances for future capex supports or justifies any change to the approach to regulation of PC5 capex?
  - (d) How can the ex-post approach to regulating capital expenditure be best improved? Would there be merits of an interim review of capex in the middle of the PC5 period to ensure that the regulation of capex is as timely as practicable?

## Financial issues (Section 4)

8. To date, the Bureau has used the building-block approach to calculate the overall level of core price control revenue for each company to take account of the three key building blocks or allowances (operating cost, regulatory depreciation and regulatory returns). Capital expenditure is financed over an assets' estimated economic life, which may be many years, through inclusion in the regulatory asset value (RAV) and the calculation of allowances for regulatory depreciation and regulatory returns. An estimate of the licensee's cost of capital is used in conjunction with the RAV to calculate regulatory returns. Key issues for consultation include the following:
  - (a) Does the existing approach to financing capex and calculating RAVs and regulatory depreciation remain reasonable?

- (b) Does the existing approach to estimate the cost of capital on the basis of a real, post-tax cost of capital using Capital Asset Pricing Model (CAPM) and both overseas and local capital market data remain appropriate?
- (c) In addition to the basic estimates of operating costs, regulatory depreciation and regulatory returns, what further financial adjustments might be appropriate when calculating the core level of price revenue?

# Glossary

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AADC	Al Ain Distribution Company
ADDC	Abu Dhabi Distribution Company
ADSSC	Abu Dhabi Sewage Services Company
ADWEA	Abu Dhabi Water and Electricity Authority
ADWEC	Abu Dhabi Water and Electricity Company
AIS	Annual Information Submission
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
CML	Customer Minutes Lost
CPI	Consumer Price Index
DLR	Distribution Loss Reduction
DSM	Demand Side Management
IM	Interface Metering
KPI	Key Performance Indicator
MAR	Maximum Allowed Revenue
Opex	Operating Expenditure
PC1	First Price Control covering the period 1999-2002
PC2	Second Price Control covering the period 2003-2005
PC3	Third Price Control covering the period 2006-2009 (for ADSSC, mid-2005 to 2009)
PC4	Fourth Price Control covering the period 2010-2013
PC5	Fifth Price Control covering the period 2014 onwards
PCR	Price Control Return
PIS	Performance Incentive Scheme
PWPA	Power and Water Purchase Agreement
RAG	Regulatory Accounting Guideline
RAV	Regulatory Asset Value
SAIFI	System Average Interruption Frequency Index
SBA	Separate Business Account
STA	Sewage Treatment Agreement
TA	Technical Assessor
TRANSCO	Abu Dhabi Transmission and Despatch Company
WACC	Weighted Average Cost of Capital

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# 1. Introduction and background

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## This review

- 1.1 The network companies in the electricity, water and wastewater sector in the Emirate of Abu Dhabi are natural monopolies where competition is limited or impractical. This is in contrast with electricity and water production where there is competition between bidders to build new generation and desalination plant. The Bureau has therefore established price controls to constrain the market power and to incentivise the performance of the network companies:
- (a) For **AADC**, **ADDC** and **TRANSCO**, the first price controls (PC1) were set in 1999 to run for three years and were then extended for a further year to cover the four year period 1999-2002. The second price controls (PC2) were set in 2002 to apply for three years (2003-2005), followed by the third price controls (PC3) set in 2005 for four years (2006-2009).
  - (b) 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.
  - (c) In 2009, the current (fourth) price controls (PC4) were set for **AADC**, **ADDC**, **ADSSC** and **TRANSCO** to apply for four years (2010-2014).
- 1.2 These price controls are described in detail in the Bureau's previous consultation and proposal papers which are available on the Bureau's website ([www.rsb.gov.ae](http://www.rsb.gov.ae)).
- 1.3 The current PC4 controls are due to expire at the end of 2013 and this requires new price controls to be in place to take effect from 1 January 2014. This document starts the consultation process to set the new PC5 controls for the four network companies (AADC, ADDC, ADSSC and TRANSCO) and is structured as follows:
- (a) Section 1 provides an introduction and background.
  - (b) Section 2 discusses the objectives of the review and main incentives that should be the focus of the new price control arrangements.
  - (c) Section 3 discusses the operating and capital cost allowances that will be appropriate to support these objectives and incentives.
  - (d) Section 4 discusses the financing of capital expenditure and how to calculate the overall levels of the new price controls.

## The role and duties of the regulator

- 1.4 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 and it is through licence conditions that the Bureau is able to regulate the conduct of sector companies. In doing so, the Bureau must have regard to its statutory duties and functions, which are summarised below:

- (a) 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". The Bureau 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 consumers .....as to the terms and conditions and price of supply (whether consumers are domestic, commercial or industrial)".
- (b) The Bureau also has a number of general functions (Article 55 of Law No.2 of 1998), including "the regulation of prices charged to consumers .....and the methods by which they are charged."
- (c) 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.

1.5 Accountability is reinforced by the fact that the Bureau's decisions on licence modifications (including those that will be made at the end of this review relating to the price control conditions) can be challenged by licensees through an arbitration process.

## Current price controls

- 1.6 The current price controls are in the form of CPI-X revenue caps, defining Maximum Allowed Revenue (MAR) for each company or business for each year of the price control period. The main features of the price controls are summarised below:
- (a) The MARs include a fixed term and one or two revenue drivers that link MAR with the company's outputs in terms of units and customer numbers.
  - (b) 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) cover both distribution and supply businesses. For ADSSC, a single price control covers all of its three separate businesses (sewerage, wastewater treatment and disposal).
  - (c) Costs which are subject to competition or to regulation in other parts of the supply chain are treated on a pass-through basis.
  - (d) The price controls have been set to allow the companies to recover the Bureau's estimate of an efficient level of costs, including allowances for operating expenditure, regulatory depreciation and a return on the regulatory asset base.
  - (e) Price controls provide 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.
  - (f) The calculation of regulatory depreciation and returns requires the determination of allowed capital expenditure (capex).The treatment of capex has been based on an approach of ex-post assessment with allowed capital expenditure

determined by the Bureau's efficiency reviews, carried out after the price control period has ended.

- (g) As noted above, the MAR has been calculated using annual allowances for operating costs, regulatory depreciation and returns. The revenue profile and X values are determined by present value calculations, which match estimates of regulatory revenue with the estimates of cost allowances over the period of the price control. Additional adjustments are made to reflect the outcomes of the Bureau's capital efficiency reviews.
- (h) Some companies also undertake certain unlicensed activities with the Bureau's consent (as required by their licences). These unlicensed activities are not subject to price controls. In the case of TRANSCO's unlicensed transmission activities in other Emirates, the difficulty of allocating 'common' or 'shared' assets separately to licensed and unlicensed activities meant that the scope of the price controls includes unlicensed activities using shared assets.

## Performance Incentive Scheme

- 1.7 The price controls also include a Performance Incentive Scheme (PIS) designed to encourage appropriate quality of service, outputs and performance. These incentive arrangements were first introduced for the PC2 controls and have been enhanced over time. Companies are rewarded for improved service and output performance, and are penalised for deteriorating performance. There are two types of performance indicators - Category A and Category B:
- (a) Category A indicators have precise definitions, targets and incentive rates, and an automatic annual revenue adjustment for performance via a term "Q" in the MAR formulae. Each Category A indicator has a maximum impact on the licensee's core MAR (i.e. excluding cost pass through terms, etc.) of 1% per year or, in the case of timeliness indicators, 6 or 12 times the monthly incentive rate.
  - (b) Category B indicators do not automatically adjust revenue but if there is evidence of exceptionally good or poor performance at the price control review then there may be a financial adjustment made to the proposals for MAR, subject to an overall cap of 1% of core MAR each year.
- 1.8 Companies are required to appoint an independent Technical Assessor (TA) with the Bureau's approval to verify the accuracy of the information required for calculation of Category A indicators.
- 1.9 At the last price control review, a number of changes were made to these arrangements (in addition to resetting the incentive rates and certain targets in line with the price control assumptions). The main changes were:
- (a) Three new measures were introduced as Category A indicators for AADC and ADDC to provide losses, metering and demand side management incentives.
  - (b) The bonuses for the Category A timeliness indicators for the audited Separate Business Accounts (SBAs) were removed so that only a penalty for delayed submissions applies.

- (c) The target dates for both PCRs and SBAs were changed to 30 April, while extending the target date for AIS to 31 October.
- (d) The bonus and penalty for each Category A technical indicator was made subject to an individual cap of 1% of the company's core MAR. An overall cap for Category B indicators was set at 1% of core MAR.

1.10 While reduction in water transmission constraint is shown within Category B, this indicator has its own incentive scheme (for 2009 onwards a financial adjustment would equal 50% of availability payments under PWPAs for water production capacity available but not utilised due to transmission constraints) and is not subject to a cap.

## Timetable for 2013 price control review

1.11 The following table sets out the Bureau's proposed timetable for this price control review.

**Table 1.1: Timetable for 2013 price control review**

Approximate date	Task
4 April 2012	Bureau publishes this <b>First Consultation Paper</b>
30 April 2012	Companies to submit 2011 audited Separate Business Accounts (SBAs)
6 June 2012	Companies to respond to First Consultation Paper
September 2012	Bureau publishes <b>Second Consultation Paper</b>
31 October 2012	Companies to submit 2012 Annual Information Submissions (AIS)
November 2012	Companies to respond to Second Consultation Paper
March 2013	Bureau publishes <b>Draft Proposals</b>
April 2013	Companies to submit 2012 audited SBAs
May 2013	Companies to respond to Draft Proposals
September 2013	Bureau publishes <b>Final Proposals</b>
1 January 2014	PC5 takes effect (if Final Proposals accepted)

1.12 This review spans a longer period than the previous price control reviews to provide greater opportunity for deliberations and consultations on the key issues. For example, the timetable allows the companies about two months (as compared to six weeks in the previous reviews) to respond to each of the Bureau's consultation and proposal papers. The timetable also allows more focus on more important issues such as projections of expenditure and quality of service issues.

1.13 The Bureau intends to modify the template of this year's AIS submission to seek information on licensees' forecasts of costs and outputs for the PC5 period. Licensees will be asked to provide this information by October 2012.

## Related work streams

1.14 This price control review will be supported by a number of related work streams and the work of expert consultants. These work streams are summarised below and are discussed further in the relevant sections of this paper.

1.15 On 28 November 2011, the Bureau wrote to the licensees about these work streams and the overall timetable and received generally positive responses from the companies. The

Bureau has already shared with the companies the scope of consultants' work, deliverables and timetable for the work streams associated with operating and capital expenditure. Companies have been closely involved in these work streams and have provided useful information to support consultants' work and comments on the consultants' reports.

### *PC3 capex review*

- 1.16 KEMA for electricity and ATKINS for water and wastewater were appointed in April 2011 to undertake the ex-post efficiency review of PC3 capex for the four network companies. The consultants have already issued interim and draft reports to the companies and the Bureau in November/December 2011 and March 2012, respectively. Their final reports are due in May 2012. Issues relating to capital expenditure are discussed further in Section 3.

### *Review of opex and SBAs*

- 1.17 Deloitte have been appointed as consultants to support the work on operating costs and SBAs. The consultants commenced work in February 2012 and will continue to work during 2012 and 2013. One of the first tasks of the consultants will be to understand the significant increases in distribution and supply business costs that have occurred in recent years. The consultants will then move on to consider how best to develop the SBAs in the future and the appropriate projections of operating costs that should underlie the PC5 proposals. This work will take appropriate account of Emiratisation costs and any reasonable sector restructuring costs.

### *PC4 capex review*

- 1.18 During the PC3 capex review, representations were made by the licensees about the time lags associated with the capex efficiency review process. To address licensees' concerns, the Bureau has planned to make such reviews more effective and timely by bringing forward the ex-post efficiency review of PC4 capex. The work on PC4 capital efficiency will commence in May/June 2012 and will continue into 2013.

### *PC5 capex forecast review*

- 1.19 The consultants appointed for PC4 capex review will also be asked to estimate likely capex spend for the PC5 period in order to try and reasonably align the provisional allowances for PC5 capex to be used in setting PC5 controls with reality. These matters are discussed further in Section 3.

### *Timetable for related work streams*

- 1.20 The following table sets out the indicative timetables for these work streams.

Table 1.2: Timetable for PC5 related work streams

Work stream	Indicative timescales
<b>PC3 capex review</b>	<b>April 2011 – April 2012</b>
Consultants' draft reports submitted	March 2012
Consultants' final reports submission due	May 2012
<b>Review of opex and SBAs</b>	<b>February 2012 – August 2013</b>
Phase 1 – Assess reasons for increase in opex for distribution companies over 2006-2010	February 2012 – June 2012
Phase 2 – Develop robust regulatory accounting arrangements for five companies	April 2012 – February 2013
Phase 3 – Prepare forecasts of reasonable opex for four network companies for 2014-2018	October 2012 – July 2013
Phase 4 – Additional work (if any)	October 2012 – August 2013
<b>PC4 capex review and PC5 capex forecast review</b>	<b>May 2012 – August 2013</b>

## 2. Objectives of the review and the main incentives

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### Introduction

- 2.1 This review is mainly concerned with the network businesses of AADC, ADDC, TRANSCO and ADSSC. There are also important issues relating to electricity and water supply activities and in future ADSSC may also need to develop similar supply business activities if charging for wastewater services is put in place by the Government.
- 2.2 These licensees operate capital intensive networks that provide essential utility services to consumers and across the economy. The management and operation by licensees of these networks (and their regulation by the Bureau) faces a number of challenges, including the following:
- (a) The initial evidence from the review of PC3 capital expenditure suggests that licensees have not been making efficient decisions in respect of capital expenditure. The Bureau will shortly begin work to update this analysis for the period 2010 to 2012 and will also complete its assessment of the reasons for increases in operating costs over the period 2006 to 2010.
  - (b) Government ownership of licensees place restrictions on their management, activities and commercial decision making processes. This may make it more difficult for licensees to adopt international best practice in managing their activities.
  - (c) The management of licensees do not always appear to be subject to the active shareholder pressure for efficiency seen in a number of more mature jurisdictions.
  - (d) The Emirate of Abu Dhabi is developing rapidly and has experienced rapid demand growth. Licensees have been under significant pressure to develop their networks consistently with ambitious national growth plans. In practice, it is not however clear that the associated electricity and water demand forecasts are realistic.
- 2.3 In the light of these circumstances, it is for consideration how best to regulate the sector and what should be the priorities and main incentives that the Bureau should seek to put in place for the next price control period. Given that the sector faces significant challenges in adopting international best practice and operates in a difficult business environment, it would seem most appropriate that the focus of this review should be the core activities necessary for a utility business to operate with reasonable efficiency in the Emirate of Abu Dhabi.
- 2.4 The Bureau's initial view on these core activities and incentives is summarised below:
- (a) The regulation of capital efficiency needs to be strengthened to ensure that where practicable licensees have in place best international practice for managing capital projects, that there are appropriate rewards for efficiency and

penalties for inefficiency, and, that the sector interfaces effectively with developments across the economy (in particular large developments or mega-projects).

- (b) The growing asset base of the licensees makes it increasingly important that each company has in place an appropriate approach to asset management, to ensure that assets are properly managed and maintained in the longer term, and, that asset performance is optimized. Licensees and the Bureau have already taken a number of steps in relation to these matters. For instance, TRANSCO has adopted business processes consistent with its PAS 55 accreditation and the Bureau has commenced a review of electricity distribution and transmission network asset management by licensees. This review should help inform the development of incentives relating to asset management and performance.
- (c) Consistent with the provision of essential utility services, it is important that licensees face appropriate incentives for network availability (including the timely completion of new connections and reinforcement projects), security and quality of supply. The existing price controls already contain important incentives for water and electricity transmission and distribution network operators for improvements on these service measures. There are also licence conditions relating to the security standards for the development of electricity and water networks.
- (d) In order to facilitate effective regulation of the sector, it is important that the regulator has access to high quality information. This price control review will provide an opportunity to strengthen incentives on licensees to provide high quality information. This work will build on the incentives contained in the present price controls.
- (e) Regulatory arrangements should provide the licensees with an adequate level of funding such that they can finance their activities and not expose licensees to undue risks.
- (f) There are also other important considerations which may need to be taken into account in developing price controls – such as the licensees approach to Emiratisation and the distribution/supply licensees’ role in encouraging efficient end-use of electricity and water by consumers.

2.5 The wide ranging nature of the objectives discussed above suggests that regulatory incentives should reflect a balanced score card approach to business management, with an appropriately specified range of metrics and incentives. While such an approach has considerable attractions in creating desirable overall incentives, there will be significant challenges associated with specifying and calibrating these incentives within the time available during this price control review. It may be that some of these matters will need to be subject to longer-term work streams and that such incentives will not be fully implemented until subsequent price control periods.

2.6 Issues around the basic approach and form of economic regulation are discussed in the next subsection, with the following subsections discussing how best to strengthen and improve the core incentives discussed in paragraph 2.4 above. There is discussion of matters relating to costs (including capital efficiency and Emiratisation costs) in Section 3

and discussion of issues around the funding (particularly in relation to capital expenditure) in Section 4.

## Basic approach and form of economic regulation

- 2.7 As explained in Section 1, the main mechanism for the economic regulation of network licensees is currently CPI-X price or maximum revenue controls. These controls include additional arrangements such as for the pass through of certain costs and incentives to encourage certain aspects of quality of supply and the provision of regulatory information.
- 2.8 Price caps and incentive regulation is used in many jurisdictions across Europe and Asia to protect consumers and encourage the efficient operation of monopoly utility businesses. A number of jurisdictions have recently subject these broad approaches to detail reviews and concluded that while regulatory regimes may need to evolve over time the basic framework of price controls and incentive regulation should remain in place. For instance:
- (a) Ofgem (the main economic regulator for the energy sector in the United Kingdom) concluded its RPI-X@20 review of two decades of energy regulation in October 2010 and proposed an RIIO (Revenue = Incentives + Innovation + Outputs) framework for future regulation. The objectives of this framework are to encourage energy network companies to play a full role in the delivery of long-term value for money network services, for existing and future consumers, through longer price controls and greater incentives for efficiency, outputs and innovation.
  - (b) Similarly, the proposals of Ofwat (the main economic regulator for the water sector in the United Kingdom) on future price limits in 2011 focus on enhancing price control arrangements with better incentives for business outcomes and reducing the complexity and burden of the regulatory process.
  - (c) The Australian Energy Regulator (AER) put forward proposals in 2011 for distribution and transmission businesses focusing on ensuring that cost allowances would be no more than necessary and reflect an unbiased estimate of efficient costs, and, ensuring that businesses are not rewarded for unnecessary overspends. Further, the AER announced a review of the framework for the provision of regulatory information and reporting processes for price determinations.
- 2.9 These broad conclusions are consistent with the Bureau's views – that price controls and incentive regulation can be adapted to encourage efficiency in a wide range of circumstances and so remain appropriate to both protect consumers from monopoly power and encourage efficiency and best practice across the sector. Nevertheless, as noted in paragraph 2.2 above, there are significant challenges associated with developing an incentive framework suitable for the Emirate of Abu Dhabi and this is the key challenge for this price control review. In the light of this, the Bureau proposes to retain CPI-X price/revenue controls in the very broad form of the existing regulatory arrangements, but consider how incentives can be improved during this review and in the future, with particular focus on the issues identified in paragraph 2.4.

- 2.10 This price control review could also provide an opportunity for a wide-ranging review of regulated activities, including where appropriate significant changes to operational and management arrangements and commercial structures. For instance, it may be sensible to consider whether arrangements for public-private partnerships (PPP) might help drive efficiency for certain network licensees in the short and medium-term. The price control review would ensure the alignment of the regulatory regime with such changes, provide funding for necessary transition costs and financial incentives to successfully complete the required change management programmes.

## Incentives for asset management and performance

- 2.11 As noted in paragraph 2.4 above, one of the areas that the Bureau has initially identified as a key focus for this review is asset management and performance. The Bureau has a work stream that is considering the licensees' approach to asset management in relation to electricity transmission and distribution activities. PC4 price controls contain a number of incentives that relate to network performance and security, which also provide incentives relating to asset management.

### *Wider regulatory context*

- 2.12 As the asset base of licensees expands, issues relating to asset management and performance will become more important. The Bureau's review of the asset management systems used by electricity distribution and transmission network operators encompasses:
- (a) an assessment of the electronic asset management systems used by licensees, consideration of the policies and procedures relating to asset maintenance and inspection and analysis of the methods used to monitor asset condition;
  - (b) assessment of the historical maintenance records and maintenance programs;
  - (c) consideration of the links between asset maintenance and system incidents and interruptions;
  - (d) comparisons with licensee's performance against best practice; and
  - (e) developing recommendations for improving asset management.
- 2.13 The asset management review is timetabled for completion in June 2012. If the Bureau concludes that new incentive arrangements are appropriate with respect to asset management or makes other recommendations relevant to the price control review then these issues will be addressed in the next consultation paper on PC5.

### *Price control arrangements*

- 2.14 The subsection below describes the price control incentives relating to the availability, security, and quality of supplies. These arrangements include a number of metrics and incentives that relate directly to asset performance, some of which also provide important but less direct incentives for effective asset management (such as incentives relating to water and electricity network availability and customer interruptions).

## *Key considerations*

- 2.15 Best practice in relation to asset management involves a range of factors, including ensuring that the business concerned has appropriate processes in relation to asset management and that these are implemented in an efficient and effective manner. In reviewing capital efficiency during the PC3 capex review, the Bureau has used expert consultants to assess the efficiency of certain business processes. It is for consideration how best to integrate incentives for best practice relating to asset management within the price control framework. The review of asset management practices discussed above will help inform these decisions.
- 2.16 As well as taking into account the recommendations of the asset management review, it will be important to consider whether the existing price control incentives can be broadened and strengthened. In relation to asset performance, the Bureau already monitors and incentivises a range of metrics relating to availability, security and quality of supply. These matters are discussed in the subsection below. Nevertheless, the Bureau could also seek to develop metrics and incentives relating more directly to asset management. For instance the Bureau could seek to monitor and/or incentivise:
- (a) equipment failure rates
  - (b) asset replacement and overhaul rates, and
  - (c) asset utilization factors.
- 2.17 It will be important to consider carefully the advantages and disadvantages of such enhancements, together with the views of licensees on how best to incentivise best practice in relation to asset management and asset performance.

## **Incentives for the availability, security, and quality of supplies**

- 2.18 The regulation of the availability, security and quality of supply involves a range of different regulations and licence conditions, as well as the incentives created by the price control arrangements.

## *Wider regulatory context*

- 2.19 In relation to their approach to the licensed activities of transmission, distribution and supply of water and electricity and to the transport, treatment and disposal of wastewater, all network companies are governed by a number of important laws, regulations, industry codes and licence conditions.
- 2.20 In the case of ADSSC, these include the Trade Effluent Control Regulations and the Recycled Water and Biosolids Regulations. For water and electricity network companies, these include Transmission Codes, Distribution Codes, Metering and Data Exchange Codes, Water Quality Regulations and Water Supply Regulations.
- 2.21 There are also licence conditions that prescribe network security standards and require network companies to produce a five or seven year planning statement. In terms of customer service, AADC, ADDC and ADSSC also have to meet certain Guaranteed and Overall Standards of Performance.

## Price control arrangements

2.22 As explained in Section 1, the current price control includes a Performance Incentive Scheme with both Category A and Category B incentives. Because Category A indicators provide direct incentives with a potentially greater level of materiality, they provide significantly more powerful incentives than Category B indicators.

2.23 The following table lists the current category A indicators that are relevant to the availability, security and quality of supply, with the new indicators introduced at the last price control review shown in red.

Table 2.1: Current Category A technical indicators

Company	Electricity	Water	Wastewater
AADC / ADDC	Customer Minutes Lost per Customer Interruptions per Customer (until 2009) thereafter <b>SAIFI</b> <b>Distribution Loss Reduction (DLR) indicator</b> <b>Interface Metering (IM) indicator</b> <b>Demand Side Management (DSM) indicator</b>	Water Quality <b>DLR indicator</b> <b>IM indicator</b> <b>DSM indicator</b>	
TRANSCO	Availability Energy Lost	Water Quality <b>Availability</b>	
ADSSC			

Notes: SAIFI = System Average Interruption Frequency Index

2.24 The following table lists the current Category B indicators relevant to the availability, security and quality of supply, with the new indicators introduced at the last price control review shown in red.

Table 2.2: Current Category B technical indicators

Company	Category B Indicator
AADC / ADDC	1. Technical KPIs (including <b>SAIFI for worst served customers</b> and <b>water quality sub-indices</b> )
TRANSCO	1. Technical KPIs (including <b>water quality sub-indices</b> ) 2. Economic despatch 3. <b>Reduction in water transmission constraints</b>
ADSSC	1. <b>Technical KPIs</b> 2. Performance of sewerage system (e.g., availability and reliability) 3. Customer complaints (e.g., in relation to odour and flooding) 4. Compliance with standards at treatment plants 5. Meeting targets for recycling of treated effluent and biosolids 6. Environmental performance

2.25 There are certain important points that need to be considered for further development of these performance indicators:

- As mentioned in Section 1, while reduction in water transmission constraint is shown as Category B indicator in the above table, this indicator is not subject to the 1% materiality cap.
- Water quality is included in both Categories A and B. The Category B indicator is a system of water quality indices focusing on important quality parameters. It was proposed at the last review but included only as a Category B indicator to allow

more time to test its robustness. These water quality indices are defined in Schedule 4 to the Bureau's Water Quality Regulations 2009.

- (c) In relation to availability indicators for TRANSCO and CML and SAIFI indicators distribution companies where robust data on actual performance is now available, the performance target could be defined in absolute terms rather than the existing target which is based on performance in the preceding year.
- (d) For TRANSCO, the water availability indicator could be better aligned with electricity availability by reducing the number of water system components from five to three (namely, pumps, transmission lines and storage tanks).
- (e) In relation to CML and SAIFI indicators for distribution companies, it is for consideration whether the reporting and measurement could be based on actual number of customers affected rather than the estimated average number of customers per substation.

### *Key considerations*

2.26 It will be appropriate to consider how best to enhance incentives for optimal levels of availability, security, and quality of supply, including the following.

- (a) Whether the metrics and incentives relating to water distribution and transmission can be improved – for instance by introducing incentives for maintaining pressure and availability in water distribution networks, and/or replacing existing Category A water quality indicator with water quality indices.
- (b) Introducing more direct incentives for service levels to worst served customers.
- (c) Further developing the availability indicator for TRANSCO and CML and SAIFI indicators for AADC and ADDC.
- (d) Fully developing incentive arrangements relating to ADSSC.
- (e) Whether the rapid increase in electricity and water demand, coupled with new generation sources pose serious challenges for the system operator (TRANSCO) in operating the system both economically and securely. In the light of these challenges, it is for consideration whether TRANSCO's existing Category B indicators relating to economic despatch and transmission constraints should be replaced by a full set of system operator incentives. These could encompass:
  - (i) submission of daily transmission constraint data, including water constraints:
  - (ii) meeting agreed short term demand forecasting error targets:
  - (iii) incentives to optimise spinning reserve deployment:
  - (iv) incentives to reduce deviations from the despatch schedule:
  - (v) reducing the costs of inadvertent energy exchanges across interconnectors:
  - (vi) incentives for system availability:
  - (vii) a transmission losses target: and

- (viii) submission of agreed reports on due dates.
- (f) Whether TRANSCO's Category B indicators relating to economic despatch and transmission constraints should be replaced by a full set of system operator incentives.

## Incentives for provision of high quality information

2.27 The main network companies have licence requirements to prepare and send to Bureau (and in certain instances other interested parties) a range of information. These requirements are enhanced by obligations to have certain information audited, independently verified and/or approved by the Bureau. The Performance Incentive Scheme reinforces these arrangements with a system of penalties and rewards for the timely provision of key information subject to certain basic quality tests.

### *Wider regulatory context*

2.28 The licences of the network companies contain a relatively wide range of requirements relating to the provision of information, including:

- (a) consultation and preparation of distribution codes;
- (b) preparation and periodic review of a health and safety policy;
- (c) preparation of Separate Business Accounts (SBAs) in accordance with accounting standards approved by the Bureau;
- (d) preparation and periodic review of an environmental policy;
- (e) preparation and periodic review of complaints handling procedures, with the procedure and revisions being subject to Bureau approval;
- (f) preparation and periodic review of a code of practice for the provision of services to special customers, with the code and revisions being subject to Bureau approval;
- (g) preparation and periodic review of a performance scheme and standards of customer performance, with the scheme and revisions being subject to Bureau approval;
- (h) report to the Bureau annually on water leakage and subsequently develop a programme for water leakage control and loss reduction;
- (i) preparation of a statement of charges for connection to the electricity and water networks in a form approved by the Bureau;
- (j) preparation of a statement showing present and future capacity, forecast flows and loading on each part of the network;
- (k) preparation of 5 or 7 year planning statements in a form approved by the Bureau;
- (l) preparation for Bureau approval of network security standards;
- (m) preparation for Bureau approval of supply terms and tariffs;

- (n) preparation and periodic review of a code of practice relating to the payment of bills and disconnection and methods for dealing with customers in default;
- (o) consultation and preparation for Bureau approval a code of practice relating to the efficient use of electricity and water; and
- (p) preparation of a procedure for the maintenance of an accurate register of premises connected to the network.

### *Price control arrangements*

2.29 The price control conditions require licensees to provide the following additional information:

- (a) a Price Control Return (PCR) with an auditor's certificate, Director's certificate and report by an independent Technical Assessor (TA), and
- (b) an Annual Information Submission (AIS) with a report by a TA.

2.30 As well as specifying the provision of this additional information, the price controls contain incentives for licensees to make certain information submissions on a timely and complete basis, as summarised in the tables below.

**Table 2.3: Current Category A information indicators**

Company	Category A Indicator
AADC / ADDC / TRANSCO / ADSSC	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS

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

**Table 2.4: Current Category B information indicators**

Company	Category B Indicator
AADC / ADDC	1. Interim profit & loss account timeliness 2. Meter reading 3. Five-Year Planning Statement timeliness
TRANSCO	1. Planning data accuracy and timeliness 2. Interim profit & loss account timeliness 3. Five-Year Planning Statement timeliness 4. Timeliness of Transmission Use of System Charges Statement
ADSSC	1. Interim profit & loss account timeliness 2. Five-Year Planning Statement timeliness

2.31 At present, the key information submissions made by licensees include the AIS, PCRs and SBAs. The AIS and certain inputs to PCRs are subject to review by an independent Technical Assessor and the PCRs and SBAs are subject to review by each licensee's external auditors. These external reviews are designed to ensure the provision of high quality information by the licensee.

2.32 The work stream on opex and SBAs discussed in Section 1 should improve the quality of SBA's over time. This work will encompass:

- (a) the development of appropriate draft regulatory accounting guidelines (RAGs) and SBA templates for each licensee covering all key accounting issues with the

objectives of increasing transparency and consistent reporting and providing appropriate guidance for cost allocations, attributions and recharges;

- (b) strengthening the reconciliations to statutory accounts and price controls – which may allow the streamlining of PCRs;
- (c) encouraging a robust commentary / detailed narrative; and
- (d) discussion and recommendations on the role of licensees' external auditors in auditing and checking the SBAs.

### *Key considerations*

2.33 Key questions relating to further improving the quality of information include the following.

- (a) How effective are the arrangements for review by the technical assessor and auditors in improving the quality of information?
- (b) Are there better or more cost effective procedures for improving the quality of information that should be adopted by the Bureau?
- (c) Should the Bureau make greater use of independent reviews and/or audits given the wide range of information requirements on licenses?
- (d) Should the Bureau have a more focused approach to gathering information from licensees and if so what should this be?
- (e) In what areas would improving the quality of information provided by licensees make the most difference and why?
- (f) Some of the existing Category B indicators relate to information where sector companies are required to develop detailed forecasts and plans of the future. Such information is important to the efficient operation of the sector in the future, but it is inherently difficult to establish metrics that would reliably indicate the quality and robustness of these plans. Are there particular approaches and incentives that should be adopted in relation to the provision of this information?

## Protecting licensees from undue risks

### *Price control arrangements*

2.34 Price controls have a number of features designed to balance the advantages of providing incentives for efficiency against the disadvantages of placing undue risks on licensees. For instance, each price control:

- (a) has revenue drivers that link regulated revenue with changes in consumer demand, so adjusting revenue in line with costs;
- (b) includes cost pass-through terms allowing the recovery of costs that licensees have limited or no control over;
- (c) is set for a fixed number of years, allowing licensees to retain the benefits of efficiency savings for a number of years but providing the opportunity of a

medium term review to take account of unexpected developments and changes in costs; and

- (d) has a definition of the scope of activities subject to price control regulation, ensuring that licensees have clarity as to whether a business activity is subject to regulation or normal commercial considerations and risks.

2.35 The table below summarises the current revenue drivers and pass-through costs for each licensee.

**Table 2.5: Current revenue drivers and pass-through costs**

Company	Revenue driver	Revenue driver weight in MAR formula	Pass-through items
<b>AADC / ADDC (both water and electricity)</b>	Fixed term	80%	Water and electricity purchases
	Customer numbers	15%	Transmission charges
	Metered units distributed	5%	Embedded electricity purchases*
<b>TRANSCO (both water and electricity)</b>	Fixed term	80%	Electricity ancillary service costs
	Metered peak demand	10%	
	Metered units transmitted	10%	
<b>ADSSC</b>	Fixed term	80%	STA costs**
	Annual flow at treatment plants	20%	

Notes: All pass-through costs are subject to the relevant licensee's economic purchasing obligation. \*These are electricity purchases from embedded generation (along with the distribution company's margin approved by the Bureau). \*\*STA stands for Sewage Treatment Agreement.

### Revenue drivers

2.36 Each company / business has two revenue drivers (except for ADSSC, which has one revenue driver) linked to their outputs, such as number of customers served, units transmitted or distributed or treated, and system peak demands. In each case, the weights of the fixed element and the variable element subject to the revenue driver are in the ratio of 80:20.

2.37 More detailed considerations relating to the revenue drivers in the current price controls are summarised below:

- (a) The choice of revenue drivers and their weights reflected a number of considerations, including the cost structure of the business (thereby reducing the licensee's exposure to increases in its costs resulting from demand growth) and providing desirable incentives - for example, for licensees to serve new customers and improve metering.
- (b) 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. On the other hand, revenue drivers based on metered units delivered to customers have provided valuable incentives to the distribution companies to improve customer metering. At the last review, these revenue drivers were retained but their weighting was reduced from 15% to 5% to reduce any undesirable incentives associated with encouraging excessive use.
- (c) There is an on-going discussion on transferring the responsibility and ownership of water interface metering from the distribution companies to TRANSCO. Such a

transfer could have implications for the revenue drivers for TRANSCO and the Category A Interface Metering (IM) indicator for the distribution companies.

- (d) In contrast to other companies, ADSSC currently has one revenue driver (annual flow entering treatment plants). It may be appropriate to consider introducing an additional revenue driver for ADSSC's new price controls to better reflect company's cost-structure and/or incentivise improvements in specific areas of company's service.
- (e) Future projections of revenue drivers will be required to estimate revenue requirements and set the new price controls. At the last price control review, the Bureau adopted the revenue driver projections from the companies' latest AIS submissions with only a few adjustments or estimations. These projections have important implications for both costs and revenues and there are significant advantages if new price control arrangements are based on reasonably accurate forecasts of demand.

### *Cost pass-through arrangements*

2.38 Certain costs have been allowed as pass-through in the price controls, including the following:

- (a) For distribution companies, bulk 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). Electricity purchases from embedded generation (including the distribution company's profit margin as determined by the Bureau) were allowed the same treatment for PC4, mainly to incentivise the distribution companies to connect renewable energy generation.
- (b) In view of the development of four major wastewater treatment plants by the private sector for ADSSC, the payments under relevant long-term Sewage Treatment Agreements (STAs) were allowed in PC4 a pass-through treatment subject to ADSSC's economic purchasing obligation. There remain outstanding questions as to the consistency of these costs with economic purchasing, both in relation to whether the capacity efficiently meets demand and whether the contracts were competitively tendered.

### *Duration*

2.39 Both the PC1 and PC2 controls were set for 3 years, although PC1 was subsequently extended for another year. PC3 controls and the present PC4 controls were then set for 4 years (but 4½ years in the case of PC3 controls for ADSSC).

2.40 The duration of a price control needs to strike a balance between providing incentives for efficiency and reducing exposure to unanticipated outcomes. A longer duration provides stronger incentives for companies to implement efficiency savings. Such controls 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 the expectations at the time of setting the price control and adverse unanticipated outcomes.

- 2.41 Internationally CPI-X price controls are typically set for between 4 and 5 years. The UK energy regulator, Ofgem, has recently proposed a duration of 8 years as part of its review of RPI-X regulation in the UK, to recognise the maturity of the industry and further strengthen incentives for efficiency.
- 2.42 In Abu Dhabi, the choice of a shorter duration for price controls was driven by a general lack of reliable and audited data on companies' performance as well as the uncertainties within the sector relating to issues such as demand growth. Recent price controls have therefore been of a 4-year duration.
- 2.43 In addition to the balance between incentives and managing risk, there are important questions around the focus given to individual activities when all the main network licensees are subject to simultaneous review. There would be significant advantages associated with a staggered approach to price control reviews in the future, allowing for more focus on sector business specific issues.
- 2.44 An approach that would start to address these issues, while retaining significant incentives for efficiency, would be to set PC5 controls for ADSSC for 3 years (2014-2016) and for AADC, ADDC and TRANSCO for 5 years (2014-2018). A shorter duration control for ADSSC might also be appropriate in order to coordinate with the possible development of a non-drinking water licensee and the transfer of certain regulated activities from ADSSC to the new company. The longer period for AADC, ADDC and TRANSCO would reflect the increasing maturity of the sector. The next price control reviews would then be due in 2016 and 2018 for ADSSC and electricity and water network companies, respectively, with review for ADWEC in 2014.

### *Scope and separation*

- 2.45 Further focus on business specific issues and risks could be achieved by considering the scope and separation of the present price controls. The existing arrangements are summarised below:
- (a) There are separate price controls for the water and electricity businesses of AADC, ADDC and TRANSCO. There is no such separation of controls for the sewerage, wastewater treatment and disposal businesses of ADSSC, or for the distribution and supply businesses of the distribution companies.
  - (b) The scope of price control or regulated revenue excludes only revenues from unlicensed activities for which the concerned company has received the consent of the Bureau under the respective licence.
  - (c) Nonetheless, TRANSCO's unlicensed transmission activities outside the Emirate of Abu Dhabi which share the same assets with the licensed activities (referred to as unlicensed shared assets) are included within its price controls and regulated revenue.
  - (d) For AADC and ADDC, regulated revenue is defined in the licence to include any revenue which should be billed to and collected from their customers according to

approved tariffs, rather than the revenue actually billed to the customers (this provides an incentive for distribution companies to bill all income to which they are entitled under the approved tariffs). There is also a Category A incentive indicator relating to customer debt reduction.

- 2.46 It is for consideration whether the arrangements relating to separation of price controls remain appropriate for the future or whether they should be revised and if so what changes would be most appropriate.
- 2.47 The creation of new regulated activities associated with the distribution and supply of non-drinking water are under consideration. If the Government approves these new arrangements then this may necessitate a change in the scope of ADSSC's regulated activities and price controls. The timetable for any new arrangements will depend on the completion of the study being undertaken currently.

### *Key considerations*

- 2.48 It will be important that the price controls continue to balance incentives for efficiency with protecting licensees from undue risks. Bearing this in mind it will be appropriate to carefully consider the following issues:
- (a) How best to formulate revenue drivers to protect licensees from fluctuations in demand, encourage good standards of service while avoiding incentives to encourage profligate end use?
  - (b) Whether it is appropriate to retain the pass-through treatment of STA costs for ADSSC?
  - (c) Whether any additional items, such as the Bureau's annual licence fees, sector restructuring cost and/or Emiratisation costs, should be allowed as pass-through items?
  - (d) Whether the duration of price controls should be altered so that future price control reviews can be carried out on a staggered basis, allowing for more focus on licensee specific issues?
  - (e) Whether the scope of the existing price controls remains appropriate and whether there should be any changes to business separation and whether these should be reflected in price control arrangements.

## **Incentives for efficient use of water and electricity**

- 2.49 In the Emirate of Abu Dhabi, water and electricity consumption per capita are relatively high. Final customer tariffs remain heavily subsidised and at present do not provide sufficient signals for the efficient use of water and electricity. Managing system losses and leakage are equally important to save scarce resources.
- 2.50 At the last price control review, a Demand Side Management (DSM) Category A indicator was introduced to incentivise the distribution companies to encourage residential consumers to reduce water and electricity consumption. It will be appropriate to consider how best to improve the effectiveness of these arrangements as part of this price control

review. For instance, the price controls could provide more funding for DSM initiatives and consumer information campaigns. Nevertheless, any such arrangements would need to be carefully monitored and regulated to ensure the effective use of resources.

2.51 Since the last review, the Bureau has also taken a number of important steps to further promote the efficient use of water and electricity:

- (a) It has created WaterWise and PowerWise offices to promote efficient use of water and electricity.
- (b) Together with the two distribution companies, the Bureau has developed new billing arrangements and launched a media campaign (“Are you in the Green? Are you in the Red?”) to introduce the new layout of distribution companies’ bills. These bills increase transparency and provide important new information on consumption levels to customers.
- (c) The Bureau has developed a trial of time of day electricity prices and metering for residential customers, to test the opportunities for load management and moving demand away from expensive to serve peak periods.

## Key issues for consultation

2.52 Key issues for consultation include the following:

- (a) Are the six core activities and incentives as discussed in paragraph 2.4 - capital efficiency, asset management and performance, availability/security/quality of supply, high quality information, adequate funding and Emiratisation/efficiency programmes - those that this price control review should focus on?
- (b) Is the initial conclusion to retain CPI-X price/revenue controls in the very broad form of the existing regulatory arrangements, but consider how incentives can be improved robust?
- (c) Whether the sector is willing to drive forward restructuring with a view to improving efficiency and effectiveness and if so how this should be taken account of at this price control review?
- (d) Are there better and/or more direct ways of incentivising best practice in asset management and performance through the price control?
- (e) Should the metrics discussed in paragraph 2.16 (such as asset replacement) be monitored and incentivised as part of the price control arrangements?
- (f) How can the performance incentive scheme or other price control incentives be improved to encourage licensees to provide appropriate levels of availability, security, and quality of supply?
- (g) What would be the best approach to dealing with the possible enhancements to the current arrangements discussed in paragraph 2.26, including the proposals for new system operator incentives?
- (h) Are there other steps that the Bureau should take to improve incentives for the availability, security, and quality of supply?

- (i) How effective are the arrangements for review by the technical assessor and auditors in improving the quality of information provided by licensees to the Bureau?
- (j) Are there better or more cost effective procedures for improving the quality of information that should be adopted by the Bureau?
- (k) Should the Bureau have a more focused approach to gathering information from licensees and if so what should this be?
- (l) In what areas would improving the quality of information provided by licensees make the most difference and why?
- (m) Should the existing revenue drivers be retained and/or should the relative weights between fixed and variable elements be retained or changed? Should the Bureau rely on the licensees projections of demands and customer numbers or should these projections be made on a different basis?
- (n) Should the existing approach to cost pass through be retained? Is there a case for extending cost pass through to Bureau licence fees? Should there be a different treatment for Sewerage Treatment Agreement (STA) costs or Emiratisation costs?
- (o) Would it be appropriate to set PC5 controls for ADSSC for 3 years (2014-2016) and for AADC, ADDC and TRANSCO for 5 years (2014-2018)?
- (p) Do the existing arrangements for separation of businesses and the scope of price controlled activities remain appropriate for the future or should they be revised and if so what changes would be most appropriate?
- (q) What would be the best approach to improving the incentives on distribution licensees to encourage the efficient end use of water and electricity?

## 3. Operating and capital costs

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### Introduction

- 3.1 It is important that the price controls make appropriate allowances for both operating expenditure (opex) and capital expenditure (capex). Projections of reasonable opex and capex over the price control period are main inputs to the price control calculations and efficient spending of both capital and operating costs is critical to overall network performance. Capital spending has effects in both the short and long-term, with network assets typically having the potential for useful lives of 30 years or more.
- 3.2 The initial evidence from the PC3 capex review (covering the period 2006 to 2009) suggests that the licensees have not been making efficient decisions in respect of capital costs. The Bureau's review of PC4 capex that is scheduled to start later this year will provide an important update on the companies' performance on capital efficiency over the period 2010 to 2012.
- 3.3 It will also be important to take account of the interactions between operating and capital costs. This will involve incentivising a whole life cycle costing approach to capital projects, optimal asset management and asset performance strategies. It will also be necessary to properly understand and take account of capitalisation policy in determining allowances for operating costs and regulatory depreciation.
- 3.4 These issues highlight the importance of strengthening of regulation of operating and capital efficiency to ensure that where practicable licensees have in place best international practice for managing these costs, and, that there are appropriate rewards for efficiency and penalties for inefficiency.
- 3.5 Four main considerations appear particularly important in considering the approach to the regulatory treatment of opex and capex:
- (a) Allowed revenue under the price controls should be sufficient to enable a reasonably efficient company to finance its business and operate effectively.
  - (b) Cost projections should reflect the costs expected of a reasonably efficient operator;
  - (c) The development of best practices should be encouraged, including in relation to whole life costing and asset management; and
  - (d) There should be consistency in regulation - it will be important to align and develop metrics and incentives with respect to asset management and availability/quality/security of supply in a way which is consistent with allowances for costs, and, to take account of the interactions between operating and capital costs.

### Companies' performance on opex to date

- 3.6 In the following paragraphs, the trends in opex of the four network companies (AADC, ADDC, ADSSC and TRANSCO) over the periods 1999-2010 and particularly over the

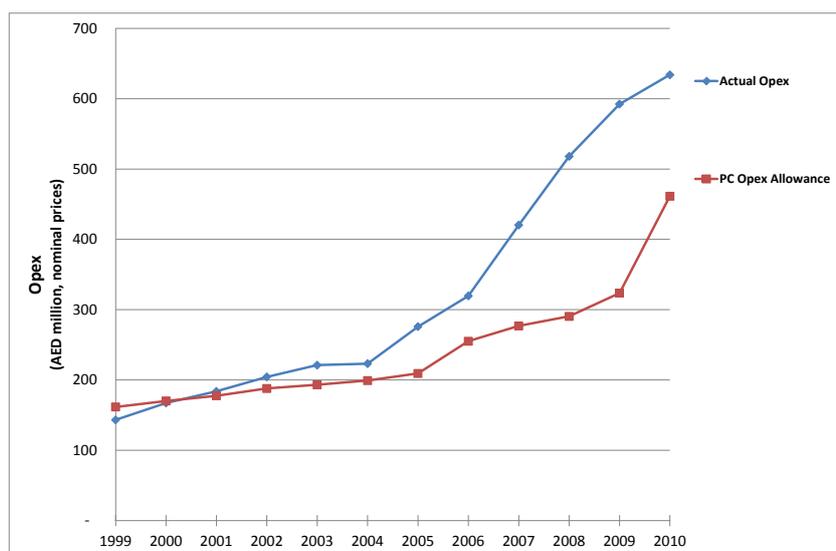
period 2006-2010 are assessed. The purpose of this analysis is to illustrate the relationship between actual costs and the assumptions made in setting previous price controls. While costs have increased rapidly, this is not necessarily an indication of inefficiency – as the total level of costs is influenced by a wide range of factors. These include the significant increases in demand for services, labour market conditions and regulations, the balance between Emirati and other staff, recharges from the ADWEA group and other accounting policies. As noted in Section 1, the Bureau has appointed expert consultants to assess the reasons for changes in distribution companies' costs since 2006. The Bureau will summarise the findings of this work in its second consultation paper on PC5 in September 2012.

- 3.7 The actual opex has been sourced from the companies' audited SBAs and comprise (a) staff costs (b) repair, maintenance and consumables (c) water tanker hire cost (for water distribution businesses) and (d) administration and other expenses, but exclude provisions for slow moving and obsolete inventory and doubtful debts.

### AADC's opex performance

- 3.8 The chart below shows AADC's actual opex (for both water and electricity businesses combined) against the projections made in setting price controls.

Figure 3.1: AADC's opex (nominal prices)



- 3.9 Key issues include:
- (a) over the period 2006-2010, AADC's actual opex increased on average by about 19% per annum. This is significantly above the rate of general inflation in the UAE which averaged about 6% per annum;
  - (b) in 2010, the company's total opex reached AED 634 million, almost double the 2006 level (AED 320 million) and indicates an over-spending against price control allowances by about AED 173 million or 37%;
  - (c) electricity and water businesses account for about 65% and 35% respectively of the company's total opex; and

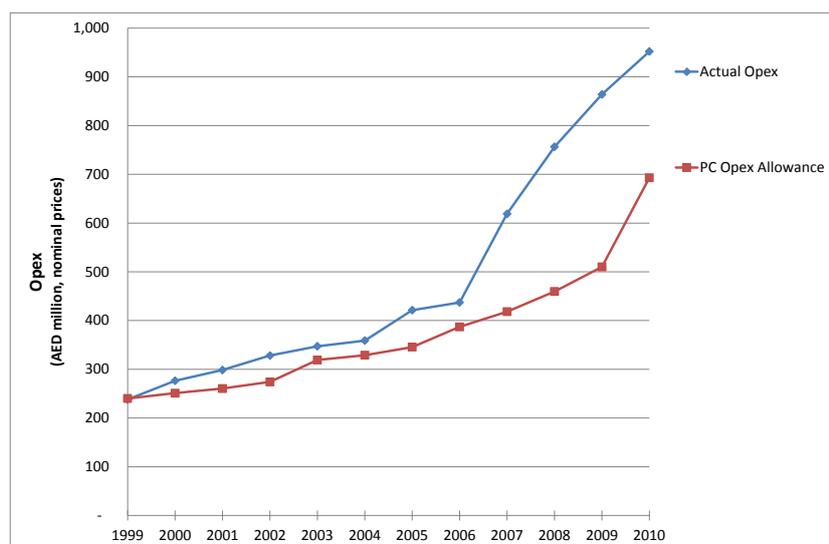
- (d) staff costs constitute the largest part (about 65%) of opex, followed by administration and other expenses (about 30%).

### *ADDC's opex performance*

3.10 As shown in the chart below and described below, ADDC shows similar trends in costs as AADC:

- (a) over the period 2006-2010, ADDC's actual opex increased on average by about 21% per annum;
- (b) in 2010, the company's total opex reached AED 952 million, more than double the 2006 level (AED 437 million) and indicates over-spending against price control allowances by about AED 259 million or 37%;
- (c) similar to AADC, electricity and water businesses account for about 65% and 35% respectively of the company's total opex; and
- (d) staff costs constitute the largest part (over 60%) of opex, followed by administration and other expenses (about 30%).

Figure 3.2: ADDC's opex (nominal prices)

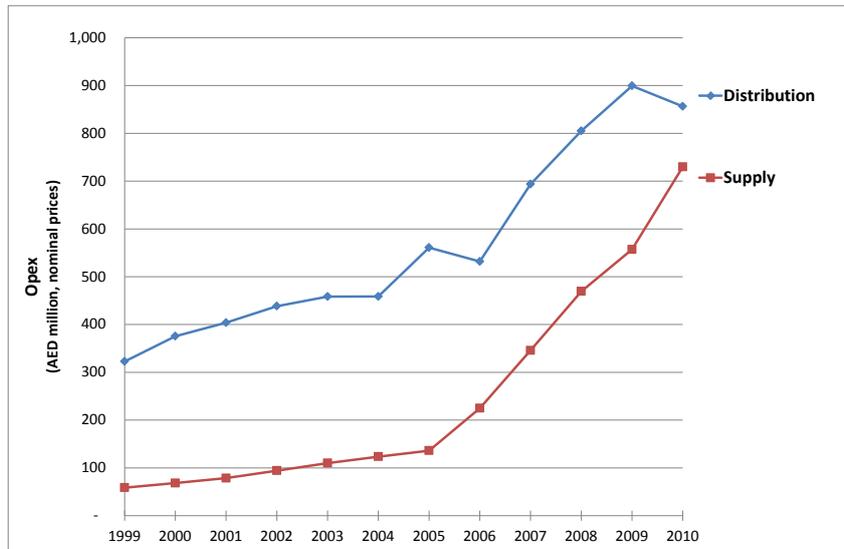


### *Growth in supply business costs*

3.11 One specific area of concern is the significant growth in the supply business costs of AADC and ADDC, as discussed and shown in the chart below:

- (a) for both AADC and ADDC combined, the ratio of supply business costs to distribution business costs has increased from 18% in 1999 to 85% in 2010; and
- (b) generally, this ratio has been higher for water businesses than electricity businesses and AADC than ADDC.

Figure 3.3: Distribution and supply opex (nominal prices)

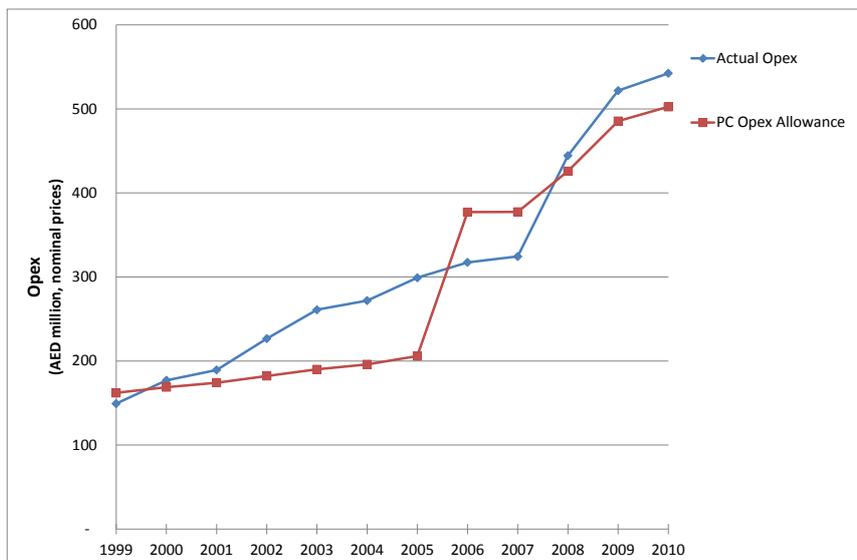


### TRANSCO's opex performance

3.12 Trends in TRANSCO's opex are discussed below:

- (a) over the period 2006-2010, TRANSCO's actual opex increased on average by about 14% per annum compared to average UAE inflation rate of 6% per annum. In 2010, the company's total opex reached AED 542 million, about 71% higher than the 2006 level (AED 317 million) with an over-spend against price control allowances by about AED 40 million or 8%;
- (b) each of electricity and water businesses accounts for about half of the company's total opex; and
- (c) staff costs were 50% of total opex and administration and other were 32% of total opex.

Figure 3.4: TRANSCO's opex (nominal prices)

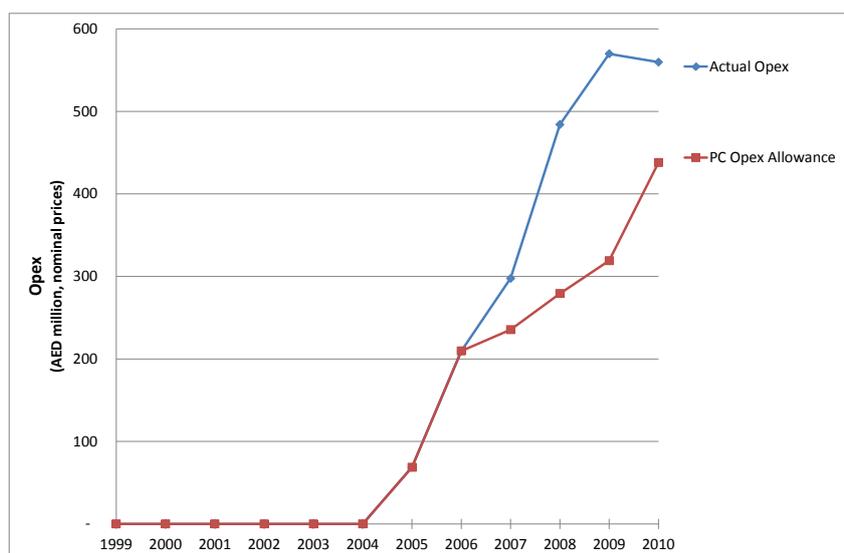


## ADSSC's opex performance

3.13 ADSSC was established in mid-2005 and so the period 2005 to 2010 is the focus of the analysis below:

- (a) ADSSC's opex has increased by 28% per annum on average, in part reflecting the very rapid growth in costs as the company started its operations and regulated activities;
- (b) in 2010, the company's opex reached AED 560 million, more than double the 2006 level and over-spending against price control allowances for 2010 by about AED 122 million or 28%;
- (c) Sewerage business accounts for the largest part (about 68%) of the company's total opex, followed by wastewater treatment (25%) and disposal (7%); and
- (d) in contrast to other network companies where staff costs constitute the largest part of opex, the repair, maintenance and consumables account for about 50% of opex with staff costs about 33% of opex.

Figure 3.5: ADSSC's opex (nominal prices)



## Opex per unit and per customer

3.14 The following two charts present the companies' opex in real terms on per unit distributed, transmitted or treated basis as well as per customer basis for electricity businesses.

Figure 3.6: Opex per unit in real prices (electricity)

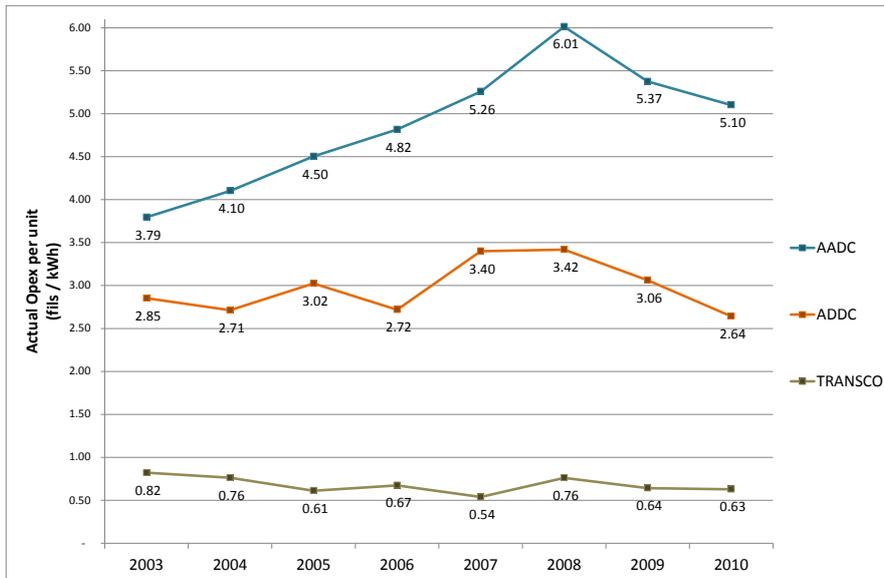
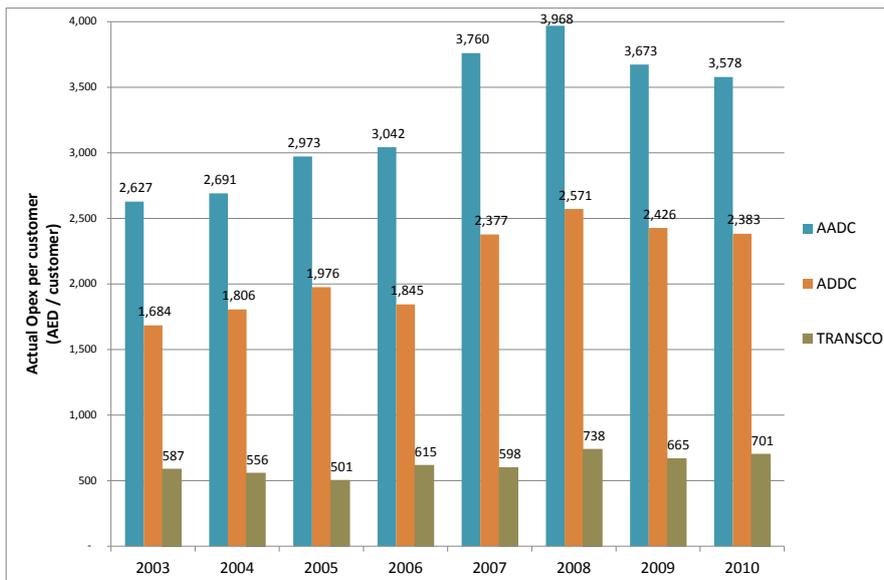


Figure 3.7: Opex per customer in real prices (electricity)



3.15 The following two charts present the same information for network companies' water and wastewater businesses.

Figure 3.8: Opex per unit in real prices (water and wastewater)

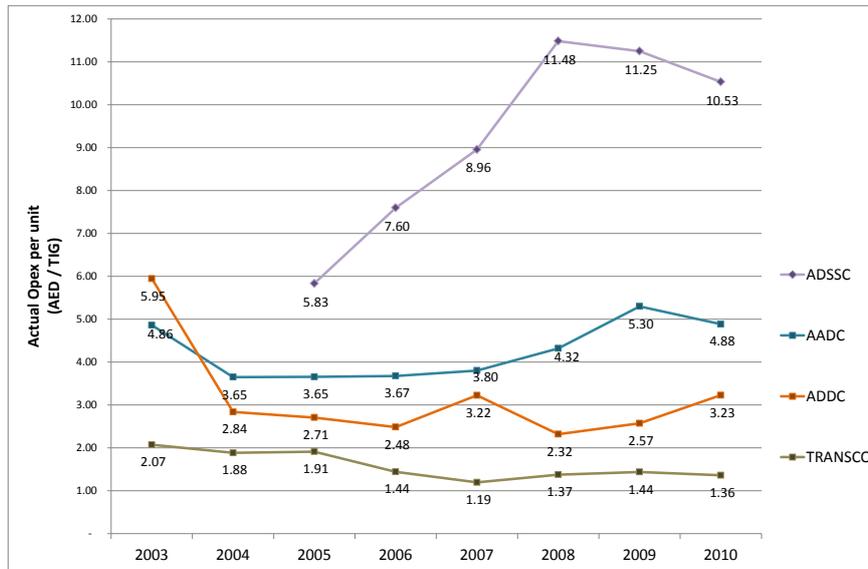
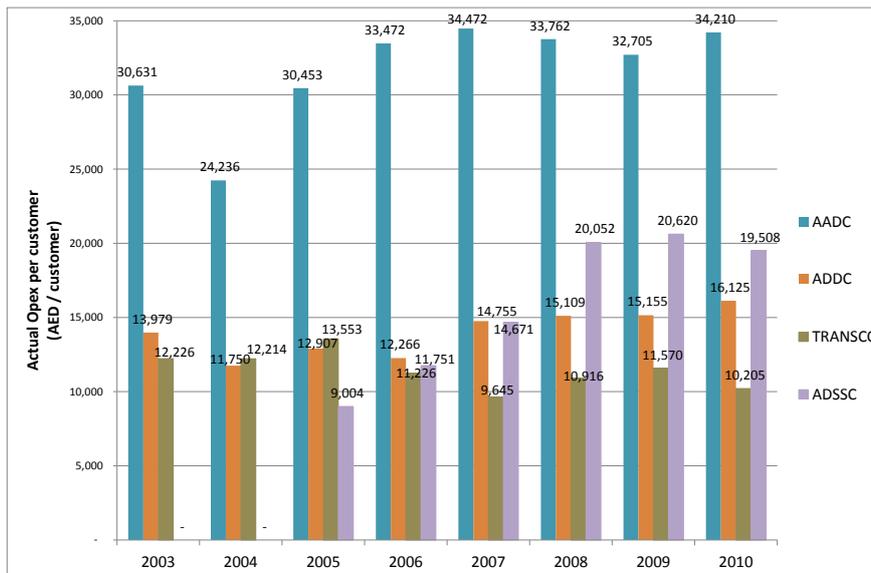


Figure 3.9: Opex per customer in real prices (water and wastewater)



3.16 The opex performance during 2003-2010 depicted in these charts can be summarised as follows:

- (a) Costs in real per unit terms have increased much more slowly and/or have decreased, reflecting the previous trends in absolute cost levels, inflation and rapid demand/customer growth.
- (b) On electricity side, from 2006 to 2010:
  - (i) AADC: opex per unit distributed and opex per customer increased on average by about 1% and 7% per annum, respectively;

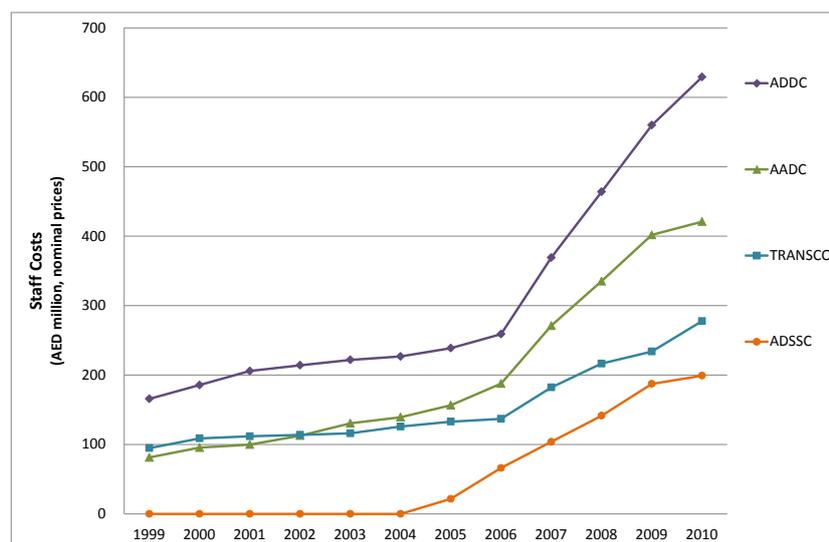
- (ii) ADDC: while opex per unit distributed decreased by 1% per annum, opex per customer increased by 7% per annum on average; and
  - (iii) TRANSCO: opex unit transmitted decreased by 2% per annum, but opex per customer increased by 3% per annum on average (customers assumed to be total number of customers for AADC and ADDC).
- (c) For water businesses, from 2006 to 2010:
- (i) AADC: opex per unit distributed and per customer increased on average by about 7% and 1% per annum, respectively;
  - (ii) ADDC: both opex per unit distributed and per customer increased by 7% per annum on average; and
  - (iii) TRANSCO: opex unit transmitted and per customer decreased on average by 1% and 2% per annum, respectively.
- (d) For wastewater, opex per unit of wastewater treated and opex per customer increased on average by 9% and 14% per annum, respectively, during 2006-2010.

3.17 Looking across both water and electricity, it is clear that the trends in real unit costs have been broadly flat over the period 2003 to 2010 – with the exception of the electricity costs of AADC and ADSSC’s unit costs.

### Staff costs

3.18 For all network companies, staff costs (including salaries and all staff-related allowances) constitute a major (and often the largest) part of actual opex:

Figure 3.10: Network companies’ actual staff costs



- (a) total staff costs of the four network companies have increased from AED 342 million in 1999 to AED 650 million 2006 and to AED 1,527 million in 2010;

- (b) total staff costs of network companies increased from 2006 to 2010 by 24% per annum in nominal prices, with average annual increases for each company as follows: AADC 22%, ADDC 25%, TRANSCO 19% and ADSSC 32%; and
- (c) AADC and ADDC have the lowest average staff cost per employee in 2010, followed by TRANSCO and ADSSC.

### *Emiratisation programmes*

3.19 Following setting the PC4 controls, the Bureau has agreed additional allowances for recruitment, training, employment and retention of the UAE Nationals for the remaining PC4 period (2011-2013), consistent with the wider Government policy on these matters. The following table summarises these allowances.

**Table 3.1: Emiratisation allowances for PC4**

<b>AED million, nominal prices</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
AADC	30.00	40.00	60.00
ADDC	60.00	80.00	110.00
TRANSCO	20.00	30.00	40.00
ADSSC	6.00	9.00	12.00
<b>Total</b>	<b>126.00</b>	<b>169.00</b>	<b>242.00</b>

3.20 In 2010, the UAE Nationals constitute about 32% of the total work force (over 2,000 staff in total) for the four network companies accounting for circa 50% of total staff costs.

## Approach to opex projections

### *Bureau's approach to date*

- 3.21 The Bureau has used the following broad approach to set the opex allowances for PC2 controls and onwards:
- (a) determine a base level of opex (for PC4, the base level was calculated as the average of actual opex in 2008 and opex projected in PC3 controls for 2009, uprated for inflation);
  - (b) 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) modify 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) make further adjustments to opex projections as appropriate - for example, at previous price control reviews adjustments were made for additional opex for upgrading customer's water installations (for AADC), additional water pumping costs (for TRANSCO), and additional staff requirement and salary increases (for ADSSC).

- 3.22 At this review, the Bureau will analyse (with the assistance of expert consultants) the reasons for the increase in companies' opex in recent years. This should facilitate an informed and balanced assessment of opex projections for PC5.
- 3.23 As noted above and in Section 1, the Bureau has appointed consultants (Deloitte) to assist with the review of operating costs. The consultants will undertake this work in three broad phases as summarised below:

*Phase 1 – assess reasons for increase in opex of AADC and ADDC over 2006-2010*

- 3.24 The first phase is an assessment of the reasons for the increase in opex of AADC and ADDC over 2006-2010. The consultants will review the underlying reasons, business drivers and accounting policies and issues driving these increases and quantify the reasons for increase in the overall opex as well as its major components over this period. This phase has already commenced in February 2012 and is expected to conclude in June 2012.

*Phase 2 – develop robust regulatory accounting arrangements for five companies*

- 3.25 In the second phase the consultants will review the existing SBA arrangements and develop proposals for a robust set of regulatory accounting arrangements to be applied in the future covering AADC, ADDC, TRANSCO, ADSSC and ADWEC. This phase is expected to run from April 2012 to February 2013 and detailed in Section 2.

*Phase 3 – prepare forecasts of reasonable opex for four network companies for 2014-2018*

- 3.26 Taking into account the results of phase 1 of the study, the consultants will review and critique the operating costs forecasts of the four network companies (AADC, ADDC, TRANSCO and ADSSC) and develop forecasts of operating costs for the period 2014 to 2018 based on an assessment of costs in a base year and a high level productivity review of each licensee's activities, taking into account any guidance issued by the Bureau in respect of factors such as Emiratisation costs. The work on this phase is scheduled to be carried out during October 2012 to July 2013.

## Treatment of past capex

- 3.27 Capital expenditure is important for network companies. It allows for the timely meeting of demand for new connections and supplies and has a significant impact on the security and reliability of supplies provided by electricity, water and wastewater networks. In response to rapidly rising demand, the level of network capital expenditure has also been rising rapidly. In 2006, the network companies spent approximately AED 4 billion on capital expenditure. By the end of the PC3 period in 2009, this had increased to approximately AED 12 billion. For 2010 (the last year for which audited data is currently available), it amounted to about AED 10 billion.
- 3.28 At present, the large majority of capital expenditure is related to load growth, reflecting the fast developing nature of Abu Dhabi. This means that the majority of infrastructure is relatively new and at present there is relatively little capital spending on asset replacement.

3.29 The treatment of capex by the Bureau in previous price control reviews has essentially been based on an ex-post assessment – that is, allowed capex has been determined after the event (based on efficiency criteria established by the Bureau). This approach to capital expenditure regulation has been used in other jurisdictions around the world, including the UK. Nevertheless, by the standards of more mature jurisdictions, it has produced relatively low efficiency scores and consequently relatively large downward adjustments to the capital that has been allowed for the purposes of calculating regulatory asset values (RAVs) and so price control revenue. The efficiency scores that were applied to PC2 capex are summarised in the table below.

**Table 3.2: Consultants' efficiency assessment of PC2 capex**

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

Source: SKM and ATKINS final reports on PC2 capex assessment, 2007

3.30 The Bureau's ex-post approach to the assessment of capex can be summarised as follows:

- (a) provisional allowances for future capex are incorporated into the price controls;
- (b) actual capex spent by a company is assessed at the end of the control period against the efficiency criteria established by the Bureau; and
- (c) necessary financial adjustments are then made at the subsequent price control review to compensate the company for the difference between the provisional capex allowed in the price controls and the actual efficient capex (taking account of financing costs foregone or unduly earned).

3.31 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.

3.32 The high level efficiency criteria for capex as established by the Bureau in 1999 are:

- (a) was the capex required to meet growth in customer demand or relevant security and performance standards; and
- (b) was it efficiently procured (procurement to be interpreted both in relation to both the tendering process and project management).

3.33 The application of the above approach to capex over each price control period to date is summarised in the following table.

Table 3.3: Treatment of capex in price controls

Treatment	PC1 capex	PC2 capex	PC3 capex	PC4 capex	PC5 capex
<b>Provisional capex allowances</b>	Included in PC2	Included in PC2	Included in PC3	Included in PC4	To be included in PC5
<b>Capex efficiency review</b>	Undertaken by Bureau in 2004	Undertaken by independent consultants in 2007	Undertaken by independent consultants in 2011-2012	To be undertaken in 2012-2013 (and later)	To be decided
<b>Adjustment for efficient capex</b>	Made in PC3	Made in PC4	To be made in PC5	To be made in PC5 (and PC6)	To be decided

Notes: Discussion about the treatment of PC1 capex and PC2 capex does not apply to ADSSC which was established in 2005. For ADSSC, treatment of capex spent over its first control period 2005-2009 is the same that as described here for PC3 capex for other network companies.

3.34 Key points to note are set out below:

- (a) PC1 and PC2 capex are closed matters requiring no further adjustment;
- (b) the efficiency assessment of PC3 capex and the associated adjustments to price control revenue will be dealt with as part of this price control review;
- (c) while the efficiency assessment of PC4 capex was originally envisaged to be undertaken in setting the PC6 price controls, the Bureau has agreed with the companies to bring this assessment forward as much as possible and incorporate the results of such efficiency assessment in setting the PC5 control at this review; and
- (d) an approach to the treatment of PC5 capex (including any provisional allowances) needs to be agreed at this review and incorporated into PC5.

3.35 The remaining part of this Section 3 discusses the treatment of PC3 and PC4 capex efficiency reviews and how PC5 capex should be treated at this review.

## Treatment of PC3 capex

### *PC3 Final Proposals*

3.36 For all the four network companies, the provisional capex allowances for the PC3 period (2006-2009, and in the case of ADSSC, 2005-2009) were incorporated into the PC3 controls at the 2005 price controls review (2007 price control review in case of ADSSC). It was agreed at the time that:

- (a) The assessment of PC3 capex efficiency will be undertaken in 2011 against the Bureau's efficiency criteria by independent consultants appointed by the Bureau, when audited data for all PC3 years will become available. Any adjustment for differences between efficient and provisional PC3 capex (including foregone financing costs) will be incorporated into PC5.
- (b) In contrast to the PC1 and PC2, a relative-efficiency approach will be adopted for water and electricity network companies.
- (c) Relative efficiency scores so calculated would then be subject to further adjustment to reflect movement in the capex efficiency frontier of the whole sector. This would reflect improvements in capital efficiency that should be expected of the sector as a whole.

## Provisional and actual PC3 capex

3.37 The following table shows the provisional capex allowances (totalling about AED 15.6 billion in 2006 prices) which were incorporated into the PC3 price controls at the previous price control reviews of AADC, ADDC, ADSSC and TRANSCO.

Table 3.4: PC3 provisional capex allowances

AED million, 2006 prices		2006	2007	2008	2009	Total
AADC	Electricity	305	305	305	305	1,220
	Water	153	153	153	153	612
	Total	458	458	458	458	1,832
ADDC	Electricity	536	536	536	536	2,144
	Water	315	315	315	315	1,260
	Total	851	851	851	851	3,404
TRANSCO	Electricity	1,200	1,200	1,200	1,200	4,800
	Water	750	750	750	750	3,000
	Total	1,950	1,950	1,950	1,950	7,800
ADSSC	Total	539	438	637	956	2,570
<b>Total</b>		<b>3,798</b>	<b>3,697</b>	<b>3,896</b>	<b>4,215</b>	<b>15,606</b>

3.38 The following table shows actual PC3 capex for these network companies based on the audited SBAs for the respective years – a total of about AED 31.3 billion in nominal prices over 2006-2009.

Table 3.5: PC3 actual capex

AED million, nominal prices		2006	2007	2008	2009	Total
AADC	Electricity	505	404	795	1,331	3,036
	Water	78	88	-3	260	422
	Total	583	492	792	1,592	3,458
ADDC	Electricity	494	993	1,393	2,677	5,557
	Water	222	278	526	448	1,474
	Total	716	1,271	1,919	3,125	7,031
TRANSCO	Electricity	1,377	2,813	4,623	2,726	11,539
	Water	574	720	2,237	2,419	5,949
	Total	1,950	3,534	6,860	5,145	17,489
ADSSC	Total	530*	276	739	1,809	3,353
<b>Total</b>		<b>3,780</b>	<b>5,573</b>	<b>10,309</b>	<b>11,670</b>	<b>31,332</b>

Source: Companies' 2007-2009 audited Separate Business Accounts (SBAs)

Notes: Actual capex is derived from the cash flow statements in the audited SBAs as follows:

(a) Purchase of property, plant and equipment;

(b) Add: Advances to contractors;

(c) Subtract: Proceeds from disposal of property, plant and equipment;

(d) Subtract: Net book value of property, plant and equipment transferred to a third party;

(e) Subtract: Material returns from property, plant and equipment;

(f) Subtract: Transfer of property, plant and equipment to inventory; and

(g) Add / Subtract: Inter-group transfer of property, plant and equipment from / to another party, respectively.

\* For ADSSC, 2006 capex includes 2005 capex. Separate accounts are not available for 2005 (covering the period from ADSSC's establishment in July 2005 to end of 2005).

3.39 When compared in 2006 prices, the total actual capex of the four network companies was higher than the total provisional allowances by about AED 10.3 billion. In 2010 prices, this figure translates into AED 14.3 billion. The following two tables list the actual

and provisional PC3 capex for the network in 2010 prices for ease of comparison on year on year basis.

**Table 3.6: PC3 provisional capex allowances (2010 prices)**

AED million, 2010 prices		2006	2007	2008	2009	Total
AADC	Electricity	422	422	422	422	1,689
	Water	212	212	212	212	847
	Total	634	634	634	634	2,536
ADDC	Electricity	742	742	742	742	2,968
	Water	436	436	436	436	1,744
	Total	1,178	1,178	1,178	1,178	4,713
TRANSCO	Electricity	1,661	1,661	1,661	1,661	6,646
	Water	1,038	1,038	1,038	1,038	4,153
	Total	2,700	2,700	2,700	2,700	10,799
ADSSC	Total	746	607	882	1,323	3,558
<b>Total</b>		<b>5,258</b>	<b>5,119</b>	<b>5,394</b>	<b>5,835</b>	<b>21,606</b>

**Table 3.7: PC3 actual capex (2010 prices)**

AED million, 2010 prices		2006	2007	2008	2009	Total
AADC	Electricity	699	512	907	1,352	3,470
	Water	108	111	-4	265	479
	Total	806	623	903	1,617	3,949
ADDC	Electricity	684	1,258	1,588	2,719	6,249
	Water	307	353	600	455	1,715
	Total	992	1,611	2,187	3,174	7,963
TRANSCO	Electricity	1,906	3,564	5,270	2,769	13,509
	Water	794	912	2,550	2,456	6,713
	Total	2,700	4,477	7,820	5,225	20,222
ADSSC	Total	734	349	842	1,837	3,762
<b>Total</b>		<b>5,233</b>	<b>7,060</b>	<b>11,752</b>	<b>11,852</b>	<b>35,897</b>

### *PC3 capex efficiency assessment*

3.40 In accordance with the PC3 Final Proposals, the Bureau appointed KEMA and WS Atkins in March 2011 as the independent consultants to undertake the efficiency review of PC3 capex for the electricity and water/wastewater businesses, respectively. The consultants are presently undertaking this review in close consultation with the Bureau and the four network companies. The consultants have 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 have produced several reports while considering the comments of all stakeholders. The consultants have presently employed two approaches to assessing the capex efficiency: scoring method (i.e. scoring the efficiency of business processes on a scale of 0-4 or 0-5) and monetary quantification method (i.e., quantifying the difference between actual and efficient costs). The interim reports and draft reports were issued by the consultants to the Bureau and the companies in December 2011 and March 2012 for their review and comments. The final reports by the consultants are expected in May 2012.

- 3.41 Various processes and sub-processes could be affected by ADWEA's prescribed standards and policies, instructions and directives, or otherwise. Similarly, the rapid growth, culture and working environment in the Emirate could have significant impact. These factors can result in inefficiencies and prevent a project or a company achieving best industry practices. The consultants have therefore been asked to attribute or allocate inefficiency in each process and project between the company, its shareholder (e.g., ADWEA) and exogenous factors specific to Abu Dhabi. The objective of these attributions is to assist the companies to have useful dialogue with the relevant entities and authorities to avoid or minimise such inefficiencies in future.
- 3.42 The main issue at this review is how to apply these efficiency scores to the actual PC3 capex of the companies to determine the efficient PC3 capex. We are also considering whether ADSSC should also be given a relative efficiency score and whether any further adjustment to the relative efficiency scores would be required, consistent with the commitments made by the Bureau at the time of the PC3 review.

## Treatment of PC4 capex

### *PC4 Final Proposals*

- 3.43 At the 2009 price control review, provisional capex allowances (of about AED 56 billion in total, in 2010 prices) for the PC4 period (2010-2013) were incorporated into the PC4 controls for AADC, ADDC, ADSSC and TRANSCO. It was agreed that once the audited data on actual PC4 capex is available, it will be assessed by independent consultants against the Bureau's established efficiency criteria.

Table 3.8: PC4 provisional capex allowances

AED million, 2010 prices		2010	2011	2012	2013	Total
AADC	Electricity	900	900	900	900	3,600
	Water	130	130	130	130	520
	Total	1,030	1,030	1,030	1,030	4,120
ADDC	Electricity	1,570	1,570	1,570	1,570	6,280
	Water	590	590	590	590	2,360
	Total	2,160	2,160	2,160	2,160	8,640
TRANSCO	Electricity	5,230	5,230	5,230	5,230	20,920
	Water	2,530	2,530	2,530	2,530	10,120
	Total	7,760	7,760	7,760	7,760	31,040
ADSSC	Total	3,000	3,000	3,000	3,000	12,000
<b>Total</b>		13,950	13,950	13,950	13,950	55,800

- 3.44 In the light of the efficiency review of actual PC4 capex and the relative-efficiency based approach already agreed for PC3 capex, an appropriate adjustment will be made at a future review for any difference between the efficient PC4 capex and the provisional PC4 capex allowed, along with any foregone financing costs.

## *PC4 capex efficiency assessment*

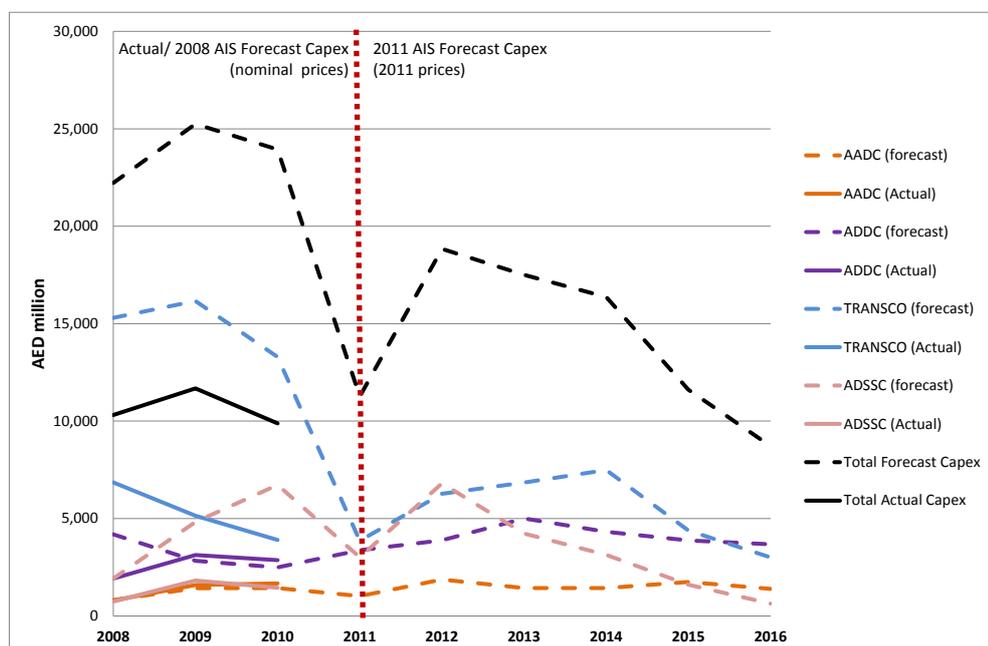
- 3.45 It was originally envisaged that the actual capex incurred during all the years of the PC4 period will be available and assessed in 2014-2015 prior to the setting of PC6 controls. However, the companies during the ongoing PC3 capex review made representations to express concerns about the long lags associated with the present process of capex review. In order to make the capex review more effective and timely, the Bureau and companies have now agreed to bring PC4 capex efficiency assessment forward and appoint consultants to undertake the assessment of the first three years (2010-2012) in 2012-2013 when the following audited accounts will be available from the companies:
- (a) audited accounts for 2010 are already available;
  - (b) audited accounts for 2011 are due by end of April 2012; and
  - (c) audited accounts for 2012 are due by end of April 2013.
- 3.46 The review of PC4 capex therefore needs to be structured such that 2010-2011 capex will be reviewed in 2012 and that 2012 capex will be reviewed in 2013. The capex incurred during the last year of the PC4 period (i.e. 2013) will be reviewed in future alongside PC5 capex.
- 3.47 It is expected that the PC4 capex efficiency consultants will commence their work in May 2012 (following conclusion of PC3 capex review) and conclude it in April-May 2013. In contrast to earlier capex reviews, the Bureau plans to provide more specific guidelines to the consultants for PC4 capex review on the methods for assessment that will be substantially similar to those used for PC3 capex review. It is hoped that this approach will provide more certainty to the companies. The Bureau is consulting with the licensees on the scope of consultants' work, timetable and deliverables.
- 3.48 The Bureau will adopt a separate process for valuing network assets that are built by developers as part of so called "mega projects" and transferred to licensees for ownership, operation and maintenance;

## Treatment of future capex

- 3.49 The Bureau has already brought forward the timing of the review of PC4 capex (2010 - 2012) and this will commence later this year. The intention is to make the review of capex more timely, and so provide a greater impetus for capital efficiency across the sector. It will also be appropriate to consider whether there are further steps that the Bureau could take to make the regulation of capital expenditure more effective and further improve incentives for capital efficiency. In the longer-term, this should promote overall efficiency and reduce the downward adjustments made to capex for the purposes of calculating RAVs - and so also reduce the risks on licensees and their shareholders.
- 3.50 At the previous price control reviews, the Bureau adopted a high-level approach to setting the provisional allowances for future capex focusing primarily on the amounts of capex spent by the companies in recent years. In some cases (particularly for ADSSC), the Bureau however set a higher provisional allowance than actual capex in recent years to recognise the company's committed projects.

- 3.51 For the PC5 period, the Bureau considers that more robust capex allowances are appropriate. To this end, we have planned to seek the help of the consultants that are appointed for the PC4 capex efficiency review. The consultants will be required to undertake a high-level review of the companies' PC5 capex forecasts, the basis of these forecasts and the underlying major projects while taking account of the actual capex in recent years. We intend to seek the required information from the companies through the 2012 AIS submissions due in October 2012. The consultants would then be able to provide their inputs to the Bureau for the draft and final proposals on PC5 in 2013.
- 3.52 In the above context, the following chart summarises the network companies' 2008 forecasts of capex (taken from the 2008 AIS) against actuals (taken from their SBAs) and their 2011 forecasts for the period up to 2016.

Figure 3.11: Network companies' capex forecasts



- 3.53 The chart shows the following:
- the four network companies' actual capex spend over 2008-2010 was about AED 31.9 billion in nominal prices, against a total forecast for AED 71.4 billion in nominal prices;
  - the four companies have forecast a total capex of about AED 36.7 billion (2011 prices) over the period from 2014-2016, which translates to annual capex of about AED 12.2 billion per year over 2014-2016 against the actual annual capex of about AED 10.6 billion per year during 2008-2010;
  - TRANSCO (AED 14.9 billion) and ADDC (AED 11.9 billion) have the highest projected spend over 2014-2016; and
  - there is a general decline in the annual forecast capex in the later years perhaps indicating a slowdown in capex spending, inadequate information on future projects and/or other challenges associated with longer-term forecasting.

## Key issues for consultation

3.54 Key issues for consultation include:

- (a) How can the assessment of opex be best improved from the approach adopted by the Bureau in PC4?
- (b) What are the key relationships between opex and capex and how should these be best dealt with by the Bureau?
- (c) What are the key drivers of future operating costs and how should the Bureau best take account of these in making projections of future opex?
- (d) Is the consultants' work programme on opex summarised in paragraphs 3.23-3.26 appropriate and how might it be improved?
- (e) How can the incentives for the companies be enhanced through price controls to manage their operating costs more efficiently?
- (f) How can the price controls and related incentives be enhanced to ensure that they are consistent with the Government's Emiratization policy?
- (g) How can the ex-post approach to regulating capital expenditure be best improved?
- (h) The PC3 capital efficiency review has involved identifying efficiency scores by project scoring and monetary quantification methods. How should these be combined into an overall efficiency score? What further adjustments should be made to take account of the relative position of licensees and the overall efficiency frontier?
- (i) Should ADSSC be treated differently in the assessment of PC3 capital efficiency because it is relatively a new company?
- (j) Should the approach for assessing PC4 capex be the same as for PC3 capex or should the approach be modified? If changes are appropriate, what would these be and how should these be implemented?
- (k) Whether the planned support from external consultants to establish provisional allowances for future capex supports or justifies any change to the approach to regulation of PC5 capex?
- (l) Would there be merits of an interim review of capex in the middle of the PC5 period to ensure that the regulation of capex is as timely as practicable?
- (m) Are there other changes which should be considered at this review in relation to the regulation of opex and capex?

## 4. Financial issues

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### Introduction

- 4.1 Section 3 of this paper discusses the levels of operating and capital expenditures that it would be prudent to allow to support the objectives and incentives described in Section 2. This section discusses how these operating and capital expenditures should be financed and how the overall level of core price control revenue should be calculated.
- 4.2 Because capital expenditure relates to assets that should have an economic life of many years, it is generally appropriate to allow for the recovery of these costs over an extended period of time. This can be accomplished by allowing these costs to be capitalised and added to the regulatory asset value (RAV) with an annual allowance for depreciation. In order to finance the unamortised portion of the RAV, it is also appropriate to allow the licensee to earn a return or cost of capital on this net asset value.
- 4.3 This section considers the calculation of the RAV and the appropriate allowances for regulatory depreciation and returns. It then goes on to consider how the overall level of core price control revenue should be calculated – taking account of the three key building blocks - allowances for operating cost, regulatory depreciation and returns. Once the new price control arrangements are put in place, this level of core revenue will be subject to incentive arrangements and cost pass-through terms (as discussed in Section 2) allowing the determination of total price control revenue.

### Regulatory asset values and regulatory depreciation

#### *Approach to updating RAVs*

- 4.4 To calculate the RAVs for the next price period, the Bureau intends to use an approach consistent with that adopted during previous price control reviews. This would involve making calculations for each year since the start of the PC3 price control period in 2006. For the PC3 and PC4 periods, it would be necessary to align previous provisional estimates of capital expenditure and allowances for regulatory depreciation with estimates of efficient capital expenditure for the period 2006 to 2009, and, to the extent that is practicable, 2010 to 2013. For the PC5 period, it would be necessary to make projections of capital expenditure, RAVs and regulatory depreciation.
- 4.5 The purpose of aligning the provisional estimates of capital expenditure made at previous price control reviews with the estimates of efficient spending derived from the PC3 and PC4 capital expenditure reviews (discussed in Section 3) is to encourage efficiency and ensure that licensees only recover costs through price controls that are reasonable.
- 4.6 In practice, the adjustments for the period 2006 to 2009 can be made by calculating the opening RAV for 2014 (i.e. the first year of the PC5 control period) from the RAV calculated for the end of 2013 at the last review by adding the difference between efficient and provisional PC3 capex (net of accumulated regulatory depreciation) from the time such capex was spent up to the end of 2013. It will also be necessary to make an adjustment for financing costs of the differences between the efficient and provisional

estimates of capital expenditure for each year of the PC3 period, until the start of the new price controls in 2014. This adjustment for foregone financing costs can be either made to the RAV (as was done for PC1 capex financing costs) or remunerated as additional revenue over the PC5 period (as was done for PC2 capex financing costs).

- 4.7 The same approach as described above can be applied to the updating the RAVs for PC4 capex to the extent they are reviewed for capex efficiency prior to issue of the PC5 Final Proposals in 2013. We anticipate that by this stage the consultants will have completed efficiency reviews of 2010, 2011 and 2012.
- 4.8 For PC5, the RAVs can be calculated simply by adding provisional PC5 capex and subtracting the estimate of regulatory depreciation for each year of the price control period.

### *Regulatory depreciation*

- 4.9 In any year, regulatory depreciation can be calculated as the sum of the depreciation on the existing asset value at the start of the price control period plus regulatory depreciation on the provisional allowances for capital expenditure made at the price control review. The calculation of regulatory depreciation requires assumptions about capitalisation policy, depreciation profiles and asset lives for the company. To date, the Bureau has assumed that the approach to capitalisation policy used in the Separate Business Accounts should also be used for price control purposes and that it is appropriate to use straight line depreciation. Assumptions with respect to asset lives are summarised in the table below.

**Table 4.1: Asset life assumptions at previous price control reviews**

Business	Initial RAV				Life of New Capex years
	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

- 4.10 Once the initial RAV or the new capex is fully depreciated at the end of the respective life shown in the above table then there are no further allowances for depreciation or returns for that tranche of assets.
- 4.11 For the calculation of the depreciation for PC5 controls, the Bureau's current thinking is to continue with the straight-line method and asset life assumptions as set out in the table above.

## Cost of capital

- 4.12 Setting the price controls for network companies requires the determination of an allowed cost of capital or rate of return to be applied to the net RAV each year to allow for the financing of the asset base. This cost of capital is an estimate of the minimum return investors will accept for investing in a particular company, taking account of its risks.

### Overall framework

- 4.13 Companies are usually financed by a mixture of debt and equity and so the cost of capital is calculated as a weighted-average of the costs of debt and equity finance. This is the Weighted Average Cost of Capital (WACC), which can be calculated 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.

- 4.14 The important features of this approach to cost of capital calculation can be summarised as follows.

- (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** can be 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. Nevertheless, CAPM remains the method that is most widely used by regulators, businesses and investors for estimating the cost of equity.
- (d) The **risk-free rate** represents the return available from a riskless form of investment, typically estimated as the return on 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 cash flows 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 compared to the risk-free rate.
- (g) The **equity beta** measures the riskiness of a given investment (i.e. shares of a specific business) relative to the average level of risk in the equity market.
- (h) Estimates of the cost of debt and equity need to be made in a way which is consistent with the assumptions on gearing. In many jurisdictions there are tax advantages associated with higher levels of gearing, but also disadvantages as high levels of leverage create increasing risks of bankruptcy. The trade-off between these factors can create an optimal level of gearing, which takes

advantages of the tax shield created by debt finance to the point where these incremental advantages are offset by the increased risk of financial failure.

- 4.15 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. 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. In Abu Dhabi, there are no taxes on corporate profits at present and so the pre-tax and the post-tax measures of cost of capital are therefore equal. In many jurisdictions, where taxes on corporate profits are applicable and investors are concerned with the return they receive after corporate taxes (i.e. the post-tax cost of capital). It is therefore the post-tax cost of capital from such countries that provides the relevant comparison for Abu Dhabi.

### *Approach to date*

- 4.16 In view of the limited size and liquidity of debt and equity markets in the Emirate of Abu Dhabi, the Bureau's previous estimates of the cost of capital have drawn heavily on the estimates of cost of capital components used by regulators of similar businesses in the UK and Australia. The Bureau used a real post-tax cost of capital of 6% for setting the PC1 and PC2 controls for water and electricity companies. For PC3 controls, a basic cost of capital of 5% was used for all four network companies. The Bureau's cost of capital calculations used in setting PC3 controls are summarized in the following table.

**Table 4.2: Bureau's cost of capital calculations for PC3/PC4**

	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%
<b>Post-tax cost of capital (real)</b>	<b>4.5%</b>	<b>5.6%</b>

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

- 4.17 For the PC4 controls, the Bureau adopted a cost of capital of 4.5% for all network companies – that is, the lower end of the PC3 range - based on the following:
- (a) the regulatory decisions in the UK and Australia at the time;
  - (b) upgrading of the ratings of the UAE and a sector entity;
  - (c) declines in (i) the risk-free rate (as low as 2% p.a. in nominal terms), (ii) the overall cost of debt in global markets, and (iii) the UAE inter-bank interest rates;
  - (d) Bureau's analysis of responses from sector companies quoting overseas regulators' data and the actual cost of borrowing for sector companies, respectively; and

- (e) the cost of capital estimates from the local capital market analysts for the UAE companies operating in the utility and other sectors at the time.

## Calculating core price control revenue

### *Sculpting revenue*

- 4.18 As discussed above, the core revenue requirement (i.e. revenue requirement excluding the pass-through costs) for each year of the control period (sufficient to finance a reasonably efficient business) is calculated as follows:

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

- 4.19 The calculations of RAVs and regulatory depreciation are discussed above. Returns are calculated by applying the cost of capital to the mid-year average RAV. Projections of opex and capex to be used in these calculations are discussed in Section 3. All the calculations are carried out in real terms (i.e. at constant prices).
- 4.20 To date, the Bureau used a net present value (NPV) approach to sculpting revenue requirements over the period of the price control. NPVs are calculated using the estimate of the cost of capital discussed above as the discount rate. This has involved the following steps:
- Required revenues for the price control period are calculated as NPVs, which are then matched against the NPV of the projected revenues.
  - Projected revenue is derived according to the form of the control in terms of fixed terms and revenue drivers and the forecasts of these revenue drivers. Projected revenue is controlled and sculptured by selecting base prices (i.e., notified values of 'a', 'b' and 'c' in the MAR formulae) and X values.
  - Other things being equal, a higher (lower) base price will increase (reduce) projected revenue and prices to customers and a higher (lower) X value will reduce (increase) prices to customers over the price control period, assuming a traditional CPI-X price control.

### *Financial adjustments*

- 4.21 As explained above, the three basic building-blocks are used to determine the core price control revenue – allowances for operating costs, regulatory depreciation and returns. At the previous price control reviews, the Bureau made a number of additional one-off adjustments for various reasons not captured by the core revenue calculations. Such adjustments may be required for a range of reasons including the following:
- Financial adjustments for performance scheme Category B indicators.*** Category B indicators and incentives are described in Section 1. At the last price control review, financial adjustments for TRANSCO's performance on water transmission constraints and five-year planning statements were applied to PC4 controls.

- (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 control review. No adjustment for this was made at the last review because any errors identified were corrected in the following year's PCR.
- (c) **Other financial adjustments.** For example, adjustments were applied for AADC's and ADDC's performance on customers' water asset installations (to finance which additional costs were previously allowed in price controls) and water interface metering at the last price control review.

## Key issues for consultation

4.22 Key issues for consultation include the following:

- (a) What is the best approach to financing capital expenditure and does the approach to calculating regulatory asset values (RAVs) and regulatory depreciation described above remain reasonable?
- (b) Should the Bureau continue to estimate the cost of capital on the basis of a real post-tax cost of capital with inflation allowed for by adjusting base prices in the price control formula and CPI indexation?
- (c) Is Capital Asset Pricing Model (CAPM) the best model for estimating the cost of capital?
- (d) Should the Bureau consider both overseas and local capital market data to inform its estimates of the cost of capital?
- (e) In addition to the basic estimates of operating costs, regulatory depreciation and regulatory returns, what further financial adjustments might be appropriate when calculating the core level of price revenue?
- (f) Is it appropriate to use present value calculations to sculpt projections of revenue and calibrate base prices and X values for the new price controls?
- (g) Are there further issues that should be taken into account in determining core price control revenue?