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2009 Price Controls Review

Draft Proposals

CR/E02/035

24 June 2009

Contents

Foreword

1. This document describes our Draft Proposals for PC4 for AADC, ADDC, ADSSC and TRANSCO taking into account the responses to the Second Consultation Paper issued in March 2009.

2. The existing price controls are due to expire on 31 December 2009. The "fourth price controls" or "PC4" are therefore required for 2010 onwards. A separate document setting out the Bureau's Draft Proposals on PC4 for ADWEC will be published in August 2009. As earlier consultation papers on PC4 discussed, the existing controls for RASCO are being extended to continue indefinitely.

3. We continue to propose the PC4 controls for the four network companies to be in the form of CPI-X revenue caps with a four-year duration (2010-2013) and appropriate revenue drivers. We also suggest enhancing the existing Performance Incentive Scheme (PIS) and introducing new performance incentives.

4. Written responses to the Draft Proposals are requested by **6 August 2009** to the following address:

Mark Clifton
Director of Economic Regulation
Regulation and Supervision Bureau
PO Box 32800, Abu Dhabi
Fax: 02-4439-334
Email: mpclifton@rsb.gov.ae

5. The Bureau proposes to make responses to the consultation exercise publicly available. Following consideration of responses to the Draft Proposals, we intend to issue our Final Proposals in September or October 2009.

6. Lastly, it is anticipated that the Bureau's Final Proposals will be formally incorporated into each relevant company's licence on or before 1 January 2010.

NICK CARTER

DIRECTOR GENERAL

Executive summary

Introduction

1. The present price controls for the four network companies (AADC, ADDC, ADSSC and TRANSCO) are due to expire on 31 December 2009. The Bureau therefore commenced a consultation process to set new price controls (to be termed "PC4") for these companies for 2010 and onwards. We published our First Consultation Paper and Second Consultation Paper in November 2008 and March 2009, respectively.

2. This document describes our Draft Proposals for PC4 for the network companies following consideration of the responses to the Second Consultation Paper.

Form of controls

3. The form of PC4 controls for the network companies will remain the CPI-X revenue cap accompanied by a Performance Incentive Scheme (PIS) as at present. However, the PC4 controls will incorporate some new structural features compared to the existing controls:

   (a) All controls will have a four-year duration (2010-2013 inclusive).

   (b) All controls will continue to have the same two revenue drivers as at present (see **Table 1** below), except for ADSSC which will have a new revenue driver (namely annual flow at treatment plants).

   (c) A new term, termed the "Loss, Metering and Demand Incentives" (LMDI), will be introduced in the MAR formulae for AADC and ADDC for both water and electricity businesses to provide a number of new incentives. The LMDI term will comprise three components, each with a cap of 2% of company's "own" MAR (i.e., excluding pass through costs) on the relevant bonuses or penalties:

      (i) Distribution Loss Reduction Incentive (DLRI);

      (ii) Interface Metering Incentive (IMI); and

      (iii) Demand Side Management Incentive (DSMI).

      Section 3 describes the structure and incentive rates for each LMDI.

(d) The scope of TRANSCO's price controls will be formally extended to include its unlicensed transmission activities outside the Emirate of Abu Dhabi which share the same assets with the licensed activities.

(e) ADSSC's payments under Sewage Treatment Agreements (STAs) to new private treatment plants will be treated on a pass-through basis, subject to the economic purchasing obligation.

(f) Electricity purchases (including any approved distribution company's margin) by AADC and ADDC from embedded generation will be treated on a pass-through basis, subject to the economic purchasing obligations.

(g) A Price Control Reopening Mechanism (PCROM) will be introduced into the licence of each company to allow adjustment of the price control between the price control reviews for unforeseen events having material financial impact.

4. The general structure of the maximum allowed revenue (MAR) for each business for any year "t" of the control period shall be as follows:

$$\mathbf{MAR_t = Pass\ Through\ Costs_t + a_t + (b_t \times RD1_t) + (c_t \times RD2_t) + LMDI_t + Q_t - K_t}$$

where:

(a) "a_t", "b_t" and "c_t" are the notified values for the year "t" as determined by the Bureau for 2010 in 2010 prices subject to an adjustment for actual UAE CPI for 2009 and are indexed each year against UAE CPI less an "X" factor, where X has been set at zero;

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

(c) "$LMDI_t$" are the bonuses or penalties in year "t" under the Loss, Metering and Demand Incentives (AADC and ADDC only); and

(d) "Q_t" and "K_t" are the PIS Category A incentive amount and the correction factor for the year "t", respectively.

Framework for price control calculations

5. Consistent with the approach taken to date, a net present value (NPV) framework has been adopted to establish the level and profile of allowed revenue for each business:

(a) The notified values “a”, “b” and “c” for the PC4 period are determined by equating the NPV of the forecast annual MARs to the NPV of the annual required revenues over the control period.

(b) The annual required revenue is calculated using the “building-block” approach as the sum of:

(i) operating expenditure (opex);

(ii) depreciation; and

(iii) return on capital.

(c) The NPV of the annual required revenues over the control period is also adjusted by the NPV of certain financial adjustments discussed in Section 8.

(d) The annual MARs are estimated using the revenue driver projections for the PC4 period (discussed below) and the weights of the revenue drivers as set out in the following table:

Table 1: Revenue drivers and their weights for PC4 – Draft Proposals

Company	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	10%
	Metered units transmitted	10%
ADSSC	Fixed term	80%
	Annual flow at treatment plants	20%

(e) All calculations are carried out in 2010 prices and the cost of capital used to calculate the return on capital (discussed below) is used as the discount rate for NPV calculations.

Revenue driver projections

6. We have adopted the revenue driver projections provided by the respective companies in their 2008 Annual Information Submissions (AIS). The only exception to this is the projections for AADC’s water metered units distributed, which we have adjusted to assume higher metering penetration over time.

Table 2: Revenue driver projections for PC4 – Draft Proposals

			2010	2011	2012	2013
AADC	Electricity customer accounts	Customers	107,072	110,748	114,569	118,541
	Electricity metered units distributed	GWh	9,668	10,926	11,814	12,520
	Water customer accounts	Customers	58,218	58,852	59,539	60,281
	Water metered units distributed	MIG	40,858	54,642	72,391	102,193
ADDC	Electricity customer accounts	Customers	251,538	275,459	284,796	299,655
	Electricity metered units distributed	GWh	26,735	32,217	40,074	44,631
	Water customer accounts	Customers	213,717	233,998	241,887	254,465
	Water metered units distributed	MIG	95,604	101,677	107,541	111,514
TRANSCO	Electricity metered peak demand	MW	9,025	11,307	13,521	14,767
	Electricity metered units transmitted	GWh	56,040	71,026	85,563	93,696
	Water metered peak demand	MIGD	720	789	809	872
	Water metered units transmitted	MIG	246,422	269,668	277,039	297,761
ADSSC	Annual wastewater flow treated	m^3	246,323,170	267,223,070	296,051,865	314,445,675

Operating expenditure

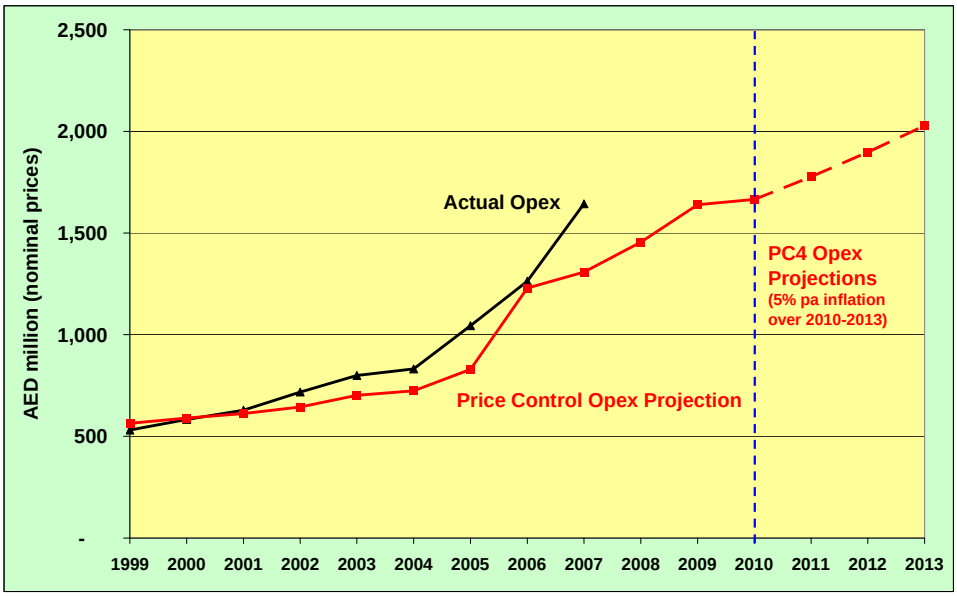
7. The Bureau has used the opex projected for 2009 at the last price control reviews, converted into 2010 prices, as the base level of opex for the PC4 controls. Such base opex has then been adjusted for demand growth (0.75% opex increase for each 1% demand increase) and efficiency improvement (5% opex decrease per year in real terms). The resulting opex projections in 2010 prices are shown in the table below:

Table 3: PC4 opex projections – Draft Proposals

AED million, 2010 prices		2010	2011	2012	2013
AADC	Electricity	225.79	225.04	224.30	223.55
	Water	103.82	102.53	101.25	99.98
	Total	329.61	327.57	325.54	323.54
ADDC	Electricity	334.28	348.17	362.64	377.70
	Water	185.14	182.88	180.65	178.44
	Total	519.42	531.05	543.28	556.14
TRANSCO	Electricity	167.18	181.72	197.52	214.70
	Water	327.23	326.93	326.63	326.33
	Total	494.41	508.65	524.15	541.03
ADSSC	Total	321.40	324.72	328.07	331.45
Total		**1,664.84**	**1,691.98**	**1,721.04**	**1,752.16**

8. As shown in the following chart, the above opex allowances for PC4 are higher than the actual opex for the companies to date in nominal terms (even with a conservative estimate of future inflation). While these allowances attempt to constrain the current rate of cost increases, the increasing trend will continue for opex.

Figure 1: Opex projections – Draft Proposal



Notes: Conversions to nominal prices are based on UAE CPI inflation for years up to 2009 as set out in Table 2.5 and a 5% UAE CPI inflation assumption for each year of the PC4 period (2010-2013).

Capital expenditure

PC2 capex (2003-2005)

9. We have applied the following PC2 capex efficiency scores to the actual PC2 capex as per the audited accounts to determine the efficient PC2 capex for AADC, ADDC and TRANSCO. These figures are as per the consultants' findings without any adjustment (i.e. Approach 1 discussed in the Second Consultation Paper):

Table 4: PC2 capex efficiency – Draft Proposals

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

10. The resulting additional efficient PC2 capex over and above the provisional PC2 allowances incorporated into the PC2 controls are shown in **Table 5**. This amounts to a total of AED 2,631 million in 2003 prices for the three network companies.

11. The NPVs of the foregone or unduly earned financing costs (depreciation and return on capital) up to 2010 in respect of the above amounts, calculated using a discount rate of 6% (the cost of capital for the PC2 period, to which the adjustment relates), have been added to the revenue requirement over the PC4 period. For the three network companies combined, this positive adjustment amounts to about AED 2,517 million in 2010 prices. In addition, efficient PC2 capex (as determined above, and net

of accumulated depreciation) is incorporated into the RAVs for 2010 onwards resulting in additional efficient capex of AED 4,156 million (2010 prices) over and above the PC2 provisional capex allowed earlier.

Table 5: Additional efficient PC2 capex – Draft Proposals

AED million, 2003 prices		2003	2004	2005	Total
AADC	Electricity	173.78	152.75	263.52	590.05
	Water	47.30	65.95	103.45	216.70
	Total	221.07	218.70	366.97	806.75
ADDC	Electricity	62.54	(37.40)	(262.26)	(237.13)
	Water	258.85	90.01	(99.52)	249.34
	Total	321.38	52.61	(361.78)	12.21
TRANSCO	Electricity	(205.07)	839.89	931.27	1,566.09
	Water	427.19	745.73	(927.04)	245.88
	Total	222.12	1,585.62	4.23	1,811.97
Total	2003 prices	764.58	1,856.92	9.43	2,630.93
	2010 prices	**1,207.70**	**2,933.12**	**14.89**	**4,155.71**

PC4 capex (2010-2013)

12. As in the past, an ex-post approach, with provisional capex allowances, has been adopted for PC4 capex. The following table shows the provisional PC4 capex allowances in 2010 prices (about AED 35 billion in total). Pending the receipt of audited data for 2008, the allowance for each business is based on the actual capex spent in 2007, converted into 2010 prices. For ADSSC, the allowance is however set on a significantly higher level than the 2007 level. The total allowance for the four network companies is about half of the companies' forecasts for PC4 capex.

Table 6: Provisional PC4 capex allowances – Draft Proposals

AED million, 2010 prices		2010	2011	2012	2013	Total
AADC	Electricity	510.00	510.00	510.00	510.00	2,040.00
	Water	110.00	110.00	110.00	110.00	440.00
	Total	620.00	620.00	620.00	620.00	2,480.00
ADDC	Electricity	1,250.00	1,250.00	1,250.00	1,250.00	5,000.00
	Water	350.00	350.00	350.00	350.00	1,400.00
	Total	1,600.00	1,600.00	1,600.00	1,600.00	6,400.00
TRANSCO	Electricity	3,540.00	3,540.00	3,540.00	3,540.00	14,160.00
	Water	1,000.00	1,000.00	1,000.00	1,000.00	4,000.00
	Total	4,540.00	4,540.00	4,540.00	4,540.00	18,160.00
ADSSC	Total	2,000.00	2,000.00	2,000.00	2,000.00	8,000.00
Total		**8,760.00**	**8,760.00**	**8,760.00**	**8,760.00**	**35,040.00**

13. These allowances have been rolled into the RAVs for the PC4 period using the straight-line depreciation method with an average asset life assumption of 50 years for ADSSC and 30 years for the other companies.

14. These allowances are not indicative of the Bureau's views of the appropriate or efficient level of capex. Once audited data on actual PC4 capex is available, it will be reviewed against the efficiency criteria established by the Bureau for the sector. That is, capex will be considered efficient if it:

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

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

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

Cost of capital

16. The Draft Proposals use a real, post-tax cost of capital of 4.50% to calculate the return on capital component of the annual revenue requirement. However, in view of the prospective introduction of PCROM at this review, which reduces the risk of unanticipated cost impacts, we are considering whether to further reduce our estimate of the cost of capital by, say, 0.1% - 0.5%.

Financial adjustments

17. Section 8 describes a number of financial adjustments, summarised in the following table, which have been applied to the revenue requirement at this review in NPV terms (in 2010 prices, at 1 January 2010):

Table 7: Financial adjustments – Draft Proposals

AED million, 2010 prices	Customer asset installations	Interface metering	Planning statements	Transmission constraints	Total
AADC Water	-40.33	-30.41			-70.73
ADDC Water		-99.88			-99.88
TRANSCO Electricity			-16.47		-16.47
TRANSCO Water		130.29	-12.32	-285.45	-167.48
Total					**-354.57**

Price control calculations

18. The notified values determined in these Draft Proposals are given in **Table 8** below:

Table 8: Notified values for PC4 – Draft Proposals

			Values for 2010		
2010 prices		**X**	**a**	**b**	**c**
AADC	Electricity	0.00	768.22 AEDm	1,280.11 AED/customer account	0.4295 fils/kWh metered
	Water	0.00	285.34 AEDm	903.98 AED/customer account	0.2685 AED/TIG metered
ADDC	Electricity	0.00	1,103.40 AEDm	746.85 AED/customer account	0.1938 fils/kWh metered
	Water	0.00	541.04 AEDm	431.13 AED/customer account	0.3258 AED/TIG metered
TRANSCO	Electricity	0.00	2,123.73 AEDm	22.03 AED/kW metered	0.3499 fils/kWh metered
	Water	0.00	1,238.93 AEDm	194.79 AED/TIGD metered	0.5697 AED/TIG metered
ADSSC		0.00	1,134.98 AEDm	1.0144 AED/m^3 metered	

Notes: These notified values for 2010 are based on an assumed UAE CPI of 113.07 (base year 2007 = 100) for 2009. They will be subject to an adjustment for actual UAE CPI for 2009.

19. These notified values are for 2010 expressed in 2010 prices. For subsequent years, these notified values will be adjusted by CPI-X indexation. These values will also be adjusted for actual CPI for 2009 through the Price Control Return (PCR) process.

20. The annual MARs projected for each business over the PC4 period in respect of its "own" costs are summarised in **Table 9** below:

Table 9: Projected MAR over PC4 period – Draft Proposals

AED million, 2010 prices		**2010**	**2011**	**2012**	**2013**
AADC	Electricity	946.80	956.91	965.62	973.73
	Water	348.94	353.21	358.60	367.28
	Total	1,295.74	1,310.13	1,324.22	1,341.01
ADDC	Electricity	1,343.08	1,371.58	1,393.78	1,413.71
	Water	664.32	675.05	680.36	687.08
	Total	2,007.41	2,046.62	2,074.14	2,100.79
TRANSCO	Electricity	2,518.66	2,621.37	2,721.01	2,776.92
	Water	1,519.66	1,546.32	1,554.29	1,578.46
	Total	4,038.32	4,167.68	4,275.30	4,355.38
ADSSC	Total	1,384.84	1,406.04	1,435.28	1,453.94
Total		**8,726.30**	**8,930.47**	**9,108.94**	**9,251.11**

21. In nominal terms, the total 2010 projected MAR is higher than the 2008 actual MAR by AED 3,105 million or 55%. This increase remains significant in real terms: about AED 2,371 million (in 2010 prices) or 37%.

22. **Figures 2, 3 and 4** show the expected effect of these Draft Proposals on the total price-controlled costs and unit costs for electricity, water and wastewater,

respectively (in 2010 prices). While the annual MARs are expected to continue the increasing trend in real terms, the increasing demand means that the Draft Proposals are expected to result in a declining trend for the unit cost.

Figure 2: Projected trend of price-controlled MAR - Electricity

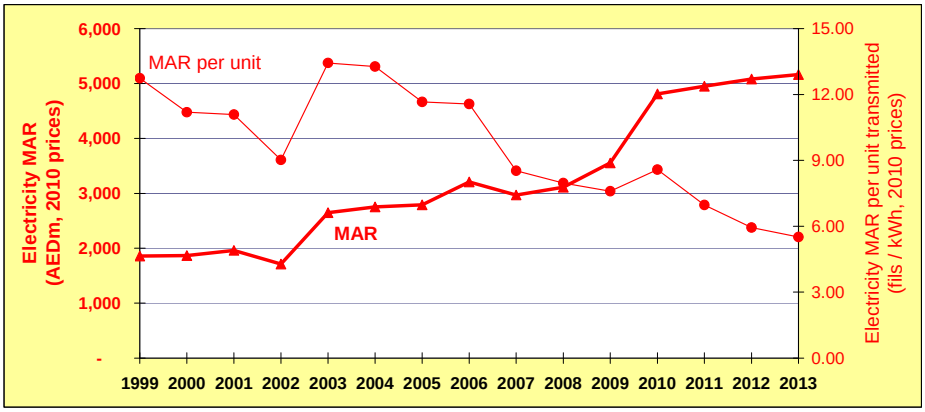


Figure 3: Projected trend of price-controlled MAR - Water

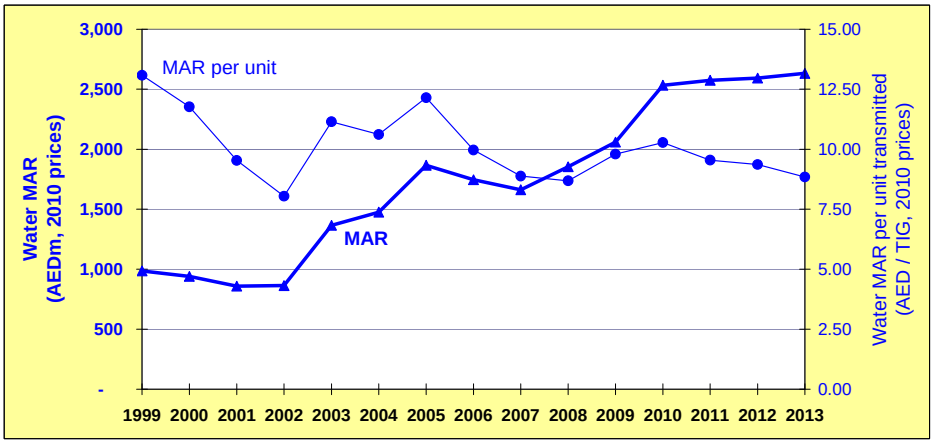
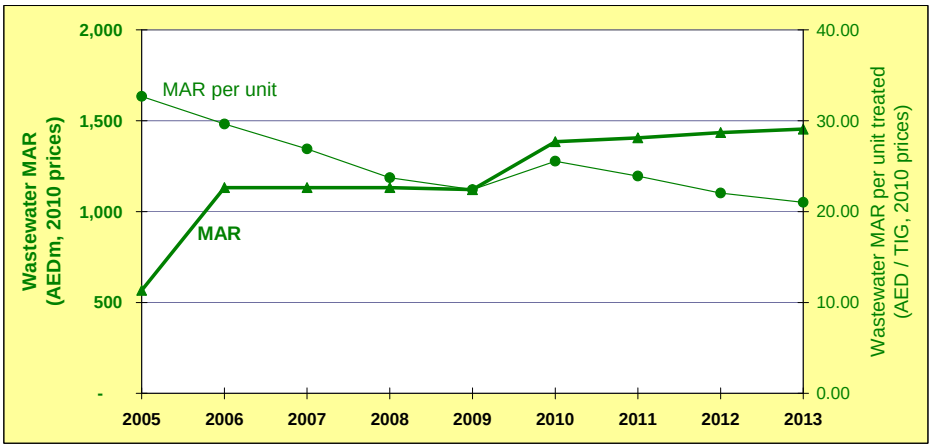


Figure 4: Projected trend of price-controlled MAR - Wastewater



Performance Incentive Scheme (PIS)

23. The PIS will continue to have Category A indicators (listed in **Table 10** below) and Category B indicators. Each Category A technical indicator will be subject to a cap of 1% of the relevant business' "own" annual MAR. There will be no overall cap on Category A indicators. Category B indicators will remain subject to 2% overall cap. Section 10 describes these indicators and their performance targets and incentive rates.

24. The main changes from the existing PIS are summarised below:

(a) The PIS bonuses of the Category A timeliness indicators for audited SBAs will be removed so that only a penalty for delayed submission should apply (bonuses will be retained for PCR and AIS).

(b) The PIS target dates for both PCRs and SBAs will be changed to 30 April, while extending the target date for AIS to 31 October.

(c) The PIS bonus and penalty for each Category A technical indicator will be subject to an individual cap of 1% of the company's "own" MAR. There will be no overall cap on Category A indicators.

(d) While the existing water quality indicator will be retained (with revised compliance target and bonus structure), some new Category A indicators (highlighted in a **red bold** font in **Table 10** below) will be introduced.

Table 10: Category A Indicators for PC4 – Draft Proposals

Company	Electricity	Water	Wastewater
AADC / ADDC	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS Customer Minutes Lost per Customer **Customer Debt Reduction** **SAIFI**	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS Water Quality **Customer Debt Reduction**	
TRANSCO	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Availability Energy Lost	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Water Quality **Availability**	
ADSSC			Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS

Notes: SBA = Separate Business Accounts; PCR = Price Control Return; AIS = Annual Information Submission; SAIFI = System Average Interruption Frequency Index

1. Introduction and background

Overall regulatory framework

1.1 The three water and electricity network companies in the Emirate of Abu Dhabi, namely, Al Ain Distribution Company (AADC), Abu Dhabi Distribution Company (ADDC) and Abu Dhabi Transmission and Despatch Company (TRANSCO), have been subject to price controls set by the Bureau since 1999:

(a) The first price controls (PC1) applied for four years (1999-2002).

(b) The second price controls (PC2) ran for three years (2003-2005).

(c) The current (third) price controls (PC3) apply for four years (2006-2009).

1.2 The water production and electricity generation activities of the Abu Dhabi Company for Servicing Remote Areas (more commonly known as the Remote Area Services Company or RASCO) have been subject to the Bureau's price controls since 2003 following its restructuring in 2002 (when its distribution and supply businesses were transferred to AADC and ADDC). These price controls applied for two years (2004-2005) and were extended in 2005 to apply for a further period.

1.3 The wastewater collection, treatment and disposal activities of the Abu Dhabi Sewerage Services Company (ADSSC) have been subject to a price control set by the Bureau in 2007. This price control applies from the date of establishment of ADSSC (21 June 2005) until the end of 2009.

1.4 The price controls are important because they provide incentives for cost efficiency and performance improvement and determine the cap on the annual revenue of each company. For AADC, ADDC and ADSSC, the difference between the revenue cap and the revenue from customers determines the subsidy required from the government. In 2008, the price-controlled costs in the sector accounted for about AED 5.4 billion, or 43% of total sector costs (AED 12.4 billion).

1.5 The remaining sector costs (not subject to price controls) relate to electricity generation and water desalination, which are subject to competition between bidders to build new production plants and to the economic purchasing obligation of the Abu Dhabi Water and Electricity Company (ADWEC) – the single buyer in the sector and the seller of water and electricity to AADC and ADDC. ADWEC's procurement costs (mainly staff-related costs) are however subject to price controls.

2009 price controls review

1.6 All the current price controls are due to expire at the end of 2009 and require new price controls to be in place to take effect from 1 January 2010. The Bureau's First Consultation Paper marked the start of the process in November 2008 to set the new price controls (referred to as the "PC4" controls), followed by the publication of the Second Consultation Paper in March 2009.

1.7 As discussed in these papers, the Bureau has decided to extend the existing controls for RASCO, and to subject ADWEC to a different control cycle and structure. The Bureau has published a separate Second Consultation Paper in March 2009 on the price control review for ADWEC, to be followed by separate Draft Proposals for ADWEC in August 2009. This paper therefore focuses on the four network companies (i.e., **AADC, ADDC, ADSSC and TRANSCO**).

Timetable for 2009 price controls review

Progress to date

1.8 The First Consultation Paper in November 2008 set out the timetable for the current review. **Table 1.1** below summarises the progress to date against that timetable:

Table 1.1: Progress to date on 2009 Price Controls Review

Target Date	Task	Actual Date
November 2008	Bureau published First Consultation Paper	18 November 2008
5 January 2009	Responses to First Consultation Paper	
	AADC	27 January 2009
	ADDC	22 January 2009
	ADSSC	13 January 2009
	ADWEA	28 December 2008
	TRANSCO	5 January 2009
March 2009	Bureau published Second Consultation Paper	19 March 2009
30 April 2009	Responses to Second Consultation Paper	
	AADC	11 May 2009
	ADDC	10 May 2009
	ADSSC	4 May 2009
	MASDAR	30 April 2009
	TRANSCO	3 May 2009
Meetings to discuss Second Consultation Paper and responses to the paper		
	AADC	21 May 2009
	ADDC	26 May 2009
	ADSSC	14 May 2009
	TRANSCO	12 May 2009
June 2009	Bureau published Draft Proposals	24 June 2009

Notes: Dates shown for responses to Second Consultation Paper are the dates of their receipt by the Bureau.

1.9 The Bureau has received detailed responses to its Second Consultation Paper from each concerned licensee. The Bureau also met with AADC, ADDC, ADSSC and TRANSCO separately in May 2009 to discuss the paper and their responses.

1.10 The responses to the First and Second Consultation Papers were in most cases delayed, by up to three weeks in some cases. TRANSCO was most prompt in responding whereas AADC was most delayed. However, we have tried to minimise the impact of these delays on the timetable for the remainder of the review.

Timetable for remainder of review

1.11 **Table 1.2** below sets out the timetable for the remainder of the review while keeping the six-week period for companies to respond to the consultation papers:

Table 1.2: Remaining timetable for 2009 Price Controls Review

Approximate Date	Task
30 June 2009	Companies to submit Audited Separate Business Accounts
6 August 2009	Companies to respond to Draft Proposals
September / October 2009	Bureau to publish *Final Proposals*

Responses to Second Consultation Paper

1.12 The responses to the Second Consultation Paper are discussed in the relevant sections of this paper. In many cases, we have made changes to our proposals in view of these responses. Some comments relate to the price controls review process, which are discussed below. Where the issues raised by the companies are not related to the price controls review (for example, ADDC's comments on customer tariffs and sector restructuring), the company is invited to make a separate submission.

Comments on review process

1.13 In its response to the Second Consultation Paper, AADC suggested delaying the publication of the Final Proposals until the 2009 Annual Information Submission (AIS) (due to be submitted by 30 September 2009), to enable latest information to be considered (especially for revenue drivers). Our timetable aims at providing adequate time for consideration of the Final Proposals and the required formal consultation period on the proposed licence modifications before they are due to take effect. Companies should therefore submit any comments on the revenue driver projections in response to the consultation papers.

1.14 AADC also suggested that the Bureau publish on its website all the responses to the consultation exercise (to the extent non-commercially sensitive and non-confidential).

As mentioned in each of our consultation papers, we propose to make all responses to the consultation exercise publicly available. We have no objection to the publication by AADC of its response on its website.

1.15 AADC and TRANSCO expressed concern that their issues were not being adequately addressed by the Bureau and that the consultation process was being constrained from being open and transparent. We believe that we have discussed in each consultation paper all the relevant issues raised by respondents. The Bureau needs to strike a balance between the interests of the various stakeholders, including customers, and government (as the subsidy provider to the sector), and to distinguish the issues of significance for this review. The outcome of the consultation on each issue may therefore not be to the full satisfaction of every stakeholder.

2. Form of controls

Introduction

2.1 This section discusses the overall design of the controls for the PC4 period:

(a) type and form of regulation;

(b) duration of controls;

(c) scope and separation of controls;

(d) pass-through costs;

(e) choice of revenue drivers and their weightings;

(f) price control re-opening mechanism (PCROM); and

(g) framework for price control calculations and UAE CPI assumptions.

2.2 Related to the overall structure of PC4 controls, Section 3 discusses new incentive measures for AADC and ADDC (outside the Performance Incentive Scheme) collectively termed as “Loss, Metering and Demand Incentives” (LMDIs).

Type of regulation

2.3 The Second Consultation Paper suggested that CPI-X regulation should continue to apply to all the network companies, with UAE CPI to continue to be used as the price escalation index.

2.4 In their responses to the Second Consultation Paper, all companies supported the continuation of CPI-X regulation. ADDC and ADSSC reiterated their concerns about the inflationary pressure or impact of construction costs on capex and suggested the need for a mechanism / index to reflect the sector costs. As previously clarified, the CPI is the only official price index published in the UAE and thus other published indices are not available. In any case, the impact on capex of construction price inflation will be taken into account at the time of the ex-post capex review. In relation to opex, the CPI is a broad index which includes, for example, housing costs which licensees have highlighted as a key inflationary pressure.

2.5 We have therefore adopted CPI-X regulation for these Draft Proposals (using UAE CPI).

Form of regulation

2.6 The Second Consultation Paper set out the Bureau's thinking that the hybrid form of revenue caps (i.e. fixed revenue term plus variable revenue terms involving revenue drivers) should continue for AADC, ADDC and TRANSCO, and should be introduced for ADSSC with suitable revenue drivers.

2.7 All respondents to the paper supported this thinking. These Draft Proposals are therefore based on hybrid form of revenue caps for all four network companies.

Choice of revenue drivers

2.8 The table below summarises the current revenue drivers and their weights in the MAR formulae for each company as well as the Bureau's thinking for PC4 in the Second Consultation Paper:

Table 2.1: Revenue drivers and their weights in MAR formulae

Company	Revenue Driver	Weight in current price controls	Proposed weight in Second Consultation Paper
AADC / ADDC (both water and electricity)	Fixed term	70%	80%
	Customer numbers	15%	15%
	Metered units distributed	15%	5%
TRANSCO (both water and electricity)	Fixed term	70%	70%
	Metered peak demand	15%	15%
	Metered units transmitted	15%	15%
ADSSC	Fixed term	100%	70%
	Customer numbers	0%	15%
	Annual flow at treatment plants	0%	15%

2.9 Respondents to the Second Consultation Paper raised the following issues:

(a) AADC considered the weightings to be arbitrary and suggested they should reflect the fixed and variable costs of the businesses.

(b) ADDC supported the reduction of weights for metered units distributed revenue drivers to 5%, to remove any undesirable incentive for encourage excessive consumption by customers. However, it expressed concern about the exclusion of estimated meter reads from the calculation of metered units in the MAR formula for the 2008 financial year.

(c) ADSSC argued that the revenue drivers should be within its direct control in order to improve performance. At the meeting on 14 May 2009, ADSSC argued against the use of customer accounts as the revenue driver, as

ADSSC currently has no control over the accuracy of the forecast and the reporting of actual numbers (which is done by the distribution companies). The company supported "annual flow entering treatment plants" as the revenue driver, being metered with reasonable accuracy (+/-3% to 5% tolerance) and reflective of its business size and costs. It however sought to clarify the basis of the weights of revenue drivers in the MAR formula.

(d) TRANSCO expressed concerns about 30% of its revenue being at risk from delays in MDEC-compliant interface metering (through its revenue drivers) and contrasted this to the 1% revenue risk for the distribution companies through the proposed indicators for interface metering. While these meters are owned and maintained by the distribution companies, TRANSCO said it bears the associated revenue risk without any direct control over such assets. TRANSCO highlighted its financial losses due to its metering related revenue drivers in 2008 and 2009. TRANSCO also pointed out that the incentives and risks via the revenue drivers for PC3 were at variance with deadline of January 2010 agreed by the parties in MDEC for completion of interface metering. These issues were discussed at length in a meeting on 12 May 2009 between the Bureau and TRANSCO.

2.10 Our views on these issues are as follows:

(a) As mentioned in earlier consultation papers, the choice of revenue drivers and their weights reflects a number of considerations. They are generally intended to reflect the cost structure of the business, thereby reducing the licensee's exposure to increases in its costs resulting from demand growth. Network businesses have predominately fixed costs but also costs which vary with "outputs" (such as customer numbers and demands). Revenue drivers may also be designed so as to provide desirable incentives, such as increasing metering coverage or reducing losses. This should clarify certain issues raised by AADC and ADSSC on the purpose and calibration of revenue drivers and their weights. We acknowledge that no single revenue driver can satisfy all of these objectives, and are willing to consider any proposal from AADC for alternative revenue driver weightings based on its analysis of the fixed and variable costs of the business.

(b) The Draft Proposals incorporate the reduced weighting of 5% for the 'metered units distributed' revenue driver. We would welcome views on whether this weighting should be further reduced (with corresponding increase in the weight attached to customer numbers) in order to strengthen the incentive for distribution companies to undertake Demand Side Management (DSM) measures. With regard to estimated meter reads, the Bureau has previously

informed ADDC that it supports in principle the inclusion of such units in the definition of 'metered units distributed' for PC4. However we first require ADDC to submit a report detailing its experience with the meter read estimation methodology implemented in February 2008. The Bureau requested such report via letter of 23 February 2009 but has yet to receive a reply from ADDC.

(c) In line with ADSSC's comments, the Draft Proposals incorporate 'annual flow entering treatment plants' as the revenue driver for the company. Further we propose to set the weights of the fixed and variable components in the ratio 80:20, consistent with that for the distribution companies.

(d) We agree with TRANSCO that distribution companies should bear some of the financial consequences of delays in the interface metering programme, but we do not agree that TRANSCO bears no responsibility in view of its licence obligations. Furthermore, the agreement within the MDEC forum related to January 2010 deadline does not make the metering incentives agreed for PC3 invalid and is, in any case, not an issue for PC4 as it takes effect prior to the start of the PC4 period. To address TRANSCO's concerns we have therefore previously proposed in the Second Consultation Paper that the distribution companies should bear a proportion of the loss incurred in 2008 by TRANSCO due to the delay in the water interface metering programme (in earlier years, derogations were granted to TRANSCO to reduce the impact in those years), and that a new Interface Metering Incentive (IMI) be introduced for the distribution companies for the PC4 period. Furthermore, in response to the concerns expressed by TRANSCO in its response to the Second Consultation Paper, that the interface metering incentives given to the TRANSCO (via its revenue drivers) are still greater than those given to distribution companies (via the Interface Metering Incentive), we propose two refinements of our earlier proposal. Firstly, the cap on the IMI has been increased in these Draft Proposals from 1% of MAR to 2% of MAR. Secondly, the weight given to the variable terms in the MAR formulae for TRANSCO is reduced from 30% in aggregate to 20%, in line with other companies. However it should be noted that the weight of a revenue driver is not directly comparable to an incentive cap, as a variation in out-turn revenue drivers does not take away the entire 20% or 30% of revenue, whereas an incentive can reach its cap of 1% or 2%. We believe our Draft Proposal reflect an appropriate balance between the responsibilities of the various parties. Providing the companies concerned respond appropriately to the incentives provided, any negative financial impact can be minimized.

Table 2.2: Revenue drivers and their weights in MAR formulae – Draft Proposals

Company	Revenue Driver	Proposed weight
AADC / ADDC	Fixed term	80%
(both water and electricity)	Customer numbers	15%
	Metered units distributed	5%
TRANSCO	Fixed term	80%
(both water and electricity)	Metered peak demand	10%
	Metered units transmitted	10%
ADSSC	Fixed term	80%
	Annual flow at treatment plants	20%

Duration of controls

2.11 Earlier consultation papers discussed the need for the control duration to strike a balance between providing incentives for efficiency and reducing exposure to unanticipated outcomes, and to be consistent with the best international practice. The Second Consultation Paper suggested that the PC4 controls should have a duration of four years (2010-2013).

2.12 Respondents to the Second Consultation Paper continued to support the four-year duration for PC4. AADC, while reiterating its preference for a three-year period in order to reduce exposure to unanticipated outcomes, indicated its acceptance of a four-year duration upon its satisfaction that *"reasonable "re-opener" provisions will adequately deal with these outcomes as and when they arise."*

2.13 The Price Control Re-Opening Mechanism (PCROM) is discussed below. We have adopted a four-year control duration for PC4 in this paper.

Scope and separation of controls

2.14 The scope and separation of the present price controls can be summarised as follows:

(a) There are separate price controls for the water and electricity businesses of AADC, ADDC and TRANSCO. There is no such separation of controls for the sewerage, wastewater treatment and disposal businesses of ADSSC, nor for the distribution and supply businesses of the distribution companies.

(b) The scope of the present price controls covers, via the definition of the term "Regulated Revenue" in the respective licences, all the income of these companies, excluding only any revenues from unlicensed activities for which the concerned company has received the consent of the Bureau under the respective licence (termed "Excluded Income" in the licences).

(c) However, TRANSCO's unlicensed transmission activities outside the Emirate of Abu Dhabi which share the same assets with the licensed activities (referred to as 'unlicensed shared' assets) are included within the scope of the current price controls (as per an understanding agreed between TRANSCO and the Bureau).

(d) For AADC, ADDC and ADSSC, "Regulated Revenue" is defined in the licence to include any revenue which *should be* billed to and collected from their customers according to approved tariffs, rather than the revenue actually billed to the customers (this provides incentive for distribution companies to bill all income to which they are entitled under the approved tariffs).

2.15 In the Second Consultation Paper, we proposed that the existing scope and separation of price controls should be retained for all companies, with necessary changes to formally extend the scope of TRANSCO's price controls to include 'unlicensed shared' assets. The paper also sought views on whether any changes are required to further clarify the definition of Regulated Revenue.

2.16 Respondents to the paper supported the retention of the existing separation and scope of price controls. AADC explicitly accepted the definition of the Regulated Revenue. ADDC reiterated some of its concerns and suggestions regarding separation/merger between distribution and supply businesses. However, it accepted continuation of the current separation of controls in view of the additional costs that the sector could incur otherwise.

2.17 We have therefore not made any change to our proposal on the scope and separation of price controls.

Pass-through costs

2.18 As shown in **Table 2.3** below, the Second Consultation Paper expressed the Bureau's thinking to:

(a) retain all the existing pass-through items in the price controls;

(b) allow ADSSC's payments to new private wastewater treatment plants under the long-term Sewage Treatment Agreements (STAs) as pass-through costs, subject to ADSSC demonstrating compliance with its economic purchasing obligation; and

(c) treat the cost of electricity purchases by ADDC and AADC from embedded generation on a pass-through basis in the MAR formulae in the same manner

as their other electricity and water purchases (from ADWEC and RASCO), subject to the economic purchasing obligation.

Table 2.3: Pass-through costs

Company	Current pass-through costs	Additional pass-through costs identified in Second Consultation Paper
AADC / ADDC	Water and electricity purchases Transmission charges	Electricity purchases from embedded generation
TRANSCO	Electricity ancillary service costs	
ADSSC	None	Sewerage Treatment Agreements (STAs) costs

2.19 The paper also indicated the new incentives we were possibly considering for both the developers and the distribution companies to encourage the development of embedded RE projects, such as (a) payment of the full cost-reflective tariff payments (as approved by the Bureau) by the relevant distribution company without the need for a separate, direct 'green' payment by the government to embedded RE projects – with the distribution companies showing as a separate subsidy line in its audited PCR the equivalent 'green' payment (i.e., the difference between the full cost-reflective tariff payment to RE projects and the costs of equivalent energy from other sources (e.g., average BST and TUoS costs)); and (b) providing the relevant distribution company a profit margin on the energy purchases from RE projects to finance and encourage such activities.

2.20 Finally, the paper suggested introducing a mechanism similar to a pass-through treatment for the Bureau's licence fees, which would limit future increases in such fees to no more than the UAE CPI inflation (assuming no increase in the scope of our legal duties).

2.21 Respondents to the Second Consultation Paper generally supported the retention of the existing pass-through costs and the introduction of the new pass-through items. However, they raised a number of important issues:

(a) AADC expressed concerns that the proposed pass-through of electricity purchases from embedded RE projects at full cost-reflective tariffs (exceeding electricity purchase costs from ADWEC) will increase the sector's subsidy requirements. It highlighted the need to ensure transparency of such additional subsidy and take account of the resulting additional administration costs for the distribution companies.

(b) ADDC sought clarification on the details / calculation of full cost-reflective tariffs and its profit margin for embedded RE generation and justification for the change in pricing methodology from the avoidable cost basis (currently being discussed for a wind power project).

(c) On the economic purchasing obligation for STA costs, ADSSC stated that it will exert all efforts to obtain appropriate documentation that demonstrate efficient procurement. However, the company suggested that the Bureau should also contact ADWEA for such evidence.

(d) MASDAR via its response dated 30 April 2009 supported incentives for both the developers and the distribution companies in relation to the embedded RE projects and proposed payment of a full cost-reflective tariff to such projects. It suggested the development of a framework for tariff setting and a standard power purchase agreement (PPA) for such projects. It also highlighted a number of issues to be considered for such projects and the PPAs.

2.22 We welcome the positive and constructive discussion on the embedded RE projects. The Bureau will continue to work with all the relevant parties on this subject with the objective to formulate a regulatory policy for the determination of tariffs, subsidy and the distribution company's profit margin for such projects. From the price control review perspective, we consider it important to confirm the following at this stage:

(a) all actual costs of electricity purchases from embedded generation (RE or otherwise), including any profit margin determined by the Bureau for purchases from RE projects, will be treated on pass-through basis in the MAR formulae for distribution companies, subject to their economic purchasing obligation; and

(b) for any RE project for which it is agreed that the distribution company makes payments on a cost-reflective basis, it will be required to show as a separate line in its PCR the subsidy or green payment required as the difference between the tariff payment and the benchmark cost of energy from conventional sources (avoided BST and TUoS costs).

2.23 The above should provide the administrative cost recovery mechanism for the distribution companies (through the profit margin) and the transparency of subsidy implications relating to RE projects (through the PCR, if applicable).

2.24 With regards to STA costs, we appreciate ADSSC's undertaking to demonstrate efficient procurement. It is worth noting here that the burden of proof for such procurement is on ADSSC as the licensee and not ADWEA.

2.25 For these Draft Proposals, we have therefore adopted the following pass-through costs all subject to the economic purchasing obligations, which will be incorporated into the respective licences through the modifications required to give effect to PC4:

Table 2.4 : Pass through costs – Draft Proposals

Company	Pass-through costs for PC4
AADC / ADDC	1. Water and electricity purchases 2. Transmission charges 3. Electricity purchases from embedded generation (along with any distribution company's margin approved by the Bureau)
TRANSCO	Electricity ancillary service costs
ADSSC	Sewerage Treatment Agreements (STAs) costs

Notes: All pass-through costs are subject to the relevant licensee's economic purchasing obligation.

2.26 With respect to the Bureau's licence fees, we propose that any licence fee charged during the PC4 period to a network company in excess of the 2009 fee level in real terms should be remunerated (along with the interest foregone) to the relevant company at the next price control review through appropriate financial adjustment to its future revenue (or vice versa). This is a similar to a pass-through treatment, but at the later date rather than through an automatic annual adjustment in the MAR. The objective is to retain the accountability aspect of the Bureau's costs and licensees' ability to question them.

Extension of price controls for RASCO

2.27 Based on the analysis showing satisfactory operation of the current price controls for RASCO over the last five years, earlier consultation papers suggested that the present price controls for RASCO should be continued indefinitely until notification is given by the Bureau of an intention to modify the controls (or RASCO requests such controls to be reviewed).

2.28 In its response to the Second Consultation Paper, ADDC reluctantly agreed to the above proposal and reiterated that the restructuring issues raised earlier by ADDC (i.e. merger of RASCO and ADWEC and relevant price controls into ADDC, and licence modification for RASCO to purchase electricity from embedded generators) should be addressed. These issues are already discussed in the Second Consultation Paper.

2.29 For these Draft Proposals, the Bureau continues with its proposal to extend the current price controls for RASCO indefinitely.

Price Control Re-Opening Mechanism (PCROM)

2.30 During the PC3 period, a number of licensees raised concerns about unanticipated inflationary increases in costs which had occurred since the last price controls review, which they regarded as being outside of their control. Notwithstanding the Bureau's views on the specifics of such claims, the Bureau undertook to consider the introduction of a mechanism into companies' licences at this review to allow price

controls to be re-opened between price control reviews in future – in certain defined circumstances.

2.31 The Second Consultation Paper therefore described the Bureau's thinking to introduce a Price Control Reopening Mechanism (PCROM) into the licence of each network company at this review with the following features:

(a) Price controls can be re-opened between the price control reviews for types of events pre-specified in the licences, provided their cumulative impact is equal to 10% or more of the annual turnover ('own' MAR) of the respective company.

(b) Such pre-specified events could include (i) events beyond the control of a licensee, (ii) unreasonably 'excessive' profits earned by a licensee, and (iii) a takeover or privatisation of a licensee.

(c) Upon the occurrence or observation of such an event or events, the mechanism can be invoked by the Bureau on a licensee's request or otherwise.

(d) The Bureau will undertake the necessary calculations to reset the price controls if necessary (subject to appropriate consultation with the licensee concerned).

2.32 Such a mechanism has a benefit of reducing the risks for the licensees, thus lowering their cost of capital. As mentioned in Section 7, we are therefore considering reducing our cost of capital estimate for PC4 calculations, if PCROM is adopted at this review.

2.33 No respondents to the Second Consultation Paper opposed the proposal. However, AADC and ADDC while accepting the proposal raised some points of clarification:

(a) AADC did not agree that re-opening events must be "*rare*" and suggested that the "*correct conditions for re-opening should prevail regardless of whether these turn out to be "rare" or not"*. It also sought validation of the 10% re-opener trigger and recommended that "sector restructuring" be included as an additional pre-specified event.

(b) ADDC reiterated its concerns in relation to the mega projects and, along with AADC, recommended that the PCROM should also apply to mega projects.

2.34 Our views on these points are as follows:

(a) It was AADC which suggested in its response to the First Consultation Paper that the events triggering PCROM should be infrequent and unusual in nature. The Bureau agreed with this and emphasised that the threshold for the materiality of the financial impact of such events should therefore be sufficiently wide to avoid a frequent need for reopening. While the proposed text for PCROM does not presently use the word "rare" for triggering events, it is the intent of the mechanism. With regards to the threshold, the First and Second Consultation Papers explain how it was derived. We are however willing to consider a higher threshold if AADC and other companies wish so. On the other point raised by AADC, we propose to add "*sector restructuring which involves the merger of, or separation of any business from, the licensee and changes the legal obligations or responsibilities of the licensee*" as an additional pre-specified event. This event therefore does not intend to cover a company's internal reorganisation or a sector restructuring having no impact on the company's responsibilities.

(b) The Second Consultation Paper and the relevant sections of this paper discuss the regulation of capex relating to mega projects. We reiterate that PCROM is not intended for events (such as mega projects-related capex) already foreseen as a future possibility and taken into account in the design of the price controls (such as through the ex-post approach to capex regulation in this case).

2.35 We have therefore retained our proposal on PCROM for the Draft Proposals as outlined in paragraph 2.31 above modified as suggested in paragraph 2.34(a) above. We welcome views on this for any further improvement which we can consider while proposing the precise licence modification in the Final Proposals.

Structure of PC4 controls

2.36 Based on the above discussion, the structure of the Maximum Allowed Revenue (MAR) for each business for any year "t" of the PC4 control period shall be as follows:

$$\mathbf{MAR_t = Pass\ Through\ Costs_t + a_t + (b_t \times RD1_t) + (c_t \times RD2_t) + LMDI_t + Q_t - K_t}$$

where:

(a) Pass through costs are those listed in **Table 2.4** above.

(b) "a_t", "b_t" and "c_t" are the notified values for the year "t" as determined by the Bureau in 2010 prices through price control calculations and are indexed

against UAE Consumer Price Index (CPI) less a "X" factor (including an adjustment for actual 2009 UAE CPI as per paragraph 2.47 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";

(d) "$LMDI_t$" is the Loss, Metering and Demand Incentive for AADC and ADDC (described in Section 3); and

(e) "Q_t" and "K_t" are the PIS Category A incentive amount and the correction factor for the year "t", respectively.

Framework for price control calculations

2.37 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 to date.

2.38 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

+ Financial adjustments

+ PC2 capex financing costs foregone

where:

(a) Operating expenditure (opex) refers to operating costs excluding depreciation and is discussed in Section 5.

(b) Depreciation is calculated using a straight-line method and an assumed average asset life separately in respect of the initial Regulatory Asset Value (RAV) (at the time of first control setting) and each year's capex, as discussed in Section 6.

(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. This is also discussed in Section 6.

(d) NPV of the financial adjustments, discussed in Section 8, are applied (added or subtracted, as the case may be) to the NPV of the required revenue over the control period.

(e) NPV of the foregone financing costs in respect of the additional efficient PC2 capex (discussed in Section 6), are applied to the NPV of the required revenue over the control period.

2.39 The projected MAR for each year of the control period is calculated using the revenue driver projections (Section 4), appropriate weightings for the fixed and variable terms (discussed earlier in this Section 2), and an appropriate 'X' factor (set to zero).

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

NPV of projected annual MARs = NPV of required revenues

2.41 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 LMDIs, Q and K terms are excluded.

2.42 Subsequent sections of this document discuss the required inputs to the price control calculations as mentioned above. Section 9 describes the price control calculations in detail as well as the financial model used for these calculations.

UAE CPI assumptions

2.43 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:

Table 2.5: UAE CPI Assumptions – Draft Proposals

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009YTD	2009A
UAE CPI	65.34	66.74	67.66	69.55	71.58	73.82	77.54	82.34	89.99	100.00	112.30	113.07	114.63
UAE Inflation		2.15%	1.37%	2.80%	2.92%	3.12%	5.04%	6.20%	9.29%	11.13%	**12.30%**	**0.69%**	**2.07%**

Source: UAE Ministry of Economy (Base year 2007 = 100). The UAE CPI figures for 1998-2006 with base year 2007 = 100 have been derived from earlier official CPI figures with base year 1995 = 100 or base year 2000 = 100.

Notes: 2009 CPI is an assumption based on latest available CPI (i.e. CPI for April 2009). "2009YTD" is the actual year-to-date CPI inflation as of end of April 2009. "2009A" is an annualised CPI inflation for 2009 assuming each of the four-month periods in 2009 has the same inflation as that for January-April 2009.

2.44 In their responses to the Second Consultation Paper, AADC, ADDC and TRANSCO argued against the CPI assumption of 6% for 2009 used in that paper and suggested using the latest available actual CPI (i.e. for 2007) as the assumption for 2009. It was

argued that this would be consistent with the approach used at the previous review in relation to the CPI assumption for the final year of the expiring control period. AADC and ADDC also suggested financial adjustments at this review to compensate them for the difference between the 5.04% inflation assumption for 2005 used at the previous review and the actual 6.20% inflation for 2005. AADC further argued for a similar financial adjustment at the next review for such difference for 2009.

2.45 We consider it appropriate to use as reasonable as possible a forecast of future inflation. The Bureau's assumption for 2005 inflation at the previous review was our best estimate at the time. Our assumption for 2009 inflation in the Second Consultation Paper was consistent with the 6% forecast available at the time (MEED Vol. 53 No.11, 13-19 March 2009).

2.46 In early June 2009, the UAE Ministry of Economy released the official outturn UAE CPI of 112.30 (i.e. inflation of 12.30% p.a.) for 2008 (with the new base year 2007 = 100). We have therefore used this actual CPI for 2008 in these Draft Proposals (as shown in the above table). Further, the Ministry has also commenced publication of monthly CPI. The latest available CPI for April 2009 is 113.07 indicating a year-to-date inflation of 0.69% (with some earlier months of 2009 showing negative monthly inflation). In these Draft Proposals, we have assumed this latest CPI figure for 2009 – assuming the prices will not change during April to December 2009. If this four-month inflation however continues over the remainder of 2009, the annualised inflation for 2009 would be 2.07%. The 2009 inflation figure will be updated in the Final Proposals for latest data.

2.47 To further address the companies' concern relating to 2009 inflation, we propose adjusting the notified values "a", "b" and "c" calculated at this review in 2010 prices (using the above CPI of 113.07 or 0.69% inflation assumption for 2009) for actual inflation for 2009 when known during the PC4 period. This adjustment will be done through the Price Control Return (PCR) for 2010 using appropriate formulae in the licence modifications required to incorporate PC4.

2.48 With regards to the 2005 inflation assumption at the last review, we consider it an accepted risk for the sector and the licensees at the time which could have gone in either direction. There was no adjustment for actual inflation agreed at that time.

2.49 However, in relation to the opex projections for PC4 presented in Section 5, we have adjusted our base opex derived from the PC3 opex projection made at the time of the 2005 price controls review for the difference between the actual and assumed CPIs for 2005. (Such an adjustment is not required for ADDSC as the opex projected at its last price control review in 2007 was based on actual 2005 CPI).

3. Loss, Metering and Demand Incentives

Introduction

3.1 In the Second Consultation Paper, we suggested two new incentives for AADC and ADDC (for water and electricity) to incentivise reductions in distribution losses through a new MAR term and to incentivise interface metering through a new PIS Category A indicator. The paper also discussed our support for distribution companies' Demand Side Management (DSM) initiatives. However, we have not received detailed information on any such initiative from the distribution companies or suggestions on how to incentivise DSM. We therefore consider it timely to also propose incentives for the distribution companies to undertake DSM initiatives.

3.2 In these Draft Proposals, we propose introducing a new term in the MAR formulae called "Loss, Metering and Demand Incentives", or LMDI, comprising three components, each with a cap of 2% of company's "own" MAR (i.e., excluding pass through costs):

(a) Distribution Loss Reduction Incentive (DLRI);

(b) Interface Metering Incentive (IMI); and

(c) Demand Side Management Incentive (DSMI).

3.3 That is, for each of the water and electricity businesses of AADC and ADDC, and for any year, the new MAR term "LMDI" will be as follows:

LMDI = DLRI + IMI + DSMI

3.4 Like PIS Category A indicators, LMDIs have been structured and defined as objectively as possible. The main distinction is that each LMDI is subject to a cap of 2% of company's "own" MAR, in contrast to the 1% cap for PIS Category A technical indicators.

3.5 These LMDIs can take effect (i.e. appear in MAR formulae) from 2010 because their inputs are already audited, in one form or the other, at present. It is however for consideration whether the LMDI calculated for performance in year "t" can be used to adjust the MAR in the same year "t" or should adjust the MAR in year "t+1" or "t+2", as for the PIS.

3.6 This Section 3 sets out our specific proposal on each LMDI in turn.

Distribution Loss Reduction Incentive (DLRI)

3.7 Our earlier papers discussed the need to provide positive incentives for metering and loss reduction in view of the reduced weight given to 'metered units distributed' revenue drivers in the price control formulae. The Second Consultation Paper therefore described the Bureau's thinking to introduce a new term "DLRI" in the MAR formulae for AADC and ADDC for both water and electricity businesses, based on the proportion of water / electricity entering the distribution system which is delivered through a meter to final customers. Each year, the company's performance can be assessed against the actual performance in the previous year. This term will then increase (i.e., bonus) or decrease (i.e., penalty) the MAR for the performance improvement or deterioration over the previous year. Given the importance of these matters, MAR variation in any given year for such performance was suggested to be up to 2% of the company's "own" MAR in that year.

3.8 In its response to the Second Consultation Paper, AADC accepted the above proposal subject to the agreement on "*timing and use of a measurement*" and the incentive mechanism being "*reasonably reflective of performance attributable to the company*". AADC also argued that, if such an incentive is required, there should not be a cap. It therefore requested a justification for a cap on such an incentive.

3.9 ADDC disagreed with the proposal as, it argued, DLRI does not match costs and revenue, the 2% cap is without any evidence on volatility of the measure, and the proposal lacks details of the algorithm and the types of losses to be covered. ADDC suggested such an incentive should first be introduced and tested as a PIS Category B indicator. However, ADDC also expressed its belief that any programme for DSM must address the distribution losses, which require accurate interface metering, and sought more details on the loss-related proposal.

3.10 We believe that a measure can be (and has in the past been) introduced directly as a PIS Category A indicator or a MAR term if it meets the relevant objective criteria. The Bureau also considers that the DLRI is an objective measure and will need to be verified by the independent Technical Assessor (TA), as part of the Price Control Return (PCR) audit. The 2% cap (or, any cap, for that matter) has been proposed for the very reason or concern about the uncertainty on the volatility of the measure highlighted by ADDC. As explained in the consultation papers published on price controls since 2002, such caps on incentives are intended to limit the financial risks of a business. The proposed indicator does not distinguish between various types of losses but provides an incentive to reduce losses in total i.e. to reduce water or electricity not delivered or metered.

3.11 For these Draft Proposals, the Bureau proposes to define the DLRI for any year "t" (in UAE Dirhams) as follows (as a new MAR term subject to a cap equal to 2% of the company's "own" MAR in that year):

$$\mathbf{DLRI_t = Incentive\ Rate \times (DL_t - DL_{t-1}) / DL_{t-1} \times 100}$$

where:

DL_t means the actual distribution loss for the year "t" as verified by the TA;

DL_{t-1} means the actual distribution loss for the year "t-1" as verified by the TA; and

3.12 The actual distribution loss for any year "t" (same formula for year "t-1") is calculated as follows:

$$\mathbf{DL_t = (TUE_t - MUD_t) / TUE_t \times 100}$$

where:

TUE_t means total number of units entering the distribution system in year "t" set equal to the total quantity of water or electricity (as the case may be) charged by ADWEC to the relevant distribution company in that year under the BST;

MUD_t means the total number of metered units distributed (i.e., the existing revenue driver for the distribution companies, or the terms "QU_E" or "QU_W" defined in their licenses) for the year "t".

3.13 Both the inputs i.e., TUE and MUD, to the calculation of DLRI are currently audited for ADWEC and AADC / ADDC, respectively.

3.14 In the above formula, the "Incentive Rate" is expressed in AED per 1% of improvement or deterioration of distribution loss. We have calculated this rate separately for the water and electricity businesses of AADC and ADDC by dividing (a) 2% of the average MAR forecast for PC4 (see Section 9) of the relevant business, by (b) 20%, taken to be the assumed maximum performance improvement or deterioration. This method of calibration is consistent with the way incentive rates are calculated for the PIS Category A indicators. The resulting incentive rates for these Draft Proposals are as follows:

Table 3.1: Incentive Rates for DLRI – Draft Proposals

AED / 1% improvement or deterioration	Electricity	Water
AADC	960,000	360,000
ADDC	1,380,000	680,000

3.15 The above formula has been structured in a way that the DLRI term will automatically take a positive sign (bonus) or negative sign (penalty) if the distribution losses in a year improve or deteriorate from the previous year.

Interface Metering Incentive (IMI)

3.16 Recognising the shared responsibility of TRANSCO and the distribution companies to ensure MDEC-compliant interface metering, the Second Consultation Paper set out the Bureau's thinking to introduce a new Category A indicator for AADC and ADDC to incentivise interface metering (for both water and electricity) (TRANSCO is already incentivised via the revenue drivers in its MAR formulae). We described how such an indicator can be defined in terms of the ratio between (a) the number of units entering the respective distribution system through MDEC-compliant interface meters and (b) the total number of units entering the distribution system (whether metered or estimated otherwise) during that year, where the latter can simply be taken as the *total* units charged by ADWEC to the relevant distribution company under the BST. The company's actual performance on this indicator during a year can be used as the target for the next year or the Bureau can prescribe suitable annual targets. Further, the performance on this indicator will be subject to audit by the independent TA.

3.17 The companies' responses to the above are summarised as follows:

(a) AADC did not accept interface metering as a Category A indicator, arguing that TRANSCO is responsible for interface metering for AADC according to an agreement entered into by the two companies. Accordingly, AADC argued it cannot be held accountable for interface metering or resulting financial losses to TRANSCO. AADC also argued that a case had not been adequately made to justify this new indicator because, in AADC's area, all the meters have already been installed for electricity and are largely in place for water. AADC suggested the targets or mechanism to set targets for metering should be clearly set out before the commencement of the PC4 period.

(b) ADDC also disagreed, arguing that this indicator does not meet the Bureau's objective criteria for PIS Category A indicators, and reiterated that this should first be tested as a Category B indicator. While it argued that interface metering is a pre-requisite for accurate measurement of its distribution losses, it sought details on the loss-related DLRI term and did not see the case for an interface metering incentive.

(c) As mentioned earlier in relation to the revenue drivers, TRANSCO did not see an interface metering-related PIS Category A indicator for the distribution

companies with a 1% of MAR cap as providing sufficient incentives in comparison with the metering incentives provided through revenue drivers for TRANSCO.

3.18 Our views on the above issues are as follows:

(a) We consider that the interface metering is a shared responsibility of TRANSCO and the distribution companies. Under the MDEC, the distribution company has the obligation to install, own and maintain the interface meters, and TRANSCO has to ensure compliance with this obligation. TRANSCO also has a licence obligation to ensure all users connected to its system are appropriately metered. Any agreement to outsource installation of such meters to TRANSCO does not relieve AADC from its MDEC obligation. The recent data available to the Bureau as presented in Section 8 indicates the continuing need for further, significant metering. In addition, if interface metering is as complete as AADC's response suggests, AADC should not be adversely affected by the proposed Interface Metering Incentive.

(b) We have provided further details on the Interface Metering Incentive (below) to address AADC's suggestion for clarity on the mechanism and targets and ADDC's concerns on the objectivity of the measure. We are not clear about ADDC's statements in its response about this and other incentive mechanisms. For example, ADDC wrote that: "*ADDC believes that DSM is critical to the future of the industry and a key element of any program to reduce DSM is to understand losses which require accurate interface metering. ADDC suggests that appropriate introduction of a network loss indicator will better serve the sector than an arguable retrospective penalty that Transco has known about and suffered and now want to transfer to someone else."* ADDC however then stated that a network loss measure needs the interface meters to work.

(c) As clarified earlier, the weight of a revenue driver is not directly comparable to an incentive cap. However, we agree with TRANSCO that the 1% cap on the interface metering incentive for the distribution companies is not sufficient.

3.19 For these Draft Proposals, the Bureau proposes to define a new term "Interface Metering Incentive" or IMI in the MAR formulae for the distribution companies with a cap equal to 2% of the company's own MAR. This new IMI term (in UAE Dirhams) for any year "t" is defined as follows:

$$\mathbf{IMI_t = - Incentive\ Amount \times [(100\% - IM_{t-1}) - (IM_t - IM_{t-1})] / (100\% - IM_{t-1}) \times 100}$$

where:

IM_t means the actual interface metering for the year "t" as verified by the TA;

IM_{t-1} means the actual interface metering for the year "t-1" as verified by the TA; and

3.20 The actual interface metering for any year "t" (same formula for year "t-1") is calculated as follows:

$$IM_t = MUE_t / TUE_t \times 100$$

where:

TUE_t as defined earlier for DLRI;

MUE_t means the total number of units entering the distribution system in the year "t" as measured through MDEC-compliant meters.

3.21 Both the inputs i.e., TUE and MUE, to the calculation of IMI are currently audited for ADWEC and TRANSCO, respectively.

3.22 In the above formula, the "Incentive Amount" is a total amount of incentives (expressed in AED) rather than an incentive rate (AED / 1% of improvement or deterioration). We have calculated this amount separately for the water and electricity businesses of AADC and ADDC simply by taking 2% of the average MAR forecast for PC4 (see Section 9) of the relevant business. The resulting incentive amounts for these Draft Proposals are as follows:

Table 3.2: Incentive Amounts for IMI – Draft Proposals

AED million	Electricity	Water
AADC	19,220,000	7,140,000
ADDC	27,610,000	13,530,000

3.23 The IMI term can either be zero or negative (penalty) but will never be positive (bonus). The target metering for each year would be 100% and the maximum penalty for any year will be capped at 2% of the company's own MAR:

(a) If a distribution company achieves 100% interface metering in a year, it will not incur any penalty (IMI = zero) for that year.

(b) If the company fails to achieve 100% in a year, it will incur a penalty. The higher the difference between actual metering and 100% metering, the higher will be the penalty.

(c) If the interface metering in a year does not improve or deteriorates from the previous year, the penalty will be equal to the Incentive Amount shown in the above table.

(d) A company will therefore need to improve its interface metering (i) from the previous year to reduce the penalty under IMI and (ii) up to 100% to avoid any penalty under IMI.

Demand Side Management Incentive (DSMI)

3.24 ADDC's response, in particular, highlighted the importance of future DSM initiatives and the need for a supportive regulatory environment. We are therefore proposing a specific measure to incentivise and finance DSM initiatives. We propose the DSMI, as a component of the new MAR term LMDI, to be defined as follows (separately for water and electricity):

$$\mathbf{DSMI_t = Incentive\ Rate \times (MUDR_{2009} - MUDR_t) / MUDR_{2009}}$$

where:

$MUDR_t$ means the total number of metered units distributed (of electricity or water in GWh or MIG) during the year "t" to residential customers, divided by the number of residential customer accounts (electricity or water) for that year, as verified by the TA (as part of its report for the PCR for the financial year "t");

$MUDR_{2009}$ means the total number of metered units distributed (of electricity or water in GWh or MIG) during the year 2009 to residential customers, divided by the number of residential customer accounts (electricity or water) for that year, as verified by the TA (as part of its report for the PCR for the financial year 2009 or 2010);

3.25 MUDR is the only input to the calculation of DSMI and is a sub-set of currently audited "metered units distributed" revenue driver for AADC and ADDC. The "Incentive Rates" would be the same as those for DLRI as set out in **Table 3.1**.

3.26 The DSMI term can be positive (bonus), zero (no bonus or penalty), or negative (penalty). The maximum penalty or bonus for any year will be capped at 2% of the company's own MAR for that year. The operation of this DSMI will be as follows:

(a) If a company reduces the residential customer annual demand per customer (i.e. MUDR) in a year below the 2009 level, it will earn a bonus (positive DSMI term) for that year. The higher the reduction, the greater will be the bonus.

(b) DSMI will have a value of zero for a year if the residential demand per customer in that year equals the 2009 level.

(c) However, if residential demand per customer in a year is above the 2009 level, it will incur a penalty (negative DSMI term) for that year. The higher the demand increase over the 2009 level, the greater will be the penalty.

(d) If the company reduces (increases) its residential demand per customer in a year to a level 20% lower (higher) than the 2009 level, it will earn the maximum bonus (penalty) – that is, 2% of company's "own" MAR for the year.

3.27 AADC and ADDC will therefore have strong incentives to reduce electricity and water residential demands per customer in their areas. However, the customer account revenue driver in their MAR formulae will still provide incentives for them to connect new customers and areas to their systems.

3.28 Defining MUDR in the above formula in terms of units per customer account aims at addressing the risks of windfall gains or losses due to factors outside the control of the companies (e.g., as a result of the mega projects and associated customers and their annual demand) and allows the total annual residential demand and number of residential customers to increase to meet new demands.

3.29 The proposed measure focuses only on metered household or residential customers. While this aims at incentivising conservation or savings without affecting the industrial/economic growth in the emirate, it is for consideration whether the measure should be applied on an aggregate basis (i.e. on a company level rather than only a residential segment). While, the measure does not necessarily result in reducing the system peak demand and hence the installed production capacity requirement, it still has the potential to reduce variable operating costs and fuel requirements of the sector.

3.30 The Bureau will welcome views on any aspect of this proposal.

3.31 In addition to the above high-level DSM incentive mechanism incorporated into the PC4 price controls, the Bureau is considering an additional scheme to incentivise specific DSM projects. Under such a scheme, the Bureau would monitor specific DSM projects as an appropriate technical solution for reducing system peak demands and undertake a technical audit of their implementation. Once it has been confirmed that the scheme has been implemented and is operational, the distribution company would be entitled to a payment expressed in Dirhams per unit of peak demand (MW or MIG) saved. At this stage we envisage this mechanism would be developed and administered outside of the price control formulae.

4. Revenue driver projections

Introduction

4.1 Section 2 sets out our proposals for the revenue drivers for PC4 and identifies the need for the revenue driver projections in order to make projections of annual MARs over the PC4 period. This Section 4 sets out the revenue driver projections which have been used in the price control calculations described in Section 9.

4.2 The Second Consultation Paper described the Bureau's thinking to adopt the revenue driver projections provided by the respective companies in their 2008 Annual Information Submissions (AIS) which have been reviewed by the independent Technical Assessor (TA). The one exception to this was mentioned to be the projections for AADC's water metered units distributed, which we intended to adjust to assume 100% metering over an appropriate timescale.

4.3 Response to the Second Consultation Paper are summarised below:

(a) AADC suggested using the updated revenue driver projections from its 2009 AIS and delaying the Final Proposals until November 2009 to make use of such latest information. AADC did not agree that the 100% metering coverage is achievable.

(b) While ADDC agreed to the revenue driver projections as per the 2008 AIS, it also suggested using the 2009 AIS if the latter shows material variance.

(c) TRANSCO enquired about the precise source (e.g. table reference to 2008 AIS) of data on its metered quantities and highlighted the financial losses it has been incurring and expects to incur through revenue drivers during 2008 and 2009 as a result of incomplete interface metering.

4.4 Our views on the option of delaying the Final Proposals are set out in Section 1. We are however willing to consider and review the 2009 AIS for the revenue driver projections if the 2009 AIS (along with the TA report) can be submitted well before the Final Proposals. We have separately clarified to TRANSCO the precise source of data on its metering quantities. In response to AADC's concerns, we have adjusted projections of AADC's water metered units distributed to assume 97% metering coverage by 2013, rather than 100% as suggested in the Second Consultation Paper. We believe this is achievable. By comparison, ADDC's water metering coverage is currently over 90% and projected by the company to increase to 97% by 2013.

4.5 In the following paragraphs, we have set out the revenue driver projections for each company adopted from the respective 2008 AIS with (a) an adjustment for AADC as explained above and (b) derivation of metered peak demands for TRANSCO from metering coverage for metered units transmitted (as explained in the Second Consultation Paper).

4.6 The last column in each table reports the compound annual growth rates (CAGRs) averaged across the two demand measures over 2010-2013, which are then used in Section 5 for opex projections.

AADC's revenue driver projections

Table 4.1: Revenue driver projections – AADC electricity

		2010	2011	2012	2013	CAGR
Customer accounts	**Nos.**	**107,072**	**110,748**	**114,569**	**118,541**	
Annual growth		3.42%	3.43%	3.45%	3.47%	3.45%
Metered units distributed	**GWh**	**9,668**	**10,926**	**11,814**	**12,520**	
Annual growth		18.66%	13.01%	8.13%	5.97%	
Total units distributed	GWh	9,959	11,255	12,170	12,897	
Annual growth		18.66%	13.01%	8.13%	5.97%	9.00%
Metering coverage		97%	97%	97%	97%	
Average CAGR of demand for opex						**6.22%**

Source: Company's 2008 AIS submission.

Notes: CAGR is the "compounded average growth rate" over the period 2010-2013. "Total units distributed" includes both metered and unmetered units.

Table 4.2: Revenue driver projections – AADC water

		2010	2011	2012	2013	CAGR
Customer accounts	**Nos.**	**58,218**	**58,852**	**59,539**	**60,281**	
Annual growth		1.01%	1.09%	1.17%	1.25%	1.17%
Metered units distributed (AADC projections)	MIG	33,068	34,301	34,075	39,855	
Metered units distributed (adjusted)	**MIG**	**40,858**	**54,642**	**72,391**	**102,193**	
Annual growth		125.58%	33.74%	32.48%	41.17%	
Total units distributed	MIG	81,717	91,070	90,488	105,354	
Annual growth		77.79%	11.45%	-0.64%	16.43%	8.84%
Metering coverage (AADC projections)		40%	38%	38%	38%	
Metering coverage (adjusted)		50%	60%	80%	97%	
Average CAGR of demand for opex						**5.00%**

Source: Company's 2008 AIS submission, with the Bureau' adjustment to metered units distributed and metering coverage.

Notes: CAGR is the "compounded average growth rate" over the period 2010-2013. "Total units distributed" includes both metered and unmetered units.

ADDC's revenue driver projections

Table 4.3: Revenue driver projections – ADDC electricity

		2010	2011	2012	2013	CAGR
Customer accounts	**Nos.**	**251,538**	**275,459**	**284,796**	**299,655**	
Annual growth		5.94%	9.51%	3.39%	5.22%	6.01%
Metered units distributed	**GWh**	**26,735**	**32,217**	**40,074**	**44,631**	
Annual growth		15.16%	20.51%	24.39%	11.37%	
Total units distributed	GWh	27,118	32,600	40,457	45,014	
Annual growth		14.92%	20.22%	24.10%	11.26%	18.40%
Metering coverage		99%	99%	99%	99%	
Average CAGR of demand for opex						**12.21%**

Source: Company's 2008 AIS submission.

Notes: CAGR is the "compounded average growth rate" over the period 2010-2013. "Total units distributed" includes both metered and unmetered units.

Table 4.4: Revenue driver projections – ADDC water

		2010	2011	2012	2013	CAGR
Customer accounts	**Nos.**	**213,717**	**233,998**	**241,887**	**254,465**	
Annual growth		5.91%	9.49%	3.37%	5.20%	5.99%
Metered units distributed	**MIG**	**95,604**	**101,677**	**107,541**	**111,514**	
Annual growth		6.04%	6.35%	5.77%	3.69%	
Total units distributed	MIG	101,494	106,095	110,486	114,459	
Annual growth		4.07%	4.53%	4.14%	3.60%	4.09%
Metering coverage		94%	96%	97%	97%	
Average CAGR of demand for opex						**5.04%**

Source: Company's 2008 AIS submission.

Notes: CAGR is the "compounded average growth rate" over the period 2010-2013. "Total units distributed" includes both metered and unmetered units.

TRANSCO's revenue driver projections

Table 4.5: Revenue driver projections – TRANSCO electricity

		2010	2011	2012	2013	CAGR
Metered peak demand	**MW**	**9,025**	**11,307**	**13,521**	**14,767**	
Annual growth		17.79%	25.29%	19.58%	9.22%	
Total peak demand	MW	9,025	11,307	13,521	14,767	
Annual growth		17.79%	25.29%	19.58%	9.22%	17.84%
Metering coverage		100%	100%	100%	100%	
Metered units transmitted	**GWh**	**56,040**	**71,026**	**85,563**	**93,696**	
Annual growth		19.76%	26.74%	20.47%	9.51%	
Total units transmitted	GWh	56,040	71,026	85,563	93,696	
Annual growth		19.76%	26.74%	20.47%	9.51%	18.69%
Metering coverage		100%	100%	100%	100%	
Average CAGR of demand for opex						**18.26%**

Source: Company's 2008 AIS submission.

Notes: CAGR is the "compounded average growth rate" over the period 2007-2013. "Total peak demand" and "Total units transmitted" includes both metered and unmetered demands and units, respectively.

Table 4.6: Revenue driver projections – TRANSCO water

		2010	2011	2012	2013	CAGR
Metered peak demand	**MIGD**	**720**	**789**	**809**	**872**	
Annual growth		17.24%	9.56%	2.46%	7.85%	
Total peak demand	MIGD	720	789	809	872	
Annual growth		17.24%	9.56%	2.46%	7.85%	6.58%
Metering coverage		100%	100%	100%	100%	
Metered units transmitted	**MIG**	**246,422**	**269,668**	**277,039**	**297,761**	
Annual growth		17.22%	9.43%	2.73%	7.48%	
Total units transmitted	MIG	246,422	269,668	277,039	297,761	
Annual growth		17.22%	9.43%	2.73%	7.48%	6.51%
Metering coverage		100%	100%	100%	100%	
Average CAGR of demand for opex						**6.54%**

Source: Company's 2008 AIS submission.

Notes: CAGR is the "compounded average growth rate" over the period 2007-2013. "Total peak demand" and "Total units transmitted" includes both metered and unmetered demands and units, respectively.

ADSSC's revenue driver projections

4.7 As discussed in Section 2, ADSSC is proposed to have only one revenue driver, namely, the annual flow entering the treatment plants. The following table also presents forecasts of customer numbers only for the purposes of calculation of an average demand growth rate for opex projections in Section 5. This is because we believe that customer number is an important cost driver for a network company like ADSSC:

Table 4.7: Revenue driver projections – ADSSC

		2010	2011	2012	2013	CAGR
Number of customers		300,938	328,171	351,186	374,949	
Annual growth		15.70%	9.05%	7.01%	6.77%	7.60%
Total volume handled	**m^3**	**246,323,170**	**267,223,070**	**296,051,865**	**314,445,675**	
Total volume handled	Ml	246,323	267,223	296,052	314,446	
Average daily flow handled	Ml/d	675	732	811	861	
Annual growth		8.38%	8.48%	10.79%	6.21%	8.48%
Average CAGR of demand for opex						**8.04%**

Source: Company's 2008 AIS submission.

Notes: CAGR is the "compounded average growth rate" over the period 2007-2013. "Ml" stands for "million litres" and "Ml/d" for "million litres per day". 1 Ml = 1,000 m^3

5. Opex projections

Introduction

5.1 This Section 5 discusses the operating expenditure (opex) projections, which are one of the main inputs to the price control calculations in Section 9, accounting for about one-third of the revenue requirement. Note that the term "operating expenditure" or "opex" in this paper refers to operating costs excluding depreciation.

5.2 Earlier consultation papers identified three main considerations when assessing opex projections: (a) the sufficiency of the allowed revenue to enable the company to finance its business; (b) the economy and efficiency of the sector; and (c) consistency in regulation. A number of approaches to assessing opex allowances were discussed. It was suggested that a 'top-down' approach (assessing total opex of the company or business as a whole) as used at the previous price control reviews should be used at this review, as follows:

(a) determine a **base level** of opex;

(b) adjust the base level of opex to reflect increased costs for future **demand increases** (a 0.75% increase in opex for each 1% increase in demand was adopted at the last price controls review);

(c) adjust the demand-adjusted opex for **efficiency improvements** expected over the control period (a 5% decrease in opex per year in real terms was used at the last price controls review); and

(d) make **further adjustments** to opex projections for new one-off costs (or cost savings) or for anticipated changes in the real price of inputs.

Second Consultation Paper

5.3 The Second Consultation Paper presented analysis showing that:

(a) the actual opex of the network companies continues to increase both in real terms as well as in excess of opex allowances assumed in setting the previous price controls;

(b) the Bureau's traditional approach to setting base opex level using the most recent actual opex (2007 or 2008) will continue to result in rising sector costs;

(c) increasing actual opex over time also means that there is more room for efficiency in the future;

(d) the performance of one network company (i.e., TRANSCO) in the sector has shown that a reduction in opex was possible even with rising staff salaries and allowances; and

(e) the expected easing of inflation in the near future, particularly of the costs influenced by the construction sector, including staff accommodation costs, may potentially result in opex reductions (in real terms) over the PC4 period.

5.4 In view of the above, the paper set out the Bureau's thinking to use a similar top-down approach as used at the last price control reviews to project opex allowances for the PC4 period, with the same adjustments for demand growth (0.75%) and efficiency (5%). However, in a departure from the approach used at previous reviews, the paper suggested that the opex projected for 2009 at the last price control review for each company, converted into 2010 prices, should be used as the base level of opex for the PC4 controls, possibly with some additional opex for staff costs.

5.5 The Bureau considered this new methodology necessary in order to provide a stronger incentive for licensees to be efficient in their operating expenditure, given the experience since 1999 of steadily rising costs in real terms.

5.6 The paper acknowledged that this approach would result in lower opex projections for PC4 than using the most recent (2007) actual audited opex – by over AED 400 million per annum for all the network companies combined, which is similar to the cumulative increase in staff costs for all network companies from 2004 to 2007. The paper indicated that some staff cost increase should be met by the companies from their efficiency initiatives and optimisation of resources rather than simply from additional opex allowance under the price controls.

5.7 The paper also discussed additional opex allowances suggested by ADDC for trade education and certification (up to AED 500 million) and DSM initiatives (up to AED 250 million). The mechanism described in paragraph 5.2(d) above for additional opex allowances exists to fund new obligations, if approved by the Bureau. However, these two new obligations have not yet been discussed with the Bureau in any detail. The paper therefore recommended that, for such proposals to be considered at the current price control review, ADDC must enter into a separate dialogue with the Bureau to explain its proposals in more detail. Alternatively, if new obligations are imposed on licensees in the course of a price control period, the approved costs can be 'logged up' and remunerated at the next price controls review.

Responses

Summary of responses

5.8 In general, the licensees opposed the use of the PC3 projected opex for 2009 as the base level of opex for PC4. These responses are summarised as follows:

5.9 AADC argued against the proposals on opex projections based on the following:

(a) It sought an objective assessment of the validity of the PC3 opex projections against the actual outturn costs (at least for 2005) taking account of: (a) the UAE CPI assumption in the PC3 projections for 2005 against the actual 2005 CPI and actual cost growth in the sector; (b) additional regulatory obligations and the Bureau's licence fees; (c) additional costs to AADC (and potential savings to TRANSCO) due to constrained water supplies; (d) additional staff costs imposed by the government and due to actual staff cost growth being higher than forecast.

(b) It considered that an approach that used opex projections made at the time of the PC3 review for PC4 is not the best practice and, without validation of PC3 outturn costs, cannot be fair or consistent with the Bureau's obligations under Article 96 of the Law No.(2) of 1998 (i.e., to act consistently, minimise regulatory burden, take account of the licensee's financial position, and give reasons for decisions). According to AADC, this approach does not consider the additional regulatory burden on licensees for PC4 arising from the Bureau's work plan for 2009, anticipated new requirements as a result of this price control review, embedded generation and continuing upstream water supply constraints.

(c) It argued that staff costs, contributing about 65% of opex, are imposed by the government and hence uncontrollable, and cannot be reduced by AADC through any optimisation of resources or efficiency gains from the remaining 35% of opex. It therefore suggested treating staff cost as a pass-through cost. The company also sought re-validation of the assumptions for opex adjustments for demand-growth (0.75%) and efficiency (5%) at this review. AADC also cast doubts on these assumptions being achievable in the sector based on TRANSCO's opex performance presented in the Second Consultation Paper in the absence of an assessment of actual opex for each business. According to AADC, such an analysis did not consider the obvious differences, such as lower costs for TRANSCO (and higher costs for AADC) due to water supply constraints and stable network coverage (in contrast to the greater customer base and network coverage for distribution businesses).

(d) At the meeting held on 21 May 2009, AADC suggested that if the opex projections for 2009 made at the time of the PC3 review are adopted for PC4, they should also be adjusted for 2005 actual inflation.

5.10 ADDC disagreed with the Bureau's thinking on the base level of opex and on the demand and efficiency adjustments. Like AADC, it considered the Bureau's analysis of opex flawed and inappropriate for reasons such as: AADC and ADDC being different from TRANSCO due to supply businesses and significant growth in service levels, customer demands and connections; and TRANSCO's opex being understated. ADDC argued against applying a UK style CPI-X regulation to the utility sector in the UAE subject to significant development and growth. It therefore suggested to assume a zero efficiency in opex and to consider the actual relationship between opex and demand in the sector rather than the World Bank's estimates. ADDC also sought support for a further initiative, to improve consumers' confidence in tap water being drinkable, in addition to trade education and certification and the DSM initiatives mentioned previously.

5.11 TRANSCO referred to its comments on the First Consultation Paper for its response to the Second Consultation Paper. In essence, those comments argued against the use of opex projections made at the previous price control review for PC4, being not reflective of increasing staff costs and the 5% efficiency assumption being not achievable.

5.12 ADSSC also reiterated its earlier suggestion that the most recent actual audited opex should be used as the base level. The company intended to submit detailed justification in due course. At the meeting on 14 May 2009, it argued that the Bureau's traditional approach to setting base opex level using the most recent actual opex (2007 or 2008 in this case) which has been applied to other network companies for a decade should continue to apply to ADSSC at least at this review given it is a relatively new company which is building up its staff resources.

Our views on responses

5.13 In our view, most of the comments made by the companies were already discussed by the Bureau in the Second Consultation Paper and earlier. However, we wish to respond to some important issues raised by the licensees:

(a) The Second Consultation Paper provided an objective assessment of the actual opex incurred by each company over time and against the price control projections (summarised on a total basis in **Figure 5.1** below at the end of this Section 5). The analysis showed the increasing trend of actual opex and the efficiencies achievable in the sector. There is no doubt that the companies

in general overspent on opex against the price control assumptions. We would however welcome further analysis from any licensee in support of its arguments.

(b) Most of the regulatory requirements, obligations and factors identified by AADC and ADDC have existed for many years and some date back even to 1999. As such, they are reflected in the historical costs and hence do not warrant any additional opex allowance at this review. Indeed, these companies have not yet fully complied with some regulatory requirements leading to the inclusion of such requirements in the Bureau's future work plan. However, where new legal obligations or regulatory requirements are identified, they may require additional financing at this review.

(c) AADC highlighted a number of times in its response the upstream water supply constraints as the source of additional costs for itself and some kind of cost savings for TRANSCO. We have previously proposed negative financial adjustments for TRANSCO for water transmission constraints in the past, and an incentive mechanism for TRANSCO to remove such constraints in the future (see Section 8). We however do not agree that due to such constraints AADC will incur additional cost which is not reflected in the historical cost base. This is because AADC has been subject to such constraints for a number of years and its cost of managing such constraints has already been reflected in the historical cost base.

(d) The consultation papers published at the previous price control reviews provided the evidence for the assumptions on opex adjustment for demand and efficiency based on actual achievements (not estimates) made in other countries. In some cases, these showed lower opex increase for demand growth, and higher efficiency, than the Bureau's assumptions of 0.75% and 5%, respectively. For example, the reports by the World Bank, Europe Economics, CEPA and OXERA referred to in the 2005 price control review covered the actual performance of numerous network businesses in a range of countries, and in the electricity, water and wastewater sectors. The Second Consultation Paper re-validated these assumptions through assessment of TRANSCO's recent opex performance. Such opex performance took account of all the factors prevailing during recent years including the regulatory requirements, significant growth in inflation and sector demands, and water transmission constraints.

(e) In many cases, where we propose a new regulatory requirement during the consultation exercise on price controls (e.g. the TA report for AIS and PCR, or a new Category A indicator), such requirement is accompanied by incentives

which should offset the resulting additional costs. In some cases, where we propose regulatory requirements with only penalties (interface metering) or without any incentives, they reflect practices which the companies need in any case to run their businesses or should already have been adopted to comply with the existing requirements.

(f) Where a licensee identifies a new regulatory requirement or legal obligation which has cost implications not already reflected in the base cost, the mechanisms described at paragraph 5.2(d) above can apply. Accordingly, AADC or ADDC (or another licensee for that matter) can make a submission on additional cost items, for the Bureau's review.

(g) While licensees identified a number of reasons why costs may increase, we are disappointed to see that no licensee has identified in its response any specific initiatives it has taken or intends to take to improve efficiency. We have therefore written to the companies, parallel to the publication of these Draft Proposals, requesting them to make a submission identifying such efficiency initiatives and expected cost savings.

(h) The opex projections for 2009 made at the time of the PC3 price controls review will be adjusted upwards for the UAE CPI over the period 2004-2009 (2004 being the base opex year for that review). UAE CPI is expected to increase by about 60% over the period 2004-2009, which will be reflected in the PC4 cost allowances. The UAE CPI itself captures the effect of rising costs especially staff salaries and accommodation rental costs.

(i) The treatment of a cost of a licensee (unless subject to competition or regulation upstream to the licensee) on a pass-through basis is not consistent with the Bureau's duty to ensure economy and efficiency of the sector.

5.14 In particular, we do not agree with respondents who argued that using the most recent actual cost is the best regulatory practice. Best regulatory practice is to set opex allowances according to an efficient level of cost and thus de-link the price controls from the actual cost. This provides incentives for companies to improve their efficiency. Using the latest actual opex as the base for future projections at each review provides no incentive for the companies to reduce opex. Instead such an approach, if known to the companies to be used at each review, actually provides incentives for them to spend more opex in the last years of a control period so as to have higher opex projections for the next control period.

5.15 In the case of ADSSC's argument that it is a less mature business than the other licensees, we can consider its detailed justification for higher opex allowance if

submitted in response to the Draft Proposals. To the extent we are satisfied given our statutory duties, we may propose appropriate adjustment to our PC4 opex projections in the Final Proposals. However, we are concerned about the recent significant increases in costs relating to their O&M contracts.

5.16 In view of the above discussion, we have adopted in these Draft Proposals the opex projection for 2009 (converted into 2010 prices) made at the time of the last price control reviews as the base level, and applied the 0.75% demand-opex relationship and 5% efficiency assumptions, to calculate opex allowances for PC4. As suggested by AADC, we have however first adjusted the opex projection (which was based on an assumed inflation for 2005) for the 2005 actual inflation.

Opex projections

Base level of opex

5.17 **Table 5.1** shows the base level of opex using the PC3 review opex projection for 2009, converted into 2010 prices (using the UAE CPI assumptions from **Table 3.7**):

Table 5.1: Base level of opex for PC4 – Draft Proposals

Company	Business	2009 opex projected at last review (based on assumed 2005 CPI) (AED million, 2006 prices)*	2009 opex projected at last review (adjusted for actual 2005 CPI) (AED million, 2006 prices)**	Opex base level for 2010 (AED million, 2010 prices)
AADC	Electricity	162.64	164.43	225.79
	Water	74.78	75.61	103.82
	Total	237.43	240.03	329.61
ADDC	Electricity	240.79	243.44	334.28
	Water	133.36	134.82	185.14
	Total	374.15	378.26	519.42
TRANSCO	Electricity	120.42	121.75	167.18
	Water	235.71	238.30	327.23
	Total	356.13	360.04	494.41
ADSSC*	Total	220.40*	234.05	321.40
Total		**1,201.76***	**1,212.39**	**1,664.84**

Source: (1) Bureau's Final Proposals for PC3, November 2005; (2) Bureau's Addendum to Final Proposals for PC3 for AADC and ADDC, January 2006; and (3) Bureau's Final Proposals for ADSSC's first price controls, January 2008.

Notes: * All figures in the third column are in 2006 prices (except for ADSSC which is in 2005 prices) based on an assumed UAE CPI (base year 2000 = 100) of 120.38 (i.e. 5.04% inflation) for 2005. The total in the last row in this column includes ADSSC's opex in 2006 prices based on actual UAE CPI for 2005. ** All figures in the fourth column are in 2006 prices (including that for ADSSC) based on an actual UAE CPI (base year 2000 = 100) of 121.70 (i.e. 6.20% inflation) for 2005.

5.18 In the above table:

(a) The third column reports the opex projected for 2009 at the last price control reviews. With the exception of ADSSC, all opex projections here are in 2006

prices projected then with an assumed UAE CPI of 120.38 (or 5.04% inflation) for 2005. For ADSSC, opex here is reported in 2005 prices based on the actual UAE CPI of 121.70 (or 6.20% inflation) for 2005. (All UAE CPI figures here are based on the base year 2000 = 100)

(b) The fourth column shows, for all the companies, the opex projected for 2009 at the last reviews in 2006 prices based on actual UAE CPI for 2005.

(c) The fifth or the last column presents, for all the companies, the opex projected for 2009 at the last reviews in 2010 prices based on the UAE CPI assumptions set out in **Table 2.5**. These are the proposed base levels of opex for PC4.

5.19 The table shows that the total base opex for PC4 for the four network companies amounts to AED 1,665 million in 2010 prices. In nominal terms, the total base opex for 2010 is about AED 21 million or 1.3% higher than the total 2007 actual opex of AED 1,644 million.

Adjustments for demand growth and efficiency

5.20 As described in paragraph 5.2, the base opex is then adjusted for the assumed effects of demand growth and efficiency improvements. The following table shows the calculation of the annual opex adjustment for each business. First, the annual opex increase for demand growth has been calculated (in the fourth column) by applying the 0.75% assumption to the average demand growth rate (in the third column) calculated in Section 4. Then, the net annual opex adjustment (net annual increase or decrease) has been calculated (in the sixth or last column) by subtracting 5% efficiency assumption (fifth column) from the annual opex increase for demand growth (fourth column).

Table 5.2: Net annual opex adjustments – Draft Proposals

Company	Business	Annual demand growth rate (3)	Annual opex adjustment for demand growth (4) = 0.75 x (3)	Annual efficiency improvement (5)	Net annual opex adjustment (6) = (4) – (5)
AADC	Electricity	6.22%	4.67%	-5.00%	-0.33%
	Water	5.00%	3.75%	-5.00%	-1.25%
ADDC	Electricity	12.21%	9.15%	-5.00%	4.15%
	Water	5.04%	3.78%	-5.00%	-1.22%
TRANSCO	Electricity	18.26%	13.70%	-5.00%	8.70%
	Water	6.54%	4.91%	-5.00%	-0.09%
ADSSC		8.04%	6.03%	-5.00%	1.03%

5.21 For the above table, we have calculated the demand growth as the simple average of growth rates for customer accounts and total units distributed for AADC and ADDC. However, given the significant reduction in the weight of the metered units distributed revenue driver in the MAR formulae for these companies (from 15% to 5%) and the potential for further reduction (as discussed in Section 2), it is under consideration whether the demand growth in the above table should be calculated as a weighted average of the two demand growths (i.e., with higher weight for customer accounts than for the units distributed).

PC4 opex projections

5.22 The above adjustments have then been applied to the base opex levels in **Table 5.1** to determine the following annual opex allowances used in the price control calculations in Section 9:

Table 5.3: PC4 opex projections – Draft Proposals

AED million, 2010 prices		2010	2011	2012	2013
AADC	Electricity	225.79	225.04	224.30	223.55
	Water	103.82	102.53	101.25	99.98
	Total	329.61	327.57	325.54	323.54
ADDC	Electricity	334.28	348.17	362.64	377.70
	Water	185.14	182.88	180.65	178.44
	Total	519.42	531.05	543.28	556.14
TRANSCO	Electricity	167.18	181.72	197.52	214.70
	Water	327.23	326.93	326.63	326.33
	Total	494.41	508.65	524.15	541.03
ADSSC	Total	321.40	324.72	328.07	331.45
Total		**1,664.84**	**1,691.98**	**1,721.04**	**1,752.16**

5.23 The table shows that the total annual opex allowance for PC4 increases, in real terms, from AED 1,665 million in 2010 to AED 1,752 million in 2013 i.e., by over AED 87 million or over 5%. This indicates that the effect of future demand growth (e.g., due to mega projects) outweighs the assumed efficiency improvements. The indexation of the notified values “a”, “b” and “c” (and hence the MAR) against the UAE CPI during implementation of the PC4 controls will mean even higher opex allowances in nominal terms (adjusted for inflation).

5.24 Assuming a UAE CPI inflation of 5% p.a. over the PC4 period, the following table lists the PC4 opex projections in nominal terms (for information only), so that the companies can readily assess them against their requirements in nominal terms:

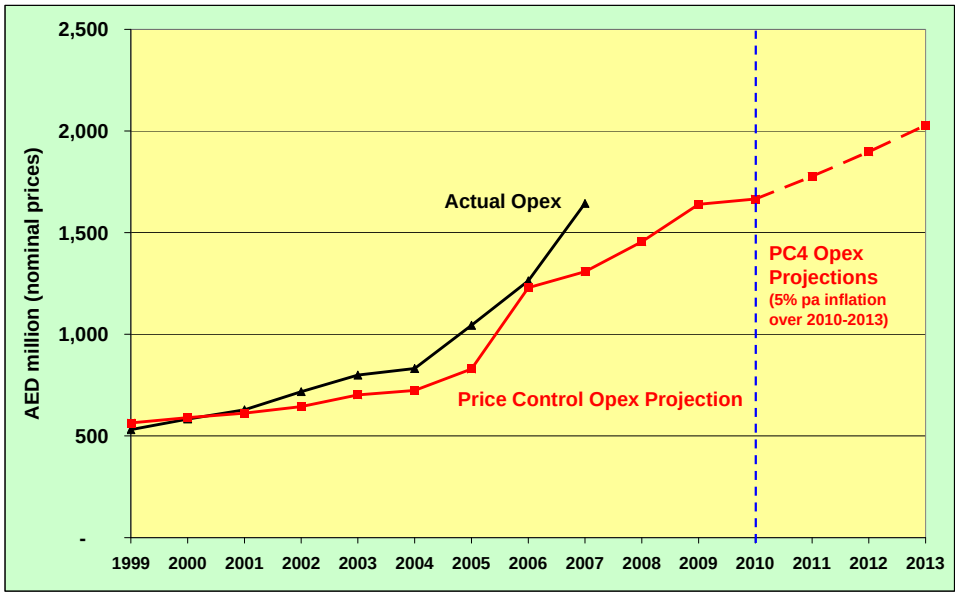
Table 5.4: PC4 opex projections in nominal terms (for information only)

AED million, nominal prices		2010	2011	2012	2013
AADC	Electricity	225.79	236.29	247.29	258.79
	Water	103.82	107.65	111.63	115.74
	Total	329.61	343.95	358.91	374.53
ADDC	Electricity	334.28	365.58	399.81	437.24
	Water	185.14	192.02	199.16	206.57
	Total	519.42	557.60	598.97	643.80
TRANSCO	Electricity	167.18	190.81	217.77	248.54
	Water	327.23	343.27	360.10	377.76
	Total	494.41	534.08	577.87	626.31
ADSSC	Total	321.40	340.95	361.69	383.70
Total		**1,664.84**	**1,776.58**	**1,897.45**	**2,028.34**

Notes: These projections assume a UAE CPI inflation of 5% p.a. for each year of the PC4 period.

5.25 The following chart shows the above opex allowances for PC4 are higher than the actual opex for the companies to date in nominal terms (even with a conservative estimate of future inflation). While these allowances attempt to constrain the current rate of cost increases, the increasing trend will continue for opex.

Figure 5.1: Opex projections – Draft Proposal



Notes: Conversions to nominal prices are based on UAE CPI inflation for years up to 2009 as set out in Table 2.5 and a 5% UAE CPI inflation assumption for each year of the PC4 period (2010-2013).

6. Capex, asset valuation and depreciation

Introduction

6.1 Capital expenditure (capex) enters into the price control calculations in two ways, in the form of (i) return of capital (i.e., depreciation) and (ii) return on capital (i.e., allowed profit). These two components account for the majority (over 70%) of the revenue requirements for network businesses. This Section 6 discusses:

(a) the treatment of past capex;

(b) the allowances for future capex;

(c) the depreciation assumptions; and

(d) the updating of the Regulatory Asset Values (RAVs) for such capex, depreciation and CPI assumptions.

6.2 The Bureau has to date adopted the "ex-post" approach towards the treatment of capex as follows:

(a) provisional allowances for future capex are incorporated into the price controls;

(b) actual capex spent by a company is assessed at the end of the control period against the efficiency criteria established by the Bureau; and

(c) necessary financial adjustments are then made at the subsequent price control review to compensate the company for the difference between the provisional capex allowed in the price controls and the actual efficient capex (taking account of the time value of money and financing costs foregone or unduly earned).

6.3 The efficiency criteria (as established in 1999 and applied consistently thereafter) are that the 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 both the tendering process and project management).

6.4 The application of the above approach to capex over each price control period to date is summarised in the following table, which also highlights the issues to be dealt with in setting the PC4 controls at this price control review:

Table 6.1: Treatment of capex in price controls

Treatment	PC1 capex	PC2 capex	PC3 capex	PC4 capex
Provisional capex allowances	Included in PC2	Included in PC2	Included in PC3	**To be included in PC4**
Capex efficiency review	Undertaken by Bureau in 2004	Undertaken by independent consultants in 2007	To be undertaken in 2010	To be undertaken in 2014
Adjustment for efficient capex	Made in PC3	**To be made in PC4**	To be made in PC5	To be made in PC6

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

Treatment of PC2 capex

Provisional PC2 capex allowances in PC2

6.5 **Table 6.2** below shows the provisional capex allowances for the PC2 period in 2003 prices (as well as totals in 2010 prices for comparison purposes) which were incorporated into the PC2 controls for AADC, ADDC and TRANSCO at the 2002 price controls review (PC2 calculations were carried out in 2003 prices).

Table 6.2: Provisional PC2 capex allowances included in PC2 controls

AED million, 2003 prices		2003	2004	2005	Total
AADC	Electricity	205.80	205.80	205.80	617.39
	Water	72.37	72.37	72.37	217.11
	Total	278.17	278.17	278.17	834.50
ADDC	Electricity	461.88	484.97	509.22	1,456.06
	Water	151.42	158.99	166.94	477.35
	Total	613.30	643.96	676.16	1,933.41
TRANSCO	Electricity	1,267.79	730.38	346.04	2,344.20
	Water	1,261.10	1,280.09	243.24	2,784.43
	Total	2,528.89	2,010.47	589.28	5,128.64
Total	2003 prices	3,420.35	2,932.59	1,543.60	**7,896.55**
	2010 prices	5,402.66	4,632.20	2,438.21	**12,473.07**

Source: Bureau's Final Proposals for PC2, November 2002.

Notes: All figures are in 2003 prices, except for 'Total' where figures are also expressed in 2010 prices for later comparisons. The amounts shown in 2010 prices in this paper are slightly different than those presented in the Second Consultation Paper due to different inflation assumptions for 2009.

6.6 As the above table shows, PC2 provisional capex allowances amounted to a total of AED 7,897 million in 2003 prices (or AED 12,473 million in 2010 prices).

PC2 capex efficiency review

6.7 As agreed at the previous price control reviews, the Bureau appointed Sinclair Knight Merz (SKM) and WS Atkins as the independent consultants to undertake the efficiency review of PC2 capex for the electricity and water businesses, respectively. The consultants undertook this review over a period of about one year in close consultation with the Bureau and the companies and produced draft and final reports for each company separately in May and November 2007. The consultants' efficiency assessments of PC2 capex are summarised below:

Table 6.3: Consultants' efficiency assessment of PC2 capex

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

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

Actual audited PC2 capex

6.8 The following table lists the actual PC2 capex as per the audited Separate Business Accounts (SBAs) of the three water and electricity network companies:

Table 6.4: Actual PC2 capex as per audited SBAs

AED million, nominal prices		2003	2004	2005	Total
AADC	Electricity	409.91	399.28	548.98	1,358.16
	Water	130.50	155.54	207.68	493.73
	Total	540.41	554.82	756.66	1,851.89
ADDC	Electricity	582.03	512.24	296.89	1,391.16
	Water	466.21	291.79	82.99	840.99
	Total	1,048.24	804.02	379.88	2,232.15
TRANSCO	Electricity	1,135.39	1,729.96	1,478.15	4,343.50
	Water	1,958.58	2,423.44	-859.25	3,522.76
	Total	3,093.96	4,153.40	618.90	7,866.26
Total	Nominal prices	4,682.61	5,512.24	1,755.44	**11,950.30**
	2003 prices	4,682.61	5,345.51	1,620.64	**11,648.77**
	2010 prices	7,396.47	8,443.55	2,559.91	**18,399.92**

Source: Companies' Audited Separate Business Accounts (SBAs) for 2003-2005

Notes: All figures are in nominal prices, except for 'Total' where figures are also expressed in 2003 and 2010 prices for later comparisons. Negative figure for TRANSCO for 2005 are due to "Advances to Contractors" in earlier years.

Notes: As described in the Second Consultation Paper, capex is derived from the cash flow statements in the audited SBAs as follows:

(a) Purchase of property, plant and equipment;
(b) Add: Advances to contractors;
(c) Subtract: Proceeds from disposal of property, plant and equipment;
(d) Subtract: Net book value of property, plant and equipment transferred to a third party;
(e) Subtract: Material returns from property, plant and equipment;
(f) Subtract: Transfer of property, plant and equipment to inventory; and
(g) Add / Subtract: Inter-group transfer of property, plant and equipment from / to another party, respectively.

6.9 The three companies therefore spent a total capex of AED 11,950 million in nominal prices over the PC2 period. In 2003 prices, this was higher than the total provisional allowances by about AED 3,752 million (or by AED 5,926 million in 2010 prices).

Second Consultation Paper

6.10 The Second Consultation Paper considered three main options on how to apply the PC2 capex efficiency scores recommended by the consultants:

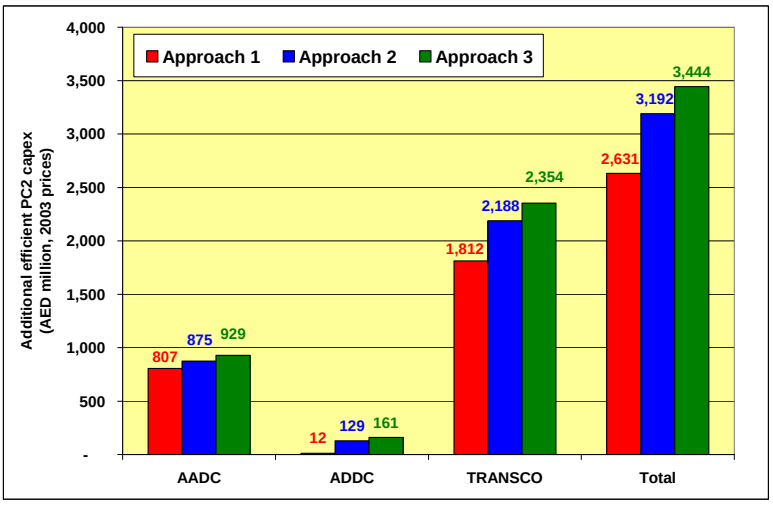
(a) ***Approach 1:*** Apply the consultants' capex efficiency scores without any adjustment – reflecting the strict application of the approach agreed at the 2002 price control review for PC2 capex;

(b) ***Approach 2:*** Apply some proportion, say, half of the capex inefficiencies assessed by the consultants – reducing the financial impact on the network companies; and

(c) ***Approach 3:*** Apply a relative-efficiency based approach – reflecting the relative rather than absolute efficiency assessment by the consultants, similar to the relative-efficiency based approach agreed for PC3 capex.[1]

6.11 The paper discussed these approaches and their results in detail. **Figure 6.1** below summarises these results in terms of efficient PC2 capex over and above the provisional allowances (in AED million, 2003 prices).

Figure 6.1: Additional efficient PC2 capex under three approaches



[1] The discussion of Approach 3 in the Second Consultation Paper was also useful in clarifying how the relative-efficiency approach can work for PC3 capex. However, it was noted that the actual application of this approach to PC3 capex will differ from Approach 3 in some respects. TRANSCO in its response expressed its satisfaction with the explanation of this approach as a reasonable basis for PC3 capex.

6.12 The Second Consultation Paper noted that many of the companies' comments on the consultants' PC2 capex efficiency review were already raised and considered by the consultants during the efficiency review. While the consultants employed slightly different methodologies for that review, they followed the same two efficiency criteria established by the Bureau (set out in paragraph 6.3 above) and arrived at very similar conclusions. The paper also clarified the difference between the treatment of the delay in the Shuweihat water pipeline in the PC2 capex review and our proposed financial adjustment for TRANSCO for such delay (discussed in Section 8).

6.13 The paper highlighted the Bureau's objective to promote sound investment processes and the agreement at the 2002 price control review suggesting that the independent consultants' efficiency review results (as set out in **Table 6.3** above) should be applied to the PC2 capex. However, in light of the responses to the First Consultation Paper, we sought views of the respondents on the alternative two approaches discussed above, particularly the relative-efficiency based approach.

6.14 Based on the respondents' support, the paper also proposed incorporating any foregone or unduly earned financing costs relating to the PC2 capex into the PC4 controls via an adjustment to the revenue allowance over the PC4 period (rather than via an addition to the RAV, as had been done for PC1 capex).

Responses

6.15 While all respondents to the Second Consultation Paper supported the proposal to incorporate PC2 capex-related foregone financing costs into PC4 revenue, the responses on the application of PC2 capex efficiency scores were as follows:

(a) AADC accepted Approach 3 (i.e., applying relative-efficiency scores).

(b) ADDC accepted Approach 3 *"as the best of a set of alternatives to which ADDC does not agree"*. It reiterated its earlier concerns on the PC2 capex assessment, consultants' methodologies and permanent disallowance of inefficient capex. It also argued that the Bureau does not have a duty under the relevant laws *"to promote sound investment processes"*.

(c) While TRANSCO also supported Approach 3, it reiterated its earlier concerns on the PC2 capex assessment and expressed the concern that Approach 3 does not allow the possibility for the most efficient company to outperform the efficient frontier.

6.16 On the issue raised by ADDC, we refer to Article 54(8) of Law No (2) of 1998 entrusting a duty on the Bureau to ensure the efficiency and economy of the sector. We consider that the promotion of sound investment processes in the sector is essential to meeting this duty.

Draft Proposals

6.17 We have used Approach 1 in these Draft Proposals, reflecting a strict application of the agreement reached at the 2002 review to apply the PC2 capex efficiencies as assessed by the independent consultants.

6.18 In applying Approach 1, we have also been mindful of our recent request for a more rigorous assessment and in some cases reassessment of future capex projects by licensees as part of the work on five-year planning statements. We will continue to monitor companies' response and progress on this work until the Final Proposals due in September 2009 in order make a final decision on whether to apply Approach 1 or otherwise. At this stage, it does not appear to be appropriate to relax the PC2 capex efficiency assessments made by the consultants (i.e. apply Approach 2 or Approach 3) when the companies are not seen to be demonstrating improvement in their capex forecasting capabilities.

6.19 **Table 6.5** below presents the PC2 efficient capex calculated by applying the efficiency scores as set out in **Table 6.3** above (i.e. Approach 1) to PC2 actual capex in **Table 6.4** above, converted in 2003 prices:

Table 6.5: Efficient PC2 capex – Draft Proposals

AED million, 2003 prices		2003	2004	2005	Total
AADC	Electricity	379.57	358.55	469.32	1,207.44
	Water	119.67	138.32	175.82	433.81
	Total	499.24	496.86	645.14	1,641.25
ADDC	Electricity	524.41	447.57	246.96	1,218.93
	Water	410.27	249.00	67.43	726.70
	Total	934.68	696.57	314.38	1,945.63
TRANSCO	Electricity	1,062.72	1,570.26	1,277.31	3,910.29
	Water	1,688.29	2,025.82	-683.80	3,030.31
	Total	2,751.02	3,596.08	593.51	6,940.60
Total		**4,184.93**	**4,789.52**	**1,553.03**	**10,527.48**

6.20 Subtracting PC2 provisional capex in **Table 6.2** from PC2 efficient capex in **Table 6.5** gives the additional PC2 efficient capex (over and above PC2 provisional capex) as shown below, which needs to be financed at this price control review. In total, this amounts to AED 2,631 million in 2003 prices (or AED 4,156 million in 2010 prices).

TRANSCO has the largest share in this (AED 1,812 million in 2003 prices), followed by AADC (AED 807 million in 2003 prices). The minimal share for ADDC (AED 12 million in 2003 prices) is reflective of its higher provisional allowance compared to actual capex, and its efficiency score.

Table 6.6: Additional efficient PC2 capex – Draft Proposals

AED million, 2003 prices		2003	2004	2005	Total
AADC	Electricity	173.78	152.75	263.52	590.05
	Water	47.30	65.95	103.45	216.70
	Total	221.07	218.70	366.97	806.75
ADDC	Electricity	62.54	(37.40)	(262.26)	(237.13)
	Water	258.85	90.01	(99.52)	249.34
	Total	321.38	52.61	(361.78)	12.21
TRANSCO	Electricity	(205.07)	839.89	931.27	1,566.09
	Water	427.19	745.73	(927.04)	245.88
	Total	222.12	1,585.62	4.23	1,811.97
Total	2003 prices	764.58	1,856.92	9.43	2,630.93
	2010 prices	**1,207.70**	**2,933.12**	**14.89**	**4,155.71**

Treatment of PC4 capex

Second Consultation Paper

6.21 Earlier consultation papers discussed the ex-ante and ex-post approaches to the assessment and treatment of future capex. Given the continuing uncertainty associated with the sector capex forecasts, the satisfactory working of the ex-post approach over the years ,and the companies' support for the approach, we proposed to continue with its ex-post approach for PC4 capex along with provisional allowances at this review.

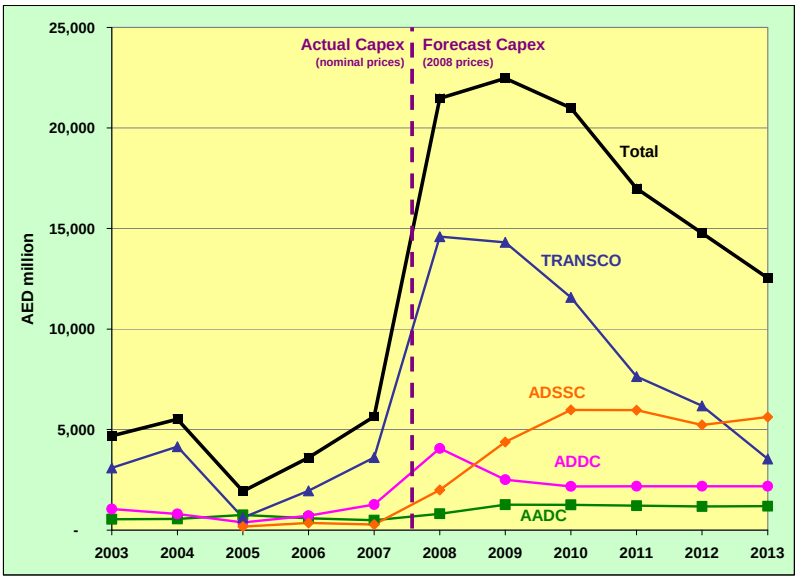
6.22 In response to certain specific comments of the companies, the Second Consultation Paper provided that:

(a) The Bureau is open minded on including capex relating to mega projects (being undertaken by the developers for transfer to licensee upon completion) in the provisional PC4 capex allowances, if such capex can be forecast with reasonable accuracy and supporting explanation or justification. However, no such forecasts are available to the Bureau at this stage. In any case, the main advantage of the ex-post approach is that it can handle well the unanticipated investments such as those relating to mega projects. The company will be remunerated for all efficient capex at a future date while taking account of foregone financing costs and the time value of money.

(b) All capex (incurred over PC3 or PC4 period) including payments to the developers of mega projects are subject to assessment against the efficiency criteria. In the case of mega projects, the emphasis of such an assessment would however be on the role and performance of the network companies in ensuring the reasonableness and efficiency of project designs, specifications and procurement processes used by the developers. The Bureau believes that subjecting mega projects-related capex to the efficiency review and not treating such capex on a pass through basis is in the best interests of the sector. This is because it provides a leverage for the licensees in dealing with the developers.

6.23 The paper also summarised our review of the PC4 capex forecasts contained in the companies' latest (2008) AIS (see **Figure 6.2** below). The four network companies have forecast a capex of about AED 65 billion in total over the PC4 period. The majority of such capex is projected to be spent by TRANSCO (AED 29 billion) and ADSSC (AED 23 billion). This would be around three times the total actual capex spent in the past five years (2003-2007) and thus may not be realistic.

Figure 6.2: Assessment of PC4 capex forecasts against historical actual capex



Source: Actual capex as per companies' audited SBAs 2003-2007 and forecast capex as per companies' 2008 AIS

6.24 Such forecasts were made prior to the current global financial crisis which has led, among other things, to a reduction in construction prices and a slowdown in the economy and hence in the demands on the utilities.

6.25 The Second Consultation Paper noted that, while the sector companies are expecting significant growth in infrastructure, the magnitude of the projected growth discussed above would require further justification given the recent slowdown in the

global and local economy and the resource capabilities available in the sector companies to undertake such capex. The paper therefore expressed our intention to base the provisional PC4 capex allowances on the actual capex spent by the companies in recent years up to 2008 (for which the audited accounts are expected by end June 2009) rather than on the companies' capex forecasts.

Responses

6.26 The respondents to the Second Consultation Paper continued their support for an ex post approach, along with the relative-efficiency based approach agreed for PC3 capex, for PC4 capex regulation. However, AADC and ADDC reiterated some of their earlier specific comments with regards to mega projects-related capex:

(a) AADC and ADDC argued that actual capex spent to date should not be used as the basis for provisional allowances for PC4 capex, given the expected exponential growth in the demand and infrastructure requirements. ADDC suggested the companies' latest capex forecasts from their five-year planning statements and AIS should be used for projecting PC4 provisional capex allowances. ADDC said that it will not accept the PC4 provisional allowance which does not include mega projects related capex. In this regard, ADDC intended to provide an updated capex forecast taking account of mega projects as the most recent AIS does not include such projects.

(b) AADC and ADDC did not support the view that mega projects related capex should be subject to the efficiency review given that these projects are initiated and managed by other parties.

(c) AADC suggested that, in case the past capex is used to project PC4 provisional capex, the price controls should be allowed to be re-opened through the PCROM (see Section 2) if actual PC4 capex is found to be significantly different than the provisional capex.

(d) With regards to the ex-post approach towards remuneration of capex, and particularly mega projects, ADDC stated that its shareholder will most likely require an appropriate return on the book value during PC4 instead of waiting until 2018 to have any variations between actual book value and RAV compensated. The company argued that it is not indifferent between *"being paid money today as opposed to being paid money in 10 years time"* in NPV terms, because *"the current WACC determination does not consider regulatory risk, default risk and interest rate risk"*.

6.27 Our views on these issues are as follows:

(a) The use of the ex-post approach to capex regulation fits well with the existing sector practice.

(b) As discussed in earlier papers (see paragraph 6.22(a) above), we are open minded on including mega projects related capex in the provisional PC4 capex allowances if such capex can be forecast with reasonable accuracy and supporting explanation or justification. However, no such justifications have been submitted to the Bureau to date, thereby making it difficult to consider them for inclusion in PC4 provisional capex allowances.

(c) The main advantage of the ex-post approach is that it can handle well the unanticipated investments such as those relating to mega projects. The company will be remunerated for all efficient capex at a future date while taking account of foregone financing costs and the time value of money. Note that each annual capex is remunerated through the price controls along with pre-agreed return over a pre-agreed duration (30 years in the case of electricity and water networks) from the year when such capex was incurred.

(d) We do not agree that the current WACC does not reflect the risks identified by ADDC. The equity beta, the debt premium and the underlying tenor of the risk-free rate (combined with the asset life assumption for price controls) used in WACC calculations (see Section 7) capture the regulatory risk, default risk and interest rate risk, respectively.

(e) The efficiency review of mega projects has already been discussed in earlier consultation papers (see paragraph 6.22(b) above). In essence, the scope of efficiency assessment would be more limited for such projects than that for other capex undertaken by the licensees. The emphasis in this case would be on the role and performance of the network companies in ensuring the reasonableness and efficiency of project designs, specifications and procurement processes used by the developers. We understand that such a role for the licensees has already been provided for in the memorandum of understanding (e.g. in schedule 3 thereto entitled “responsibility matrix”) or the agreement between the licensee and the respective developers.

(f) The scope of PCROM and its relevance to mega projects has already been discussed in Section 2 of this paper.

6.28 We are however mindful of ADSSC being a less mature company in the sector than the other companies (which have been operating for ten years) and facing a backlog of various replacement projects and significant demand growth (similar to other companies). It therefore seems appropriate to allow higher PC4 provisional capex

allowances for ADSSC than its actual annual capex to date (AED 276 million in 2007) but still lower than the company's forecast for PC4 (about AED 5.7 billion a year on average in 2008 prices).

6.29 It is important to note that the provisional capex used in setting the price control is solely to facilitate the financing of capex and the smoothing of the price control revenue from one period to another. It is not intended to be indicative of the Bureau's views of the appropriate or efficient level of capex. Once the audited accounts for all the years of the PC4 period are available, the actual capex spent over the period will be assessed against the Bureau's efficiency criteria for any financial adjustment at the next review, using the relative-efficiency score approach (as previously also agreed for PC3 capex for the water and electricity network companies).

PC4 capex provisional allowances

6.30 For these Draft Proposals, we have used the most recent actual capex (i.e. for 2007) to make provisional allowances for PC4 capex for each company. For this, we have converted 2007 actual capex into 2010 prices and appropriately rounded them off. The resulting provisional allowances are presented in **Table 6.7** below.

6.31 However, as discussed above, we have set these allowances for ADSSC at AED 2 billion per year - significantly higher than its actual annual capex to date. This allowance is higher than that for each of the distribution companies but lower than that for TRANSCO on a total basis.

Table 6.7: PC4 provisional capex allowances – Draft Proposals

AED million, 2010 prices		2010	2011	2012	2013	Total
AADC	Electricity	510.00	510.00	510.00	510.00	2,040.00
	Water	110.00	110.00	110.00	110.00	440.00
	Total	620.00	620.00	620.00	620.00	2,480.00
ADDC	Electricity	1,250.00	1,250.00	1,250.00	1,250.00	5,000.00
	Water	350.00	350.00	350.00	350.00	1,400.00
	Total	1,600.00	1,600.00	1,600.00	1,600.00	6,400.00
TRANSCO	Electricity	3,540.00	3,540.00	3,540.00	3,540.00	14,160.00
	Water	1,000.00	1,000.00	1,000.00	1,000.00	4,000.00
	Total	4,540.00	4,540.00	4,540.00	4,540.00	18,160.00
ADSSC	Total	2,000.00	2,000.00	2,000.00	2,000.00	8,000.00
Total		**8,760.00**	**8,760.00**	**8,760.00**	**8,760.00**	**35,040.00**

6.32 This table shows a total PC4 provisional capex allowance of about AED 35 billion (2010 prices) for the four network companies. This is about half of the licensees'

forecasts for PC4 capex (converted into 2010 prices) and thus represents a more realistic level of expenditure.

6.33 Should the 2008 audited actual capex be available by the time of publication of the Final Proposals, this will be used (rather than 2007 audited actual capex) as the basis for the PC4 provisional capex allowances.

Depreciation

Second Consultation Paper

6.34 Depreciation for any year is calculated in relation to both the opening RAV for that year and the capex allowed for that year. For all the companies, price control calculations to date have used the straight-line depreciation method both for initial RAVs and new capex. **Table 6.8** below shows the average asset life assumption for the price controls to date for both initial RAVs and new capex:

Table 6.8: Asset life assumptions at previous price control reviews

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

6.35 Earlier consultation paper set out the Bureau's thinking to continue for PC4 with the straight-line method and the asset life assumptions used to date for the price controls as set out in the above table.

Responses

6.36 In general, respondents to the Second Consultation Paper continued to support this approach.

6.37 However, ADSSC argued that the life of its new capex cannot be assumed to be 50 years and argued for a shorter life. This issue was discussed with ADSSC on 14 May 2009. We reminded the company that the matter was discussed at length at the 2007 review while setting its first price controls. The Bureau then found that the weighted average asset life assumption of 50 years for future assets was not contradicted by

the data for asset lives of different asset classes presented by ADSSC (refer to ADSSC's letter of 6 September 2007 and Bureau's letter of 18 October 2007). In fact, the company accepted this assumption at the last review via its letter of 31 October 2007 by stating that *"We note that the weighted average life of 50 years for new assets is dominated by the extent of our underground and civil assets but accept this figure as a reasonable assumption, based on current information"*.

6.38 As discussed in the Second Consultation Paper, a significant element of ADSSC's future capex programme relates to the construction of a major sewerage 'tunnel' on the Island of Abu Dhabi which is expected to have an asset life in excess of 100 years.

6.39 In the absence of any evidence to the contrary, the Bureau therefore remains satisfied with its average life assumption of 50 years for ADSSC's future assets.

Calculation of depreciation

6.40 At the previous price control reviews, the depreciation on initial RAVs (adopted for the first price controls) and on the previous capex was calculated or reported in the same financial model used for the main price control calculations. However, the increase in the number of years since the first controls now means more detailed calculations are required. Further, initial RAVs, in some cases, are expected to be fully depreciated in the near future.

6.41 At this review, we have therefore developed a separate Microsoft Excel based model (to be referred to as the "***PC4 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 during the PC1 and PC2 periods; (c) each annual provisional capex during the PC3 period; and (d) the foregone financing costs in relation to PC1 efficient capex agreed to be added to the RAV.

6.42 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 2010 prices. There are separate worksheets in the model for each business. The model is available to the network companies upon request and will be updated at each price control review as appropriate.

6.43 **Table 6.9** below shows the total depreciation for each business calculated by this model for each year of the PC4 period in 2010 prices, in respect of initial RAVs, efficient PC1 and PC2 capex, and provisional PC3 capex:

Table 6.9: Depreciation on initial RAV and on capex to date (excluding PC4 capex)

AED million, 2010 prices		2010	2011	2012	2013
AADC	Electricity	307.04	307.04	307.04	307.04
	Water	102.58	102.58	102.58	102.58
ADDC	Electricity	505.12	505.12	505.12	505.12
	Water	240.82	240.82	240.82	221.11
TRANSCO	Electricity	846.23	846.23	846.23	846.23
	Water	567.11	567.11	567.11	567.11
ADSSC	Total	544.41	544.41	544.41	544.41
Total		**3,113.31**	**3,113.31**	**3,113.31**	**3,093.60**

6.44 It is noted that depreciation for ADDC's water business is lower in 2013 than in earlier years, as the initial (1999) RAV becomes fully depreciated in that year (in line with the initial RAV asset life shown in **Table 6.8**).

6.45 The above table excludes the depreciation in respect of the provisional PC4 capex, which is calculated in the main price control financial model discussed in Section 9 and is shown in **Table 6.10** below:

Table 6.10: Depreciation on PC4 provisional capex

AED million, 2010 prices		2010	2011	2012	2013
AADC	Electricity	8.50	25.50	42.50	59.50
	Water	1.83	5.50	9.17	12.83
ADDC	Electricity	20.83	62.50	104.17	145.83
	Water	5.83	17.50	29.17	40.83
TRANSCO	Electricity	59.00	177.00	295.00	413.00
	Water	16.67	50.00	83.33	116.67
ADSSC	Total	20.00	60.00	100.00	140.00
Total		**132.67**	**398.00**	**663.33**	**928.67**

6.46 **Table 6.11** below presents the total annual depreciation for each business on all assets, namely the initial RAV, PC1 and PC2 efficient capex, PC3 provisional capex and PC4 provisional capex. Each amount in this table is the sum of corresponding amounts shown in **Tables 6.9** and **6.10** above.

Table 6.11: Total depreciation for PC4 calculations – Draft Proposals

AED million, 2010 prices		2010	2011	2012	2013
AADC	Electricity	315.54	332.54	349.54	366.54
	Water	104.42	108.08	111.75	115.42
ADDC	Electricity	525.95	567.62	609.29	650.95
	Water	246.66	258.32	269.99	261.95
TRANSCO	Electricity	905.23	1,023.23	1,141.23	1,259.23
	Water	583.77	617.11	650.44	683.77
ADSSC	Total	564.41	604.41	644.41	684.41
Total		**3,245.98**	**3,511.31**	**3,776.65**	**4,022.27**

Updating RAVs

6.47 The opening 2010 RAVs projected at the last price control reviews need to be updated for the following items (as well as adjustment to 2010 prices):

(a) additional efficient PC2 capex over and above the provisional PC2 capex allowances in PC2 controls, in the case of AADC, ADDC and TRANSCO; and

(b) provisional PC4 capex allowances being made at this review for all the four companies.

Updating RAVs for PC2 capex

6.48 As agreed at the previous price control reviews, the additional efficient PC2 capex over and above the provisional PC2 capex allowances (i.e., the amounts in **Table 6.6** above) needs to be rolled into the RAVs. However, in line with the earlier discussion in this Section 6, the foregone financing costs (both depreciation and return on capital) relating to the period between when the PC2 capex was undertaken and when it will be financed is proposed to be remunerated over the PC4 period (rather than added to the RAVs as was done in the case of PC1 capex). **Annex A** to this paper shows how this has been done for each business of AADC, ADDC and TRANSCO separately in **Annexes A.1 through A.6**. 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.

6.49 The results of this updating are summarised below:

Table 6.12: Updated RAVs and foregone financing costs for PC2 capex

AED million		NPV of PC2 capex foregone financing costs (2010 prices)	Opening 2010 RAVs from last review (2006 prices)	Opening 2010 RAVs updated for efficient PC2 capex (2010 prices)
AADC	Electricity	518.18	3,300.51	5,298.10
	Water	186.03	1,628.53	2,518.78
ADDC	Electricity	(155.58)	7,037.90	9,341.40
	Water	291.29	2,611.91	3,889.43
TRANSCO	Electricity	1,209.61	12,118.09	18,720.51
	Water	467.66	7,494.15	10,536.78
Total		**2,517.19**	**34,191.09**	**50,305.00**

6.50 This table indicates that the total NPV of adjustments for foregone financing costs up to 2010 for all businesses amounts to about AED 2,517 million (in 2010 prices). The total opening 2010 RAV for all the businesses has increased from about AED 34 billion to about AED 50 billion. The increase reflects both the change in price basis from 2006 prices to 2010 prices (i.e. due to CPI inflation) and the inclusion of foregone financing costs relating to PC2 capex.

Updating RAVs for PC4 capex

6.51 **Annexes A.1 through A.6** to this paper also show the updating of RAVs for provisional PC4 capex for each of AADC, ADDC, ADSSC and TRANSCO (all figures are in 2010 prices). The following table summarises the results of this updating:

Table 6.13: Opening RAVs updated for provisional PC4 capex

AED million, 2010 prices		2010	2011	2012	2013	2014
AADC	Electricity	5,298.10	5,492.56	5,670.01	5,830.47	5,973.92
	Water	2,518.78	2,524.37	2,526.29	2,524.54	2,519.12
ADDC	Electricity	9,341.40	10,065.45	10,747.83	11,388.54	11,987.59
	Water	3,889.43	3,992.77	4,084.45	4,164.46	4,252.51
TRANSCO	Electricity	18,720.51	21,355.28	23,872.05	26,270.82	28,551.59
	Water	10,536.78	10,953.00	11,335.90	11,685.45	12,001.68
ADSSC		7,725.34	9,160.94	10,556.53	11,912.13	13,227.72
Total		**58,030.34**	**63,544.36**	**68,793.05**	**73,776.40**	**78,514.13**

6.52 The total RAV for all the businesses increases from about AED 58 billion (in 2010 before adjustments for provisional PC4 capex) to over AED 78 billion by end of 2013 (after adjustments for provisional PC4 capex). The RAVs shown in **Table 6.13** are used as inputs to the PC4 price control calculations in Section 9. The opening 2014 RAVs will also be used as the starting points at the next price controls review for any RAV updates for efficient or provisional capex.

7. Cost of capital

Introduction

7.1 This Section 7 discusses the Bureau's estimate of the cost of capital for the network companies. This estimate is used as the allowed rate of return to be applied to the RAV each year to calculate the return on capital component of the annual revenue requirement.

7.2 Earlier consultation papers described the theoretical framework and the Bureau's approach to cost of capital calculations in detail. The Bureau has to date calculated the cost of capital as the forward-looking, post-tax Weighted Average Cost of Capital (WACC) for the companies by applying the Capital Asset Pricing Model (CAPM) to the data available from local and international capital markets. Since the Bureau's price control calculations are carried out in **real terms** (i.e. excluding inflation), the inputs to the cost of capital calculation have also been in real terms.

7.3 The Bureau's cost of capital calculations to date have drawn heavily on the estimates of cost of capital components used by regulators of similar businesses in the UK and Australia subject to a similar regulatory regime. However, with the continuing improvements in the local and regional capital markets, these estimates were cross-checked against the information available from such markets in order to capture any particular factors that may be specific to the businesses operating in Abu Dhabi.

7.4 The Bureau's cost of capital calculations adopted at the last price control reviews for network companies are summarised in the following table:

Table 7.1: Bureau's cost of capital calculations for PC3 review

	Low	High
Risk-free rate (real)	2.9%	3.0%
Debt premium	1.3%	1.3%
Corporation Tax	30.0%	30.0%
Post-tax cost of debt (real)	2.9%	3.0%
Equity Risk Premium	4.3%	4.7%
Equity Beta	0.86	1.00
Post-tax cost of equity (real)	6.5%	7.7%
Gearing	55.0%	45.0%
Post-tax cost of capital (real)	**4.5%**	**5.6%**

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

Second Consultation Paper

Recent developments

7.5 Earlier consultation papers provided the following evidence indicating a lower cost of capital than 5% previously used by the Bureau:

(a) The regulatory decisions in the UK and Australia during 2007 showing the real post-tax cost of capital in the range of 3.83% - 5.20%, with a mid-point average of 4.52%.

(b) Upgrading of the UAE's country rating by Moody's Investor Services by one level from A1 to Aa3, indicating (all else equal) a lower cost of capital for UAE companies than before.

(c) Assigning of a credit rating of Aa3 by Moody's to Abu Dhabi National Energy Company (or TAQA), a subsidiary of ADWEA holding significant ownership of the IWPPs in Abu Dhabi. This indicates a lower rate of return (by approximately 0.5 to 1 percentage points) for Abu Dhabi companies than that estimated by the overseas regulators, who base their analysis on a (lower) investment grade credit rating.

(d) Recent significant volatility in the equity markets and declines in (i) the risk-free rate (as low as 2% p.a. in nominal terms), (ii) the overall cost of debt in global markets, and (iii) the UAE inter-bank interest rates.

Assessment of respondents' estimates

7.6 In order to assess the responses to the First Consultation Paper, which referred to other sources for cost of capital data in nominal terms, the Second Consultation Paper converted the Bureau's real WACC estimates from **Table 7.1** above into nominal WACC estimates (for a like to like comparison against other sources) assuming a medium-term UAE inflation of 5% per annum:

Table 7.2: Bureau's cost of capital calculations for PC3 in nominal prices

	Estimates in real terms	Equivalent estimates in nominal terms (based on 5% inflation assumption)
Post-tax cost of debt	2.9% - 3%	7.9% - 8%
Post-tax cost of equity	6.5% - 7.7%	11.5% - 12.7%
Gearing	45% - 55%	45% - 55%
Post-tax cost of capital	**4.5% - 5.6%**	**9.5% - 10.6%**

Source: Bureau's calculations using a simpler formula (nominal WACC = real WACC + inflation) than the actual relationship.

7.7 This table shows that the Bureau's calculations at the last review give a nominal cost of debt of 7.9-8% and a nominal cost of capital of 9.5%-10.6%, for a 5% inflation

assumption. As shown in the table below, the Bureau's estimates were, if anything, on the higher side compared to the evidence submitted by the respondents.

Table 7.3: Respondents' estimated costs of capital in nominal prices

	Bureau's estimates (based on 5% inflation assumption)	ADDC (quoted from overseas regulators)	ADWEA (actual cost of borrowing for sector companies)
Post-tax cost of debt	7.9% - 8%		4.75%-7.50% (assuming 4% EIBOR)
Post-tax cost of capital	9.5% - 10.6%	5.13%-8.60%	

Assessment of latest local capital market estimates

7.8 The Second Consultation Paper also presented recent cost of capital estimates by some local capital market analysts for the UAE companies operating in the transport, telecom, district cooling and real estate sectors as follows:

Table 7.4: Recent local capital market estimates of cost of capital (nominal terms)

	Analyst	Company	Sector	Date	Cost of equity	Cost of debt	WACC
1.	EFG Hermes	Aldar	Real estate	Jun 2008	11.04%		9.25%
2.	Morgan Stanley	Tabreed	Cooling water	Jun 2008	14.00%	5.00%	8.00%
3.	EFG Hermes	Air Arabia	Airline	Jul 2008	10.50%		
4.	Citigroup	Air Arabia	Airline	Jul 2008	10.90%	6.00%	
5.	NBK Capital	Du	Telecom	Dec 2008	12.75%		
6.	Prime Holding	Emaar	Real estate	Dec 2008	15.51%	6.86%	12.5%
7.	HSBC	Sorouh	Real estate	Jan 2009	12.30%	6.50%	10.00%
	Range of estimates				**10.5%-15.51%**	**5%-6.860%**	**8%-12.5%**
	Mid-point				**13%**	**5.93%**	**10.25%**

Source: Various research reports by the analyst firms listed above.

7.9 Comparing these local capital market estimates against the Bureau's nominal estimates in **Table 7.3** above, the following was noted:

(a) The nominal cost of equity estimated by analysts (10.5%-15.51%) was consistent with range estimated by the Bureau (11.5%-12.7%);

(b) The analysts' estimates of nominal cost of debt (5%-6.86%) were consistent with ADWEA's actual cost of borrowing (3.75%-7.50%) but significantly lower than the Bureau's previously estimated cost of debt (7.9%-8%); and

(c) The analysts' estimates of overall nominal WACC (8%-12.5%) were consistent with the Bureau's nominal WACC estimates (9.5%-10.6%).

Bureau's thinking in Second Consultation Paper

7.10 The evidence provided by the respondents to the First Consultation Paper and the latest local capital market estimates indicated a cost of capital lower than the Bureau's estimate at the last reviews. The Second Consultation Paper therefore set out our thinking to use a real, post-tax WACC of 4.50% for PC4 calculations for all network companies.

Responses

7.11 In response to the Second Consultation Paper, the companies generally deferred the cost of capital issue to their shareholder, ADWEA. While ADDC pointed to the additional return of 0.5% previously included in the cost of capital for the distribution companies, it did not make a case justifying why such additional return be considered at this review.

7.12 ADSSC wished to discuss how the cost of capital is incorporated in its current budgeting environment. At the meeting on 14 May 2009, we explained to ADSSC that, while the company at present does not receive full subsidy from the government covering all components of its revenue requirement or MAR, the cost of capital is used to calculate the return on capital component of its revenue requirement (which is similar in magnitude to the depreciation component). However, once the framework for subsidy calculation as developed for the distribution companies is adopted for ADSSC, the company will be able to see the impact of the cost of capital.

7.13 While we have not received any further response from ADWEA on the cost of capital, we have already explained in detail in the Second Consultation Paper (summarised above) how our estimate compares against ADWEA's estimate.

Draft Proposal

7.14 Based on the above discussion and evidence, we have adopted a real, post-tax cost of capital of 4.50% for these Draft Proposals in respect of all network companies.

7.15 However, as discussed in Section 2, the introduction of PCROM at this review will result in lower risks and hence lower cost of capital for the companies. We are therefore considering whether to further reduce our estimate of the cost of capital by, say, 0.1%-0.5% to reflect the lower risks.

8. Financial adjustments

Introduction

8.1 The Second Consultation Paper identified the following potential financial adjustments relating to past years which may be required at this review:

Table 8.1: Financial adjustments at this review – Second Consultation Paper

S.No.	Financial adjustment for	Company
1.	Performance on PIS Category B indicators	All network companies (under review)
2.	Performance on 2007 Five-Year Planning Statement	TRANSCO (electricity)
3.	Mis-statement of revenue drivers or regulated revenues in audited PCR (if any)	All network companies (under review)
4.	Asset disposal or transfer (if related incomes not already included within regulated revenue in audited PCRs)	All network companies (under review)
5.	Delay in implementation of Bureau's approved large customer tariff for TRANSCO (if commencement of such implementation is not confirmed)	AADC (pending confirmation)
6.	Impact of S1 transmission system constraints (amounting to about AED 150 million in 2004-2007 prices)	TRANSCO
7.	Delay in customers' water asset installations (amounting to about AED 25 million in 2003 prices)	AADC
8.	Delay in water interface metering	ADDC (and possibly AADC)
9.	Implementation of Guaranteed Standards (depending on consultant's report on performance) and internet-based bill payment methods (depending on web portal operation by June 2009)	AADC and ADDC

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

8.2 The paper also highlighted the introduction of a mechanism for TRANSCO whereby a financial adjustment (equal to 50% of PWPA availability payments unnecessarily incurred by the sector) would be made at the next price control review for any water transmission constraints remaining for 2009 onwards.

8.3 Each of the above financial adjustments is discussed below in turn, along with the responses we received in respect of that adjustment. Where appropriate, the adjustment has been calculated in NPV terms as if it had been made at the time of occurrence of the event to which it relates. For this, we have used the UAE CPI assumptions set out in **Table 2.5** for conversion of different amounts into 2010 prices, and the cost of capital determined at the previous price control reviews as the discount rate for the relevant years. The financial adjustments proposed here have been used in the price control calculations in Section 9.

Financial adjustments for performance on PIS Category B

Second Consultation Paper

8.4 The Second Consultation Paper explained that we will continue to monitor companies' performance on PIS Category B indicators over the PC3 period until publication of the Final Proposals on PC4 in September 2009 for any required financial adjustment (up to 2% of a company's "own" MAR) at this review, as agreed at the previous control reviews. Any adjustments for performance in respect of the 2009 financial year would need to be deferred to the next price controls review (i.e., 2013). While the paper expressed general concerns on the performance of some companies on certain Category B indicators, it particularly expressed our intention to apply a negative financial adjustment in respect of TRANSCO's 2007 Five-Year Planning Statement (Electricity), which the Bureau was not able to approve.

Responses

8.5 In response to the Second Consultation Paper, ADDC reiterated its concerns on such adjustments being of no real purpose, retrospective, subjective, arbitrary and without any foundation for ADDC to improve and measure against.

8.6 TRANSCO expressed its disappointment with the proposed adjustment for its performance on the planning statement. It requested the Bureau to identify the precise clause or requirement of its licence which TRANSCO did not fulfil and can justify the financial penalty in question. TRANSCO argued that its 2007 statement met all requirements of Licence Condition 15 (evidenced from inclusion of all projects proposed in the 2007 statement in the approved 2008 statement) and that it worked hard within its new organisational structure to address each of the Bureau's concerns. It argued that the Bureau's information requirement was not clearly defined at the time.

8.7 On ADDC's concern, we remind the companies that, while there are many Category B indicators and many of them are not defined as clearly as Category A ones, we have proposed financial adjustments only for those (few) indicators where the relevant company's performance was exceptionally good or poor.

8.8 We refer TRANSCO to paragraph 5 of its Licence Condition 15 which states that *"The Licensee shall … … prepare statements (separately in relation to the Licensee's water transmission system and electricity transmission system) in a form approved by the Bureau showing in respect of each of the five succeeding financial years …….".* This clearly requires the preparation of the statement in a *form approved by the Bureau*. We believe that the Bureau's requirements were clear at the time and

TRANSCO did not provide the required information and did not prepare the statement in the form that the Bureau could approve. This led to such a performance on a measure which TRANSCO knew was a PIS Category B indicator with associated potential financial adjustment. The 2008 statement was approved by the Bureau only because TRANSCO then complied with its Licence Condition 15.

8.9 It is also noted that the Bureau was not able to approve TRANSCO's 2006 Five-Year Planning Statement (Water). The Draft Proposals therefore also include a negative financial adjustment in this case.

Calculation

8.10 The following table shows our calculation of the two financial adjustments for TRANSCO in 2010 prices. This is shown as NPV at 1 January 2010 based on 1% of the relevant MAR and using the relevant cost of capital as the discount rate:

Table 8.2: Financial adjustments for TRANSCO's FYS – Draft Proposals

TRANSCO's 2007 FYS (Electricity)		
2007 Maximum Allowed Revenue (MAR)	AED million, 2007 prices	1,160.28
	AED million, 2010 prices	1,457.92
Financial adjustment	% of MAR	-1.00%
	AED million, 2010 prices	-14.58
Cost of capital used for PC3	%	5.00%
Multiplication factor (mid-year basis) to calculate PV at 1 Jan 2010		1.130
PV of financial adjustment at 1 January 2010	**AED million, 2010 prices**	**-16.47**
TRANSCO's 2006 FYS (Water)		
2007 Maximum Allowed Revenue (MAR)	AED million, 2007 prices	756.32
	AED million, 2010 prices	1,038.57
Financial adjustment	% of MAR	-1.00%
	AED million, 2010 prices	-10.39
Cost of capital used for PC3	%	5.00%
Multiplication factor (mid-year basis) to calculate PV at 1 Jan 2010		1.186
PV of financial adjustment at 1 January 2010	**AED million, 2010 prices**	**-12.32**

Source: TRANSCO's audited PCRs for 2006-2007
Notes: MAR includes Q term but excludes K factor and any derogation

PCR-related financial adjustments

8.11 For these Draft Proposals, we have not identified the need for any financial adjustment for mis-statement of revenue drivers and/or regulated revenues in the companies' past PCRs. Any such errors when identified were corrected in the following year's PCR.

Financial adjustments for asset disposal or transfer

8.12 For these Draft Proposals, we have not identified a requirement for any financial adjustment for asset disposal or transfer. This is because (a) the actual PC2 capex used in Section 6 automatically deducts the net book value of certain assets disposed of or transferred by the company from the capex, and (b) we are not aware of any incomes from asset sales / transfers which have not been included within the "regulated revenue" in the audited PCRs for the PC3 period to date.

Financial adjustment for implementation of large customer tariff

8.13 The Second Consultation Paper expressed our intention not to make any negative financial adjustment for the delay in implementation by AADC of the large-user special tariff for TRANSCO, provided AADC had implemented the tariff (which has been confirmed by AADC).

Financial adjustment for transmission system constraints (TRANSCO)

Financial adjustment for past constraints

8.14 In accordance with the Bureau's determination at the 2005 price controls review, the Second Consultation Paper described our intention to apply a negative adjustment of about AED 150 million (in nominal prices over the period 2004-2007) to TRANSCO's future revenue at this review. This is for the delays in the completion of the water transmission system associated with the Shuweihat (S1) production project. This was based on 50% of the availability payments unnecessarily incurred by ADWEC under the PWPA for the S1 project.

8.15 Due to the confidential nature of some data, the paper did not present the calculation of the adjustment and instead offered sharing the calculation with TRANSCO for review and any comments.

8.16 In response to the paper, TRANSCO reiterated its concerns on being penalised twice for this delay through the PC2 capex efficiency review and the proposed financial adjustment. It however noted that Approach 3 (i.e. relative-efficiency approach) if used for PC2 capex would mitigate the impact of this "*double jeopardy assessment*" to some extent. AADC argued for a positive financial adjustment to its opex at this review for the additional costs it incurred to manage the impact of upstream water supply constraints in terms of extended intermittent supply regime, prolonged manual valve operations, leakage due to intermittent pressurisation, alternative water supply arrangements, increased customer concerns and contact centre calls.

8.17 We have clarified to TRANSCO the difference between the treatment of delay in the Shuweihat water pipeline in (i) the PC2 capex review and (ii) our proposed financial adjustment for TRANSCO at this review, and referred to the Second Consultation Paper for this clarification.[2]

8.18 With regards to AADC's response, we consider that the water supply constraints to AADC have existed for a number of years and the resulting additional costs (if any) are already reflected in the historical opex used in setting the price control.

8.19 The following table shows the calculation of the PV of this adjustment as of 1 January 2010 in 2010 prices using the approach described in the Second Consultation Paper but without showing data of a confidential nature (e.g. the PWPA rates for S1):

Table 8.3: Financial adjustment for TRANSCO's S1 constraint – Draft Proposals

		2004	2005	2006	2007
Months		May - Dec	Jan - Dec	Jan - Dec	Jan - Aug
Capacity payment for water not despatched	AEDm, nominal prices	115.74	116.56	42.27	25.96
Financial adjustment	AEDm, nominal prices	-57.87	-58.28	-21.14	-12.98
	AEDm, 2010 prices	-88.65	-84.99	-29.03	-16.31
Cost of capital assumed at the time (PC2 or PC3)		6.00%	6.00%	5.00%	5.00%
Multiplication factor (mid-year basis) to calculate PV at Jan 2010		1.378	1.300	1.186	1.130
PV of financial adjustment	AEDm, 2010 prices	-122.13	-110.46	-34.43	-18.42
PV of total financial adjustment	**AEDm, 2010 prices**	**-285.45**			

Incentives for future constraint removal

8.20 Earlier consultation papers described the incentive mechanism introduced for TRANSCO to remove other water network transmission constraints, particularly in relation to water supplies to AADC.

8.21 These Draft Proposals confirm that, from 1 January 2009, TRANSCO will bear a cost equal to 50% of the availability payments paid by ADWEC to the production companies under the PWPAs in respect of water which is made available by producers but which cannot be supplied to final customers due to transmission constraints. The Bureau will monitor TRANSCO's performance on transmission constraints from 2009 onwards, and any required financial adjustment will be made at the next price control review.

[2] Paragraph 5.20 of the Second Consultation Paper is reproduced here for TRANSCO's ready reference as it seemed to be unaware of this in its response and in the meeting on 12 May 2009: *"With regards to TRANSCO's comment on the adjustment for the delay in the Shuweihat water pipeline, the Bureau considers that the PC2 capex review took account of such delay in relation to its effect on the capex efficiency and hence the transmission network costs. In contrast to this, the Bureau's proposed financial adjustment (discussed in Section 8) relates to the effect of such delay on the production costs. This delay resulted in PWPA availability payments by ADWEC to Shuweihat IWPP without utilising the available water production capacity."*

Financial adjustment for customers' water asset installations (AADC)

8.22 At the 2005 price controls review, the Bureau agreed to AADC's request to finance in the PC3 controls for AADC an additional opex allowance of AED 25 million spread evenly across 2006 and 2007. This was for costs associated with the upgrading of customers' water installations to facilitate the completion of a 24-hour water supply in AADC area. However, AADC has subsequently informed the Bureau that it has only spent a small proportion of the allocated amount, and has been unable to provide the Bureau with a clear plan of its proposed future expenditure in this area.

8.23 The Second Consultation Paper therefore set out the Bureau's thinking to make a negative adjustment at this review to AADC's water revenue requirement to remove the entire opex allowance of AED 25 million in 2003 prices (while taking account of the time value of money and inflation) previously granted to AADC. Keeping in view the need to facilitate this important work, we stated our intention to continue discussion with AADC to ensure the completion of works as soon as possible. AADC will then be remunerated at the next price control review for its reasonable costs (up to a maximum of AED 25 million) incurred on the programme.

8.24 In its response to the paper, AADC argued for consideration of the small component of the work and related cost which it has already undertaken, and argued that the Bureau's proposed ex-post financing arrangement for the work at the next review supports its view that the work (and funding) is outside the scope of AADC's licensed activities and hence of this price control review.

8.25 We are disappointed to note the lack of commitment on the part of AADC to such an important work stream. In view of the limited information provided by AADC on the work undertaken to date, we are unable to take account of this in our calculation of the necessary financial adjustment. This is particularly disappointing in view of the fact that the additional opex allowance was allowed at the last review at AADC's own request to facilitate completion of a 24-hour water supply in the AADC area.

8.26 We have calculated the financial adjustment for AADC, as follows:

Table 8.4: Financial adjustment for AADC's water assets – Draft Proposals

		2006	2007
Additional opex allowed in PC3	AED million, 2006 prices	12.50	12.500
	AED million, 2010 prices	17.16	17.16
Financial adjustment	AED million, 2010 prices	- 17.16	- 17.16
Cost of capital for PC3	%	5.50%	5.50%
Multiplication factor (mid-year basis) to calculate PV at 1 Jan 2010		1.206	1.143
PV of financial adjustments at 1 January 2010	AED million, 2010 prices	-20.70	-19.62
PV of total financial adjustment at 1 January 2010	**AED million, 2010 prices**		**-40.33**

Financial adjustment for water interface metering (AADC / ADDC)

Second Consultation Paper

8.27 As previously discussed, TRANSCO has a licence obligation to ensure that MDEC-compliant meters are installed at the water network interfaces between TRANSCO and distribution companies. However, the interface meters themselves are owned by the distribution companies. In practice, the procurement of the meters has been undertaken partly by TRANSCO and partly by the distribution companies.

8.28 Earlier consultation papers discussed the impact of delays in completing the installation of MDEC-compliant interface meters in terms of lower MAR for TRANSCO during the PC3 period, without any financial impact on the distribution companies. The papers also presented TRANSCO's argument that, as the delays in completing the interface metering are attributable to some degree to the distribution companies, they should share some of the financial (MAR) impact borne by TRANSCO due to such delays. Conversely ADDC argued that (a) despite the resulting financial penalty, TRANSCO has not done enough to sufficiently raise this issue with either ADDC or ADWEA, or to progress these meters, and (b) TRANSCO has had full power to install these meters on AADC's behalf and has not achieved markedly different results in AADC's area from those achieved in the ADDC area. TRANSCO however argued that, while it has the licence obligation to ensure such metering, it does not have the ability to ensure that the distribution companies install or maintain such meters.

8.29 The Second Consultation Paper considered the interface metering as the shared responsibility of TRANSCO and the distribution companies, and stated that the Bureau was considering whether to make a negative financial adjustment for ADDC (and possibly for AADC) at this review for delays in the installation of interface metering to date. It was noted that this matter would be considered further once TRANSCO's audited PCR for the 2008 financial year (showing metered units transmitted in 2008) is received at the end of March 2009. For the future, we intended to introduce incentives for the distribution companies to play their due role in ensuring interface metering, while retaining the existing metered revenue drivers for TRANSCO (see Section 2).

Responses

8.30 Companies' responses to the Second Consultation Paper are summarised below:

(a) AADC did not accept the responsibility for, and hence any financial adjustment for, the delay in the interface metering, in view of its agreement

with TRANSCO wherein the latter undertook to install meters on AADC's behalf.

(b) ADDC also did not accept this financial adjustment, arguing that the delay would not have arisen or would have been addressed if the Bureau and TRANSCO had amended MDEC to transfer ownership responsibilities from the distribution companies to TRANSCO. It also expressed concern (emphasised at the meeting on 26 May 2009) about the lack of details on the magnitude of this adjustment and not being informed in advance to enable it to address the issue.

8.31 On both the responses, the Bureau's view is that MDEC places clear obligations on the distribution companies to install interface metering. Furthermore, any agreement outsourcing interface metering to TRANSCO (or any other party, for that matter), or any proposed amended to MDEC not implemented, are irrelevant and do not relieve AADC and ADDC from their responsibilities in relation to the interface metering. In the Bureau's view, responses of this nature further emphasise the necessity to ensure distribution companies face financial consequences from failure to meet their MDEC obligations.

Calculations

8.32 Based on TRANSCO's 2008 audited PCR (and ADWEC's 2008 audited PCR) for water, we have calculated the financial loss, separately for AADC and ADDC areas, that TRANSCO incurred during 2008 via its revenue drivers due to a lack of metering in these areas. Negative financial adjustments have then been calculated to share 50% of these losses with AADC and ADDC. An opposite but equal financial adjustment has also been calculated for TRANSCO to compensate it for 50% of its losses. These calculations are presented in Table 8.5 below.

8.33 We have not calculated similar financial adjustments for 2006 and 2007 because we granted certain derogations to TRANSCO to mitigate the impact of financial losses for those years. At present, such an adjustment cannot be calculated for 2009 as the audited data on metering for the complete year 2009 (through the audited PCRs) will not be available until early 2010. For 2010 onwards, incentives for interface metering will be provided through the Interface Metering Incentive (IMI) (see Section 3).

Table 8.5: Financial adjustments for water interface metering – Draft Proposals

Financial adjustment for 2008 interface metering		AADC	ADDC	TRANSCO
TRANSCO's financial loss due to Peak Demand				
Metered exiting transmission system	MIGD	75.53	134.31	
Total entering transmission system	MIGD	164.13	438.67	
Total exiting transmission system	MIGD	157.56	421.12	
Unmetered exiting transmission system	MIGD	82.03	286.81	
PC3 notified value "b" for TRANSCO	AED/TIGD, 2008 prices	285.59	285.59	
TRANSCO's financial loss	AED million, 2008 prices	23.43	81.91	105.34
TRANSCO's financial loss due to Units Transmitted				
Metered exiting transmission system	MIG	23,404.41	38,251.71	
Total exiting transmission system	MIG	55,612.57	137,957.30	
Unmetered exiting transmission system	MIG	32,208.16	99,705.59	
PC3 notified value "c" for TRANSCO	AED/TIG, 2008 prices	0.8137	0.8137	
TRANSCO's financial loss	AED million, 2008 prices	26.21	81.13	107.34
Financial adjustments				
TRANSCO's total financial loss	AED million, 2008 prices	49.64	163.04	212.68
Loss to be shared	%	50.00%	50.00%	
Financial adjustment	AED million, 2008 prices	-24.82	-81.521	
	AED million, 2010 prices	-28.06	-92.18	
Multiplication factor (mid-year basis) to calculate PV at Jan 2010		1.084	1.084	
PV of financial adjustment at Jan 2010	**AED million, 2010 prices**	**-30.41**	**-99.88**	**+130.29**

Source: TRANSCO's and ADWEC's audited PCRs for 2008

Notes: Total quantities (metered and unmetered) exiting the transmission systems have been sourced from ADWEC's 2008 audited PCR, with an assumption of 4% transmission loss in the case of peak demand (where only quantities entering the transmission system were available).

Financial adjustments for Guaranteed Standards and Bill Payment Methods (AADC/ADDC)

8.34 At the 2005 price controls review, the Bureau expressed its intention to assess the "customer satisfaction" related PIS Category B indicator over the PC3 period in terms of the performance of AADC and ADDC on the implementation of Guaranteed Standards (GS) and Overall Standards (OS). (Refer to Section 11.3 of Bureau's *"Final Proposals for PC3"*, November 2005.)

8.35 In early 2009, the Bureau appointed Ernst & Young as the consultant to audit the implementation of GS standards and the required systems and processes. Pending the consultants' findings, the Second Consultation Paper indicated the potential for a negative financial adjustment for AADC and ADDC if such standards or associated systems and processes are not found to be implemented properly. The paper also expressed our intention to apply a negative financial adjustment if the web portal being developed and tested by each distribution company for internet based payment method is not operational by the time of publication of these Draft Proposals.

8.36 At the meeting on 21 May 2009, AADC informed us that its web portal was being tested within the company through actual bill payment by the staff (as the company's customers) and will be available soon for use by its customers in general.

8.37 ADDC in its response disagreed with these financial adjustments. It considered that its performance on GS and OS has been measured every month for the last two years and expressed lack of clarity about the performance being assessed by the Bureau's consultants. It also highlighted that the adjustment was not mentioned in the First Consultation Paper nor was ever informed otherwise. The company also argued that internet web portal based systems are very expensive to operate and take time and effort to implement and that the resulting additional costs to implement such systems had not been recognised by the Bureau.

8.38 As mentioned earlier, the possibility of a financial adjustment for performance on OS and GS was always known to the companies since the 2005 price control review. On the internet based payment, we find ADDC's argument to be unconvincing given such payment systems are now standard practice for all leading utility companies. We also believe that such payment system will result in cost savings in the medium to long term and its benefits should outweigh any additional cost indicated by ADDC.

8.39 We have now received our consultants' report on OS and GS performance audit and are currently reviewing it. We will present our findings on this in the Final Proposals along with any proposed financial adjustment. We will also provide a further opportunity for AADC and ADDC to avoid a negative financial adjustment by ensuring that their internet based payment system is operational by the publication of our Final Proposals for PC4 (due by mid September 2009). According to the mechanism in place for Category B indicators, such a negative financial adjustment can be up to 2% of the company's "own" MAR for the relevant year.

Summary of financial adjustments at this review

8.40 Pending finalisation of certain financial adjustments discussed above, the following table summarises the financial adjustments that we have calculated for these Draft Proposals and used in the price control calculations in Section 9:

Table 8.6: Financial adjustments at this review – Draft Proposals

AED million, 2010 prices	Customer asset installations	Interface metering	Planning statements	Transmission constraints	Total
AADC Electricity					
AADC Water	-40.33	-30.41			-70.73
ADDC Electricity					
ADDC Water		-99.88			-99.88
TRANSCO Electricity			-16.47		-16.47
TRANSCO Water		130.29	-12.32	-285.45	-167.48
ADSSC					
Total					**-354.57**

9. Price control calculations

Introduction

9.1 Section 2 describes the overall framework for the price control calculations used in these Draft Proposals. Subsequent sections then discuss and set out the various inputs required for these calculations. This Section 9 describes the price control calculations in detail and sets out the results and their implications.

9.2 We have developed a Microsoft Excel based financial model to carry out the PC4 price control calculations (to be referred to as the "***PC4 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, i.e., those relating to opex and revenue driver projections, efficient PC2 capex and related foregone financing costs, updating of RAVs for efficient PC2 capex and provisional PC4 capex, and the financial adjustments.

9.3 As discussed in Section 6, another separate Excel based model (the ***PC4 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 2009. The PC4 Financial Model takes the total depreciation on RAV and capex to date (in 2010 prices) directly from this PC4 Depreciation Model. Both of these models are available for the network companies upon request.

9.4 The PC4 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, 2010 prices. The discount rate used in the present value or NPV calculation is the cost of capital set out in Section 7; that is, 4.50% (real, post-tax). The NPV of costs is calculated on a mid-year basis; that is, the cost is assumed to be spread uniformly over a year or occur at the middle of the year.

Price control calculations

9.5 **Annex B** to this paper present detailed price control calculations for each business (extracted from the relevant spreadsheets of the PC4 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 PC4 Financial Model.

Notified values

9.6 Based on these price control calculations, the Bureau's Draft Proposals for the notified values are summarised in **Table 9.1** below. The notified values given in **Table 9.1** (to the accuracy to decimal places expressed therein) will be those used to calculate MARs when the price controls are implemented.

Table 9.1: Notified values for PC4 – Draft Proposals

			Values for 2010		
2010 prices		**X**	**a**	**b**	**c**
AADC	Electricity	0.00	768.22 AEDm	1,280.11 AED/customer account	0.4295 fils/kWh metered
	Water	0.00	285.34 AEDm	903.98 AED/customer account	0.2685 AED/TIG metered
ADDC	Electricity	0.00	1,103.40 AEDm	746.85 AED/customer account	0.1938 fils/kWh metered
	Water	0.00	541.04 AEDm	431.13 AED/customer account	0.3258 AED/TIG metered
TRANSCO	Electricity	0.00	2,123.73 AEDm	22.03 AED/kW metered	0.3499 fils/kWh metered
	Water	0.00	1,238.93 AEDm	194.79 AED/TIGD metered	0.5697 AED/TIG metered
ADSSC		0.00	1,134.98 AEDm	1.0144 AED/m^3 metered	

Notes: Based on an assumed UAE CPI for 2009

9.7 These notified values are for 2010 expressed in 2010 prices based on the assumed UAE CPI inflation rate of 0.69% for 2009. The adjustment for actual inflation for 2009 will be done upon its availability during 2010 i.e., during the PC4 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

9.8 **Table 9.2** presents the projected MAR in respect of "own" costs (i.e., excluding pass-through costs, if applicable) for each business and in total for 2010-2013:

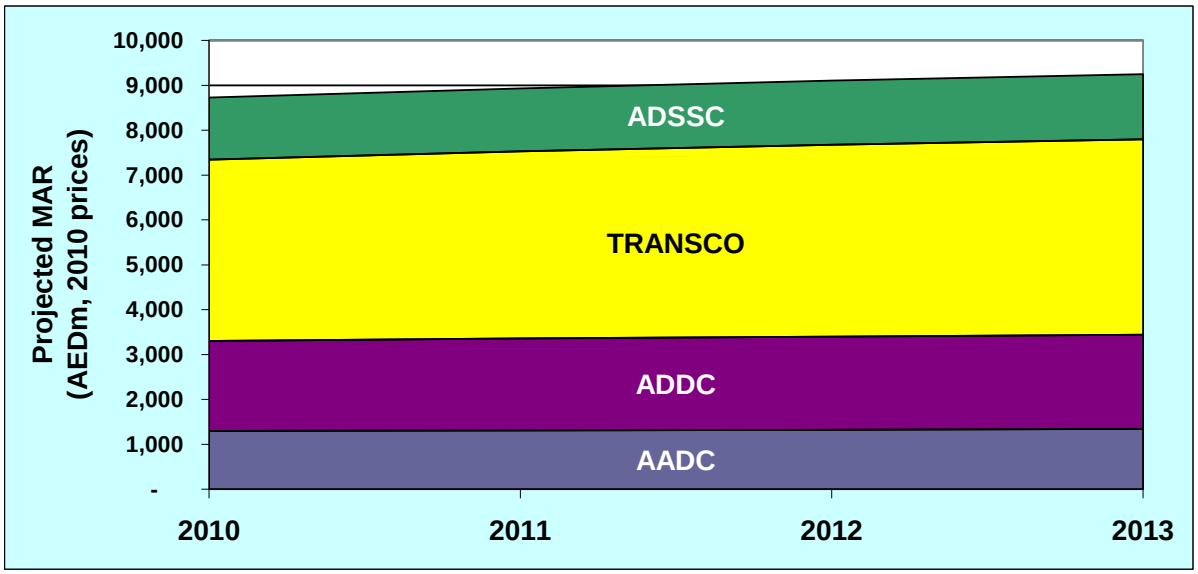
Table 9.2: Projected MAR over PC4 period – Draft Proposals

AED million, 2010 prices		**2010**	**2011**	**2012**	**2013**
AADC	Electricity	946.80	956.91	965.62	973.73
	Water	348.94	353.21	358.60	367.28
	Total	1,295.74	1,310.13	1,324.22	1,341.01
ADDC	Electricity	1,343.08	1,371.58	1,393.78	1,413.71
	Water	664.32	675.05	680.36	687.08
	Total	2,007.41	2,046.62	2,074.14	2,100.79
TRANSCO	Electricity	2,518.66	2,621.37	2,721.01	2,776.92
	Water	1,519.66	1,546.32	1,554.29	1,578.46
	Total	4,038.32	4,167.68	4,275.30	4,355.38
ADSSC	Total	1,384.84	1,406.04	1,435.28	1,453.94
Total		**8,726.30**	**8,930.47**	**9,108.94**	**9,251.11**

9.9 In total, companies' MAR (excluding pass-through costs) is expected to be over AED 8.7 billion in 2010 reaching almost AED 9.3 billion by 2013. The projected 2010 MAR is higher by about AED 3.1 billion (or 55%) in nominal prices, and by about AED 2.4 billion (or 37%) in real prices, as compared to the actual 2008 MAR of AED 5.6 billion in 2008 prices (AED 6.4 billion in 2010 prices). This is excluding any bonuses or penalties that the companies will earn or incur under the PIS over the PC4 period.

9.10 The following chart shows the projected MAR profile for each company over the PC4 period, indicating that TRANSCO accounts for a large share of the MAR:

Figure 9.1: Projected MARs over PC4 period



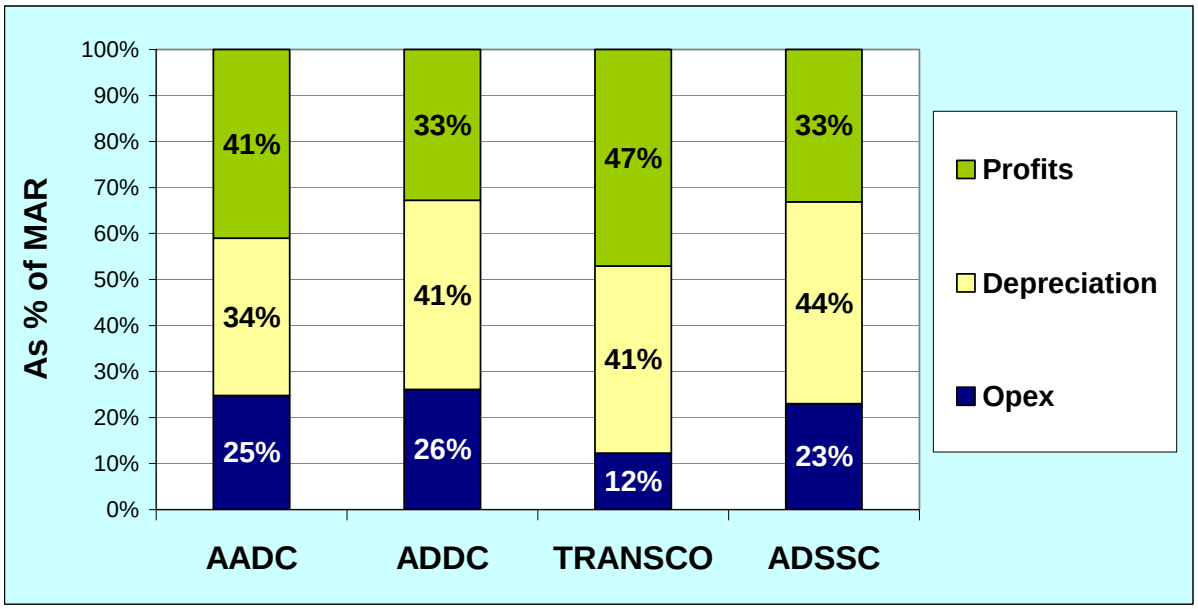
Analysis of Draft Proposals

Constituents of Projected MARs

9.11 **Figure 9.2** 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 financial adjustments and PC2 capex related foregone financing costs have been treated as part of the profits.

9.12 This figure shows that the capital cost related components (i.e. depreciation and return on capital) account for a significant proportion of the revenue for each company (in the range of 74% to 88%), compared to opex which accounts for only 12% to 26% of revenue. This highlights the capital intensity of the four network companies.

Figure 9.2: Constituents of MARs (excluding pass-through costs)



Projected Profits

9.13 **Figure 9.3** shows the expected profit profile for the companies. Overall, the total profits for the four companies are expected to be of the order of AED 3.7 billion (2010 prices) a year on average over the PC4 period, with the average projected profit (including financial adjustments mentioned earlier) for each company as follows (2010 prices):

(a) AADC: AED 540 million per annum

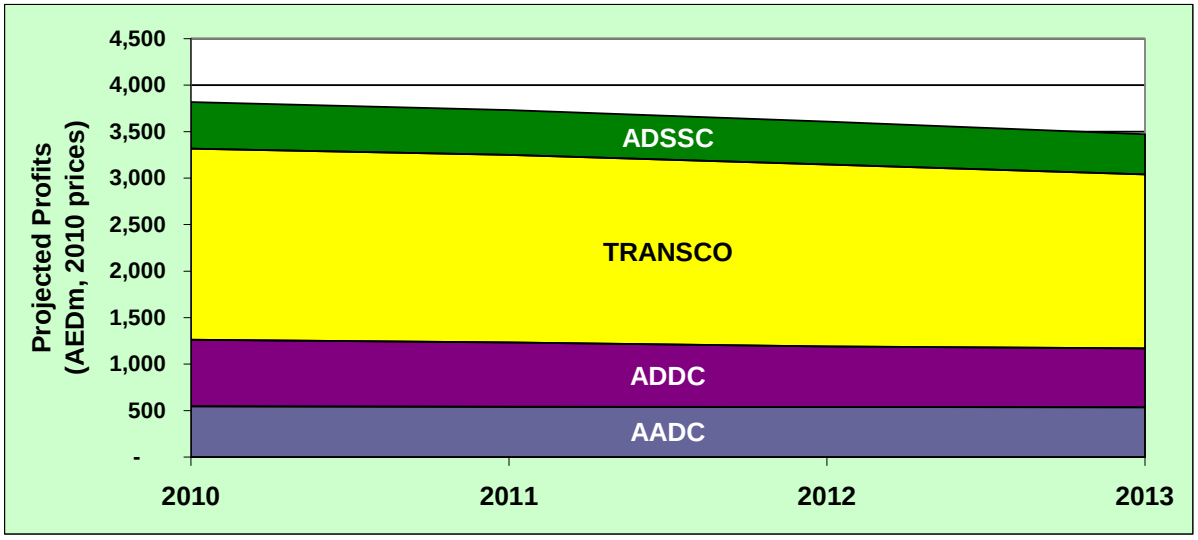
(b) ADDC: AED 672 million per annum

(c) ADSSC: AED 469 million per annum

(d) TRANSCO: AED 1,976 million per annum

9.14 This level of profit reflects the capital investment and cost of capital and is necessary to promote adequate network investment. Profits fall slightly over the price control period due to the revenue profiling assumption and the increasing depreciation and opex allowances.

Figure 9.3: Projected profits over PC4 period



Effect of Draft Proposals on sector costs

9.15 **Figures 9.4, 9.5 and 9.6** show the expected effect of these Draft Proposals on the total price-controlled costs and unit costs for electricity, water and wastewater, respectively (in 2010 prices):

Figure 9.4: Projected trend of price-controlled MAR - Electricity

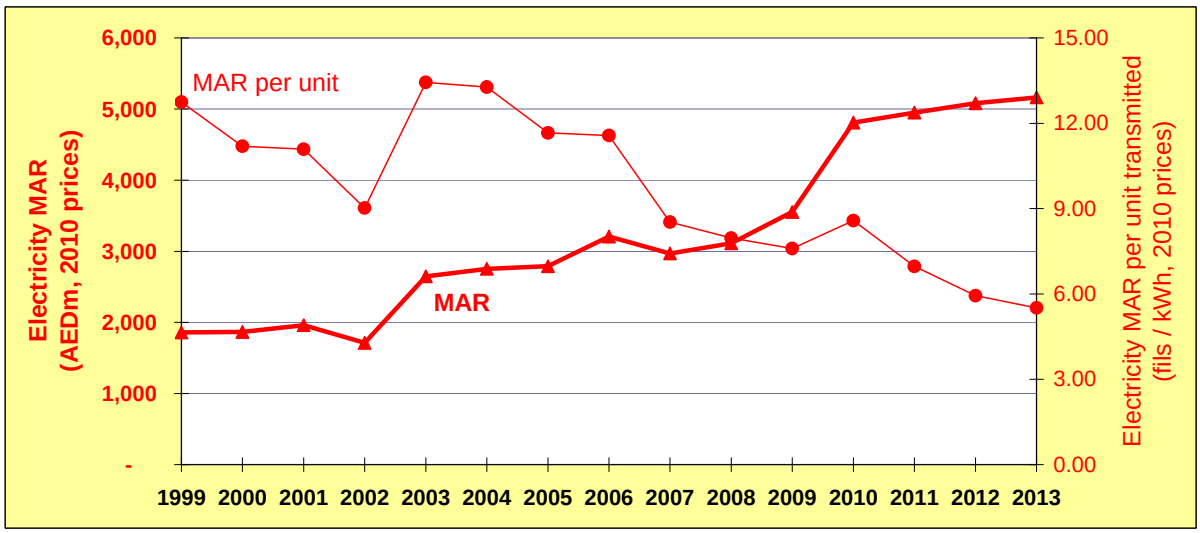


Figure 9.5: Projected trend of price-controlled MAR - Water

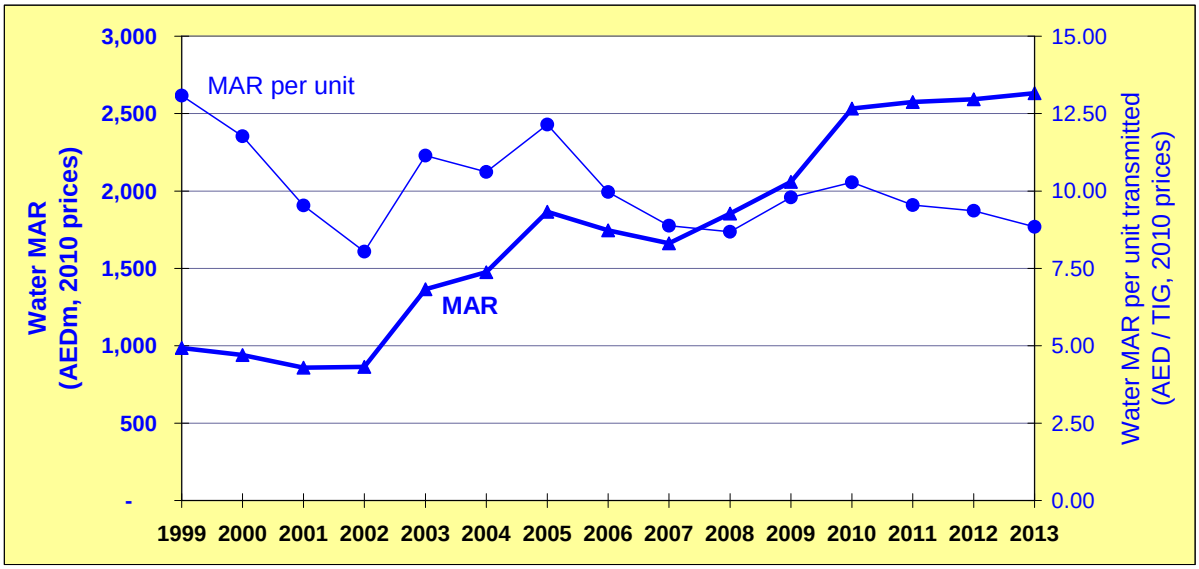
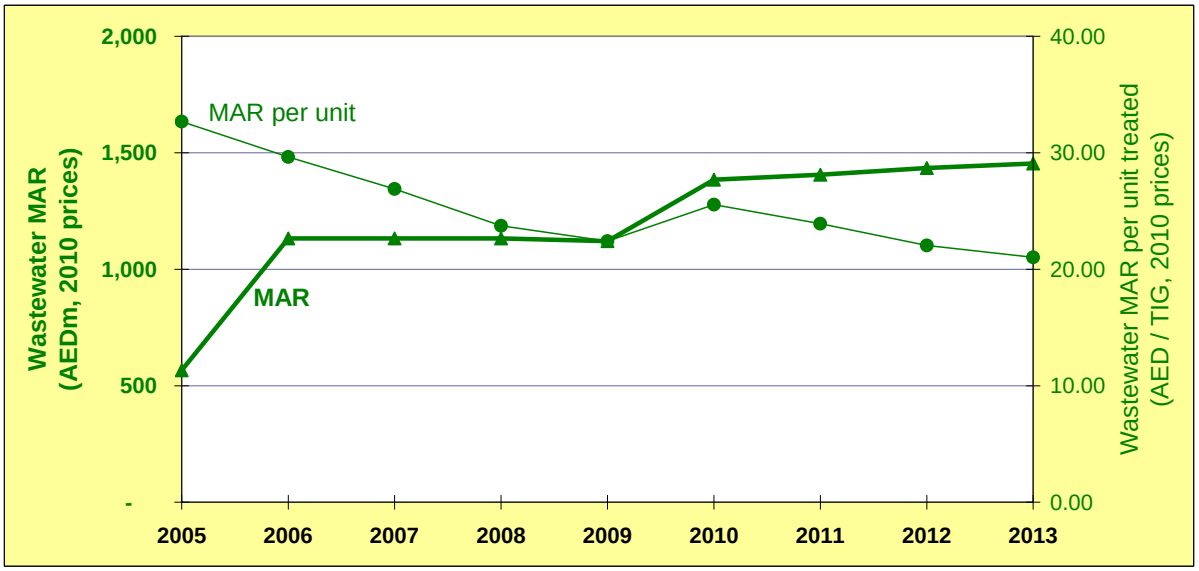


Figure 9.6: Projected trend of price-controlled MAR - Wastewater



9.16 These charts indicate that the annual MARs are expected to continue the increasing trend in real terms. However, the increasing demand means that the Draft Proposals are expected to result in a declining trend for the unit cost. This shows that, as a result of the Draft Proposals:

(a) ***for electricity:*** while the total MAR for AADC, ADDC and TRANSCO (excluding pass-through costs) is expected to increase by 178% from 1999 to 2013 (in real terms), the MAR per unit transmitted is expected to be 5.51 fils/kWh in 2013, lower by 57% than in 1999 (in 2010 prices);

(b) ***for water:*** while the total MAR for AADC, ADDC and TRANSCO (excluding pass-through costs) is expected to increase by 167% from 1999 to 2013 (in real terms), the MAR per unit transmitted is expected to be 8.84 AED/TIG in 2013, lower by 32% than in 1999 (in 2010 prices); and

(c) ***for wastewater:*** while the total MAR for ADSSC (excluding any pass-through costs) is expected to increase by 28% from 2005 to 2013 (in real terms), the MAR per unit transmitted is expected to be 4.62 AED/m^3 or 21.02 AED/TIG in 2013, lower by 36% than in 2005 (in 2010 prices).

Comparison against 2008 actual MARs

9.17 The following table compares the projected MARs for PC4 against the 2008 actual MARs. As previously highlighted, the total 2010 projected MAR is higher than the 2008 actual MAR by 37% in real terms.

Table 9.3: Comparison of PC4 projected MARs against 2008 actual MARs

AED million		2008 actual MAR		2010	2013
		2008 prices	2010 prices	2010 prices	2010 prices
AADC	Electricity	587	663	946.80	973.73
	Water	251	284	348.94	367.28
	Total	837	947	1,295.74	1,341.01
ADDC	Electricity	1,129	1,277	1,343.08	1,413.71
	Water	489	553	664.32	687.08
	Total	1,618	1,829	2,007.41	2,100.79
TRANSCO	Electricity	1,291	1,459	2,518.66	2,776.92
	Water	874	988	1,519.66	1,578.46
	Total	2,164	2,447	4,038.32	4,355.38
ADSSC	Total	1,002	1,133	1,384.84	1,453.94
Total		**5,621**	**6,356**	**8,726.30**	**9,251.11**

Notes: Based on assumed UAE CPI for 2009

9.18 The projected MARs continue to increase over the PC4 period. By 2013, the total projected MAR exceeds the total 2008 actual MAR by AED 2,895 million (in 2010 prices) or 46%.

9.19 These projections are reflective of, among other things, the opex and capex allowances for PC4 and the remuneration of efficient PC2 capex.

10. Performance Incentive Scheme

Introduction

10.1 This Section sets the Bureau's proposals for the Performance Incentive Scheme (PIS) that will apply to the four network companies over the PC4 period.

10.2 Under the PIS, companies are rewarded for improved service and output performance, and penalised for deteriorating performance. The current PIS for all businesses has two types of performance indicator:

(a) Category A indicators (listed in **Table 10.1** below) with precise definitions, targets and incentive rates, and an automatic annual revenue adjustment for performance via a term "Q" in the MAR formulae, subject to an overall cap at 4% of MAR each year; and

(b) Category B indicators, less precisely defined but subject to a possible financial adjustment at the following review for exceptionally good or poor performance, subject to an overall cap at 2% of MAR each year.

Table 10.1: Current Category A Indicators

Company	Electricity	Water	Wastewater
AADC / ADDC	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS No. of Interruptions per Customer Customer Minutes Lost per Customer	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS Water Quality	
TRANSCO	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS Availability Energy Lost (Unsupplied)	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS Water Quality	
ADSSC			Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS

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

10.3 Over time, the Bureau has introduced new Category A indicators or moved some indicators from Category B to Category A. However, given the automatic mechanistic adjustments to MAR, Category A indicators must meet the Bureau's established objective criteria (i.e., measurable, verifiable, non-manipulable, non-distortionary and customer-oriented).

Second Consultation Paper

10.4 Given the positive results that the PIS has achieved in terms of driving companies' performance on the targeted measures to date, the Second Consultation Paper stated our thinking to retain the existing PIS for all companies for PC4 controls (with some refinements) and to introduce a number of new measures:

(a) The PIS bonuses of the Category A timeliness indicators for audited SBAs and audited PCRs should be removed so that only a penalty for delayed submission should apply.

(b) The PIS target dates for both PCRs and SBAs should be changed to 30 April, while extending the target date for AIS to 31 October.

(c) The PIS bonus and penalty for each Category A technical indicator should be subject to an individual cap of 1% of the company's "own" MAR.

(d) The following new Category A indicators should be introduced:

(i) For all network companies: a timeliness indicator for the Five-Year Planning Statements with target dates for approval of 30 June for AADC, ADDC and ADSSC, and 31 May for TRANSCO, along with relevant changes to TRANSCO's licence in line with current licence requirements for other network companies;

(ii) For TRANSCO: water system availability indicator; and

(iii) For AADC and ADDC: interface metering indicator, SAIFI indicator for overall system, SAIFI indicator for worst served customers only, and customer debt reduction indicator.

(e) The Bureau also stated that it was considering the replacement of the current water quality-related Category A indicator for AADC, ADDC and TRANSCO with a system of water quality indices representing particular group of parameters.

(f) "Technical KPIs" to be developed and monitored for ADSSC over PC4 period should be introduced as a new Category B indicator at this review.

Responses

PIS bonuses for timeliness indicators

10.5 In their responses to the Second Consultation Paper, AADC, ADDC and ADSSC disagreed with our thinking that PIS bonuses for Category A timeliness indicators for audited SBAs and audited PCRs should be removed. They argued for a fair and balanced scheme where both good and poor performance should equally be rewarded and penalised, respectively. TRANSCO reiterated its earlier concerns about the linking of a bonus or penalty to implementation of the TA's recommendations in relation to the PCR and AIS submissions, and indicated the need for formal documented regulatory guidelines for the scope of the TA's recommendations and for all aspects of the PCR and AIS.

10.6 In principle, we believe that bonuses should not be available for meeting a licence requirement. However, given that the PCR and AIS involve the procurement of a TA's report, with associated expense and resource commitment by licensees, we propose the PIS bonuses to continue for both the PCR and AIS (but not for SBAs) for PC4. Regarding TRANSCO's concerns, we believe the licences clearly set out the regulatory requirements for PCR and AIS including the TA's role and the scope of its recommendations. We have accepted TRANSCO's suggestion for the regulatory guidelines and already provided formal documented regulatory guidelines to the companies for the 2009 AIS. Table 10.2 shows the development of the Bureau's thinking over the consultation process, in response to the concerns expressed by the licensees.

Table 10.2: PIS bonuses for Category A timeliness indicators

Category A indicator	Current arrangement	First Consultation Paper	Second Consultation Paper	Draft Proposals
Audited SBA timeliness	Both bonus / penalty	Only penalty	Only penalty	Only penalty
Audited PCR timeliness	Both bonus / penalty	Only penalty	Only penalty	Both bonus / penalty
AIS timeliness	Both bonus / penalty	Only penalty	Both bonus / penalty	Both bonus / penalty

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

PIS target dates for timeliness indicators

10.7 AADC and ADSSC agreed with the revised PIS target dates for PCRs and SBAs (30 April) and AIS (31 October) suggested in the Second Consultation Paper. ADDC and TRANSCO suggested 15 May for PCRs and SBAs mainly as a 'mid-way' compromise and also to ease the normal month end closing activity of the business. We however continue to prefer 30 April as a target date both being an end-of-month date as per the norms and being consistent with the UAE Commercial Companies

Law No.8 of 1984 (which requires companies to produce accounts within four months of the end of the financial year).

Table 10.3: PIS target dates for Category A timeliness indicators

Category A indicator	Current target dates	First Consultation Paper	Second Consultation Paper	Draft Proposals
Audited SBA timeliness	30 June	30 April	30 April	30 April
Audited PCR timeliness	31 March	30 April	30 April	30 April
AIS timeliness	30 September	31 October	31 October	31 October

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

Timeliness indicator for Five-Year Planning Statement

10.8 All the companies accepted the introduction of a new timeliness indicator for the Five-Year Planning Statements with target dates for approval of 30 June for AADC, ADDC and ADSSC, and 31 May for TRANSCO. However, AADC, ADDC and TRANSCO highlighted their dependency on data and planning statements from each other and the need for timetables for such deliverables. TRANSCO also argued that it would need three months from the receipt of required information from ADWEC to prepare and submit its statement. Further, the companies suggested that their performance assessment for PIS should not be affected if other companies' performance on the dependent deliverables was poor.

10.9 While the Bureau welcomes the companies' support for the proposed timeliness indicator, the dependencies and timetabling issues identified by the companies are such that we do not feel they can be adequately addressed in this review. In particular, further discussion is required in both the Water and Electricity Transmission Code meetings to determine the most appropriate sector demand forecasting timetable.

10.10 In view of the above, we believe that the current treatment of the timeliness of planning statements as a Category B indicator should continue.

Changes to Category A technical indicators

Individual cap on PIS bonus/penalty for Category A

10.11 At present, there are caps on the total incentives for all Category A indicators (4% of company's "own" MAR) and on incentives for individual Category A timeliness indicators (6 or 12 times the monthly incentive rate). However, there are presently no such caps for individual technical indicators. Given the possibility of undesirable significant variability of some technical indicators, the Second Consultation Paper suggested capping the PIS bonus and penalty for individual Category A technical indicator at 1% of each company's "own" MAR.

10.12 In the absence of any objection to this suggestion, we have adopted it for these Draft Proposals. As discussed later in this Section 10, we have also used the 1% cap of MAR for calibration of all Category A indicators, both technical and timeliness indicators. As a result of the individual caps on the technical indicators, we intend to remove the overall cap on Category A indicators at this review.

Water network availability related Category A indicators

Second Consultation Paper

10.13 In line with the reliability and availability-related Category A indicators for electricity networks (measured in terms of interruptions, customer minutes lost, energy lost or otherwise), the First Consultation Paper sought suggestions for similar indicators for the water networks of AADC, ADDC and TRANSCO. In the absence of any suggested measure from the companies, the Second Consultation Paper set out our thinking to introduce a water network availability Category A indicator for TRANSCO, to be defined in a similar manner as the existing Category A indicator for electricity transmission system availability. We however sought views on certain specific issues (i.e. component and minimum duration) relating to the definition of this indicator and suggestions on a similar or suitable equivalent indicator for the water distribution systems.

Responses

10.14 Companies' responses to the Second Consultation Paper are summarised below:

(a) While AADC supported the proposed water network availability indicator for TRANSCO, it emphasised that the fundamental issue of water supply capacity shortfall in TRANSCO and upstream producers should be addressed. AADC also suggested for the Bureau to consider internationally accepted definitions of water distribution system availability indicators; however it did not identify or suggest one.

(b) TRANSCO expressed its surprise to find a "*totally new Category A indicator proposed for Water Transmission System Availability about which there has been no consultation*". It also argued for an indicator measuring the service or its loss, being more of a customer's concern, than an availability indicator, and argued against a 100% availability target as being unrealistic and inefficient. It also suggested using a fixed performance target rather than a floating target based on actual performance in the previous year.

10.15 Our views on these responses are as follows:

(a) In respect of water supply constraints to Al Ain, we have already implemented incentives for TRANSCO for future performance on this aspect.

(b) We do not support TRANSCO's concern regarding consultation, as views on a water network availability / reliability indicator for TRANSCO (and other companies) was first sought in the First Consultation Paper published in November 2008.

(c) While we agree with TRANSCO that a service (or loss of service) indicator would, in principle, be better than an availability indicator, we note that (i) there is no water service indicator available or proposed with a track record similar to water network availability; (ii) network availability also assures security of supply or service especially in the long run and in the absence of a service based indicator; and (iii) TRANSCO has been reporting the measure to the Bureau for a number of years.

(d) We have proposed an availability target based on the previous year's actual performance, rather than a 100% availability target. Further, we agree that the marginal cost of achieving higher availability increases as the availability increases. However, at some point, the marginal cost outweighs the potential PIS bonus of achieving a higher availability. This is an optimal level of availability and we do not expect TRANSCO to exceed this. The mechanism we have proposed for water network availability (already in operation for electricity) should help determine this optimal availability.

Draft Proposals

10.16 In view of the above, we are proceeding with the water availability indicator for TRANSCO as proposed in the Second Consultation Paper, pending any suggestions to further improve it in the Final Proposals.

Category A technical indicator(s) for ADSSC

10.17 The First and Second Consultation Papers highlighted that, in common with the other companies, one or more Category A indicators should be considered for ADSSC to provide incentives to improve technical aspects of its operations, such as network availability and reliability. While ADSSC has been supportive of this suggestion, we have not been able to identify appropriate technical performance indicators which are currently monitored by ADSSC.

10.18 The Second Consultation Paper indicated our thinking to introduce "Technical KPIs" as Category B indicators for ADSSC which would be monitored and developed over the PC4 period as a candidate for Category A at the next review.

10.19 We reiterate our desire to introduce a Category A technical indicator for ADSSC at this review and request the company to provide details in response to these Draft Proposals on the technical KPIs or measures which it presently monitors internally, for example, to assess its expenditure needs, its own performance and the performance of its contractors.

SAIFI-related Category A indicator(s) for AADC and ADDC

10.20 As mentioned in the earlier consultation papers, the electricity businesses of AADC and ADDC currently have two Category A technical indicators, namely (i) the number of interruptions per customer and (ii) the customer minutes lost per customer (sometimes referred to as System Average Interruption Duration Index (SAIDI)). The former measure is similar to, but not exactly the same as, the technical KPI of System Average Interruption Frequency Index (SAIFI), also often used by utilities. Based on the respondents' suggestions, the Second Consultation Paper proposed introducing a new Category A indicator defined in terms of SAIFI. The paper also sought views on another new Category A or Category B indicator defined in terms of SAIFI but focussing on 'worst served customers' (i.e. those customers who face interruptions most frequently) and raised a number of specific issues to be considered in defining this new indicator.

10.21 Both AADC and ADDC supported the introduction of SAIFI as a new Category A indicator, but as a replacement of the existing interruption indicator, arguing the latter to be a "non standard" or "non industry-standard" indicator. They also sought more details on the additional SAIFI indicator for worst served customer and did not agree to such an indicator as Category A.

10.22 We note that the existing interruption indicator was developed in consultation with the two distribution companies at the last review and has been successful in achieving the desired results. However, it is important to be able to compare performance to benchmark companies in other countries using standard measures. We therefore confirm its replacement by the new Category A indicator defined in terms of SAIFI. We have also decided to keep the SAIFI indicator for worst served customer in Category B for further development and refinement.

10.23 The new SAIFI-related Category A indicator for a distribution company will be defined, for any year, as the ratio between (a) the sum, across all "Interruptions" (as already defined in the licences) in the year, of the numbers of customers affected by

each Interruption in the relevant distribution company's area and (b) the total number of customer accounts registered with the relevant distribution company at the end of the year.

Water Quality Indicator

Second Consultation Paper

10.24 A performance indicator for overall water quality was introduced into the PIS for the first time during the PC3 period, for AADC, ADDC and TRANSCO. Both the First and Second Consultation Papers indicated the Bureau's thinking to further develop this indicator into a system of water quality indices focusing on important water quality parameters. At the companies' request, the Bureau initiated a separate consultation process to discuss and provide further details on the design of these water quality indices; namely, Disinfection and disinfection by-product Control Index (DCI); Reservoir Integrity Index (RII); and Transmission or Distribution Maintenance Index (TMI or DMI). Each index was to be calculated in the same manner as the existing water quality indicator, but from pre-selected parameters rather than all parameters specified in the Bureau's Water Quality Regulations. It was suggested that the new Category A indicator would then be an appropriately weighted combination of the three indices.

Responses

10.25 In their responses to the Second Consultation Paper, AADC, ADDC and TRANSCO argued that the current water quality indicator has been in place only since 2008 and has faced some issues and that the new indicator does not meet the objective criteria for Category A. They therefore suggested that the new indicator should first be introduced as Category B.

10.26 AADC reiterated its concerns about the controllability of water quality events and what it considered to be a lack of clarity in the licence definition of Exceptional Event. It argued (in its response and at the 21 May meeting) that the said definition was not intended to apply to the water quality indicator. It therefore suggested additional measures to ensure incentives for the company's own performance. ADDC believed that careful consideration should be given to any proposed change to the Water Quality Regulation and the related Category A indicator and suggested any such change to be considered at the next price control review.

10.27 AADC's comments regarding the licence definition of Exceptional Event were discussed in detail at the 21 May meeting. We have repeated our clarification (provided previously) that the reference to customer minutes lost in the definition of

Exceptional Event should be ignored for the purpose of its application to the water quality indicator. We have drawn AADC's attention to past discussion on this issue making clear that the licence definition of Exceptional Event was always intended to apply to the water quality indicator. For this, see paragraphs 30 and 42(a) of AADC's licence referring to Exceptional Event in relation to the water quality indicator, and the last paragraph on page 74 of the Bureau's Final Proposals for PC3 published in November 2005.

Draft Proposals

10.28 In view of companies' responses, we propose retaining the current water quality indicator for PC4 and introducing the new indicator only as a Category B indicator at this review. The target compliance for the water quality indicator is proposed to increase from 90% for 2009 (under the current PIS) to 95% for each year of the PC4 period. Further, we propose to redraft the formula to clarify that a bonus can only be attained if a company passes 100% of the required tests (excluding Exceptional Events). In this case, we propose that the bonus will be set at the maximum amount i.e., 20 times the incentive rate (see below).

New Category A indicator for customer debt reduction

10.29 The Second Consultation Paper stated our thinking to introduce a new Category A indicator for AADC and ADDC (separately for water and electricity businesses) at this review to incentivise these companies to reduce their accounts receivable or customer debts. It suggested that a company can then be rewarded or penalised for any improvement (i.e. reduction) or deterioration (i.e. increase) in its customer debts (as per the audited accounts) in a year compared to the previous year or the Bureau's prescribed annual target.

10.30 In its response to the paper, AADC considered it unreasonable for the proposed indicator to include debt resulting from government policy or the regulations described in the disconnection code which is currently under review. It also suggested for the mechanism to set any target should be clarified before the commencement of PC4 controls. ADDC reiterated its general concern in relation to introduction of any performance measure in Category A before being tested in Category B.

10.31 While we acknowledge AADC's concern, we note the following in support of the proposed indicator: (a) the indicator provides incentives for reduction in the total amount of customer debt; (b) the simplicity and clear reference to a line (accounts receivable at the year end) in the audited accounts (balance sheet) support the indicator to be defined in terms of total debts; and (c) the more frequent reporting of

customer debts which the Bureau has requested since 2008 has not been satisfactory and hence cannot be relied on as the basis for the design or implementation of an indicator that can distinguish between different types of debt. However, if reporting improves, refinements can be considered to the indicator at the next review.

10.32 We propose that the target for each year of the PC4 period should be the actual customer debt for the previous year. However, in the case of the first year of operation of this indicator (i.e., 2011 – see below), if the actual customer debt for 2010 (which is not subject to any incentive for reduction) is found to be exceptionally higher (say by 10% or more) than that for 2009, the actual customer debt for 2009 should be considered as the target for 2011. ADDC's concern on the introduction of a measure directly as a Category A indictor has been discussed earlier.

10.33 We have therefore adopted the proposed Category A indicator for customer debt reduction.

Category A Indicators for PC4

10.34 Based on the above discussion, the following table lists the proposed Category A indicators for PC4. The new indicators are highlighted in a **red bold** font.

Table 10.4: Category A Indicators for PC4 – Draft Proposals

Company	Electricity	Water	Wastewater
AADC / ADDC	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS Customer Minutes Lost per Customer **Customer Debt Reduction** **SAIFI**	Timeliness of Audited SBA Timeliness of Audited PCR Timeliness of AIS Water Quality **Customer Debt Reduction**	
TRANSCO	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Availability Energy Lost	Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS Water Quality **Availability**	
ADSSC			Timeliness of Audited SBAs Timeliness of Audited PCR Timeliness of AIS

Notes: SBA = Separate Business Accounts; PCR = Price Control Return; AIS = Annual Information Submission; SAIFI = System Average Interruption Frequency Index

Incentive rates for Category A Indicators for PC4

Overall approach

10.35 The incentive rates for Category A indicators for each business have been calculated using the following approach which is similar to the approach used at the previous price control reviews:

(a) First, determine the total amount "at risk" (the maximum penalty or reward) for each Category A indicator as 1% of average forecast MAR for the PC4 period in relation to "own costs". This calculation based on 1% of MAR also applies to timeliness indicators which in practice will be subject to different caps (6 and 12-month based bonuses and penalties) than 1% of MAR.

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

(i) For all timeliness indicators: 6 months delay; and

(ii) For all other indicators: 20% change on the previous year's performance or the target performance.

10.36 These calibration assumptions are similar to those used at the previous price control reviews. However, in the case of water quality indicator, the 20% non-compliance assumption used at this review is more reflective of the current situation than the 50% non-compliance assumption used at the last review.

10.37 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 scheme.

Calculations

10.38 **Table 10.5** shows (a) the calculation of the amount 'at stake' for each PIS Category A based on 1% of average MAR forecast for the businesses for the PC4 period, and (b) the incentive rate for each indicator (rounded off appropriately) calculated by dividing the amount at stake by the calibration assumption:

10.39 As expected, the incentive rates vary significantly from business to business, reflecting the size (or MAR) of each business. Further, for any business, each of the three timeliness indicators (audited accounts, audited PCRs and AISs) has the same incentive rate as shown in the table. Similar is the case for the technical indicators specific to a business.

Table 10.5: Incentive rates for Category A Indicators – Draft Proposals

		Average MAR (AED million)	Amount at stake for each Category A (AED)	Timeliness indicator (AED / month)	Water quality indicator (AED / 1% non-compliance)	All other indicators (AED / 1% change)
AADC	**Electricity**	960.77	9,607,677	**1,600,000**		**480,000**
	Water	357.01	3,570,079	**600,000**	**180,000**	**180,000**
ADDC	**Electricity**	1,380.54	13,805,385	**2,300,000**		**690,000**
	Water	676.70	6,767,016	**1,130,000**	**340,000**	**340,000**
TRANSCO	**Electricity**	2,659.49	26,594,888	**4,432,000**		**1,330,000**
	Water	1,549.68	15,496,821	**2,583,000**	**520,000**	**520,000**
ADSSC		1,420.02	14,200,218	**2,370,000**		

Notes: 1. "Timeliness indicators" means those relating to SBAs, PCRs and AIS.

Notes: 2. "All other indicators" refers to indicators (a) customer debt reduction, (b) customer minutes lost. (c) SAIFI, (d) availability, and (e) energy lost.

Application of incentive rates

10.40 The present licences already set out the Q terms (and the incentive rates) in relation to the existing Category A indicators for the formula years up to 2011. The new incentive rates (as set out above) for the existing indicators will apply to the Q terms in the 2012 formula year onwards (i.e., relating to performance in 2010, the first year of the PC4 period). For new Category A indicators, the new incentive rates will apply to the Q terms in the 2013 formula year onwards, i.e., assessing performance in 2011 onwards. This is because these indicators will require performance in 2010 (as the target for 2011) to be assessed by the TA in order to provide the target for 2011. This is summarised in the table below:

Table 10.6: Implementation of Category A Indicators – Draft Proposals

	Existing Category A indicator	New Category A indicator
Target performance year (if applicable)	2009	2010
First year performance to be incentivised	2010	2011
Audit of first year performance	2011	2012
Apply Q for first year performance	2012	2013

10.41 The performance in 2010 on the new Category A indicators will not therefore be subject to a reward or penalty. However, where the performance target for each year is based on the previous year's performance, there will be a requirement for the companies in 2011 to provide audited data for performance in 2010 as part of the TA's report accompanying PCRs for the 2010 financial year, so as to determine the target for 2011 performance. In order to maintain the integrity of the PIS, the Bureau will reserve (consistent with the approach adopted for PC3) the right to direct an adjustment of the targets for 2011 in the case of exceptionally poor performance in 2010 on new Category A indicators, but does not expect the need to exercise this option.

Operation of PIS for Category A Indicators for PC4

10.42 The PIS for PC4 operates in the same manner as has been operating for the current price controls, as set out below:

10.43 The term Qt, the performance adjustment for year t, is 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 Category A indicators 1, 2, …., N, respectively.

10.44 The following sub-sections describe the Bureau's proposed formulae to determine the Q terms for various Category A indicators for the PC4 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).

Q terms for timeliness Category A indicators

10.45 For audited SBAs, audited PCRs and AIS indicators:

(a) For any delay 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

(b) For any submission of PCRs and AIS on or before the target date in any year, the company will receive a reward calculated as follows:

Q = 6 x Incentive Rate

(c) There will no bonus for timely submission of SBAs.

(d) As for the existing PIS, the maximum delay in any timeliness related Category A indicator will be capped at the penalty that would be incurred if the statement is submitted on the target date for the same indicator for the following year. Such a cap is required in order to finalise the Q terms for these indicators in a timely manner. This means the maximum penalty for a timeliness indicator will be capped by a delay of 12 months. That is, the maximum penalty will be:

Q = - 12 x Incentive Rate

10.46 The number of months shall be rounded up to whole calendar months. That is, the submission will effectively be treated as having been received on the last day of the month in which it was received.

Q terms for water quality indicators

10.47 For the water quality indicators:

(a) If the business does not achieve 95% or more compliance (i.e. number of samples passed tests divided by the number of samples required to be taken) in a year, it will be subject to a penalty calculated as follows:

Q = - Incentive Rate x [1- (No. of samples passed tests / No. of samples required to be taken)] x 100

(b) There will be no penalty or reward if the business achieves compliance of 95% or more (but less than 100%).

(c) If the business fully complies (100%) with the Water Quality Regulations in a year, it will receive a reward calculated as follows:

Q = 20 x Incentive Rate

Q terms for all other indicators

10.48 For all other indicators of AADC, ADDC and TRANSCO (i.e. customer debt reduction, CML, interruptions, SAIFI, availability and energy lost), the penalty or reward in a year will be of the form:

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

10.49 However, for availability indicators (which are incentivised to have higher values than the targets), the signs in the formula will be reversed. That is:

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

10.50 For any year, the target performance means the actual performance of the business on the relevant indicator in the preceding year.

Caps on Q terms

10.51 Bonus or penalty for each of the timeliness indicators will be capped as discussed above i.e., 6 or 12 times the incentive rate. The maximum bonus or penalty for each of the other indicators will be capped at 1% of business' "own" MAR.

10.52 In view of these individual caps on all indicators, the total bonus or penalty through the overall Q term will not be capped.

Category B Indicators for PC4

10.53 These Draft Proposals retain the current Category B indicators (as listed in the First Consultation Paper) for PC4 controls with all technical- and network-related performance indicators under Key Performance Indicators (KPIs) agreed or to be agreed between the Bureau and the respective companies outside this review grouped as "Technical KPIs".

10.54 The following table lists the Category B indicators for PC4, with an overall cap of 2% of the "own" MAR of each business in the year for any financial adjustment at the next review for exceptionally good or poor performance during the PC4 period. The new indicators are highlighted in a **red bold** font.

Table 10.7: Category B Indicators for PC4 – Draft Proposals

Company	Category B Indicator
AADC / ADDC	1. Technical KPIs **2. SAIFI for worst served customers** 3. Customer satisfaction (Guaranteed / Overall Standards) 4. Interim profit & loss account timeliness 5. Meter reading 6. Five-Year Planning Statement timeliness
TRANSCO	1. Technical KPIs 2. Settlement data accuracy and timeliness 3. Planning data accuracy and timeliness 4. Interim profit & loss account timeliness 5. Five-Year Planning Statement timeliness 6. Timeliness of Transmission Use of System Charges Statement 7. Economic despatch
ADSSC	**1. Technical KPIs** 2. Performance of sewerage system (e.g., availability and reliability) 3. Customer complaints (e.g., in relation to odour and flooding) 4. Performance against guaranteed service standards for customers 5. Compliance with standards at treatment plants 6. Meeting targets for recycling of treated effluent and biosolids 7. Environmental performance 8. Interim profit & loss account timeliness 9. Five-Year Planning Statement timeliness

Annex A: Updating RAVs

A.1 This **Annex A** to the Draft Proposals for PC4 describes and sets out the updating of the opening 2010 RAVs projected at the last price control reviews updated for:

(a) additional efficient PC2 capex over and above the provisional PC2 capex allowances in PC2 controls, in the case of AADC, ADDC and TRANSCO; and

(b) provisional PC4 capex allowances being made at this review for all the four companies.

A.2 ***Annexes A.1 through A.6*** show how this has been done for each business of AADC, ADDC, ADSSC and TRANSCO. 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 ***PC4 Financial Model*** (a Microsoft Excel based computer model developed by the Bureau to carry out PC4 calculations).

A.3 The results of these calculations are summarised and discussed in Section 6 of the paper.

Updating RAVs for PC2 capex

A.4 Lines 1 through 29 of ***Annexes A.1 through A.6*** set out the updating of opening 2010 RAVs for additional efficient PC2 capex for each of the water and electricity businesses of AADC, ADDC and TRANSCO. These lines are not used for ADSSC.

A.5 Line 1 shows the CPI data used for price base conversion.

A.6 Lines 2-6 show the actual PC2 capex in nominal terms as per the audited accounts, the relevant efficiency score, the efficient PC2 capex (in nominal prices and 2003 prices) based on such efficiency score, and the provisional PC2 capex allowed in PC2 controls in 2003 terms. Line 7 calculates the additional efficient PC2 capex (in 2003 prices) as the difference between efficient PC2 capex (from Line 5) and provisional PC2 capex (from Line 6). The result is shown in **Table 6.6** in the paper.

A.7 Lines 8-10 show the calculation of depreciation foregone (in 2003 prices) during 2003-2009 on the additional efficient PC2 capex, using the additional efficient PC2 capex from Line 7 and average asset life assumption from Line 8. The depreciated closing value of additional efficient PC2 capex is shown at the end of Line 14, which is to be added to the opening 2010 RAV.

A.8 Lines 11-17 show the calculation of return on capital foregone (in 2003 prices) during 2003-2009 on the efficient PC2 capex, using the additional efficient PC2 capex from Line 7 and the cost of capital used for PC2 controls from Line 16.

A.9 Lines 18-24 show the calculation of net present value (NPV) (first in 2003 prices and then in 2010 prices) at 1 January 2010 of total foregone financing costs on efficient PC2 capex during 2003-2009. This is done by adding the depreciation foregone (from Line 10) and the return on capital foregone (from Line 17) and then calculating the present value of the sum at 1 January 2010 by using the cost of capital from Line 16 as the discount rate. The resulting NPV of the total foregone financing cost for each business is presented in **Table 6.12** in the paper. This NPV amount needs to be added to the required revenue for the PC4 period (see Section 9 of the paper).

A.10 Lines 25-29 show how the depreciated closing value of additional efficient PC2 capex over and above the provisional PC2 allowances (from Line 14) has been rolled forward into the initial 2010 RAV from the PC3 calculations at the last review (which already includes provisional PC2 allowances). These lines also show the adjustment of the resulting opening 2010 RAV to 2010 prices, which is required for PC4 price control calculations in Section 9. The opening 2010 RAVs so updated are listed in **Table 6.12** of the paper.

Updating RAVs for PC4 capex

A.11 ***Annexes A.1 through A.6*** to this paper also show the updating of RAVs for provisional PC4 capex for each of AADC, ADDC, ADSSC and TRANSCO (all figures are in 2010 prices):

A.12 Line 30 shows the average asset life assumption for PC4 capex (see **Table 6.8** in the paper).

A.13 The beginning of Line 31 shows the RAV updated for efficient PC2 capex from Line 29 (see **Table 6.12**). In the case of ADSSC, this shows the opening 2010 RAV calculated at the last review, converted into 2010 prices.

A.14 Line 32 lists the provisional PC4 capex as shown in **Table 6.7** of the paper.

A.15 Line 33 lists the total depreciation on RAV and all capex to date (excluding provisional PC4 capex) as calculated by the PC4 Depreciation Model and presented in **Table 6.9** of the paper.

A.16 Line 34 calculates the depreciation on provisional PC4 capex as presented in **Table 6.10** of the paper.

A.17 Line 35 calculates the total depreciation by addition Lines 33 and 34 (results shown in **Table 6.11** of the paper).

A.18 Line 36 calculates the closing RAV for each year by adding the provisional PC4 capex (from Line 32) to, and deducting the total depreciation (from Line 35) from, the opening RAV for that year (from Line 31). The closing RAV for a year becomes the opening RAV for the next year in Line 31.

A.19 The updated opening RAVs for all businesses are listed in **Table 6.13** of the paper.

Annex A.1: AADC Electricity – Updating RAV

Updating 2010 Opening RAV for PC2 Efficient Capex

Line No.

	UAE CPI Assumptions		2002	2003	2004	2005	2006	2007	2008	2009
1	**CPI (2000 = 100) used in calculations**		**71.58**	**73.82**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**113.07**

	Additional Efficient PC2 Capex to be allowed at this Review			2003	2004	2005
2	Actual PC2 capex	AEDm, nominal prices		409.91	399.28	548.98
3	Applied capex efficiency factor	%	92.60%			
4	Efficient PC2 capex	AEDm, nominal prices		379.57	369.73	508.35
5	Efficient PC2 capex	AEDm, 2003 prices		379.57	358.55	469.32
6	Provisional PC2 capex	AEDm, 2003 prices		205.80	205.80	205.80
7	**Additional efficient PC2 capex to be allowed at PC4**	**AEDm, 2003 prices**		**173.78**	**152.75**	**263.52**

	Depreciation foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
8	Assumed average asset life for new investment	years	30							
9	Additional efficient PC2 capex to be allowed at PC4	AEDm, 2003 prices		173.78	152.75	263.52				
10	**Depreciation on additional efficient PC2 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2003 prices		**2.90**	**8.34**	**15.28**	**19.67**	**19.67**	**19.67**	**19.67**

	Return on Capital foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
11	Additional efficient PC2 capex - Opening value	AEDm, 2003 prices		0.00	170.88	315.29	563.54	543.87	524.20	504.53
12	Additional efficient PC2 capex	AEDm, 2003 prices		173.78	152.75	263.52				
13	Depreciation on additional efficient PC2 capex	AEDm, 2003 prices		2.90	8.34	15.28	19.67	19.67	19.67	19.67
14	Additional efficient PC2 capex - Closing value	AEDm, 2003 prices		170.88	315.29	563.54	543.87	524.20	504.53	**484.86**
15	Average of Opening and Closing values	AEDm, 2003 prices		85.44	243.09	439.41	553.70	534.03	514.37	494.70
16	Cost of capital (real)	%	6.00%							
17	**Return on capital foregone**	AEDm, 2003 prices		**5.13**	**14.59**	**26.36**	**33.22**	**32.04**	**30.86**	**29.68**

	Financing Costs foregone on Additional Efficient PC2 Capex		2003	2004	2005	2006	2007	2008	2009
18	Depreciation foregone	AEDm, 2003 prices	2.90	8.34	15.28	19.67	19.67	19.67	19.67
19	Return on capital foregone	AEDm, 2003 prices	5.13	14.59	26.36	33.22	32.04	30.86	29.68
20	Total financing costs foregone	AEDm, 2003 prices	8.02	22.92	41.64	52.89	51.71	50.53	49.35
21	Years from year mid point to 1 Jan 2010	years	6.50	5.50	4.50	3.50	2.50	1.50	0.50
22	NPV @ 1 Jan 2010 of financing costs foregone	AEDm, 2003 prices	11.72	31.58	54.13	64.86	59.82	55.15	50.81
23	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone	AEDm, 2003 prices							328.06
24	**Accumulated NPV (@ 1 Jan 2010) of financing costs foregone**	**AEDm, 2010 prices**							**518.18**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		2010
25	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2006 prices	3,300.51
26	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2003 prices	2,869.30
27	Add: Additional efficient PC2 capex - Closing value @ 31 Dec 2009	AEDm, 2003 prices	484.86
28	Updated Opening 2010 RAV including Additional Efficient PC2 capex	AEDm, 2003 prices	3,354.16
29	**Updated Opening 2010 RAV including Efficient PC2 capex**	**AEDm, 2010 prices**	**5,298.10**

Updating PC4 RAVs for PC4 Provisional Capex

	Updated PC4 RAVs including PC4 Provisional Capex			2010	2011	2012	2013
30	Assumed average asset life for new investment	years	30				
31	**Opening RAV**	**AEDm, 2010 prices**		**5,298.10**	**5,492.56**	**5,670.01**	**5,830.47**
32	Provisional PC4 capex	AEDm, 2010 prices		510.00	510.00	510.00	510.00
33	Total Depreciation on RAV and capex (excluding PC4 provisional capex)	AEDm, 2010 prices		307.04	307.04	307.04	307.04
34	Depreciation on provisional PC4 capex (half-year depreciation for first year)	AEDm, 2010 prices		8.50	25.50	42.50	59.50
35	**Total depreciation for PC4**	**AEDm, 2010 prices**		**315.54**	**332.54**	**349.54**	**366.54**
36	**Closing RAV**	**AEDm, 2010 prices**		**5,492.56**	**5,670.01**	**5,830.47**	**5,973.92**

Annex A.2: AADC Water – Updating RAV

Updating 2010 Opening RAV for PC2 Efficient Capex

Line No.

	UAE CPI Assumptions		2002	2003	2004	2005	2006	2007	2008	2009
1	**CPI (2000 = 100) used in calculations**		**71.58**	**73.82**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**113.07**

	Additional Efficient PC2 Capex to be allowed at this Review			2003	2004	2005
2	Actual PC2 capex	AEDm, nominal prices		130.50	155.54	207.68
3	Applied capex efficiency factor	%	91.70%			
4	Efficient PC2 capex	AEDm, nominal prices		119.67	142.63	190.45
5	Efficient PC2 capex	AEDm, 2003 prices		119.67	138.32	175.82
6	Provisional PC2 capex	AEDm, 2003 prices		72.37	72.37	72.37
7	**Additional efficient PC2 capex to be allowed at PC4**	**AEDm, 2003 prices**		**47.30**	**65.95**	**103.45**

	Depreciation foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
8	Assumed average asset life for new investment	years	30							
9	Additional efficient PC2 capex to be allowed at PC4	AEDm, 2003 prices		47.30	65.95	103.45				
10	**Depreciation on additional efficient PC2 capex**	AEDm, 2003 prices		**0.79**	**2.68**	**5.50**	**7.22**	**7.22**	**7.22**	**7.22**
	(half-year depreciation for the first year of each annual capex)									

	Return on Capital foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
11	Additional efficient PC2 capex - Opening value	AEDm, 2003 prices		0.00	46.51	109.78	207.74	200.51	193.29	186.07
12	Additional efficient PC2 capex	AEDm, 2003 prices		47.30	65.95	103.45				
13	Depreciation on additional efficient PC2 capex	AEDm, 2003 prices		0.79	2.68	5.50	7.22	7.22	7.22	7.22
14	Additional efficient PC2 capex - Closing value	AEDm, 2003 prices		46.51	109.78	207.74	200.51	193.29	186.07	**178.84**
15	Average of Opening and Closing values	AEDm, 2003 prices		23.26	78.15	158.76	204.13	196.90	189.68	182.46
16	Cost of capital (real)	%	6.00%							
17	**Return on capital foregone**	AEDm, 2003 prices		**1.40**	**4.69**	**9.53**	**12.25**	**11.81**	**11.38**	**10.95**

	Financing Costs foregone on Additional Efficient PC2 Capex		2003	2004	2005	2006	2007	2008	2009
18	Depreciation foregone	AEDm, 2003 prices	0.79	2.68	5.50	7.22	7.22	7.22	7.22
19	Return on capital foregone	AEDm, 2003 prices	1.40	4.69	9.53	12.25	11.81	11.38	10.95
20	Total financing costs foregone	AEDm, 2003 prices	2.18	7.36	15.02	19.47	19.04	18.60	18.17
21	Years from year mid point to 1 Jan 2010	years	6.50	5.50	4.50	3.50	2.50	1.50	0.50
22	NPV @ 1 Jan 2010 of financing costs foregone	AEDm, 2003 prices	3.19	10.15	19.53	23.88	22.02	20.30	18.71
23	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone	AEDm, 2003 prices							117.77
24	**Accumulated NPV (@ 1 Jan 2010) of financing costs foregone**	**AEDm, 2010 prices**							**186.03**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		2010
25	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2006 prices	1,628.53
26	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2003 prices	1,415.77
27	Add: Additional efficient PC2 capex - Closing value @ 31 Dec 2009	AEDm, 2003 prices	178.84
28	Updated Opening 2010 RAV including Additional Efficient PC2 capex	AEDm, 2003 prices	1,594.61
29	**Updated Opening 2010 RAV including Efficient PC2 capex**	**AEDm, 2010 prices**	**2,518.78**

Updating PC4 RAVs for PC4 Provisional Capex

	Updated PC4 RAVs including PC4 Provisional Capex			2010	2011	2012	2013
30	Assumed average asset life for new investment	years	30				
31	**Opening RAV**	**AEDm, 2010 prices**		**2,518.78**	**2,524.37**	**2,526.29**	**2,524.54**
32	Provisional PC4 capex	AEDm, 2010 prices		110.00	110.00	110.00	110.00
33	Total Depreciation on RAV and capex (excluding PC4 provisional capex)	AEDm, 2010 prices		102.58	102.58	102.58	102.58
34	Depreciation on provisional PC4 capex (half-year depreciation for first year)	AEDm, 2010 prices		1.83	5.50	9.17	12.83
35	**Total depreciation for PC4**	**AEDm, 2010 prices**		**104.42**	**108.08**	**111.75**	**115.42**
36	**Closing RAV**	**AEDm, 2010 prices**		**2,524.37**	**2,526.29**	**2,524.54**	**2,519.12**

Annex A.3: ADDC Electricity – Updating RAV

Updating 2010 Opening RAV for PC2 Efficient Capex

Line No.

	UAE CPI Assumptions		2002	2003	2004	2005	2006	2007	2008	2009
1	**CPI (2000 = 100) used in calculations**		**71.58**	**73.82**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**113.07**

	Additional Efficient PC2 Capex to be allowed at this Review			2003	2004	2005
2	Actual PC2 capex	AEDm, nominal prices		582.03	512.24	296.89
3	Applied capex efficiency factor	%	90.10%			
4	Efficient PC2 capex	AEDm, nominal prices		524.41	461.53	267.50
5	Efficient PC2 capex	AEDm, 2003 prices		524.41	447.57	246.96
6	Provisional PC2 capex	AEDm, 2003 prices		461.88	484.97	509.22
7	**Additional efficient PC2 capex to be allowed at PC4**	**AEDm, 2003 prices**		**62.54**	**(37.40)**	**(262.26)**

	Depreciation foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
8	Assumed average asset life for new investment	years	30							
9	Additional efficient PC2 capex to be allowed at PC4	AEDm, 2003 prices		62.54	-37.40	-262.26				
10	**Depreciation on additional efficient PC2 capex**	AEDm, 2003 prices		**1.04**	**1.46**	**-3.53**	**-7.90**	**-7.90**	**-7.90**	**-7.90**
	(half-year depreciation for the first year of each annual capex)									

	Return on Capital foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
11	Additional efficient PC2 capex - Opening value	AEDm, 2003 prices		0.00	61.49	22.63	-236.10	-228.20	-220.29	-212.39
12	Additional efficient PC2 capex	AEDm, 2003 prices		62.54	-37.40	-262.26				
13	Depreciation on additional efficient PC2 capex	AEDm, 2003 prices		1.04	1.46	-3.53	-7.90	-7.90	-7.90	-7.90
14	Additional efficient PC2 capex - Closing value	AEDm, 2003 prices		61.49	22.63	-236.10	-228.20	-220.29	-212.39	**-204.48**
15	Average of Opening and Closing values	AEDm, 2003 prices		30.75	42.06	-106.74	-232.15	-224.24	-216.34	-208.43
16	Cost of capital (real)	%	6.00%							
17	**Return on capital foregone**	AEDm, 2003 prices		**1.84**	**2.52**	**-6.40**	**-13.93**	**-13.45**	**-12.98**	**-12.51**

	Financing Costs foregone on Additional Efficient PC2 Capex		2003	2004	2005	2006	2007	2008	2009
18	Depreciation foregone	AEDm, 2003 prices	1.04	1.46	-3.53	-7.90	-7.90	-7.90	-7.90
19	Return on capital foregone	AEDm, 2003 prices	1.84	2.52	-6.40	-13.93	-13.45	-12.98	-12.51
20	Total financing costs foregone	AEDm, 2003 prices	2.89	3.98	-9.94	-21.83	-21.36	-20.88	-20.41
21	Years from year mid point to 1 Jan 2010	years	6.50	5.50	4.50	3.50	2.50	1.50	0.50
22	NPV @ 1 Jan 2010 of financing costs foregone	AEDm, 2003 prices	4.22	5.49	-12.92	-26.77	-24.71	-22.79	-21.01
23	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone	AEDm, 2003 prices							-98.50
24	**Accumulated NPV (@ 1 Jan 2010) of financing costs foregone**	**AEDm, 2010 prices**							**-155.58**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		2010
25	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2006 prices	7,037.90
26	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2003 prices	6,118.41
27	Add: Additional efficient PC2 capex - Closing value @ 31 Dec 2009	AEDm, 2003 prices	(204.48)
28	Updated Opening 2010 RAV including Additional Efficient PC2 capex	AEDm, 2003 prices	5,913.93
29	**Updated Opening 2010 RAV including Efficient PC2 capex**	**AEDm, 2010 prices**	**9,341.40**

Updating PC4 RAVs for PC4 Provisional Capex

	Updated PC4 RAVs including PC4 Provisional Capex			2010	2011	2012	2013
30	Assumed average asset life for new investment	years	30				
31	**Opening RAV**	**AEDm, 2010 prices**		**9,341.40**	**10,065.45**	**10,747.83**	**11,388.54**
32	Provisional PC4 capex	AEDm, 2010 prices		1,250.00	1,250.00	1,250.00	1,250.00
33	Total Depreciation on RAV and capex (excluding PC4 provisional capex)	AEDm, 2010 prices		505.12	505.12	505.12	505.12
34	Depreciation on provisional PC4 capex (half-year depreciation for first year)	AEDm, 2010 prices		20.83	62.50	104.17	145.83
35	**Total depreciation for PC4**	**AEDm, 2010 prices**		**525.95**	**567.62**	**609.29**	**650.95**
36	**Closing RAV**	**AEDm, 2010 prices**		**10,065.45**	**10,747.83**	**11,388.54**	**11,987.59**

Annex A.4: ADDC Water – Updating RAV

Updating 2010 Opening RAV for PC2 Efficient Capex

Line No.

	UAE CPI Assumptions		2002	2003	2004	2005	2006	2007	2008	2009
1	**CPI (2000 = 100) used in calculations**		**71.58**	**73.82**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**113.07**

	Additional Efficient PC2 Capex to be allowed at this Review			2003	2004	2005
2	Actual PC2 capex	AEDm, nominal prices		466.21	291.79	82.99
3	Applied capex efficiency factor	%	88.00%			
4	Efficient PC2 capex	AEDm, nominal prices		410.27	256.77	73.03
5	Efficient PC2 capex	AEDm, 2003 prices		410.27	249.00	67.43
6	Provisional PC2 capex	AEDm, 2003 prices		151.42	158.99	166.94
7	**Additional efficient PC2 capex to be allowed at PC4**	**AEDm, 2003 prices**		**258.85**	**90.01**	**(99.52)**

	Depreciation foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
8	Assumed average asset life for new investment	years	30							
9	Additional efficient PC2 capex to be allowed at PC4	AEDm, 2003 prices		258.85	90.01	-99.52				
10	**Depreciation on additional efficient PC2 capex**	AEDm, 2003 prices		**4.31**	**10.13**	**9.97**	**8.31**	**8.31**	**8.31**	**8.31**
	(half-year depreciation for the first year of each annual capex)									

	Return on Capital foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
11	Additional efficient PC2 capex - Opening value	AEDm, 2003 prices		0.00	254.53	334.42	224.93	216.62	208.31	200.00
12	Additional efficient PC2 capex	AEDm, 2003 prices		258.85	90.01	-99.52				
13	Depreciation on additional efficient PC2 capex	AEDm, 2003 prices		4.31	10.13	9.97	8.31	8.31	8.31	8.31
14	Additional efficient PC2 capex - Closing value	AEDm, 2003 prices		254.53	334.42	224.93	216.62	208.31	200.00	**191.69**
15	Average of Opening and Closing values	AEDm, 2003 prices		127.27	294.47	279.67	220.78	212.46	204.15	195.84
16	Cost of capital (real)	%	6.00%							
17	**Return on capital foregone**	AEDm, 2003 prices		**7.64**	**17.67**	**16.78**	**13.25**	**12.75**	**12.25**	**11.75**

	Financing Costs foregone on Additional Efficient PC2 Capex		2003	2004	2005	2006	2007	2008	2009
18	Depreciation foregone	AEDm, 2003 prices	4.31	10.13	9.97	8.31	8.31	8.31	8.31
19	Return on capital foregone	AEDm, 2003 prices	7.64	17.67	16.78	13.25	12.75	12.25	11.75
20	Total financing costs foregone	AEDm, 2003 prices	11.95	27.80	26.75	21.56	21.06	20.56	20.06
21	Years from year mid point to 1 Jan 2010	AEDm, 2003 prices	6.50	5.50	4.50	3.50	2.50	1.50	0.50
22	NPV @ 1 Jan 2010 of financing costs foregone	years	17.45	38.30	34.77	26.44	24.36	22.44	20.66
23	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone	AEDm, 2003 prices							184.41
24	**Accumulated NPV (@ 1 Jan 2010) of financing costs foregone**	**AEDm, 2010 prices**							**291.29**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		2010
25	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2006 prices	2,611.91
26	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2003 prices	2,270.66
27	Add: Additional efficient PC2 capex - Closing value @ 31 Dec 2009	AEDm, 2003 prices	191.69
28	Updated Opening 2010 RAV including Additional Efficient PC2 capex	AEDm, 2003 prices	2,462.35
29	**Updated Opening 2010 RAV including Efficient PC2 capex**	**AEDm, 2010 prices**	**3,889.43**

Updating PC4 RAVs for PC4 Provisional Capex

	Updated PC4 RAVs including PC4 Provisional Capex			2010	2011	2012	2013
30	Assumed average asset life for new investment	years	30				
31	**Opening RAV**	**AEDm, 2010 prices**		**3,889.43**	**3,992.77**	**4,084.45**	**4,164.46**
32	Provisional PC4 capex	AEDm, 2010 prices		350.00	350.00	350.00	350.00
33	Total Depreciation on RAV and capex (excluding PC4 provisional capex)	AEDm, 2010 prices		240.82	240.82	240.82	221.11
34	Depreciation on provisional PC4 capex (half-year depreciation for first year)	AEDm, 2010 prices		5.83	17.50	29.17	40.83
35	**Total depreciation for PC4**	**AEDm, 2010 prices**		**246.66**	**258.32**	**269.99**	**261.95**
36	**Closing RAV**	**AEDm, 2010 prices**		**3,992.77**	**4,084.45**	**4,164.46**	**4,252.51**

Annex A.5: TRANSCO Electricity – Updating RAV

Updating 2010 Opening RAV for PC2 Efficient Capex

Line No.

	UAE CPI Assumptions		2002	2003	2004	2005	2006	2007	2008	2009
1	**CPI (2000 = 100) used in calculations**		**71.58**	**73.82**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**113.07**

	Additional Efficient PC2 Capex to be allowed at this Review			2003	2004	2005
2	Actual PC2 capex	AEDm, nominal prices		1,135.39	1,729.96	1,478.15
3	Applied capex efficiency factor	%	93.60%			
4	Efficient PC2 capex	AEDm, nominal prices		1,062.72	1,619.24	1,383.55
5	Efficient PC2 capex	AEDm, 2003 prices		1,062.72	1,570.26	1,277.31
6	Provisional PC2 capex	AEDm, 2003 prices		1,267.79	730.38	346.04
7	**Additional efficient PC2 capex to be allowed at PC4**	**AEDm, 2003 prices**		**-205.07**	**839.89**	**931.27**

	Depreciation foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
8	Assumed average asset life for new investment	years	30							
9	Additional efficient PC2 capex to be allowed at PC4	AEDm, 2003 prices		-205.07	839.89	931.27				
10	**Depreciation on additional efficient PC2 capex** (half-year depreciation for the first year of each annual capex)	AEDm, 2003 prices		**-3.42**	**7.16**	**36.68**	**52.20**	**52.20**	**52.20**	**52.20**

	Return on Capital foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
11	Additional efficient PC2 capex - Opening value	AEDm, 2003 prices		0.00	-201.65	631.07	1,525.66	1,473.46	1,421.26	1,369.05
12	Additional efficient PC2 capex	AEDm, 2003 prices		-205.07	839.89	931.27				
13	Depreciation on additional efficient PC2 capex	AEDm, 2003 prices		-3.42	7.16	36.68	52.20	52.20	52.20	52.20
14	Additional efficient PC2 capex - Closing value	AEDm, 2003 prices		-201.65	631.07	1,525.66	1,473.46	1,421.26	1,369.05	**1,316.85**
15	Average of Opening and Closing values	AEDm, 2003 prices		-100.83	214.71	1,078.37	1,499.56	1,447.36	1,395.16	1,342.95
16	Cost of capital (real)	%	6.00%							
17	**Return on capital foregone**	AEDm, 2003 prices		**-6.05**	**12.88**	**64.70**	**89.97**	**86.84**	**83.71**	**80.58**

	Financing Costs foregone on Additional Efficient PC2 Capex		2003	2004	2005	2006	2007	2008	2009
18	Depreciation foregone	AEDm, 2003 prices	-3.42	7.16	36.68	52.20	52.20	52.20	52.20
19	Return on capital foregone	AEDm, 2003 prices	-6.05	12.88	64.70	89.97	86.84	83.71	80.58
20	Total financing costs foregone	AEDm, 2003 prices	-9.47	20.05	101.38	142.18	139.04	135.91	132.78
21	Years from year mid point to 1 Jan 2010	years	6.50	5.50	4.50	3.50	2.50	1.50	0.50
22	NPV @ 1 Jan 2010 of financing costs foregone	AEDm, 2003 prices	-13.83	27.62	131.78	174.34	160.85	148.33	136.71
23	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone	AEDm, 2003 prices							765.79
24	**Accumulated NPV (@ 1 Jan 2010) of financing costs foregone**	**AEDm, 2010 prices**							**1209.61**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		2010
25	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2006 prices	12,118.09
26	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2003 prices	10,534.87
27	Add: Additional efficient PC2 capex - Closing value @ 31 Dec 2009	AEDm, 2003 prices	1,316.85
28	Updated Opening 2010 RAV including Additional Efficient PC2 capex	AEDm, 2003 prices	11,851.72
29	**Updated Opening 2010 RAV including Efficient PC2 capex**	**AEDm, 2010 prices**	**18,720.51**

Updating PC4 RAVs for PC4 Provisional Capex

	Updated PC4 RAVs including PC4 Provisional Capex			2010	2011	2012	2013
30	Assumed average asset life for new investment	years	30				
31	**Opening RAV**	**AEDm, 2010 prices**		**18,720.51**	**21,355.28**	**23,872.05**	**26,270.82**
32	Provisional PC4 capex	AEDm, 2010 prices		3,540.00	3,540.00	3,540.00	3,540.00
33	Total Depreciation on RAV and capex (excluding PC4 provisional capex)	AEDm, 2010 prices		846.23	846.23	846.23	846.23
34	Depreciation on provisional PC4 capex (half-year depreciation for first year)	AEDm, 2010 prices		59.00	177.00	295.00	413.00
35	**Total depreciation for PC4**	**AEDm, 2010 prices**		**905.23**	**1,023.23**	**1,141.23**	**1,259.23**
36	**Closing RAV**	**AEDm, 2010 prices**		**21,355.28**	**23,872.05**	**26,270.82**	**28,551.59**

Annex A.6: TRANSCO Water – Updating RAV

Updating 2010 Opening RAV for PC2 Efficient Capex

Line No.

	UAE CPI Assumptions		2002	2003	2004	2005	2006	2007	2008	2009
1	**CPI (2000 = 100) used in calculations**		**71.58**	**73.82**	**77.54**	**82.34**	**89.99**	**100.00**	**112.30**	**113.07**

	Additional Efficient PC2 Capex to be allowed at this Review			2003	2004	2005
2	Actual PC2 capex	AEDm, nominal prices		1,958.58	2,423.44	(859.25)
3	Applied capex efficiency factor	%	86.20%			
4	Efficient PC2 capex	AEDm, nominal prices		1,688.29	2,089.00	(740.68)
5	Efficient PC2 capex	AEDm, 2003 prices		1,688.29	2,025.82	(683.80)
6	Provisional PC2 capex	AEDm, 2003 prices		1,261.10	1,280.09	243.24
7	**Additional efficient PC2 capex to be allowed at PC4**	**AEDm, 2003 prices**		**427.19**	**745.73**	**(927.04)**

	Depreciation foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
8	Assumed average asset life for new investment	years	30							
9	Additional efficient PC2 capex to be allowed at PC4	AEDm, 2003 prices		427.19	745.73	-927.04				
10	**Depreciation on additional efficient PC2 capex**	AEDm, 2003 prices		**7.12**	**26.67**	**23.65**	**8.20**	**8.20**	**8.20**	**8.20**
	(half-year depreciation for the first year of each annual capex)									

	Return on Capital foregone on Additional Efficient PC2 Capex			2003	2004	2005	2006	2007	2008	2009
11	Additional efficient PC2 capex - Opening value	AEDm, 2003 prices		0.00	420.07	1,139.13	188.44	180.25	172.05	163.85
12	Additional efficient PC2 capex	AEDm, 2003 prices		427.19	745.73	-927.04				
13	Depreciation on additional efficient PC2 capex	AEDm, 2003 prices		7.12	26.67	23.65	8.20	8.20	8.20	8.20
14	Additional efficient PC2 capex - Closing value	AEDm, 2003 prices		420.07	1,139.13	188.44	180.25	172.05	163.85	**155.66**
15	Average of Opening and Closing values	AEDm, 2003 prices		210.04	779.60	663.79	184.34	176.15	167.95	159.76
16	Cost of capital (real)	%	6.00%							
17	**Return on capital foregone**	AEDm, 2003 prices		**12.60**	**46.78**	**39.83**	**11.06**	**10.57**	**10.08**	**9.59**

	Financing Costs foregone on Additional Efficient PC2 Capex		2003	2004	2005	2006	2007	2008	2009
18	Depreciation foregone	AEDm, 2003 prices	7.12	26.67	23.65	8.20	8.20	8.20	8.20
19	Return on capital foregone	AEDm, 2003 prices	12.60	46.78	39.83	11.06	10.57	10.08	9.59
20	Total financing costs foregone	AEDm, 2003 prices	19.72	73.44	63.47	19.26	18.76	18.27	17.78
21	Years from year mid point to 1 Jan 2010	years	6.50	5.50	4.50	3.50	2.50	1.50	0.50
22	NPV @ 1 Jan 2010 of financing costs foregone	AEDm, 2003 prices	28.80	101.19	82.50	23.61	21.71	19.94	18.31
23	Accumulated NPV (@ 1 Jan 2010) of financing costs foregone	AEDm, 2003 prices							296.07
24	**Accumulated NPV (@ 1 Jan 2010) of financing costs foregone**	**AEDm, 2010 prices**							**467.66**

	Updated 2010 Opening RAV (including Additional Efficient PC2 Capex)		2010
25	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2006 prices	7,494.15
26	Initial Opening 2010 RAV (with provisional PC2 capex)	AEDm, 2003 prices	6,515.05
27	Add: Additional efficient PC2 capex - Closing value @ 31 Dec 2009	AEDm, 2003 prices	155.66
28	Updated Opening 2010 RAV including Additional Efficient PC2 capex	AEDm, 2003 prices	6,670.70
29	**Updated Opening 2010 RAV including Efficient PC2 capex**	**AEDm, 2010 prices**	**10,536.78**

Updating PC4 RAVs for PC4 Provisional Capex

	Updated PC4 RAVs including PC4 Provisional Capex			2010	2011	2012	2013
30	Assumed average asset life for new investment	years	30				
31	**Opening RAV**	**AEDm, 2010 prices**		**10,536.78**	**10,953.00**	**11,335.90**	**11,685.45**
32	Provisional PC4 capex	AEDm, 2010 prices		1,000.00	1,000.00	1,000.00	1,000.00
33	Total Depreciation on RAV and capex (excluding PC4 provisional capex)	AEDm, 2010 prices		567.11	567.11	567.11	567.11
34	Depreciation on provisional PC4 capex (half-year depreciation for first year)	AEDm, 2010 prices		16.67	50.00	83.33	116.67
35	**Total depreciation for PC4**	**AEDm, 2010 prices**		**583.77**	**617.11**	**650.44**	**683.77**
36	**Closing RAV**	**AEDm, 2010 prices**		**10,953.00**	**11,335.90**	**11,685.45**	**12,001.68**

Annex A.7: ADSSC – Updating RAV

Updating 2010 Opening RAV for PC2 Efficient Capex

Line No.

	UAE CPI Assumptions	2002	2003	2004	2005	2006	2007	2008	2009
1	CPI (2000 = 100) used in calculations	71.58	73.82	77.54	82.34	89.99	100.00	112.30	113.07

Updating PC4 RAVs for PC4 Provisional Capex

	Updated PC4 RAVs including PC4 Provisional Capex			2010	2011	2012	2013
30	Assumed average asset life for new investment	years	50				
	Initial Opening 2010 RAV (excluding PC4 provisional capex)	AEDm, 2005 prices		5,297.62			
31	**Opening RAV**	**AEDm, 2010 prices**		**7,725.34**	**9,160.94**	**10,556.53**	**11,912.13**
32	Provisional PC4 capex	AEDm, 2010 prices		2,000.00	2,000.00	2,000.00	2,000.00
33	Total Depreciation on RAV and capex (excluding PC4 provisional capex)	AEDm, 2010 prices		544.41	544.41	544.41	544.41
34	Depreciation on provisional PC4 capex (half-year depreciation for first year)	AEDm, 2010 prices		20.00	60.00	100.00	140.00
35	**Total depreciation for PC4**	**AEDm, 2010 prices**		**564.41**	**604.41**	**644.41**	**684.41**
36	**Closing RAV**	**AEDm, 2010 prices**		**9,160.94**	**10,556.53**	**11,912.13**	**13,227.72**

Annex B: Price Control Calculations

B.1 This **Annex B** to the Draft Proposals for PC4 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 spreadsheets of the ***PC4 Financial Model*** – a Microsoft Excel based computer model developed by the Bureau to carry out PC4 calculations. The results of these calculations are described in Section 9 of the paper.

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 PC4 Financial Model:

Inputs (Lines 1-15)

B.3 Lines 1-15 show the inputs to the main price control calculations:

(a) Line 1 shows the opex allowance for each year of the PC4 period (2010-2013) in 2010 prices as per Section 5.

(b) Lines 2 and 3 list the opening and closing RAVs, respectively, in 2010 prices for each year of the PC4 period (see Section 6 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 PC4 period as determined in Section 6.

(d) Lines 6-8 list the assumptions for the revenue drivers. The assumptions for the variable revenue drivers are as per Section 4, whereas the fixed revenue driver is set to unity.

(e) Line 9 shows the NPV of financial adjustments in 2010 prices as of 1 January 2010 (discussed in Section 8).

(f) Line 10 shows the NPV as of 1 January 2010 of the financing costs foregone or unduly earned in respect of the additional efficient PC2 capex (over and above the provisional PC2 capex allowances in the PC2 controls) in 2010 prices (discussed in Section 6).

(g) Line 11 shows the post-tax, real cost of capital as discussed in Section 7. This is used in the calculation of NPVs as well as the return on capital component of the annual revenue requirement.

(h) Lines 12-14 list the weights for the revenue drivers in the price-controlled revenue as per Section 2.

(i) Line 15 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 16-23)

B.4 Lines 16-23 show the calculations of required revenue for PC4 in 2010 prices:

(a) Lines 16 and 17 reproduce the annual opex allowances and depreciation for the PC4 period from Lines 1 and 5. Line 18 calculates the annual return on capital by multiplying the mid-year RAVs (Line 4) by the cost of capital (Line 11). The final column in each line shows the NPV of the relevant allowances over the PC4 period.

(b) Line 19 calculates the annual revenue requirement for the PC4 period, by adding Lines 16-18. The final column of Line 19 calculates the NPV of the annual revenue requirements over the PC4 period.

(c) Line 20 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 19.

(d) The last column in Lines 21 and 22 reproduces the NPVs of financial adjustments and PC2 capex foregone financing costs from Lines 9 and 10, respectively.

(e) Line 23 shows the NPV of the revenue requirement after financial adjustments and PC2 capex foregone financing costs, calculated by adding the last columns of Lines 20, 21 and 22. This is the figure used in setting the controls.

Revenue Forecast and Profiling (Lines 24-37)

B.5 Lines 24-37 describe the process for calibrating the controls, which utilises the 'Solver' function (an optimisation tool) of Excel:

(a) Lines 24-27 relate to the fixed revenue term (referred to as "Revenue Driver 1" in the PC4 Financial Model), Lines 28-31 relate to the first variable revenue term (or "Revenue Driver 2"), and Lines 32-35 to (where applicable) the second variable revenue term (or "Revenue Driver 3").

(b) Lines 24-27 relate to Revenue Driver 1 (the fixed revenue term) and run as follows:

(i) Line 24 shows the revenue driver forecast, which in this case is set to unity due to the fixed nature of this driver.

(ii) Line 25 shows the notified value 'a' for each year of the 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 2010 is known, those for 2011, 2012 and 2013 are automatically calculated.

(iii) In Line 26, a forecast of revenue from this revenue driver is calculated by multiplying Line 24 (driver forecast) with Line 25 (value of 'a'). The last figure in Line 26 is the NPV of the revenue forecast related to Revenue Driver 1 over the control period.

(iv) Line 27 calculates the share of revenue related to Revenue Driver 1 in the total annual revenue by dividing Line 26 (revenue forecast for Revenue Driver 1) by Line 36 (annual revenue). The last column figure in Line 27 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 37 (total discounted allowed revenue at 1 January 2010). This NPV share is unknown initially but is one of the constraints used in Excel solver.

(c) Lines 28-31 and Lines 32-35 follow the same format as Lines 24-27 but are related to Revenue Drivers 2 and 3 (i.e., the two variable revenue drivers), respectively.

(d) Line 36 calculates the annual revenue forecast as the sum of revenue forecasts for each of the three revenue drivers (i.e., Lines 26, 30 and 34).

(e) Line 37 simply shows, on an annual basis, the discounted figures for annual revenues shown in Line 36 and, in the penultimate column, the total NPV of the revenues over the control period. The last column in Line 37 ("Difference") is used to equate this to the NPV of the total required revenue after financial adjustments and PC2 capex foregone financing costs from Line 23.

(f) After inputting the required data and formulae in Lines 24-35, the Excel solver is run to set the last column figure in Line 37 (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 2010 (in Lines 25, 29 and 33), subject to the constraint that the shares of the NPVs of revenue forecasts for the revenue drivers (shown at the end of Lines 27, 31 and 35) in the NPV of total revenue forecast (Line 37) must be equal to the weights set out in Section 2 (as shown in Lines 12, 13 and 14, 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 2010 are determined. The values of 'a', 'b' and 'c' for 2011, 2012 and 2013 are then automatically calculated by the model.

Results (Lines 38-41)

B.6 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 42-43)

B.7 These two lines calculate two financial indicators in real terms to assess the financing viability of the company as a result of the price control calculations:

B.8 Line 42 shows the implied annual profit, calculated by subtracting Line 1 (opex allowance) and Line 5 (total depreciation) from Line 36 (annual allowed revenue).

B.9 Line 43 calculates the implied return on the mid-year RAVs in percentage terms by dividing Line 42 (implied annual profit) by Line 4 (mid-year RAVs).

Annex B.1: AADC Electricity – Price Control Calculations

Line No.				(all AED amounts are in 2010 prices)				
	Inputs			**2010**	**2011**	**2012**	**2013**	
1	Operating expenditure allowance	AEDm		225.79	225.04	224.30	223.55	
2	Opening RAV	AEDm		5,298.10	5,492.56	5,670.01	5,830.47	
3	Closing RAV	AEDm		5,492.56	5,670.01	5,830.47	5,973.92	
4	Mid-Year RAV	AEDm		5,395.33	5,581.28	5,750.24	5,902.20	
5	Total depreciation for PC4	AEDm		315.54	332.54	349.54	366.54	
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	
7	Forecast for revenue driver 2	Customer Accounts		107,072	110,748	114,569	118,541	
8	Forecast for revenue driver 3	GWh		9,668	10,926	11,814	12,520	
9	PV of financial adjustments	AEDm	0.00					
10	PV of financing costs foregone on PC2 capex	AEDm	518.18					
11	Cost of capital (real)		4.50%					
12	Weight in revenue for Revenue driver 1		80.00%					
13	Weight in revenue for Revenue driver 2		15.00%					
14	Weight in revenue for Revenue driver 3		5.00%					
15	Negative X Factor		0.00					

	PC3 Required Revenue Calculations		**2010**	**2011**	**2012**	**2013**	**PV over PC4 Period at 1 January 2010**
16	Operating expenditure allowance	AEDm	225.79	225.04	224.30	223.55	824.10
17	Total depreciation for PC3	AEDm	315.54	332.54	349.54	366.54	1,247.30
18	Return on mid-year RAV	AEDm	242.79	251.16	258.76	265.60	932.09
19	Annual revenue requirement	AEDm	784.12	808.74	832.60	855.70	3,003.49
20	Discounted annual revenue requirement	AEDm	767.06	757.07	745.84	733.52	3,003.49
21	PV of financial adjustments	AEDm					0.00
22	PV of financing costs foregone on PC2 capex	AEDm					518.18
23	PV of revenue requirement (after financial adjustment and foregone financing costs)	AEDm					**3,521.67**

	PC3 Required Forecast and Profiling		**2010**	**2011**	**2012**	**2013**	**PV Share in TOTAL**
24	**Revenue driver 1**		1.00	1.00	1.00	1.00	
25		AEDm	**768.22**	768.22	768.22	768.22	
26		AEDm	768.22	768.22	768.22	768.22	2,817.34
27		%	81%	81%	81%	81%	**80%**
28	**Revenue driver 2**	Customer Accounts	107,072	110,748	114,569	118,541	**Constraints for Solver Run**
29		AED / Customer	**1,280.11**	1,280.11	1,280.11	1,280.11	
30		AEDm	137	142	147	152	528.25
31		%	14%	15%	15%	16%	**15%**
32	**Revenue driver 3**	kWh	9,667,804,848	10,925,910,590	11,814,156,542	12,519,899,501	
33		fils / kWh	**0.43**	0.43	0.43	0.43	
34		AEDm	41.52	46.92	50.74	53.77	176.08
35		%	4%	5%	5%	6%	**5%**
		Variables for Solver Run					
36	Annual revenue	AEDm	946.80	956.91	965.62	973.73	**TOTAL** Difference
37	**Discounted annual revenue at 1 January 2006**	AEDm	926.19	895.77	865.00	834.71	**3,521.67** **0.00**
							Target for Solver Run

	Results		**2010**
38	**X Factor**		**0.0**
39	**Fixed revenue term (a)**	**AED million**	**768.22**
40	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**1,280.11**
41	**Co-efficient of variable revenue term (c)**	**fils / kWh metered**	**0.4295**

	Implied Financial Indicators		**2010**	**2011**	**2012**	**2013**	**Average**
42	Implied annual profit	AEDm	405.47	399.33	391.78	383.64	395.05
43	Implied return on mid-point RAV	%	7.52%	7.15%	6.81%	6.50%	7.00%

Annex B.2: AADC Water – Price Control Calculations

Line No.				(all AED amounts are in 2010 prices)				
	Inputs			**2010**	**2011**	**2012**	**2013**	
1	Operating expenditure allowance	AEDm		103.82	102.53	101.25	99.98	
2	Opening RAV	AEDm		2,518.78	2,524.37	2,526.29	2,524.54	
3	Closing RAV	AEDm		2,524.37	2,526.29	2,524.54	2,519.12	
4	Mid-Year RAV	AEDm		2,521.58	2,525.33	2,525.41	2,521.83	
5	Total depreciation for PC4	AEDm		104.42	108.08	111.75	115.42	
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	
7	Forecast for revenue driver 2	Customer Accounts		58,218	58,852	59,539	60,281	
8	Forecast for revenue driver 3	MIG		40,858	54,642	72,391	102,193	
9	PV of financial adjustments	AEDm	-70.73					
10	PV of financing costs foregone on PC2 capex	AEDm	186.03					
11	Cost of capital (real)		4.50%					
12	Weight in revenue for Revenue driver 1		80.00%					
13	Weight in revenue for Revenue driver 2		15.00%					
14	Weight in revenue for Revenue driver 3		5.00%					
15	Negative X Factor		0.00					

	PC3 Required Revenue Calculations		**2010**	**2011**	**2012**	**2013**	**PV over PC4 Period at 1 January 2010**
16	Operating expenditure allowance	AEDm	103.82	102.53	101.25	99.98	373.94
17	Total depreciation for PC3	AEDm	104.42	108.08	111.75	115.42	402.36
18	Return on mid-year RAV	AEDm	113.47	113.64	113.64	113.48	416.46
19	Annual revenue requirement	AEDm	321.71	324.25	326.64	328.88	1,192.76
20	Discounted annual revenue requirement	AEDm	314.71	303.53	292.60	281.92	1,192.76
21	PV of financial adjustments	AEDm					-70.73
22	PV of financing costs foregone on PC2 capex	AEDm					186.03
23	PV of revenue requirement (after financial adjustment and foregone financing costs)	AEDm					**1,308.06**

	PC3 Required Forecast and Profiling		**2010**	**2011**	**2012**	**2013**	**PV Share in TOTAL**
24	**Revenue driver 1**		1.00	1.00	1.00	1.00	
25		AEDm	**285.34**	285.34	285.34	285.34	
26		AEDm	285.34	285.34	285.34	285.34	1,046.45
27		%	82%	82%	82%	82%	**80%**
28	**Revenue driver 2**	Customer Accounts	58,218	58,852	59,539	60,281	**Constraints for Solver Run**
29		AED / Customer	**903.98**	903.98	903.98	903.98	
30		AEDm	53	53	54	54	196.21
31		%	15%	15%	15%	16%	**15%**
32	**Revenue driver 3**	TIG	40,858,327	54,641,902	72,390,771	102,192,992	
33		AED / TIG	**0.27**	0.27	0.27	0.27	
34		AEDm	10.97	14.67	19.44	27.44	65.40
35		%	3%	4%	6%	8%	**5%**
		Variables for Solver Run					
36	Annual revenue	AEDm	348.94	353.21	358.60	367.28	**TOTAL** Difference
37	**Discounted annual revenue at 1 January 2006**	AEDm	341.34	330.65	321.23	314.84	**1,308.06** **0.00**
							Target for Solver Run

	Results		**2010**
38	**X Factor**		**0.0**
39	**Fixed revenue term (a)**	**AED million**	**285.34**
40	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**903.98**
41	**Co-efficient of variable revenue term (c)**	**AED / TIG metered**	**0.2685**

	Implied Financial Indicators		**2010**	**2011**	**2012**	**2013**	**Average**
42	Implied annual profit	AEDm	140.70	142.61	145.61	151.88	145.20
43	Implied return on mid-point RAV	%	5.58%	5.65%	5.77%	6.02%	5.75%

Annex B.3: ADDC Electricity – Price Control Calculations

Line No. **(all AED amounts are in 2010 prices)**

	Inputs			2010	2011	2012	2013
1	Operating expenditure allowance	AEDm		334.28	348.17	362.64	377.70
2	Opening RAV	AEDm		9,341.40	10,065.45	10,747.83	11,388.54
3	Closing RAV	AEDm		10,065.45	10,747.83	11,388.54	11,987.59
4	Mid-Year RAV	AEDm		9,703.42	10,406.64	11,068.18	11,688.06
5	Total depreciation for PC4	AEDm		525.95	567.62	609.29	650.95
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	Customer Accounts		251,538	275,459	284,796	299,655
8	Forecast for revenue driver 3	GWh		26,735	32,217	40,074	44,631
9	PV of financial adjustments	AEDm	0.00				
10	PV of financing costs foregone on PC2 capex	AEDm	-155.58				
11	Cost of capital (real)		4.50%				
12	Weight in revenue for Revenue driver 1		80.00%				
13	Weight in revenue for Revenue driver 2		15.00%				
14	Weight in revenue for Revenue driver 3		5.00%				
15	Negative X Factor		0.00				

	PC3 Required Revenue Calculations		2010	2011	2012	2013	PV over PC4 Period at 1 January 2010
16	Operating expenditure allowance	AEDm	334.28	348.17	362.64	377.70	1,301.55
17	Total depreciation for PC3	AEDm	525.95	567.62	609.29	650.95	2,149.67
18	Return on mid-year RAV	AEDm	436.65	468.30	498.07	525.96	1,762.56
19	Annual revenue requirement	AEDm	1,296.89	1,384.09	1,469.99	1,554.62	5,213.78
20	Discounted annual revenue requirement	AEDm	1,268.66	1,295.66	1,316.81	1,332.65	5,213.78
21	PV of financial adjustments	AEDm					0.00
22	PV of financing costs foregone on PC2 capex	AEDm					-155.58
23	PV of revenue requirement (after financial adjustment and foregone financing costs)	AEDm					**5,058.20**

	PC3 Required Forecast and Profiling		2010	2011	2012	2013	PV Share in TOTAL	
24	**Revenue driver 1**		1.00	1.00	1.00	1.00		
25		AEDm	**1,103.40**	1,103.40	1,103.40	1,103.40		
26		AEDm	1,103.40	1,103.40	1,103.40	1,103.40	4,046.56	
27		%	82%	82%	82%	82%	**80%**	
28	**Revenue driver 2**	Customer Accounts	251,538	275,459	284,796	299,655	**Constraints for Solver Run**	
29		AED / Customer	**746.85**	746.85	746.85	746.85		
30		AEDm	188	206	213	224	758.73	
31		%	14%	15%	16%	17%	**15%**	
32	**Revenue driver 3**	kWh	26,734,527,971	32,216,925,947	40,073,914,669	44,630,705,942		
33		fils / kWh	**0.19**	0.19	0.19	0.19		
34		AEDm	51.82	62.45	77.68	86.52	252.91	
35		%	4%	5%	6%	6%	**5%**	
		Variables for Solver Run						
36	Annual revenue	AEDm	1,343.08	1,371.58	1,393.78	1,413.71	**TOTAL**	Difference
37	**Discounted annual revenue at 1 January 2006**	AEDm	1,313.85	1,283.94	1,248.54	1,211.86	**5,058.20**	**0.00**
							Target for Solver Run	

	Results		2010
38	**X Factor**		**0.0**
39	**Fixed revenue term (a)**	**AED million**	**1,103.40**
40	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**746.85**
41	**Co-efficient of variable revenue term (c)**	**fils / kWh metered**	**0.1938**

	Implied Financial Indicators		2010	2011	2012	2013	Average
42	Implied annual profit	AEDm	482.85	455.79	421.86	385.06	436.39
43	Implied return on mid-point RAV	%	4.98%	4.38%	3.81%	3.29%	4.12%

Annex B.4: ADDC Water – Price Control Calculations

Line No.				(all AED amounts are in 2010 prices)				
	Inputs			**2010**	**2011**	**2012**	**2013**	
1	Operating expenditure allowance	AEDm		185.14	182.88	180.65	178.44	
2	Opening RAV	AEDm		3,889.43	3,992.77	4,084.45	4,164.46	
3	Closing RAV	AEDm		3,992.77	4,084.45	4,164.46	4,252.51	
4	Mid-Year RAV	AEDm		3,941.10	4,038.61	4,124.46	4,208.49	
5	Total depreciation for PC4	AEDm		246.66	258.32	269.99	261.95	
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00	
7	Forecast for revenue driver 2	Customer Accounts		213,717	233,998	241,887	254,465	
8	Forecast for revenue driver 3	MIG		95,604	101,677	107,541	111,514	
9	PV of financial adjustments	AEDm	-99.88					
10	PV of financing costs foregone on PC2 capex	AEDm	291.29					
11	Cost of capital (real)		4.50%					
12	Weight in revenue for Revenue driver 1		80.00%					
13	Weight in revenue for Revenue driver 2		15.00%					
14	Weight in revenue for Revenue driver 3		5.00%					
15	Negative X Factor		0.00					

	PC3 Required Revenue Calculations		**2010**	**2011**	**2012**	**2013**	**PV over PC4 Period at 1 January 2010**
16	Operating expenditure allowance	AEDm	185.14	182.88	180.65	178.44	667.09
17	Total depreciation for PC3	AEDm	246.66	258.32	269.99	261.95	949.51
18	Return on mid-year RAV	AEDm	177.35	181.74	185.60	189.38	672.22
19	Annual revenue requirement	AEDm	609.15	622.94	636.24	629.77	2,288.81
20	Discounted annual revenue requirement	AEDm	595.89	583.14	569.94	539.85	2,288.81
21	PV of financial adjustments	AEDm					-99.88
22	PV of financing costs foregone on PC2 capex	AEDm					291.29
23	PV of revenue requirement (after financial adjustment and foregone financing costs)	AEDm					**2,480.22**

	PC3 Required Forecast and Profiling		**2010**	**2011**	**2012**	**2013**	**PV Share in TOTAL**	
24	**Revenue driver 1**		1.00	1.00	1.00	1.00		
25		AEDm	**541.04**	541.04	541.04	541.04		
26		AEDm	541.04	541.04	541.04	541.04	1,984.18	
27		%	81%	81%	81%	81%	**80%**	
28	**Revenue driver 2**	Customer Accounts	213,717	233,998	241,887	254,465	**Constraints for Solver Run**	
29		AED / Customer	**431.13**	431.13	431.13	431.13		
30		AEDm	92	101	104	110	372.03	
31		%	14%	15%	16%	17%	**15%**	
32	**Revenue driver 3**	TIG	95,604,105	101,677,174	107,541,128	111,514,301		
33		AED / TIG	**0.33**	0.33	0.33	0.33		
34		AEDm	31.15	33.13	35.04	36.33	124.01	
35		%	5%	5%	5%	5%	**5%**	
		Variables for Solver Run						
36	Annual revenue	AEDm	664.32	675.05	680.36	687.08	**TOTAL**	Difference
37	**Discounted annual revenue at 1 January 2006**	AEDm	649.86	631.92	609.46	588.98	**2,480.22**	**0.00**
							Target for Solver Run	

	Results		**2010**
38	**X Factor**		**0.0**
39	**Fixed revenue term (a)**	**AED million**	**541.04**
40	**Co-efficient of variable revenue term (b)**	**AED / Customer Account**	**431.13**
41	**Co-efficient of variable revenue term (c)**	**AED / TIG metered**	**0.3258**

	Implied Financial Indicators		**2010**	**2011**	**2012**	**2013**	**Average**
42	Implied annual profit	AEDm	232.53	233.84	229.72	246.69	235.70
43	Implied return on mid-point RAV	%	5.90%	5.79%	5.57%	5.86%	5.78%

Annex B.5: TRANSCO Electricity – Price Control Calculations

Line No. **(all AED amounts are in 2010 prices)**

	Inputs			2010	2011	2012	2013
1	Operating expenditure allowance	AEDm		167.18	181.72	197.52	214.70
2	Opening RAV	AEDm		18,720.51	21,355.28	23,872.05	26,270.82
3	Closing RAV	AEDm		21,355.28	23,872.05	26,270.82	28,551.59
4	Mid-Year RAV	AEDm		20,037.89	22,613.66	25,071.43	27,411.20
5	Total depreciation for PC4	AEDm		905.23	1,023.23	1,141.23	1,259.23
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	MW		9,025	11,307	13,521	14,767
8	Forecast for revenue driver 3	GWh		56,040	71,026	85,563	93,696
9	PV of financial adjustments	AEDm	-16.47				
10	PV of financing costs foregone on PC2 capex	AEDm	1,209.61				
11	Cost of capital (real)		4.50%				
12	Weight in revenue for Revenue driver 1		80.00%				
13	Weight in revenue for Revenue driver 2		10.00%				
14	Weight in revenue for Revenue driver 3		10.00%				
15	Negative X Factor		0.00				

	PC3 Required Revenue Calculations		2010	2011	2012	2013	PV over PC4 Period at 1 January 2010
16	Operating expenditure allowance	AEDm	167.18	181.72	197.52	214.70	694.64
17	Total depreciation for PC3	AEDm	905.23	1,023.23	1,141.23	1,259.23	3,945.13
18	Return on mid-year RAV	AEDm	901.71	1,017.61	1,128.21	1,233.50	3,902.71
19	Annual revenue requirement	AEDm	1,974.12	2,222.56	2,466.97	2,707.44	8,542.48
20	Discounted annual revenue requirement	AEDm	1,931.14	2,080.56	2,209.90	2,320.87	8,542.48
21	PV of financial adjustments	AEDm					-16.47
22	PV of financing costs foregone on PC2 capex	AEDm					1,209.61
23	PV of revenue requirement (after financial adjustment and foregone financing costs)	AEDm					**9,735.62**

	PC3 Required Forecast and Profiling		2010	2011	2012	2013	PV Share in TOTAL
24	**Revenue driver 1**		1.00	1.00	1.00	1.00	
25		AEDm	**2,123.73**	2,123.73	2,123.73	2,123.73	
26		AEDm	2,123.73	2,123.73	2,123.73	2,123.73	7,788.49
27		%	84%	84%	84%	84%	**80%**
28	**Revenue driver 2**	kW	9,024,905	11,306,905	13,520,905	14,766,905	**Constraints for Solver Run**
29		AED / kW	**22.03**	22.03	22.03	22.03	
30		AEDm	199	249	298	325	973.56
31		%	8%	10%	12%	13%	**10%**
32	**Revenue driver 3**	kWh	56,039,873,986	71,025,888,749	85,562,717,119	93,695,990,565	
33		fils / kWh	**0.35**	0.35	0.35	0.35	
34		AEDm	196.06	248.49	299.35	327.80	973.56
35		%	8%	10%	12%	13%	**10%**
		Variables for Solver Run					
36	Annual revenue	AEDm	2,518.66	2,621.37	2,721.01	2,776.92	**TOTAL** Difference
37	**Discounted annual revenue at 1 January 2006**	AEDm	2,463.83	2,453.88	2,437.47	2,380.44	**9,735.62** **0.00**
							Target for Solver Run

	Results		2010
38	**X Factor**		**0.0**
39	**Fixed revenue term (a)**	**AED million**	**2,123.73**
40	**Co-efficient of variable revenue term (b)**	**AED / kW metered**	**22.03**
41	**Co-efficient of variable revenue term (c)**	**fils / kWh metered**	**0.3499**

	Implied Financial Indicators		2010	2011	2012	2013	Average
42	Implied annual profit	AEDm	1446.25	1416.42	1382.26	1302.99	1386.98
43	Implied return on mid-point RAV	%	7.22%	6.26%	5.51%	4.75%	5.94%

Annex B.6: TRANSCO Water – Price Control Calculations

Line No. **(all AED amounts are in 2010 prices)**

	Inputs			2010	2011	2012	2013
1	Operating expenditure allowance	AEDm		327.23	326.93	326.63	326.33
2	Opening RAV	AEDm		10,536.78	10,953.00	11,335.90	11,685.45
3	Closing RAV	AEDm		10,953.00	11,335.90	11,685.45	12,001.68
4	Mid-Year RAV	AEDm		10,744.89	11,144.45	11,510.68	11,843.57
5	Total depreciation for PC4	AEDm		583.77	617.11	650.44	683.77
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00
7	Forecast for revenue driver 2	MIGD		720	789	809	872
8	Forecast for revenue driver 3	MIG		246,422	269,668	277,039	297,761
9	PV of financial adjustments	AEDm	-167.48				
10	PV of financing costs foregone on PC2 capex	AEDm	467.66				
11	Cost of capital (real)		4.50%				
12	Weight in revenue for Revenue driver 1		80.00%				
13	Weight in revenue for Revenue driver 2		10.00%				
14	Weight in revenue for Revenue driver 3		10.00%				
15	Negative X Factor		0.00				

	PC3 Required Revenue Calculations		2010	2011	2012	2013	PV over PC4 Period at 1 January 2010
16	Operating expenditure allowance	AEDm	327.23	326.93	326.63	326.33	1,198.47
17	Total depreciation for PC3	AEDm	583.77	617.11	650.44	683.77	2,317.55
18	Return on mid-year RAV	AEDm	483.52	501.50	517.98	532.96	1,863.32
19	Annual revenue requirement	AEDm	1,394.52	1,445.53	1,495.05	1,543.06	5,379.34
20	Discounted annual revenue requirement	AEDm	1,364.17	1,353.17	1,339.26	1,322.74	5,379.34
21	PV of financial adjustments	AEDm					-167.48
22	PV of financing costs foregone on PC2 capex	AEDm					467.66
23	PV of revenue requirement (after financial adjustment and foregone financing costs)	AEDm					**5,679.52**

	PC3 Required Forecast and Profiling		2010	2011	2012	2013	PV Share in TOTAL
24	**Revenue driver 1**		1.00	1.00	1.00	1.00	
25		AEDm	**1,238.93**	1,238.93	1,238.93	1,238.93	
26		AEDm	1,238.93	1,238.93	1,238.93	1,238.93	4,543.61
27		%	82%	82%	82%	82%	**80%**
28	**Revenue driver 2**	TIGD	720,447	789,300	808,698	872,147	**Constraints for Solver Run**
29		AED / TIGD	**194.79**	194.79	194.79	194.79	
30		AEDm	140	154	158	170	567.95
31		%	9%	10%	10%	11%	**10%**
32	**Revenue driver 3**	TIG	246,421,548	269,668,274	277,039,260	297,760,599	
33		AED / TIG	**0.57**	0.57	0.57	0.57	
34		AEDm	140.39	153.63	157.83	169.64	567.95
35		%	9%	10%	10%	11%	**10%**
		Variables for Solver Run					
36	Annual revenue	AEDm	1,519.66	1,546.32	1,554.29	1,578.46	**TOTAL** Difference
37	**Discounted annual revenue at 1 January 2006**	AEDm	1,486.58	1,447.52	1,392.33	1,353.09	**5,679.52** **0.00**
							Target for Solver Run

	Results		2010
38	**X Factor**		**0.0**
39	**Fixed revenue term (a)**	**AED million**	**1,238.93**
40	**Co-efficient of variable revenue term (b)**	**AED / TIGD metered**	**194.79**
41	**Co-efficient of variable revenue term (c)**	**AED / TIG metered**	**0.5697**

	Implied Financial Indicators		2010	2011	2012	2013	Average
42	Implied annual profit	AEDm	608.66	602.28	577.23	568.36	589.13
43	Implied return on mid-point RAV	%	5.66%	5.40%	5.01%	4.80%	5.22%

Annex B.7: ADSSC – Price Control Calculations

Line No. **(all AED amounts are in 2010 prices)**

	Inputs			2010	2011	2012	2013
1	Operating expenditure allowance	AEDm		321.40	324.72	328.07	331.45
2	Opening RAV	AEDm		7,725.34	9,160.94	10,556.53	11,912.13
3	Closing RAV	AEDm		9,160.94	10,556.53	11,912.13	13,227.72
4	Mid-Year RAV	AEDm		8,443.14	9,858.74	11,234.33	12,569.92
5	Total depreciation for PC4	AEDm		564.41	604.41	644.41	684.41
6	Forecast for revenue driver 1	Fixed term		1.00	1.00	1.00	1.00
8	Forecast for revenue driver 2	m3		246,323,170	267,223,070	296,051,865	314,445,675
9	PV of financial adjustments	AEDm	0.00				
10	PV of financing costs foregone on PC2 capex	AEDm	0.00				
11	Cost of capital (real)		4.50%				
12	Weight in revenue for Revenue driver 1		80.00%				
13	Weight in revenue for Revenue driver 2		20.00%				
15	Negative X Factor		0.00				

	PC3 Required Revenue Calculations		2010	2011	2012	2013	PV over PC4 Period at 1 January 2010
16	Operating expenditure allowance	AEDm	321.40	324.72	328.07	331.45	1,196.38
17	Total depreciation for PC3	AEDm	564.41	604.41	644.41	684.41	2,281.85
18	Return on mid-year RAV	AEDm	379.94	443.64	505.54	565.65	1,724.72
19	Annual revenue requirement	AEDm	1,265.75	1,372.77	1,478.02	1,581.50	5,202.95
20	Discounted annual revenue requirement	AEDm	1,238.20	1,285.06	1,324.00	1,355.70	5,202.95
21	PV of financial adjustments	AEDm					0.00
22	PV of financing costs foregone on PC2 capex	AEDm					0.00
23	PV of revenue requirement (after financial adjustment and foregone financing costs)	AEDm					**5,202.95**

	PC3 Required Forecast and Profiling		2010	2011	2012	2013	PV Share in TOTAL	
24	**Revenue driver 1**		1.00	1.00	1.00	1.00		
25		AEDm	**1,134.98**	1,134.98	1,134.98	1,134.98		
26		AEDm	1,134.98	1,134.98	1,134.98	1,134.98	4,162.36	
27		%	82%	82%	82%	82%	**80%**	
							Constraints for Solver Run	
28	**Revenue driver 2**	m3	246,323,170	267,223,070	296,051,865	314,445,675		
29		AED / m3	**1.01**	1.01	1.01	1.01		
30		AEDm	249.86	271.06	300.30	318.96	1,040.59	
31		%	18%	20%	22%	23%	**20%**	
		Variables for Solver Run						
36	Annual revenue	AEDm	1,384.84	1,406.04	1,435.28	1,453.94	**TOTAL**	Difference
37	**Discounted annual revenue at 1 January 2006**	AEDm	1,354.69	1,316.20	1,285.72	1,246.35	**5,202.95**	**0.00**
							Target for Solver Run	

	Results		2010
38	**X Factor**		**0.0**
39	**Fixed revenue term (a)**	**AED million**	**1,134.98**
40	**Co-efficient of variable revenue term (b)**	**AED / m3**	**1.0144**
		AED / TIG	4.6113

	Implied Financial Indicators		2010	2011	2012	2013	Average
42	Implied annual profit	AEDm	499.03	476.91	462.81	438.08	469.21
43	Implied return on mid-point RAV	%	5.91%	4.84%	4.12%	3.49%	4.59%