مكتب التنظيم و الرقابة
Regulation & Supervision Bureau

2013 Price Control Review

PC5 Draft Proposals

Consultation Document

15 May 2013 CR/E02/100

2013 Price Control Review

PC5 Draft Proposals

CR/E02/100

15 May 2013

Foreword

1. In 2012, the Bureau commenced the consultation process to review the price controls that apply to the four electricity, water and wastewater network companies operating in the Emirate of Abu Dhabi (AADC, ADDC, ADSSC and TRANSCO). The first consultation paper was published in April 2012, followed by the second consultation paper in October 2012.

2. This document sets out our draft proposals for the fifth price controls known as the PC5 controls applicable to the four network companies and takes into account their responses to our second consultation paper. We continue to work with the network companies to further develop the regulatory regime to address the priority areas and challenges with significant changes to various aspects of regulation while retaining and enhancing the incentives of the multi-year CPI-X model of regulation.

3. The Bureau plans to publish the final proposals in the early fourth quarter of 2013, with the intention that new price controls should take effect from 1 January 2014.

4. Queries via email on the contents of this paper should be sent to:

   Aftab Raza
   Head of Network Price Controls
   Regulation and Supervision Bureau
   PO Box 32800, Abu Dhabi
   Fax: 02-6424217
   Email: araza@rsb.gov.ae

5. Formal responses to the issues raised in the paper must be forward by no later than 15 July 2013 to:

   Dr Nadira Barakatullah
   Director of Economic Regulation
   Regulation and Supervision Bureau
   PO Box 32800, Abu Dhabi
   Fax: 02-6424217
   Email: nbarkatullah@rsb.gov.ae

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

NICK CARTER
Director General

Executive Summary

Introduction

1. This document describes the Bureau's draft proposals for the PC5 price controls for AADC, ADDC, TRANSCO and ADSSC and takes into account the responses from the licensees to the second consultation paper published in October 2012.

Form of controls (Section 2)

2. Section 2 describes our draft proposals on the form, structure and duration of new price controls:

   (a) The form of PC5 controls for the network companies should remain the CPI-X revenue cap.

   (b) PC5 controls should be set for ADSSC for 4 years (2014-2017) and for AADC, ADDC and TRANSCO for 5 years (2014-2018).

   (c) The scope of TRANSCO's price controls should be expanded to include unlicensed dedicated activities outside the Emirate of Abu Dhabi.

   (d) All price controls should have two revenue drivers with the following features:

      (i) no changes to the existing revenue drivers for the distribution companies;

      (ii) customer numbers included as an additional revenue driver for ADSSC; and

      (iii) change of TRANSCO's revenue drivers to metered units and metered peak demands, without strict compliance with MDEC.

   (e) The 80:20 weights for the fixed and variable terms of the MAR remain appropriate for calibrating the PC5 controls.

   (f) We have adopted the revenue driver projections provided by the respective companies in their 2012 Annual Information Submissions (AIS), except for TRANSCO.

   (g) The existing cost pass-through arrangements should be retained.

3. The general structure of the Maximum Allowed Revenue (MAR) for each business for any year "t" of the PC5 control period shall be as follows:

$$MAR_t = \text{Pass-through Costs}_t + a_t + (b_t \times RD1_t) + (c_t \times RD2_t) + Q_t - K_t$$

   where:

   (a) "a_t", "b_t" and "c_t" are the notified values for the year "t" as determined by the Bureau in 2014 prices through price control calculations and are indexed against the UAE Consumer Price Index (CPI) less an "X" factor;

   (b) "$RD1_t$" and "$RD2_t$" are the actual values of the relevant revenue drivers in year "t"; and

(c) "Q_t" and "K_t" are the performance incentive amount and the correction factor for the year "t", respectively.

Operating expenditure (Section 3)

4. Section 3 discusses the approach to determining operating cost allowances and the regulation of operating costs for the PC5 period. Our PC5 opex projections in 2014 prices adopted in these draft proposals and listed in **Table 1** are based on our opex consultant's interim report issued in March 2013.

Table 1: PC5 opex projections (2014 prices) – draft proposals

AED million, 2014 prices		2014	2015	2016	2017	2018
AADC	Electricity	327	312	298	287	277
	Water	207	197	187	179	173
	Total	534	509	485	465	450
ADDC	Electricity	592	590	583	576	569
	Water	333	326	320	314	311
	Total	925	916	902	890	880
TRANSCO	Electricity	280	276	265	257	245
	Water	378	383	365	367	357
	Total	658	659	630	624	602
ADSSC	Total	528	508	493	481	474
Total		**2,645**	**2,592**	**2,509**	**2,461**	**2,405**

5. The proposed opex allowances for PC5 are generally lower (except for TRANSCO) than the companies' 2011 actual opex by around 0.50%-4.6% and significantly lower than their 2012 AIS forecasts in real terms.

6. At present, these opex projections use 2011 costs as the base year and include allowances for Emiratisation costs. Further work is being undertaken by our consultant on opex projections which will be presented in the consultant's draft and final reports expected at the end of May and July 2013, respectively. The consultant will be reviewing the 2012 SBAs recently received and further information from the companies and estimating allowances for the Bureau's licence fees, mega developments, and ADSCC's management of private tankering services. The consultant's work is therefore likely to result in changes to the opex projections which will be taken into account by the Bureau in the PC5 final proposals.

Capital expenditure (Section 4)

PC3 capex (2006-2009)

7. We have adjusted the PC3 capital efficiency scores assessed by our consultants (KEMA and Atkins) using the results from their PC3 capex final reports in June 2012 as follows:

Table 2: PC3 capex efficiency – draft proposals

Adjusted efficiency	Electricity	Water / Wastewater
AADC	96.22%	96.19%
ADDC	96.25%	95.54%
TRANSCO	95.65%	96.57%
ADSSC		97.49%

8. Based on this, the additional efficient PC3 capex (over and above the provisional PC3 allowances incorporated into the PC3 controls) amounting to AED 12.9 billion (2014 prices) is being financed at this review through an upward adjustment to the companies' regulatory asset values (RAVs) and future revenues.

Table 3: Additional efficient PC3 capex – draft proposals

AED million, 2014 prices		2005	2006	2007	2008	2009	Total
AADC	Electricity		259	75	466	863	1,663
	Water		-112	-109	-223	30	-414
ADDC	Electricity		-86	485	813	1,831	3,043
	Water		-148	-103	142	-105	-213
TRANSCO	Electricity		167	1,816	3,497	1,011	6,491
	Water		-281	-163	1,463	1,367	2,386
ADSSC	Total	-14	16	-276	-63	283	-54
Total		**-14**	**-184**	**1,726**	**6,096**	**5,280**	**12,903**

PC4 capex (2010-2013)

9. The Bureau proposes using the PC3 efficiency figures in **Table 2** above to determine PC4 efficient capex for 2010-2011 at this review. This efficiency assessment, combined with the companies' under-spending against the PC4 provisional capex allowances, results in an aggregate downward adjustment of about AED 9 billion (in 2014 prices) to the companies' RAVs and future revenues.

Table 4: Additional efficient PC4 capex – draft proposals

AED million, 2014 prices		2010	2011	Total
AADC	Electricity	228	-534	-306
	Water	284	-22	262
ADDC	Electricity	30	769	799
	Water	-12	-122	-134
TRANSCO	Electricity	-3,115	-2,261	-5,377
	Water	-1,114	-934	-2,049
ADSSC	Total	-1,671	-588	-2,259
Total		**-5,371**	**-3,693**	**-9,064**

10. The capex in the last two years of the PC4 period (ie, 2012-2013) will be reviewed alongside the PC5 capex in the future with any adjustment to be made in PC6.

PC5 capex (2014-2018)

11. We have proposed retaining an ex-post efficiency review approach to the PC5 capex and included the following provisional allowances for PC5 capex based on the capex

consultants' work. In total, these allowances amount to about AED 43.6 billion over 2014-2018, which is about 74% of the companies' 2012 AIS forecasts for PC5 capex. We have also proposed changes to the overall regulatory regime for future capex in terms of limited, ex-ante annual capex reviews and more timely ex-post capex reviews.

Table 5: Provisional PC5 capex allowances – draft proposals

AED million, 2014 prices		2014	2015	2016	2017	2018	Total
AADC	Electricity	810	810	810	810	810	4,050
	Water	160	160	160	160	160	800
ADDC	Electricity	2,690	2,690	2,690	2,690	2,690	13,450
	Water	620	620	620	620	620	3,100
TRANSCO	Electricity	2,080	2,080	2,080	2,080	2,080	10,400
	Water	950	950	950	950	950	4,750
ADSSC	Total	1,850	1,520	1,390	1,350	980	7,090
Total		**9,160**	**8,830**	**8,700**	**8,660**	**8,290**	**43,640**

Financial issues (Section 5)

12. Based on the overseas regulatory proposals and evidence from local and regional capital markets, we have proposed a real cost of capital of 5.50% for PC5.

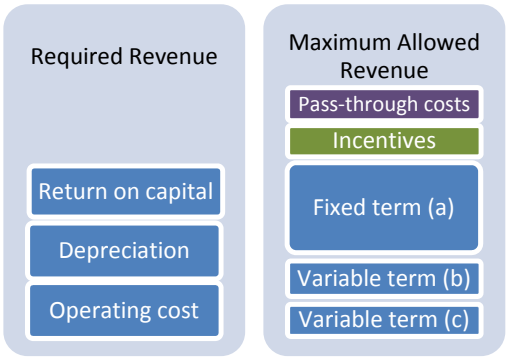
13. The additional efficient PC3 and PC4 capex have been rolled into the RAVs, increasing the 2014 opening RAVs by about AED 2.4 billion (in 2014 prices). With the provisional PC5 capex, RAVs have increased to AED 119 billion (2014 prices) by the end of 2018.

14. The foregone financing costs of the difference between efficient and provisional estimates of PC3 and PC4 capex have been allowed as an adjustment to PC5 revenue by about AED 3.6 billion (in 2014 prices) in present value terms.

Price control calculations (Section 6)

15. Consistent with the previous work, a "building-block" approach has been adopted to determine the revenue requirement (comprising opex, depreciation and return on capital) and a net present value (NPV) framework to determine the notified values "a", "b" and "c" for PC5.

Figure 1: Price control calculations framework



16. The notified values (a, b, and c) determined in these draft proposals for 2014 (expressed in 2014 prices) are given below. Their calculations are detailed in Section 6 and **Annex B**. For subsequent years, these notified values will be adjusted by CPI-X indexation.

Table 6: Notified values for PC5 – draft proposals

2014 prices		X		a		b		c
AADC	Electricity	0.00	1,222.18	AEDm	1,383.84	AED / customer account	0.7035	fils/ kWh metered
	Water	0.00	346.55	AEDm	779.44	AED / customer account	0.3055	AED / TIG metered
ADDC	Electricity	0.00	2,530.82	AEDm	989.16	AED / customer account	0.3353	fils / kWh metered
	Water	0.00	704.16	AEDm	395.82	AED / customer account	0.2552	AED / TIG metered
TRANSCO	Electricity	0.00	3,651.39	AEDm	29.41	AED / kW metered	0.5091	fils / kWh metered
	Water	0.00	1,959.13	AEDm	254.01	AED / TIGD metered	0.7473	AED / TIG metered
ADSSC		0.00	1,702.87	AEDm	360.31	AED / customer account	0.6681	AED / m^3 metered

Notes: These notified values for 2014 are based on an assumed UAE CPI of 118.00 (base year 2007 = 100) for 2013. They will be subject to an adjustment for actual UAE CPI for 2013.

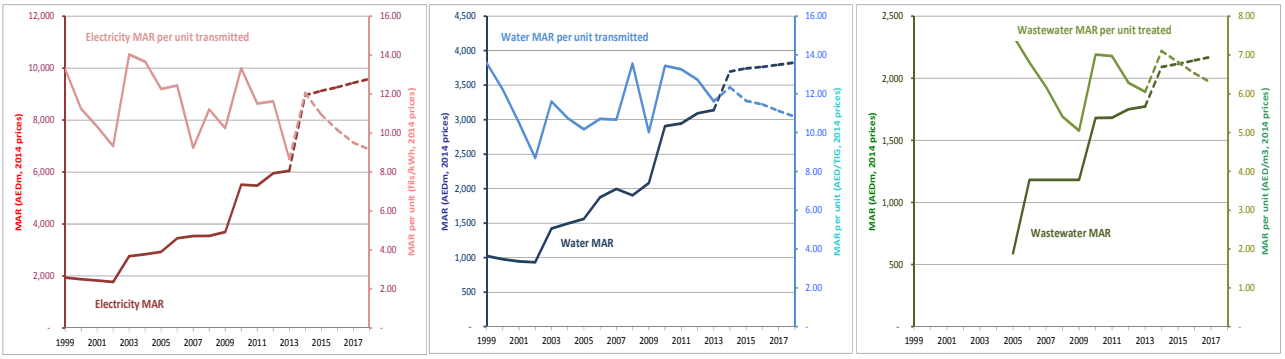
17. The annual MARs projected for each business over the PC5 period in respect of its "own" costs (i.e. excluding pass-through costs) are summarised in **Table 7**.

Table 7: Projected MAR over PC5 period – draft proposals

AED million, 2014 prices		2014	2015	2016	2017	2018
AADC	Electricity	1,495	1,513	1,528	1,547	1,565
	Water	428	431	434	436	439
ADDC	Electricity	3,047	3,112	3,162	3,228	3,302
	Water	861	872	881	891	901
TRANSCO	Electricity	4,414	4,502	4,573	4,658	4,714
	Water	2,408	2,440	2,450	2,469	2,487
ADSSC	Total	2,090	2,116	2,143	2,172	-
Total		**14,744**	**14,986**	**15,171**	**15,401**	**13,409**

18. The charts below show the expected effect of these draft proposals on the total price-controlled costs and unit costs for electricity, water and wastewater, respectively (in 2014 prices). While the annual MARs are projected to increase, the increasing demand means that the draft proposals are expected to result in reductions in the unit costs (in real terms) by 10% to 20% from the 2011 levels.

Figure 2: Projected trends of price-controlled MARs



19. The majority of the projected MAR is accounted for by capital cost related components, ie, regulatory depreciation and the return on capital. In aggregate, the average return on

capital or profit is expected to be around AED 7 billion (2014 prices) a year over the PC5 period.

Incentives and outputs (Section 7)

20. **Table 8** summarises all the incentives now included in these draft proposals; it is proposed that these will be incorporated into the network companies' licences at this price control review for implementation in PC5.

21. Compared to the second consultation paper, the proposed number of new incentives for all businesses has now been reduced. Each incentive will be subject to a cap equal to 0.50% of business' core MAR (ie, excluding pass-through costs).

Table 8: Incentives developed for PC5 – draft proposals

	AADC (E)	AADC (W)	ADDC (E)	ADDC (W)	TRANSCO (E)	TRANSCO (W)	ADSSC
Availability, security and quality of supply (Annex C)							
Water quality		✓		✓		✓	
Transmission system availability					✓	✓	
Removal of timed water supply		☑		☑			
Interface metering	✓	✓	✓	✓	☑	☑	
Distribution losses	✓	✓	✓	✓			
Security of supply						☑	
SAIDI	✓		✓				
SAIFI	✓		✓				
Energy lost					✓		
Biosolid reuse							☑
Information (Annex D)							
SBAs (including PCRs as per new RAGs)	✓	✓	✓	✓	✓	✓	✓
AIS	✓	✓	✓	✓	✓	✓	✓
End-use efficiency							
DSM strategy and action plan	☑	☑	☑	☑			
Number of existing incentives for PC5	6	5	6	5	4	4	2
Number of new incentives for PC5	1	2	1	2	1	2	1
Total number of incentives for PC5	**7**	**7**	**7**	**7**	**5**	**6**	**3**
Total number of existing incentives for PC4	**9**	**8**	**9**	**8**	**5**	**5**	**3**

Notes: "✓" represents an existing incentive; "☑" represents a new incentive.

22. We have also proposed a number of incentives to be developed during the PC5 period in five key areas, which if agreed will be implemented later in the PC5 period or at the next price control review.

Glossary

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
BST	Bulk Supply Tariff
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
CML	Customer Minutes Lost
CPI	Consumer Price Index
DLR	Distribution Loss Reduction
DUoS	Distribution Use of System
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
RIG	Regulatory Instruction and Guidance
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SBA	Separate Business Account
STA	Sewage Treatment Agreement
TA	Technical Assessor
TIG	Thousand Imperial Gallon
TSO	Transmission System Operator
TUoS	Transmission Use of System
TRANSCO	Abu Dhabi Transmission and Despatch Company
WACC	Weighted Average Cost of Capital

Contents

1. Introduction

This Review

1.1 The network companies in the electricity, water and wastewater sector in the Emirate of Abu Dhabi are natural monopolies and are therefore subject to price controls:

(a) For **AADC**, **ADDC** and **TRANSCO**, the first price controls (PC1) were set in 1999 for three years but were then extended for a further year to cover a four year period (1999-2002). The second price controls (PC2) were set in 2002 and spanned over a three year period (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 for about four and a half years from the date of its establishment (21 June 2005) until 31 December 2009. For ease of reference, these controls are termed as PC3.

(c) In 2009, the current (fourth) price controls (PC4) were set for **AADC**, **ADDC**, **ADSSC** and **TRANSCO** to apply for four years (2010-2013).

1.2 The current PC4 controls are due to expire on 31 December 2013 and this requires new price controls to be in place to take effect from 1 January 2014. The Bureau therefore commenced a price control review.

1.3 The progress on the review is summarised as follows:

(a) First consultation paper issued in April 2012 set out the Bureau's initial views on the main issues that should be considered in setting the PC5 controls.

(b) Second consultation paper was issued in October 2012 after taking into account the detailed responses from the network licensees.

(c) ADDC and TRANSCO sought deferral of the PC5 start to 2015 (instead of 2014) to allow further time to consult. AADC requested more time to respond to the second consultation paper. We were reluctant to agree to any deferment of deliverables given the complexity of the sector.

(d) We received detailed responses from the sector companies to the second consultation paper as follows:

(i) responses from ADSSC and TRANSCO by the due date of 10 December 2012;

(ii) response from ADWEC in early January 2013 on the issue of unlicensed dedicated activities of TRANSCO outside the Emirate of Abu Dhabi;

(iii) responses from AADC and ADDC in February 2013; and

(iv) ADDC's response to the Bureau's explanatory letter on adjustments made in the paper to the PC3 capex efficiency scores.

(e) Subsequently, we rescheduled the publication of our draft proposals from March 2013 to May 2013 following the delays in responses from the two distribution

companies to the second consultation paper and the companies' inputs to our consultant's work.

(f) We have considered these responses in developing our draft proposals.

(g) We are scheduled to publish our final proposals in the early fourth quarter of 2013.

Current regulatory framework and price controls

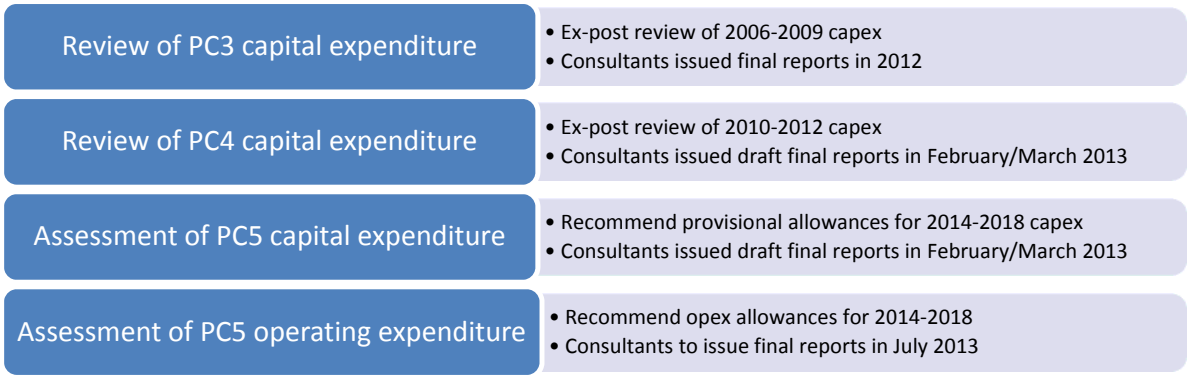
1.4 The first and second consultation papers summarised the role and main duties and functions of the Bureau as the regulatory body for the water and electricity sector under Law No (2) of 1998 and for the sewerage services sector under Law No (17) of 2005.

1.5 These papers described and summarised some of the main elements of the current price control arrangements which have been in place since 1999 with minor adjustments.

PC5 related work streams

1.6 This price control review is being supported by a number of related work streams, including the work of our expert consultants. We shared with the companies the scope of our consultants' work, deliverables and timetable, and received generally positive responses from the companies. These work streams are summarised below and discussed further in Sections 3 and 4.

Figure 1.1: External consultants' support for PC5



Review of opex and SBAs

1.7 Deloitte were appointed in February 2012 to support the work on operating costs and SBAs in three phases:

(a) In phase 1, Deloitte worked with AADC and ADDC to understand the significant increases in distribution and supply business costs that have occurred in recent years. In August 2012, they issued their final report for phase 1.

(b) Our consultants then commenced phase 2 of their work to develop the SBAs for the five price-controlled companies for the future. Their final report, along with RAGs and SBA templates, was delivered in April 2013.

(c) Phase 3, which commenced in October 2012, involved developing projections of operating costs to support the PC5 proposals. The consultants issued their initial and interim reports in the first quarter of 2013. The interim report contains the initial recommendations on opex allowances for PC5 which constitute an important input to these draft proposals. The phase 3 draft and final reports due at the end of May and July 2013, respectively, will be taken into account in our final proposals.

PC3 capex review

1.8 To undertake the ex-post efficiency review of PC3 capex for the four network companies, two consultants were appointed by the Bureau in April 2011 - KEMA for electricity and ATKINS for water and wastewater. Our consultants issued interim, draft and final reports during 2011-2012.

PC4 capex review

1.9 To address the licensees' concerns about the time lags associated with the capex efficiency review process, we agreed to bring forward the ex-post efficiency review of PC4 capex by appointing the PC3 capex consultants to undertake this review.

1.10 The consultants commenced their work on the 2010-2011 capex review in June 2012 and issued their interim and draft reports in December 2012 and February/March 2013 respectively. Further work was not feasible in view of the time and resource constraints.

PC5 capex forecast review

1.11 The scope of work of the PC4 capex consultants also included developing projections of likely capital expenditure for the PC5 period. The consultants' interim and draft reports on the 2010-2011 capex review included methodology and PC5 capex projections.

Timetable for related work streams

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

Table 1.1: Timetable for PC5 related work streams

Work stream	Indicative timescales
PC3 capex review	**April 2011 – June 2012**
• Consultants' final reports issued	June 2012
Review of opex and SBAs	**February 2012 – August 2013**
Phase 1 – Assess reasons for increase in opex for distribution companies over 2006-2010	February 2012 – June 2012
• Consultant's final report issued	August 2012
Phase 2 – Develop robust regulatory accounting arrangements for five companies	April 2012 – February 2013
• Consultant's final report issued	April 2013
Phase 3 – Prepare forecasts of reasonable opex for four network companies for 2014-2018	October 2012 – July 2013
• Consultants' interim reports issued	March 2013
• Consultant's final report to be issued	July 2013
PC4 capex review and PC5 capex forecast review	**May 2012 – March 2013**
• 2010-2011 capex efficiency review – interim reports issued	December 2012

Structure of this document

1.13 The remainder of this document is structured as follows:

(a) Section 2 describes our draft proposals on the form, structure, duration and scope of PC5 controls and the revenue driver projections adopted for PC5.

(b) Section 3 describes our approach to operating expenditure.

(c) Section 4 discusses the treatment of past capital expenditure and future capital expenditure.

(d) In Section 5, we discuss the financial issues, particularly the cost of capital, depreciation and updating of regulatory asset values (RAVs). The detailed calculations to update RAVs are presented in **Annex A**.

(e) Section 6 sets out the results of our price control calculations. These price controls calculations are presented in **Annex B**.

(f) Finally, Section 7 along with **Annexes C-D** describes our draft proposals for the output and performance incentives for PC5.

2. Form of price controls

Introduction

2.1 The Bureau's first and second consultation papers on PC5 set out the Bureau's thinking on the key challenges and priorities for this price control review and a suitable form of regulation.

2.2 The second consultation paper noted that the current price controls have the following important features:

(a) revenue drivers, adjusting revenue in line with outputs;

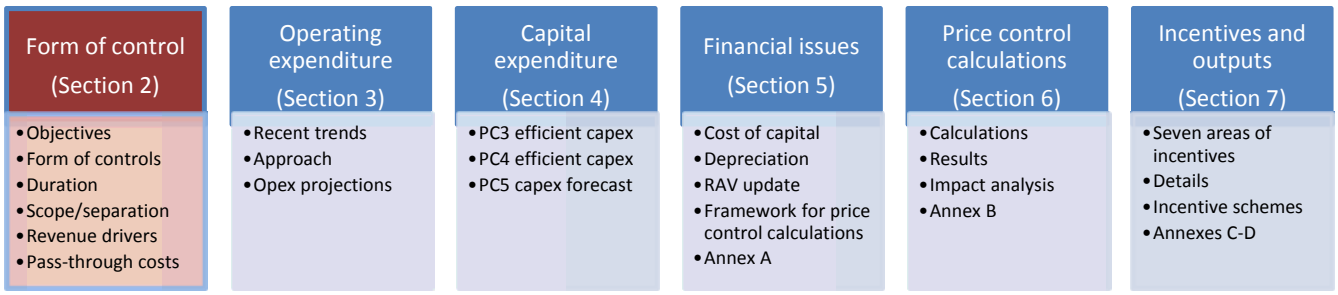
(b) cost pass-through terms, allowing the recovery of costs that licensees have limited or no control over;

(c) multi-year duration, allowing the 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) defined scope of activities subject to price control regulation, ensuring that the licensees have clarity as to whether a business activity is subject to regulation or normal commercial considerations and risks.

2.3 This Section 2 summarises and assesses the views of the respondents on these issues and sets out the Bureau's draft proposals on these matters for PC5.

Figure 2.1: Form of controls – Section 2



Objectives and priorities of this review

Second consultation paper

2.4 In order to improve the performance of the sector and in light of the challenging circumstances associated with operating a utility business in the Emirate of Abu Dhabi, the second consultation paper suggested that the focus of this price control review should include the following six core activities (and related incentives):

(a) capital efficiency

(b) asset management and performance

(c) availability, security and quality of supply

(d) high quality information

(e) adequate funding

(f) other important considerations – such as Emiratisation and end-use efficiency of electricity and water.

2.5 In relation to ADSSC's suggestions on aligning Government and regulatory funding, we agreed to consult further with the Department of Finance and ADSSC on these matters.

2.6 Taking into consideration an ADDC's suggestion, we proposed that AADC and ADDC should bring forward proposals to integrate RASCO into distribution and supply activities (for instance, as unlicensed assets and activities).

Responses

2.7 In response to the second consultation paper, network companies continued to support the six focus areas for PC5 with further specific suggestions as follows:

(a) AADC generally agreed with the challenges and priorities discussed in the paper and that the six areas remain a valid priority. It however considered that asset management and performance, and high quality information required more detailed discussion with the Bureau.

(b) While ADDC agreed that the six areas are important for any utility, it highlighted the following additional areas as a priority for PC5: overall water management plan; internal improvement of management accounting; introduction of cost-reflective tariffs; development of distribution use of system (DUoS) charges; better customer services; mega developments; demand side management (DSM); and Emiratisation.

(c) ADSSC welcomed the Bureau's efforts to address ADSSC's proposed four themes: alignment of regulatory and funding frameworks; use of incentives as effective drivers for improvements; integrated planning; and, closer working arrangement with the Bureau. ADSSC suggested a prioritisation of the six focus areas for PC5 and identified apparently conflicting objectives of Emiratisation and related incentives. It welcomed the Bureau's proposal on aligning Government and regulatory funding and expressed interest to participate in the relevant discussions and the need for these discussions to cover all funding issues in terms of Government's role as shareholder, financier and customer.

(d) TRANSCO generally considered the six priority areas as success factors applicable to any network operator and emphasised closer collaboration.

Assessment and draft proposals

2.8 The Bureau welcomes the companies' continued support and suggestions for the priority areas for this review, which have been considered in developing these draft proposals. Initial discussions have already been held with the companies on the details of incentives, capital efficiency assessments and funding for additional responsibilities.

2.9 Some of the areas identified by the companies, such as a water management plan, DUoS charges, cost-reflective tariffs, accounting arrangements, mega developments, DSM, funding arrangements, and Emiratisation, are wider areas and subject to separate work streams. However, to the extent relevant to the price controls, we have given due consideration to them and made specific proposals in this document to facilitate the work on these subjects.

2.10 With respect to RASCO, we have not received any proposal sought in the second consultation in response to ADDC's suggestion that RASCO should be rolled into the distribution businesses.

Basic approach to economic regulation

Second consultation paper

2.11 The second consultation paper suggested that the CPI-X controls should be retained, with a more flexible arrangement for specified elements of operating costs and capex review.

Responses

2.12 The companies' responses to the second consultation paper are summarised below:

(a) ADDC agreed to retaining some form of CPI-X regulation with the flexibility to allow changes in the key areas of Government direction and implementation.

(b) In ADSSC's view, the CPI-X model is a tried and tested framework. However, significant modification is required to align regulatory and funding arrangements for ADSSC and to reflect the cost drivers, pace of growth in the Emirate, company's maturity and changing market, and its new regulatory obligations.

(c) According to TRANSCO, the CPI-X approach to regulation has delivered value and will need to be retained. It however reiterated its earlier suggestions, including targeted incentives, logging-up of opex not envisaged in PC5 projections, ex-ante capital assessment, and further improvement in ex-post capex review methodology.

Assessment and draft proposals

2.13 Given the general support from the licensees and our statutory duties for consistency and efficiency, we have retained the CPI-X approach to regulation in these draft proposals.

2.14 The companies' views on their cost drivers, impact of growth in the Emirate, changing markets, and regulatory obligations should be input to our consultant's work on opex projections for PC5. We note ADDC's positive comments about working with the consultant to develop opex projections to address additional capabilities, mega developments, Emiratisation targets and appropriate efficiency factors.

2.15 In relation to capital expenditure, the Bureau has already taken steps to make its assessments more timely and forward looking and has proposed additional measures,

such as an interim review of capital expenditure, ex-ante assessment of the need case and high level design processes for large capital projects on an annual basis, and further involvement in the annual planning processes for capital expenditure.

2.16 The licensees' joint note regarding the four proposed changes in approach to regulation was taken into consideration in the second consultation paper. Many aspects of this note were also reflected in the companies' responses to the first consultation paper, which were explicitly addressed in the second consultation paper.

Duration of controls

Second consultation paper

2.17 Earlier consultation papers highlighted a number of considerations relating to the duration of new controls including providing incentives for efficiency, reducing exposure to unanticipated outcomes, and the advantages of a staggered approach to price control reviews in the future. The second consultation paper suggested that the PC5 controls for ADSSC should be set for 3 years (2014-2016) and for AADC, ADDC and TRANSCO for 5 years (2014-2018).

Responses

2.18 Respondents to the second consultation paper generally preferred, in principle, a longer control duration with the following suggestions:

(a) AADC supported a 5-year duration (2014-2018) for PC5.

(b) ADDC proposed a 4-year duration to align with its 2013-2017 business plan.

(c) ADSSC preferred a longer control period given the extensive efforts at each review and recommended that its PC5 controls should also be set for five years.

(d) TRANSCO agreed with the merits of a longer price control duration in principle. However, it was cautious to commit full support without better understanding of incentives, capital efficiency and logging-up of operating expenditure.

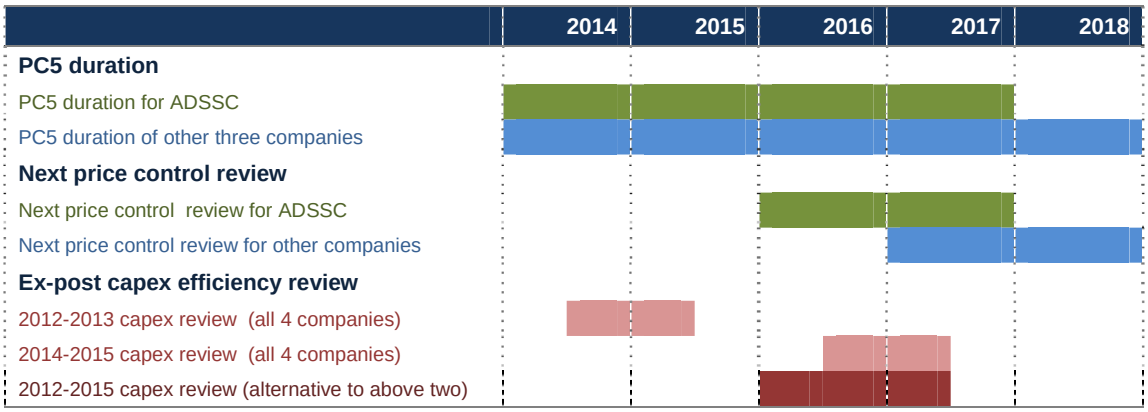
Assessment and draft proposals

2.19 The companies' suggestions were discussed in detail in the second consultation paper. Our proposals on capital expenditure, operating expenditure and incentives are designed to increase the flexibility of the regulatory regime and reduce risks on the licensees.

2.20 We see the merits in ADSSC's argument for a longer control duration than 3 years given the extensive efforts required at each review. However, a shorter duration would enable a staggered approach to price control reviews in the future and more focus on business specific issues.

2.21 Based on the above, we propose that the PC5 controls for ADSSC should be set for 4 years (2014-2017) and for AADC, ADDC and TRANSCO for 5 years (2014 -2018). This will fit well with our plans for the ex-post capital efficiency reviews as shown below, allowing time for such reviews prior to the next price control review (see **Table 2.1**).

Table 2.1: Price control duration considerations



Scope and separation of controls

Second consultation paper

2.22 Consistent with the licensees' views, the second consultation paper suggested retention of the existing scope and separation of price controls for PC5, with two possible exceptions:

(a) On ADDC's suggestion, the paper expressed the Bureau's willingness to work with the licensees to ensure proper separation of distribution and supply businesses, provided ADDC specifies a realistic and persuasive plan and timetable for the achievement of these objectives; else, the existing scope and separation of price controls for AADC and ADDC should be retained.

(b) The paper also considered whether the scope of TRANSCO's price controls (currently covering licensed and unlicensed shared activities) should be expanded to unlicensed dedicated activities outside the Emirate of Abu Dhabi.

Responses

2.23 In response to the second consultation paper:

(a) ADDC suggested further alignment on the separation of supply and distribution in view of a number of proposed initiatives, accounting separation and potential separation of managers.

(b) ADSSC emphasised that any separation of distribution and supply should not adversely affect the ability of AADC and ADDC to provide ADSSC with customer care and billing services and welcome the Bureau's approach to derive implementation of these services.

(c) TRANSCO did not accept the extended scope of its price controls to include unlicensed dedicated activities mainly due to the application of a capital efficiency adjustment particularly when it raised concerns regarding the PC3 and PC4 capital efficiency assessments. The company however appreciated the rationale and benefits of such extended scope of controls.

(d) ADWEC highlighted the use of different assumptions and procedure for determining transmission charges for unlicensed dedicated activities and the apparent lack of a process for allocation of assets, costs and demands between unlicensed shared and dedicated assets. It therefore supported the proposal to extend TRANSCO's price controls to cover unlicensed dedicated activities to avoid any anomaly in transmission service prices.

Assessment and draft proposals

2.24 We welcome the companies' suggestions and comments and are willing to work with the licensees to ensure proper separation of distribution and supply businesses. The implementation of the proposed regulatory accounting arrangements (RAGs) should improve the accounting separation and facilitate consideration of separation of controls at the next price control review.

2.25 We are not convinced by TRANSCO's argument against the extended scope of TRANSCO's price controls due to the following reasons:

(a) similarities between licensed/unlicensed shared and unlicensed dedicated activities, including investment decisions and other capex processes;

(b) relatively small outstanding capital investment in unlicensed dedicated assets (less than AED 70 million in total) compared to TRANSCO's overall RAV of over AED 50 billion; and

(c) the benefits of extended scope of controls supported by TRANSCO as well as its customer, ADWEC.

2.26 Based on these considerations and further discussions with TRANSCO, we have adopted an extended scope of TRANSCO's price controls in these draft proposals to include the unlicensed dedicated activities. While the entire PC3 and PC4 capex review programmes were developed in consultation with the companies, we understand that the companies have residual concerns.

Revenue drivers

Second consultation paper

2.27 The second consultation paper suggested retaining the 80:20 split of weights for the fixed and variable terms of the revenue and the existing revenue drivers for all companies. Nonetheless, it suggested that the number of customers should be included as an additional revenue driver for ADSSC and that TRANSCO's revenue drivers should be changed to metered units and metered peak demands, irrespective of strict compliance with MDEC.

Responses

2.28 Respondents made the following comments.

(a) AADC agreed to the 80:20 weights for the fixed and variable terms of MAR.

(b) ADDC did not agree with the proposed weights for the fixed and variable terms. As most of its opex relates to the distribution business, it suggested that weights should be directly related to system capacity, such as number of transformers and switchgears and circuit length to facilitate adoption of mega development assets. It supported this approach for PC5 opex projections.

(c) ADSSC continued to support the weights of 80:20 for fixed and variable elements but suggested influent strength or load on treatment plant as the additional revenue driver of its MAR rather than customer numbers.

(d) TRANSCO sought clarification on how the proposed change to its metered revenue drivers would address the MDEC compliance risk presently faced by TRANSCO, considering that MDEC compliance is not within its full control.

Assessment and draft proposals

2.29 Given the broad support expressed by the licensees, we retain the 80:20 split of weights for the fixed and variable elements of revenue and the existing revenue drivers for all companies with some changes for ADSSC and TRANSCO, as summarised in **Table 2.2**.

Table 2.2: Revenue drivers – draft proposals

Company	Revenue driver	Revenue driver weight in MAR formula
AADC / ADDC (both water and electricity)	Fixed term	80%
	Customer numbers	15%
	Metered units distributed	5%
TRANSCO (both water and electricity)	Fixed term	80%
	Metered peak demand (irrespective of MDEC compliance)	10%
	Metered units transmitted (irrespective of MDEC compliance)	10%
ADSSC	Fixed term	80%
	Customer numbers	10%
	Annual flow at treatment plants	10%

2.30 In relation to ADDC's comments, we believe that the revenue drivers should be output or customer demand based cost drivers rather than inputs to the business, such as system capacity or length, which do not necessarily reflect customer demand and may provide unnecessary incentives for system expansion and hence inefficiency. We also note that opex constitutes only a part of MAR. Therefore, network length should be considered in the context of opex projections only rather than the MAR in total.

2.31 In relation to ADSSC's revenue driver, we consider that customer numbers reflect certain costs (for example, connections and billing related costs) not captured by annual flows and are a more effective and a broader cost driver than influent strength which mainly reflects smaller industrial base.

2.32 On TRANSCO's revenue drivers, we note that the proposed measures for PC5 are not required to be compliant with MDEC and include both MDEC and non-MDEC compliant metered quantities. However, as discussed in Section 7, we have proposed an interface metering incentive (not exceeding 0.50% of MAR) for TRANSCO in line with similar incentives for the distribution companies, recognising the shared responsibilities of the

parties to ensure MDEC compliance. This will reduce the risk currently faced by TRANSCO (around 20% of its MAR) to a more reasonable and comparable basis.

Cost pass-through arrangements

Second consultation paper

2.33 The second consultation paper suggested that the existing cost pass-through arrangements should be retained, perhaps with this treatment extended to the Bureau's licence fees.

Responses

2.34 Licensees continued to support the retention of the existing pass-through costs and made some specific comments as follows:

(a) ADDC supported the pass-through treatment for the Bureau's licence fees. It suggested that Emiratisation allowances should be included within the MAR rather than being pass-through. ADDC welcomed the new volume-based structure for both BST and TUoS charges with a total daily or hourly rate to send appropriate cost signals, and suggested similar structure for DUoS charges and pass-through of all costs including green payment for renewable energy to the supply businesses.

(b) ADSSC considered that its STA contracts were subject to full competitive tendering and were accepted to be pass-through in PC4. It welcomed the Bureau's suggestion for pass-through treatment of its licence fees and suggested the pass-through of Emiratisation costs. It also believed that its O&M contract costs have been competitively tendered and agreed to provide evidence to this effect.

Assessment and draft proposals

2.35 In view of the broad support expressed by the licensees, the Bureau proposes retaining the existing cost pass-through arrangements for PC5, as summarised below.

Table 2.3: Pass-through costs – draft proposals

Company	Pass-through items
AADC / ADDC (both water and electricity)	Water and electricity purchases Transmission charges Embedded electricity purchases*
TRANSCO (both water and electricity)	Electricity ancillary service costs
ADSSC	STA costs**

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 = Sewage Treatment Agreement.

2.36 We have retained the existing treatment of the Bureau's licence fees where the regular fees are financed via opex allowances and the one-off project-specific fees are allowed a pass-through treatment via derogations. The Bureau's licence fees, Emiratisation costs

and ADSSC's O&M contract costs are discussed in Section 3 in relation to opex projections.

Structure of PC5 controls

2.37 Based on the above discussion, the structure of the Maximum Allowed Revenue (MAR) for each business for any year "t" of the PC5 control period shall be as follows:

$$MAR_t = \text{Pass-through Costs}_t + a_t + (b_t \times RD1_t) + (c_t \times RD2_t) + Q_t - K_t$$

where:

(a) Pass-through costs are those listed in **Table 2.3** above.

(b) "a_t", "b_t" and "c_t" are the notified values for the year "t" as determined by the Bureau in 2014 prices through the price control calculations and are indexed against the UAE Consumer Price Index (CPI) less an "X" factor (including an adjustment for actual 2013 UAE CPI as discussed below);

(c) "$RD1_t$" and "$RD2_t$" are the actual values of the relevant revenue drivers (listed in **Table 2.2** above) in year "t"; and

(d) "Q_t" and "K_t" are the performance incentive amount as discussed in Section 7 and the correction factor for the year "t", respectively.

2.38 The Bureau has used the following UAE CPI data and assumptions for conversion of nominal prices into real prices or vice versa in this paper. For earlier years not shown here, the CPI where required is based on actual official CPI data (presented in PC4 final proposals dated 4 November 2009):

Table 2.4: UAE CPI assumptions – draft proposals

	2005	2006	2007	2008	2009	2010	2011	2012	2013
UAE CPI	82.34	89.99	100.00	112.30	114.00	115.00	116.01	116.78	118.00
UAE Inflation	6.20%	9.29%	11.13%	12.30%	1.51%	0.88%	0.88%	0.66%	1.04%

Source: UAE National Bureau of Statistics (Base year 2007 = 100). The UAE CPI figures for years upto 2006 with base year 2007 = 100 have been derived from earlier official CPI figures with base year 1995 = 100 or base year 2000 = 100.

Notes: 2013 CPI is an assumption based on CPI for April 2013.

2.39 In line with our approach for PC4, the notified values "a", "b" and "c" calculated at this review in 2014 prices (using the above CPI of 118.00 or 1.04% inflation assumption for 2013) will be adjusted for actual inflation for 2013 when known during the PC5 period. This adjustment will be done through the Price Control Return (PCR) for 2014 using appropriate formulae in the licence modifications required to incorporate PC5.

Revenue driver projections

2.40 The four network companies have provided revenue driver projections in their latest 2012 Annual Information Submissions (AIS) which have been reviewed by the independent Technical Assessor (TA). While there are some differences in these projections as compared to other sources as well as the actual past trends, these differences are either not significant or offset each other over the years and we see no clear basis to make any adjustment to them or adopt projections from other sources, with the following two

exceptions. We have therefore in principle adopted the companies' revenue driver projections from their respective 2012 AIS submissions as shown in the **Table 2.5** below. The companies' projections of metered quantities imply high metering coverage (between 97% and 100%) over the PC5 period and we have adopted them without any change.

Table 2.5: Revenue driver projections for PC5 – draft proposals

			2014	2015	2016	2017	2018	CAGR 2013-2018
AADC	Electricity customer accounts	Customers	146,868	157,148	165,006	176,557	187,814	6.1%
	Electricity metered units distributed	GWh	9,912	10,491	10,969	11,409	11,753	4.7%
	Water customer accounts	Customers	78,021	80,700	83,524	86,501	89,632	3.5%
	Water metered units distributed	MIG	66,592	70,898	72,023	72,442	73,343	2.8%
ADDC	Electricity customer accounts	Customers	395,832	444,466	477,451	525,475	579,358	10.4%
	Electricity metered units distributed	GWh	37,318	42,124	47,345	52,980	59,030	12.4%
	Water customer accounts	Customers	294,976	317,168	334,687	355,088	376,650	6.8%
	Water metered units distributed	MIG	157,801	165,894	173,204	181,122	188,392	5.1%
TRANSCO	Electricity metered peak demand	MW	13,068	14,512	15,577	17,059	18,048	8.2%
	Electricity metered units transmitted	GWh	74,276	83,325	91,080	99,148	104,558	8.4%
	Water metered peak demand	MIGD	886	946	966	1,003	1,039	4.7%
	Water metered units transmitted	MIG	299,776	321,703	328,646	341,471	353,651	5.5%
ADSSC	Customer accounts	Customers	529,367	570,129	614,030	661,309	712,230	7.7%
	Annual wastewater flow treated	1000 m3	294,480	310,461	328,449	345,622	364,730	4.5%

Source: Network companies' 2012 AIS submissions. Revenue driver projections for TRANSCO have been adopted from **Tables 2.7 -2.9**
Notes: CAGR stands for compounded average growth rate.

2.41 The two areas where we see the need for adjustment to the companies' revenue driver projections from their 2012 AIS submissions are as follows:

(a) In relation to customer number projections for ADSSC, we have noted that the company's 2012 AIS shows a significant increase (by around 54%) in customer accounts from 2010 to 2011 (this increased level continues in the future years). This increase is not supported by the corresponding data on water customers from AADC and ADDC. We have not made any adjustment to ADSSC's projections (which have been adopted for these draft proposals in **Table 2.5** without any change) but seek ADSSC's review and explanation.

(b) In relation to all revenue driver projections for TRANSCO, we have found that the company's 2012 AIS projections include no or insignificant exports (i.e. demands and units for unlicensed activities) for most of the years from 2012 to 2018 when compared to corresponding forecasts from ADWEC's 2012 AIS, ADWEC's draft 2012 statement of future capacity requirement (also known as seven year statement (SYS)), and TRANSCO's own recent submissions on 2013 transmission use of system (TUoS) charges to the Bureau. TRANSCO's 2012 AIS template and submission does not provide the detailed breakdown of these projections into licensed and unlicensed for 2014-2018. We have therefore adopted in **Table 2.5** the revenue driver projections from ADWEC's draft 2012 statement of future capacity requirement rather than from TRASNCO's 2012 AIS.

2.42 **Table 2.6** presents the actual or estimated data for the PC4 period on the same revenue drivers for comparison purposes.

Table 2.6: Actual or estimated revenue driver data for earlier years

			2010	2011	2012	2013	CAGR 2010-2013
AADC	Electricity customer accounts	Customers	114,566	123,318	130,724	139,874	6.9%
	Electricity metered units distributed	GWh	8,010	8,140	8,579	9,331	5.2%
	Water customer accounts	Customers	65,528	70,739	73,023	75,499	4.8%
	Water metered units distributed	MIG	42,779	41,392	58,126	63,752	14.2%
ADDC	Electricity customer accounts	Customers	256,701	281,966	308,186	353,411	11.2%
	Electricity metered units distributed	GWh	22,747	25,217	28,949	32,926	13.1%
	Water customer accounts	Customers	211,083	223,850	248,436	270,768	8.7%
	Water metered units distributed	MIG	99,941	123,160	139,169	146,966	13.7%
TRANSCO	Electricity metered peak demand	MW	7,129	8,545	9,416	12,147	19.4%
	Electricity metered units transmitted	GWh	41,391	47,582	51,160	69,737	19.0%
	Water metered peak demand	MIGD	664	677	727	825	7.5%
	Water metered units transmitted	MIG	216,255	222,054	242,818	270,229	7.7%
ADSSC	Customer accounts	Customers	275,210	423,750	456,379	491,521	21.3%
	Annual wastewater flow treated	1000 m3	239,750	241,260	278,616	293,019	6.9%

Source: Actual data for 2010-2011 from network companies' 2010-2011 PCRs, except for TRANSCO's revenue drivers and ADSSC's customer accounts which are sourced from their 2012 AIS. All other data are from companies' 2012 AIS submissions, with adjustment to TRANSCO's 2012 AIS figures for exports.

Source: CAGR stands for compounded average growth rate.

2.43 The PCRs being audited by the companies' financial auditors and TA are more reliable and preferred source of data on the past revenue drivers. However, past PCRs for ADSSC and TRANSCO do not provide data on newly proposed revenue drivers for these companies – that is, customer accounts for ADSSC and metered (MDEC compliant or otherwise) quantities for TRANSCO. Therefore, the data in **Table 2.6** have been sourced as follows:

(a) For all cases, except as described in sub-paragraphs (b) and (c) below:

(i) actual data for 2010-2011 have been sourced from the respective companies' past PCRs; and

(ii) estimated data on 2012-2013 from their 2012 AIS submissions.

(b) In relation to customer number projections for ADSSC, actual data for 2010-2011 have been taken from ADSSC's 2012 AIS submission.

(c) In relation to all revenue driver data for TRANSCO:

(i) actual data for 2010-2011 have been taken from TRANSCO's 2012 AIS submission; and

(ii) estimated data on 2012-2013 have been derived by adding export figures from TRANSCO's 2013 TUoS statement or ADWEC's 2012 AIS to TRANSCO's 2012 AIS figures. This is because we have found that the company's 2012 AIS figures include no or insignificant exports, particularly for water, when compared to corresponding data from other sources. However, this results in the figures shown in the table which include unmetered quantities as well. These unmetered quantities are less significant for electricity than water.

2.44 The growth rates implied by the revenue driver projections for these draft proposals in **Table 2.5** comparable to those estimated over recent past in **Table 2.6** appear to be

lower, and hence require further review for any adjustment in the final proposals, for those adopted for TRANSCO's revenue drivers and ADSSC's customer accounts.

2.45 The following four tables compare TRANSCO's 2012 AIS revenue driver projections (implying almost 100% metering – including both MDEC and non-MDEC compliant metered quantities) against other sources (following adjustment for production plant auxiliary consumption, diversity factor and transmission losses where necessary to make them comparable).

Table 2.7: TRANSCO – assessment of electricity peak demand projections (MW)

		2012	2013	2014	2015	2016	2017	2018
TRANSCO's 2012 AIS	Licensed	7,416	8,417					
	Exports	-	330					
	Total	7,416	8,747	9,855	11,143	11,978	13,229	13,993
TRANSCO's 2013 TUoS	Licensed	7,043	8,260					
	Exports	2,000	3,730					
	Total	9,043	11,990					
ADWEC's 2012 SYS	Licensed	7,234	8,131	9,313	10,636	11,473	12,713	13,445
	Exports	2,007	3,641	3,755	3,876	4,104	4,346	4,603
	Total	9,241	11,772	13,068	14,512	15,577	17,059	18,048
ADWEC's 2012 AIS	Licensed	7,934	8,136					
	Exports	2,050	3,855					
	Total	9,984	11,991					

Table 2.8: TRANSCO – assessment of electricity units transmitted projections (GWh)

		2012	2013	2014	2015	2016	2017	2018
TRANSCO's 2012 AIS	Licensed	41,364	46,961					
	Exports	-	1,777					
	Total	41,364	48,738	54,933	62,143	66,810	73,813	78,074
TRANSCO's 2013 TUoS	Licensed	30,686	47,125					
	Exports	9,796	22,776					
	Total	40,482	69,901					
ADWEC's 2012 SYS	Licensed	39,911	44,605	51,515	59,885	66,260	72,860	76,716
	Exports	12,437	22,115	22,761	23,440	24,820	26,288	27,842
	Total	52,348	66,719	74,276	83,325	91,080	99,148	104,558
ADWEC's 2012 AIS	Licensed	45,788	46,621					
	Exports	12,437	23,280					
	Total	58,225	69,901					

Table 2.9: TRANSCO – assessment of water peak demand projections (MIGD)

		2012	2013	2014	2015	2016	2017	2018
TRANSCO's 2012 AIS	Licensed	699	770					
	Exports	-	-					
	Total	699	770	828	886	919	955	988
TRANSCO's 2013 TUoS	Licensed	698	751					
	Exports	28	55					
	Total	726	806					
ADWEC's 2012 SYS	Licensed	682	751	807	859	891	925	956
	Exports	45	55	79	87	75	78	83
	Total	727	806	886	946	966	1,003	1,039
ADWEC's 2012 AIS	Licensed	742	751					
	Exports	54	55					
	Total	796	806					

Table 2.10: TRANSCO – assessment of water units transmitted projections (MIG)

		2012	2013	2014	2015	2016	2017	2018
TRANSCO's 2012 AIS	Licensed	224,384	251,171					
	Exports	-	-					
	Total	224,384	251,171	265,791	289,010	295,210	311,517	317,629
TRANSCO's 2013 TUoS	Licensed	174,650	253,714					
	Exports	6,909	19,058					
	Total	181,559	272,772					
ADWEC's 2012 SYS	Licensed	229,413	254,250	273,067	292,410	303,277	314,960	325,639
	Exports	14,465	18,512	26,709	29,293	25,369	26,511	28,012
	Total	243,878	272,762	299,776	321,703	328,646	341,471	353,651
ADWEC's 2012 AIS	Licensed	238,845	253,714					
	Exports	18,434	19,058					
	Total	257,279	272,772					

2.46 Based on this comparison, we have adopted (in **Table 2.5**) revenue driver projections over PC5 period for both licensed and unlicensed activities from ADWEC's draft 2012 statement of future capacity requirement (highlighted in the four tables above).

3. Operating expenditure

Introduction

3.1 Operating expenditure or opex (ie, operating cost excluding depreciation) is one of the main inputs to the price control calculations and constitutes one of the three building blocks of a company's required revenue. It is important to make appropriate allowances for operating costs for these purposes. The Bureau's first and second consultation papers on PC5 highlighted that efficient spending on operating costs is critical to overall network performance.

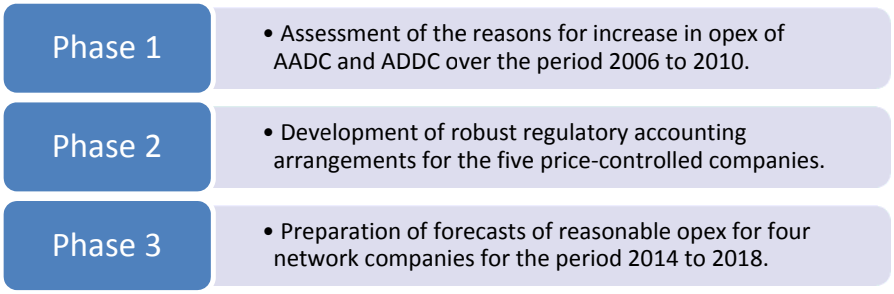
3.2 The Bureau has appointed a consultant, Deloitte & Touche ME, to assist with the review of operating costs in three phases:

(a) For phase 1, the consultant's final report issued in August 2012 identified a number of reasons for the increases in opex of AADC and ADDC and particularly increases in their supply business costs over the period 2006 to 2010. Nonetheless, during the phase 1 work, the licensees were not able to provide evidence showing that the level of cost increases were consistent with efficient operations.

(b) For phase 2, the consultant's final report was issued in April 2013 containing the proposed RAGs and standard SBA format for each company. Nonetheless, it will not be until 2015 that the Bureau starts to receive financial and accounting information (i.e. 2014 SBAs) fully consistent with these arrangements.

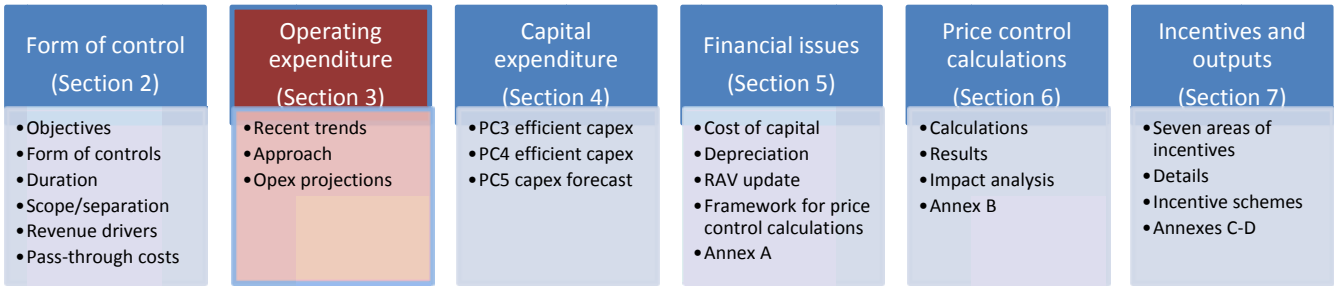
(c) Deloitte commenced their work on phase 3 (developing the opex projections for PC5) in October 2012. The consultants have issued their initial report in February 2013 setting out their methodology and initial analysis and an interim report in March containing their initial opex projections for 2014-2018.

Figure 3.1 : Opex consultants' support for PC5



3.3 This Section 3 summarises the companies' 2011 opex performance and the work that the consultant has already completed on phase 3. We have assessed the licensees' responses to the second consultation paper before presenting our proposals on opex allowances for PC5 based on the consultant's phase 3 interim report.

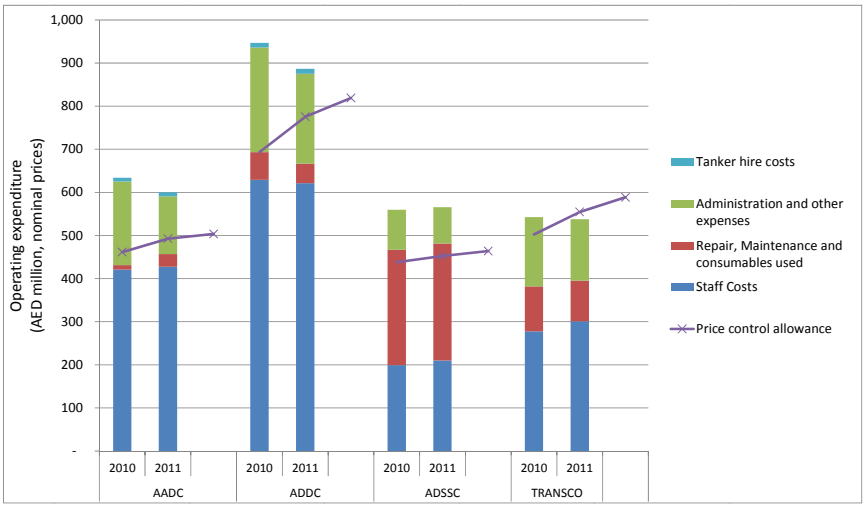
Figure 3.2: Operating expenditure – Section 3



2011 actual opex performance

3.4 In the first consultation paper, we assessed the companies' opex performance from 2006 to 2010 and observed significant increases in their total opex, staff costs and supply business costs over this period. Since then, companies' audited SBAs for 2011 containing 2011 actual opex have been made available. Based on this recent information, **Figure 3.3** summarises the companies' actual performance in 2011 against 2010 (excluding TRANSCO's unlicensed dedicated activities).

Figure 3.3: Companies' 2011 actual opex performance (nominal prices)



Source: Companies' 2011 SBAs

3.5 A number of trends can be observed from this:

(a) From 2010 to 2011, actual opex declined by 1% to 6% for all companies in nominal prices, except for ADSSC which slightly increased (by 1%). The four companies' aggregate opex declined slightly from around AED 2.7 billion to AED 2.6 billion in nominal terms.

(b) Staff costs continued to constitute the largest or major part (37% to 71%) of the companies' opex and amounted to over AED 1.5 billion in total for all companies (ie, 60% of total opex).

(c) For both AADC and ADDC combined, the ratio of supply business costs to distribution business costs continued to increase to about 90% in 2011.

(d) All the companies reduced the gap between their actual opex and price control opex allowance from 2010 (a gap of AED 588 million or 28% above price control allowance) to 2011 (AED 316 million or 14%). However, the gap remained significant for all the companies (actual opex being 14% to 25% above the allowance), except for TRANSCO which was able to reduce actual opex, 3% below the price control opex allowance.

Approach to operating cost projections and allowances

Second consultation paper

3.6 Earlier consultation papers summarised the high-level approach that the Bureau has used to set the opex allowances at the previous price control reviews. The second consultation paper did not consider it practicable for the Bureau to approve operating costs on an annual basis. There may be some merit in logging-up or down variances in specific costs such as those associated with developing the UAE Nationals.

3.7 While the paper assessed a number of the companies' comments on opex, many comments were deferred to the opex consultants to consider in their work on projections of operating costs. These included: choice of base year(s) for the future opex projections; underlying costs drivers for opex, treatment of ADSSC's network operation and maintenance contract costs; classification of costs into controllable and non-controllable; logging up or other similar process for some costs; and, any significant additional opex due to mega developments.

Responses

3.8 The network licensees generally responded positively to the above issues and made a number of suggestions:

(a) ADDC expressed its satisfaction with the approach taken by the Bureau's consultant towards developing opex forecasts. It reiterated that under CPI-X regulation the opex levels during the price control period should be the most efficient achievable.

(b) ADSSC did not see the need for an annual approval of operating costs and supported a 5-year control period similar to other companies, provided alignment between government funding and regulatory regimes is achieved. The company suggested that opex consultant should use 2011 actual costs as a baseline for the PC5 projections, review the 2012 and 2013 budgets, and agree on the PC5 projections particularly for its five cost drivers: staff costs (including Emiratisation); O&M costs; STA payments; fees and expenses; and materials. It agreed to provide evidence to the consultant on the efficiency and competitiveness of its cost projections.

ADSSC also highlighted a number of considerations for any benchmarking undertaken by the opex consultant and the need to revisit the Bureau's previous assumptions for operating cost adjustment for demand growth and efficiency target to confirm their validity for PC5.

(c) TRANSCO supported the Bureau's conclusion against any annual approval of operating costs but argued for setting criteria and process for logging-up of costs not envisaged at the time of setting opex allowances at this review. It also offered to make available to the opex consultant detailed information on its cost projections, particularly by virtue of its activity based costing adopted for operation and maintenance division (accounting for more than 50% of its direct workforce) and its participation in ITOMS benchmarking, to demonstrate the efficiency of its operation and maintenance against other transmission operators.

Assessment

3.9 The Bureau welcomes the licensees' support for the opex consultant's work and their offers to make detailed information available to the consultant to demonstrate their opex efficiency. Our comments on other specific suggestions are as follows:

(a) The opex consultants have agreed with the companies to use the latest audited actual cost (i.e. 2011 until 2012 SBAs are available) as the baseline for consultant's opex forecasts for PC5. In addition to critically assessing the companies' opex forecasts, the consultant have undertaken both high-level and more detailed bottom-up assessment and benchmarking of the companies' baseline costs to assess their efficiency.

(b) We recognise the challenges of projecting efficient operating costs and the limitations of any benchmarking but understand that the opex consultant has attempted to take account of the local factors and operating environment by identifying the local and regional comparators as well as the non-controllable costs.

(c) We do not agree with ADDC's comment that a company's actual opex should be assumed to be efficient under the CPI-X regulation. Even in matured jurisdictions where CPI-X regulation is applied, actual costs are not assumed to be efficient and regulators often use benchmarking to determine efficient levels of costs.

(d) With regards to ADSSC's comments on the Bureau's assumptions for opex-demand relationship and opex efficiency used at the previous review, we understand that the opex consultant have carried out their own research to verify efficiency and productivity assumptions based on more recent evidence from the sector and elsewhere.

(e) As discussed in the second consultation paper, the issues relating to any logging up or a similar process for some costs have been referred to the consultant for consideration.

Proposed approach to opex projections

3.10 In their interim report issued in March 2013, the opex consultants have proposed the following seven-step methodology to developing opex projections using both a high-level top-down approach and a more detailed bottom-up approach using various cost and efficiency benchmarks from the sector and elsewhere:

(a) **Step 1** - Establish the company's base level of cost from 2011 (the latest audited actual costs) by excluding mainly non-cash items, one-off costs and non-controllable costs (such as the Bureau's licence fee) – termed by consultant as "**current recurring controllable cash opex (CC)**".

(b) **Step 2** - Roll forward the company's base level of cost from 2011 derived in step 1 to the start of PC5 period (ie, 2014).

(c) **Step 3** - Starting with rolled forward costs from step 2, develop projections of opex to the end of PC5 period (ie, over 2014-2018) based on the top-down approach using estimates of high-level cost-volume relationship and expected productivity improvements - termed as "**top-down cost projections (TCP)**". For both steps 2 and 3, the consultant assumed a 0.5% increase in opex for each 1% increase in demand and a real efficiency gain of 5% per annum. These assumptions are based on the sector companies' experience over 2006-2011 as well as evidence from other countries. The demand growth is measured in terms of: (i) average growth in units transmitted and peak demand for TRANSCO, separately for water and electricity businesses; (ii) average growth in units distributed and customer numbers for AADC and ADDC, separately for water and electricity businesses; and (iii) growth in average daily flow for ADSSC.

(d) **Step 4** - Establish efficient level of base year (ie 2011) costs using detailed bottom-up benchmarks for efficient costs - termed as "**bottom-up efficient cost (BEC)**".

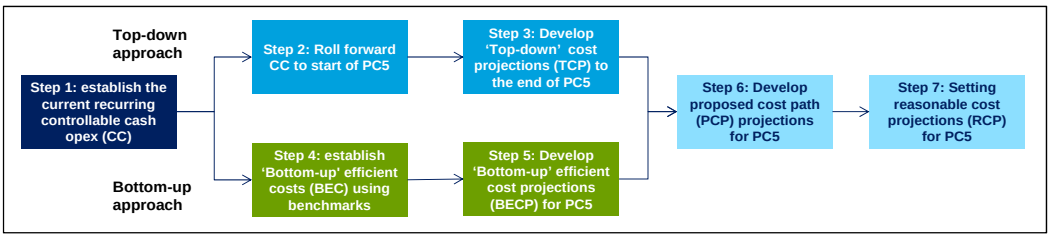
(e) **Step 5** – Starting with efficient level of base year costs from step 4, develop projections of efficient opex to the end of PC5 period based on a detailed bottom-up assessment of costs - termed as "**bottom-up efficient cost projection (BECP)**". These projections are based on a set of comparator benchmarks and a bottom-up assessment of cost/volume relationship using cost drivers for specific costs, while other costs are assumed to be fixed over time. An annual frontier shift efficiency assumption of 1% per annum has also been included in the BECP.

(f) **Step 6** – Develop proposed projections of reasonable, controllable opex over the PC5 period by allowing a transition path for the company from its expected level of opex at the start of the PC5 period based on TCP from step 3 towards the efficient cost level based on BECP from step 5 - termed as "**proposed cost path (PCP)**". For all companies, the PCP projections have been based on a linear catch-up rate of 15% per annum that closes 75% of the gap between TCP and BECP by 2018. This may require further consideration to reflect the extent to which surpassing the 5% per annum real productivity gain may be achievable.

(g) **Step 7** – Set the projections of reasonable total opex for PC5 by adding a reasonable estimate of non-controllable opex (eg, Bureau's licence fee, if necessary) to the opex projections from step 6 - termed as "**reasonable cost projection (RCP)**".

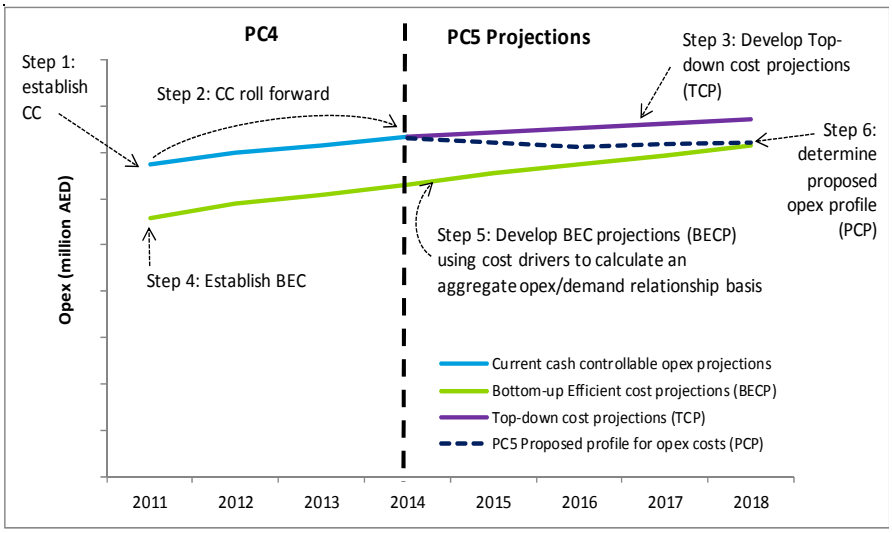
3.11 The consultant's methodology is further illustrated in **Figures 3.4** and **3.5**. At present, consultant's opex projections use the audited 2011 actual costs as the base level and are expressed in 2011 prices.

Figure 3.4: Consultant's seven-step methodology to PC5 opex projections



Source: Deloitte's Interim Report, March 2013

Figure 3.5: Consultant's approach to PC5 opex projections



Source: Deloitte's Interim Report, March 2013
Notes: For illustration purposes only and not drawn to scale.

Proposed approach to treatment of specific costs

3.12 The opex consultant in its interim report also proposed various options for the treatment of certain specific costs in its opex projections, as summarised below:

(a) **Emiratisation costs:** For each business, the consultant included additional allowances for Emiratisation costs based on the Emiratisation rate assumed in the companies' 2012 AIS forecasts and suggested that this allowance can be adjusted annually or at the next price control review against the company's actual annual Emiratisation rate.

(b) **Mega developments:** For AADC, ADDC and ADSSC, the consultant's intention is to include a specific opex allowance for additional costs arising from the utility infrastructure of the mega developments to be transferred to the companies in its next reports based on additional discussions and data from the companies.

(c) **Demand side management:** For AADC and ADDC, the consultant's intention is to include a specific opex allowance for this additional organisational activity in its next reports based on additional discussion with the companies.

(d) **Bureau licence fee:** The consultant excluded this cost from the opex projections assuming a pass-through treatment for this cost (further discussion in Section 2).

(e) **Real price effects – staff costs:** The consultant included an additional allowance for real increases in staff costs over the PC5 period in its opex projections assuming a 1% real unit cost increase in staff costs.

(f) **Additional water pumping costs:** For TRANSCO's water business, the consultant included an additional allowance in its top-down and bottom-up opex projections for an increase in the pumping costs due to increases in electricity tariffs and additional costs for pumping stations recently transferred to TRANSCO. However, these allowances and their underlying assumptions need to be further reviewed in the consultant's next reports.

(g) **Other costs:** For TRANSCO, the consultant did not include any allowance in its opex projections for GCC grid costs and the Liwa Aquifier Recharge Scheme (in view of the issues being discussed between TRANSCO and the Bureau).

Allowance for Emiratisation costs

3.13 The following table sets out the assumptions used by the consultant in calculating additional allowance for Emiratisation costs in their interim report in terms of (a) total number of full-time employees (FTEs); (b) Emiratisation rate (ie the number of UAE National employees as a proportion of total FTEs); and (c) additional cost relating to the UAE National employees as compared to expatriate employees.

Table 3.1: Assumptions for Emiratisation cost allowance

AED million, 2011 prices		2011	2012	2013	2014	2015	2016	2017	2018
AADC (E)	Total FTEs	1,200	1,133	1,121	1,097	1,077	1,049	1,025	998
	Emiratisation rate (%)	37.6%	40.4%	38.9%	41.2%	42.5%	44.2%	45.2%	45.7%
	Cost (AEDm/staff)	0.02							
AADC (W)	Total FTEs	649	707	693	672	654	630	604	581
	Emiratisation rate (%)	36.5%	39.6%	37.5%	38.1%	40.0%	41.0%	42.0%	42.8%
	Cost (AEDm/staff)	0.02							
ADDC (E)	Total FTEs	1,575	1,649	1,684	1,706	1,728	1,728	1,736	1,743
	Emiratisation rate (%)	29.5%	30.9%	32.4%	33.4%	33.4%	33.9%	33.4%	33.0%
	Cost (AEDm/staff)	0.216							
ADDC (W)	Total FTEs	982	1,039	1,024	1,014	994	968	945	921
	Emiratisation rate (%)	29.1%	30.4%	29.5%	30.3%	30.6%	31.2%	30.7%	30.1%
	Cost (AEDm/staff)	0.216							
TRANSCO (E)	Total FTEs	465	515.9	536.3	543.5	551.9	545.0	546.3	534.7
	Emiratisation rate (%)	28.6%	28.8%	33.2%	35.7%	38.1%	39.1%	40.9%	40.9%
	Cost (AEDm/staff)	0.216							
TRANSCO (W)	Total FTEs	377	340.7	342.5	336.8	333.2	321.4	312.9	301.5
	Emiratisation rate (%)	27%	35%	40%	43%	45%	46%	48%	48%
	Cost (AEDm/staff)	0.216							
ADSSC	Total FTEs	563	574.1	561.0	534.4	522.2	510.4	499.0	487.8
	Emiratisation rate (%)	61.6%	65.0%	65.7%	66.4%	67.2%	67.9%	68.7%	69.3%
	Cost (AEDm/staff)	0.216							

Source: Deloitte's interim report, March 2013

Notes: (1) Total FTEs are those implied by the consultant's top-down opex projections.
(2) Emiratisation rate refers to the number of UAE National staff as a proportion of total number of staff in the company and is set equal to the target implied by the staff data in the company's 2012 AIS.
(3) Cost (AEDm/staff) refers to the additional staff unit cost of a UAE National relative to an expatriate staff.

3.14 Taking into consideration the companies' responses and the consultant's recommendations, the Bureau proposes that an adjustment should be made for each year of the PC5 period for any deviation (both increase and decrease) in the relevant company's actual Emiratisation rate as compared to the assumed Emiratisation rate. Following receipt of the evidence from the company for its actual annual Emiratisation rate, such an adjustment can be made annually or at the next price control period.

Allowance for mega development assets

3.15 To facilitate and appropriately incentivise the timely transfer of utility infrastructure of mega developments to the sector companies, the Bureau proposes that additional opex allowances for the related costs should be made at this review. The opex consultant intends to estimate such an allowance based on the network length of related assets and a suitable benchmark for opex per kilometre of network but require reasonable estimates of network length and timing of the transfer of such assets from the companies. Once such opex estimates are incorporated into PC5 at this price control review, the Bureau can adjust this allowance annually for any deviation in the actual size and timing of assets transferred against the size and timing assumed for the allowance made at this review. Such an adjustment would be made using the opex per kilometre benchmark established at this price control review.

3.16 The annual or periodic adjustments for Emiratisation and mega development cost allowances would be made by taking account of CPI inflation and a time value of money.

Allowance for private tankering services for ADSSC

3.17 We also intend to include additional opex allowances in our final proposals for ADSSC to take over the management of, private tankering services to collect and properly treat the wastewater from customers which are presently not connected to the sewerage network. At present, these services are directly procured and paid by the customers (mainly labour camp owners in the Western Region). The Bureau and ADSSC are currently assessing the size and cost impact of this activity and discussing with the opex consultant suitable allowances that can be provided at this price control review. Our preliminary assessment shows the following two costs are involved:

(a) Payment to third party contractors for haulage of wastewater from customers to ADSSC's treatment reception points, estimated to be about AED 300 million per annum based on around 27,000 tanker trips per month; and

(b) ADSSC's costs of managing this activity based on the company's requirement for new staff.

3.18 We propose that the payment of tanker hire costs discussed in (a) above should be recovered by ADSSC from the relevant customers (who have already been paying these costs directly to private tankers). This mechanism will therefore be cost-neutral for both ADSSC and its customers. However, ADSSC's own costs of managing this activity discussed in (b) above will be considered to be funded by appropriate opex allowances. This additional allowance will be estimated by the opex consultant based on review of estimates and assumptions from ADSSC.

Operating cost projections

Companies' future opex projections

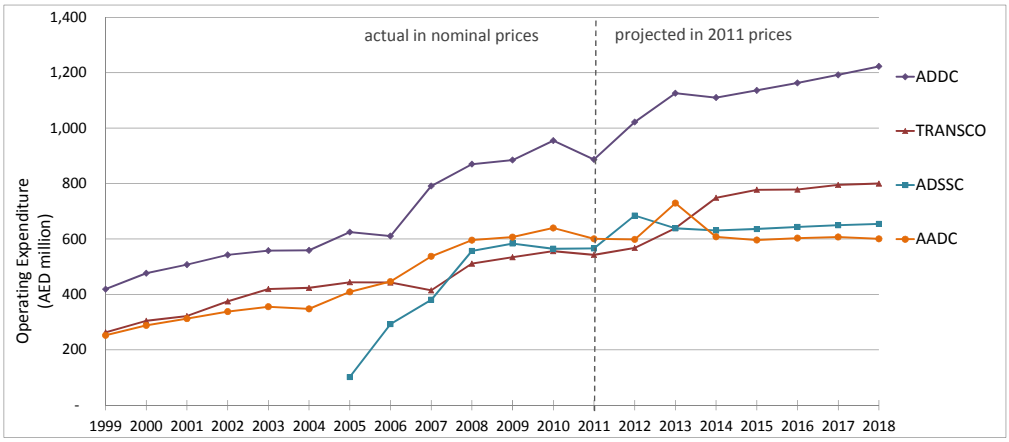
3.19 The companies' opex projections for 2012-2018 from their 2012 AIS submissions (including TRANSCO's unlicensed dedicated activities) are summarised in **Table 3.2** and graphically presented in **Figure 3.6**. For the purpose of comparison against the consultant's opex projections, we have expressed the companies' opex projections (provided in AIS in 2012 prices) in 2011 prices.

Table 3.2: Companies' PC5 opex forecasts (2011 prices)

AED million, 2011 prices		2011	2012	2013	2014	2015	2016	2017	2018
AADC	Electricity	375	373	462	376	369	376	379	377
	Water	225	225	267	232	227	227	227	223
	Total	600	598	729	608	596	603	607	600
ADDC	Electricity	558	685	755	729	746	763	781	801
	Water	328	337	371	381	390	400	411	422
	Total	887	1,022	1,126	1,110	1,136	1,163	1,192	1,223
TRANSCO	Electricity	278	277	313	328	337	339	342	345
	Water	265	290	327	420	441	440	453	455
	Total	543	568	639	749	778	778	795	800
ADSSC	Total	566	685	639	630	636	643	650	654
Total		**2,596**	**2,872**	**3,133**	**3,097**	**3,146**	**3,188**	**3,244**	**3,277**

Source: 2011 actual opex as per companies' 2011 SBAs. 2012-2018 opex forecasts as per companies' 2012 AIS submissions.

Figure 3.6: Companies' 2012-2018 opex forecasts (2011 prices)



Source: 1999-2011 actual opex as per companies' 2011 SBAs. 2012-2018 opex forecasts as per companies' 2012 AIS submissions.
Notes: Actual opex for 1999-2011 is in nominal prices; projected opex for future years is in 2011 prices.

3.20 The main trends in these forecasts are summarised as follows:

(a) The four companies' aggregate opex is projected to increase from around AED 2.6 billion to 3.3 billion in real 2011 prices from 2011 to 2018 at an average annual rate of 3.4% p.a. (cumulative increase by 26%). Company specific trend up to 2018 is as follows:

(i) AADC: almost at the same level at AED 600 million

(ii) ADDC: increased by 4.7% p.a. on average or cumulative 38% to AED 1.2 billion

(iii) ADSSC: increased by 2.1% p.a. or cumulative 16% to AED 650 million

(iv) TRANSCO: increased by 5.7% p.a. or cumulative 47% to AED 800 million

(b) Staff costs increase from AED 1.5 billion to 1.85 billion over 2011-2018 in 2011 prices at an average rate of 2.5% per annum (cumulative increase by 19%) and remain the largest or major part of opex, accounting for overall 57% of total opex.

(c) For both AADC and ADDC combined, the ratio of supply business costs to distribution business costs is projected to remain high at around 84% over the period.

Consultant's initial opex projections

3.21 In their interim report, the opex consultant have projected opex for the network companies using the top-down and bottom-up approaches for the period 2014-2018 in 2011 prices. On average, the bottom-up projections are lower than the top-down projections by about 15%. The bottom-up projections are for an efficient level of opex for the base yeas, which leads to a difference between the top-down and bottom-up projections.

3.22 The consultant's initial recommendation for the PC5 opex allowances is summarised in **Table 3.3**. This represents a proposed cost path assuming a 75% catch-up of the gap from top-down projections to bottom-up projections by the end of 2018 to allow sufficient time for the companies to make improvements and achieve reasonable efficiency. These projections include cost allowances for TRANSCO's unlicensed dedicated activities. The projections indicate an aggregate opex of about AED 2.6 billion for the four network companies in 2014 decreasing at an average rate of 2.3% per annum to AED 2.3 billion by 2018.

Table 3.3: Consultant's initial PC5 opex projections (2011 prices)

AED million, 2011 prices		2014	2015	2016	2017	2018
AADC	Electricity	319	304	290	279	270
	Water	202	192	182	174	169
	Total	521	496	473	454	438
ADDC	Electricity	577	575	568	561	554
	Water	324	317	311	306	303
	Total	901	892	879	867	857
TRANSCO	Electricity	273	269	258	251	239
	Water	369	373	356	357	348
	Total	641	642	614	608	587
ADSSC	Total	514	495	480	469	462
Total		**2,577**	**2,526**	**2,446**	**2,398**	**2,344**

Source: Deloitte's Interim Report, March 2013

Assessment of consultant's opex projections

Comparison against companies' opex forecasts

3.23 As the comparison between **Tables 3.2** and **3.3** indicates, the consultant's initial opex projections are significantly lower than the companies' 2012 AIS opex forecasts:

(a) The consultant has estimated an aggregate opex for the four companies in the range of AED 2.3-2.6 billion in 2011 prices against the companies' forecasts of AED 3.1 - 3.3 billion over the period 2014-2018. That is, the consultant's projections are lower than the companies' forecasts by AED 520-933 million or, on average by AED 732 million or 23% in 2011 prices.

(b) For individual companies, the consultant's initial opex projections imply a reduction by around 21% to 25% on average over the period 2014-2018 against the companies' forecasts.

Comparison against companies' 2011 actual opex

3.24 **Table 3.4** compares the consultant's initial opex projections for PC5 against the companies' 2011 actual opex and highlights important expected trends:

(a) For TRANSCO, the projections assume an increase in opex from 2011 to 2014 at an average annual rate of 5.7% p.a. and from 2011 to 2018 at 1.1% p.a.

(b) For ADDC, the opex projections increase from 2011 to 2014 at an average annual rate of 0.5% p.a. and decrease from 2011 to 2018 at 0.50% p.a.

(c) For AADC and ADSSC, the projections assume a decrease in opex from 2011 to 2014 at an average annual rate by 4.6% p.a. and 3.1% p.a. and from 2011 to 2018 at 4.4% and 2.9% p.a., respectively.

(d) On an aggregate basis, the projections indicate a reduction in costs from 2011 by AED 18 million by 2014 (at an average rate of 0.2% p.a.) and by AED 251 million by 2018 (at an average rate of 1.4% p.a.).

Table 3.4: Consultant's initial opex projections – comparison against 2011 actual costs

AED million, 2011 prices	2011 actual opex	2014 projection against 2011 actual			2018 projection against 2011 actual		
		2014 opex	Difference	CAGR (%)	2018 opex	Difference	CAGR (%)
AADC	600	521	-80	-4.6%	438	-162	-4.4%
ADDC	887	901	15	0.5%	857	-30	-0.5%
TRANSCO	543	641	99	5.7%	587	44	1.1%
ADSSC	566	514	-52	-3.1%	462	-104	-2.9%
Total	**2,596**	**2,577**	**-18**	**-0.2%**	**2,344**	**-251**	**-1.4%**

Comparison against 2013 price control allowances

3.25 **Table 3.5** compares the consultant's initial opex projections for PC5 against the PC4 allowance for 2013 opex. This comparison highlights the following points:

(a) The projections assume an increase in opex allowance for all the four network companies from 2013 to 2014 at a rate of 0.9% to 10%. On an aggregate basis, this implies an increase by about AED 111 million or 4.5%.

(b) However, from 2013 to 2018, the projections indicate a decrease in opex allowance at an average rate of 0.04%-3.2% p.a. for the companies and an aggregate decrease by about AED 112 or 1% p.a.

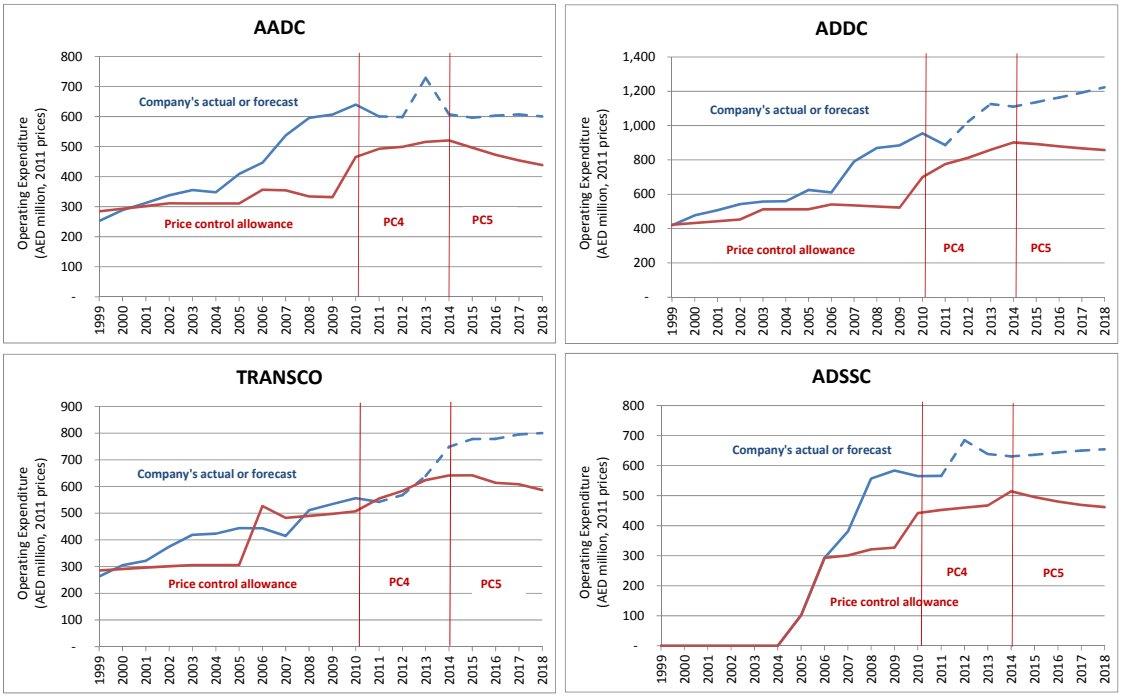
Table 3.5: Consultant's initial projections – comparison against 2013 price control allowance

AED million, 2011 prices	2013 allowance	2014 against 2013 allowance			2018 against 2013 allowance		
		2014 opex	Difference	CAGR (%)	2018 opex	Difference	CAGR (%)
AADC	516	521	5	0.9%	438	-78	-3.2%
ADDC	859	901	43	5.0%	857	-2	-0.04%
TRANSCO	624	641	17	2.8%	587	-37	-1.2%
ADSSC	467	514	47	10.0%	462	-6	-0.2%
Total	**2,466**	**2,577**	**111**	**4.5%**	**2,344**	**-122**	**-1.0%**

Summary of comparisons

3.26 The following charts present the consultant's initial PC5 opex projections as well as the above comparative analysis and overall trends for the price control opex allowances and companies' actual opex.

Figure 3.7: Initial PC5 opex projections for network companies (2011 prices)



3.27 As the above charts show, the proposed opex allowances for PC5 are generally lower (except for TRANSCO) than the companies' 2011 actual opex by around 0.50%-4.6% and significantly lower than their 2012 AIS forecasts in real terms due to both exclusion of certain costs and expected efficiency gains. However, these allowances start at higher levels than the existing PC4 opex allowances, thereby allowing time for the companies to improve efficiency.

Draft proposals

3.28 Pending further work by the opex consultant over the next few months, the Bureau has adopted in these draft proposals the consultant's initial opex projections for PC5 as set out in **Table 3.3** above.

3.29 For the price control calculations, the opex projections need to be expressed in 2014 prices. **Table 3.6** presents these opex projections by converting our proposals in **Table 3.3** from 2011 terms to 2014 terms by applying CPI assumptions as set out in Section 2. This has increased the opex projections by approximately 2.6%.

Table 3.6: PC5 opex projections (2014 prices) – draft proposals

AED million, 2014 prices		2014	2015	2016	2017	2018
AADC	Electricity	327	312	298	287	277
	Water	207	197	187	179	173
	Total	534	509	485	465	450
ADDC	Electricity	592	590	583	576	569
	Water	333	326	320	314	311
	Total	925	916	902	890	880
TRANSCO	Electricity	280	276	265	257	245
	Water	378	383	365	367	357
	Total	658	659	630	624	602
ADSSC	Total	528	508	493	481	474
Total		**2,645**	**2,592**	**2,509**	**2,461**	**2,405**

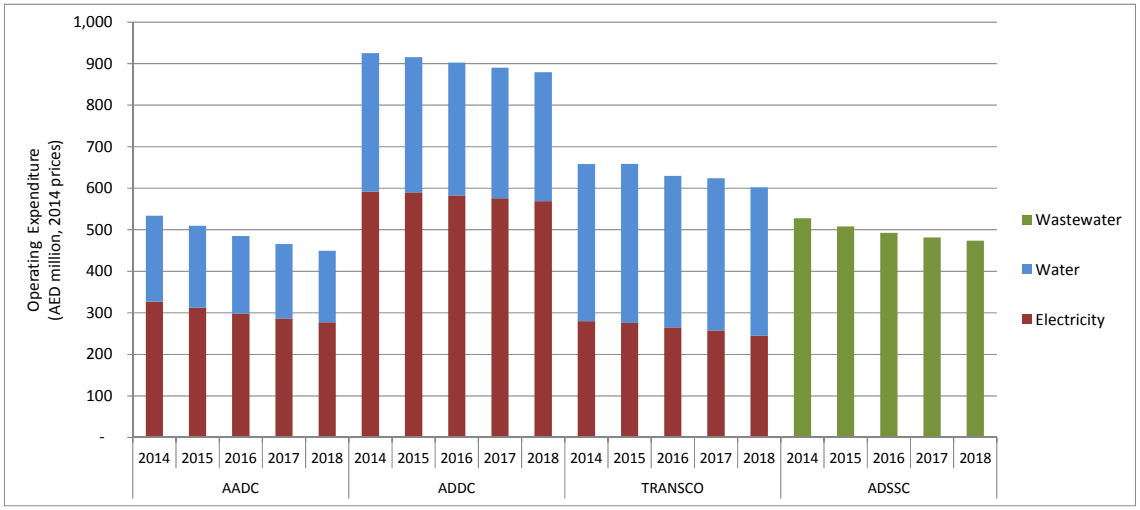
3.30 The following chart presents the above projections, highlighting:

(a) the profile of opex allowances over the PC5 period in real prices;

(b) the dominance of opex accounted for by ADDC (around AED 900 million p.a.), followed by TRANSCO (over AED 600 million p.a.), and AADC and ADSSC (around AED 500 million p.a.); and

(c) the higher opex accounted for by the electricity businesses than water businesses for AADC and ADDC and vice versa for TRANSCO.

Figure 3.8: PC5 opex projections (2014 prices) – draft proposals



3.31 A number of points are worth noting in relation to the PC5 opex projections presented above and adopted in these draft proposals:

(a) These projections include provisional allowances for Emiratisation costs subject to an adjustment for actual Emiratisation rate achieved by the business during each year of the PC5 period.

(b) These projections include allowances for TRANSCO's licensed and unlicensed shared activities as well as its unlicensed dedicated activities in line with the scope of PC5 controls proposed in Section 2.

(c) The projections exclude the Bureau's licence fees. As discussed, the Bureau's regular licence fees will be included in opex projections in the Bureau's final proposals.

(d) While these projections presently do not include additional allowances for mega developments (for AADC, ADDC and ADSSC) and private tankering services (for ADSSC), we would include provisional allowances for these in our final proposals to facilitate the transfer of the respective responsibilities to network companies in a timely manner. The allowances for mega developments will be subject to annual or periodic adjustments against the timing and the size of actual mega development asset transfer during the PC5 period.

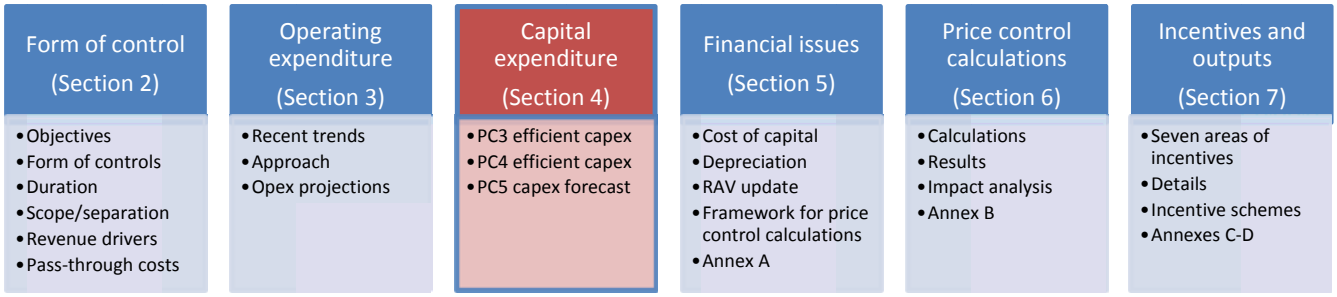
(e) While the above projections show the opex projected for 2018 for ADSSC, this is not included in the price control calculations in these draft proposals in view of the proposed 4-year control period for ADSSC in Section 2.

3.32 Opex consultants are due to issue their draft and final reports at the end of May and July 2013, respectively. The consultant will update their PC5 opex projections by taking into account the companies' 2012 actual audited costs, further information and comments from the companies, and any further research they undertake.

4. Capital expenditure

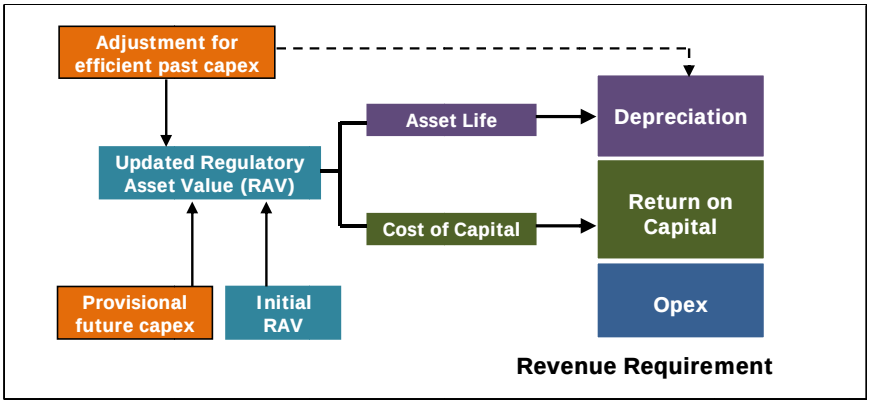
Introduction

Figure 4.1: Capital expenditure – Section 4



4.1 Capital expenditure (capex) is the most significant input to the price control calculations and directly affects two of the three building blocks of required revenue – namely, depreciation and return on capital – see **Figure 4.2**. From a network companies' perspective, capex is important as it allows them to meet demand for new connections and supplies in a timely manner. Capex is also vital for the replacement or improvement of the existing network infrastructure.

Figure 4.2: Capex in price control calculations



4.2 The treatment of capex by the Bureau in previous price control reviews has essentially been based on an ex-post assessment of efficient capex. Pending the ex-post assessment, provisional allowances for future capex are incorporated into the price controls to facilitate the financing of capex and the smoothing of the price control revenue from one period to another. Necessary financial adjustments are then made at the subsequent price control review to compensate a company for the difference between the provisional capex allowance and the actual efficient capex (taking account of financing costs) – see **Figure 4.2**. The efficiency criteria (established in 1999) are that capex will be considered efficient if it:

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

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

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

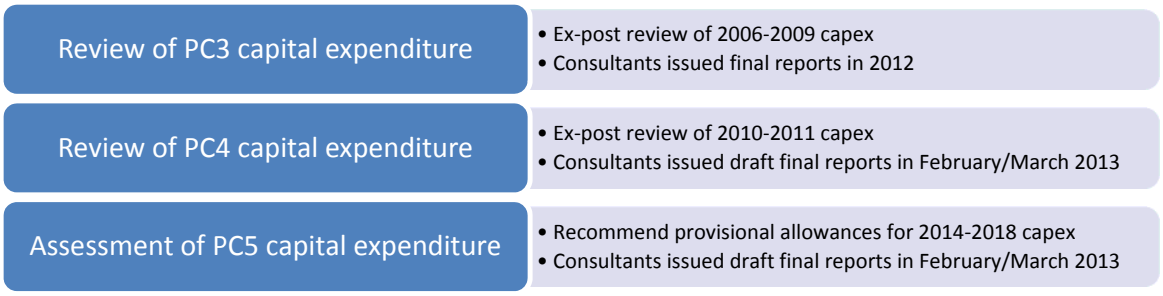
Table 4.1: Treatment of capex at various price control reviews

Treatment	PC1 capex	PC2 capex	PC3 capex	PC4 capex	PC5 capex
Provisional capex allowance	Provisional allowance included in PC2	Provisional allowance included in PC2	Provisional allowance included in PC3	Provisional allowance included in PC4	Provisional allowance to be included in PC5
Capex efficiency review	Reviewed by Bureau in 2004	Reviewed by consultants in 2007	Reviewed by consultants in 2011-2012	2010-2011 capex reviewed by consultants in 2012-2013 2012-2013 to be reviewed in future with PC5 capex	To be reviewed in future
Adjustment for efficient capex	Adjustment made in PC3	Adjustment made in PC4	Adjustment to be made in PC5	Adjustment for 2010-2011 capex to be made in PC5 Adjustment for 2012-2013 to be made in PC6	Adjustment to be made in PC6 and future price controls

Notes: Discussion about treatment of PC1 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 as that for PC3 capex for other network companies.

4.4 PC1 and PC2 capex has been dealt with at previous price control reviews. This Section 4 deals with the PC3 (2006 to 2009) and PC4 (2010 to 2013) capex efficiency reviews and how PC5 (2014 and onwards) capex should be treated at this review. Two external consultants (Atkins and KEMA) supported us on the work streams relating to capex as shown in **Figure 4.3** and described later in this section.

Figure 4.3: External consultants' support on capex for PC5



Treatment of PC3 capex

Second consultation paper

4.5 The Bureau's first and second consultation papers summarised the arrangements for PC3 capex agreed at the previous price control reviews and the work undertaken by the Bureau's capex consultants in 2011-2012 on the efficiency review of PC3 capex for the network businesses. The consultants reviewed the companies' capex processes and sample projects using two approaches to assessing the capex efficiency –process scoring and monetary quantification methods. They also assigned inefficiency in each process and project to the company, its shareholder and exogenous factors (specific to Abu Dhabi). The consultants issued final reports in June 2012.

4.6 The second consultation paper suggested various adjustments to the efficiency scores for PC3 capex. We also issued a letter dated 15 October 2012 to the four network companies explaining in detail the calculation of these scores.

PC3 actual and provisional capex allowances

4.7 The following table reproduces the provisional PC3 capex for the network companies in 2014 prices from the earlier consultation papers amounting to about AED 22.4 billion:

Table 4.2: PC3 provisional capex (2014 prices)

AED million, 2014 prices		2005	2006	2007	2008	2009	Total
AADC	Electricity		437	437	437	437	1,748
	Water		219	219	219	219	877
ADDC	Electricity		768	768	768	768	3,072
	Water		451	451	451	451	1,806
TRANSCO	Electricity		1,720	1,720	1,720	1,720	6,879
	Water		1,075	1,075	1,075	1,075	4,299
ADSSC	Total	577	195	628	913	1,370	3,683
Total		**577**	**4,866**	**5,299**	**5,583**	**6,040**	**22,364**

4.8 The following two tables summarise the actual PC3 capex for the network companies in nominal prices and 2014 prices, respectively. The aggregate actual PC3 capex for the four companies amounts to about AED 31 billion in nominal prices or about AED 37 billion in 2014 prices. The PC3 actual capex is higher than the PC3 provisional capex allowances in price controls by about AED 14.3 billion in 2014 prices.

Table 4.3: PC3 actual capex (nominal prices)

AED million, nominal prices		2005	2006	2007	2008	2009	Total
AADC	Electricity		505	406	795	1,285	2,991
	Water		78	88	-3	246	408
ADDC	Electricity		494	993	1,393	2,570	5,450
	Water		222	278	526	346	1,372
TRANSCO	Electricity		1,377	2,819	4,622	2,717	11,535
	Water		574	720	2,227	2,406	5,927
ADSSC	Total	379	151	276	739	1,614	3,158
Total		**379**	**3,401**	**5,579**	**10,299**	**11,184**	**30,842**

Source: Companies' audited SBAs
Notes: Some of the individual companies' annual capex have been adjusted slightly since the earlier PC5 consultation papers mainly for corrections based on the latest SBAs (eg, 2007 capex revised in company's 2008 SBAs) or for correct treatment of certain cost components.

Table 4.4: PC3 actual capex (2014 prices)

AED million, 2014 prices		2005	2006	2007	2008	2009	Total
AADC	Electricity		723	532	939	1,351	3,545
	Water		111	115	-4	259	481
ADDC	Electricity		708	1,302	1,643	2,701	6,354
	Water		318	365	621	363	1,667
TRANSCO	Electricity		1,973	3,696	5,454	2,855	13,978
	Water		822	944	2,628	2,528	6,923
ADSSC	Total	577	217	361	872	1,696	3,722
Total		**577**	**4,873**	**7,316**	**12,153**	**11,752**	**36,671**

Responses

4.9 In response to the second consultation paper and our letter of 15 October 2012, the licensees generally welcomed the efficiency assessments and the steps taken by the Bureau to address a number of concerns about capex assessments. They however expressed concerns about the methodologies used by the capex consultants and inconsistencies between their results. The licensees suggested further adjustments to the PC3 capex efficiency scores to recognise exogenous factors.

4.10 At a meeting held on 14 March 2013 with the Bureau, the four network companies reiterated their concerns and suggestions as expressed in their responses summarised above. While the companies highlighted the advantages and disadvantages of the two assessment methods, they generally supported the adoption of efficiency results based on process scoring method for PC3 capex and proposed additional adjustments to the efficiency scores.

Assessment and draft proposals

4.11 We understand that companies have residual concerns about the PC3 capex review and resulting scores. Consultants had a challenging task and their assessment involved inevitable technical judgement and subjectivity. While we made all efforts to agree with the consultants and the companies clear criteria and methodology for assessment of PC3 capex and particularly PC4 capex, it should be acknowledged that the attribution of inefficiency between different factors is not an exact science. The attribution does not have to be the same across all businesses, as different businesses and projects are affected by these factors to varying degrees. However, we recognise the companies' concerns and propose below appropriate adjustments.

4.12 We also see the companies' point of view about the shareholder's influence being out of the company management's reasonable control and being similar to Abu Dhabi factors. However, inefficiency attribution to different factors would send an appropriate signal for efficiency improvements.

4.13 Based on the above considerations and the network companies' comments, we have made further adjustments to the PC3 capex efficiency scores as described below:

(a) Given the debate and lack of agreement between the process scoring and monetary quantification methods, we have taken the average of the scores from both the methods and have used these average scores as the basis for further upward adjustments as described below.

(b) For ADDC's electricity business, we have made upward adjustments to inefficiency attributable to Abu Dhabi factors and shareholder, increasing them to the averages of the corresponding figures for other two electricity businesses (ie, 22% and 38.5%, respectively) and reducing the inefficiency attributable to the company (to 39.5%%) accordingly.

(c) For TRANSCO water business, we have applied an average figure of 46.5% to their shareholder inefficiency by reducing the company inefficiency figure (to 33.5%) accordingly.

(d) For all businesses, we have adjusted efficiency scores by removing the Abu Dhabi and shareholder factors as being outside the control of each company.

(e) For all businesses, a further upward adjustment has been made to the efficiency score for half of the inefficiency score attributable to each company.

4.14 The resulting scores adopted in these draft proposals are presented in the following table. It is important to note that the adjustments we have proposed to PC3 capex efficiency scores will not be available or automatically applicable to future capex reviews, except as discussed later in relation to PC4 capex. We have already written to the companies in March 2013 explaining these adjustments and our approach to PC3 capex efficiency.

Table 4.5: PC3 capex efficiency – draft proposals

Adjusted efficiency	Electricity	Water / Wastewater
AADC	96.22%	96.19%
ADDC	96.25%	95.54%
TRANSCO	95.65%	96.57%
ADSSC		97.49%

4.15 The above efficiency scores have been applied to the companies' respective actual PC3 capex figures in **Table 4.4** to determine the actual efficient PC3 capex as set out below. In total, the efficient PC3 capex for the four companies amounts to AED 35.3 billion in 2014 prices, as compared to the actual PC3 capex of AED 36.7 billion in 2014 prices.

Table 4.6: PC3 efficient capex (2014 prices) – draft proposals

AED million, 2014 prices		2005	2006	2007	2008	2009	Total
AADC	Electricity		696	512	903	1,300	3,411
	Water		107	111	-4	249	463
ADDC	Electricity		682	1,253	1,582	2,599	6,116
	Water		304	349	593	347	1,593
TRANSCO	Electricity		1,887	3,535	5,217	2,731	13,370
	Water		794	912	2,538	2,441	6,685
ADSSC	Total	562	212	352	850	1,653	3,629
Total		**562**	**4,681**	**7,024**	**11,679**	**11,320**	**35,267**

4.16 The provisional PC3 capex figures previously incorporated in the price controls and shown in **Table 4.2** (amounting to AED 22.4 billion in total in 2014 prices) have been subtracted from the efficient PC3 capex shown above to calculate the additional PC3 efficient capex which needs to be financed at this price control review. The resulting additional PC3 efficient capex (over and above PC3 provisional capex) is presented in **Table 4.7** below. In total, this amounts to AED 12.9 billion in 2014 prices for the four companies.

4.17 With regards to ADSSC's request for clarification on monetary adjustment, we note that the additional PC3 efficient capex (over and above PC3 provisional capex) presented above is being rolled into the respective business's RAV at this review. As discussed in Section 5, the annual capex amounts shown in the table above, net of depreciation up to the start of PC5 period, have been rolled into the companies' RAVs. This has the effect of

increasing the 2014 opening RAVs, but partially offset by a negative figure for PC4 additional efficient capex (discussed later).

Table 4.7: PC3 additional efficient capex (2014 prices) – draft proposals

AED million, 2014 prices		2005	2006	2007	2008	2009	Total
AADC	Electricity		259	75	466	863	1,663
	Water		-112	-109	-223	30	-414
ADDC	Electricity		-86	485	813	1,831	3,043
	Water		-148	-103	142	-105	-213
TRANSCO	Electricity		167	1,816	3,497	1,011	6,491
	Water		-281	-163	1,463	1,367	2,386
ADSSC	Total	-14	16	-276	-63	283	-54
Total		**-14**	**-184**	**1,726**	**6,096**	**5,280**	**12,903**

Treatment of PC4 capex

Second consultation paper

4.18 The Bureau's earlier consultation papers on PC5 summarised the arrangements agreed at the last price control review for the treatment of PC4 capex – which are similar to that for PC3 capex. The PC4 capex review was brought forward as suggested by the companies. The review was structured such that 2010-2012 capex would be reviewed in 2012-2013 with the efficiency adjustments to RAVs made at this review and 2013 capex reviewed in future alongside PC5 capex.

4.19 The capex consultants (KEMA and Atkins) undertook the PC4 capex review by using the process scoring method to calculate efficiency scores, as this provides better information to the licensees on areas of potential business improvement.

4.20 Given the similar circumstances of the PC3 and PC4 reviews, the second consultation paper suggested that an approach similar to that used for PC3 efficiency should be applied to translating PC4 efficiency scores into RAV adjustments.

4.21 In respect of network assets that are built by the developers as part of their mega developments, the Bureau is keen to see these assets transferred to the respective network businesses as quickly as possible. This is key to ensure that customers are protected and appropriate asset stewardship is in place. In order to inform the Bureau's position with regard to the efficient transfer of such assets, the Bureau has adopted a separate process and separate consultants (EC Harris) for valuing these network assets. The Bureau's consultants will be advising on both the transfer price (i.e. the price to be paid by the relevant network company to the concerned developer) as well as recommending an efficient value of these assets (i.e. the value to be used in calculating RAVs). The transfer price may be reduced to reflect any material inefficiencies caused by the developers (or any additional costs associated with remedial work to bring the assets up to an acceptable specification and imposed on the network companies). For the avoidance of doubt, the efficient values of assets determined as above would be added into the RAVs without any further review.

PC4 actual and provisional capex allowances

4.22 The following table reproduces the provisional PC4 capex allowances (2010-2011) from the second consultation paper in 2014 prices. In total, this amounts to about AED 29 billion in 2014 prices over 2010-2011.

Table 4.8: PC4 provisional capex allowances (2014 prices)

AED million, 2014 prices		2010	2011	Total 2010-2011
AADC	Electricity	939	939	1,878
	Water	136	136	271
ADDC	Electricity	1,638	1,638	3,277
	Water	616	616	1,231
TRANSCO	Electricity	5,458	5,458	10,916
	Water	2,640	2,640	5,281
ADSSC	Total	3,131	3,131	6,262
Total		**14,558**	**14,558**	**29,116**

4.23 The following table summarises the actual capex for 2010-2011 in nominal prices calculated from the respective companies' SBAs. We have made adjustments to these figures to exclude payments made by ADDC to mega project developers for networks to be transferred to ADDC. This is because the mega developments are being treated separately to the companies' usual "in-house" managed capex.

Table 4.9: PC4 actual capex to date

AED million		2010	2011	Total 2010-2011	2010	2011	Total 2010-2011
		(nominal prices)	(nominal prices)	(nominal prices)	(2014 prices)	(2014 prices)	(2014 prices)
AADC	Electricity	1,172	410	1,583	1,213	421	1,634
	Water	422	115	536	436	118	554
ADDC	Electricity	1,675	2,437	4,112	1,734	2,501	4,235
	Water	610	504	1,114	632	517	1,149
TRANSCO	Electricity	2,366	3,257	5,623	2,449	3,342	5,791
	Water	1,527	1,722	3,248	1,580	1,766	3,347
ADSSC	Total	1,446	2,542	3,989	1,497	2,609	4,106
Total		**9,218**	**10,987**	**20,205**	**9,541**	**11,274**	**20,815**

Source: Companies' audited SBAs

4.24 The above table also reproduces the 2010-2011 actual capex in 2014 prices as required for the PC5 price control calculations. In total, this amounts to about AED 21 billion compared to total provisional allowances of about AED 29 billion in 2014 prices over the two year period as shown in **Table 4.8** above. This two-year under-spending by about AED 8.3 billion (2014 prices) against the provisional allowance means that a downward adjustment to RAV is required besides any adjustment arising from the efficiency assessment. As discussed earlier, this downward adjustment will partially offset the increasing effect of PC3 additional efficient capex on the RAV.

Responses

4.25 Licensees' responses to the second consultation paper on the issues relating to PC4 capex review are summarised below:

(a) AADC suggested that further discussion on capex reviews is required with the Bureau and ADWEA and that it will respond to the issues soon.

(b) ADDC did not agree that the same methodology can be used for PC3 and PC4 capex and stated that PC4 capex efficiency results could not be compared against PC3 results and that PC4 scores being solely based on process assessment could not be related to the value of expenditure. ADDC stated that it referred this matter to the Government for further direction and would advise the Bureau accordingly.

(c) ADSSC accepted that the approach agreed for PC3 capex efficiency should be used for PC4 capex. However, it considered that the international best practices used by the consultants to assess PC4 capex were subjective, which may lead to the same concerns about the PC4 capex review results as was the case with PC3 capex review.

(d) While TRANSCO recognised the value of maintaining a consistent approach across PC3 and PC4 capex, it suggested that the consistency objective should not detract from the improvements that can be made for PC4 capex. The company acknowledged that it originally supported the use of process scoring method for PC4 capex though with limitations.

Assessment and draft proposals

4.26 We note that there is a wide range of approaches and methods available to assess capex efficiency and we have used some of them in Abu Dhabi with further modifications and improvements from time to time. The methodology for the PC4 capex review was developed and adopted following consultation with the licensees and keeping in view its benefits in terms of identifying the areas where further improvements are required. Nevertheless, we propose a number of adjustments to the consultants' efficiency scores to address the companies' concerns, as discussed below.

4.27 The companies have acknowledged that all the parties made their best endeavours to improve the PC4 capex review process in the light of experience and lessons from the PC3 capex review. The consultants' scope of work that prescribes the process scoring methodology in relatively more detail than PC3 capex review was developed by taking account of the companies' comments. However, it is clear from the meeting with the companies on 14 March 2013 and their subsequent written representations that the licensees have significant concerns.

4.28 The Bureau has given due consideration to the issues surrounding the PC4 capex review and the desire to reduce the time lag between actual spent and price control adjustment. Accordingly, the PC3 efficiency scores from **Table 4.5** have been applied to the companies' respective actual PC4 capex figures for 2010-2011 in **Table 4.9** above to determine the actual efficient capex as set out below. In total, the efficient PC4 capex for

the four companies amounts to about AED 20 billion in 2014 prices, as compared to the actual capex of around AED 21 billion in 2014 prices over the period 2010-2011.

Table 4.10: PC4 efficient capex to date (2014 prices) – draft proposals

AED million, 2014 prices		2010	2011	Total 2010-2011
AADC	Electricity	1,167	405	1,573
	Water	420	113	533
ADDC	Electricity	1,669	2,407	4,076
	Water	603	494	1,097
TRANSCO	Electricity	2,343	3,197	5,539
	Water	1,526	1,706	3,232
ADSSC	Total	1,459	2,543	4,003
Total		**9,187**	**10,865**	**20,053**

4.29 The comparison of the above against the provisional PC4 capex shown in **Table 4.8** above shows the following PC4 additional efficient capex (over and above PC4 provisional capex) which needs to be financed at this review. For most businesses, the table shows negative figures – meaning an adjustment is required at this review to remove part of provisional PC4 capex which has now been found to be inefficient or underspent. In total, this amounts to minus AED 9 billion in 2014 prices.

Table 4.11: PC4 additional efficient capex (2014 prices) – draft proposals

AED million, 2014 prices		2010	2011	Total 2010-2011
AADC	Electricity	228	-534	-306
	Water	284	-22	262
ADDC	Electricity	30	769	799
	Water	-12	-122	-134
TRANSCO	Electricity	-3,115	-2,261	-5,377
	Water	-1,114	-934	-2,049
ADSSC	Total	-1,671	-588	-2,259
Total		**-5,371**	**-3,693**	**-9,064**

4.30 The additional PC4 efficient capex (over and above PC4 provisional capex) presented above is being rolled into the respective business' RAV at this review – in the same manner as mentioned for PC3 capex but a negative figure will have an opposite effect. That is, as discussed earlier, this downward adjustment will partially offset the increasing effect of PC3 additional efficient capex on the RAV. Section 5 provides further details on these matters.

Treatment of PC5 capex

Second consultation paper

4.31 The second consultation paper noted the companies' general preferences for a more forward looking approach to capex regulation, alignment of regulatory capex forecasts with their business plans, and Bureau's closer involvement in capex planning. The paper

therefore suggested the following three main changes in the Bureau's approach to the regulation of capital efficiency:

(a) The consultants' work to review the companies' forecasts of PC5 capex (2014-2018) should support the Bureau's objective to set more robust provisional capex allowances for PC5 and satisfy the companies' desire for better alignment with their business plans.

(b) Our plan for the future years of PC5 to work with the companies is to review the front-end elements of their capex plans on an annual forward-looking basis, which should limit the scope of ex-post assessment and associated risks to some extent.

(c) Our plan to undertake ex-post capital efficiency review for the past years on a more frequent basis (say, every 2 or 3 years) – rather than towards the end of the price control period should provide more timely support to the sector to learn from the review and incorporate identified improvements in the capex processes.

Responses

4.32 Licensees generally supported these suggestions and put forward further proposals:

(a) AADC supported the approach and steps being taken by the Bureau to make the capital efficiency review more timely, to update the regulatory asset values (RAVs) to be reflective of the capital expenditure, and to minimise the difference between provisional and efficient capex.

(b) ADDC stated that, given the capital expenditure is approved by the Government, a separate regulatory focus on capex may not be required and suggested that forward looking improvement plans be agreed.

(c) ADSSC reiterated its preference for an ex-ante approach to capex regulation focused on outputs rather than spend. It however acknowledged that this will take time to develop and implement and perhaps should be seen as the aim for the next price control review.

(d) TRANSCO supported the consultants' work on developing more robust provisional capex allowances but sought commitment that this work will avoid reassessment of capex need during the next capital efficiency review. While it also supported ex-ante assessment of the future capital plans and an interim ex-post review, it suggested development of an improvement plan towards a good performing utility.

Assessment

4.33 We welcome the licensees' support to our suggestions on regulation of future capex and would like to make the following comments on their specific suggestions:

(a) While we continue to make endeavours to move towards more ex-ante capex regulation, the quality of the companies' capex forecasting, planning and procurement processes will ultimately determine the extent of any ex-ante and ex-post assessments.

(b) The capex consultants' work provide an independent assessment of the companies' current capex forecasts but it is on a high-level and covers front-end review of only a few sample projects for each business to assess the overall robustness of forecasts and will not take away the requirement for an ex-post capex review.

(c) We will work with the companies to develop precise scope and plan for any annual review of front-end elements of their capex plans. The objective would be to help the companies prepare robust capex budgets and associated requests for Government funding, and limit the scope and risk of ex-post assessment to some extent. However, the companies will remain responsible for developing and implementing detailed action plans and capex processes.

(d) As was the case with PC4 capex review, we will consult with the licensees on the consultants' scope of work and methodology for any interim capex efficiency review during the PC5 period.

4.34 The following table summarises the four network companies' PC5 capex forecasts (excluding mega developments) from their 2012 AIS submissions (converted in 2014 prices). In total, these forecasts amount to around AED 59.3 billion in 2014 prices over 2014-2018. In view of the proposed 4-year control period for ADSSC, the table also shows the total capex forecast of AED 58.6 billion for the companies excluding 2018 capex forecast for ADSSC. The 2012 AIS submissions of AADC, ADDC and ADSSC also include payments of about AED 3.2 billion to the developers of mega real estate projects for network assets to be transferred to these companies. However, mega developments are being treated separately, as discussed previously. Further, the capex associated with these assets are expected to be significantly higher than the estimates included in the 2012 AIS. The capex associated with mega developments have therefore not been considered in the PC5 capex forecasts and provisional allowances discussed here.

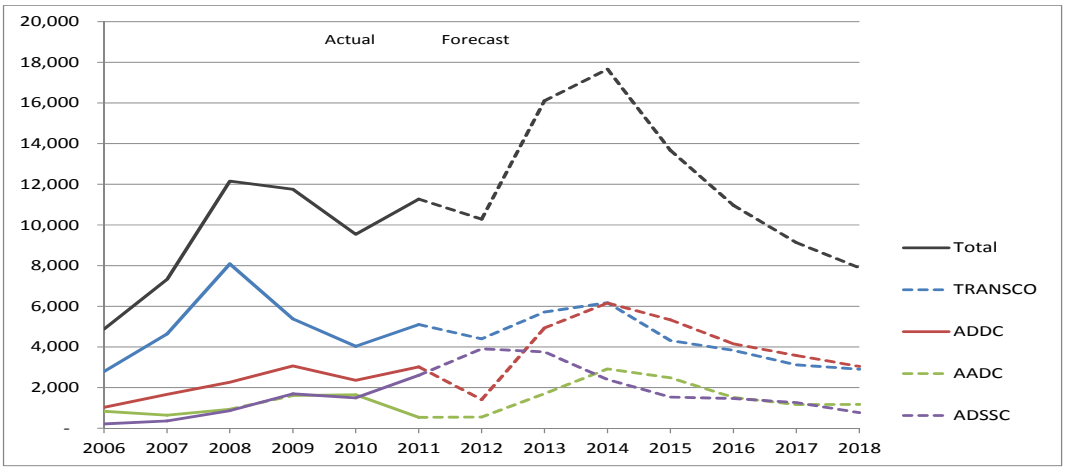
Table 4.12: PC5 capex forecasts as per companies' 2012 AIS (2014 prices)

AED million, 2014 prices		2014	2015	2016	2017	2018	Total
AADC	Electricity	2,556	2,116	1,285	1,000	960	7,918
	Water	366	371	235	166	213	1,350
ADDC	Electricity	4,289	3,858	3,218	2,960	2,623	16,949
	Water	1,870	1,474	934	619	420	5,318
TRANSCO	Electricity	4,581	2,533	2,308	1,824	2,032	13,278
	Water	1,596	1,786	1,525	1,297	878	7,082
ADSSC	Total	2,401	1,534	1,464	1,270	767	7,435
Total		17,659	13,672	10,968	9,136	7,894	59,329
Total (excl ADSSC's 2018 capex)		**17,659**	**13,672**	**10,968**	**9,136**	**7,127**	**58,563**

4.35 The following chart compares these forecasts against the actual spending trend in real 2014 prices. All the businesses taken together, the average annual forecast spending over the PC5 period is about AED 11.9 billion p.a., which is higher by 25% than the actual average annual capex over 2006-2011 (AED 9.5 billion p.a.) in real terms. The average annual forecast capex excluding ADSSC's 2018 capex is around AED 11.7 billion p.a. over this period. However, the forecasts for the near future (2013-2015) are significantly higher than the historical trend as well as forecasts for the later years –

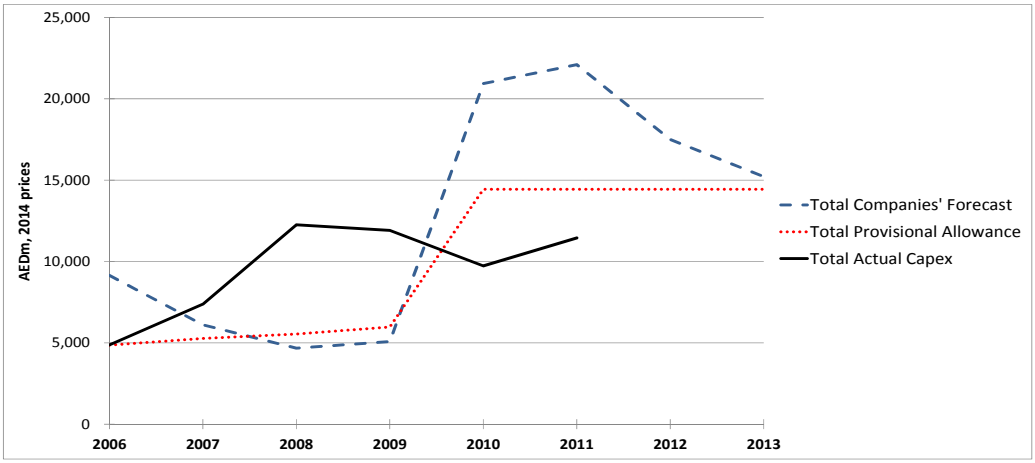
perhaps reflecting the companies' limited planning horizon or more certainty about near future than later years.

Figure 4.4: Companies' capex forecasts against actual trend (2014 prices)



4.36 In relation to the accuracy of the companies' forecasts, we note that there were significant variations between the companies' forecasts available at the previous price control reviews to set provisional allowances and their actual expenditure as shown in the following chart. This highlights the need for more robust forecasts to set provisional allowances in the future. This also shows how the overall economic growth affects the utilities' capex plans. During high economic growth until 2008, actual capex exceeded the companies' forecasts by large margins. As economic development slowed down in later years, the companies' actual capex spending fell below their forecast levels or the companies continued to forecast high capex based on high economic growth assumptions.

Figure 4.5: Companies' aggregate capex forecasts at previous reviews (2014 prices)



Recommended capex forecasts and draft proposals

4.37 In February-March 2013, the Bureau's capex consultants issued their draft final reports which included their assessment of the companies' PC5 capex forecasts. However, the

assessment was high level due to the time constraints and limited information available in the companies' 2012 AIS submissions about the PC5 capex forecasts. Due to the time limitations, consultants' further work and interactions with the companies required to carry out a more vigorous analysis have not been practicable.

4.38 The consultants' overall approach to developing their PC5 capex forecasts was to classify the companies' capex project forecasts into projects according to the stage of their development (eg, appraisal, planning, design, procurement and delivery) and then re-phase the project capex by incorporating some delays (generally 1 to 2 years) based on historical trends in the companies' forecast, budgeted and actual spends. This approach has resulted in a flattening of the expenditure profile over the PC5 period than the front-end loaded profile of the companies' 2012 AIS forecasts discussed earlier. In some cases, the consultants have excluded certain projects or made specific changes where necessary. For water distribution businesses, the consultants' assessment is that, based on actual capex trend analysis and limited information in the AIS on forecasts, there is little justification for allowed expenditure to be any higher than the current levels.

4.39 **Table 4.13** summarises the consultants' recommendations for PC5 capex forecasts. We have converted the consultants' base-case capex forecasts (given in 2012 prices, except for AADC and ADDC water businesses in 2010 prices) into 2014 prices and rounded off these forecasts to the nearest ten millions. In total, the consultants' recommended PC5 capex forecasts amount to AED 43.6 billion in 2014 prices for the four companies against the companies' capex forecasts amounting to AED 59.3 billion in 2014 prices (excluding mega developments). That is, the consultants' overall recommended forecasts are about 74% of (or lower by 26% than) the companies' aggregate forecasts. On an individual company basis, the consultants' assessed forecast varies from 51% (for AADC electricity) to 95% (for ADSSC) of the respective company's 2012 AIS forecast. In aggregate, these forecasts translate into an average annual capex spend of about AED 8.8 million p.a. as compared to the companies' forecast of AED 11.9 million p.a. These forecasts are therefore more in line with historical trends over 2006-2011. In view of the proposed 4-year control period for ADSSC, the table also shows the total capex forecast of AED 42.7 billion (average of AED 8.5 billion p.a.) for the companies excluding 2018 capex forecast for ADSSC.

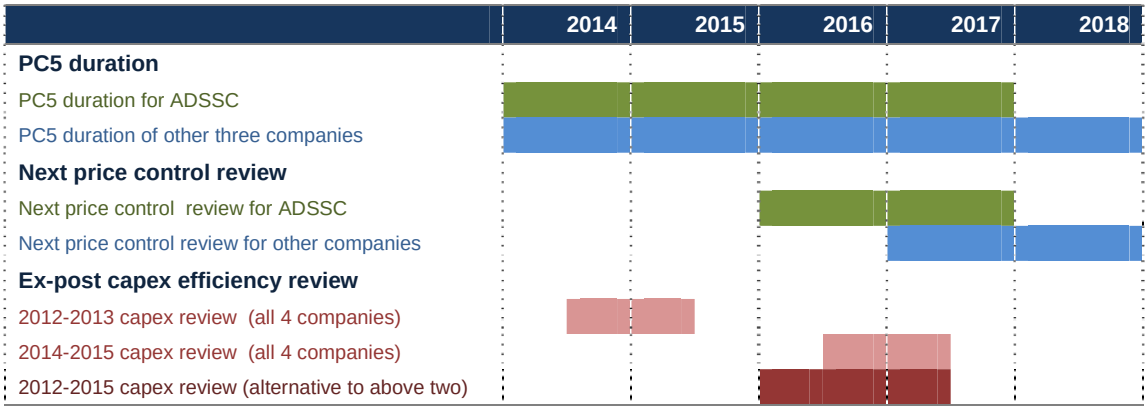
4.40 We have adopted the consultants' recommended capex forecasts as PC5 provisional capex in these draft proposals. These PC5 provisional capex allowances are set out in the table below:

Table 4.13: PC5 provisional capex allowances (2014 prices) – draft proposals

AED million, 2014 prices		2014	2015	2016	2017	2018	Total
AADC	Electricity	810	810	810	810	810	4,050
	Water	160	160	160	160	160	800
ADDC	Electricity	2,690	2,690	2,690	2,690	2,690	13,450
	Water	620	620	620	620	620	3,100
TRANSCO	Electricity	2,080	2,080	2,080	2,080	2,080	10,400
	Water	950	950	950	950	950	4,750
ADSSC	Total	1,850	1,520	1,390	1,350	980	7,090
Total		**9,160**	**8,830**	**8,700**	**8,660**	**8,290**	**43,640**
Total (excluding ADSSC's 2018 capex)		**9,160**	**8,830**	**8,700**	**8,660**	**7,310**	**42,660**

4.41 As mentioned in Section 2, an ex-post efficiency review of capex spent in 2012-2013 could be undertaken during 2014-2015 and review of capex spent in 2014-2015 during 2016-2017. Alternatively, a review of entire capex spent in 2012-2015 could be carried out during 2016-2017. In any case, the efficiency scores should be available to make an appropriate adjustment at the next price control review in 2017 for ADSSC and 2018 for the other three network companies. As suggested in the second consultation paper, we will seek to appoint consultants to undertake such reviews using the process scoring method.

Table 4.14: Price control duration considerations

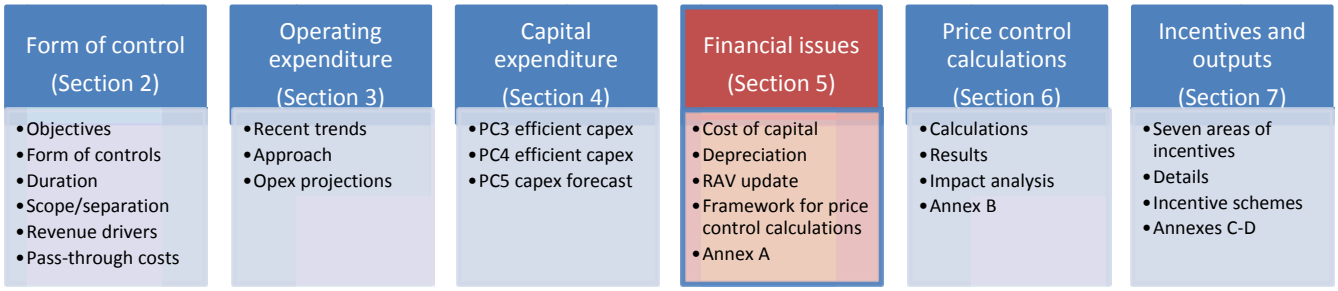


5. Financial issues

Introduction

5.1 This section discusses how operating and capital expenditures should be financed (including the calculation of allowances for regulatory depreciation and returns) and how the overall level of price control revenue should be calculated at this review. The price control calculations involve using allowances for operating costs, regulatory depreciation and returns (sometimes called building blocks), together with present value calculations, to derive the core price control revenue (i.e. revenue requirement excluding pass-through costs).

Figure 5.1: Capital expenditure – Section 5



5.2 Earlier consultation papers discussed these calculations in some detail and particularly the approach and assumptions to calculate regulatory depreciation and returns. The second consultation paper also set out the evidence from both overseas and local and regional sources on the cost of capital which can be used to calculate regulatory returns and to perform present value calculations at this review.

5.3 In response to the second consultation paper, AADC, ADDC and TRANSCO noted that ADWEA would be in a better position to comment on some financial issues. The companies' more specific comments are discussed in the following paragraphs.

Cost of capital

Second consultation paper

5.4 Earlier consultation papers explained the Bureau's approach used to date for the calculation of the cost of capital as the forward-looking, real Weighted Average Cost of Capital (WACC), with the cost of equity calculated by applying the Capital Asset Pricing Model (CAPM). 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 the cost of capital components used by regulators of similar businesses in the UK and Australia. The Bureau used a real cost of capital of 5% and 4.5% for setting the PC3 and PC4, respectively.

5.5 The second consultation paper noted that local capital markets remain subject to various limitations, which mean that it may not be practicable to base estimates of the cost of

capital solely or mainly on local evidence. Nonetheless, we continued our efforts to cross check our calculation based on overseas data against local or regional estimates to the extent they are available. This is consistent with the approach adopted by telecommunication regulatory authorities in Bahrain and Oman.

5.6 The second consultation paper summarised the relevant parameters and estimates from the recent regulatory decisions or proposals in the UK, Northern Island and Australia. As compared to our estimates at previous control reviews, these overseas proposals indicate a decrease in the risk free rate but increases in debt premium and equity risk premium and hence an overall increase in both the costs of debt and equity.

5.7 Based on the above evidence, the second consultation paper presented our initial cost of capital calculations for PC5 as follows:

Table 5.1: Bureau's initial cost of capital calculations for PC5 (real terms)

	Low	High	Mid-Point Average
Risk-free rate (real)	1.50%	2.00%	1.75%
Debt premium	1.50%	3.94%	2.72%
Cost of debt (real)	3.00%	5.94%	4.47%
Equity Risk Premium	5.00%	6.75%	5.88%
Equity Beta	0.68	1.00	0.84
Cost of equity (real)	4.90%	8.75%	6.69%
Gearing	60.00%	50.00%	55.00%
Cost of capital (real)	**3.76%**	**7.35%**	**5.47%**

5.8 We then compared these calculations against the recent cost of capital estimates from local and regional capital market analysts for the regionally listed electricity and water sector companies and for the locally listed companies (in real estate, energy and telecommunication sectors) as well as against the estimates made by Oman's Telecommunications Regulatory Authority (TRA) in October 2011. The paper found these estimates broadly consistent with the Bureau's estimates, and, where some differences existed, explained the reasons for such differences. Our initial conclusion was that a range of 3.8% to 7.3% for the real cost of capital with a mid-point average of 5.5% would be appropriate for PC5.

Responses

5.9 Respondents to the second consultation paper generally did not comment on the Bureau's cost of capital calculations and deferred this matter to ADWEA. AADC however highlighted that higher allowance for debt financing might be inconsistent with the approach that ADWEA is planning towards financing. According to AADC, this might have an impact on the WACC calculation and hence the discount rate used to calculate the NPVs in price control calculations.

Assessment

5.10 We welcome AADC's comments and note that the analysis in the second consultation paper presented evidence for an increasing trend for the cost of debt financing and indicated that a higher allowance (in terms of interest rate) for debt financing is justified for our cost of capital calculations. This would also help the companies in the emerging

trend in the sector financing, as we understood at the time, towards bank or commercial debt and less reliance on interest-free loans from the Government. It is also important to note that our cost of capital calculations are based on reasonable level of gearing for utilities rather than on the companies' actual gearing or actual cost of funding including interest-free loans.

Recent overseas and regional regulatory determinations

5.11 Since the publication of our second consultation paper on PC5, a number of overseas regulators have published their decisions or proposals on the cost of capital. The following table summarises the relevant parameters and estimates from the recent regulatory decisions or proposals in the UK and Australia. These decisions indicate a range of 3% to 5% for the real cost of capital.

Table 5.2: Recent regulatory proposals on cost of capital parameters (real terms) - Overseas

	QCA Dec 2012	Ofgem RIIO-GD1 Dec 2012	Ofgem RIIO-T1 Dec 2012	ESCOSA Feb 2013	IPART (Low) Feb 2013	IPART (High) Feb 2013
Risk-free rate (real)	0.05%*			0.92%*	0.19%*	0.19%*
Debt premium	3.31%			3.53%	2.50%	3.30%
Equity Risk Premium	6.00%			6.00%	5.50%	6.50%
Equity Beta	0.55			0.80	0.60	0.80
Gearing	60.00%	65.00%	60.00%	60.00%	60.00%	60.00%
Real cost of capital calculations						
Cost of debt (real)	3.36%	2.92%	2.92%	4.45%	2.69%	3.49%
Cost of equity (real)	3.35%	6.70%	7.00%	5.72%	3.49%	5.39%
Cost of capital (real)	**3.35%**	**4.24%**	**4.55%**	**4.96%**	**3.01%**	**4.25%**

Source: Various overseas regulatory proposals or decisions as listed below:
(1) Queensland Competition Authority: "Seqwater Irrigation Price Review 2013-17 Volume 1 - Draft Report", December 2012;
(2) Ofgem: "RIIO-GD1: Final Proposals - Overview", 17 December 2012;
(3) Ofgem: "RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas - Final Decision Overview Document", 17 December 2012;
(4) Essential Services Commission of South Australia (ESCOSA): "SA Water's Water and Sewerage Revenues 2013/14-2015/16 – Draft Determination: Statement of Reasons", February 2013;
(5) IPART New South Wales: "Gosford City Council and Wyong Shire Council - Prices for water, sewerage and stormwater drainage services from 1 July 2013 to 30 June 2017: Water – Draft Report", February 2013.

Notes: * indicates a parameter calculated by the Bureau using the information available in the relevant regulator's publication – for example, the real risk-free rate calculated from nominal risk-free rate and inflation estimate using the relationship: Real rate = [(1+Nominal rate) / (1+ Inflation)] -1.

5.12 **Table 5.3** summarises the relevant parameters and estimates from the recent regulatory decisions or proposals in the region. These decisions include the recent UAE Telecommunication Regulatory Authority (TRA) and relate to the telecommunication sector, which would be expected to have relatively high risks and, with no or low gearing assumptions, a relatively high cost of capital. This is shown in the resulting cost capital range of 6% to over 8%.

5.13 **Table 5.4** summarises the recent overseas and regional regulatory decisions in terms of cost of capital calculations based on low, high and mid-point average of the parameters listed in the preceding two tables. This indicates a range of 3% to 8% with a mid-point average of 5.5%. This range is wider than the Bureau's estimated range of 3.76%-7.35% but with the same mid-point average of 5.5% as shown in **Table 5.1** above.

Table 5.3: Recent regulatory proposals on cost of capital parameters (real terms) - Regional

	Bahrain TRA Nov 2012				UAE TRA July 2012	
	International (Low)	International (High)	Domestic (Low)	Domestic (High)	Fixed Network	Mobile Network
Risk-free rate (real)	3.14%	3.92%	2.35%	2.84%	2.18%	2.18%
Debt premium					1.12%	1.12%
Equity Risk Premium	5.50%	6.50%	5.50%	6.50%	5.75%	5.75%
Equity Beta	0.50	0.60	0.75	0.85	0.89	0.95
Gearing	0.00%	0.00%	0.00%	0.00%	31.34%	31.34%
Real cost of capital calculations						
Cost of debt (real)	3.14%	3.92%	2.35%	2.84%	3.30%	3.30%
Cost of equity (real)	5.89%	7.82%	6.48%	8.37%	7.30%	7.64%
Cost of capital (real)	**5.89%**	**7.82%**	**6.48%**	**8.37%**	**6.05%**	**6.28%**

Source: Various overseas regulatory proposals or decisions as listed below:
(1) Telecommunication Regulatory Authority - Bahrain: "Cost of Capital - Draft Determination", 5 November 2012;
(2) Telecommunications Regulatory Authority - UAE: "Annexure to Determination No.(2) of 2012: Etisalat's Regulated Weighted Average Cost of Capital", 1 July 2012.

Notes: * indicates a parameter calculated by the Bureau using the information available in the relevant regulator's publication – for example, the real risk-free rate calculated from nominal risk-free rate and inflation estimate using the relationship: Real rate = [(1+Nominal rate) / (1+ Inflation)] -1.

Table 5.4: Overseas and Regional cost of capital - Summary

	Low	High	Mid-Point Average
Risk-free rate (real)	0.05%	3.92%	1.80%
Debt premium	1.12%	3.53%	2.48%
Equity Risk Premium	5.50%	6.50%	5.95%
Equity Beta	0.50	0.95	0.73
Gearing	0.00%	65.00%	35.64%
Real cost of capital calculations			
Cost of debt (real)	1.17%	7.45%	4.28%
Cost of equity (real)	2.80%	10.10%	6.14%
Cost of capital (real)	**2.80%**	**8.38%**	**5.47%**

Draft proposals

5.14 Bearing all of the above in mind, we have adopted a real cost of capital of 5.50% in these draft proposals for PC5. This is the mid-point average of the range 3.8%-7.3% calculated in the second consultation paper and is supported by the recent estimates from other regulators' proposals or decisions.

Regulatory asset values and regulatory depreciation

Second consultation paper

5.15 Earlier consultation papers expressed the Bureau's intention to use an approach consistent with that adopted during the previous price control reviews to calculate the RAVs for the next price control period. This would involve making calculations for each year since the start of the PC3 period in 2006 so that the previous provisional estimates of capex and depreciation allowances are aligned with the efficient capex for the PC3 period, and, to the extent practicable, PC4 period. For the PC5 period, it would be necessary to make projections of capex, RAVs and regulatory depreciation.

5.16 The second consultation paper suggested continuation of the approach used for PC4 to calculate regulatory depreciation and RAVs using the straight-line method of depreciation and asset life assumptions as set out below:

Table 5.5: Asset life assumptions

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

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

5.17 When updating the RAVs, it will be necessary to make an adjustment for financing costs of the differences between the actual efficient and provisional estimates of capex for each year of the PC3 and PC4 periods, until the start of PC5 in 2014. In order to allow timely recovery and to reduce complexity, the second consultation paper suggested that these financing costs should be remunerated as an adjustment to revenue over the PC5 period rather than as an addition to the RAVs (for recovery over 30 years or more).

Responses

5.18 AADC supported the approach and steps being taken by the Bureau to make the capital efficiency review more timely, in order for the RAVs to be reflective of the capital expenditure and to minimise the need for adjustments to revenue for the foregone financing costs. It also agreed with the suggestion to remunerate the foregone financing costs via an adjustment to revenue over the PC5 period.

5.19 ADDC considered the remuneration of foregone financing costs through an adjustment to PC5 revenue an agreed position in PC4 price control review. With regards to the approach to calculate regulatory depreciation and RAVs, it suggested adopting a different treatment for supply businesses given their smaller asset base and different risk profile than distribution businesses, and using the approach adopted at the PC3 review. ADDC also proposed the same treatment of mega development assets as used for other assets within the RAV even though the former assets may be gifted in order to compensate ADDC for depreciation to allow replacement of these assets.

5.20 ADSSC suggested that a new approach to calculation of regulatory depreciation and RAVs should be agreed as part of Deloitte's work. While the company sought clarification on how the efficiency scores assessed by the consultants for PC3 and PC4 capex would be applied to calculate any monetary adjustment to price controls, it supported the suggestion to allow timely recovery of foregone financing costs associated with PC3 and PC4 capex over the PC5 period.

Assessment

5.21 We welcome the companies' broad support for our suggestions in the second consultation paper. In relation to ADDC's comments, we note that the approach to calculate regulatory depreciation and RAVs proposed for PC5 and used for PC4 is the same as used at PC3 review and that we will take similar approach for mega development assets if paid for by the companies. Any efficient capital expenditure incurred by a company to replace assets including mega development assets is financed separately through price controls via a new regulatory depreciation allowance rather than via regulatory depreciation on the existing assets.

5.22 With regards to ADSSC's comments, as noted in the paper, Deloitte's work on RAGs should help increase transparency and consistency between the SBAs and price control calculations, but it will not determine the approaches to calculating the regulatory depreciation and RAV.

Draft proposals

5.23 In view of the above, the Bureau remains content with the approach used for PC4 to calculate regulatory depreciation and RAVs and the recovery of foregone financing costs associated with PC3 and PC4 capex over the PC5 period. The following paragraphs describe our calculation of regulatory depreciation and updated RAVs adopted in these draft proposals for PC5.

Calculating regulatory depreciation

5.24 At this price control review, we have updated the Microsoft Excel based model developed at the previous review (referred to as the "***PC5 Depreciation Model***") solely to calculate, for each business separately, the depreciation on all allowed investments to date. This is done by separately calculating and adding depreciation on (a) the initial RAV, (b) each annual efficient capex determined to date i.e. during PC1, PC2, PC3 and PC4 periods (excluding 2012 and 2013); (c) each annual provisional capex during the PC4 period for which efficiency review has not been completed (i.e. 2012 and 2013); and (d) the foregone financing costs in relation to PC1 efficient capex previously added to the RAV.

5.25 The model uses the average asset life assumptions and the capex efficiency assumptions adopted at this (or the previous reviews) for the initial RAV and subsequent capex. As any initial RAV or annual capex becomes fully depreciated, its depreciation for future years is set to zero. The output of this model is the total annual depreciation on the initial RAV and the capex (provisional or efficient, as the case may be) to date expressed in 2014 prices. There are separate worksheets in the model for each business.

5.26 **Table 5.6** below shows the total depreciation for each business calculated by using the PC5 Depreciation Model for each year of the PC5 period in 2014 prices, in respect of initial RAVs, efficient capex for PC1, PC2, PC3 and PC4 (excluding 2012 and 2013), and provisional capex for PC4 (2012 and 2013 only).

5.27 It is noted that depreciation for TRANSCO's water business is lower in 2017 and 2018 than in earlier years, as the initial (1999) RAV becomes fully depreciated in 2017 (in line with the initial RAV asset life shown in **Table 5.5**).

Table 5.6: Depreciation on initial RAV and on capex to date (excluding PC5 capex)

AED million, 2014 prices		2014	2015	2016	2017	2018
AADC	Electricity	491	491	491	491	383
	Water	120	120	120	120	120
ADDC	Electricity	874	874	874	874	874
	Water	219	219	219	219	219
TRANSCO	Electricity	1,648	1,648	1,648	1,648	1,648
	Water	958	958	958	767	753
ADSSC	Total	772	772	772	772	772
Total		**5,082**	**5,082**	**5,082**	**4,891**	**4,770**

5.28 The above table excludes the depreciation in respect of the provisional PC5 capex, which is calculated in the main price control financial model discussed in Section 6 and is shown in **Table 5.7** below:

Table 5.7: Depreciation on PC5 provisional capex

AED million, 2014 prices		2014	2015	2016	2017	2018
AADC	Electricity	14	41	68	95	122
	Water	3	8	13	19	24
ADDC	Electricity	45	135	224	314	404
	Water	10	31	52	72	93
TRANSCO	Electricity	35	104	173	243	312
	Water	16	48	79	111	143
ADSSC	Total	19	52	81	109	122
Total		**140**	**418**	**690**	**962**	**1,219**

5.29 **Table 5.8** below presents the total annual depreciation for each business on all assets, namely the initial RAV, efficient capex for PC1-PC4 periods, and provisional capex for PC4 remaining years and PC5 period. Each amount in this table is the sum of corresponding amounts shown in **Tables 5.6** and **5.7** above.

Table 5.8: Total depreciation for PC5 calculations – draft proposals

AED million, 2014 prices		2014	2015	2016	2017	2018
AADC	Electricity	504	531	558	585	505
	Water	123	128	133	139	144
ADDC	Electricity	919	1,008	1,098	1,188	1,277
	Water	229	250	270	291	312
TRANSCO	Electricity	1,683	1,752	1,821	1,891	1,960
	Water	974	1,006	1,038	878	896
ADSSC	Total	791	825	854	881	895
Total		**5,223**	**5,500**	**5,773**	**5,852**	**5,988**

Updating RAVs

5.30 The opening 2014 RAVs projected at the last price control reviews need to be updated for the following items (as well as adjustment to 2014 prices):

(a) additional efficient PC3 capex over and above the provisional PC3 capex allowances in PC3 controls;

(b) additional efficient PC4 capex over and above the provisional PC4 capex allowances in PC4 controls in respect of the years for which efficiency review has been completed (ie, excluding 2012 and 2013); and

(c) provisional PC5 capex allowances being made at this review.

5.31 To set a price control for a number of years, the opening and closing RAVs for each year need to be calculated. The closing RAV for a year is also the opening RAV for the next year. The approach to calculating these RAVs works as follows:

(a) The opening RAV for 2014 (i.e. the first year of the PC5 control period) is calculated from the 2013 closing RAV calculated at the last review by adding the difference between efficient and provisional PC3 capex net of accumulated depreciation from the time such capex was spent up to the end of 2013.

(b) The same approach as described above can be applied to updating the RAVs for PC4 capex for 2010 and 2011 at this review as per the efficiency assessment described in Section 4.

(c) 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.

Updating RAVs for PC3 and PC4 additional efficient capex

5.32 As agreed at the previous price control reviews, the additional efficient PC3 and PC4 capex over and above the provisional PC3 and PC4 capex allowances (i.e., the amounts in **Tables 4.8** and **4.12**, respectively) needs to be rolled into the RAVs. However, as discussed earlier, the foregone financing costs (both depreciation and return on capital) relating to the period between when the PC3 and PC4 capex was undertaken and when it will be financed is proposed to be remunerated over the PC5 period (rather than added to the RAVs). **Annex A** to this paper shows how this has been done for each business of AADC, ADDC and TRANSCO separately and ADSSC in **Annexes A.1 through A.7**. The format of tables and calculations in each of these Annexes is standardised. This **Annex A** also describes the calculations on a line-by-line basis, with results summarised below:

Table 5.9: Updated RAVs and foregone financing costs for PC3 and PC4 capex

AED million		NPV of PC3 and PC4 capex foregone financing costs	Opening 2014 RAVs from last review	Opening 2014 RAVs updated from last review	Opening 2014 value of PC3 and PC4 additional efficient capex	Opening 2014 RAVs updated for efficient PC3 and PC4 capex
		(to be added to PC5 revenue)			(to be added to RAV)	
		(2014 prices)	(2010 prices)	(2014 prices)	(2014 prices)	(2014 prices)
AADC	Electricity	735	7,430	7,754	1,079	8,833
	Water	-162	2,594	2,707	-96	2,611
ADDC	Electricity	1,478	13,182	13,757	3,267	17,024
	Water	-163	5,149	5,373	-287	5,086
TRANSCO	Electricity	1,833	34,861	36,381	439	36,820
	Water	416	17,714	18,486	178	18,664
ADSSC	Total	-571	17,068	17,812	-2,149	15,663
Total		**3,567**	**97,997**	**102,270**	**2,431**	**104,701**

5.33 This table indicates that the total NPV of adjustments for foregone financing costs relating to PC3 and PC4 capex for all businesses amounts to about AED 3.6 billion (in 2014 prices) up to 2014. In the price control calculations described in Section 6, this NPV amount has been added to the companies' revenue requirements over PC5 period.

5.34 The total opening 2014 RAV for all the businesses has increased from about AED 98 billion in 2010 prices from the last price control review to about AED 105 billion in 2014 prices. This increase in RAV by about AED 7 billion reflects mainly the change in price basis from 2010 prices to 2014 prices (i.e. due to CPI inflation) and the addition of a positive figure (AED 2.4 billion) for the depreciated value of aggregate PC3 and PC4 additional efficient capex discussed in Section 4.

Updating RAVs for PC5 provisional capex

5.35 **Annexes A.1 through A.7** to this paper also show the updating of RAVs for the provisional PC5 capex for each business. **Table 5.10** summarises the results of this updating of RAVs (all figures are in 2014 prices).

5.36 The total RAV for all the businesses increases from about AED 105 billion (in 2014 before adjustments for provisional PC5 capex) to about AED 119 billion by end of 2018 (after adjustments for provisional PC5 capex). The RAVs shown in **Table 5.10** are used as inputs to the PC5 price control calculations in Section 6.

5.37 However, given the proposed 4-year control period for ADSSC, the 2019 opening RAV for ADSSC does not include 2018 provisional capex and is shown in the above table for illustration purposes only. The opening 2019 RAVs (in case of ADSSC, opening 2018 RAV) will also be used as the starting point at the next price control review for any RAV updates for efficient or provisional capex.

Table 5.10: Opening RAVs updated for provisional PC5 capex

AED million, 2014 prices		2014	2015	2016	2017	2018	2019
AADC	Electricity	8,833	9,138	9,417	9,668	9,893	10,198
	Water	2,611	2,648	2,680	2,707	2,728	2,744
ADDC	Electricity	17,024	18,796	20,478	22,070	23,572	24,985
	Water	5,086	5,477	5,848	6,197	6,526	6,835
TRANSCO	Electricity	36,820	37,217	37,545	37,803	37,992	38,112
	Water	18,664	18,639	18,583	18,496	18,568	18,622
ADSSC	Total	15,663	16,722	17,417	17,954	18,422	17,528
Total		**104,701**	**108,638**	**111,968**	**114,895**	**117,703**	**119,025**

Approach to calculating core price control revenue

Second consultation paper

5.38 Earlier consultation papers explained the NPV approach used by the Bureau in previous price control reviews to sculpt the revenue requirements over the price control period. The company's own or core revenue requirement (i.e. revenue requirement excluding the pass-through costs) for each year of the control period is calculated using a building

block approach by adding annual allowances for operating cost, regulatory depreciation and returns.

5.39 In the second consultation paper, we suggested that the approach to calculating and sculpting price control revenue used for PC4 remains appropriate at this review.

Responses

5.40 AADC suggested that its comment on the cost of capital calculation might have an impact on the discount rate used to calculate the NPVs in price control calculations.

5.41 ADDC suggested that the approach to price control calculation needs to be consistent with the timing of the agreed additional licensed activities (such as sewage services billing, and distribution and supply of non-potable water).

5.42 ADSSC suggested revisiting the Bureau's assumptions for operating cost adjustment for demand growth and the efficiency target to verify their validity for PC5.

Assessment and draft proposals

5.43 AADC's comment has been discussed above in relation to the cost of capital. ADSSC's comment relates to opex projections and is appropriately dealt with in Section 3. With regards to ADDC's comments, we note that the additional activities as and when agreed may be unregulated and therefore revenue generating.

5.44 In view of no further comments and support extended by the licensees to the second consultation paper, we have retained the approach to price control calculation used for PC4 at this review and reproduced it below to provide the context for the results of PC5 price control calculations in Section 6.

Framework for price control calculations

5.45 Setting the price controls means determining the values of the fixed term 'a' and the coefficients of revenue drivers 'b' and 'c' in the MAR formula, and the value of the X-factor. In these draft proposals, the Bureau has used the following framework for its price control calculations consistent with the one used at the previous price control review.

5.46 The revenue requirement for each year of the control period (sufficient to finance a reasonably efficient business) is calculated using the "building block approach":

Required revenue = Opex + Depreciation + Return on capital
+ PC3 and PC4 additional efficient capex financing costs foregone

where:

(a) Operating expenditure (opex) refers to operating costs excluding depreciation.

(b) Depreciation is calculated using a straight-line method and an assumed average asset life separately in respect of the initial RAV (at the time of first control setting) and each year's capex.

(c) Return on capital in any year is calculated by multiplying the mid-year average of opening and closing RAVs in that year by the cost of capital. For each year, the closing RAV is determined by adding the efficient capital expenditure (capex) incurred in that year to, and subtracting the depreciation from, the opening RAV.

(d) NPV of the foregone financing costs in respect of the additional efficient PC3 and PC4 capex, are applied to the NPV of the required revenue over the PC5 period.

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

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

NPV of projected annual MARs = NPV of required revenues

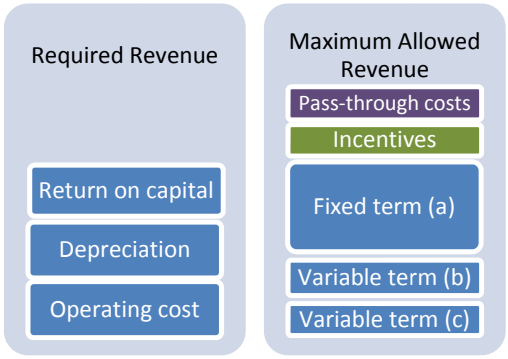
5.49 All calculations are carried out in real terms (i.e. excluding the effect of inflation). For the purpose of these calculations, pass-through costs and Q and K terms are excluded.

6. Price control calculations

Introduction

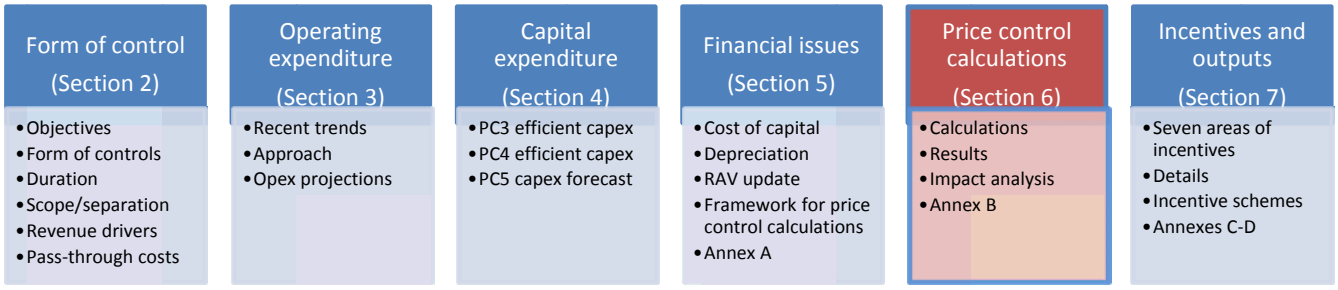
6.1 The calculations of price control revenue involve using allowances for operating costs, regulatory depreciation and returns, together with present value calculations, to derive the companies' own or core price control revenues (i.e. revenue requirement excluding pass-through costs). We then use these core price control revenues to determine base values for the new price controls, which will be included in new price control conditions in the licences for the four network companies. Once the new price control arrangements are put in place, this level of base revenue will be subject to cost pass-through terms (see Section 2) and incentive arrangements (see Section 7), allowing the determination of total price control revenue.

Figure 6.1: Building blocks of revenue requirement



6.2 Section 5 describes the overall framework for the price control calculations used in these draft proposals. Earlier sections discuss and set out the various inputs required for these calculations. This Section 6 describes the price control calculations in detail and sets out the results and their implications.

Figure 6.2: Price control calculations – Section 6



6.3 We have developed a Microsoft Excel based financial model to carry out the PC5 price control calculations (referred to as the "***PC5 Financial Model***") leading to determination of the notified values "a", "b" and "c" for each company or business. The same model also includes the calculations discussed in earlier sections relating to efficient PC3 and PC4 capex and related foregone financing costs and updating of RAVs for such capex as well as provisional PC5 capex.

6.4 As discussed in Section 5, another separate Excel based model (the ***PC5 Depreciation Model***) has also been developed to calculate annual depreciation on the initial RAV (i.e. RAV at the time of first price control setting) and on subsequent efficient or provisional capex for each year up to 2013. The PC5 Financial Model takes the total depreciation on RAV and capex to date (in 2014 prices) directly from this PC5 Depreciation Model.

6.5 The PC5 Financial Model is substantially the same as the models used at the previous price control reviews. At this review, all calculations are carried out in real, 2014 prices. The discount rate used in the present value or NPV calculation is the real cost of capital of 5.50%. The NPV of costs is calculated on a mid-year basis.

Price control calculations

6.6 **Annex B** to this paper present detailed price control calculations for each business (extracted from the relevant spreadsheets of the PC5 Financial Model) separately in seven sub-annexes, namely **Annexes B.1 through B.7**. These calculations are presented in a standard format for all businesses. They are explained in **Annex B** with reference to "Line" numbers used in these Annexes and in the PC5 Financial Model.

Notified values

6.7 Based on these price control calculations, the Bureau's draft proposals for the notified values are summarised in **Table 6.1** below. The notified values given in this table (to the accuracy to decimal places expressed therein) will be those used to calculate MARs when the price controls are implemented.

Table 6.1: Notified values for PC5 – draft proposals

2014 prices		X		a		b		c
AADC	Electricity	0.00	1,222.18	AEDm	1,383.84	AED / customer account	0.7035	fils/ kWh metered
	Water	0.00	346.55	AEDm	779.44	AED / customer account	0.3055	AED / TIG metered
ADDC	Electricity	0.00	2,530.82	AEDm	989.16	AED / customer account	0.3353	fils / kWh metered
	Water	0.00	704.16	AEDm	395.82	AED / customer account	0.2552	AED / TIG metered
TRANSCO	Electricity	0.00	3,651.39	AEDm	29.41	AED / kW metered	0.5091	fils / kWh metered
	Water	0.00	1,959.13	AEDm	254.01	AED / TIGD metered	0.7473	AED / TIG metered
ADSSC		0.00	1,702.87	AEDm	360.31	AED / customer account	0.6681	AED / m^3 metered

Notes: These notified values for 2014 are based on an assumed UAE CPI of 118.00 (base year 2007 = 100) for 2013. They will be subject to an adjustment for actual UAE CPI for 2013.

6.8 These notified values are for 2014 expressed in 2014 prices based on the assumed UAE CPI of 118.00 (base year 2007 = 100), that is inflation rate of 1.04% for 2013. The adjustment for actual inflation for 2013 will be done upon its availability during 2014 i.e., during the PC5 period itself (see Section 2) via the Price Control Return (PCR) process. For subsequent years, these notified values will be adjusted by CPI-X indexation in the usual way.

Projected MARs

6.9 **Table 6.2** presents the projected MAR in respect of "own" costs (i.e., excluding pass-through costs, if applicable) for each business for 2014-2018:

Table 6.2: Projected MAR over PC5 period – draft proposals

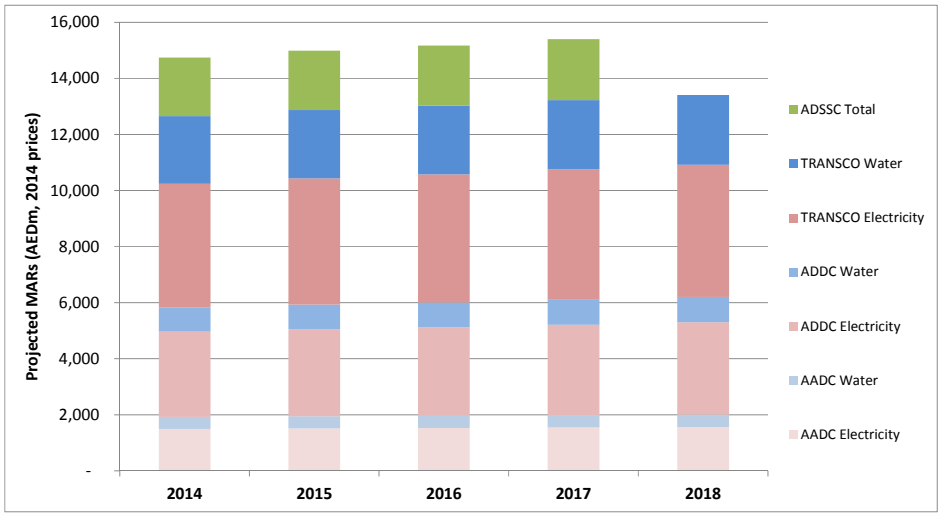
AED million, 2014 prices		2014	2015	2016	2017	2018
AADC	Electricity	1,495	1,513	1,528	1,547	1,565
	Water	428	431	434	436	439
ADDC	Electricity	3,047	3,112	3,162	3,228	3,302
	Water	861	872	881	891	901
TRANSCO	Electricity	4,414	4,502	4,573	4,658	4,714
	Water	2,408	2,440	2,450	2,469	2,487
ADSSC	Total	2,090	2,116	2,143	2,172	-
Total		**14,744**	**14,986**	**15,170**	**15,401**	**13,409**

6.10 In total, the four network companies' MAR (excluding pass-through costs) is expected to be over AED 14.7 billion in 2014 reaching around AED 15.4 billion by 2017. For the three water and electricity network companies, the aggregate MAR is projected to average over AED 13 billion over the PC5 period.

6.11 For the four companies combined, the projected 2014 MAR is higher by AED 4.9 billion (or 50%) in nominal prices, and by AED 4.6 billion (or 46%) in real prices, as compared to the actual 2011 MAR of AED 9.8 billion in 2011 prices (AED 10.1 billion in 2014 prices). This MAR comparison excludes performance bonuses and penalties, correction factor, pass-through costs and other financial adjustments or derogations.

6.12 **Figure 6.3** presents the projected MAR profile for each company over the PC5 period, indicating that TRANSCO accounts for a large share of the companies' total MAR:

Figure 6.3: Projected MARs over PC5 period



Analysis of draft proposals

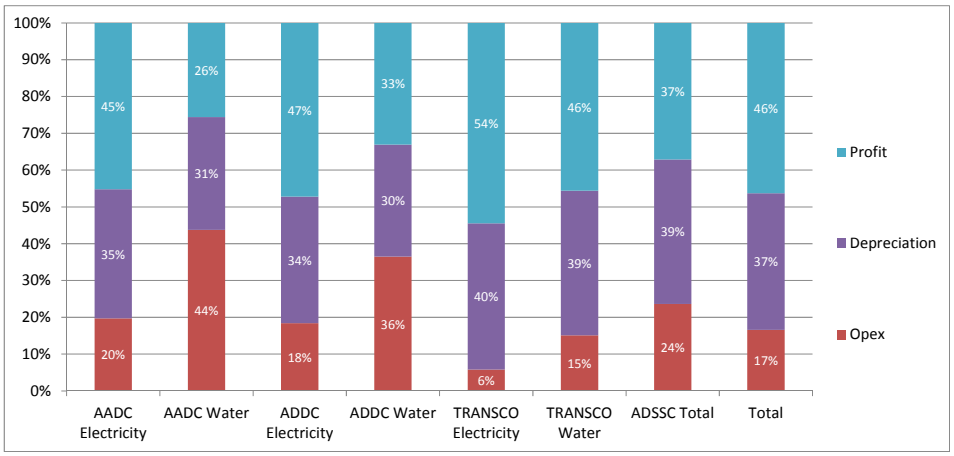
Constituents of projected MARs

6.13 **Figure 6.4** below presents the percentage breakdown of total revenue (excluding pass-through costs) into projected opex, depreciation and profits in NPV terms for each

company. For this purpose, the PC3 and PC4 capex related foregone financing costs have been treated as part of the profits.

6.14 This figure shows that the capital cost related components (i.e. depreciation and the return on capital) account for a significant proportion of the revenue for each company (in the range of 56% to 94%), compared to opex which accounts for only 6% to 44% of revenue.

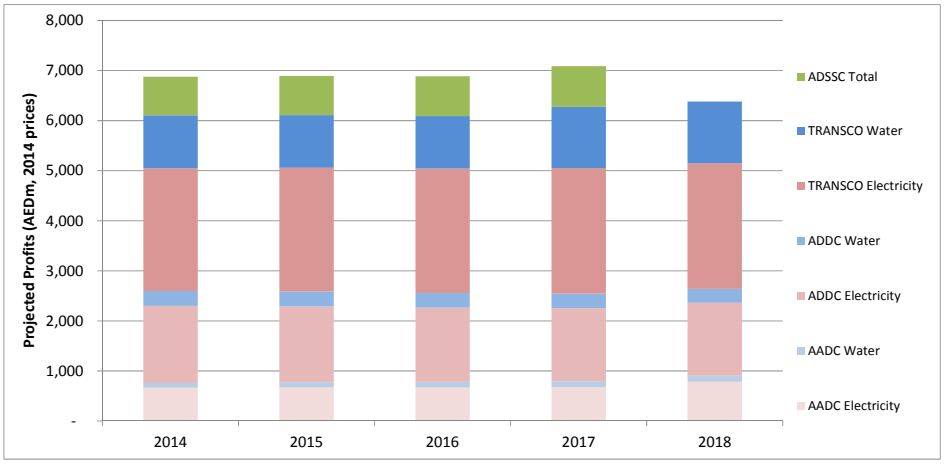
Figure 6.4: Constituents of MARs (excluding pass-through costs)



Projected Profits

6.15 **Figure 6.5** shows the profile of projected profit (or more precisely, the return on capital) for the companies.

Figure 6.5: Projected profits over the PC5 period



6.16 Overall, the total profits for the four companies are expected to be of the order of AED 7 billion (2014 prices) a year on average over the PC5 period, as compared to the actual profit of AED 4.3 billion in 2011. The average projected profit (including financial adjustments mentioned earlier) for each company is as follows (2014 prices):

(a) AADC: about AED 800 million per annum

(b) ADDC: about AED 1,800 million per annum

(c) ADSSC: about AED 800 million per annum

(d) TRANSCO: about AED 3,600 million per annum

6.17 This level of profit reflects the capital investment and cost of capital and is necessary to promote adequate network investment.

Effect of Draft Proposals on sector costs

6.18 **Figures 6.6**, **6.7** and **6.8** show the expected effect of these draft proposals on the total price-controlled costs and unit costs for electricity, water and wastewater, respectively (in 2014 prices). The MAR per unit has been calculated using units transmitted for electricity and water businesses (in fils/kWh and AED/TIG, respectively) and units treated for sewerage business (in AED/m3).

Figure 6.6: Projected trend of price-controlled MAR – electricity

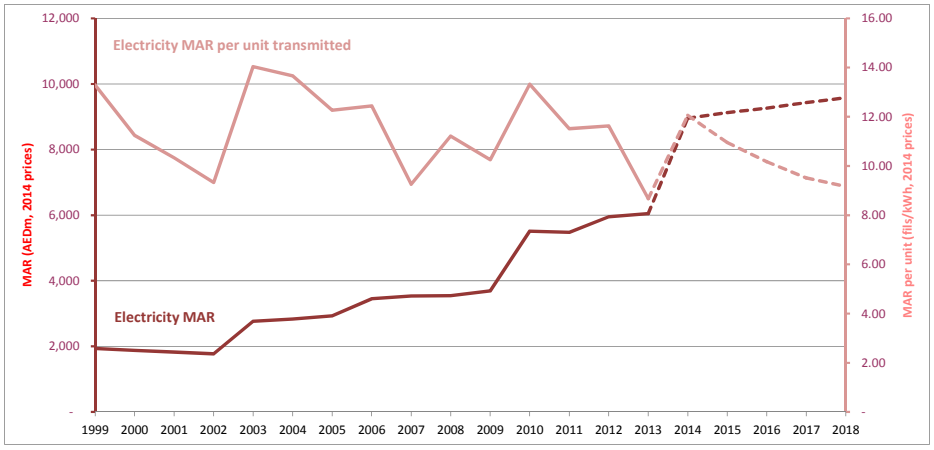


Figure 6.7: Projected trend of price-controlled MAR -water

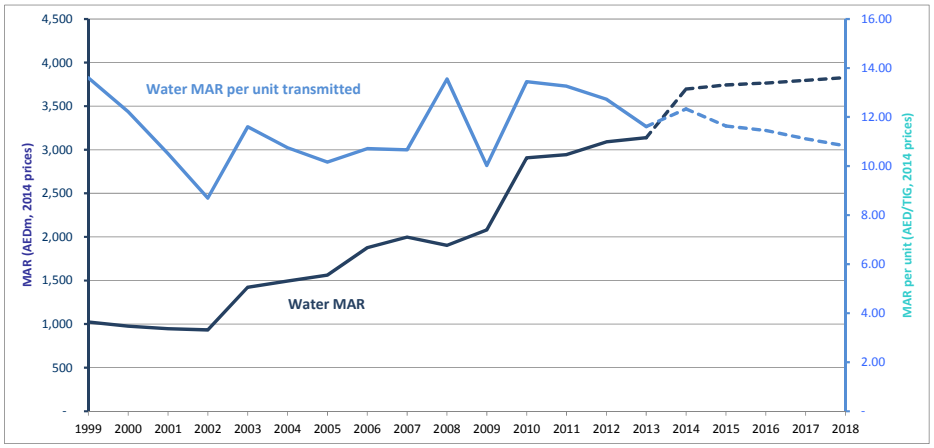
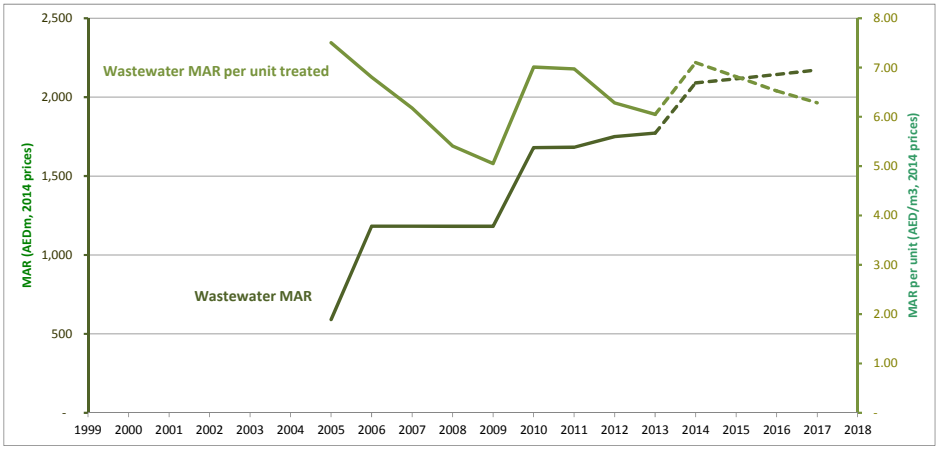


Figure 6.8: Projected trend of price-controlled MAR – wastewater



6.19 These charts indicate that the annual MARs are expected to continue the increasing trend in real terms. However, the projected increase in demand means that the draft proposals are expected to result in a declining trend for the unit cost for electricity, water and wastewater businesses. This shows that:

(a) ***For electricity:*** while the total MAR for AADC, ADDC and TRANSCO (excluding pass-through costs) is expected to almost quadruple from 1999 to 2018 (in real terms), the MAR per unit transmitted is expected to be around 9 fils/kWh in 2018, lower by 30% than that in 1999 (in 2014 prices);

(b) ***For water:*** while the total MAR for AADC, ADDC and TRANSCO (excluding pass-through costs) is expected to increase by about 270% from 1999 to 2018 (in real terms), the MAR per unit transmitted is expected to be 11 AED/TIG in 2018, lower by 20% than in 1999 (in 2014 prices); and

(c) ***For wastewater:*** while the total MAR for ADSSC (excluding any pass-through costs) is expected to increase by 84% from 2005 (annualised) to 2018 (in real terms), the MAR per unit transmitted is expected to be 6.28 AED/m^3 in 2018, lower by 16% than in 2005 (in 2014 prices).

Comparison against 2011 actual MARs

6.20 **Table 6.3** compares the projected MARs for PC5 against the 2011 actual MARs. This comparison excludes performance bonuses and penalties, correction factor, pass-through costs and other financial adjustments or derogations.

6.21 As previously highlighted, the total 2014 projected MAR is higher than the 2011 actual MAR by AED 4.6 billion or 46% in real terms. The projected MARs continue to increase over the PC5 period. By 2017, the total projected MAR exceeds the total 2011 actual MAR by AED 5.3 billion (in 2014 prices) or 52%.

6.22 However, MAR per unit transmitted or treated is projected to decline in 2014 prices from 2011 as follows:

(a) Electricity: decline by about 2.35 fils/kWh or 20% by 2018;

(b) Water: decline by about 2.44 AED/TIG or 18% by 2018; and

(c) Wastewater: decline by approximately 0.7 AED/m^3 or 10% by 2017.

Table 6.3: Comparison of PC5 projected MARs against 2011 actual MARs

AED million		2011 actual MAR		2014 MAR	2017 MAR	2018 MAR
		2011 prices	2014 prices	2014 prices	2014 prices	2014 prices
AADC	Electricity	1,123	1,152	1,495	1,547	1,565
	Water	428	440	428	436	439
ADDC	Electricity	1,562	1,603	3,047	3,228	3,302
	Water	801	822	861	891	901
TRANSCO	Electricity	2,653	2,723	4,414	4,658	4,714
	Water	1,640	1,682	2,408	2,469	2,487
ADSSC	Total	1,639	1,682	2,090	2,172	-
Total		**9,847**	**10,104**	**14,744**	**15,401**	**13,409**

Notes: Based on assumed UAE CPI for 2013

7. Incentives and outputs

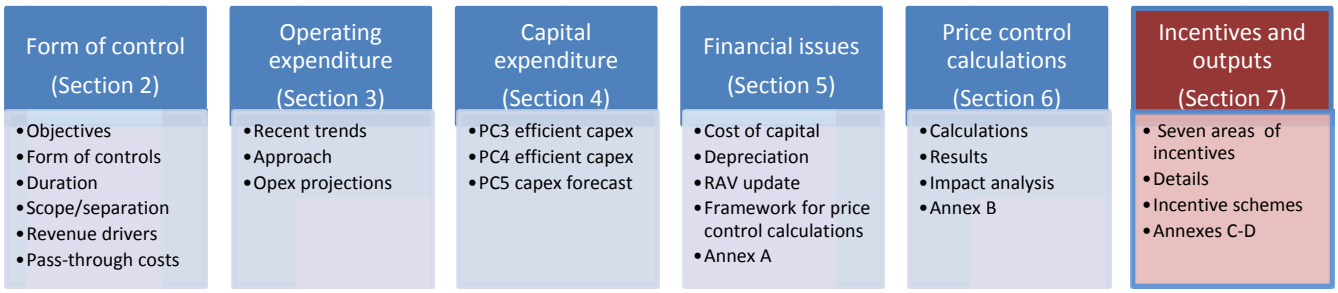
Introduction

7.1 Price controls provide incentives for the network companies to reduce costs. However, there is a risk that some incentives for cost efficiency, if not implemented properly by the companies, may affect the quality of service. Therefore, the Bureau's first and second consultation papers on PC5 highlighted that incentives and outputs form key elements of regulatory frameworks internationally, and provide an opportunity to improve sector focus and to incentivise better service, efficiency, transparency and performance. The second consultation paper made a number of proposals for incentives in six areas.

7.2 This section summarises the licensees' responses and our revised proposals on incentives. The section begins with a discussion of our overall approach to formulating incentives at this price control review and then sets out in turn our proposals on each of the six groups of incentives originally identified. This is followed by details of the proposed calibration of incentive schemes and the proposed magnitude of respective incentives. **Annexes C** and **D** containing details on the proposed incentives will be issued to the four network companies separately.

7.3 For PC5, we propose continuing with the concept of performance indicators subject to automatic annual MAR adjustment in line with the present Category A indicators. However, we propose that the current concept of Category B indicators with a potential financial adjustment at the next price control review no longer applies to PC5. This should address the companies' concerns about the regulatory risks arising from performance incentives that are not fully developed and precisely defined. In contrast, we propose to develop in consultation with the licensees new performance indicators during the PC5 period with the automatic annual incentive arrangement.

Figure 7.1: Incentives and outputs – Section 7



Overall approach

Second consultation paper

7.4 In the second consultation paper, we put forward a wide range of proposed incentives in the following six areas:

(a) Asset management and performance

(b) Availability, security and quality of supply

(c) Transmission system operator

(d) Provision of high quality information

(e) Emiratisation

(f) End-use efficiency.

7.5 We highlighted the challenges of specifying and calibrating such incentives and outputs and the possibility that some incentives would take longer to be developed. Three annexes to the second consultation paper provided details of the proposed incentives under paragraphs 7.4(b), 7.4(c) and 7.4(d) above. The Bureau then met with the licensees to discuss these incentives and indicated that the draft proposals will reflect these discussions as well as written responses.

7.6 **Table 7.1** summarises all the specific incentives that we originally proposed in the second consultation paper to be incorporated into the network companies' licences at this price control review. The table shows by business existing incentives (shown by a tick symbol "✓") and new incentives (shown by a tick box symbol "☑").

Licensees' overall responses

7.7 Licensees generally responded positively to the second consultation paper:

(a) AADC supported a number of proposed incentives and provided specific and detailed comments on individual incentives. These comments are discussed in the relevant annexes to this document and in the relevant sections below.

(b) ADDC commented broadly on the various incentives in the six key areas, which are discussed below in the relevant sections. In relation to availability, security and quality of supply, it stated that it would be responding separately.

(c) ADSSC welcomed output focused targets based on completion of specific initiatives and improved services under paragraph 7.4(b). However, it expressed concerns about the expansion of information submission incentives and the step change in the scale and scope of assessments required from the Technical Assessor (TA). It suggested that the number of incentives must be manageable, taking account of a company's capacity, that targets should be within ADSSC's full control to achieve without requiring third parties in the decision making process, and that incentives should be paid directly through opex and capex budgets agreed with the government.

(d) TRANSCO appreciated the Bureau's efforts in seeking to propose incentives for sector-wide improvements. However, it expressed concerns about the large number of the proposed incentives.

Table 7.1: Incentives developed for PC5 – second consultation paper

	AADC (E)	AADC (W)	ADDC (E)	ADDC (W)	TRANSCO (E)	TRANSCO (W)	ADSSC
Asset management							
PAS 55 accreditation	☑	☑	☑	☑	☑	☑	☑
Availability, security and service quality							
Water quality		✓		✓		✓	
Transmission system availability					✓	✓	
Removal of ground storage tanks		☑		☑			
Interface metering	✓	✓	✓	✓	☑	☑	
Distribution losses	✓	✓	✓	✓			
SAIDI	✓		✓				
SAIFI	✓		✓				
Connectivity model	☑		☑				
Biosolid reuse							☑
Restricted water supply		☑		☑			
Distribution system availability		☑		☑			
Worst served customers	☑		☑				
Demand at single circuit risk					☑		
Protection system performance					☑		
Transmission system reliability					☑		
Collections system overflows							☑
Recycled water supplies							☑
Mobile plant flow metering							☑
Transmission system operator (TSO)							
Transmission losses					☑		
Scheduled despatch deviations					☑	☑	
Security of supply						☑	
Energy lost					✓		
Demand forecasting					☑		
Spinning reserve deviation					☑		
Transmission constraints reporting					☑	☑	
Unit commitment input accuracy					☑	☑	
Information							
SBAs (including PCRs as per new RAGs)	✓	✓	✓	✓	✓	✓	✓
AIS	✓	✓	✓	✓	✓	✓	✓
Summer reliability assessment (SRA)	☑		☑		☑		
Planning statement	☑	☑	☑	☑	☑	☑	☑
Water leakage/losses report		☑		☑			
Security standards report							☑
End-use efficiency							
Consumption per customer	☑	☑	☑	☑			
Number of existing incentives	6	5	6	5	4	4	2
Number of new incentives	6	7	6	7	13	7	7
Total number of incentives	**12**	**12**	**12**	**12**	**17**	**11**	**9**

Notes: "✓" represents an existing incentive; "☑" represents a new incentive.

Way forward

7.8 We accept the licensees' suggestions that the number of proposed incentives should be reduced. This will focus the companies' attention on specific areas within their reasonable control; it will also assist in containing the TA's role to a manageable level. Our specific proposals mainly focus on the four areas of incentives:

(a) availability, security and quality of supply;

(b) provision of high quality information;

(c) Emiratisation; and

(d) end-use efficiency.

7.9 The above considerations are reflected in our proposals put forward in this Section 7. **Annexes C** and **D** referred to in this section provide a summary and assessment of the companies' more specific comments as well as our proposals on each incentive in the areas of availability, security and quality of supply and high quality information. Incentives for Emiratisation are provided through opex allowances and hence discussed in detail in Section 3. End-use efficiency incentives are discussed in this Section 7.

7.10 However, we see it as equally important that we continue the constructive dialogue within the sector to further prioritise and develop all the incentives under consideration. We propose that we adopt a flexible arrangement which will allow us to introduce, following consultation, further incentives during the PC5 period.

7.11 There are a number of considerations that are relevant to the magnitude of the financial incentives. Even developed jurisdictions have found it challenging to set an appropriate level of incentive that strikes a balance between a company's costs of improvement, its value to customers, and the impact of the potential penalty on a company's financial position. We have proposed limiting each individual incentive to a maximum of 0.5% of a company's "own" revenue (i.e., revenue excluding pass-through costs). We believe that this allows recovery of the cost of an initiative and ensures a reasonable balance between the company's financial position and the value of the initiative. In contrast to the existing cap of 1% of a company's revenue, the proposed lower limit is reasonable in view of the higher projected MARs for the PC5 period and the companies' desire to reduce regulatory risks. The proposed lower limit will also allow additional incentives to be developed and introduced during the PC5 period in other key areas.

Summary of proposed incentives

7.12 The following table summarises all incentives now included in these draft proposals to be incorporated into the network companies' licences at this price control review for implementation in PC5. These relate to three areas: availability, security and quality of supply; high quality information and end-use efficiency. Incentives for Emiratisation are provided through opex allowances and hence discussed in detail in Section 3.

7.13 Compared to the second consultation paper, the number of new incentives for all businesses has now been reduced. The number of incentives for a business now varies in the range of 3-7 compared to the range of 9-17 incentives proposed in the second consultation paper.

Table 7.2: Incentives developed for PC5 – draft proposals

	AADC (E)	AADC (W)	ADDC (E)	ADDC (W)	TRANSCO (E)	TRANSCO (W)	ADSSC
Availability, security and service quality (Annex C)							
Water quality		✓		✓		✓	
Transmission system availability					✓	✓	
Removal of timed water supply		☑		☑			
Interface metering	✓	✓	✓	✓	☑	☑	
Distribution loss reduction	✓	✓	✓	✓			
Security of supply						☑	
SAIDI	✓		✓				
SAIFI	✓		✓				
Energy lost					✓		
Biosolids reuse							☑
Information (Annex D)							
SBAs (including PCRs as per new RAGs)	✓	✓	✓	✓	✓	✓	✓
AIS	✓	✓	✓	✓	✓	✓	✓
End-use efficiency							
DSM strategy and action plan	☑	☑	☑	☑			
Number of existing incentives for PC5	6	5	6	5	4	4	2
Number of new incentives for PC5	1	2	1	2	1	2	1
Total number of incentives for PC5	**7**	**7**	**7**	**7**	**5**	**6**	**3**
Total number of existing incentives for PC4	9	8	9	8	5	5	3

Notes: "✓" represents an existing incentive; "☑" represents a new incentive.

7.14 We have also proposed a number of incentives to be developed during the PC5 period. If agreed with the licensees, these will be implemented later in the PC5 period or at the next price control review. These incentives are listed in the following table and relate to five key areas. We intend to develop only 1 incentive in each of these five key areas.

Table 7.3: Incentive to be developed for PC5 – draft proposals

	AADC (E)	AADC (W)	ADDC (E)	ADDC (W)	TRANSCO (E)	TRANSCO (W)	ADSSC
Asset management incentives	☑	☑	☑	☑	☑	☑	☑
Customer service incentives	☑	☑	☑	☑	☑	☑	☑
TSO incentives					☑	☑	
DSM initiatives and schemes	☑	☑	☑	☑			
Carbon accounting	☑	☑	☑	☑	☑	☑	☑
Total number of incentives	4	4	4	4	4	4	3

7.15 Each of the original six key areas of incentives and the newly added area of carbon accounting is discussed in turn in the following sections. The precise definitions, targets and amounts of specific incentives as set out in this Section 7 and **Annexes C** and **D**, once agreed, will be incorporated into the companies' licences. Further, following consultation with the companies, we will issue and amend Regulatory Instruction and Guidance (RIG) document from time to time to provide detailed guidance on the measurement and reporting of individual performance indicators so as to address emerging issues and incorporate lessons learnt.

Asset management

Second consultation paper

7.16 The incentives proposed for asset management in the second consultation paper are listed in **Table 7.1**.

7.17 As the asset base of the licensees expands, issues relating to asset management and performance will become more important. Although incentives relating to network performance and security also provide incentives for asset management, more direct incentives for asset management can be introduced to complement and strengthen these broader incentives.

7.18 The second consultation paper suggested providing price control incentives for all licensees to achieve accreditation for PAS 55 and/or ISO 55000 during the PC5 period. This was based on the licensees' views and the positive impact of implementation of PAS 55 by TRANSCO on its asset management performance. We also sought views on whether the improvement of data quality and post-PAS 55 surveillance reviews should be subject to price control incentives.

Responses

7.19 Both ADSSC and TRANSCO in their responses supported the above suggestions. However, ADSSC noted that the magnitude of financial incentives and associated timescales and priorities need to be agreed. TRANSCO sought fair recognition of the fact that it has already achieved PAS 55 accreditation.

7.20 The four licensees also supported the Bureau's broad strategy and particularly the incentives for PAS 55 accreditation and annual renewal at a meeting in February 2013.

7.21 However, ADDC in its subsequent response to the second consultation paper did not agree that any additional incentives are required for asset management and believed that the capital efficiency review should be the catalyst for asset management improvements. It proposed introducing an incentive around capital efficiency to identify, assess and reward focused areas of improvements.

Assessment and draft proposals

7.22 The companies have strong incentives via the capital efficiency assessment to improve their asset management processes. The adoption of a forward-looking process scoring method for capital expenditure review provides clear guidelines about where a licensee needs to improve on its processes and particularly asset management. Further, the existing incentives for network performance and security already provide incentives for asset management.

7.23 Lastly, it is envisaged that PAS 55 may be replaced by a new standard ISO 55000 in 2014 and that the Abu Dhabi Quality and Conformity Council (QCC) may adopt specific standards for utilities. We have therefore not included any specific incentive in the draft proposals for asset management pending further work as set out in **Table 7.3**.

Availability, security, and quality of supply

Second consultation paper

7.24 The incentives proposed in the second consultation paper are listed in **Table 7.1**.

7.25 The Bureau's first and second consultation papers summarised the broad regulatory framework relating to availability, security and quality of supply and the important incentive arrangements that are part of the current price controls.

7.26 The second consultation paper suggested a wide range of incentives, retaining the existing incentives with some refinements and introducing certain new incentives. We shared the view expressed by the licensees that new incentives should be based on standard international metrics of network performance and should also be appropriate for the business environment of the Emirate of Abu Dhabi.

Responses

7.27 In its response to the second consultation paper, AADC supported many of the incentives with suggestions for further refinements in the definitions, targets and titles. ADDC generally preferred that incentives should be consistent with industry practice, measurable and controllable by the company and focused on agreed areas that require improvements. ADSSC suggested that any incentives need to be challenging but should be achievable and result in measurable benefits to the business.

7.28 TRANSCO, considering its performance comparable to international benchmarks, suggested that the availability, security and service quality incentives are less important and should not be further strengthened. In particular, it did not accept that it should be incentivised on interface metering in view of its exposure to significant risks on non-MDEC compliance via the revenue drivers and because of issues relating to meter ownership transfer.

7.29 The companies made specific comments on individual incentives in their formal responses as well as in meetings with the Bureau during December-February. These comments indicated that some of incentives are not within the company's full control, or overlap with other incentives, or require significant changes. These comments are discussed in **Annex C**.

Assessment and draft proposals

7.30 The incentives now proposed for PC5 are listed in **Table 7.4** below and described in **Annex C**.

7.31 In view of the licensees' comments, the Bureau's overall desire is to keep the incentives to a manageable number so as not to impose undue regulatory burden on the companies while still achieving efficiency gains.

Table 7.4: Availability, security and service quality incentives for PC5 – draft proposals

	AADC (E)	AADC (W)	ADDC (E)	ADDC (W)	TRANSCO (E)	TRANSCO (W)	ADSSC
Availability, security and service quality (Annex C)							
Water quality		✓		✓		✓	
Transmission system availability					✓	✓	
Removal of timed water supply		☑		☑			
Interface metering	✓	✓	✓	✓	☑	☑	
Distribution losses	✓	✓	✓	✓			
Security of supply						☑	
SAIDI	✓		✓				
SAIFI	✓		✓				
Energy lost					✓		
Biosolids reuse							☑

7.32 On the specific issue raised by TRANSCO regarding MDEC-compliant metering, we have proposed in Section 2 that the significant risk through the revenue drivers (of up to 20% of its revenue) should be removed. The proposed interface metering incentive is significantly lower than this and acknowledges a fair sharing of responsibilities and risks between TRANSCO and its users under the metering arrangements.

7.33 We consider that incentives should also be developed in relation to the customer experience, particularly with respect to electricity and water distribution services. In addition to the SAIDI and SAIFI, we note that customer satisfaction, customer complaint handling, call centre efficiency, billing punctuality/accuracy, accessibility and convenience of payment channels, customer connection time, and demand management, are all indicators of the quality of customer service provided by the licensees. While we note that progress has been made with respect to aligning billing statements with current meter readings, this is an area which has been problematic in the past and where particular attention to continuous improvement needs to be focused. We will engage with the licensees to develop a framework for identifying and quantifying these customer service indicators.

Transmission system operator

Second consultation paper

7.34 The incentives proposed for the transmission system operator (TSO) function of TRANSCO in the second consultation paper are listed in **Table 7.1**.

7.35 The TSO is concerned with maintaining security and balancing the system such that reasonable demands for electricity and water can be met effectively and efficiently, taking account of constraints on production capacity and constraints on the transmission networks.

7.36 Based on this and the expected rapid growth of demand, production capacity and the transmission networks over the coming years, the second consultation paper proposed that the system operator function of TRANSCO should be appropriately incentivised and equipped to undertake its roles and deliver the desired outputs. We accepted that further

discussion is required in order that new incentives can be sensibly developed, and that, in certain instances better information and reporting arrangements will also be needed. The Bureau therefore made a number of proposals to promote debate and the development of appropriate incentives.

Responses

7.37 TRANSCO was of the view that the Bureau had not previously raised questions about system operation activities but recognised the need for further transparency in this area. TRANSCO also expressed concerns about the number of proposed incentives. It also highlighted the inter-relationship between incentives and the role of other licensees. It therefore suggested, as a starting point, providing incentives for performance on a few selected measures, rather than a wide range of performance indicators. It emphasised improving reporting on other aspects pending the consideration of a broader set of incentives. It did not accept any reporting or incentive on the unit commitment model input accuracy where responsibility for maintaining the model and its standing data is vested with another licensee.

7.38 ADDC suggested agreeing on an overarching water management plan, particularly as it may be likely that the non-potable water network will also be licensed to ADDC.

Assessment and draft proposals

7.39 TRANSCO and the Bureau had useful discussions during December-February and agreed in principle on adopting a limited number of specific incentives and reporting requirements for PC5.

7.40 In particular, TRANSCO and the Bureau have discussed how best to monitor and incentivise the achievement of economic despatch. The Bureau acknowledges the proposals brought forward by TRANSCO and will work with TRANSCO to discuss these further.

7.41 Based on the above and pending further work and consultation as set out in Table 7.3, we have not yet proposed any incentives for the system operator for PC5.

7.42 On the specific issue raised by TRANSCO in relation to the unit commitment tool, TRANSCO has statutory duties under the law, licence and transmission code to perform the related function and ensure economic despatch is based on the correct inputs into unit commitment or any other model used for this function. This matter has been subject to reviews by the Bureau and its consultants in the past and a negative revenue adjustment at the previous price control review. Outsourcing the inputs into the model or its maintenance to another licensee or any other third party does not relieve TRANSCO of its statutory obligations regarding economic despatch taking into account the commercial arrangements contained in the power and water purchase agreements (PWPAs).

Provision of high quality information

Second consultation paper

7.43 The incentives proposed for the provision of high quality information in the second consultation paper are listed in **Table 7.1**.

7.44 The Bureau's first and second consultation papers explained the importance of the Bureau receiving high quality information from the licensees in order to both promote effective regulation and to strengthen and improve sector wide planning and decision making. A summary was included of the present requirements on the licensees to provide information, the incentives for selected information submissions, and the role of the external TA and financial auditors in ensuring the provision of high quality information by the licensee.

7.45 The Bureau agreed that the requirements relating to the provision of information should be coordinated and focused on key areas of activity that have real benefits in terms of sector performance or promoting effective regulation. While the timeliness of information is significant, the most important factor in many cases is the quality of information provided by the licensees.

Responses

7.46 In response to the second consultation paper, AADC suggested extending the target date for submission of the water leakage report and did not support the introduction of an incentive for the planning statement.

7.47 ADDC accepted the need for improvement in the company's IT systems and data collection processes to ensure robust and consistent information for planning statements and other submissions and sought the Bureau's support for such improvements including funding through the opex and capex allowances.

7.48 ADSSC expressed concerns about the increased regulatory burden due to the proposed incentives for information provision. The company suggested a review of these incentives to avoid duplication and overlaps and to keep them to a manageable level. While it supported the proposals on SBAs, AIS and the security standards report, it argued against the planning statement proposal, saying that the current process is satisfactory.

7.49 TRANSCO recognised the importance of high quality information. However, it did not support the incentives and assessment of the planning statement and summer reliability assessment (SRA) because the existing arrangements are working satisfactorily and submissions continue to improve. The company suggested an additional information submission focusing on capital justification separately to the planning statement to facilitate the Bureau's plan for an ex-ante annual review of capex to reduce the company's risks relating to ex-post capex review.

Assessment and draft proposals

7.50 The incentives now proposed for provision of high quality information during PC5 are listed in **Table 7.5** and described in **Annex D**.

Table 7.5: Information incentives for PC5 – draft proposals

	AADC (E)	AADC (W)	ADDC (E)	ADDC (W)	TRANSCO (E)	TRANSCO (W)	ADSSC
Information (Annex D)							
SBAs (including PCRs as per new RAGs)	✓	✓	✓	✓	✓	✓	✓
AIS	✓	✓	✓	✓	✓	✓	✓

7.51 The working arrangements and improvements for planning statements continue to work satisfactorily. An assessment of these statements (involving expert judgement and subjectivity) for incentive purposes may also unnecessarily expose the licensees to a regulatory risk. Therefore, it is proposed that the submission of planning statements should not be subject to incentives.

7.52 Similarly, we have also accepted the companies' comments on other information submissions. We will continue to work with the network companies to improve the quality and timeliness of the SRA, water leakage report, security standards report and other submissions without introducing any financial incentives for PC5. It is important to note that the companies are required by their licences to submit all such information in a timely manner.

7.53 Based on the above considerations, we have proposed continuing with the existing two incentives for SBAs (including PCRs as per the new RAGs) and AIS submissions.

7.54 Given the current quality, timeliness and importance of some information, the Bureau will seek to strengthen the duty of care of the TA to the Bureau by providing specific guidance in the RIGs. This will include the requirement that the TA's draft report, and particularly recommendations, be reviewed and approved by the Bureau prior to issue of the TA's final report. .

7.55 Further, the Bureau seeks to further streamline its information requirements to minimise regulatory burden on the licensees and to avoid duplication and overlaps with other information submission. We have recently undertaken such work on AIS, SBAs and PCRs whereby AIS requirements have been reduced significantly and SBAs and PCRs will be merged in future as the Regulatory Accounting Guidelines are implemented.

Emiratisation

Second consultation paper

7.56 The Bureau and all the licensees agree on the importance of Emiratisation. As part of the process for introducing the PC4 price controls, the Bureau made special allowances for Emiratisation costs for the period 2011 to 2013, as summarised in **Table 7.6** below.

7.57 The Bureau in the second consultation paper welcomed the comments of the licensees regarding the importance of Emiratisation, especially with regard to investment in people and new training and apprenticeship schemes. The paper raised important questions on whether more sector wide coordination is required in developing strategies and plans relating to Emiratisation, how these should be assessed, and, whether new incentives should be introduced to encourage the development of high quality plans and timely implementation.

Table 7.6: UAE National training and employment allowances for PC4

AED million, nominal prices	2011	2012	2013
AADC	30	40	60
ADDC	60	80	110
TRANSCO	20	30	40
ADSSC	6	9	12
Total	**116**	**159**	**222**

7.58 The paper raised questions as to whether a more targeted approach to cost recovery is appropriate for PC5 and whether the costs of Emiratisation should be allowed by identifying in advance the expected additional costs of the UAE National staff in each grade or job type and using this on an annual basis to provide for the costs of additional National staff.

Responses

7.59 In response to the second consultation paper, AADC provided detailed comments on how to address the Emiratisation in the most efficient way. These included identifying existing skills and knowledge gaps; sector-wide sharing of experience and ideas to develop strategies based on "right person for the right job"; coordination with relevant government organisations and local educational institutions; assessing and further improving the strategies; and, providing price control incentive based on Emiratisation rate achieved and the difference between staff costs for the UAE National and expat employees.

7.60 ADDC referred to its Emiratisation policy and considered it difficult to develop any incentive scheme for Emiratisation without knowing the Bureau's feedback on the company's plan or the basis of the current Emiratisation allowances.

7.61 ADSSC suggested a sector-wide training and development initiative for the UAE Nationals, both new recruits and management/executive positions, and a pass-through treatment of relevant costs, mainly staff costs, without any efficiency assessment. However, it argued against establishing any new entity or arrangements to assess Emiratisation strategies or progress as such entities already exist.

7.62 TRANSCO also supported sector-wide coordination to develop the UAE National skills and competency and suggested that the licensees should be responsible for developing Emiratisation strategy and initiatives with efficiency assessment involving the Bureau. It supported the continuation of a special allowance in price controls for Emiratisation, the need for transparency of related costs enabling any efficiency assessments, and senior level support from the Bureau for key sector initiatives. However, it argued against any additional incentives for Emiratisation.

Assessment and draft proposals

7.63 The Bureau welcomes the comments made by the licensees about the importance of Emiratisation and expresses its willingness to support any sector initiative or strategy. Based on these comments, we have proposed a mechanism in Section 3 to set special allowances for costs relating to Emiratisation based on the Emiratisation rates proposed by the companies in the 2012 AIS submissions or separately to our opex consultants.

Efficient use of water and electricity

Second consultation paper

7.64 The incentives proposed for end-use efficiency in the second consultation paper are listed in **Table 7.1**.

7.65 Our second consultation paper highlighted the need to improve the incentives on AADC and ADDC to encourage and promote the efficient use of electricity and water by their customers, by providing funding for demand side management (DSM) initiatives. These initiatives could include providing high quality information to customers about their usage and potential savings by careful interaction with customers to encourage the adoption of suitable DSM techniques. The supply business and customer service activities of the licensees would be best placed to undertake such activities. The Bureau has already created the PowerWise and WaterWise Offices to help coordinate the delivery of these initiatives.

7.66 The paper also discussed ways to fund and incentivise the distribution companies to develop new DSM strategies and pilot schemes, including a one-off allowance in price controls for the costs of developing these new energy efficiency strategies. We considered whether the existing incentive to reduce average residential electricity and water consumption should only focus on the UAE Nationals living in villas (rather than all residential premises), given their high residential usage..

Responses

7.67 ADDC considered that a customer tariff strategy would have significantly greater impact on efficient use of electricity and water than the existing incentive for reduction in average residential consumption. It suggested that necessary resources should be provided within ADDC to support the Bureau's initiatives of WaterWise and PowerWise Offices.

7.68 ADSSC and TRANSCO did not make any specific comments on this area of incentives. However, TRANSCO generally supported any rational incentive to promote efficient use of a scarce resource. ADSSC suggested end use strategies could include efficient use of recycled water and biosolids as well as advice to customers to avoid issues such as blockages in private sewers. ADSSC was keen to continue working with the Bureau on customer awareness in addition to the introduction of informative bills.

Assessment and draft proposals

7.69 The incentive now proposed for end-use efficiency is listed in **Table 7.2**.

7.70 The Bureau welcomes the comments and suggestions made by the licensees and suggests the following multi-pronged approach to deal with this important matter:

(a) AADC and ADDC should actively engage with the Bureau (via the PowerWise and WaterWise offices) to propose and agree on a plan to develop skills and capabilities within the companies. The companies should then make a case to our opex consultant, Deloitte, to justify appropriate additional opex funding at this price control review.

(b) We also propose that the distribution companies engage actively with the Bureau (via the PowerWise and WaterWise Offices) to develop their overall strategy and action plan with specific targets and milestones on the end-use efficiency over a medium to long term. Each company should commence such engagement as soon as practicable and submit a draft document setting out its strategy and action plan to the Bureau for review by 30 June 2014. The final document, taking account of the Bureau's requirements, should be submitted by 31 December 2014. If the companies develop such a document to the Bureau's satisfaction by 31 December 2014, they will be rewarded with an incentive amount equivalent of 0.50% of their core MAR for 2014; if not, they will be subject to an equivalent penalty. The companies and the Bureau will then discuss additional incentives and funding requirements to implement the approved strategy and action plan.

(c) As part of the process for developing new strategies during the PC5 period, it would be for the licensees to bring forward pilot schemes and DSM initiatives to PowerWise and WaterWise for discussion, approval and funding. The overall mechanism will work as follows:

(i) A process will be established to allow the Bureau to approve pilot projects and other DSM initiatives in advance, including the provision of an estimate of the costs of implementing the projects and key milestones and deliverables and an assessment of benefits. This process would also allow the Bureau to set an incentive payment for each project or initiative.

(ii) Operating costs will be recovered via a price control derogation, but subject to an audit showing that actual costs had been incurred with a reasonable degree of efficiency. The related capital expenditure will be subject to the standard capital efficiency review by the Bureau.

(iii) Incentive payments will be made by price control derogation, following evidence that the pilot project has been a success.

(iv) The total costs including operating and capital expenditure, incentive payments and any other costs funded by the price controls, must be less than the benefits of the pilot project or initiative - for example, in terms of avoided costs of water and electricity which would have been incurred otherwise.

7.71 In view of the limited success of the existing incentives in reducing average residential consumption and the broader work planned for DSM strategy and action plans, we are not proposing continuing with the current or similar incentive for PC5.

Carbon accounting

7.72 In addition to the six key areas of incentives discussed in the second consultation paper, the Bureau has also identified carbon accounting as another important area which must be addressed in the coming years. Consequently, in conjunction with the Environmental Agency - Abu Dhabi (EAD), we intend to undertake work on assessing the environmental impact of the regulated activities carried out by the sector companies. In this regard, we plan to carry out a separate consultation and appoint an independent consultant to assist

us. The long-term objective is to have a complete measurement of carbon emissions for the sector by 2020.

Performance targets for incentives

7.73 The following table lists the proposed targets for all incentives which will be incorporated into the network companies' licences at this price control review.

Table 7.7: Performance targets for PC5 incentives – draft proposals

	Target / deadband	First year of performance against incentive
Availability, security and service quality (Annex C)		
Water quality	4.6-4.8 (deadband)	2014
Transmission system availability	E: 97.5%-98.5% (deadband) W: 96.5%-97.5% (deadband)	2014
Removal of timed water supply	Previous year performance	2015
Interface metering	100%	2014
Distribution losses	Previous year performance	2015
Security of supply	Previous year performance	2015
SAIDI	Previous year performance	2014
SAIFI	Previous year performance	2014
Energy lost	0 (bonus); 0 - 0.00025158% of total annual energy (deadband); above (penalty)	2014
Biosolids reuse	Bonus: 75%, 50%, 25%, 0% Penalty: Previous year performance – 10 percentage points	2015
Information (Annex D)		
SBAs (including PCRs as per new RAGs)	30 April	2014
AIS	31 October	2014
End-use efficiency		
DSM strategy and action plan	31 December	2014

7.74 A number of points are worth noting here:

(a) In the case of information incentives, these targets are in the form of a specific date by which an information submission is required. A timely submission will result in a lump sum financial reward. A delay beyond the target date will trigger a financial penalty or a reduction in the financial bonus, which will be calculated on a monthly basis.

(b) For all other incentives, the performance target for a year is generally based on the company's actual performance in the preceding year as verified by the TA as follows:

(i) For the existing incentives, the company's actual performance in 2013 would be verified under the PC4 arrangement and can be used to set the target for 2014.

(ii) However, in cases where we have proposed a new incentive or significantly modified an existing incentive where the actual performance in the preceding year was not measured according to the new or modified definitions, then 2015 will be the first year when the performance will be

subject to incentives and the performance in 2014 will only be verified by TA to set the target for 2015.

(c) There are however incentives where performance targets are proposed in absolute terms rather than based on the previous year performance. Such incentives can be introduced from the first year of PC5 period (ie, 2014).

(d) For a number of incentives, we have proposed a deadband for performance where a company will not be subject to any bonus or penalty.

Incentive mechanisms and caps on financial impact

Second consultation paper

7.75 The second consultation paper explained the following four possible types of incentives and outputs that are discussed above:

(a) Formula based incentives for performance against metrics specified as part of this price control review involving precise definitions, targets, TA assessment and the Bureau's Regulatory Instruction and Guidance (RIG) will be incorporated into the licences at this review.

(b) Incentives for the satisfactory completion of agreed initiatives or outputs which are yet to be developed (eg, for asset management, Emiratisation and end-use efficiency) will not be incorporated into licences at this review; however these could be developed during the PC5 period.

(c) Further incentives that are identified at a high level at this review (but where the detailed specification or underlying data will require further development, and may be introduced during the PC5 period) are similar to those in sub-paragraph (a) above but will be incorporated into the licences via licence derogation during PC5 period.

(d) Funding arrangements for end-use efficiency or DSM initiatives and projects as discussed earlier.

7.76 The paper also suggested a cap on the financial impact of each incentive of no more than between ½% and 1% of MAR to ensure a balanced set of incentives and to help protect the licensee from any undue business risk. Where there are arrangements to fund extra costs – for instance relating to Emiratisation or DSM measures, any such cost recovery would be in addition to the incentive payments. We did not see the need for an overall cap on the total level of incentive payments.

Responses

7.77 In its response to the second consultation paper, ADDC argued that incentives should be either zero for not achieving the target or positive for achieving the improvement and should not be negative. It was concerned about the timeliness and inconsistent application of existing incentives by the Bureau in the recent decisions.

7.78 ADSSC considered the proposed cap on each incentive payment to be appropriate, provided the implementation cost of relevant performance improvement is dealt with separately under the funding arrangements.

7.79 TRANSCO agreed to the formula based incentives, provided incentives have a strategic value and are based on clear objectives, measured data and robust calibration. It offered support to develop such incentives and emphasised the value and independence of the TA's role in assessing performance against these incentives. It did not support the TA's role in assessing planning statements and the SRA. While TRANSCO in principle supported the proposed arrangements and flexibility for incentives to be agreed during PC5, it emphasised the need for further clarity and commitment on funding for the pilot projects when they are agreed in the future.

Assessment and draft proposals

7.80 We welcome the licensees' general support for the proposed incentive mechanisms and look forward to working on the areas that are highlighted for future consideration. The companies' comments on the magnitude of incentives and recovery of costs are addressed in paragraph 7.11 above. We do not agree that there should not be a penalty for a poor performance; however we have reduced the magnitude of individual incentives and made incentives more symmetric between bonus and penalty. Formula based incentive mechanisms referred to in paragraphs 7.75(a) and 7.75(c) above are explained below in relation to the incentives listed in **Tables 7.2** and **7.3** earlier. The funding arrangement referred to in paragraph 7.75(d) has already been described for DSM initiatives and pilot schemes. We have not proposed any incentive that would be subject to the mechanism discussed in paragraph 7.75(b).

Operation of incentive mechanism

7.81 The incentive schemes for PC5 will operate in the same manner as have the current price controls. The financial reward or penalty will be provided via the "Q" term in the MAR formula to adjust the company's allowed revenue upward or downward. The term Q_t, the performance adjustment for year t, will be calculated in AED terms as follows:

$$Q_t = Q1_t + Q2_t + Q3_t + \ldots + QN_t$$

where $Q1_t$ …. QN_t are the revenue adjustments in respect of the incentive indicators 1, 2, …., N, respectively.

7.82 As at present, MAR will be adjusted via the Q term in the year "t" for performance on incentive indicators based on:

(a) for information incentives:

(i) company's information submission (except for AIS) in year "t-1"; or

(ii) company's AIS in year "t-2";

(b) for all other incentives: company's performance in year "t-2";

7.83 This will allow time to verify a company's performance or submission and to discuss and address any issues before the financial bonus or penalty is calculated and applied.

7.84 This mechanism and timeline are illustrated in the table below. The information submission in year "t-1" (or AIS submission in year "t-2") may relate to the previous year "t-2" (ie, SBAs), or to the current year "t-2" (ie, AIS) but in all cases results in the application of the Q term to MAR in year "t". With regard to the performance indicators (eg, system availability, SAIDI and SAIFI), a company's performance on the indicator in year "t-2" will be verified by the TA in year "t-1" to determine the value of Q term that will apply to MAR in year "t".

Table 7.8: Operation of incentive schemes

Year	t-2	t-1	t
SBA submission incentives		Submission	Q applies to MAR
AIS submission incentive	Submission		Q applies to MAR
Performance indicator incentives	Performance	Verification	Q applies to MAR

7.85 The following sub-sections describe the Bureau's proposed general formulae to determine the Q terms for various incentives for the PC5 period. These formulae are structured so that the Q term will automatically take a positive sign if a reward is required (i.e. actual performance is better than the target) and a negative sign if a penalty is required (i.e. actual performance is below the target). Methods and formulae to assess a company's performance and calculate the relevant performance indicator are described in **Annexes C** and **D**. These methods and formulae can be further clarified and refined by the Bureau in Regulatory Instructions and Guidelines (RIGs) to be issued and modified from time to time following consultation with the respective licensees.

Q terms for information incentives

7.86 For information incentives relating to the SBAs and AIS, the value of the Q term will be determined as follows based on the timeliness of submission and, where applicable, the completion of the TA's recommendations for improvement from the previous year:

(a) For any delay in submission beyond the target date in any year, the company will receive a penalty calculated as follows:

Q = - Incentive rate x Number of months of delay from target date x (1 + TA ratio)

(b) The maximum penalty for any submission will be capped by a delay of 6 months. That is, the maximum penalty will be:

Q = - 6 x Incentive rate x (1 + TA ratio)

(c) For any submission on or before the target date in any year, the company will receive a lump sum reward calculated as follows:

Q = 6 x Incentive rate x (1 - TA ratio)

(d) Here, the TA ratio means the ratio between the number of TA's previous year recommendations not completed and the total number of TA's previous year recommendation. The introduction of this ratio into the formula for Q term will formalise the existing practice.

(e) In contrast to the existing incentive schemes for information submissions, we have proposed making these schemes symmetric by matching the lump sum reward to the maximum level of penalty (ignoring the TA ratio).

7.87 In contrast to the existing incentive for SBA submission, we propose a financial bonus for a timely submission as well as to incentivise implementation of the newly developed RAGs which also merges the PCR into the SBA.

Q terms for all other performance incentives

7.88 For all performance indicators (other than information incentives), the penalty or reward in a year will be of the following form where a performance indicator with a lower value than the target is considered a better performance (eg, SAIFI, SAIDI, transmission or distribution losses):

Q = Incentive Rate x [(Target performance – Actual performance)/ Target Performance] x 100

7.89 However, for performance indicators where a higher value than the targets is considered better performance (eg, system availability), the signs in the above formula for Q will be reversed. That is:

Q = Incentive Rate x [(Actual performance – Target performance)/ Target Performance] x 100

7.90 The multiplicative factor of 100 shows that deviation in actual performance from target will be assessed as a percentage of target performance and that the incentive rate will be expressed in AED per 1% deviation in performance from the target. In certain cases (such as interface metering incentives), actual performance would be assessed against an absolute target (of 100% interface metering) and the factor of 100 will not be required.

7.91 In some cases, the deviation in performance from the target is measured in percentage points rather than percentage. The formula for Q term will then not involve a target performance in the denominator and the incentive rate will be expressed in AED per 1 percentage point of deviation.

Caps on incentives

7.92 The maximum bonus or penalty for each incentive will be capped at 0.50% of the company's "own" or core MAR (i.e. MAR excluding pass-through costs). In contrast to the existing arrangement where caps on information incentives are applied slightly differently, the proposed cap of 0.50% of core MAR will apply to all incentives (individually) including the information incentives. This will reduce the maximum penalties a licensee is subject to and make the potential bonus and penalty more symmetric. Given the individual caps on all indicators, the total bonus or penalty through the overall Q term will not be capped.

Calculation of incentive rates

Overall approach

7.93 The incentive rates for all indicators proposed for introduction at this price control review have been calculated using the following approach which is similar to that used at previous price control reviews:

(a) First, determine the total amount "at risk" (the maximum penalty or reward) for each incentive as 0.50% of average forecast core MAR (excluding the pass-through costs) for the PC5 period.

(b) Second, the incentive rate for each indicator is derived by dividing the amount calculated above by a scheme calibration assumption as follows:

(i) For information submission incentives: 6 months delay

(ii) Water quality incentive: 4% deviation

(iii) Removal of timed water supply incentive: 5 percentage points deviation

(iv) For transmission system availability incentives: 2% improvement on the target performance; and

(v) For all other incentives: 20% improvement on the target performance.

7.94 Note that the above assumptions are purely hypothetical and used only for the purpose of the initial calibration of the scheme and play no further role in the implementation of the incentive schemes.

Calculation

7.95 **Table 7.9** shows:

(a) the average MAR forecast for each business for the PC5 period;

(b) the amount 'at stake' for each incentive based on 0.50% of this average MAR forecast; and

(c) the incentive rate for each indicator (rounded off appropriately) calculated by dividing the amount at stake by the calibration assumption.

Table 7.9: Incentive rates – draft proposals

		AADC (E)	AADC (W)	ADDC (E)	ADDC (W)	TRANSCO (E)	TRANSCO (W)	ADSSC
Average PC5 MAR	AED million	1,530	433	3,170	881	4,572	2,451	2,130
Amount at stake	AED million	7.65	2.17	15.85	4.41	22.86	12.25	10.65
Incentive rate for water quality	**AED / 1%**	1,912,000	542,000	3,963,000	1,102,000	5,715,000	3,064,000	2,663,000
Incentive rate for timed water supply removal	**AED / 1 ppt**	1,530,000	433,000	3,170,000	881,000	4,572,000	2,451,000	2,130,000
Incentive rate for transmission availability	**AED / 1%**	3,824,000	1,084,000	7,926,000	2,203,000	11,431,000	6,127,000	5,326,000
Incentive rate for all other indicators	**AED / 1%**	382,000	108,000	793,000	220,000	1,143,000	613,000	533,000
Incentive rate for information	AED / month	1,275,000	361,000	2,642,000	734,000	3,810,000	2,042,000	1,775,000

7.96 As expected, the incentive rates vary significantly from business to business, reflecting the size (or MAR) of each business. Further, for any business:

(a) the timeliness indicators for the SBAs and AIS have the same incentive rate; and

(b) performance indicators (other than water quality, removal of timed water supply and transmission availability) specific to a business have the same incentive rate.

7.97 The existing/new incentives and the new incentive rates proposed for PC5 in these draft proposals will take effect as follows:

(a) Existing indicators will continue to be subject to the existing incentive rates as long as the performance year (for performance indicators) or submission year (for information timeliness incentives) falls within the PC4 period (i.e. up to 2013). These indicators will however be subject to the new PC5 incentive rates as calculated in **Table 7.9** above when the performance or submission year falls during the PC5 period (i.e. 2014-2018).

(b) The new incentives or indicators will take effect from the first performance or submission year (2014 or 2015 or 2016) as listed in **Table 7.7** above and their incentive rates will apply to adjust MAR in 2015 or later as per the timeline shown in **Table 7.8**.

Annex A: Updating RAVs

Introduction

A.1 This **Annex A** to the draft proposals for PC5 describes and sets out the updating of the opening 2014 RAVs projected at the last price control reviews updated for:

(a) additional efficient PC3 capex over and above the provisional PC3 capex allowances in PC3 controls for all the four network companies (AADC, ADDC, ADSSC and TRANSCO);

(b) additional efficient PC4 capex over and above the provisional PC4 capex allowances in PC4 controls for all the four network companies; and

(c) provisional PC5 capex allowances being made at this review for all the four companies.

A.2 ***Annexes A.1 through A.7*** show how this has been done for each of the electricity And water businesses of AADC, ADDC, TRANSCO, and ADSSC. The format of tables and calculations in each of these Annexes is standardised. The following paragraphs explain these calculations with reference to "Line" numbers used in these Annexes and in the ***PC5 Financial Model*** (a Microsoft Excel based computer model developed by the Bureau to carry out PC5 calculations).

A.3 The results of these calculations are summarised and discussed in Sections 5 and 6 of the document. Various assumptions and inputs used in these calculations (such as, UAE CPI, actual, efficient and provisional capex, efficiency scores, depreciation profile, and cost of capital) are described in Sections 2 through 5 of the document.

A.4 In this Annex A:

(a) **PC3 period** refers to 2006-2009 for AADC, ADDC and TRANSCO and to 2005-2009 for ADSSC. In case of ADSSC, 2005 covers only the second half of 2005.

(b) **PC4 period** refers to 2010-2013 but PC4 capex to be treated at this review includes capex relating to only 2010-2011.

(c) **PC5 period** refers to 2014-2018 for AADC, ADDC and TRANSCO and to 2014-2017 for ADSSC.

Updating RAVs for efficient PC3 and PC4 capex

A.5 Lines 1 through 31 of ***Annexes A.1 through A.7*** set out the updating of opening 2014 RAVs for additional efficient PC3 and PC4 capex for each of the water and electricity businesses of AADC, ADDC, TRANSCO, and ADSSC.

A.6 Line 1 shows the CPI data used for price base conversion.

A.7 Lines 2-8 contain the calculations of additional efficient PC3 and PC4 capex to be allowed in PC5:

(a) Line 2 shows the actual PC3 and PC4 capex in nominal terms as per the audited accounts

(b) Line 3 shows the relevant efficiency scores for PC3 and PC4 capex

(c) Line 4-5 show the efficient PC3 and PC4 capex based on these efficiency scores in nominal prices and 2014 prices, respectively

(d) Line 6 shows the provisional PC3 and PC4 capex allowed in PC3 and PC4 controls in 2006 (or 2005 in the case of ADSSC) and 2010 terms, respectively

(e) Line 7 expresses these provisional PC3 and PC4 capex in 2014 terms, and

(f) Line 8 then calculates the additional efficient PC3 and PC4 capex (in 2014 prices) as the difference between efficient PC3 and PC4 capex (from Line 5) and provisional PC3 and PC4 capex (from Line 7). The results are shown in section 4 of the paper.

A.8 Lines 9-11 show the calculation of depreciation foregone (in 2014 prices) during 2006-2013 on the additional efficient PC3 and PC4 capex, using the additional efficient PC3 and PC4 capex from Line 8 and average asset life assumption from Line 9. The depreciation so calculated in Line 11 is then used in Lines 12-15 to calculate the depreciated closing value of additional efficient PC3 and PC4 capex at the end of Line 15, which is to be added to the opening 2014 RAV.

A.9 Lines 12-18 show the calculation of return on capital foregone (in 2014 prices) during 2006-2013 (2005-2013 in the case of ADSSC) on the efficient PC3 and PC4 capex, using the additional efficient PC3 and PC4 capex from Line 8 and the cost of capital used for PC3 and PC4 controls from Line 17. This return on capital is calculated in Line 18 by applying the relevant cost of capital to the average of opening and closing values of the additional efficient capex for each year. The return on capital foregone so calculated is to be added along with the depreciation foregone in Line 11, in net present value (NPV) terms, to the required revenue over PC5 in the price control calculations in Annex B. This NPV is calculated in Line 27.

A.10 Lines 19-27 contain the calculation of NPV (in 2014 prices) at 1 January 2014 of total foregone financing costs on efficient PC3 and PC4 capex during 2006-2013 (2005-2013 in the case of ADSSC). This is done by adding the depreciation foregone (from Line 11) and the return on capital foregone (from Line 18). The total financing costs foregone so calculated in Line 21 is then used to calculate the NPV of such costs in Line 27 as follows:

(a) Lines 22-24 calculate the present value of the sum of PC3 related costs at 1 January 2010 by using the PC3 cost of capital from Line 17 as the discount rate

(b) Lines 25-27 calculate the present value of the sum of PC4 related costs as well as PC3 related costs at 1 January 2014 by using the PC4 cost of capital from Line 17 as the discount rate,

A.11 The resulting NPV of the total foregone financing cost for each business is presented in section 5 of the paper. This NPV amount needs to be added to the required revenue for the PC5 period (see Section 6 of the paper and price control calculations in **Annex B**).

A.12 Lines 28-31 show how the depreciated closing value of additional efficient PC3 and PC4 capex over and above the provisional PC3 and PC4 allowances (from Line 15) has been rolled forward into the initial 2014 RAV from the PC4 calculations at the last price control review (which already includes provisional PC3 and PC4 allowances). At the start of these calculations, Line 29 shows the adjustment of the opening 2014 RAV from PC4 calculations to 2014 prices, which is required for PC5 price control calculations in Section 6 and **Annex B**. The opening 2014 RAVs so updated are listed in section 5 of the paper.

Updating RAVs for provisional PC5 capex

A.13 ***Annexes A.1 through A.7*** to this paper also show the updating of RAVs for provisional PC5 capex for each of AADC, ADDC, ADSSC and TRANSCO (all figures are in 2014 prices).

A.14 Line 32 shows the average asset life assumption for PC5 capex (see section 5 of the paper).

A.15 The beginning of Line 33 shows the RAV updated for efficient PC3 and PC4 capex from Line 31 (see section 5 of the paper).

A.16 Line 34 lists the provisional PC5 capex as shown in section 5 of the paper.

A.17 Line 35 lists the total depreciation on RAV and all capex to date (excluding provisional PC5 capex) as calculated by the ***PC5 Depreciation Model*** and presented in section 5 of the paper.

A.18 Line 36 calculates the depreciation on provisional PC5 capex as presented in section 5 of the paper.

A.19 Line 37 calculates the total depreciation by adding Lines 35 and 36 (results shown in section 5 of the paper).

A.20 Line 38 calculates the closing RAV for each year by adding the provisional PC5 capex (from Line 34) to, and deducting the total depreciation (from Line 37) from, the opening RAV for that year (from Line 33). The closing RAV in Line 38 for a year becomes the opening RAV for the next year in Line 33.

A.21 The updated opening RAVs for all businesses are listed in section 5 of the paper.

Annex A.1: AADC electricity – Updating RAV

Updating 2014 Opening RAV for PC3 and PC4 Efficient Capex

Line No.

	UAE CPI Assumptions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	**CPI (2000 = 100) used in calculations**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**114.00**	**115.00**	**116.01**	**116.78**	**118.00**
						Assumed in PC4	113.07				

				PC3				PC4		
	Additional Efficient PC3 and PC4 Capex to be allowed at this Review		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
2	Actual PC3 and PC4 capex	AEDm, nominal prices	504.86	405.79	795.42	1,285.42	1,172.14	410.41	-
3	Applied capex efficiency factor	%	96.22%	96.22%	96.22%	96.22%	96.22%	96.22%	96.22%
4	Efficient PC3 and PC4 capex	AEDm, nominal prices	485.77	390.45	765.35	1,236.83	1,127.84	394.89	-
5	Efficient PC3 and PC4 capex	AEDm, 2014 prices	696.14	512.00	903.11	1,299.61	1,167.41	405.20	-
6	Provisional PC3 and PC4 capex	AEDm, PC3 2006 / PC4 2010 p	305.00	305.00	305.00	305.00	900.00	900.00	-
7	Provisional PC3 and PC4 capex	AEDm, 2014 prices	437.08	437.08	437.08	437.08	939.24	939.24	-
8	**Additional efficient PC3 and PC4 capex to be allowed at PC5**	**AEDm, 2014 prices**	**259.06**	**74.91**	**466.03**	**862.53**	**228.17**	**-534.05**	**0.00**

	Depreciation foregone on Additional Efficient PC3 and PC4 Capex			**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
9	Assumed average asset life for new investment	years	30								
10	Additional efficient PC3 and PC4 capex to be allowed at PC4	AEDm, 2014 prices		259.06	74.91	466.03	862.53	228.17	-534.05	0.00	
11	**Depreciation on additional efficient PC3 and PC4 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2014 prices		**4.32**	**9.88**	**18.90**	**41.04**	**59.22**	**54.12**	**45.22**	**45.22**

	Return on Capital foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12	Additional efficient PC3 and PC4 capex - Opening value	AEDm, 2014 prices	0.00	254.74	319.77	766.90	1,588.38	1,757.33	1,169.16	1,123.94
13	Additional efficient PC3 and PC4 capex	AEDm, 2014 prices	259.06	74.91	466.03	862.53	228.17	-534.05	0.00	
14	Depreciation on additional efficient PC3 and PC4 capex	AEDm, 2014 prices	4.32	9.88	18.90	41.04	59.22	54.12	45.22	45.22
15	Additional efficient PC3 and PC4 capex - Closing value	AEDm, 2014 prices	254.74	319.77	766.90	1,588.38	1,757.33	1,169.16	1,123.94	**1,078.72**
16	Average of Opening and Closing values	AEDm, 2014 prices	127.37	287.26	543.33	1,177.64	1,672.85	1,463.25	1,146.55	1,101.33
17	Cost of capital (real)	%	5.50%	5.50%	5.50%	5.50%	4.50%	4.50%	4.50%	4.50%
18	**Return on capital foregone**	AEDm, 2014 prices	**7.01**	**15.80**	**29.88**	**64.77**	**75.28**	**65.85**	**51.59**	**49.56**

	Financing Costs foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
19	Depreciation foregone	AEDm, 2014 prices	4.32	9.88	18.90	41.04	59.22	54.12	45.22	45.22
20	Return on capital foregone	AEDm, 2014 prices	7.01	15.80	29.88	64.77	75.28	65.85	51.59	49.56
21	Total financing costs foregone	AEDm, 2014 prices	11.32	25.68	48.78	105.81	134.50	119.97	96.82	94.78
22	Years from year mid point to 1 Jan 2010 (PC3 capex)	years	3.50	2.50	1.50	0.50				
23	NPV @ 1 Jan 2010 of financing costs foregone (PC3 capex)	AEDm, 2014 prices	13.66	29.36	52.86	108.68				
24	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone (PC3 capex)	AEDm, 2014 prices				204.56				
25	Years from year mid point to 1 Jan 2014 (PC3 and PC4 capex)	AEDm, 2014 prices				4.50	3.50	2.50	1.50	0.50
26	NPV @ 1 Jan 2014 of financing costs foregone (PC3 and PC4 capex)	AEDm, 2014 prices				243.95	156.90	133.92	103.42	96.89
27	**Accumulated NPV (@ 1 Jan 2014) of financing costs foregone**	**AEDm, 2014 prices**								**735.08**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		**2013**
28	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2010 prices	7,429.92
29	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2014 prices	7,753.88
30	Add: Additional efficient PC3 and PC4 capex - Closing value @ 31 Dec 2013	AEDm, 2014 prices	1,078.72
31	**Updated Opening 2014 RAV including Additional Efficient PC3 and PC4 capex**	**AEDm, 2014 prices**	**8,832.60**

Updating PC5 RAVs for PC5 Provisional Capex

	Updated PC5 RAVs including PC5 Provisional Capex			PC5				
	AEDm, 2014 prices			**2014**	**2015**	**2016**	**2017**	**2018**
32	Assumed average asset life for new investment	years	30					
33	**Opening RAV**	**AEDm, 2014 prices**		**8,832.60**	**9,138.21**	**9,416.83**	**9,668.44**	**9,893.06**
34	PC5 Provisional capex	AEDm, 2014 prices		810.00	810.00	810.00	810.00	810.00
35	Total Depreciation on RAV and capex (excluding PC5 provisional capex)	AEDm, 2014 prices		490.89	490.89	490.89	490.89	383.50
36	Depreciation on provisional PC5 capex (half-year depreciation for first year)	AEDm, 2014 prices		13.50	40.50	67.50	94.50	121.50
37	**Total depreciation for PC5**	AEDm, 2014 prices		**504.39**	**531.39**	**558.39**	**585.39**	**505.00**
38	**Closing RAV**	AEDm, 2014 prices		**9,138.21**	**9,416.83**	**9,668.44**	**9,893.06**	**10,198.06**

Annex A.2: AADC water – Updating RAV

Updating 2014 Opening RAV for PC3 and PC4 Efficient Capex

Line No.

	UAE CPI Assumptions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	**CPI (2000 = 100) used in calculations**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**114.00**	**115.00**	**116.01**	**116.78**	**118.00**
							Assumed in PC4	113.07			

			PC3				PC4		
	Additional Efficient PC3 and PC4 Capex to be allowed at this Review		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
2	Actual PC3 and PC4 capex	AEDm, nominal prices	77.66	87.72	(3.36)	246.45	421.56	114.71	-
3	Applied capex efficiency factor	%	96.19%	96.19%	96.19%	96.19%	96.19%	96.19%	96.19%
4	Efficient PC3 and PC4 capex	AEDm, nominal prices	74.70	84.38	(3.23)	237.06	405.50	110.34	-
5	Efficient PC3 and PC4 capex	AEDm, 2014 prices	107.05	110.65	(3.81)	249.10	419.73	113.22	-
6	Provisional PC3 and PC4 capex	AEDm, PC3 2006 / PC4 2010 p	153.00	153.00	153.00	153.00	130.00	130.00	-
7	Provisional PC3 and PC4 capex	AEDm, 2014 prices	219.26	219.26	219.26	219.26	135.67	135.67	-
8	**Additional efficient PC3 and PC4 capex to be allowed at PC5**	**AEDm, 2014 prices**	**-112.21**	**-108.61**	**-223.07**	**29.84**	**284.06**	**-22.45**	**0.00**

	Depreciation foregone on Additional Efficient PC3 and PC4 Capex			**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
9	Assumed average asset life for new investment	years	30								
10	Additional efficient PC3 and PC4 capex to be allowed at PC4	AEDm, 2014 prices		-112.21	-108.61	-223.07	29.84	284.06	-22.45	0.00	
11	**Depreciation on additional efficient PC3 and PC4 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2014 prices		**-1.87**	**-5.55**	**-11.08**	**-14.30**	**-9.07**	**-4.71**	**-5.08**	**-5.08**

	Return on Capital foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12	Additional efficient PC3 and PC4 capex - Opening value	AEDm, 2014 prices	0.00	-110.34	-213.40	-425.39	-381.25	-88.13	-105.87	-100.79
13	Additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-112.21	-108.61	-223.07	29.84	284.06	-22.45	0.00	
14	Depreciation on additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-1.87	-5.55	-11.08	-14.30	-9.07	-4.71	-5.08	-5.08
15	Additional efficient PC3 and PC4 capex - Closing value	AEDm, 2014 prices	-110.34	-213.40	-425.39	-381.25	-88.13	-105.87	-100.79	**-95.70**
16	Average of Opening and Closing values	AEDm, 2014 prices	-55.17	-161.87	-319.39	-403.32	-234.69	-97.00	-103.33	-98.25
17	Cost of capital (real)	%	5.50%	5.50%	5.50%	5.50%	4.50%	4.50%	4.50%	4.50%
18	**Return on capital foregone**	AEDm, 2014 prices	**-3.03**	**-8.90**	**-17.57**	**-22.18**	**-10.56**	**-4.36**	**-4.65**	**-4.42**

	Financing Costs foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
19	Depreciation foregone	AEDm, 2014 prices	-1.87	-5.55	-11.08	-14.30	-9.07	-4.71	-5.08	-5.08
20	Return on capital foregone	AEDm, 2014 prices	-3.03	-8.90	-17.57	-22.18	-10.56	-4.36	-4.65	-4.42
21	Total financing costs foregone	AEDm, 2014 prices	-4.90	-14.45	-28.65	-36.48	-19.63	-9.07	-9.73	-9.50
22	Years from year mid point to 1 Jan 2010 (PC3 capex)	years	3.50	2.50	1.50	0.50				
23	NPV @ 1 Jan 2010 of financing costs foregone (PC3 capex)	AEDm, 2014 prices	-5.92	-16.52	-31.04	-37.47				
24	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone (PC3 capex)	AEDm, 2014 prices				-90.95				
25	Years from year mid point to 1 Jan 2014 (PC3 and PC4 capex)	AEDm, 2014 prices				4.50	3.50	2.50	1.50	0.50
26	NPV @ 1 Jan 2014 of financing costs foregone (PC3 and PC4 capex)	AEDm, 2014 prices				-108.46	-22.90	-10.13	-10.40	-9.71
27	**Accumulated NPV (@ 1 Jan 2014) of financing costs foregone**	**AEDm, 2014 prices**								**-161.59**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		**2013**
28	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2010 prices	2,593.79
29	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2014 prices	2,706.88
30	Add: Additional efficient PC3 and PC4 capex - Closing value @ 31 Dec 2013	AEDm, 2014 prices	(95.70)
31	**Updated Opening 2014 RAV including Additional Efficient PC3 and PC4 capex**	**AEDm, 2014 prices**	**2,611.18**

Updating PC5 RAVs for PC5 Provisional Capex

Updated PC5 RAVs including PC5 Provisional Capex			PC5				
AEDm, 2014 prices			**2014**	**2015**	**2016**	**2017**	**2018**
32	Assumed average asset life for new investment	years	30				
33	**Opening RAV**	**AEDm, 2014 prices**	**2,611.18**	**2,648.45**	**2,680.38**	**2,706.99**	**2,728.26**
34	PC5 Provisional capex	AEDm, 2014 prices	160.00	160.00	160.00	160.00	160.00
35	Total Depreciation on RAV and capex (excluding PC5 provisional capex)	AEDm, 2014 prices	120.06	120.06	120.06	120.06	120.06
36	Depreciation on provisional PC5 capex (half-year depreciation for first year)	AEDm, 2014 prices	2.67	8.00	13.33	18.67	24.00
37	**Total depreciation for PC5**	AEDm, 2014 prices	**122.73**	**128.06**	**133.40**	**138.73**	**144.06**
38	**Closing RAV**	AEDm, 2014 prices	**2,648.45**	**2,680.38**	**2,706.99**	**2,728.26**	**2,744.20**

Annex A.3: ADDC electricity – Updating RAV

Updating 2014 Opening RAV for PC3 and PC4 Efficient Capex

Line No.

	UAE CPI Assumptions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	**CPI (2000 = 100) used in calculations**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**114.00**	**115.00**	**116.01**	**116.78**	**118.00**
						Assumed in PC4	113.07				

			PC3				PC4		
	Additional Efficient PC3 and PC4 Capex to be allowed at this Review		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
2	Actual PC3 and PC4 capex	AEDm, nominal prices	494.24	992.98	1,392.57	2,570.15	1,674.82	2,437.45	-
3	Applied capex efficiency factor	%	96.25%	96.25%	96.25%	96.25%	96.25%	96.25%	96.25%
4	Efficient PC3 and PC4 capex	AEDm, nominal prices	475.71	955.75	1,340.34	2,473.77	1,612.02	2,346.05	-
5	Efficient PC3 and PC4 capex	AEDm, 2014 prices	681.72	1,253.28	1,581.61	2,599.33	1,668.58	2,407.25	-
6	Provisional PC3 and PC4 capex	AEDm, PC3 2006 / PC4 2010 pr	536.00	536.00	536.00	536.00	1,570.00	1,570.00	-
7	Provisional PC3 and PC4 capex	AEDm, 2014 prices	768.12	768.12	768.12	768.12	1,638.45	1,638.45	-
8	**Additional efficient PC3 and PC4 capex to be allowed at PC5**	**AEDm, 2014 prices**	**-86.40**	**485.16**	**813.48**	**1,831.21**	**30.12**	**768.79**	**0.00**

	Depreciation foregone on Additional Efficient PC3 and PC4 Capex			**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
9	Assumed average asset life for new investment	years	30								
10	Additional efficient PC3 and PC4 capex to be allowed at PC4	AEDm, 2014 prices		-86.40	485.16	813.48	1831.21	30.12	768.79	0.00	
11	**Depreciation on additional efficient PC3 and PC4 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2014 prices		**-1.44**	**5.21**	**26.85**	**70.93**	**101.95**	**115.27**	**128.08**	**128.08**

	Return on Capital foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12	Additional efficient PC3 and PC4 capex - Opening value	AEDm, 2014 prices	0.00	-84.96	394.99	1,181.62	2,941.90	2,870.08	3,523.61	3,395.53
13	Additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-86.40	485.16	813.48	1,831.21	30.12	768.79	0.00	
14	Depreciation on additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-1.44	5.21	26.85	70.93	101.95	115.27	128.08	128.08
15	Additional efficient PC3 and PC4 capex - Closing value	AEDm, 2014 prices	-84.96	394.99	1,181.62	2,941.90	2,870.08	3,523.61	3,395.53	**3,267.45**
16	Average of Opening and Closing values	AEDm, 2014 prices	-42.48	155.01	788.30	2,061.76	2,905.99	3,196.84	3,459.57	3,331.49
17	Cost of capital (real)	%	5.50%	5.50%	5.50%	5.50%	4.50%	4.50%	4.50%	4.50%
18	**Return on capital foregone**	AEDm, 2014 prices	**-2.34**	**8.53**	**43.36**	**113.40**	**130.77**	**143.86**	**155.68**	**149.92**

	Financing Costs foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
19	Depreciation foregone	AEDm, 2014 prices	-1.44	5.21	26.85	70.93	101.95	115.27	128.08	128.08
20	Return on capital foregone	AEDm, 2014 prices	-2.34	8.53	43.36	113.40	130.77	143.86	155.68	149.92
21	Total financing costs foregone	AEDm, 2014 prices	-3.78	13.73	70.21	184.32	232.72	259.12	283.76	278.00
22	Years from year mid point to 1 Jan 2010 (PC3 capex)	years	3.50	2.50	1.50	0.50				
23	NPV @ 1 Jan 2010 of financing costs foregone (PC3 capex)	AEDm, 2014 prices	-4.55	15.70	76.08	189.33				
24	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone (PC3 capex)	AEDm, 2014 prices				276.55				
25	Years from year mid point to 1 Jan 2014 (PC3 and PC4 capex)	AEDm, 2014 prices				4.50	3.50	2.50	1.50	0.50
26	NPV @ 1 Jan 2014 of financing costs foregone (PC3 and PC4 capex)	AEDm, 2014 prices				329.79	271.48	289.27	303.13	284.18
27	**Accumulated NPV (@ 1 Jan 2014) of financing costs foregone**	**AEDm, 2014 prices**								**1477.84**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		**2013**
28	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2010 prices	13,182.25
29	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2014 prices	13,757.02
30	Add: Additional efficient PC3 and PC4 capex - Closing value @ 31 Dec 2013	AEDm, 2014 prices	3,267.45
31	**Updated Opening 2014 RAV including Additional Efficient PC3 and PC4 capex**	**AEDm, 2014 prices**	**17,024.46**

Updating PC5 RAVs for PC5 Provisional Capex

	Updated PC5 RAVs including PC5 Provisional Capex			PC5				
	AEDm, 2014 prices			**2014**	**2015**	**2016**	**2017**	**2018**
32	Assumed average asset life for new investment	years	30					
33	**Opening RAV**	**AEDm, 2014 prices**		**17,024.46**	**18,795.95**	**20,477.76**	**22,069.91**	**23,572.39**
34	PC5 Provisional capex	AEDm, 2014 prices		2,690.00	2,690.00	2,690.00	2,690.00	2,690.00
35	Total Depreciation on RAV and capex (excluding PC5 provisional capex)	AEDm, 2014 prices		873.68	873.68	873.68	873.68	873.68
36	Depreciation on provisional PC5 capex (half-year depreciation for first year)	AEDm, 2014 prices		44.83	134.50	224.17	313.83	403.50
37	**Total depreciation for PC5**	AEDm, 2014 prices		**918.52**	**1,008.18**	**1,097.85**	**1,187.52**	**1,277.18**
38	**Closing RAV**	AEDm, 2014 prices		**18,795.95**	**20,477.76**	**22,069.91**	**23,572.39**	**24,985.21**

Annex A.4: ADDC water – Updating RAV

Updating 2014 Opening RAV for PC3 and PC4 Efficient Capex

Line No.

	UAE CPI Assumptions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	**CPI (2000 = 100) used in calculations**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**114.00**	**115.00**	**116.01**	**116.78**	**118.00**
						Assumed in PC4	113.07				

			PC3				PC4		
	Additional Efficient PC3 and PC4 Capex to be allowed at this Review		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
2	Actual PC3 and PC4 capex	AEDm, nominal prices	221.92	278.42	526.30	345.55	610.24	503.75	-
3	Applied capex efficiency factor	%	95.54%	95.54%	95.54%	95.54%	95.54%	95.54%	95.54%
4	Efficient PC3 and PC4 capex	AEDm, nominal prices	212.03	266.00	502.83	330.14	583.02	481.29	-
5	Efficient PC3 and PC4 capex	AEDm, 2014 prices	303.85	348.81	593.34	346.90	603.48	493.84	-
6	Provisional PC3 and PC4 capex	AEDm, PC3 2006 / PC4 2010 p	315.00	315.00	315.00	315.00	590.00	590.00	-
7	Provisional PC3 and PC4 capex	AEDm, 2014 prices	451.42	451.42	451.42	451.42	615.72	615.72	-
8	**Additional efficient PC3 and PC4 capex to be allowed at PC5**	**AEDm, 2014 prices**	**-147.57**	**-102.61**	**141.92**	**-104.52**	**-12.25**	**-121.88**	**0.00**

	Depreciation foregone on Additional Efficient PC3 and PC4 Capex			**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
9	Assumed average asset life for new investment	years	30								
10	Additional efficient PC3 and PC4 capex to be allowed at PC4	AEDm, 2014 prices		-147.57	-102.61	141.92	-104.52	-12.25	-121.88	0.00	
11	**Depreciation on additional efficient PC3 and PC4 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2014 prices		**-2.46**	**-6.63**	**-5.97**	**-5.35**	**-7.30**	**-9.53**	**-11.56**	**-11.56**

	Return on Capital foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12	Additional efficient PC3 and PC4 capex - Opening value	AEDm, 2014 prices	0.00	-145.11	-241.09	-93.19	-192.36	-197.31	-309.66	-298.10
13	Additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-147.57	-102.61	141.92	-104.52	-12.25	-121.88	0.00	
14	Depreciation on additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-2.46	-6.63	-5.97	-5.35	-7.30	-9.53	-11.56	-11.56
15	Additional efficient PC3 and PC4 capex - Closing value	AEDm, 2014 prices	-145.11	-241.09	-93.19	-192.36	-197.31	-309.66	-298.10	**-286.54**
16	Average of Opening and Closing values	AEDm, 2014 prices	-72.55	-193.10	-167.14	-142.78	-194.84	-253.49	-303.88	-292.32
17	Cost of capital (real)	%	5.50%	5.50%	5.50%	5.50%	4.50%	4.50%	4.50%	4.50%
18	**Return on capital foregone**	AEDm, 2014 prices	**-3.99**	**-10.62**	**-9.19**	**-7.85**	**-8.77**	**-11.41**	**-13.67**	**-13.15**

	Financing Costs foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
19	Depreciation foregone	AEDm, 2014 prices	-2.46	-6.63	-5.97	-5.35	-7.30	-9.53	-11.56	-11.56
20	Return on capital foregone	AEDm, 2014 prices	-3.99	-10.62	-9.19	-7.85	-8.77	-11.41	-13.67	-13.15
21	Total financing costs foregone	AEDm, 2014 prices	-6.45	-17.25	-15.17	-13.20	-16.06	-20.94	-25.24	-24.72
22	Years from year mid point to 1 Jan 2010 (PC3 capex)	years	3.50	2.50	1.50	0.50				
23	NPV @ 1 Jan 2010 of financing costs foregone (PC3 capex)	AEDm, 2014 prices	-7.78	-19.72	-16.43	-13.56				
24	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone (PC3 capex)	AEDm, 2014 prices				-57.50				
25	Years from year mid point to 1 Jan 2014 (PC3 and PC4 capex)	AEDm, 2014 prices				4.50	3.50	2.50	1.50	0.50
26	NPV @ 1 Jan 2014 of financing costs foregone (PC3 and PC4 capex)	AEDm, 2014 prices				-68.56	-18.74	-23.37	-26.96	-25.27
27	**Accumulated NPV (@ 1 Jan 2014) of financing costs foregone**	**AEDm, 2014 prices**								**-162.91**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		**2013**
28	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2010 prices	5,148.51
29	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2014 prices	5,373.00
30	Add: Additional efficient PC3 and PC4 capex - Closing value @ 31 Dec 2013	AEDm, 2014 prices	(286.54)
31	**Updated Opening 2014 RAV including Additional Efficient PC3 and PC4 capex**	**AEDm, 2014 prices**	**5,086.46**

Updating PC5 RAVs for PC5 Provisional Capex

Updated PC5 RAVs including PC5 Provisional Capex			PC5				
AEDm, 2014 prices			**2014**	**2015**	**2016**	**2017**	**2018**
32	Assumed average asset life for new investment	years 30					
33	**Opening RAV**	**AEDm, 2014 prices**	**5,086.46**	**5,477.45**	**5,847.77**	**6,197.43**	**6,526.42**
34	PC5 Provisional capex	AEDm, 2014 prices	620.00	620.00	620.00	620.00	620.00
35	Total Depreciation on RAV and capex (excluding PC5 provisional capex)	AEDm, 2014 prices	218.68	218.68	218.68	218.68	218.68
36	Depreciation on provisional PC5 capex (half-year depreciation for first year)	AEDm, 2014 prices	10.33	31.00	51.67	72.33	93.00
37	**Total depreciation for PC5**	AEDm, 2014 prices	**229.01**	**249.68**	**270.34**	**291.01**	**311.68**
38	**Closing RAV**	AEDm, 2014 prices	**5,477.45**	**5,847.77**	**6,197.43**	**6,526.42**	**6,834.74**

Annex A.5: TRANSCO electricity – Updating RAV

Updating 2014 Opening RAV for PC3 and PC4 Efficient Capex

Line No.

	UAE CPI Assumptions		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	**CPI (2000 = 100) used in calculations**		**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**114.00**	**115.00**	**116.01**	**116.78**	**118.00**
								Assumed in PC4	113.07			

				PC3				PC4		
	Additional Efficient PC3 and PC4 Capex to be allowed at this Review		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
2	Actual PC3 and PC4 capex	AEDm, nominal prices	1,376.69	2,818.66	4,622.32	2,716.96	2,366.18	3,257.24	-
3	Applied capex efficiency factor	%	95.65%	95.65%	95.65%	95.65%	95.65%	95.65%	95.65%
4	Efficient PC3 and PC4 capex	AEDm, nominal prices	1,316.80	2,696.04	4,421.25	2,598.77	2,263.25	3,115.55	-
5	Efficient PC3 and PC4 capex	AEDm, 2014 prices	1,887.06	3,535.35	5,217.08	2,730.68	2,342.67	3,196.83	-
6	Provisional PC3 and PC4 capex	AEDm, PC3 2006 / PC4 2010 pr	1,200.00	1,200.00	1,200.00	1,200.00	5,230.00	5,230.00	-
7	Provisional PC3 and PC4 capex	AEDm, 2014 prices	1,719.68	1,719.68	1,719.68	1,719.68	5,458.03	5,458.03	-
8	**Additional efficient PC3 and PC4 capex to be allowed at PC5**	**AEDm, 2014 prices**	**167.38**	**1,815.67**	**3,497.40**	**1,011.00**	**-3,115.37**	**-2,261.21**	**0.00**

	Depreciation foregone on Additional Efficient PC3 and PC4 Capex			**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
9	Assumed average asset life for new investment	years	30								
10	Additional efficient PC3 and PC4 capex to be allowed at PC4	AEDm, 2014 prices		167.38	1815.67	3497.40	1011.00	-3115.37	-2261.21	0.00	
11	**Depreciation on additional efficient PC3 and PC4 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2014 prices		**2.79**	**35.84**	**124.39**	**199.53**	**164.46**	**74.85**	**37.16**	**37.16**

	Return on Capital foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12	Additional efficient PC3 and PC4 capex - Opening value	AEDm, 2014 prices	0.00	164.59	1,944.42	5,317.43	6,128.90	2,849.07	513.01	475.85
13	Additional efficient PC3 and PC4 capex	AEDm, 2014 prices	167.38	1,815.67	3,497.40	1,011.00	-3,115.37	-2,261.21	0.00	
14	Depreciation on additional efficient PC3 and PC4 capex	AEDm, 2014 prices	2.79	35.84	124.39	199.53	164.46	74.85	37.16	37.16
15	Additional efficient PC3 and PC4 capex - Closing value	AEDm, 2014 prices	164.59	1,944.42	5,317.43	6,128.90	2,849.07	513.01	475.85	**438.69**
16	Average of Opening and Closing values	AEDm, 2014 prices	82.30	1,054.50	3,630.92	5,723.16	4,488.98	1,681.04	494.43	457.27
17	Cost of capital (real)	%	5.00%	5.00%	5.00%	5.00%	4.50%	4.50%	4.50%	4.50%
18	**Return on capital foregone**	AEDm, 2014 prices	**4.11**	**52.73**	**181.55**	**286.16**	**202.00**	**75.65**	**22.25**	**20.58**

	Financing Costs foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
19	Depreciation foregone	AEDm, 2014 prices	2.79	35.84	124.39	199.53	164.46	74.85	37.16	37.16
20	Return on capital foregone	AEDm, 2014 prices	4.11	52.73	181.55	286.16	202.00	75.65	22.25	20.58
21	Total financing costs foregone	AEDm, 2014 prices	6.90	88.57	305.94	485.69	366.46	150.50	59.41	57.74
22	Years from year mid point to 1 Jan 2010 (PC3 capex)	years	3.50	2.50	1.50	0.50				
23	NPV @ 1 Jan 2010 of financing costs foregone (PC3 capex)	AEDm, 2014 prices	8.19	100.06	329.17	497.68				
24	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone (PC3 capex)	AEDm, 2014 prices				935.10				
25	Years from year mid point to 1 Jan 2014 (PC3 and PC4 capex)	AEDm, 2014 prices				4.50	3.50	2.50	1.50	0.50
26	NPV @ 1 Jan 2014 of financing costs foregone (PC3 and PC4 capex)	AEDm, 2014 prices				1,115.12	427.50	168.00	63.47	59.02
27	**Accumulated NPV (@ 1 Jan 2014) of financing costs foregone**	**AEDm, 2014 prices**								**1833.12**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		**2013**
28	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2010 prices	34,860.92
29	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2014 prices	36,380.90
30	Add: Additional efficient PC3 and PC4 capex - Closing value @ 31 Dec 2013	AEDm, 2014 prices	438.69
31	**Updated Opening 2014 RAV including Additional Efficient PC3 and PC4 capex**	**AEDm, 2014 prices**	**36,819.59**

Updating PC5 RAVs for PC5 Provisional Capex

Updated PC5 RAVs including PC5 Provisional Capex			PC5				
AEDm, 2014 prices			**2014**	**2015**	**2016**	**2017**	**2018**
32	Assumed average asset life for new investment	years	30				
33	**Opening RAV**	**AEDm, 2014 prices**	**36,819.59**	**37,216.77**	**37,544.62**	**37,803.13**	**37,992.31**
34	PC5 Provisional capex	AEDm, 2014 prices	2,080.00	2,080.00	2,080.00	2,080.00	2,080.00
35	Total Depreciation on RAV and capex (excluding PC5 provisional capex)	AEDm, 2014 prices	1,648.15	1,648.15	1,648.15	1,648.15	1,648.15
36	Depreciation on provisional PC5 capex (half-year depreciation for first year)	AEDm, 2014 prices	34.67	104.00	173.33	242.67	312.00
37	**Total depreciation for PC5**	AEDm, 2014 prices	**1,682.82**	**1,752.15**	**1,821.49**	**1,890.82**	**1,960.15**
38	**Closing RAV**	AEDm, 2014 prices	**37,216.77**	**37,544.62**	**37,803.13**	**37,992.31**	**38,112.16**

Annex A.6: TRANSCO water – Updating RAV

Updating 2014 Opening RAV for PC3 and PC4 Efficient Capex

Line No.

	UAE CPI Assumptions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	**CPI (2000 = 100) used in calculations**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**114.00**	**115.00**	**116.01**	**116.78**	**118.00**
						Assumed in PC4	113.07				

			PC3				PC4		
	Additional Efficient PC3 and PC4 Capex to be allowed at this Review		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
2	Actual PC3 and PC4 capex	AEDm, nominal prices	573.74	720.08	2,227.33	2,405.95	1,526.75	1,721.56	-
3	Applied capex efficiency factor	%	96.57%	96.57%	96.57%	96.57%	96.57%	96.57%	96.57%
4	Efficient PC3 and PC4 capex	AEDm, nominal prices	554.06	695.38	2,150.93	2,323.43	1,474.38	1,662.51	-
5	Efficient PC3 and PC4 capex	AEDm, 2014 prices	794.00	911.86	2,538.10	2,441.36	1,526.12	1,705.88	-
6	Provisional PC3 and PC4 capex	AEDm, PC3 2006 / PC4 2010 p	750.00	750.00	750.00	750.00	2,530.00	2,530.00	-
7	Provisional PC3 and PC4 capex	AEDm, 2014 prices	1,074.80	1,074.80	1,074.80	1,074.80	2,640.31	2,640.31	-
8	**Additional efficient PC3 and PC4 capex to be allowed at PC5**	**AEDm, 2014 prices**	**-280.80**	**-162.94**	**1,463.30**	**1,366.56**	**-1,114.19**	**-934.43**	**0.00**

	Depreciation foregone on Additional Efficient PC3 and PC4 Capex			**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
9	Assumed average asset life for new investment	years	30								
10	Additional efficient PC3 and PC4 capex to be allowed at PC4	AEDm, 2014 prices		-280.80	-162.94	1463.30	1366.56	-1114.19	-934.43	0.00	
11	**Depreciation on additional efficient PC3 and PC4 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2014 prices		**-4.68**	**-12.08**	**9.60**	**56.76**	**60.97**	**26.82**	**11.25**	**11.25**

	Return on Capital foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12	Additional efficient PC3 and PC4 capex - Opening value	AEDm, 2014 prices	0.00	-276.12	-426.98	1,026.72	2,336.52	1,161.35	200.10	188.85
13	Additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-280.80	-162.94	1,463.30	1,366.56	-1,114.19	-934.43	0.00	
14	Depreciation on additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-4.68	-12.08	9.60	56.76	60.97	26.82	11.25	11.25
15	Additional efficient PC3 and PC4 capex - Closing value	AEDm, 2014 prices	-276.12	-426.98	1,026.72	2,336.52	1,161.35	200.10	188.85	**177.60**
16	Average of Opening and Closing values	AEDm, 2014 prices	-138.06	-351.55	299.87	1,681.62	1,748.93	680.73	194.48	183.23
17	Cost of capital (real)	%	5.00%	5.00%	5.00%	5.00%	4.50%	4.50%	4.50%	4.50%
18	**Return on capital foregone**	AEDm, 2014 prices	**-6.90**	**-17.58**	**14.99**	**84.08**	**78.70**	**30.63**	**8.75**	**8.25**

	Financing Costs foregone on Additional Efficient PC3 and PC4 Capex		**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
19	Depreciation foregone	AEDm, 2014 prices	-4.68	-12.08	9.60	56.76	60.97	26.82	11.25	11.25
20	Return on capital foregone	AEDm, 2014 prices	-6.90	-17.58	14.99	84.08	78.70	30.63	8.75	8.25
21	Total financing costs foregone	AEDm, 2014 prices	-11.58	-29.65	24.59	140.84	139.67	57.46	20.00	19.50
22	Years from year mid point to 1 Jan 2010 (PC3 capex)	years	3.50	2.50	1.50	0.50				
23	NPV @ 1 Jan 2010 of financing costs foregone (PC3 capex)	AEDm, 2014 prices	-13.74	-33.50	26.46	144.32				
24	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone (PC3 capex)	AEDm, 2014 prices				123.54				
25	Years from year mid point to 1 Jan 2014 (PC3 and PC4 capex)	AEDm, 2014 prices				4.50	3.50	2.50	1.50	0.50
26	NPV @ 1 Jan 2014 of financing costs foregone (PC3 and PC4 capex)	AEDm, 2014 prices				147.32	162.93	64.14	21.37	19.93
27	**Accumulated NPV (@ 1 Jan 2014) of financing costs foregone**	**AEDm, 2014 prices**								**415.69**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		**2013**
28	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2010 prices	17,713.68
29	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2014 prices	18,486.02
30	Add: Additional efficient PC3 and PC4 capex - Closing value @ 31 Dec 2013	AEDm, 2014 prices	177.60
31	**Updated Opening 2014 RAV including Additional Efficient PC3 and PC4 capex**	**AEDm, 2014 prices**	**18,663.62**

Updating PC5 RAVs for PC5 Provisional Capex

	Updated PC5 RAVs including PC5 Provisional Capex			PC5				
	AEDm, 2014 prices			**2014**	**2015**	**2016**	**2017**	**2018**
32	Assumed average asset life for new investment	years	30					
33	**Opening RAV**	**AEDm, 2014 prices**		**18,663.62**	**18,639.33**	**18,583.37**	**18,495.74**	**18,568.00**
34	PC5 Provisional capex	AEDm, 2014 prices		950.00	950.00	950.00	950.00	950.00
35	Total Depreciation on RAV and capex (excluding PC5 provisional capex)	AEDm, 2014 prices		958.46	958.46	958.46	766.90	753.22
36	Depreciation on provisional PC5 capex (half-year depreciation for first year)	AEDm, 2014 prices		15.83	47.50	79.17	110.83	142.50
37	**Total depreciation for PC5**	AEDm, 2014 prices		**974.30**	**1,005.96**	**1,037.63**	**877.73**	**895.72**
38	**Closing RAV**	AEDm, 2014 prices		**18,639.33**	**18,583.37**	**18,495.74**	**18,568.00**	**18,622.29**

Annex A.7: ADSSC – Updating RAV

Updating 2014 Opening RAV for PC3 and PC4 Efficient Capex

Line No.

	UAE CPI Assumptions		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	**CPI (2000 = 100) used in calculations**		**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**114.00**	**115.00**	**116.01**	**116.78**	**118.00**
								Assumed in PC4	113.07			

				PC3				PC4		
	Additional Efficient PC3 and PC4 Capex to be allowed at this Review		**2005H2**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
2	Actual PC3 and PC4 capex	AEDm, nominal prices	379.01	151.41	275.57	738.67	1,613.76	1,446.20	2,542.35	-
3	Applied capex efficiency factor	%	97.49%	97.49%	97.49%	97.49%	97.49%	97.49%	97.49%	97.49%
4	Efficient PC3 and PC4 capex	AEDm, nominal prices	369.50	147.61	268.66	720.13	1,573.25	1,409.90	2,478.54	-
5	Efficient PC3 and PC4 capex	AEDm, 2014 prices	562.32	211.53	352.29	849.75	1,653.11	1,459.37	2,543.20	-
6	Provisional PC3 and PC4 capex	AEDm, PC3 2005 / PC4 2010 p	379.01	128.25	412.76	600.00	900.00	3,000.00	3,000.00	-
7	Provisional PC3 and PC4 capex	AEDm, 2014 prices	576.80	195.18	628.16	913.11	1,369.66	3,130.80	3,130.80	-
8	**Additional efficient PC3 and PC4 capex to be allowed at PC5**	**AEDm, 2014 prices**	**-14.48**	**16.36**	**-275.87**	**-63.36**	**283.44**	**-1,671.43**	**-587.61**	**0.00**

	Depreciation foregone on Additional Efficient PC3 and PC4 Capex		**2005H2**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
9	Assumed average asset life for new investment	years	50								
10	Additional efficient PC3 and PC4 capex to be allowed at PC4	AEDm, 2014 prices	-14.48	16.36	-275.87	-63.36	283.44	-1671.43	-587.61	0.00	
11	**Depreciation on additional efficient PC3 and PC4 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2014 prices	**-0.07**	**-0.13**	**-2.72**	**-6.11**	**-3.91**	**-17.79**	**-40.38**	**-46.26**	**-46.26**

	Return on Capital foregone on Additional Efficient PC3 and PC4 Capex		**2005H2**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
12	Additional efficient PC3 and PC4 capex - Opening value	AEDm, 2014 prices	0.00	-14.41	2.08	-271.07	-328.31	-40.96	-1,694.60	-2,241.82	-2,195.56
13	Additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-14.48	16.36	-275.87	-63.36	283.44	-1,671.43	-587.61	0.00	
14	Depreciation on additional efficient PC3 and PC4 capex	AEDm, 2014 prices	-0.07	-0.13	-2.72	-6.11	-3.91	-17.79	-40.38	-46.26	-46.26
15	Additional efficient PC3 and PC4 capex - Closing value	AEDm, 2014 prices	-14.41	2.08	-271.07	-328.31	-40.96	-1,694.60	-2,241.82	-2,195.56	**-2,149.30**
16	Average of Opening and Closing values	AEDm, 2014 prices	-7.20	-6.16	-134.49	-299.69	-184.63	-867.78	-1,968.21	-2,218.69	-2,172.43
17	Cost of capital (real)	%	5.00%	5.00%	5.00%	5.00%	5.00%	4.50%	4.50%	4.50%	4.50%
18	**Return on capital foregone**	AEDm, 2014 prices	**-0.36**	**-0.31**	**-6.72**	**-14.98**	**-9.23**	**-39.05**	**-88.57**	**-99.84**	**-97.76**

	Financing Costs foregone on Additional Efficient PC3 and PC4 Capex		**2005H2**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
19	Depreciation foregone	AEDm, 2014 prices	-0.07	-0.13	-2.72	-6.11	-3.91	-17.79	-40.38	-46.26	-46.26
20	Return on capital foregone	AEDm, 2014 prices	-0.36	-0.31	-6.72	-14.98	-9.23	-39.05	-88.57	-99.84	-97.76
21	Total financing costs foregone	AEDm, 2014 prices	-0.43	-0.43	-9.45	-21.10	-13.14	-56.84	-128.95	-146.10	-144.02
22	Years from year mid point to 1 Jan 2010 (PC3 capex)	years	4.25	3.50	2.50	1.50	0.50				
23	NPV @ 1 Jan 2010 of financing costs foregone (PC3 capex)	AEDm, 2014 prices	-0.53	-0.52	-10.67	-22.70	-13.47				
24	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone (PC3 capex)	AEDm, 2014 prices					-47.89				
25	Years from year mid point to 1 Jan 2014 (PC3 and PC4 capex)	AEDm, 2014 prices					4.50	3.50	2.50	1.50	0.50
26	NPV @ 1 Jan 2014 of financing costs foregone (PC3 and PC4 capex)	AEDm, 2014 prices					-57.11	-66.31	-143.95	-156.07	-147.22
27	**Accumulated NPV (@ 1 Jan 2014) of financing costs foregone**	**AEDm, 2014 prices**									**-570.66**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		**2013**
28	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2010 prices	17,067.72
29	Initial Opening 2014 RAV (with provisional PC3 and PC4 capex)	AEDm, 2014 prices	17,811.90
30	Add: Additional efficient PC3 and PC4 capex - Closing value @ 31 Dec 2013	AEDm, 2014 prices	(2,149.30)
31	**Updated Opening 2014 RAV including Additional Efficient PC3 and PC4 capex**	**AEDm, 2014 prices**	**15,662.59**

Updating PC5 RAVs for PC5 Provisional Capex

Updated PC5 RAVs including PC5 Provisional Capex			PC5				
AEDm, 2014 prices			**2014**	**2015**	**2016**	**2017**	**2018**
32	Assumed average asset life for new investment	years	50				
33	**Opening RAV**	**AEDm, 2014 prices**	**15,662.59**	**16,721.74**	**17,417.20**	**17,953.55**	**18,422.50**
34	PC5 Provisional capex	AEDm, 2014 prices	1,850.00	1,520.00	1,390.00	1,350.00	-
35	Total Depreciation on RAV and capex (excluding PC5 provisional capex)	AEDm, 2014 prices	772.35	772.35	772.35	772.35	772.35
36	Depreciation on provisional PC5 capex (half-year depreciation for first year)	AEDm, 2014 prices	18.50	52.20	81.30	108.70	122.20
37	**Total depreciation for PC5**	AEDm, 2014 prices	**790.85**	**824.55**	**853.65**	**881.05**	**894.55**
38	**Closing RAV**	AEDm, 2014 prices	**16,721.74**	**17,417.20**	**17,953.55**	**18,422.50**	**17,527.95**

Annex B: PC5 price control calculations

Introduction

B.1 This **Annex B** to the Draft Proposals for PC5 comprises **Annexes B.1 through B.7** and presents detailed price control calculations for each of the four network companies (i.e., AADC, ADDC, ADSSC and TRANSCO), separately for water and electricity businesses, where applicable. These calculations have been extracted from the relevant spread sheets of the ***PC5 Financial Model*** – a Microsoft Excel based computer model developed by the Bureau to carry out PC5 calculations. The results of these calculations are described in Section 6 of the paper. Various assumptions and inputs used in these calculations (such as, UAE CPI, revenue driver projections and weights, opex allowances, and cost of capital) are described in Sections 2 through 5 of the document.

B.2 The calculations in each of **Annexes B.1 through B.7** are presented in a standard format for all businesses. They are explained below with reference to "Line" numbers used in these Annexes and in the PC5 Financial Model.

B.3 In this **Annex B**, **PC5 period** refers to:

(a) the five year period 2014-2018 for AADC, ADDC and TRANSCO, and

(b) the four year period 2014-2017 for ADSSC.

Inputs (Lines 1-14)

B.4 Lines 1-14 show the inputs to the main price control calculations:

(a) Line 1 shows the opex allowance for each year of the PC5 period in 2014 prices as per Section 3.

(b) Lines 2 and 3 list the opening and closing RAVs, respectively, in 2014 prices for each year of the PC5 period (see Section 5 and **Annexes A1-A7** for details). Line 4 shows the mid-year RAV for each year calculated as the average of the opening and closing RAVs for that year.

(c) Line 5 lists the total annual depreciation over the PC5 period as determined in Section 5 and calculations in **Annex A**.

(d) Lines 6-8 list the assumptions for the revenue drivers. The assumptions for the variable revenue drivers are as per Section 2, whereas the fixed revenue driver is set to unity.

(e) Line 9 shows the NPV as of 1 January 2014 of the financing costs foregone or unduly earned in respect of the additional efficient PC3 and PC4 capex (over and above the provisional PC3 and PC4 capex allowances in the PC3 and PC4 controls) in 2014 prices (discussed in Section 5 and calculated in **Annex A**).

(f) Line 10 shows the post-tax, real cost of capital proposed for PC5 in Section 5. This is used in the calculation of NPVs as well as the return on capital component of the annual revenue requirement.

(g) Lines 11-13 list the weights for the revenue drivers in the price-controlled revenue as per Section 2.

(h) Line 14 shows the Bureau's assumption for the X factor. The choice of X factor determines the revenue profile over the price control period and has been set to zero in these Draft Proposals for all businesses.

Required revenue calculations (Lines 15-21)

B.5 Lines 15-21 show the calculations of required revenue for PC5 in 2014 prices:

(a) Lines 15 and 16 reproduce the annual opex allowances and depreciation for the PC5 period from Lines 1 and 5. Line 17 calculates the annual return on capital by multiplying the mid-year RAVs (Line 4) by the cost of capital (Line 10). The final column in each line shows the NPV of the relevant allowances over the PC5 period.

(b) Line 18 calculates the annual revenue requirement for the PC5 period by adding opex, depreciation and return on capital from Lines 15-17. The final column of Line 18 calculates the NPV of the annual revenue requirements over the PC5 period.

(c) Line 19 calculates, on an annual basis, the discounted annual revenue requirements. The last column figure is the simple sum of these discounted annual revenue requirements over the period and reconciles to the last column figure of Line 18.

(d) The last column in Line 20 reproduces the NPV of PC3 and PC4 capex foregone financing costs from Line 9.

(e) Line 21 shows the NPV of the revenue requirement after PC3 and PC4 capex foregone financing costs added, calculated by adding the last columns of Lines 19 and 20. This is the figure used in setting the price controls.

Revenue forecast and profiling (Lines 22-35)

B.6 Lines 22-35 describe the process for calibrating the controls, which utilises the 'Solver' function (an optimisation tool) of Excel:

(a) Lines 22-25 relate to the fixed revenue term (referred to as "Revenue Driver 1" in the PC5 Financial Model), Lines 26-29 relate to the first variable revenue term (or "Revenue Driver 2"), and Lines 30-33 to the second variable revenue term (or "Revenue Driver 3").

(b) Lines 22-25 relate to Revenue Driver 1 (the fixed revenue term) and run as follows:

(i) Line 22 shows the revenue driver forecast, which in this case is set to unity due to the fixed nature of this driver.

(ii) Line 23 shows the notified value 'a' for each year of the price control period. Initially, this value is unknown. However, the model incorporates formulae which ensure that the value 'a' changes by the X factor from

year to year. Therefore, once the value for 2014 is known, those for the subsequent years of the PC5 period are automatically calculated. Refer to paragraph (f) below for determining the values of 'a', 'b' and 'c' for 2014.

(iii) In Line 24, forecast of revenue from this revenue driver is calculated by multiplying Line 22 (driver forecast) with Line 23 (value of 'a'). The last figure in Line 24 is the NPV of the revenue forecast related to Revenue Driver 1 over the control period.

(iv) Line 25 calculates the share of revenue related to Revenue Driver 1 in the total annual revenue by dividing Line 24 (revenue forecast for Revenue Driver 1) by Line 34 (annual revenue). The last column figure in Line 25 is the ratio of the NPV of revenue forecast for Revenue Driver 1 to the NPV of total revenue shown as the second last column of Line 35 (total discounted allowed revenue at 1 January 2014). This NPV share is unknown initially but is one of the constraints used in Excel solver.

(c) Lines 26-29 and Lines 30-33 follow the same format as Lines 22-25 but are related to Revenue Drivers 2 and 3 (i.e., the two variable revenue drivers), respectively.

(d) Line 34 calculates the annual revenue forecast as the sum of revenue forecasts for each of the three revenue drivers (i.e., Lines 24, 28 and 32).

(e) Line 35 simply shows, on an annual basis, the discounted figures for annual revenues shown in Line 34 and, in the penultimate column, the total NPV of the revenues over the control period. The last column in Line 35 ("Difference") is used to equate this to the NPV of the total required revenue after PC3 and PC4 capex foregone financing costs from Line 21.

(f) After inputting the required data and formulae in Lines 22-33, the Excel solver is run to set the last column figure in Line 35 (the "Difference") as the target to a value of zero. The solver is able to do so by changing the values of 'a', 'b' and 'c' for 2014 (in Lines 23, 27 and 31), subject to the constraint that the shares of the NPVs of revenue forecasts for the revenue drivers (shown at the end of Lines 25, 29 and 33) in the NPV of total revenue forecast (Line 35) must be equal to the weights set out in Section 2 (as shown in Lines 11, 12 and 13, respectively). The target cell, variable cells and constraint cells for the solver are shown as shaded cells in the Annexes and also indicated by arrows.

(g) As the result of the solver run, the values of 'a', 'b' and 'c' for 2014 are determined. The values of 'a', 'b' and 'c' for subsequent years of the PC5 period are then automatically calculated by the model in 2014 prices by applying the X factor (which has been set to zero).

Results (Lines 36-39)

B.7 These lines summarise the values of the 'a', 'b' and 'c' and the X factor as set by the above calculations.

Implied financial indicators (Lines 40-41)

B.8 These two lines calculate two financial indicators in real terms to assess the financing viability of the business as a result of the price control calculations:

B.9 Line 40 shows the implied annual profit, calculated by subtracting Line 1 (opex allowance) and Line 5 (total depreciation) from Line 34 (annual allowed revenue).

B.10 Line 41 calculates the implied return on the mid-year RAVs in percentage terms by dividing Line 40 (implied annual profit) by Line 4 (mid-year RAVs).

Annex B.1: AADC electricity – PC5 price control calculations

Line No. **(all AED amounts are in 2014 prices)**

				PC5				
	Inputs			**2014**	**2015**	**2016**	**2017**	**2018**
1	Operating expenditure allowance	AEDm		326.91	312.24	297.87	286.69	276.94
2	Opening RAV	AEDm		8,832.60	9,138.21	9,416.83	9,668.44	9,893.06
3	Closing RAV	AEDm		9,138.21	9,416.83	9,668.44	9,893.06	10,198.06
4	Mid-Year RAV	AEDm		8,985.40	9,277.52	9,542.63	9,780.75	10,045.56
5	Total depreciation for PC5	AEDm		504.39	531.39	558.39	585.39	505.00
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		146,868	157,148	165,006	176,557	187,814
8	Forecast for revenue driver 3	GWh		9,912	10,491	10,969	11,409	11,753
9	PV of financing costs foregone on PC3 and PC4 capex	AEDm	735.08					
10	Cost of capital (real)		5.50%					
11	Weight in revenue for Revenue driver 1		80.00%					
12	Weight in revenue for Revenue driver 2		15.00%					
13	Weight in revenue for Revenue driver 3		5.00%					
14	Negative X Factor		0.00					

			PC5					
	PC5 Required Revenue Calculations		**2014**	**2015**	**2016**	**2017**	**2018**	**PV over PC5 Period at 1 January 2014**
15	Operating expenditure allowance	AEDm	326.91	312.24	297.87	286.69	276.94	1,322.32
16	Total depreciation for PC5	AEDm	504.39	531.39	558.39	585.39	505.00	2,352.10
17	Return on mid-year RAV	AEDm	494.20	510.26	524.84	537.94	552.51	2,291.35
18	Annual revenue requirement	AEDm	1,325.49	1,353.89	1,381.10	1,410.02	1,334.44	5,965.77
19	Discounted annual revenue requirement	AEDm	1,290.48	1,249.41	1,208.08	1,169.07	1,048.73	5,965.77
20	PV of financing costs foregone on PC3 and PC4 capex	AEDm						735.08
21	PV of revenue requirement (after foregone financing costs)	AEDm						**6,700.85**

	PC5 Revenue Forecast and Profiling		**2014**	**2015**	**2016**	**2017**	**2018**	**PV Share in TOTAL**	
22	**Revenue driver 1**		1.00	1.00	1.00	1.00	1.00		
23		AEDm	**1,222.18**	1,222.18	1,222.18	1,222.18	1,222.18		
24		AEDm	1,222.18	1,222.18	1,222.18	1,222.18	1,222.18	5,360.68	
25		%	82%	81%	80%	79%	78%	**80%**	
26	**Revenue driver 2**	Customer Accounts	146,868	157,148	165,006	176,557	187,814	**Constraints for Solver Run**	
27		AED / Customer	**1,383.84**	1,383.84	1,383.84	1,383.84	1,383.84		
28		AEDm	203.24	217.47	228.34	244.33	259.90	1,005.13	
29		%	14%	14%	15%	16%	17%	**15%**	
30	**Revenue driver 3**	kWh	9,912,000,000	10,491,000,000	10,969,000,000	11,409,000,000	11,753,000,000		
31		fils / kWh	**0.7035**	0.7035	0.7035	0.7035	0.7035		
32		AEDm	69.73	73.81	77.17	80.27	82.69	335.04	
33		%	5%	5%	5%	5%	5%	**5%**	
		Variables for Solver Run							
34	Annual revenue	AEDm	1,495.16	1,513.46	1,527.70	1,546.78	1,564.78	**TOTAL**	Difference
35	**Discounted annual revenue at 1 January 2014**	AEDm	1,455.67	1,396.67	1,336.31	1,282.46	1,229.75	**6,700.85**	**0.00**
								Target for Solver Run	

	Results		**2014**
36	**X Factor**		**0.0**
37	**Fixed revenue term (a)**	**AED million**	**1,222.18**
38	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**1,383.84**
39	**Co-efficient of variable revenue term (c)**	**fils / kWh metered**	**0.7035**

	Implied Financial Indicators		**2014**	**2015**	**2016**	**2017**	**2018**	**Average**
40	Implied annual profit	AEDm	663.87	669.84	671.44	674.70	782.84	692.54
41	Implied return on mid-point RAV	%	7.39%	7.22%	7.04%	6.90%	7.79%	7.27%

Annex B.2: AADC water – PC5 price control calculations

Line No. **(all AED amounts are in 2014 prices)**

				PC5				
	Inputs			**2014**	**2015**	**2016**	**2017**	**2018**
1	Operating expenditure allowance	AEDm		207.17	197.11	186.95	178.74	172.90
2	Opening RAV	AEDm		2,611.18	2,648.45	2,680.38	2,706.99	2,728.26
3	Closing RAV	AEDm		2,648.45	2,680.38	2,706.99	2,728.26	2,744.20
4	Mid-Year RAV	AEDm		2,629.81	2,664.42	2,693.69	2,717.62	2,736.23
5	Total depreciation for PC5	AEDm		122.73	128.06	133.40	138.73	144.06
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		78,021	80,700	83,524	86,501	89,632
8	Forecast for revenue driver 3	MIG		66,592	70,898	72,023	72,442	73,343
9	PV of financing costs foregone on PC3 and PC4 capex	AEDm	-161.59					
10	Cost of capital (real)		5.50%					
11	Weight in revenue for Revenue driver 1		80.00%					
12	Weight in revenue for Revenue driver 2		15.00%					
13	Weight in revenue for Revenue driver 3		5.00%					
14	Negative X Factor		0.00					

			PC5					
	PC5 Required Revenue Calculations		**2014**	**2015**	**2016**	**2017**	**2018**	**PV over PC5 Period at 1 January 2014**
15	Operating expenditure allowance	AEDm	207.17	197.11	186.95	178.74	172.90	831.20
16	Total depreciation for PC5	AEDm	122.73	128.06	133.40	138.73	144.06	582.59
17	Return on mid-year RAV	AEDm	144.64	146.54	148.15	149.47	150.49	647.84
18	Annual revenue requirement	AEDm	474.54	471.72	468.50	466.94	467.45	2,061.64
19	Discounted annual revenue requirement	AEDm	462.00	435.31	409.81	387.15	367.37	2,061.64
20	PV of financing costs foregone on PC3 and PC4 capex	AEDm						-161.59
21	PV of revenue requirement (after foregone financing costs)	AEDm						**1,900.05**

	PC5 Revenue Forecast and Profiling		**2014**	**2015**	**2016**	**2017**	**2018**	**PV Share in TOTAL**	
22	**Revenue driver 1**		1.00	1.00	1.00	1.00	1.00		
23		AEDm	**346.55**	346.55	346.55	346.55	346.55		
24		AEDm	346.55	346.55	346.55	346.55	346.55	1,520.03	
25		%	81%	80%	80%	79%	79%	**80%**	
26	**Revenue driver 2**	Customer Accounts	78,021	80,700	83,524	86,501	89,632	**Constraints for Solver Run**	
27		AED / Customer	**779.44**	779.44	779.44	779.44	779.44		
28		AEDm	60.81	62.90	65.10	67.42	69.86	285.01	
29		%	14%	15%	15%	15%	16%	**15%**	
30	**Revenue driver 3**	TIG	66,592,000	70,898,000	72,023,000	72,442,000	73,343,000		
31		AED/TIG	**0.3055**	0.3055	0.3055	0.3055	0.3055		
32		AEDm	20.34	21.66	22.00	22.13	22.41	95.00	
33		%	5%	5%	5%	5%	5%	**5%**	
		Variables for Solver Run							
34	Annual revenue	AEDm	427.71	431.11	433.66	436.11	438.82	**TOTAL**	Difference
35	**Discounted annual revenue at 1 January 2014**	AEDm	416.41	397.85	379.33	361.59	344.87	**1,900.04**	**0.00**
								Target for Solver Run	

	Results		**2014**
36	**X Factor**		**0.0**
37	**Fixed revenue term (a)**	**AED million**	**346.55**
38	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**779.44**
39	**Co-efficient of variable revenue term (c)**	**AED / TIG metered**	**0.3055**

	Implied Financial Indicators		**2014**	**2015**	**2016**	**2017**	**2018**	**Average**
40	Implied annual profit	AEDm	97.81	105.94	113.31	118.63	121.87	111.51
41	Implied return on mid-point RAV	%	3.72%	3.98%	4.21%	4.37%	4.45%	4.14%

Annex B.3: ADDC electricity – PC5 price control calculations

Line No. **(all AED amounts are in 2014 prices)**

				PC5				
	Inputs			**2014**	**2015**	**2016**	**2017**	**2018**
1	Operating expenditure allowance	AEDm		592.15	590.00	582.82	575.84	568.86
2	Opening RAV	AEDm		17,024.46	18,795.95	20,477.76	22,069.91	23,572.39
3	Closing RAV	AEDm		18,795.95	20,477.76	22,069.91	23,572.39	24,985.21
4	Mid-Year RAV	AEDm		17,910.20	19,636.85	21,273.84	22,821.15	24,278.80
5	Total depreciation for PC5	AEDm		918.52	1,008.18	1,097.85	1,187.52	1,277.18
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		395,832	444,466	477,451	525,475	579,358
8	Forecast for revenue driver 3	GWh		37,318	42,124	47,345	52,980	59,030
9	PV of financing costs foregone on PC3 and PC4 capex	AEDm	1,477.84					
10	Cost of capital (real)		5.50%					
11	Weight in revenue for Revenue driver 1		80.00%					
12	Weight in revenue for Revenue driver 2		15.00%					
13	Weight in revenue for Revenue driver 3		5.00%					
14	Negative X Factor		0.00					

			PC5					
	PC5 Required Revenue Calculations		**2014**	**2015**	**2016**	**2017**	**2018**	**PV over PC5 Period at 1 January 2014**
15	Operating expenditure allowance	AEDm	592.15	590.00	582.82	575.84	568.86	2,555.29
16	Total depreciation for PC5	AEDm	918.52	1,008.18	1,097.85	1,187.52	1,277.18	4,773.27
17	Return on mid-year RAV	AEDm	985.06	1,080.03	1,170.06	1,255.16	1,335.33	5,069.31
18	Annual revenue requirement	AEDm	2,495.73	2,678.21	2,850.73	3,018.52	3,181.38	12,397.86
19	Discounted annual revenue requirement	AEDm	2,429.81	2,471.53	2,493.59	2,502.71	2,500.23	12,397.86
20	PV of financing costs foregone on PC3 and PC4 capex	AEDm						1,477.84
21	PV of revenue requirement (after foregone financing costs)	AEDm						**13,875.71**

	PC5 Revenue Forecast and Profiling		**2014**	**2015**	**2016**	**2017**	**2018**	**PV Share in TOTAL**	
22	**Revenue driver 1**		1.00	1.00	1.00	1.00	1.00		
23		AEDm	**2,530.82**	2,530.82	2,530.82	2,530.82	2,530.82		
24		AEDm	2,530.82	2,530.82	2,530.82	2,530.82	2,530.82	11,100.57	
25		%	83%	81%	80%	78%	77%	**80%**	
26	**Revenue driver 2**	Customer Accounts	395,832	444,466	477,451	525,475	579,358	**Constraints for Solver Run**	
27		AED / Customer	**989.16**	989.16	989.16	989.16	989.16		
28		AEDm	391.54	439.65	472.27	519.78	573.08	2,081.36	
29		%	13%	14%	15%	16%	17%	**15%**	
30	**Revenue driver 3**	kWh	37,318,000,000	42,124,000,000	47,345,000,000	52,980,000,000	59,030,000,000		
31		fils / kWh	**0.3353**	0.3353	0.3353	0.3353	0.3353		
32		AEDm	125.11	141.23	158.73	177.62	197.91	693.79	
33		%	4%	5%	5%	6%	6%	**5%**	
		Variables for Solver Run							
34	Annual revenue	AEDm	3,047.48	3,111.70	3,161.83	3,228.22	3,301.81	**TOTAL**	Difference
35	**Discounted annual revenue at 1 January 2014**	AEDm	2,966.98	2,871.57	2,765.71	2,676.58	2,594.87	**13,875.71**	**0.00**
								Target for Solver Run	

	Results		**2014**
36	**X Factor**		**0.0**
37	**Fixed revenue term (a)**	**AED million**	**2,530.82**
38	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**989.16**
39	**Co-efficient of variable revenue term (c)**	**fils / kWh metered**	**0.3353**

	Implied Financial Indicators		**2014**	**2015**	**2016**	**2017**	**2018**	**Average**
40	Implied annual profit	AEDm	1536.81	1513.51	1481.16	1464.87	1455.76	1490.42
41	Implied return on mid-point RAV	%	8.58%	7.71%	6.96%	6.42%	6.00%	7.13%

Annex B.4: ADDC water – PC5 price control calculations

Line No. **(all AED amounts are in 2014 prices)**

	Inputs			PC5 2014	2015	2016	2017	2018
1	Operating expenditure allowance	AEDm		332.76	325.58	319.52	314.19	310.80
2	Opening RAV	AEDm		5,086.46	5,477.45	5,847.77	6,197.43	6,526.42
3	Closing RAV	AEDm		5,477.45	5,847.77	6,197.43	6,526.42	6,834.74
4	Mid-Year RAV	AEDm		5,281.96	5,662.61	6,022.60	6,361.92	6,680.58
5	Total depreciation for PC5	AEDm		229.01	249.68	270.34	291.01	311.68
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		294,976	317,168	334,687	355,088	376,650
8	Forecast for revenue driver 3	MIG		157,801	165,894	173,204	181,122	188,392
9	PV of financing costs foregone on PC3 and PC4 capex	AEDm	-162.91					
10	Cost of capital (real)		5.50%					
11	Weight in revenue for Revenue driver 1		80.00%					
12	Weight in revenue for Revenue driver 2		15.00%					
13	Weight in revenue for Revenue driver 3		5.00%					
14	Negative X Factor		0.00					

	PC5 Required Revenue Calculations		PC5 2014	2015	2016	2017	2018	PV over PC5 Period at 1 January 2014
15	Operating expenditure allowance	AEDm	332.76	325.58	319.52	314.19	310.80	1,408.67
16	Total depreciation for PC5	AEDm	229.01	249.68	270.34	291.01	311.68	1,176.08
17	Return on mid-year RAV	AEDm	290.51	311.44	331.24	349.91	367.43	1,438.86
18	Annual revenue requirement	AEDm	852.28	886.70	921.11	955.10	989.91	4,023.61
19	Discounted annual revenue requirement	AEDm	829.77	818.27	805.71	791.89	777.97	4,023.61
20	PV of financing costs foregone on PC3 and PC4 capex	AEDm						-162.91
21	PV of revenue requirement (after foregone financing costs)	AEDm						**3,860.70**

	PC5 Required Forecast and Profiling		2014	2015	2016	2017	2018	PV Share in TOTAL	
22	**Revenue driver 1**		1.00	1.00	1.00	1.00	1.00		
23		AEDm	**704.16**	704.16	704.16	704.16	704.16		
24		AEDm	704.16	704.16	704.16	704.16	704.16	3,088.56	
25		%	82%	81%	80%	79%	78%	**80%**	
26	**Revenue driver 2**	Customer Accounts	294,976	317,168	334,687	355,088	376,650	**Constraints for Solver Run**	
27		AED / Customer	**395.82**	395.82	395.82	395.82	395.82		
28		AEDm	116.76	125.54	132.48	140.55	149.09	579.11	
29		%	14%	14%	15%	16%	17%	**15%**	
30	**Revenue driver 3**	TIG	157,801,000	165,894,000	173,204,000	181,122,000	188,392,000		
31		AED/TIG	**0.2552**	0.2552	0.2552	0.2552	0.2552		
32		AEDm	40.27	42.33	44.20	46.22	48.07	193.04	
33		%	5%	5%	5%	5%	5%	**5%**	
		Variables for Solver Run							
34	Annual revenue	AEDm	861.19	872.04	880.84	890.93	901.32	**TOTAL**	Difference
35	**Discounted annual revenue at 1 January 2014**	AEDm	838.44	804.74	770.49	738.69	708.34	**3,860.70**	**0.00**
								Target for Solver Run	

	Results		2014
36	**X Factor**		**0.0**
37	**Fixed revenue term (a)**	**AED million**	**704.16**
38	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**395.82**
39	**Co-efficient of variable revenue term (c)**	**AED / TIG metered**	**0.2552**

	Implied Financial Indicators		2014	2015	2016	2017	2018	Average
40	Implied annual profit	AEDm	299.42	296.78	290.97	285.73	278.84	290.35
41	Implied return on mid-point RAV	%	5.67%	5.24%	4.83%	4.49%	4.17%	4.88%

Annex B.5: TRANSCO electricity – PC5 price control calculations

Line No. **(all AED amounts are in 2014 prices)**

				PC5				
	Inputs			**2014**	**2015**	**2016**	**2017**	**2018**
1	Operating expenditure allowance	AEDm		279.81	275.91	264.83	257.45	244.82
2	Opening RAV	AEDm		36,819.59	37,216.77	37,544.62	37,803.13	37,992.31
3	Closing RAV	AEDm		37,216.77	37,544.62	37,803.13	37,992.31	38,112.16
4	Mid-Year RAV	AEDm		37,018.18	37,380.69	37,673.87	37,897.72	38,052.23
5	Total depreciation for PC5	AEDm		1,682.82	1,752.15	1,821.49	1,890.82	1,960.15
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		13,068	14,512	15,577	17,059	18,048
8	Forecast for revenue driver 3	GWh		74,276	83,325	91,080	99,148	104,558
9	PV of financing costs foregone on PC3 and PC4 capex	AEDm	1,833.12					
10	Cost of capital (real)		5.50%					
11	Weight in revenue for Revenue driver 1		80.00%					
12	Weight in revenue for Revenue driver 2		10.00%					
13	Weight in revenue for Revenue driver 3		10.00%					
14	Negative X Factor		0.00					

			PC5					
	PC5 Required Revenue Calculations		**2014**	**2015**	**2016**	**2017**	**2018**	**PV over PC5 Period at 1 January 2014**
15	Operating expenditure allowance	AEDm	279.81	275.91	264.83	257.45	244.82	1,164.56
16	Total depreciation for PC5	AEDm	1,682.82	1,752.15	1,821.49	1,890.82	1,960.15	7,956.78
17	Return on mid-year RAV	AEDm	2,036.00	2,055.94	2,072.06	2,084.37	2,092.87	9,064.94
18	Annual revenue requirement	AEDm	3,998.63	4,084.01	4,158.38	4,232.64	4,297.85	18,186.28
19	Discounted annual revenue requirement	AEDm	3,893.01	3,768.84	3,637.42	3,509.36	3,377.65	18,186.28
20	PV of financing costs foregone on PC3 and PC4 capex	AEDm						1,833.12
21	PV of revenue requirement (after foregone financing costs)	AEDm						**20,019.40**

	PC5 Revenue Forecast and Profiling		**2014**	**2015**	**2016**	**2017**	**2018**	**PV Share in TOTAL**	
22	**Revenue driver 1**		1.00	1.00	1.00	1.00	1.00		
23		AEDm	**3,651.39**	3,651.39	3,651.39	3,651.39	3,651.39		
24		AEDm	3,651.39	3,651.39	3,651.39	3,651.39	3,651.39	16,015.52	
25		%	83%	81%	80%	78%	77%	**80%**	
26	**Revenue driver 2**	kW metered	13,068,000	14,512,000	15,577,000	17,059,000	18,048,000	**Constraints for Solver Run**	
27		AED / kW metered	**29.41**	29.41	29.41	29.41	29.41		
28		AEDm	384.34	426.81	458.13	501.72	530.81	2,001.94	
29		%	9%	9%	10%	11%	11%	**10%**	
30	**Revenue driver 3**	kWh	74,276,000,000	83,325,000,000	91,080,000,000	99,148,000,000	104,558,000,000		
31		fils / kWh	**0.5091**	0.5091	0.5091	0.5091	0.5091		
32		AEDm	378.12	424.18	463.66	504.73	532.27	2,001.94	
33		%	9%	9%	10%	11%	11%	**10%**	
		Variables for Solver Run							
34	Annual revenue	AEDm	4,413.84	4,502.38	4,573.18	4,657.84	4,714.47	**TOTAL**	Difference
35	**Discounted annual revenue at 1 January 2014**	AEDm	4,297.25	4,154.93	4,000.25	3,861.90	3,705.07	**20,019.40**	**0.00**
								Target for Solver Run	

	Results		**2014**
36	**X Factor**		**0.0**
37	**Fixed revenue term (a)**	**AED million**	**3,651.39**
38	**Co-efficient of variable revenue term (b)**	**AED / kW metered**	**29.41**
39	**Co-efficient of variable revenue term (c)**	**fils / kWh metered**	**0.5091**

	Implied Financial Indicators		**2014**	**2015**	**2016**	**2017**	**2018**	**Average**
40	Implied annual profit	AEDm	2451.21	2474.31	2486.86	2509.57	2509.49	2486.29
41	Implied return on mid-point RAV	%	6.62%	6.62%	6.60%	6.62%	6.59%	6.61%

Annex B.6: TRANSCO water – PC5 price control calculations

Line No. **(all AED amounts are in 2014 prices)**

				PC5				
	Inputs			**2014**	**2015**	**2016**	**2017**	**2018**
1	Operating expenditure allowance	AEDm		378.11	382.73	364.77	366.62	357.39
2	Opening RAV	AEDm		18,663.62	18,639.33	18,583.37	18,495.74	18,568.00
3	Closing RAV	AEDm		18,639.33	18,583.37	18,495.74	18,568.00	18,622.29
4	Mid-Year RAV	AEDm		18,651.47	18,611.35	18,539.55	18,531.87	18,595.15
5	Total depreciation for PC5	AEDm		974.30	1,005.96	1,037.63	877.73	895.72
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		886	946	966	1,003	1,039
8	Forecast for revenue driver 3	MIG		299,776	321,703	328,646	341,471	353,651
9	PV of financing costs foregone on PC3 and PC4 capex	AEDm	415.69					
10	Cost of capital (real)		5.50%					
11	Weight in revenue for Revenue driver 1		80.00%					
12	Weight in revenue for Revenue driver 2		10.00%					
13	Weight in revenue for Revenue driver 3		10.00%					
14	Negative X Factor		0.00					

			PC5					
	PC5 Required Revenue Calculations		**2014**	**2015**	**2016**	**2017**	**2018**	**PV over PC5 Period at 1 January 2014**
15	Operating expenditure allowance	AEDm	378.11	382.73	364.77	366.62	357.39	1,625.23
16	Total depreciation for PC5	AEDm	974.30	1,005.96	1,037.63	877.73	895.72	4,216.21
17	Return on mid-year RAV	AEDm	1,025.83	1,023.62	1,019.68	1,019.25	1,022.73	4,484.13
18	Annual revenue requirement	AEDm	2,378.24	2,412.32	2,422.08	2,263.61	2,275.83	10,325.57
19	Discounted annual revenue requirement	AEDm	2,315.42	2,226.16	2,118.64	1,876.80	1,788.56	10,325.57
20	PV of financing costs foregone on PC3 and PC4 capex	AEDm						415.69
21	PV of revenue requirement (after foregone financing costs)	AEDm						**10,741.26**

	PC5 Required Forecast and Profiling		**2014**	**2015**	**2016**	**2017**	**2018**	**PV Share in TOTAL**	
22	**Revenue driver 1**		1.00	1.00	1.00	1.00	1.00		
23		AEDm	**1,959.13**	1,959.13	1,959.13	1,959.13	1,959.13		
24		AEDm	1,959.13	1,959.13	1,959.13	1,959.13	1,959.13	8,593.01	
25		%	81%	80%	80%	79%	79%	**80%**	
26	**Revenue driver 2**	TIGD	886,000	946,000	966,000	1,003,000	1,039,000	**Constraints for Solver Run**	
27		AED / TIGD	**254.01**	254.01	254.01	254.01	254.01		
28		AEDm	225.05	240.29	245.37	254.77	263.91	1,074.13	
29		%	9%	10%	10%	10%	11%	**10%**	
30	**Revenue driver 3**	TIG	299,776,000	321,703,000	328,646,000	341,471,000	353,651,000		
31		AED/TIG	**0.7473**	0.7473	0.7473	0.7473	0.7473		
32		AEDm	224.04	240.42	245.61	255.20	264.30	1,074.13	
33		%	9%	10%	10%	10%	11%	**10%**	
		Variables for Solver Run							
34	Annual revenue	AEDm	2,408.21	2,439.84	2,450.11	2,469.09	2,487.34	**TOTAL**	Difference
35	**Discounted annual revenue at 1 January 2014**	AEDm	2,344.60	2,251.56	2,143.16	2,047.17	1,954.78	**10,741.26**	**0.00**
								Target for Solver Run	

	Results		**2014**
36	**X Factor**		**0.0**
37	**Fixed revenue term (a)**	**AED million**	**1,959.13**
38	**Co-efficient of variable revenue term (b)**	**AED / TIGD metered**	**254.01**
39	**Co-efficient of variable revenue term (c)**	**AED / TIG metered**	**0.7473**

	Implied Financial Indicators		**2014**	**2015**	**2016**	**2017**	**2018**	**Average**
40	Implied annual profit	AEDm	1055.80	1051.15	1047.71	1224.74	1234.24	1122.73
41	Implied return on mid-point RAV	%	5.66%	5.65%	5.65%	6.61%	6.64%	6.04%

Annex B.7: ADSSC – PC5 price control calculations

Line No. **(all AED amounts are in 2014 prices)**

				PC5			
	Inputs			**2014**	**2015**	**2016**	**2017**
1	Operating expenditure allowance	AEDm		527.61	508.02	492.62	481.23
2	Opening RAV	AEDm		15,662.59	16,721.74	17,417.20	17,953.55
3	Closing RAV	AEDm		16,721.74	17,417.20	17,953.55	18,422.50
4	Mid-Year RAV	AEDm		16,192.17	17,069.47	17,685.37	18,188.02
5	Total depreciation for PC5	AEDm		790.85	824.55	853.65	881.05
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		529,367	570,129	614,030	661,309
8	Forecast for revenue driver 3	m3		294,480,000	310,461,000	328,449,000	345,622,000
9	PV of financing costs foregone on PC3 and PC4 capex	AEDm	-570.66				
10	Cost of capital (real)		5.50%				
11	Weight in revenue for Revenue driver 1		80.00%				
12	Weight in revenue for Revenue driver 2		10.00%				
13	Weight in revenue for Revenue driver 3		10.00%				
14	Negative X Factor		0.00				

			PC5				
	PC5 Required Revenue Calculations		**2014**	**2015**	**2016**	**2017**	**PV over PC5 Period at 1 January 2014**
15	Operating expenditure allowance	AEDm	527.61	508.02	492.62	481.23	1,812.40
16	Total depreciation for PC5	AEDm	790.85	824.55	853.65	881.05	3,008.07
17	Return on mid-year RAV	AEDm	890.57	938.82	972.70	1,000.34	3,413.65
18	Annual revenue requirement	AEDm	2,209.03	2,271.38	2,318.97	2,362.62	8,234.12
19	Discounted annual revenue requirement	AEDm	2,150.68	2,096.10	2,028.45	1,958.89	8,234.12
20	PV of financing costs foregone on PC3 and PC4 capex	AEDm					-570.66
21	PV of revenue requirement (after foregone financing costs)	AEDm					**7,663.46**

	PC5 Required Forecast and Profiling		**2014**	**2015**	**2016**	**2017**	**PV Share in TOTAL**	
22	**Revenue driver 1**		1.00	1.00	1.00	1.00		
23		AEDm	**1,702.87**	1,702.87	1,702.87	1,702.87		
24		AEDm	1,702.87	1,702.87	1,702.87	1,702.87	6,130.77	
25		%	81%	80%	79%	78%	**80%**	
26	**Revenue driver 2**	Customer Accounts	529,367	570,129	614,030	661,309	**Constraints for Solver Run**	
27		AED / Customer	**360.31**	360.31	360.31	360.31		
28		AEDm	190.73	205.42	221.24	238.27	766.35	
29		%	9%	10%	10%	11%	**10%**	
30	**Revenue driver 3**	m3	294,480,000	310,461,000	328,449,000	345,622,000		
31		AED/m3	**0.6681**	0.6681	0.6681	0.6681		
32		AEDm	196.74	207.42	219.43	230.91	766.35	
33		%	9%	10%	10%	11%	**10%**	
		Variables for Solver Run						
34	Annual revenue	AEDm	2,090.35	2,115.71	2,143.55	2,172.05	**TOTAL**	Difference
35	**Discounted annual revenue at 1 January 2014**	AEDm	2,035.13	1,952.44	1,875.00	1,800.89	**7,663.46**	**0.00**
							Target for Solver Run	

	Results		**2014**
36	**X Factor**		**0.0**
37	**Fixed revenue term (a)**	**AED million**	**1,702.87**
38	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**360.31**
39	**Co-efficient of variable revenue term (c)**	**AED / m3**	**0.6681**

	Implied Financial Indicators		**2014**	**2015**	**2016**	**2017**	**Average**
40	Implied annual profit	AEDm	771.88	783.15	797.27	809.77	790.52
41	Implied return on mid-point RAV	%	4.77%	4.59%	4.51%	4.45%	4.58%

Annex C: Incentives for availability, security and quality of supply

To be issued separately to the network companies

Annex D: Incentives for provision for high quality information

To be issued separately to the network companies