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Regulatory review of price controls for 2018 onwards

RC1 first consultation paper

EC/E02/104

4th February 2016

Regulatory review of price controls for 2018 onwards – RC1 first consultation paper				
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Executive Summary

Introduction

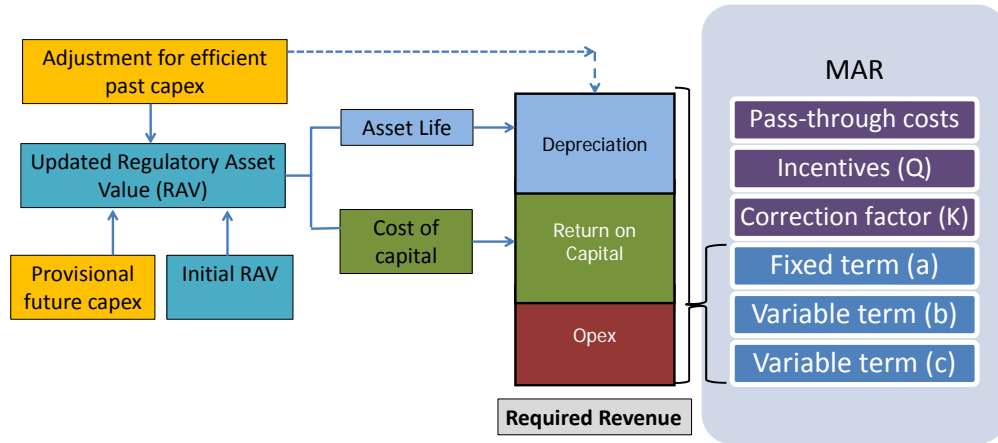
Price controls

1. The price controls for the four network companies (AADC, ADDC, TRANSCO and ADSSC) have been in the form of CPI-X revenue caps, defining maximum allowed revenue (MAR) for each company or business for each year of the price control period. The general formula for MARs include a fixed term and one or two revenue drivers that link MAR with the company's outputs in terms of units and customer numbers:

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

2. The values of fixed and variable terms (a, b, c) are notified by the Bureau for the first year of the control period following a price control review and, for subsequent years, are adjusted by UAE Consumer Price Index (CPI) less a factor X to ensure that the companies recover efficient levels of operating expenditure (opex), capital expenditure (capex) through regulatory depreciation, and return on such capital. The update to the regulatory asset value (RAV) for provisional capex and ex-post capex adjustment has a significant rationale and impact in Abu Dhabi.

Figure 1: Bureau's building-block approach to revenue requirement and MAR



Regulatory price control review

3. This first consultation paper sets out the strategic issues and objectives which need to be considered in setting new price controls for the four network companies for 2018 onwards. The paper also explores the changes that can be made to the regulatory regime and the ways and methods that can be employed to address those issues and objectives.
4. We intend to publish our second consultation paper in September 2016. Our draft and final proposals on RC1 are scheduled for publication in March 2017 and September 2017, respectively.

Strategic issues and objectives (Section 2)

5. In recent years, it has appeared that the funding and regulatory arrangements for the network companies are not being implemented as originally envisaged. In particular, we see certain key issues and challenges hampering the efficiency and effectiveness of regulation and sector performance. This consultation provides a good opportunity for a strategic review of the regulatory regime to assess where changes or improvements should be considered to address such challenges and issues. In this regard, we raise the following main issues for consultation.
6. Are the following five strategic challenges the most relevant and critical to discuss during this price control review? Are there other key challenges that we should consider?
 - (a) Treatment of Government funding
 - (b) Efficient use of capital funds
 - (c) Control of costs and smoothing revenue allowances
 - (d) Sustainability
 - (e) Customer services
7. Can these challenges be addressed at this review by the following main measures? Are there other effective measures that should be explored to address these challenges?
 - (a) On the treatment of government funding:
 - (i) Ensure that stakeholders follow the regulatory model, by repaying the Government funding with appropriate returns while the companies recover such funding and returns through the MAR (e.g., by netting-off the repayment of Government funding from the MAR before subsidy payment is determined for the relevant network companies)?
 - (ii) Use a rate of return in setting the price controls, which is reflective of the Government ownership and actual cost of funding from the Government and other fund providers.
 - (b) On the efficient use of capital funds:
 - (i) Apply a forward-looking approach through regular ex-ante capex reviews to set out firm capex allowances to be used in the price controls and use regular but limited ex-post capex reviews – which would result in regular capex adjustments to the MAR during the control period;
 - (ii) Promote and implement better alignment between different stakeholders in the capital approval and budgeting process in the sector.
 - (iii) Strengthening the processes and methods to record and report the network companies' costs and outputs.
 - (c) On controlling costs and smoothing revenue allowances:
 - (i) Use MAR profiling factors to smooth the revenue allowances through and across price controls periods.

- (ii) Consider longer asset life assumptions for the price controls.
- (d) On sustainability, develop the regulatory and related arrangements to:
 - (i) Address ADWEA recharge to make them more transparent and efficient.
 - (ii) Incentivise desired licensee's behaviour and specific outcomes.
 - (iii) Enhance the framework for development and implementation of DSM.
 - (iv) Ensure the funding, quality and efficiency of tankering services.
 - (v) Ensure the companies have the financial strength to repay Government loans, withstand financial risks and seek commercial funding in future.
- (e) On customer services, develop the economic regulatory framework to:
 - (i) Monitor and ensure that the current licence requirements are adhered to by the network companies.
 - (ii) Strengthen the framework for development and implementation of international best practices in customer services.
 - (iii) Incentivise desired licensee's behaviour and specific outcomes.

Form of controls (Section 3)

8. The key issues and challenges highlighted above can be addressed by changes to the detail design of the price controls, but the basic form of the price control can remain the same. In the light of this, we raise the following questions for consultation:
- (a) Is our initial conclusion to retain CPI-X price/revenue controls in the very broad form of the existing regulatory arrangements with appropriate enhancements to address key issues appropriate?
 - (b) Whether the existing arrangements relating to separation of price controls remain appropriate for the future or whether they should be revised and if so what changes would be most appropriate? Whether the most pragmatic solution to address new responsibilities in future (such as providing billing services for another licensee, management of tankering services, and non-drinking water distribution and supply) is to either (i) treat such responsibilities as unlicensed activities and exclude their costs and revenues from the scope of price controls or (b) include additional cost allowances in the MAR.
 - (c) Whether the existing arrangements relating to cost pass-through for the network companies remain appropriate for the future or whether they should be revised and if so what changes would be most appropriate? Whether there is a case for extending pass-through treatment to the full amount of the Bureau's licence fees?
 - (d) Whether it is appropriate to set RC1 controls for 4 or 5 years with regular adjustments of capex and some specific opex allowances?
 - (e) Whether the company's core MAR should be expressed in fixed absolute terms in full (subject to inflation indexation discussed above), without the variable elements linked to the output-based revenue drivers?

- (f) Should the depreciation allowance in the MAR be explicitly defined to repay capital only, requiring no inflation indexation?
- (g) Whether we should adopt the previous approach of price control calculations but limited to the notified value of 'a' term only to facilitate regular adjustments for capex reviews and annual netting off repayment of Government funding (and possibly ADWEA funding as well) from MAR?

Operating costs (Section 4)

9. Projections of reasonable opex over the price control period are main inputs to the price control calculations and efficient spending of operating cost allowances is critical to overall network performance. This raises the following key issues for consultation.
 - (a) Whether a hybrid of both a high-level top-down approach and a more detailed bottom-up approach, similar to PC5, is appropriate to set main opex projections for RC1? What further changes or improvements are required in this approach?
 - (b) Whether an approach similar to PC5 is appropriate to set specific allowances for cost items where the companies do not have control over the underlying cost drivers nor can estimate these costs with reasonable accuracy? What should be those specific cost items? Whether some or all of the specific allowances should be set on 'provisional' basis, with automatic adjustment mechanism for outturn results?
 - (c) How the trade-off between opex and capex should be addressed? How the companies' commitment to set and follow consistent capitalisation policies can be secured and ensured?
 - (d) Do companies report financial information in a transparent way and with sufficient granularity to allow proper assessments of financial performance?

Capital costs (Section 5)

10. Capex is important as it allows for the timely meeting of demand and the replacement or betterment of existing network infrastructure and affects the majority of companies' revenue requirement. The treatment of capex in the previous price control reviews has essentially been based on an ex-post assessment of efficient capex, with the provisional future capex allowed in price controls without review and approval of capex projects.
11. As agreed previously, the ex-post efficiency assessment of PC4 capex (2012-2013), PC5 capex (2014-2015) and the associated adjustments to price control revenue will be dealt with as part of this price control review; whereas remaining PC5 capex (2016-2017) will be dealt with at a future date following this price control review.
12. To address the deficiencies of the ex-post approach and to help companies improve capital efficiency in a timely manner, we believe that the sector should now move towards a more forward-looking approach whereby the Bureau undertakes regular ex-ante capex reviews to approve capex projects and budgets, and allow only approved firm capex (not provisional) in the price controls.

13. Key questions relating to the treatment of capex at this review include the following:
- (a) Are there any views on the work to date or planned for ex-post capex reviews for 2012-2013 and 2014-2015?
 - (b) Are there any views on the proposed approach and plan for ex-ante capex review and approval to set firm capex allowance for the RC1 period?
 - (c) Are there other changes which should be considered at this review in relation to the regulation of capex?

Financial issues (Section 6)

14. In the price controls, capex is financed over an assets' estimated economic life, which may be many years, through inclusion in the RAV and the calculation of allowances for regulatory depreciation and regulatory returns. An estimate of the licensee's cost of capital is used in conjunction with the RAV to calculate regulatory returns. Key issues for consultation on these matters for the new price controls include the following:
- (a) What are stakeholders' views on the approach discussed in this document to define and calculate the regulatory depreciation and update the RAVs?
 - (b) Do the stakeholders agree that it is opportune to review the assumptions for asset lives in the price controls?
 - (c) Should the Bureau estimate the WACC based on the actual cost of funding and reflecting the Government ownership? Specifically, whether cost of debt should be based on the actual interest rates on the loans provided to the companies by the Government, shareholders and banks, provided they do not exceed the market rates?
 - (d) Does the existing approach to estimate the cost of equity using Capital Asset Pricing Model (CAPM) and both overseas and local capital market data remain appropriate?
 - (e) Should the Bureau continue estimating and using the cost of capital in real terms for price control calculations and applying annual inflation indexation to the return on capital component of MAR during the control period?

Performance incentives (Section 7)

15. Under the current price control arrangements, companies are rewarded for improved performance, and are penalised for deteriorating performance on an annual basis (via Q term of the MAR) in three main areas, namely: provision of high quality information; availability, security and quality of supply; and end use efficiency. Companies are currently required to appoint an independent Technical Assessor (TA), with the Bureau's approval, to verify the accuracy of the information required to determine financial bonus or penalty in many cases.
16. While the companies generally performed well to earn bonus in overall terms over several years now, there remain certain areas of concern particularly the quality of

information and the lack of significant improvement and development in some specific areas. Based on these concerns as well as other experience and expectations, we raise below a number of questions for consultation to further develop the incentive arrangements at this review.

17. Whether the following new key areas for improvements and incentives are relevant and appropriate for development over the next price control period? Which other areas require improvement and whether these should be incentivised?
 - (a) Sustainable development, including environmental, carbon accounting and DSM indicators;
 - (b) Customer services; and
 - (c) Connection of new customers.
18. In relation to the incentives for high quality information:
 - (a) Whether these incentives are the best tools to encourage timely provision of information in the future? Should the financial incentives be discontinued given TRANSCO's precedence and more established systems for timely information?
 - (b) How the arrangements for review by the TA and auditors can be developed further to improve the quality of information? Should the TA be appointed by the Bureau instead of by the companies? Whether the TA should be reporting to a panel of the Bureau and companies representatives? Should the information and guidance package for the TA be put together by the relevant licensee rather than the Bureau, while the Bureau only reviews such package and provides guidance on the contents of the TA report?
 - (c) Should the TA requirement be removed and instead the company's board of directors be responsible for quality assurance (which may hire a TA itself), along with integral sign-off by the relevant data owners and managers?
19. In relation to the availability, security and quality of supply incentives:
 - (a) Whether incentives for the system availability, energy loss or security of water supply should be improved or removed for TRANSCO?
 - (b) Whether TRANSCO is ready to implement the TSO incentive (and overall KPIs) that has already been developed (i.e. through 2014 RSB study), or should we consider closer reviews and improvement actions for TSO function?
 - (c) Whether an output-focused approach such as the development of asset health and asset utilisation load indexes is opportune to improve asset management?
 - (d) Which of the existing incentives are not performing as expected and why?
 - (e) Which of the existing incentives for the distribution network businesses should be improved and how? Whether new incentives should be considered in areas such as demand forecasting, water pressure of supply, water system availability and system losses and leakage for distribution companies?

- (f) How the biosolids reuse incentive should be improved to ensure a positive response from ADSSC? What other potential incentives for the wastewater sector should be considered for future? Should the recycled water and energy consumption efficiency be targeted for future incentives?
20. How the end user efficiency should be improved? How the DSM incentive arrangements can be further developed to deliver more tangible and timely results?
21. Whether introducing reputational incentives (non-financial incentives) is beneficial and pragmatic in Abu Dhabi? What are the candidate performance areas for this type of incentives? Whether this should be an area where an aggregate index for the potential indicators can be developed for monitoring, reporting and comparison?
22. Whether the amount of financial incentives should / can be determined based on the company's cost of performance improvements or the customers' willingness to pay, or whether the present approach of setting financial incentives as a proportion of the MAR (currently set at 0.5% for each indicator) should be used in the future?
23. Whether an asymmetric design of incentives is more appropriate, by applying a penalty-only scheme either to all or some of the performance incentives? How useful the performance dead-bands (where no bonus or penalty applies) have been and how they can be improved for future?
24. Where existing incentives include absolute targets, how appropriate these targets have been in driving appropriate performance? Would any adjustment be necessary within this review? Which incentives could potentially be moved from year-on-year rolling targets to the absolute targets and how absolute targets should be determined?
25. How useful and effective the existing Regulatory Instructions and Guidance (RIG) documents have been, how this tool could be improved in the future, and which existing or new incentives may require RIG?

Glossary

AADC	Al Ain Distribution Company
ADDC	Abu Dhabi Distribution Company
ADSSC	Abu Dhabi Sewage Services Company
ADWEA	Abu Dhabi Water and Electricity Authority
ADWEC	Abu Dhabi Water and Electricity Company
AIS	Annual Information Submission
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
DoF	Department of Finance
DSM	Demand Side Management
IM	Interface Metering
KPI	Key Performance Indicator
MAR	Maximum Allowed Revenue
Opex	Operating Expenditure
PC1	First Price Control covering the period 1999-2002
PC2	Second Price Control covering the period 2003-2005
PC3	Third Price Control covering the period 2006-2009 (for ADSSC, mid-2005 to 2009)
PC4	Fourth Price Control covering the period 2010-2013
PC5	Fifth Price Control covering the period 2014-2017
PC6	Sixth Price Control covering the period 2018 onwards
PCR	Price Control Return
PIS	Performance Incentive Scheme
PPA	Power Purchase Agreement
PWPA	Power and Water Purchase Agreement
RAG	Regulatory Accounting Guideline
RAV	Regulatory Asset Value
RIG	Regulatory Instructions and Guidance
RC1	Regulatory Control 1
SBA	Separate Business Account
STA	Sewage Treatment Agreement
TA	Technical Assessor
TRANSCO	Abu Dhabi Transmission and Despatch Company
TSO	Transmission System Operator
WACC	Weighted Average Cost of Capital

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1. Introduction and background

Introduction

- 1.1 The four network companies in the electricity, water and wastewater sector in the Emirate of Abu Dhabi are natural monopolies where competition is limited or impractical. This is in contrast with electricity generation and water production where there is competition between bidders to build new generation and desalination plant. The Bureau has therefore established multi-year CPI-X price controls to constrain the market power and to incentivise the performance of the network companies:
- (a) For **AADC**, **ADDC** and **TRANSCO**, the first price controls (PC1) were set in 1999 to run for three years and were then extended for a further year to cover the four year period (1999-2002). The second price controls (PC2) were set in 2002 to apply for three years (2003-2005), followed by the third price controls (PC3) set in 2005 for four years (2006-2009).
 - (b) In 2007, the Bureau set the first price control for **ADSSC** to apply from the date of establishment of ADSSC (21 June 2005) until 31 December 2009.
 - (c) This was followed by the fourth price controls (PC4) set in 2009 for all the four network companies together for four years (2010-2013).
 - (d) In 2013, the current or fifth price controls (PC5) were set for all four network companies to apply for four years (2014-2017).
- 1.2 These price controls are described in detail in the Bureau's previous consultation and proposal papers which are available on the Bureau's website (www.rsb.gov.ae).

Figure 1.1: Multi-year price controls for network companies

PC1	PC2	PC3	PC4	PC5	RC1
1999-2002	2003-2005	2006-2009	2010-2013	2014-2017	2018 onwards

- 1.3 The current PC5 price controls for all four network companies are due to expire at the end of 2017. Accordingly, new controls are required to be in place to take effect from 1 January 2018. This document marks the commencement of the consultation process to set the new regulatory controls (RC1) for 2018 onwards.

The role and duties of the regulator

- 1.4 The Bureau was established in 1999 under Law No (2) of 1998 as the regulatory authority for the water and electricity sector in the Emirate of Abu Dhabi. The Law defines the Bureau's duties, functions and powers. Law No (17) of 2005 extended these powers to include the sewerage services sector. Any entity wishing to undertake any of the defined regulated activities in the Emirate requires a licence from the Bureau. It is through licence conditions that we are able to regulate the conduct of sector companies. In doing so, we must have regard to our statutory duties and functions, as summarised below:

- (a) The primary duty of the Bureau (Article 53 of Law No.2 of 1998) is *"to ensure, so far as it is practicable for it to do so, the continued availability of potable water for human consumption and electricity for use in hospitals and centres for the disabled, aged and sick"*. The Bureau has a number of general duties (Article 54 of Law No.2 of 1998), the most relevant of which in relation to the price control review is to *"protect the interest of consumersas to the terms and conditions and price of supply (whether consumers are domestic, commercial or industrial)"*.
 - (b) The Bureau also has a number of general functions (Article 55 of Law No.2 of 1998), including *"the regulation of prices charged to consumersand the methods by which they are charged."*
 - (c) In carrying out its functions under the Law, the Bureau is under an obligation (Article 96 of Law No.2 of 1998) to act consistently, to minimise the regulatory burden on licensees, to take account of the financial position of licensees, and to give reasons for its decisions.
- 1.5 This price control review will be governed by these and other statutory requirements of the Law No (2) of 1998 as amended from time to time. Particularly, pursuant to Article 101 of Law No (2) of 1998, the licence modifications to be proposed at the end of this review should be accepted by the network companies before the issue of such modifications. Accountability is further reinforced by the fact that the Bureau's decisions on licence modifications can be challenged by licensees through an arbitration process.

Sector structure and background

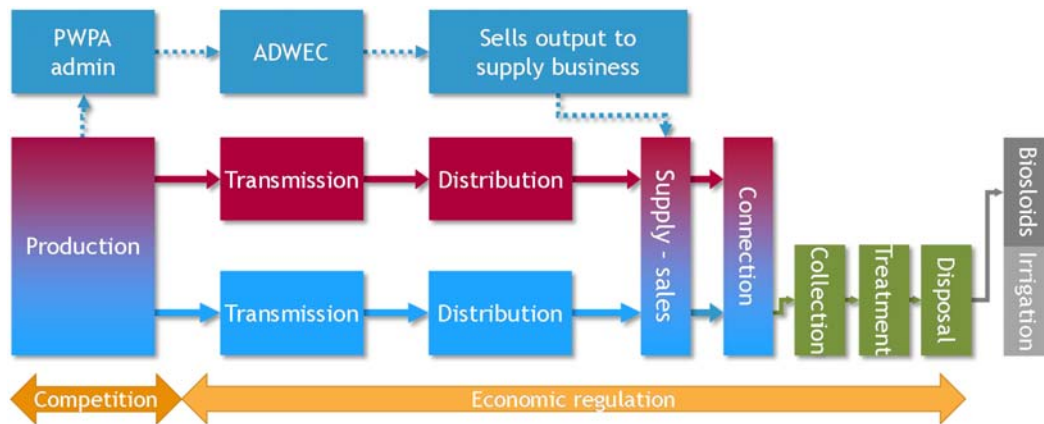
- 1.6 Electricity, water and wastewater sectors are responsible for providing water, electricity and sewerage services to the population of the Emirate of Abu Dhabi. They also export water and electricity to the neighbouring emirates and countries, if required. In 2014, the sectors provided the following services and supplies:
- (a) supplied 61,718 GWh of electricity to neighbouring Emirates and 472,992 customers in the Emirate of Abu Dhabi (via AADC and ADDC, 44,999 GWh);
 - (b) supplied 267,407 MIG of water to neighbouring Emirates and 366,610 customers in the Emirate of Abu Dhabi (via AADC and ADDC, 248,057 GWh); and
 - (c) collected and treated 323 million m³ of wastewater from 355,565 customers in the Emirate of Abu Dhabi (via ADSSC).
- 1.7 The water and electricity sector is characterised by a single-buyer structure, where:
- (a) ADWEC purchases all capacity and output from production companies including Independent Power and Water Producers (IWPPs) under respective long-term Power and Water Purchase Agreements (PWPAs).
 - (b) ADWEC also procures gas for supply to the production companies.
 - (c) ADWEC then sells water and electricity:
 - (i) to AADC and ADDC at the Bulk Supply Tariff (BST) as approved by the Bureau on an annual basis: and

- (ii) to entities outside the Emirate of Abu Dhabi at negotiated tariffs as unlicensed business properly ring-fenced from the licenced businesses in the Emirate of Abu Dhabi.
- (d) In addition to BST payments to ADWEC, the two distribution companies (AADC and ADDC) also pay Transmission Use of System (TUoS) charges and connection charges to TRANSCO.

1.8 In the wastewater sector, ADSSC is responsible for all activities from wastewater collection through treatment to disposal. However, similar to ADWEC, ADSSC has long-term Sewage Treatment Agreements (STAs) to procure wastewater treatment services from Independent Sewage Treatment Providers (ISTPs).

1.9 The revenues for the production companies and ISTPs are determined by the prices that were obtained through competitive tendering and are set out in the respective PWPAs and STAs between these companies and the relevant off-taker (ADWEC or ADSSC). For each network company, the annual turnover is capped by its relevant price control.

Figure 1.2: Structure of electricity, water and wastewater sectors



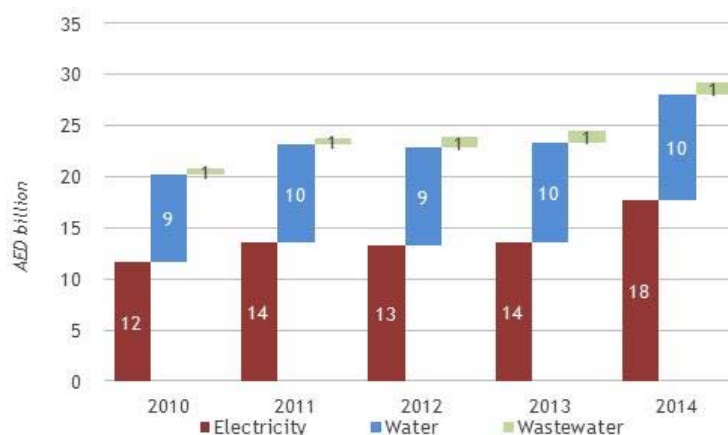
1.10 The turnover for the water, electricity and wastewater sectors, or for each company within these sectors, has features specific to the particular segment in the supply chain:

- (a) Distribution companies (AADC and ADDC) and ADSSC are at the end of the supply-chain in the electricity, water and wastewater sectors. Consequently, the aggregate revenue from these companies together with the revenues from exports represent the total turnover for each of the three sectors;
- (b) TRANSCO's main revenue source are TUoS charges paid by the distribution companies and ADWEC (for exports) for units transmitted over its network;
- (c) Distribution companies have two main revenue sources – bills charged to customers and subsidy from government as the customer tariffs are below the economic costs of provision of water and electricity; and
- (d) Currently, ADSSC does not charge customers for sewerage services. Its turnover entirely consists of government subsidy. As the subsidy is currently less than the MAR, it does not fully cover its total costs.

Sector turnover

1.11 Sector turnover has increased over time, due to growing customer demand and exports to neighbouring Emirates and the need to invest in production and treatment capacity and network assets. Total turnover increased in 2014 to AED 29.3 billion – a rise of 19% from 2013. Underlying this change were increases in electricity turnover of 30%, and water turnover of 6%, driven by the implementation of PC5 and in particular the update of the investment related components of network companies' revenue (namely depreciation and return on capital) incurred to respond to increasing demands in the electricity, water and wastewater sectors. Looking further back, the total turnover has been relatively stable, especially between 2011 and 2013.

Figure 1.3: Sector total turnover



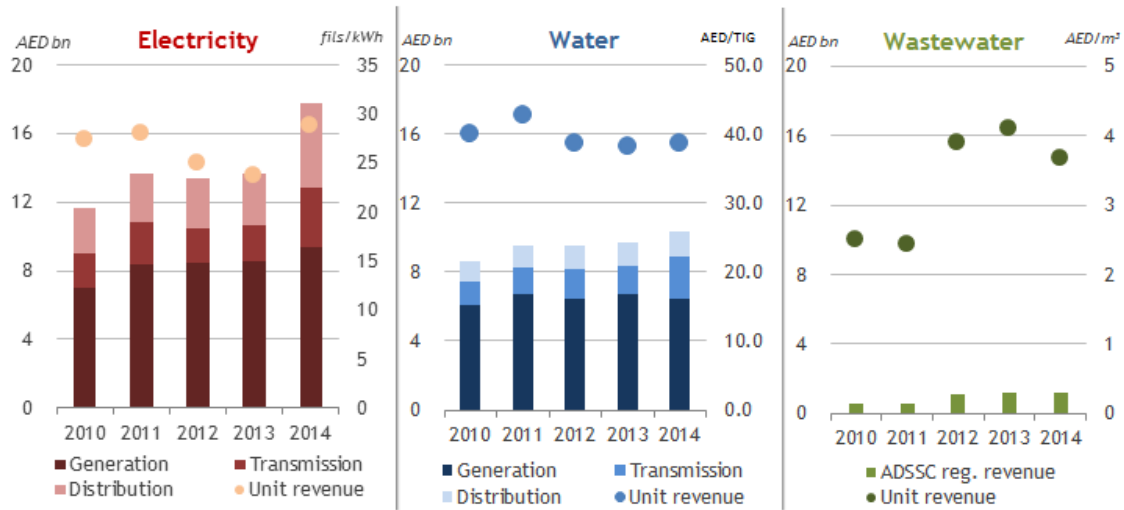
1.12 The turnover for the water and electricity sectors consists of revenue to cover production, transmission and distribution costs. In both sectors, production costs account historically for over half of turnover. In electricity, the remaining costs split almost equally between transmission and distribution and supply. For water, transmission costs form a higher proportion of the remaining costs than distribution and supply.

1.13 In 2014, electricity turnover was AED 17.7 billion, 30% above the previous year. This was caused mainly by a step-increase in the MAR of the network companies due to implementation of PC5 from January 2014 and to a 7% increase in overall demand (namely from the Northern Emirates, where demand increased by 13%).

1.14 For water, at AED 10.3 billion, the turnover was also 6% higher in 2014 due to the same factors as mentioned above for electricity.

1.15 Finally, in wastewater, turnover (composed in almost its entirety by the government subsidy) was down 3% on the preceding year, at AED 1.2 billion mainly due to the lower ISTP costs.

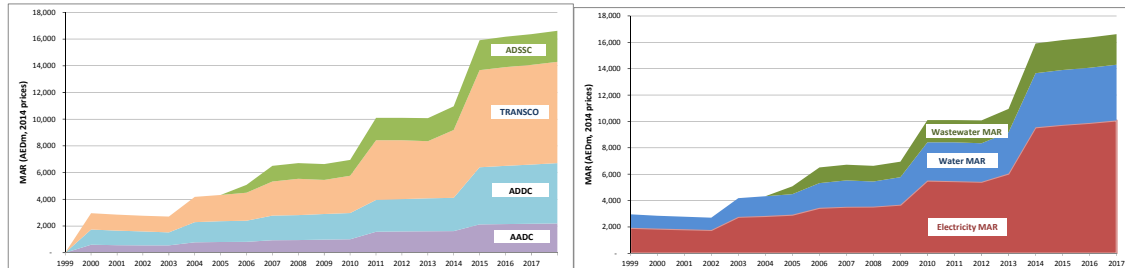
Figure 1.4: Turnover by sector (excluding exports)



1.16 Focusing on the network companies, following charts show, in AED million (2014 prices):

- (a) significant increases in companies' MARs from one control period to another;
- (b) relatively flat MAR profiles during each control period (resulting from zero value for X factors); and
- (c) continuing large share of electricity and TRANSCO's MARs in the overall sector MAR (reaching around AED 16 billion in PC5).

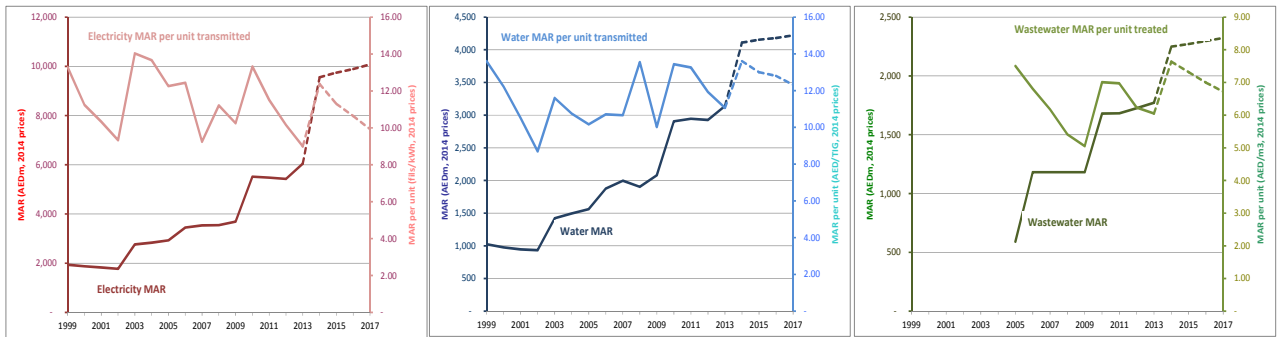
Figure 1.5: Historical and projected MAR trends over 1999-2017



1.17 While MARs continue the increasing trend in real terms, increasing demands mean an overall declining trend for the unit costs for electricity, water and wastewater businesses, as summarised below and presented in the following charts:

- (a) Electricity and water MARs per unit transmitted are expected to be 25% and 9.5% respectively lower by 2017 than that in 1999 (in 2014 prices).
- (b) Wastewater MAR per unit treated is expected to be 10.5% lower by 2017 than in 2005 (in 2014 prices).

Figure 1.6: Projected trends of price-controlled MARs



Current price controls

Main features

- 1.18 The price controls for the network companies have been in the form of CPI-X revenue caps, defining MAR for each company or business for each year of the price control period. The main features of the price controls are summarised below:
- The MARs include a fixed term and one or two revenue drivers that link MAR with the company's outputs in terms of (i) peak demand, (ii) units transmitted, distributed or treated, and (iii) customer numbers.
 - There are separate price controls for the water and electricity businesses of the companies. For AADC and ADDC, price controls cover both distribution and supply businesses. For ADSSC, a single price control covers all of its three separate businesses (sewerage, wastewater treatment and disposal).
 - Costs which are subject to competition or regulation in other parts of the supply chain (eg, BST and TUoS) are treated on a pass-through basis.
 - Price controls have been set to allow the companies to recover the estimated efficient level of opex, regulatory depreciation and a return on RAV.
 - Price controls provide incentives for companies to reduce costs since they are allowed to retain the benefit of any unforeseen efficiency gains (in the form of extra profits) at least until the next price control review.
 - The calculation of regulatory depreciation and returns requires the determination of allowed capex. The treatment of capex has been based on an approach of ex-post assessment where the companies are given only provisional capex allowances without a review or approval of capex projects. The firm capex allowance is determined by the Bureau's efficiency reviews only after the price control period. During the PC5 consultation process, we suggested moving towards an ex-ante approach to capex regulation in the next price controls.
 - The opex allowances for the PC5 period were estimated using a hybrid of top-down and bottom-up approaches in contrast to only a top-down approach for the previous price controls. These projections include various specific cost allowances for additional roles and responsibilities (e.g. Emiratisation, training

and apprenticeship, mega developments, energy costs for additional water pumping) as well as capability building in important areas (e.g. DSM, risk management, business and financial planning, tariff reforms, health and safety).

- (h) Regulatory depreciation allowances have been based on an asset life assumption of 30 years for all new investments for AADC, ADDC and TRANSCO and 50 years for ADSSC. The Weighted Average Cost of Capital (WACC) has been based on overseas regulatory decisions, cross-checked against the analyst estimates from local and regional capital markets.
- (i) Some companies also undertake certain unlicensed activities with the Bureau's consent (as required by their licences). These activities are not subject to price controls. However, in the case of TRANSCO's unlicensed transmission activities in other Emirates, the difficulty of allocating assets to licensed and unlicensed activities meant that the price controls now include unlicensed activities.

Performance and output incentives

- 1.19 Price controls also include incentives designed to encourage appropriate quality of service, outputs and performance. Companies are rewarded for improved service and output performance and are penalised for deteriorating performance on an annual basis against a set of pre-defined performance indicators and targets. In PC5, the maximum bonus or penalty for an individual indicator is capped at 0.5% of a company's own MAR (ie, excluding pass-through costs). Companies are required to appoint an independent Technical Assessor (TA) with the Bureau's approval to verify the accuracy of the information required for calculation of bonus or penalty earned.
- 1.20 In PC5, incentives were introduced in three areas: (i) availability, security and quality of supply; (ii) high quality information; and (iii) end-use efficiency. We also adopted a flexible arrangement to allow introduction of further incentives, following consultation with the stakeholders, during the PC5 period in other areas such as asset management, customer service, transmission system operator (TSO), demand side management (DSM), and carbon accounting.
- 1.21 In PC5, we also introduced the concept of Regulatory Instructions and Guidance (RIG) which the Bureau can issue from time to time, following consultation, to provide detailed guidance on the measurement and reporting of individual performance indicators, to address emerging issues and incorporate lessons learnt where necessary.

Structure of current price controls

- 1.22 The current price controls are in the form of revenue caps, defining MAR for each company for each of year of the price control duration as follows:

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

where:

- (a) Pass-through costs are the costs which are subject to competition or regulation elsewhere in the sector and are allowed on an actual basis.
- (b) 'a' is a fixed component (in UAE Dirhams).

- (c) 'b' and 'c' are the coefficients of two revenue drivers, expressed in Dirham per unit of the respective revenue driver.
- (d) 'a', 'b', and 'c' are set by the Bureau for the first year of the control period and are then automatically adjusted each year according to the following formula for (i) the UAE Consumer Price Index (CPI) inflation for the previous year and (ii) an 'X' factor set by the Bureau.
- (e) Revenue drivers are measures of companies' outputs or demands they meet in a year.
- (f) 'Q' is the revenue adjustment for performance during a year under the Performance Incentive Scheme (PIS).
- (g) 'K' is the correction factor adjusting any over- or under-recovery of revenue in the preceding year.

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

Table 1.1: Pass-through costs and revenue drivers

Company	Pass-through items	Revenue driver
AADC / ADDC (both water and electricity)	Water and electricity purchases	Fixed term
	Transmission charges	Customer numbers
	Embedded electricity purchases*	Metered units distributed
TRANSCO (both water and electricity)	Electricity ancillary service costs	Fixed term
		Metered peak demand (irrespective of MDEC compliance) Metered units transmitted (irrespective of MDEC compliance)
ADSSC	STA costs**	Fixed term Annual flow at treatment plants

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

Early engagement with stakeholders on RC1

- 1.24 The Bureau shared its proposed high-level timetable for this price control review with the stakeholders via its letter dated 23 November 2015. That letter also set out our initial thoughts on what should be the strategic issues and objectives which this price control review needs to focus, and a number of workstreams that would support, and run in parallel to, this price control review.
- 1.25 The four network companies responded to the Bureau's letter in December 2015 and January 2016. While the companies generally supported the Bureau's proposed timetable and key issues for the review, they sought further visibility about those key issues and plans for the related workstreams.
- 1.26 The Bureau held meetings with the senior management of the four companies during January 2016 to explain the key issues and plans and seek their commitment to engage and support the process. This first consultation paper provides further details on these issues and plans in the relevant sections.

Timetable for 2017 price control review

1.27 The table below sets out timetable for this review in further details:

Table 1.2: Timetable for 2017 price control review

Approximate date	Task
4 February 2016	Bureau publishes this First Consultation Paper
30 April 2016	Companies to submit 2015 audited Separate Business Accounts (SBAs)
7 April 2016	Companies to respond to First Consultation Paper
September 2016	Bureau publishes Second Consultation Paper
31 October 2016	Companies to submit 2016 Annual Information Submissions (AIS)
November 2016	Companies to respond to Second Consultation Paper
March 2017	Bureau publishes Draft Proposals
April 2017	Companies to submit 2016 audited SBAs
May 2017	Companies to respond to Draft Proposals
September 2017	Bureau publishes Final Proposals
1 January 2018	PC5 takes effect (if Final Proposals accepted)

1.28 This review spans over a period of about 2 years to provide sufficient opportunity for deliberations and consultations on the key issues. The timetable involves four consultation and proposal documents to be published by the Bureau during 2016-2017, in addition to workshops, presentations and meetings at various stages. It allows the companies about 2 months to respond to each consultation and proposal paper. The timetable also allows focus and engagement on a number of work streams which will run in parallel to, and may well feed into, the main price control review.

Related work streams

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

PC4 ex-post capex review (2012-2013)

1.30 In April 2015, the Bureau initiated a work stream to undertake an ex-post capex efficiency review of the last two years of PC4 (2012-2013) for the four network companies. In this stream, we assessed a sample of capex projects for each business using a scoring method to determine the efficient capex. The draft and final reports explaining this assessment are planned for issue in February 2016 and March 2016, respectively.

PC5 ex-post capex review (2014-2015)

1.31 The Bureau has plans to undertake an ex-post capex efficiency review of the first two years of PC5 (2014-2015) in 2016 incorporating lessons learned and improvements made following the PC4 capex review. We are targeting the start of this review in April 2016 and final report in the last quarter of 2016.

PC6 ex-ante capex review

- 1.32 In 2016, we will also initiate an ex-ante capex review to determine firm capex allowances for the RC1 period (2018 onwards) based on an assessment of front-end elements of capex projects such as project justification, optioneering, design and budgeting. We plan to hold a workshop with the companies in February 2016 to discuss the framework for this ex-ante review. We also aim to align capex approval and budgeting process with other stakeholders to minimise duplication of efforts.
- 1.33 As discussed in Section 5, ex-post reviews for both 2012-2013 capex and 2014-2015 capex as well as RC1 ex-ante capex review will provide important inputs to this price control review in terms of allowed efficient capex for the relevant years.

RC1 opex assessment

- 1.34 During 2016-2017, the Bureau will undertake an assessment of operating costs to determine the reasonable and efficient opex for the RC1 period (2018 onwards) to be allowed in the new price controls, using support of external consultant. We plan to appoint opex consultants by May 2016 so that the consultants can provide a final report before the RC1 final proposals in September 2017.

RC1 depreciation assessment

- 1.35 We will also seek advice from the opex consultant on the potential extension of asset life assumptions for calculating regulatory depreciation.

Alignment of regulatory and funding arrangements for ADSSC

- 1.36 The Bureau has been engaged with ADSSC and the Abu Dhabi Department of Finance (DoF) to achieve an alignment between the regulatory and funding arrangements. Parties have agreed in principle to ADSSC's entitlement to receive full MAR but an annual adjustment to MAR for 2017 onwards would be calculated to deduct the repayment of Government funding. Further, the accumulated financial losses to date would be adjusted against the Government's funds in ADSSC. A proposal is being developed by ADSSC in consultation with the Bureau and DoF for submission to the Abu Dhabi Executive Council for approval.

Activity Based Costing (ABC) system

- 1.37 Following a workshop in 2015, the Bureau is currently in discussion with the network companies and ADWEC to introduce an ABC system to improve the cost allocation and robustness of the accounting/financial information provided by the network companies. The implementation of this system may affect the regulatory regime for 2018 onwards.

Ring-fencing

- 1.38 Discussion on this important topic has recently commenced with the meetings with the senior management of the companies in January 2016. The scope of the consultation will focus on strengthening existing ring-fencing arrangements in existing regulatory licences

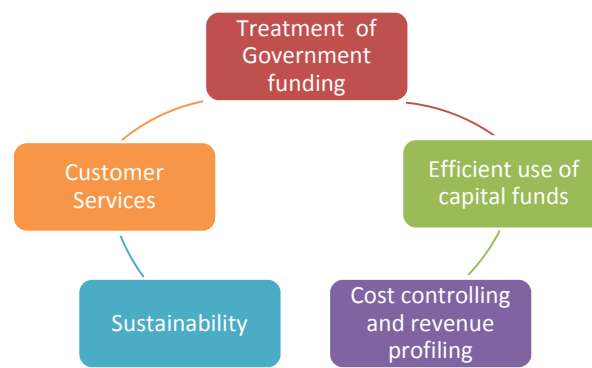
issued by the Bureau under Law No.(2) for the following five Abu Dhabi Companies – AADC, ADDC, ADSSC, ADWEC and TRANSCO. Our aim is to improve the existing regulatory regime to further enhance transparency and accountability in the Sector, and continue to strive for greater efficiency. We are currently minded to implement any ring-fencing changes separately by way of a licence modification in advance of the start of the next price control.

2. Strategic objectives and issues

Introduction

- 2.1 The scope of this regulatory price control review is the network businesses of AADC, ADDC, TRANSCO and ADSSC. These licensees operate capital intensive networks that provide essential utility services to consumers and across the economy. The funding, management and operation by licensees of these networks, and their regulation by the Bureau, face a number of challenges and issues.
- 2.2 There are also important issues relating to electricity and water supply activities and in future ADSSC may also need to develop or procure similar supply business activities if charging for wastewater services is put in place by the Government.
- 2.3 In recent years, it has appeared that the funding and regulatory arrangements for these companies are not being implemented as originally envisaged. In particular, we see issues relating to repayment of Government loans, subsidy, capital efficiency, increases and profiling of MARs and customer tariffs, customer services, and sustainability (in terms of companies' capabilities and impact on customers and environment).
- 2.4 This consultation provides a good opportunity for a strategic review of the regulatory regime to assess where changes or improvements should be considered to address such challenges and issues. This also renders us an opportunity to undertake a wide-ranging review of regulated activities, including where appropriate changes to operational and management arrangements and commercial structures should be made to deal with the emerging challenges.
- 2.5 In this context, the strategic challenges and issues that we see this price control review should focus can be grouped into five main areas, as shown below:

Figure 2.1: Five strategic challenges and issues for this review



- 2.6 This Section 2 highlights the strategic nature of this price control review. It then describes each of the above five strategic challenges and issues. We also discuss here holistically and at a high level some of the ways to address these challenges, particularly in terms of setting strategic objectives and modifying the regulatory regime. Specific tools and

methods to address these issues are further discussed in later sections of this document. This section concludes with a summary of key questions for consultation.

Price control review – an opportunity for strategic review

- 2.7 It is important to review the regulatory regime from time to time to ensure that the price controls are well designed to deliver the desired outcomes, and that the regulatory regime remains suitable and addresses any emerging or foreseen issues and challenges.
- 2.8 Regulators often undertake a major review of the regulatory regime after 10 or 20 years by taking stock of the lessons learnt and licensees' performance in the past and taking account of the new challenges emerged recently or foreseeable in the near future. For example:
- (a) The National Audit Office in the UK published a report "Pipes and Wires" in March 2002 (after a review over about 2 years) on how utility regulators (Ofgem, Ofwat, and Ofstel/nor Ofcom) were regulating the pipe and wire networks, and highlighted the benefits and limitations of the RPI-X approach. The report made recommendations in key areas of regulation which were taken into account by the relevant regulators in setting the next price controls in the future years.
 - (b) The UK energy regulator, Ofgem, concluded its RPI-X@20 review of two decades of energy regulation in October 2010 and proposed the RIIO (Revenue = Incentives + Innovation + Outputs) framework as the revised model for future regulation. In 2012-2014, Ofgem has applied this RIIO model in setting the next price controls for gas and electricity transmission and distribution networks.
 - (c) Similarly, the proposals of the UK water and wastewater regulator, Ofwat, on future price limits in 2011 focused on enhancing price control arrangements with better incentives for business outcomes and reducing the complexity and burden of the regulatory process.
 - (d) The Australian Energy Regulator (AER) put forward radical proposals in 2011 on cost allowances for distribution and transmission businesses. Further, AER announced a review of the framework for the provision of regulatory information and reporting processes for price determinations.
 - (e) In the strategic review of Scottish Water charges for 2015-2021, the Water Industry Commission for Scotland (WICS) developed the regulatory regime to address the bias between operating and capital expenditure, repayment of Government loans, and the company's financial strength via financial 'tramlines'.
- 2.9 Over the last two years, the Bureau has been engaged with various stakeholders on a number of new and radical work streams. These include customer tariff reforms and subsidy payment reforms for water and electricity sector, treatment of Government funding and capital investments for all network companies, alignment of regulatory and funding arrangements for ADSSC, and tanker services for water and wastewater. These engagements as well as a more comprehensive financial review of the network companies facilitated by the production of more robust audited SBAs have highlighted the emergence of the five key challenges and issues, as described below. The current

price control review renders us a good opportunity to review the key aspects of the existing regulatory regime to address these issues.

Strategic challenges and issues

2.10 The significant challenges faced currently by the sector suggests that the focus of this review should be the core activities necessary for a utility business to operate with reasonable efficiency in the Emirate of Abu Dhabi, and ensuring that the regulatory regime promotes the network companies efficiency and is compatible with how the sector environment and requirements have evolved over time.

Issue 1 - Treatment of Government funding

2.11 From discussions with the stakeholders and the review of the financial statements of the four network companies, the Bureau has identified some issues in relation to the design and implementation of the regulatory regime and funding arrangements for the sector:

- (a) The regulatory and funding model is not being implemented as originally envisaged, which reduces the effectiveness of regulation and the pressure for companies to improve.
- (b) Abu Dhabi Government has been providing funds to network companies via ADWEA for capital projects. However, the Government has not been receiving any repayment of, or return on, their investment, while the companies have been receiving depreciation and return on capital components of their MAR.
- (c) As the Bureau does not regulate ADWEA and does not have full visibility, it has been very challenging for us to monitor such funds flow, their use or any returns. The lack of transparency to the Bureau on the arrangements between the DoF, ADWEA and the network companies has led to a lack of visibility of the compliance with the regulatory model.
- (d) The lack of clear terms and conditions for the repayment of Government loans by the sector companies has not benefited the network companies, which keep building liabilities and increasing its risks over time, nor the Government, which does not receive repayment of and/or return on its investment.
- (e) Similarly, it is also not beneficial for the sector if the Government pays IWPPs and fuel costs directly instead of using the subsidy mechanisms, which risks blurring the effectiveness and the incentives for efficiency embedded in the price controls. This also raises important questions about the calculation and payment of the subsidy to the sector.
- (f) We also understand that DoF pays subsidy according to an approved budget and there is no reconciliation between such estimate and the actual subsidy requirements at year end.

2.12 Therefore, there is a critical need to ensure alignment of the regulatory and funding arrangements and their implementation and compliance.

Issue 2 - Efficient use of capital funds

- 2.13 The fast paced development of the Emirate of Abu Dhabi and the inherent rapid water and electricity demand growth has created significant pressure on the sector over the years:
- (a) This has forced the network companies to develop their operational businesses and to invest in the networks to meet the increasing requirements from consumers, raising the sector costs, the MAR and the subsidy requirements.
 - (b) However, the ex-post approach to capex regulation over the previous price controls reviews has not helped licensees to make efficient decisions in respect of capital investment. The regulatory approach to date has involved only provisional allowances for future capex (without review and approval of capex projects). Following an ex-post review of such capex, adjustments are made to MAR to reflect the actual efficient capex.
 - (c) Companies consider ex-post capex efficiency assessment risky and not helpful as the inefficiencies are identified only after many years from initiation of capex projects. On the other hand, the high demand growth, lack of reliable demand and capex forecasts and planning by the companies led to the continuation of the ex-post approach to capex regulation.
 - (d) Further, there are other important Government entities particularly GSEC and DoF that are now involved in review or approval and budget allocation of capital projects.
- 2.14 We therefore need to consider how the approach to capex reviews and the efficient use of capital funds may be enhanced in the future.

Issue 3 - Controlling and smoothing costs and revenues

- 2.15 The licensees management do not always appear to be subject to the active shareholder pressure for efficiency seen in a number of more mature jurisdictions. The Government funding arrangements and the lack of clear repayment conditions for the network companies are to an extent a reflection of this issue. However, the increasing costs and increasing MAR which has characterised the sector over the years, as discussed below, are putting more focus on the sector's need and ability to achieve cost savings and efficiency:
- (a) The significant growth in the sector costs caused by increasing demand and the Emirate's development pace has posed difficult challenges to the determination of the price controls reviews and calculation of the MAR for the price controls period. Since 1999, each price controls review led to a step increase in the MAR, with a relatively flat MAR over the price controls period, which is undesirable in terms of the subsidy payment requirements and the determination of end user tariffs.
 - (b) One way in which the quick development has been observed is the construction of several mega developments throughout the Emirate. The mega developments vary in size and can in some cases add new whole sections of infrastructure to

the existing cities (e.g. the development of Al Reem Island, in the city of Abu Dhabi). The developers of these projects have typically built the water and electricity network infrastructure assets in parallel to the construction of the other structures to ensure alignment between the two. These electricity, water and wastewater network assets are later adopted by the network companies, and are another potential source of the quick rise in the sector costs and the MAR. To date, only a few assets have been adopted – either through ownership or operational control – and thus the full impact on sector MAR or subsidy has not yet been seen.

- (c) The total sector costs and MAR may also face significant upward pressure in future following the scheduled introduction of the four nuclear power units at Barakah during 2017- 2020 (when the full nuclear generation could make around a quarter of the total generation capacity) and the first gas supplies from the planned LNG terminal in Fujairah. These developments have important cost implications for the sector for 2018 and onwards - for example, through quick growth in generation and transmission costs over a short period of time.
- (d) The fast development of the Emirate and increasing sector costs also pose challenges in other areas of the regulatory framework, which emphasise the need for controlling costs and profiling the MAR. Examples are the TUoS charges, which fluctuate due to demand forecasting and the correction factor in the MAR, the development of informative billing for ADSSC, and the subsidy payment reforms (where the subsidy is calculated based on metered units).

Issue 4 - Sustainability

2.16 The quick and continuous development of the Emirate of Abu Dhabi and the increasing costs raise questions about the future sustainability of the sector, and leads to higher transparency required over the sector costs and level of efficiency. Sustainability has to be looked into from a number of perspectives:

- (a) In November 2014, in collaboration with AADC and ADDC, we announced a new water and electricity tariff structure for all customer groups (except agriculture), in the Emirate of Abu Dhabi. In summary, the new tariff resulted in higher water and electricity unit prices for most customer groups effective from 1 January 2015. End users consuming above a specific level now pay a higher tariff for any consumption above this level and, in the case of expats, this higher tariff is not subsidised. The most significant change has taken place for government customers, who now receive no subsidy and pay the full cost-reflective rate for electricity and water consumption. The cost-reflective tariffs for these customer groups have been updated for 2016 based on the latest cost estimates. The introduction of the new tariff (along with new bill layout) brings more transparency to consumers in terms of the actual costs of water and electricity. This in turn will raise the awareness and expectations from consumers in relation to the level of efficiency of their suppliers and the network companies.
- (b) These customer tariff reforms will also raise awareness about the cost of electricity, water and wastewater services, how these limited resources are used and consequently raise sustainability and environmental questions about sector.

In fact, customers have been approaching the Bureau to find ways on how to reduce their electricity and water supplies from the networks (using conservation measures or own solar PV panels) to keep the bills manageable and affordable.

- (c) DSM has an important role to play in controlling and managing the level of demand for electricity, water and wastewater services from the end users. Effective DSM programs within the Emirate can help the planning of the investments in the sector and will directly alleviate the upward pressure on the sector costs. For this reason, DSM over the next price control period will continue to be one of the key aspects related with the future sustainability of the sector.
- (d) Currently, the effective and efficient delivery of potable water and collection of wastewater via tankers is another challenging area which may have repercussion over the next price control period.
- (e) From the companies' perspective, they should have reasonably strong financial position and access to requisite funding to invest in the capital projects and operations to support the rapid growth of demands and the expectations for improved service.

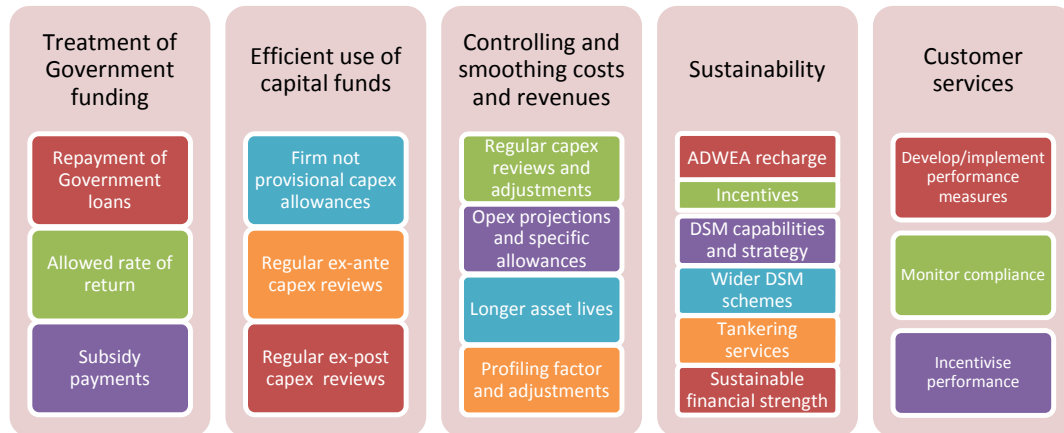
Issue 5 – Customer services

- 2.17 One of the key duties of the Bureau is to protect the interests of water, wastewater and electricity users in the Emirate of Abu Dhabi (whether they are residential, commercial, agricultural or industrial customers).
- 2.18 Network companies are expected to continue facing pressure in terms of service provision due to the fast development of the country and the rapid demand growth. It is important to ensure that this pressure does not have unintended consequence in terms of the provision of customer service quality and standards.
- 2.19 On other hand, following the recent customer tariff reforms, the sector may also see higher expectations from the customers for service quality and standards. Customer service is expected to be one of the areas of high significance and impact over the next price control period, and thus one of the key strategic issues for this review.

Strategic objectives for the review

- 2.20 The Bureau's objective is to use the current price control review to discuss these challenges and develop the regulatory regime to address them in a pragmatic manner. This may require significant changes to the regulatory and funding arrangements.
- 2.21 The next paragraphs explore certain high-level ideas to address these challenges in a holistic manner. These are initial thoughts and need to be subject to a critical assessment and reasoning in order to find workable solutions to these challenges in the future. More details are added in the relevant sections later in this document.

Figure 2.2: Strategic objectives and potential solutions



Objective 1 - Treatment of Government funding

2.22 The lack of full visibility of the arrangements and flow of funds between DoF, ADWEA and the network companies has previously made it very challenging for the Bureau to monitor the funds flow and design price controls accordingly. To address the issues about repayment of Government funds, we may need to follow a more strict approach in determining future revenue allowances in the present review, putting more reliance on the specific information made available to us. This approach impacts on two elements, namely the repayment of Government funds, and the rate of return used in price controls.

Repayment of Government loans

2.23 The Bureau is considering the options to deal more effectively with the issues around the government funding and adherence to the regulatory regime model. One option could be to continue with the existing approach to calculating the MAR which includes allowances for regulatory depreciation (or return of capital) and return on capital. However, the Bureau then deducts any repayment of government funding (with or without return) from the MAR before the subsidy requirement is calculated. The companies would then need to reduce the Government related liability accordingly on their books. This method of netting off Government funding repayment from MAR has recently been agreed in principle between DoF, the Bureau and ADSSC and is being developed for implementation for ADSSC from 2017 onwards. This method is further discussed in Section 3 of this document.

2.24 Further, the regulatory depreciation allowance in the MAR should continue to be defined as a component to repay the principal capital investment. This is in line with the explanation provided at the previous price control reviews. However, this definition should be made more explicitly now to avoid any future issues. Also, as with any principal repayment, this allowance should not provide any inflation protection. In contrast, the return on capital component of MAR should have this protection to ensure inflation adjusted returns for the investors.

Cost-reflective rate of return

- 2.25 To date, the return on capital component of the MAR has been estimated for price control purposes based on actual and benchmark rate of returns or weighted average cost of capital (WACC) observed in the international, regional and local capital markets as well as those used by overseas and local/regional utility regulators. This has been partly due to the lack of information of actual returns agreed by the companies or ADWEA with the Government and other fund providers (though, to the extent available, the Bureau's estimate of WACC took account of such information on actual cost of funding). In this review, the Bureau is considering whether return on capital should be reflective of the Government ownership of the companies and the actual cost of funding provided by the Government and other fund providers to the network companies. This is further discussed in Section 6 of this document.

Subsidy payments to distribution companies

- 2.26 The Bureau also notes that, as part of an extensive consultation in 2014 with the key stakeholders on subsidy payment reform, it was proposed that the subsidy should be paid directly to AADC and ADDC to improve transparency. This reform is expected to be implemented in advance of the new price controls.

Objective 2 - Efficient use of capital funds

- 2.27 The Bureau considers that the regulation of capital efficiency needs to be strengthened to ensure that where practicable licensees have in place international best practice for managing capital projects, that there are appropriate rewards for efficiency and penalties for inefficiency, and, that the sector interfaces effectively with developments across the Emirate (including mega developments).
- 2.28 At this price control review, we are proposing to move towards a more forward-looking approach by conducting regular ex-ante capex reviews and ex-post capex reviews. This would result in approving in advance the capex projects and allow only approved firm (not provisional) capex allowances in the price controls, with limited ex-post capex review. In the PC5 consultation documents, we proposed similar arrangements, though not significant progress was made. However, there seems to be higher determination and willingness by the sector and the Bureau to develop these proposals at this stage. Accordingly, we have planned to consult with the sector and to undertake the first ex-ante capex review in 2016 to set firm capex allowances for 2018 onwards which will be incorporated into the new price controls. This change in approach to capex regulation is further discussed in Section 5.

Objective 3 - Controlling and smoothing costs and revenues

- 2.29 To this date, the price controls have been characterised by step increases in MAR from one control period to another and significant increases in MAR over time. This issue has become inevitably important in view of the recent customer tariff reforms which also involve introduction of cost-reflective tariffs for certain customer classes. Such MAR increases if continued would result in significant volatility in cost-reflective tariffs and

subsidy requirements, which are not desirable. We are therefore considering the options to address this issue.

- 2.30 The significant increases in the costs and MAR in the past have been caused by a number of reasons such as rapid growth in demands and investments, inflationary pressures on costs, inefficiencies, delays in full adjustment of allowed capex, and choice of X-factor in designing the price controls.
- 2.31 While the growing demand and inflation may continue to affect, there are a number of possible methods and measures that are being developed or can be considered to control and smooth the sector costs and revenues, as discussed below. There are focused work streams separate to this price control review which aim at managing the effects of nuclear generation, demand forecasting and mega developments.

Regular capex reviews and adjustments

- 2.32 More frequent capex reviews discussed above will help in controlling and reducing the sector costs. Such reviews and regular capex-related adjustments to MAR will also help smoothing the MAR to avoid or minimise step increases from one control period to another.

Opex projections and specific allowances

- 2.33 The challenges arising from the fast development of the Emirate and consequent rising sector costs emphasises the importance of finding ways to improve the network companies' efficiency and reduce their opex. We need to explore the ways to further improve the approach and the underlying information used in the previous price control reviews to set efficient opex allowances. It might be appropriate to continue using some of the flexible arrangements used at the last price control review to adjust opex projections for specific work areas and responsibilities such as Emiratisation and mega developments.

Longer asset life assumptions

- 2.34 Another option for controlling and smoothing costs is revisiting the assumptions on the life of the electricity, water and wastewater assets for price controls. To date, asset life assumptions are 30 years for new electricity and water assets, and 50 years for new wastewater assets. In this review, the Bureau proposes to assess whether these life assumptions are appropriate and can be extended. Appropriate asset economic lives are important to determine the related revenue allowances (including allowances to cover cost of capital and depreciation).
- 2.35 The review of this element of the regulatory model is also usual in other jurisdictions. For example, the UK regulator for gas and electricity (Ofgem) has recently extended its asset life assumption for new electricity transmission and distribution assets to 45 years. An analysis of the weighted average asset life can be undertaken to support longer asset life assumption for depreciation purposes. While network companies can provide asset categories and asset values, the assessment of useful asset life is difficult. As discussed in Sections 1 and 6, we expect to seek external expert advice on this.

Profiling factor and adjustments

- 2.36 Finally, the regulators often look at the X-factor to profile the allowed revenue over the control period. In Abu Dhabi, the choice of a zero value for X-factor in the previous price control reviews has resulted in a relatively flat profile over each control period but step increase from one control period to another. We are considering using a negative X-factor to allow a gradual increase in MAR over the years during a control period – this would also avoid or minimise step increase from one control period to another.

Cost transparency and monitoring

- 2.37 In addition to profiling MAR appropriately, robust processes to record, monitor and report costs and outputs are a crucial element to enable controlling costs effectively on an ongoing basis. The RAGs introduced in 2013 and the ongoing efforts to produce robust SBAs and director's reports on companies' performance have improved the transparency in the SBAs. The implementation of ABC system will further help addressing this area. However, this should remain a key area of focus during the review and for the RC1 period.

Objective 4 - Sustainability

- 2.38 As discussed above, sustainability has several dimensions and we need to explore various ways to achieve sustainability in these dimensions at this price control review. Some of the measures discussed above to control costs and ensure cost efficiency also help sector sustainability. Other ways are explored as follows.

ADWEA recharge

- 2.39 The increasing sector costs leads to questions about the future sustainability of the sector, and raises the requirement for higher transparency. One example where we continue raising questions is the arrangements around ADWEA recharge. We would like to use this review to discuss how transparency in this area could be further enhanced.

Incentives

- 2.40 The use of incentives in the price controls is another area of relevance for the sustainability of the sector. Consistent with the provision of essential utility services and the promotion of a sustainable sector, we maintain our view from previous price control reviews that licensees should face appropriate incentives for delivering quality outcomes.
- 2.41 The existing price controls contain incentives covering three key areas, namely: provision of timely and good quality information; network availability, security and quality of supply; and end-user efficiency. In addition, PC5 final proposals identified five other areas for future incentives development (asset management, transmission system operator, demand side management, customer services, and carbon accounting), though there has been limited progress in developing these incentives over the last two years. We have a good opportunity to review the incentive model, the existing incentives and identify which ones should be carried forward, whether there is need to make any amendments to the existing incentives, or to identify and develop new incentives for the next price control period.

DSM capabilities and strategy

- 2.42 DSM measures provide a direct and widely-used opportunity to address sustainability in terms of customer consumption and environmental impact. At the last price control review, the Bureau introduced additional opex allowances in PC5 for the distribution companies to build capabilities within their businesses on DSM. PC5 also included an incentive for the distribution companies to develop and submit to the Bureau a DSM strategy and action plan by the end of 2014, together with a firm commitment to implement it. The progress on the DSM strategy and action plan and the building of internal capacity within the companies has been limited so far. We consider that this is a key area in the future sustainability of the sector, and expect that the companies will have their strategies and action plans ready for implementation soon.

Wider DSM schemes

- 2.43 The Bureau is open to discuss how the DSM framework can be further enhanced through this price control review, namely by the development of additional incentives which can support the successful implementation of the strategy and action plan. We note that the Bureau has been in discussion with ADWEA and ADDC through a committee on how to develop a wider DSM initiative across the Emirate and more specifically how a self-funding, incentive scheme could be developed to improve energy consumption of the existing air conditioning infrastructure for building owners and customers.
- 2.44 The sector has also been discussing opportunities to maximise recycled water use and minimise desalinated water consumption in non-drinking applications such as irrigation. Creation of new divisions within the distribution companies is under discussion and has the potential to save considerable desalinated water during the next control period.

Tankering services

- 2.45 There are important issues around the provision of potable water services and provision of wastewater services through tankers. The Bureau is currently engaged with stakeholders particularly AADC, ADDC and ADSSC to develop regulatory and logistics arrangements, which should enable the companies to better manage the tankering services in terms of safety and environmental compliance as well as to protect the customer interests in terms of pricing and quality of service. This price control review is timely in relation to this matter, and we would like to discuss with the sector how it can be used to support the development of a robust regulatory framework to fund the future provision of tankering services. One option could be to fund the development of required capabilities and management system via specific opex allowances.

Sustainable financial strength

- 2.46 It is important for the network companies to have sustainable funding sources for their investment and operations. While developing the netting mechanism for MAR discussed above to repay Government funding, we consider it appropriate to assess the financial strength of the companies using certain specific financial ratios in terms of liquidity and debt serviceability. This will not only ensure the companies to withstand any financial risks but can also enable them to seek commercial loans to fund future capex.

Objective 5 – Customer services

- 2.47 The measurement, quality and standard of customer services provided by network companies is an area that needs to be strengthened, to ensure that licensees have robust processes to deal with customers and apply best international practices.
- 2.48 The Bureau is currently working with the network companies to assess the compliance with the existing licence requirements and to check the companies' current practices on customer services. We will link and build on this work and use this price control review to consider the current practices in relation to customer services and how the economic regulatory framework can be used to facilitate and improve the way in which companies provide their services to end users.
- 2.49 In this regard, the incentive scheme is one aspect of the price controls which can be used to improve the customer service arrangements. To date, incentive schemes have been more focused on operational and technical performance of the companies. This review represents a good opportunity to enhance the scope to also include customer services. Section 7 expands further on how incentives may be used to facilitate this work.

Key issues for consultation

- 2.50 Based on the discussions in this section, there are two key issues for consultation where we are seeking the sector views:
- 2.51 Are the following five strategic challenges the most relevant and critical to discuss during this price control review? Are there other key challenges that we should consider?
- (a) Treatment of Government funding
 - (b) Efficient use of capital funds
 - (c) Control of costs and smoothing revenue allowances
 - (d) Sustainability
 - (e) Customer services
- 2.52 Can these challenges be addressed at this review by the following main measures? Are there other effective measures that should be explored to address these challenges?
- (a) On the treatment of government funding:
 - (i) Ensure that stakeholders follow the regulatory model, by repaying the Government funding with appropriate returns while the companies recover such funding and returns through the MAR (e.g., by netting-off the repayment of Government funding from the MAR before subsidy payment is determined for the relevant network companies)?
 - (ii) Use a rate of return in setting the price controls, which is reflective of the Government ownership and actual cost of funding.
 - (b) On the efficient use of capital funds:

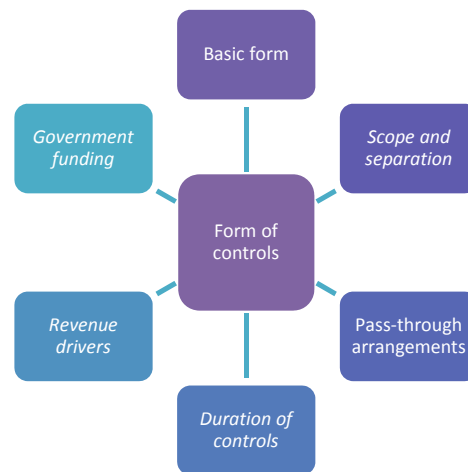
- (i) Apply a forward-looking approach through regular ex-ante capex reviews to set out firm capex allowances to be used in the price controls and use regular but limited ex-post capex reviews – which would result in regular capex adjustments to the MAR during the control period;
 - (ii) Promote and implement better alignment between different stakeholders in the capital approval and budgeting process in the sector;
 - (iii) Strengthening the processes and methods to record and report the network companies' costs and outputs.
- (c) On controlling costs and smoothing revenue allowances:
- (i) Use MAR profiling factors to smooth the revenue allowances through and across price controls periods.
 - (ii) Consider longer asset life assumptions for the price controls.
- (d) On sustainability, develop the regulatory and related arrangements to:
- (i) Address ADWEA recharge to make them more transparent and efficient.
 - (ii) Incentivise desired licensees' behaviour and specific outcomes.
 - (iii) Enhance the framework for development and implementation of DSM.
 - (iv) Ensure the funding, quality and efficiency of tankering services.
 - (v) Ensure the companies have the financial strength to repay Government loans, withstand financial risks and seek commercial funding in future.
- (e) On customer services, develop the economic regulatory framework to:
- (i) Monitor and ensure that the current licence requirements are adhered to by the network companies.
 - (ii) Strengthen the framework for development and implementation of international best practices in customer services.
 - (iii) Incentivise desired licensees' behaviour and specific outcomes.

3. Form of Controls

Introduction

- 3.1 The main objective of this review is to design the new or RC1 price controls for 2018 onwards. This requires assessment of certain fundamental aspects of the price controls which includes form, scope, separation, structure and duration of controls and pass-through arrangements for specific costs. In the structural design, the questions regarding the fixed and variable elements involving revenue drivers also need to be assessed.
- 3.2 As discussed in section 2, the price controls review provides a good opportunity to assess whether the form of the price controls remain appropriate. Section 2 also discusses a number of key challenges and issues that the sector currently faces. One of those challenges is the treatment of Government funding that the form of new controls would need to address at this review on a priority basis.
- 3.3 This section 3 discusses whether the fundamental design of the price controls remains appropriate and whether any changes are required to address the key issues. We discuss this assessment for each important aspect of the design of price controls in turn, followed by a summary of key questions for consultation.

Figure 3.1: Assessment of form of new controls



Basic form of price control

Existing arrangements

- 3.4 The main mechanism for the economic regulation of the network licensees in the sector has been multi-year CPI-X revenue controls. The framework caps the revenue that a licensee can recover from the customers in any year during the control period. The revenue cap or MAR is set on a forward looking basis using three main building blocks: namely, operating expenditure (opex), regulatory depreciation and return on capital. The MAR is constrained to change each year by the UAE CPI inflation and an X-factor. The X

factor is set to reflect a number of considerations particularly the profiling of future revenue.

- 3.5 Price controls in Abu Dhabi have a number of features designed to balance the advantages of providing incentives for efficiency against the disadvantages of placing undue risks on licensees. For instance, each price control:
- (a) includes cost pass-through terms allowing the recovery of costs that licensees have limited or no control over;
 - (b) is set for a fixed number of years, allowing licensees to retain the benefits of efficiency savings for a number of years but providing the opportunity of a medium term review to take account of unexpected developments and changes in costs; and
 - (c) has a definition of the scope of activities subject to price control regulation, ensuring that licensees have clarity as to whether a business activity is subject to regulation or normal commercial considerations and risks.

Assessment and considerations

- 3.6 Price caps and incentive regulation are used in many jurisdictions across Europe and Asia to protect consumers and encourage the efficient operation of monopoly utility businesses. A number of jurisdictions have recently subjected these broad approaches to detail reviews and concluded that while regulatory regimes may need to evolve over time, the basic framework of price controls and incentive regulation should remain in place. For instance, section 2 highlights the reviews undertaken by the UK and Australian regulators which resulted in further improvements in the regulatory regime:
- (a) Ofgem's RIIO framework encourages energy network companies to play a full role in the delivery of long-term value for money network services, for existing and future consumers, through longer price controls and greater incentives for efficiency, outputs and innovation.
 - (b) Ofwat now emphasises on enhancing incentives for business outcomes and reducing the complexity and burden of the regulatory process. Both Ofgem and Ofwat have introduced total expenditure (totex) concept to the treatment of opex and capex to remove undue bias towards capex.
 - (c) AER proposals focuses on ensuring that cost allowances would be no more than necessary and reflect an unbiased estimate of efficient costs, and, ensuring that businesses are not rewarded for unnecessary overspends.
- 3.7 However, these broad conclusions indicate that price controls and incentive regulation can be adapted to encourage efficiency in a wide range of circumstances and so remain appropriate to both protect consumers from monopoly power and encourage efficiency and best practice across the sector.
- 3.8 As described in section 2, the sector faces a number of key challenges and issues that the design of new controls should address. However, as section 2 explores, these key issues can be addressed by changes to the detail design of the price controls, but the basic form of the price control can remain the same.

- 3.9 In the light of this, the Bureau's current thinking is to retain CPI-X revenue controls in the very broad form of the existing regulatory arrangements with appropriate enhancements to address key issues.

Key issues for consultation

- 3.10 Is the initial conclusion to retain CPI-X price/revenue controls in the very broad form of the existing regulatory arrangements with appropriate enhancements to address key issues appropriate?

Scope and separation of controls

Existing arrangements

- 3.11 Currently, there are separate price controls for the water and electricity businesses of AADC, ADDC and TRANSCO. There is no such separation of controls for the sewerage, wastewater treatment and disposal businesses of ADSSC, or for the distribution and supply businesses of the distribution companies.
- 3.12 While the price controls for AADC, ADDC and ADSSC cover only their licensed activities, the scope of TRANSCO price control was extended at the last price control review to include TRANSCO's electricity and water transmissions activities (using both the shared and dedicated assets) outside the Emirate of Abu Dhabi.

Assessment and considerations

- 3.13 Separation of price controls for the businesses enhances transparency of costs, enables setting cost reflective tariffs and facilitates competition and restructuring of the sector in future. However, separation of controls is a resource intensive exercise for the Bureau and licensees and requires, among others, availability of reliable and accurate information about the separate businesses.
- 3.14 At present, the key information submissions made by licensees include the AIS, PCRs and SBAs. In recent years, the five price-controlled companies and the Bureau have worked together to improve the contents, presentation and cost allocations in the SBAs, for example, through the development and implementation of Regulatory Accounting Guidelines (RAGs). More recently, we have initiated discussions with the companies to develop and implement an activity based costing (ABC) system within the companies. This system if implemented is expected to further improve the robustness of the information submitted to the companies' management and the Bureau.
- 3.15 At this price control review, we also need to consider the new responsibilities that AADC, ADDC and ADSSC are expected to take over in relation to the following:
- (a) There are planned arrangements for ADSSC's informative billing to customers during 2016. In future, ADSSC may introduce actual customer billing and collection. Currently, ADSSC is in discussion with AADC and ADDC to procure the billing services from the latter companies' supply businesses. A possible option could be to treat the distribution companies' role in this arrangement as

unlicensed but consented activities. Therefore, the costs and revenues related to such unlicensed activities can be excluded from the scope of new price controls of distribution companies with appropriate accounting separation and reporting for these activities. The costs charged by AADC and ADDC to ADSSC for these services would however require assessment before they are allowed to be recovered by ADSSC through its MAR.

- (b) As mentioned in Section 2, AADC, ADDC and ADSSC are planned to take over additional responsibilities of managing tankering services for wastewater and drinking water. While third-party tankers will provide actual transportation services for a payment by the relevant customers, the network companies will have roles in taking customer requests, despatching and tracking tankers, and ensuring tankers' compliance with the relevant technical standards and codes of practice. In doing this, the network companies would incur additional opex on an ongoing basis and perhaps some capital costs at the start of the programme.
- (c) The sector has been considering proposals for optimum management of recycled water within the Emirate. Recycled water, where appropriately managed, has the potential to conserve considerable volumes of desalinated water currently used in non-drinking applications such as irrigation. Current management proposals are focussed on the creation of new non-drinking water divisions within the distribution companies. The companies should ensure during the next control period that these divisions are appropriately resourced and capital plans are appropriately financed and subject to regulatory scrutiny. Price controls can provide necessary funding for this to the extent the companies provide justified and costed proposals with supporting details. Incentives may also be developed to ensure the connection of non-drinking water customers and to maximise the safe and efficient use of recycled water in appropriate applications. The precise nature and timetable for any new arrangements are currently being developed.

- 3.16 None of these arrangements may necessitate any change in price control scope and separation arrangements for any company other than reasonable additional cost allowances in the relevant company's MAR. In some cases, certain costs being related to an unlicensed activity may need to be excluded while setting the price controls. To develop a more robust mechanism in the future based on accurate historical information (which are not available at present for these new activities), companies may be required to record and report the revenues and costs for these activities as separate line items in their regulatory submissions.
- 3.17 It will be important that the separation of price controls for the businesses balance the benefits of separation and extensive resources required for the Bureau and the companies to set separate price controls. This should also take into account the sector's current and future structure and challenges, particularly the availability of reliable and accurate information on each separate business.

Key issues for consultation

- 3.18 Whether the existing arrangements relating to separation of price controls as explained above remain appropriate for the future or whether they should be revised and, if so,

what changes would be most appropriate? This needs to be assessed particularly in view of the following:

- (a) any competition or restructuring in the supply business being planned that warrants separate controls for these activities;
- (b) availability of improved information from the companies following the expected implementation of ABC system;
- (c) ADSSC's informative billing or future actual billing to customers;
- (d) new responsibilities of AADC, ADDC and ADSSC in relation to the management of tankering services of water and wastewater, recycled water and the distribution and supply of non-drinking water; and
- (e) most pragmatic solution being either to exclude costs and revenues of additional responsibilities as unlicensed activities from the scope of price controls or to include additional cost allowances in the MAR.

Cost pass-through arrangements

Existing arrangements

- 3.19 Currently, the following costs are allowed as pass-through on actual basis as they are usually costs recharged from other licensees which are already subject to regulation (via an economic purchasing obligation or price controls) or competition:
- (a) for AADC and ADDC, bulk power and water purchases and transmission charges;
 - (b) for ADSSC, the payments under relevant long-term STAs;
 - (c) for TRANSCO, the purchase of ancillary services related to electricity business; and
 - (d) for all companies, a component of the Bureau's annual licence fee (allowed as pass-through via licence derogations).

Assessment and considerations

- 3.20 The pass-through arrangements for these costs on an actual basis have some disadvantages such as (a) fluctuations in cost reflective tariffs and subsidy, and (b) least drive for licensees to put cohesive efforts with relevant stakeholders on accurate estimation of such costs. However, the advantages of such arrangements, particularly in terms of protecting licensees from undue risks associated with the costs that are out of their control and least known with certainty, outweigh the disadvantages. Further, correction factor mechanism of the MAR formula appropriately addresses the cost deviations on an ongoing basis.
- 3.21 In addition to retaining the existing pass-through items, it is for consideration whether the entire Bureau's licence fee for each licensee should be allowed explicitly a pass-through

treatment without the need for any annual derogation. The current practice is that some licence fees are included in opex allowances while setting price controls and other fees are passed through derogation, effectively allowing all Bureau's fees on a pass-through basis. Adding a new term, say "L", in the MAR formula for each licensee will formalise and simplify this treatment, in line with utility regulation in other jurisdictions.

Key issues for consultation

- 3.22 It is for consideration whether:
- (a) the existing arrangements relating to cost pass-through for the network companies remain appropriate for the future or whether they should be revised and if so what changes would be most appropriate?
 - (b) there is a case for extending pass-through treatment to full amount of the Bureau's licence fees?

Duration of controls

Existing arrangements

- 3.23 Both the PC1 and PC2 controls were set for 3 years, although PC1 was subsequently extended for another year. PC3 and PC4 controls were set for 4 years (but 4½ years in the case of PC3 controls for ADSSC). The present PC5 controls were then set for 4 years.

Figure 3.2: Multi-year price controls for network companies

PC1	PC2	PC3	PC4	PC5	RC1
1999-2002	2003-2005	2006-2009	2010-2013	2014-2017	2018 onwards

Assessment and considerations

- 3.24 The duration of a price control needs to strike a balance between providing incentives for efficiency and reducing exposure to unanticipated outcomes. A longer duration provides stronger incentives for companies to implement efficiency savings. Such controls could also reduce the efforts and costs involved both for the company and the regulator in frequent price control reviews. However, a longer duration also increases the possibility of performance being at variance with the expectations at the time of setting the price control and adverse unanticipated outcomes.
- 3.25 Internationally, CPI-X price controls are typically set for between 4 and 5 years. The UK energy regulator, Ofgem, has now moved to a control duration of 8 years as part of its RIIO framework, reflecting the industry maturity and stronger incentives for efficiency. Scottish water regulator, WICS, has now extended the price control duration to 6 years for Scottish Water. The UK water regulator, Ofwat, remains content with a 5-year control duration.
- 3.26 In Abu Dhabi, the choice of a shorter duration for price controls was driven by a general lack of reliable and audited data on companies' performance as well as the uncertainties

within the sector relating to issues such as demand growth. Recent price controls have therefore been of a 4-year duration.

- 3.27 At this review, the decision on control period needs to also take account of the approach discussed in section 2 to capex regulation and more regular capex reviews and adjustments to MAR without waiting for the next price control review. Further, if we adopt specific cost allowances for additional responsibilities such as Emiratisation, mega developments and tankering services along with necessary adjustments during the control period, this would further address the uncertainties and justify a longer control period.
- 3.28 In light of the above, the Bureau's current thinking is to use a multi-year price control with a control period of 4 or 5 years, with regular reviews and adjustments of costs. Effectively, the revised regulatory regime can combine some features of annual rate of return regulation to address specific issues. At the same time, it will provide certainty, efficiency incentives and environment for better planning over a medium to long term.

Key issues for consultation

- 3.29 Whether it is appropriate to set RC1 controls for 4 years or 5 years, with regular adjustments of capex and some specific opex allowances?

Revenue drivers

Existing arrangements

- 3.30 As mentioned in section 1, the MAR formulas in Abu Dhabi contain a fixed term and one or two variable terms involving revenue drivers. At present, each network company or business has two revenue drivers (except for ADSSC, which has one revenue driver) linked to their outputs, such as number of customers served, units transmitted or distributed or treated, and system peak demands. In each case, the weights of the fixed element and the variable element subject to the revenue driver are in the ratio of 80:20.

Assessment and considerations

- 3.31 The choice of revenue drivers in the previous price controls and their weights reflected a number of considerations, including the cost structure of the business (thereby reducing the licensee's exposure to increases in its costs resulting from demand growth) and providing desirable incentives - for example, for licensees to serve new customers and improve system metering.
- 3.32 The use of variable terms in the MAR formulae and hence revenue drivers should be assessed against the following considerations:
- (a) The output units based revenue driver for distribution companies gives undesirable incentive to these licensees to encourage excessive water and electricity consumption by their customers, contradicting the sustainability or DSM.

- (b) The deviations in demand and other forecasts used in setting the price controls from the actual outturn values can result in significant fluctuations in MAR, and hence TUoS charges, customer tariffs and subsidy requirements.
- (c) Further, the regular cost adjustments discussed above (particularly capex adjustments which are often significant and apply to most of MAR via updates to RAV) can complicate price controls mechanism that involves revenue drivers.
- (d) Finally, whether the network costs significantly vary with demands and outputs in the short term (i.e year on year basis) is not clear particularly when opex component now constitutes a small proportion of the MAR.

3.33 In view of the above considerations, our current thinking is to express the company's core MAR as a fixed element in full (subject to inflation indexation as discussed in section 2), without the variable elements linked to the output based revenue drivers.

Key issue for consultation

3.34 Whether the company's core MAR should be expressed in fixed absolute terms in full (subject to inflation indexation discussed in section 2), without the variable elements linked to the output-based revenue drivers?

Treatment of Government funding

Existing arrangements

3.35 The network licensees are wholly owned by the Abu Dhabi Government, directly or through ADWEA. In addition, the Government funds all or most of the capital projects from these licensees. SBAs of the licensees show that the Government funding for projects, at present, is in the form of interest free loans without repayment terms.

3.36 The funding arrangements and assumptions underlying the price controls to date have been that the company would use the opex, depreciation and return on capital allowances of MAR to pay for actual opex and repay the capital investment (including the Government funding) with returns. Further, any difference between MAR and revenue from final customers would be paid by the Government as subsidy to the distribution companies.

Assessment and considerations

3.37 However, the recent discussions with stakeholders and reviews of companies' financials highlight that the arrangements in practice differ significantly from those assumed while setting the price controls. In particular, despite depreciation and return on capital components in the MAR, the Government has not been receiving their investment back from the companies. Further, lack of visibility and control over licensees' funding arrangements reduce incentive for the licensees to improve efficiency and drive to respond to regulatory incentives under the price controls.

Funding arrangements for ADSSC

- 3.38 In case of ADSSC, earlier sections have already explained the misalignment between regulatory and funding arrangements. In essence, the approved opex budget amount provided by the Government approximately equals (but sometimes exceeds) the opex allowance component of the MAR. Accordingly, ADSSC does not receive other two main components of MAR ie, depreciation allowance and return on capital. Recently, the following arrangement has been agreed in principle between DoF, the Bureau and ADSSC, which can be implemented for 2017 onwards upon approval by the Executive Council:
- (a) DoF will pay full MAR to ADSSC less any customer revenue less an annual amount required to repay Government loans, subject to the condition that this annual amount is calculated by the Bureau;
 - (b) The annual amount required to repay Government loans should be based on ADSSC's financial capabilities, which will depend on the price control assumptions for return and depreciation to set the allowed revenue; and
 - (c) The accumulated losses for the past years on ADSSC's books would be adjusted against the Government investment in ADSSC.

ADWEA group companies

- 3.39 In relation to AADC and ADDC, we note that the Government provides subsidy for electricity and water customers to ADWEA rather than directly to AADC and ADDC. In recent years, the Government has modified the subsidy arrangement and now pays for PWPA and fuel costs on a monthly basis, but capped at an amount equal to the subsidy calculated as the MAR less customer revenue.
- 3.40 For ADWEA group companies, all revenue collections (tariff revenue and subsidy) are transferred to ADWEA. The companies raise 'cash calls' to ADWEA for their fund requirements to pay for their operating and capital costs. ADWEA provides capex funding to the companies for the majority of their projects in the form of interest free loans without repayment terms. ADWEA's sources for such funding include funds received from the Government, the group companies' money held with ADWEA and its own cash reserves. For the companies' projects funded by bank loans, ADWEA passes on the liability and interest costs to the companies, in proportion to the companies' share in such projects.
- 3.41 Under the subsidy payment reforms consulted upon by the Bureau in 2014, each of ADWEA's group companies is expected to establish a separate treasury function.
- 3.42 As discussed in section 2, it is for consideration whether the annual netting-off Government funding repayment from MAR as proposed for ADSSC should also be applied to AADC, ADDC and TRANSCO.
- 3.43 To repay the Government loans, strengthen the licensees' financial position and achieve wider objective of bringing efficiencies in the sector, it is vital to enhance licensees' control over the funding arrangements, transparency over the fund flows and accountability over performance. The Bureau has planned to initiate a consultation with the stakeholders about enhancing financial ring fencing around the network licensees to

provide the network licensees an ability to manage their own finances, and in turn, bring more transparency and accountability on the licensees' performance.

Regulatory depreciation and return on capital allowances

- 3.44 To ensure alignment of the regulatory and funding arrangements further and avoid any future issues, we must note that the regulatory depreciation allowance provided in the MAR is to enable the companies to repay the principal investment. As such, this allowance should not be indexed against inflation as discussed in section 2. To give effect to this, we would need to remove inflation indexation from the depreciation allowance and RAV to date to estimate future depreciation without inflation. However, we do not propose making any adjustment retrospectively to the MAR that the companies have already earned according to the previous and current price controls.
- 3.45 As discussed in section 2, we are also considering whether return on capital allowance in MAR should be reflective of the Government ownership of the companies and the actual cost of funding provided by the Government and other fund providers to the network companies. However, this component would include inflation protection to ensure returns in nominal terms. If the allowed rate of return or WACC is provided in nominal terms, then the return on capital component of MAR would not be further indexed with inflation. In contrast, if we use a WACC in real terms, then the return on capital component would need annual indexation against inflation.

Key issues for consultation

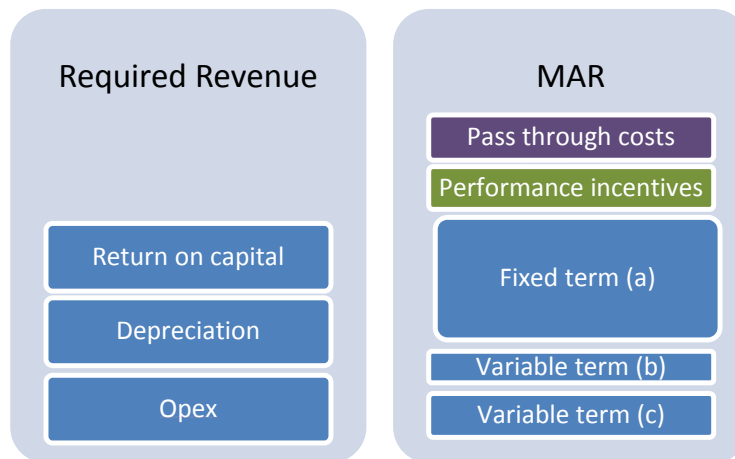
- 3.46 Should the depreciation allowance in the MAR be explicitly defined to repay capital only, requiring no inflation indexation?

Price control calculations

Existing arrangements

- 3.47 At present, the calculations of price control revenue involves using allowances for the three building blocks (opex, regulatory depreciation and return on capital), together with the present value calculations, to derive the licensees' own or core price control revenues (i.e revenue requirement excluding pass-through costs). These core price control revenues are used to determine the notified values of 'a', 'b' and 'c' in the MAR formulae for the new price controls, which is included in the new price control conditions in the license for the network companies. This level of base revenue is subject to cost pass-through terms and incentive arrangements, allowing the determination of total price control revenue.

Figure 3.3: Building blocks of revenue requirement



- 3.48 To date, the Bureau used a net present value (NPV) approach to sculpting the licensees' own or core price control revenue requirements over the period of the price control. NPVs are calculated using the estimate of the cost of capital as the discount rate. This involves the following steps:
- (a) Required revenues for the price control period are calculated as NPVs, which are then matched against the NPV of the projected revenues; and
 - (b) Projected revenue is derived according to the form of the control in terms of fixed terms and revenue drivers and the forecasts of these revenue drivers. Projected revenue is controlled and sculptured by selecting base prices (i.e. notified values of 'a', 'b' and 'c' in the MAR formulae) and X values (set at zero to date).

Assessment and considerations

- 3.49 The price control calculations should be assessed against the considerations that whether these allow and facilitate:
- (a) Regular updates for ex-ante and ex-post capex reviews; and
 - (b) Netting off Government funding repayment and return from subsidy requirement.
- 3.50 Based on the above considerations, our current thinking is to broadly retain the existing approach to the price control calculations with the following modifications to address key changes in the design of the price controls discussed above:
- (a) Licensees' core MAR is expressed in a fixed term "a" in full, without the variable components linked to revenue drivers, however, providing a breakdown of MAR into opex, depreciation and return on capital. This means there will be no need for revenue driver related calibration for a, b and c values; and
 - (b) Sector costs and revenue are profiled appropriately using a suitable value of X factor (not necessarily a zero value as used to date), or other adjustments.
- 3.51 Netting off Government funding repayment and return (and perhaps ADWEA funding repayment and return as well) could be calculated by the Bureau on annual basis taking

account of important financial ratios (refer to the arrangement being developed for ADSSC described in section 2). SBAs of the licensees will reflect netting off loan repayment as reduction in their loans.

Key issues for consultation

- 3.52 Whether we should adopt the previous approach of price control calculations but limited to the notified value of 'a' term only, to facilitate regular adjustments for capex reviews and annual netting off repayment of Government funding (and perhaps ADWEA funding as well) from MAR?

4. Operating costs

Introduction

- 4.1 Projections of reasonable opex over the price control period are main inputs to the price control calculations and efficient spending of operating costs is critical to overall network performance. It is also important to take account of the interactions between operating and capital costs both in terms of the companies' capitalisation policies and trade-off between opex and capex.
- 4.2 Accordingly, the following five considerations are particularly important in considering the approach to the regulatory treatment of opex:
- (a) Allowed revenue under the price controls should be sufficient to enable a reasonably efficient company to finance its business and operate effectively;
 - (b) The development of best practices should be encouraged, including in relation to whole life costing and asset management, taking account of the interactions between operating and capital costs; and
 - (c) The price control should provide flexibility to address uncertainties - on magnitude and/or timing of the costs – in the areas where costs are out of licensees' control and depend on outturn results such as Emiratisation rate or adoption of assets from mega developers.
 - (d) Capitalisation policies are set out and agreed explicitly in setting cost allowances in price controls and reporting costs in SBAs on an going basis and the two remain consistent over the price control period.
 - (e) Reporting should be sufficiently enhanced to provide the necessary transparency and to allow demonstrating/verifying whether efficiency objectives are being achieved.
- 4.3 This section discusses each company's opex performance to date to provide the background and context for this price control review. We then describe the potential approach to determining opex projections and allowances for price control purposes, followed by a summary of key issues for consultation in relation to opex treatment.

Companies' opex performance to date

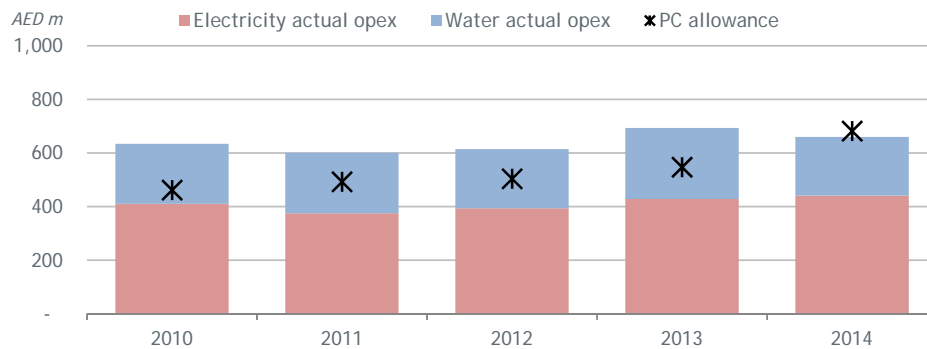
- 4.4 The trends in opex of the four network companies over the periods 2010-2014 are assessed in the following paragraphs. The purpose of this analysis is to illustrate variation of actual costs over time as well as the relationship between actual costs and the assumptions made in setting previous price controls.
- 4.5 The actual opex in this analysis has been sourced from the companies' audited SBAs and comprises (a) staff costs (b) repair, maintenance and consumables (c) water tanker hire cost (for water distribution businesses) and (d) administration and other expenses including the costs allowed as pass-through via derogations, but excludes provisions for slow moving and obsolete inventory and doubtful debts.

4.6 The companies' actual opex in general has increased from 2010 to 2014, broadly in line with the inflation and growth in the businesses seen over this period. The companies in general met or exceeded the PC opex targets set for 2014 under PC5, except for ADSSC which marginally missed the target. However, there are still concerns about certain cost items, such as the distribution companies' high supply business costs compared to the distribution business costs and inconsistencies between capitalisation policies used in setting the price control opex allowances and recording and reporting these costs in the audited SBAs.

AADC's opex performance

4.7 The chart below summarises AADC's actual opex against the projections made in setting the price controls for the period 2010-2014 in nominal prices.

Figure 4.1: AADC's opex (nominal prices)



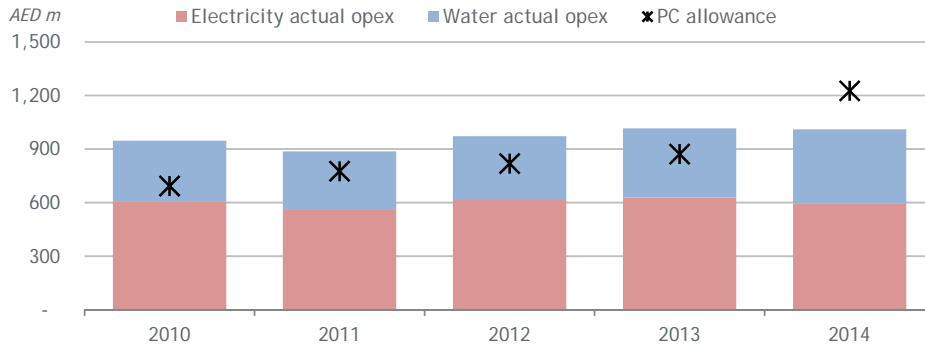
4.8 Key points to note from this chart are as follows:

- over the period 2010-2014, AADC's actual opex increased on average by about 1% per annum;
- in 2014, the company's total opex reached AED 660 million, almost 4% above the 2010 level (AED 634 million) and was, for the first time, AED 22 million or 3% lower than the price control target, showing a better performance;
- electricity and water businesses account for about 67% and 33%, respectively of the company's total opex; and
- staff costs constitute the largest part (about 71%) of opex, followed by administration and other expenses (about 26%).

ADDC's opex performance

4.9 As shown in the chart below, ADDC shows similar trends in costs as AADC.

Figure 4.2: ADDC's opex (nominal prices)



4.10 Key points to note here are:

- (a) over the period 2010-2014, ADDC’s actual opex increased on average by about 2% per annum;
- (b) in 2014, the company’s total opex reached AED 1,010 million, almost 7% above the 2010 level (AED 947 million) and was AED 216 million or 18% lower than the price control target showing a better performance;
- (c) electricity and water businesses account for about 59% and 41%, respectively of the company’s total opex; and
- (d) staff costs constitute the largest part (about 70%) of opex, followed by administration and other expenses (about 26%).

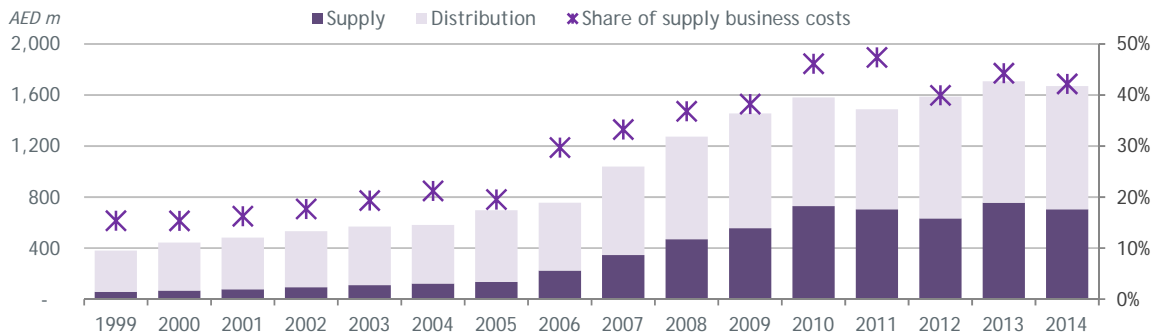
Growth in supply business costs

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

- (a) for both AADC and ADDC combined, the share of supply business costs in the total opex has increased from 15% in 1999 to 42% in 2014; and
- (b) generally, this share has been higher for water businesses than electricity businesses and higher for AADC than ADDC.

4.12 This issue was also discussed at the last price control review. The Bureau’s opex consultant reviewed these costs in detail at that time and identified certain misallocation of costs to the supply businesses. The misallocation issues were broadly addressed on implementation of the RAGs and reassessment of companies’ cost allocation methodology resulting in lower share (but still high) for supply businesses in recent years than 2010-2011. The companies cite greater Emiratisation as one of the contributor to the high costs for supply businesses.

Figure 4.3: Distribution and supply opex (nominal prices)

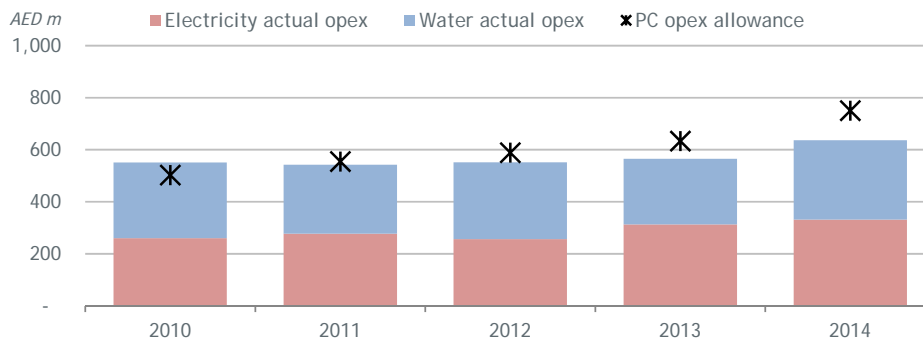


TRANSCO's opex performance

4.13 Trends in TRANSCO's opex are summarised below:

- over the period 2010-2014, TRANSCO's actual opex increased on average by about 4% per annum;
- in 2014, the company's total opex reached AED 637 million, almost 16% above the 2010 level (AED 551 million) and was AED 114 million or 15% lower than the price control target, showing a better performance;
- each of electricity and water businesses accounts for about half of the company's total opex; and
- staff costs constitute the largest part (about 54%) of opex, followed by administration and other expenses (about 25%).

Figure 4.4: TRANSCO's opex (nominal prices)



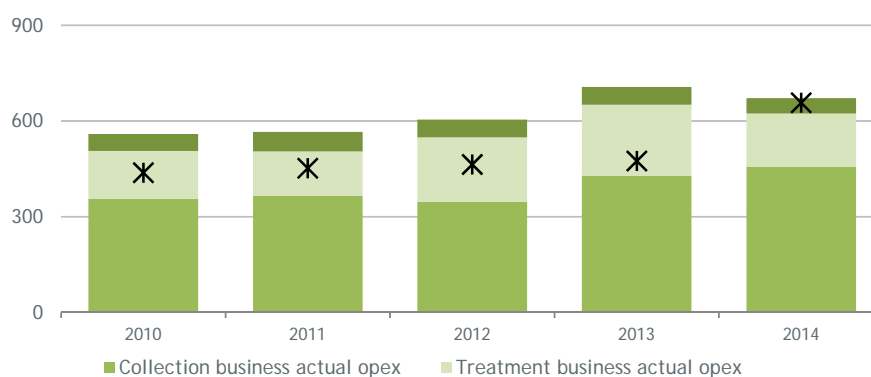
ADSSC's opex performance

4.14 Following is the assessment of trends in ADSSC's opex:

- over the period 2010-2014, ADSSC's actual opex increased on average by about 5% per annum;

- (b) in 2014, the company's total opex reached AED 672 million, almost 20% above the 2010 level (AED 560 million) and over-spending against price control allowances for 2014 by about AED 15 million or 2%;
- (c) Sewerage business accounts for the largest part (about 68%) of the company's total opex, followed by wastewater treatment (25%) and disposal (7%); and
- (d) staff costs constitute the largest part (about 45%) of opex, followed by the repair, maintenance and consumables (43%) and administration and other expenses (about 12%).

Figure 4.5: ADSSC's opex (nominal prices)



Regulatory accounting arrangements

4.15 In consultation with the companies during 2012, the Bureau started working on developing the regulatory accounting guidelines (RAGs), with the objective for the SBAs to:

- (a) increase transparency and consistent reporting and accurate cost allocations, attributions and recharges;
- (b) strengthen the reconciliations to statutory accounts and price controls returns (PCRs);
- (c) provide a robust commentary / detailed narrative on the performance in form of a board of directors report on the SBAs; and
- (d) clarify and strengthen the role of licensees' external auditors in auditing and checking the SBAs.

4.16 The companies tested the guidelines through a pilot run on the then existing (2012) SBAs. In light of the discussions and the pilot run, the full implementation of RAGs was effectuated in stages such that SBAs fully compliant with RAGs were required only for the financial year 2014 onwards. Implementation of RAGs greatly enhanced transparency of companies' costs, particularly staff costs, related-party transactions, capital costs and reconciliation of capex recorded on accrual basis to cash payments. The 2014 SBAs were accompanied with the company board of directors' report providing a platform to the companies to explain variances. Building on this, the Bureau prepared

and discussed with the companies a detailed and robust analysis of 2014 costs compared to price control targets and 2013 actual outturns. Going forward, we require the companies to produce such analysis as part of the company board of directors' report for the SBAs.

- 4.17 Despite improvements in the transparency of costs, there remain areas where the companies need to make further progress particularly on accurate allocation of costs to the separate businesses, capitalisation of costs, robust forecasting and transparency over capex funding arrangements and transactions with the shareholders. To address these issues, the Bureau is currently working with the licensees on related separate work streams such as implementation of ABC system and more robust directors' report and further transparency in the SBAs, in addition to ring fencing (discussed in section 2).

ABC system

- 4.18 During the last quarter of 2015 and January 2016, the Bureau held meetings with the sector to discuss the ABC system, where it was agreed that, in principle, the ABC system should enable a regulated company to produce cost information to a greater granularity than present in order to achieve two main objectives: first, explain the company's operating cost variance from one year to another and against the benchmarks; and second, forecast the operating costs for future years with sufficient accuracy.
- 4.19 To facilitate the above, the companies need to start with identification of activities, the cost drivers related to these activities and relationship between such drivers and their cost impacts.
- 4.20 The Bureau and the companies also discussed that, as a starting point, it may be useful to review some information requests made previously by the Bureau in order to identify the required level of granularity in cost information and hence the scope and other details for the ABC system.
- 4.21 This review could be carried out through interactive and working group discussions in working groups between the Bureau and individual sector companies. The overall target is to run a pilot project applying the ABC system in advance of full implementation in 2017, to enable production of robust 2017 SBAs in 2018 – the first year of the next price controls. The ABC system and SBAs will then be improved and developed further over time based on the experience, lessons learnt and future information requests.

Approach to opex projections and allowances

Approach used for PC4 and before

- 4.22 The Bureau used the following high-level top down approach to set the opex allowances for price controls up to PC4:
- (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 for PC4 review);

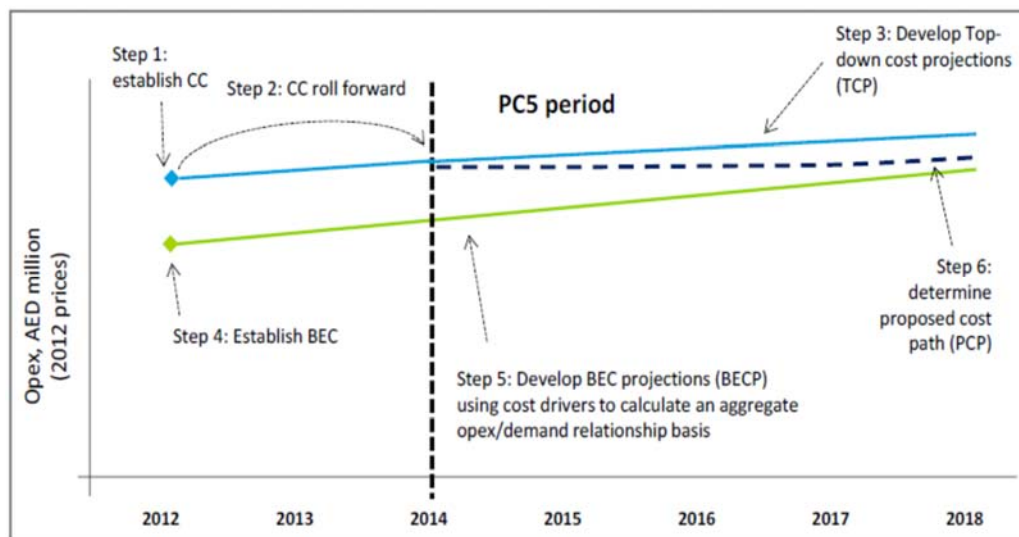
- (c) modify the demand-adjusted opex for efficiency improvements expected over the control period (a 5% decrease in opex per year in real terms was used at the PC4 review); and
- (d) make further adjustments to opex projections as appropriate.

Approach used for PC5

4.23 The opex allowances for the PC5 period were developed in 2013 using a seven-step methodology, employing a hybrid of both a high-level top-down approach and a more detailed bottom-up approach using various cost and efficiency benchmarks from the sector and elsewhere. The approach employed is summarised as follows and illustrated in Figure 4.6 below:

- (a) Establish the company's base level of cost or current recurring controllable cash opex (CC) for most recent year by excluding non-cash items, one-off costs and non-controllable costs (such as the Bureau's licence fee);
- (b) Roll forward the base level of cost to the start of PC5 period;
- (c) Develop top-down cost projections (TCP) up to the end of the PC5 period based on the top-down approach using estimates of high-level cost-volume relationship and expected productivity improvements. Both this and preceding step assume a 0.7% (for electricity businesses) or 0.85% (for water and wastewater businesses) increase in opex for each 1% increase in demand and a real annual efficiency gain of 3% for TRANSCO, 3.5% for ADDC and 4% for AADC and ADSSC;
- (d) Establish bottom-up efficient cost (BEC) for the base year costs using detailed bottom-up benchmarks for efficient costs;
- (e) Starting with BEC, develop bottom-up efficient cost projections (BECP) to last year of PC 5, based on a set of comparator benchmarks, an assessment of cost-structure and cost/volume relationship using cost drivers for specific costs, and an annual frontier shift efficiency assumption of 1% per annum.
- (f) Develop proposed cost path projections (PCP) of reasonable, controllable opex over the PC5 period by allowing a transition path for the company from its expected level of opex in the second year of the PC5 period based on TCP towards the efficient cost level based on BECP, with a linear catch-up rate that closes 60% of the gap between TCP and BECP by 2018; and
- (g) Set the reasonable cost projection (RCP) for PC5 by adding a reasonable estimate of non-controllable opex (ie, Bureau's licence fee) to PCP.

Figure 4.6: PC5 opex projections approach



4.24 These projections included various specific cost allowances for additional roles and responsibilities (e.g. Emiratisation, training and apprenticeship, mega developments, energy costs for additional water pumping) as well as capability building in important areas (e.g. DSM, risk management, business and financial planning, tariff reforms, health and safety). The additional allowances for Emiratisation, Nationals' training, energy costs and mega developments were provided as 'provisional', developed on the basis of the best estimates for underlying cost drivers such as Emiratisation percentage or network length to be adopted from developers, available at that time. These allowances are subject to automatic annual adjustments for outturn results of the cost drivers. In the first year of PC5 period (2014), the outturn values were lower than provisional estimates used in setting specific allowances.

Potential approach for RC1

4.25 Similar to PC5, the Bureau plans to hire an independent consultant to assess and propose reasonable level of opex for the next price control period (2018 onwards). Given the robustness and acceptance of the approach used for PC5, it appears reasonable to use that approach as the starting point and to develop and refine it to address the issues and challenges faced to date.

4.26 One specific area for development in future would be to take account of the interactions between operating and capital costs both in terms of the companies' capitalisation policies and trade-off between opex and capex. This involves incentivising a whole life cycle costing approach to capital projects, optimal asset management and asset performance strategies. It is also necessary to properly understand and take account of the companies' capitalisation policy in determining allowances for operating costs and regulatory depreciation. These issues highlight the importance of the regulation of operating (and capital) costs efficiency to ensure that there are appropriate rewards for efficiency and penalties for inefficiency. They also mean the approach or basis of

capitalisation used in setting the price control allowances for opex is followed by the companies in recording and reporting these costs in audited SBAs.

Key issues for consultation

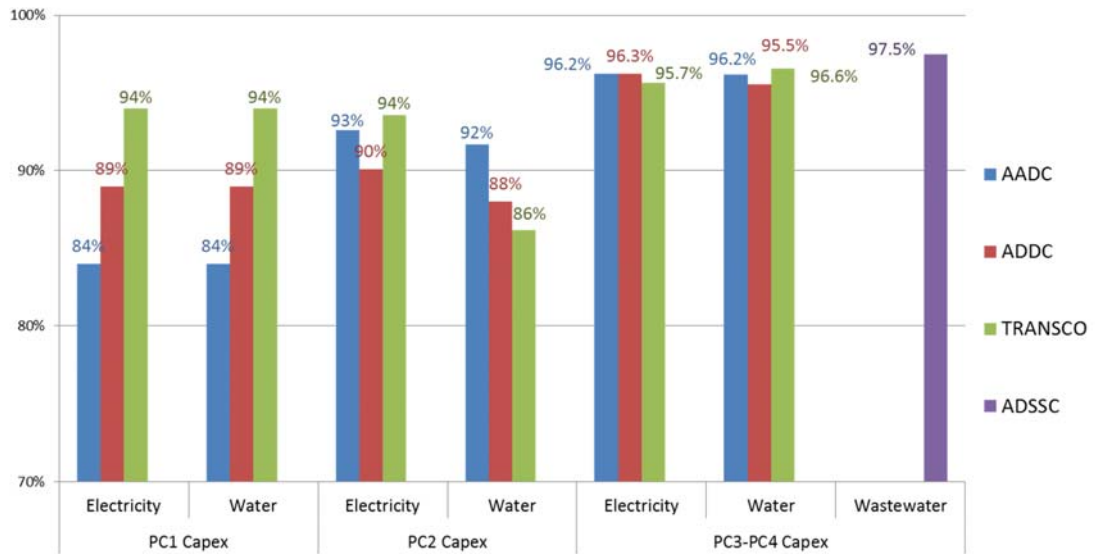
- 4.27 Whether a hybrid of both a high-level top-down approach and a more detailed bottom-up approach, similar to PC5, is appropriate to set main opex projections for RC1? What further changes or improvements are required in this approach?
- 4.28 Whether an approach similar to PC5 is appropriate to set specific allowances for cost items where the companies do not have control over the underlying cost drivers nor can estimate these costs with reasonable accuracy? What should be those specific cost items? Whether some or all of the specific allowances should be set on 'provisional' basis, with automatic adjustment mechanism for outturn results?
- 4.29 How the trade-off between opex and capex should be addressed? How the companies' commitment to set and follow consistent capitalisation policies can be secured and ensured?
- 4.30 Do companies report financial information in a transparent way and with sufficient granularity to allow proper assessments of financial performance?

5. Capital expenditure

Introduction

- 5.1 Capex is important for electricity, water and wastewater network companies. It allows for the timely meeting of demand and the replacement or betterment of existing network infrastructure. Overall, it has a significant impact on the security and reliability of supplies provided by networks. The way that capex is planned and subsequent works are procured provides significant opportunities to improve sector efficiency. As discussed in section 6, capex is financed in the price controls through depreciation allowances and returns on regulatory asset values (RAVs), where the Bureau's estimates of efficient capex are added to the RAVs over time.
- 5.2 The treatment of capex in the previous price control reviews has essentially been based on an ex-post assessment of efficient capex based on efficiency criteria established by the Bureau. Our approach to the treatment of capex can be summarised as follows:
- (a) provisional allowances for future capex are incorporated into the price controls;
 - (b) actual capex spent by a company is assessed at the end of the control period against the established efficiency criteria; and
 - (c) necessary financial adjustments are then made at the subsequent price control review to compensate the company for the difference between the provisional capex allowed in the price controls and the actual efficient capex (taking account of financing costs foregone or unduly earned).
- 5.3 Provisional capex used in setting the price control was solely to facilitate the financing of capex and smoothing of the revenue from one period to another. It was not intended to be indicative of the Bureau's views of the appropriate or efficient level of capex.
- 5.4 The high level efficiency criteria for capex as established by the Bureau in 1999 are:
- (a) was the capex required to meet growth in customer demand or relevant security and performance standards? and
 - (b) was it efficiently procured (procurement to be interpreted both in relation to both the tendering process and project management)?
- 5.5 In contrast to more mature jurisdictions such as the UK where such approach to capex regulation has been used, the capex assessment has produced relatively low efficiency scores in the Emirate of Abu Dhabi and consequently relatively large downward adjustments to the capital allowed into the RAVs and so price control revenue. The efficiency scores that were applied to capex relating PC1, PC2, PC3 and PC4 (2010-2011) periods are summarised in the table below:

Figure 5.1: Network companies' capex efficiency scores to date



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

Table 5.1: Treatment of capex in price controls

Treatment	PC1 capex	PC2 capex	PC3 capex	PC4 capex	PC5 capex	RC1 capex
Provisional capex allowances	Included in PC2	Included in PC2	Included in PC3	Included in PC4	Included in PC5	Subject of this consultation
Firm capex allowance	NA	NA	NA	NA	NA	Subject of this consultation
Capex efficiency review	Undertaken by Bureau in 2004	Undertaken by independent consultants in 2007	Undertaken by independent consultants in 2011-2012	2010-2011 capex review undertaken by independent consultants; 2012-2013 capex review undertaken by Bureau	To be undertaken	Subject of this consultation
Adjustment for efficient capex	Made in PC3	Made in PC4	Made in PC5	Adjustment for 2010-2011 made in PC5. Adjustment for 2012-2013 to be made in RC1.	To be made in RC1	To be decided

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

5.7 Key points to note from the above table are as follows:

- PC1, PC2, PC3 and PC4 (2010-2011) capex are closed matters requiring no further efficiency adjustment to price controls;
- efficiency assessment of PC4 capex (2012-2013), PC5 capex (2014-2015) and the associated adjustments to price control revenue will be dealt with as part of this price control review;
- efficiency assessment of PC5 capex (2016-2017) and associated adjustment to price controls will be dealt with at a future date following this price review; and

- (d) an approach to the treatment of RC1 capex (including moving towards an ex-ante approach) needs to be agreed and incorporated into RC1 at this price review.

5.8 The remaining part of this section 5 discusses the treatment of PC4 and PC5 capex efficiency reviews and how RC1 capex should be treated at this price control review.

Treatment of PC4 capex

PC4 and PC5 final proposals

5.9 For all the four network companies:

- (a) the provisional capex allowances for the PC4 period were incorporated into the PC4 controls at the 2013 price controls review; and
- (b) the assessment of PC4 capex (2010 – 2011) efficiency was undertaken in 2012-2013 by the independent consultants appointed by the Bureau. Earlier, the same consultants carried out an efficient assessment of PC3 capex. Following consultation with the companies at the 2013 price control review, the Bureau applied unified efficiency scores to both PC3 capex and PC4 capex (2010-2011). Adjustment for differences between efficient and provisional PC4 capex (including foregone financing costs) for 2010-2011 were incorporated into PC5.

PC4 (2012-2013) provisional capex

5.10 At the 2009 price control review, provisional capex allowances (of about AED 28 billion in total, in 2010 prices) for the PC4 period (2012-2013) were incorporated into the PC4 controls for AADC, ADDC, ADSSC and TRANSCO:

Table 5.5: PC4 (2012- 2013) provisional capex allowances in 2010 prices

AED million, 2010 prices		2012	2013	Total
AADC	Electricity	900	900	1800
	Water	130	130	260
	Total	1,030	1,030	2,060
ADDC	Electricity	1,570	1,570	3,140
	Water	590	590	1,180
	Total	2,160	2,160	4,320
TRANSCO	Electricity	5,230	5,230	10,460
	Water	2,530	2,530	5,060
	Total	7,760	7,760	15,520
ADSSC	Total	3,000	3,000	6,000
Total		13,950	13,950	27,900

Table 5.6: PC4 (2012 – 2013) provisional capex allowances in nominal prices

AED million, nominal prices		2012	2013	Total
AADC	Electricity	923	930	1,853
	Water	133	134	268
	Total	1,057	1,064	2,121
ADDC	Electricity	1,611	1,622	3,232
	Water	605	609	1,215
	Total	2,216	2,231	4,447
TRANSCO	Electricity	5,366	5,402	10,768
	Water	2,596	2,613	5,209
	Total	7,962	8,015	15,976
ADSSC	Total	3,078	3,098	6,176
Total		14,313	14,408	28,720

Notes: Conversion from 2010 prices to nominal prices is based on UAE CPI 113.07 for 2009, 116.01 for 2011 and 116.78 for 2012.

PC4 (2012-2013) actual capex

5.11 The actual capex spent by the four network companies as per their audited SBAs amount to about AED 18.6 billion in nominal terms. The capex figures in the table below relate only to the companies' own projects excluding assets recorded from or payments made to the mega developers and, in the case of distribution companies, excluding common projects between them and TRANSCO until project completion. The Bureau is in discussion with the companies to fix certain inconsistencies in the capex figures reported in the notes to the SBAs and the statement of cash flows (see notes to the table below).

Table 5.7: PC4 (2012-2013) actual capex in nominal prices

AED million, nominal prices		2012	2013	Total
AADC	Electricity	348	1,253	1,601
	Water	183	452	635
	Total	531	1,705	2,236
ADDC	Electricity	1,023	1,368	2,391
	Water	381	773	1,154
	Total	1,404	2,141	3,545
TRANSCO	Electricity	1,041	2,899	3,940
	Water	2,619	755	3,374
	Total	3,660	3,654	7,314
ADSSC	Total	3,360	2,142	5,502
Total		8,955	9,642	18,597

Note: a) The 2012 actual capex is derived from the cash flow statements in the audited SBAs as follows:

- i. Purchase of property, plant and equipment;
 - ii. Add: Advances to contractors;
 - iii. Subtract: Proceeds from disposal of property, plant and equipment;
 - iv. Subtract: Net book value of property, plant and equipment transferred to a third party;
 - v. Subtract: Material returns from property, plant and equipment;
 - vi. Subtract: Transfer of property, plant and equipment to inventory; and
 - vii. Add / Subtract: Inter-group transfer of property, plant and equipment from / to another party, respectively.
- b) The 2013 actual capex is taken from a note to the companies' SBAs "capex comparable to PC capex allowance", adjusted for actual capex on common projects (see note c, below). This note was introduced under the RAGs from the financial year 2013 and provides the companies' own calculation (audited by the financial auditor) of actual capex that should be rolled into the RAV. However, the capex figures in this note to the SBAs do not reconcile to the figures reported in the cash flow statement in case of AADC, ADDC and ADSSC. Since this note to the SBAs provides more robust calculation, the capex figures have been sourced from this note to the SBAs, instead of the statement of cash flows.
- c) TRANSCO manages certain projects that are common between TRANSCO and distribution companies. TRANSCO records full amount of capex pertaining to the common projects during execution of these projects in cash flow statement but note to the SBAs allocates relevant capex to the respective companies based on initial estimates. On completion, the relevant part of the capex is allocated to distribution companies in the cash flow statement; the distribution companies then record these projects in their books. However, the allocated capex figures relating to common projects before the project completion - transfer out (in TRANSCO SBAs) and transfers in (in the distribution companies' SBAs) - do not reconcile to each other. Therefore, the capex figures in above table have been reported by reversing the transfer in/out before completion based on initial estimates.

PC4 capex (2012-2013) efficiency assessment

- 5.12 In order to make the capex review more effective and timely, the Bureau has recently undertaken an ex-post efficiency assessment of PC4 capex (2012-2013). We commenced work on this assessment in April 2015, and plan to issue our draft reports to the companies in February 2016 and to conclude this review with the issue of final reports in March 2016. This review is based on an assessment of a sample of 8 to 10 capex projects or schemes for each business, whereby various stages (need case, optioneering, design, procurement, delivery etc.) and sub-stages of each project were scored on a scale of 0 to 3 based on evidence (where 0 means no evidence and 3 means full evidence of best or efficient practice). The overall project score would be the weighted average score of all the stages. The overall efficiency score of a business would be calculated as the weighted average score of all sample projects for that business weighted by the capex incurred during 2012-2013 on each sample project.

Treatment of PC5 capex

PC5 final proposals

- 5.13 At the 2013 price control review, provisional capex allowances of AED 40 billion in total in 2014 prices for the PC5 period were incorporated into the PC5 controls for companies:

Table 5.9: PC5 provisional capex allowances in 2014 prices

AED million, 2014 prices		2014	2015	2016	2017	PC5 Total
AADC	Electricity	700	700	700	700	2,800
	Water	300	300	300	300	1,200
ADDC	Electricity	2,700	2,700	2,700	2,700	10,800
	Water	600	600	600	600	2,400
TRANSCO	Electricity	2,300	2,300	2,300	2,300	9,200
	Water	1,800	1,800	1,800	1,800	7,200
ADSSC	Total	1,600	1,600	1,600	1,600	6,400
Total		10,000	10,000	10,000	10,000	40,000

- 5.14 It was agreed that we will undertake ex-post capital efficiency reviews for the past years on a more frequent basis (every 2 or 3 years) using a process scoring methodology.

PC5 (2014) actual capex

- 5.15 The actual capex spent by the four network companies in 2014 is around AED 6.7 billion as per their 2014 audited accounts.

Table 5.10: PC5 (2014) actual capex in nominal prices

AED million, nominal prices		2014
AADC	Electricity	246
	Water	210
ADDC	Electricity	854
	Water	701
TRANSCO	Electricity	2,369
	Water	107

ADSSC	Total	2,184
Total		6,671

Note: Refer note (b) and (c) to the Table 5.7, above. In case of TRANSCO, the actual capex is taken from the revised note provide by TRANSCO through its 9 November 2015 letter (ref: RSB/MD/SBA/09112015).

PC5 capex (2014-2015) efficiency assessment

- 5.16 Similar to the PC4 capex review, the Bureau has planned to carry out an ex-post efficiency assessment of the first two years (2014-2015) of PC5 in 2016 when the following audited accounts will be available from the companies:
- (a) audited accounts for 2014 are already available; and
 - (b) audited accounts for 2015 are due by end of April 2016.
- 5.17 We intend to apply scoring methodology similar to the one developed for the recent PC4 capex review to assess the capex efficiency of 2014-2015 capex. The methodology would be improved and refined further in the light of challenges faced and lessons learned during the PC4 capex review.

Treatment of future capex

Approach to date

- 5.18 To date, the Bureau has adopted and continued with an ex-post approach to capex treatment in the price controls due to a lack of reliable forecasts for future capex (together with uncertainties associated with the new developments in the Emirate of Abu Dhabi) at the time of setting price controls for those future years. This approach included incorporating ex-ante provisional capex allowances in price controls to minimise step increases in MAR from one control period to another as well as facilitating funding capex projects through price controls. However, it was always acknowledged that there are deficiencies in such an approach as compared to an ex-ante approach. For example, this approach created the following problems:
- (a) time lag between incurrence and compensation of capex under price controls;
 - (b) delay in feedback to companies on the capex processes requiring improvement; and
 - (c) less pressure on companies to improve front-end elements of capex projects.

Need for change

- 5.19 Therefore, the Bureau and the companies have always preferred to move towards an ex-ante or more forward-looking approach to the treatment of capex in the price controls. A number of ex-post reviews and particularly the recent more timely reviews, combined with companies' endeavours, have helped the companies to develop and further improve their capex processes. Further, the Government is now demanding more robust information before approving funding for capex projects. In view of more developed capex processes and Government requirements, we believe that it is time to move towards a forward-looking approach to the treatment of capex in price controls.

- 5.20 We understand that this approach has to be pragmatic and needs time to develop to deliver full outputs as required from an ex-ante approach. Towards that end, we may need to continue with some form of ex-post review but with a limited scope. Further, it would be helpful to take stock of the issues, findings and lessons learned during the recent ex-post capex reviews and companies' planning statements process and external capex and budget approval processes that have potential for alignment. This should help identify the gaps in the companies' front-end capex processes and the Bureau's assessment and expectations. The objective should be to develop a robust process and set of guidelines for the first ex-ante capex review to determine the firm capex allowances for 2018 onwards.
- 5.21 The benefits of aligning capital project approvals are potentially significant. At present sector companies seek approval from a number of entities for their capital plans. This can be time consuming and any delays in approvals can impact delivery of important capital programmes. If the sector can develop a process that aligns approval processes whilst ensuring all entities' required oversight and control, then a number of benefits will be realised including:
- (a) minimisation of duplication of submissions,
 - (b) streamlined approval processes;
 - (c) minimise risk to Emirate from delay of project approvals,
 - (d) reduced regulatory burden to Licensees;
 - (e) cross-entity working;
 - (f) specialist teams resourced to review and approve capital projects;
 - (g) reduced burden to Government;
- 5.22 If these benefits can be realised, it will ultimately lead to an enhanced confidence in Abu Dhabi's utility sector. The Bureau will share its proposals with all stakeholders as we discuss capex approval alignment opportunities.

Current thinking

- 5.23 Our initial thoughts on the revised regulatory regime for the treatment of capex are set out below for consideration:
- (a) The Bureau should undertake regular ex-ante capex reviews to approve capex projects and budgets, and allow only approved firm capex (not provisional) in the price controls. Ex-ante reviews would cover:
 - (i) project need case, optioneering, design and budget;
 - (ii) budget approval based on unit cost database (starting with companies' own databases, develop and update the Bureau's own database potentially using external sources); and
 - (iii) each project above a materiality threshold (eg 2%-5% of annual capex).

- (b) The Bureau should conduct regular ex-post capex reviews to approve any change in allowed capex in the price controls. Ex-post capex reviews would:
 - (i) be limited to those projects where actual capex is significantly (eg, 10%) higher than the approved capex; and
 - (ii) consider sharing additional costs/savings between companies and customers.
- (c) The Bureau would then make regular adjustments to MAR to incorporate the approved capex in the price controls. This will ensure that price controls always reflect the approved (and not provisional) capex. While this will also help smoothing out the MAR step increases over a longer term, there may be significant volatility in the shorter term as the sector adjusts to the new regime.
- (d) The Bureau and network companies will seek opportunities for alignment with other existing capital approval and budgeting processes.

5.24 In this regard, we suggest the following action plan to implement the revised regulatory regime for capex:

- (a) in February 2016: conduct a workshop with the companies to discuss the framework for ex-ante capex review;
- (b) by end March 2016: finalise process and programme for ex-ante capex review and issue relevant guidance to the companies;
- (c) by end 2016: complete an ex-ante review and approval of future capex to set firm capex allowances for 2018 onwards;
- (d) by end 2017: incorporate firm capex allowance for 2018 onwards in RC1 final proposals;
- (e) continue ex-ante and ex-post capex reviews on a regular basis (as part of the planning statement process or otherwise); and
- (f) make regular MAR adjustments for firm future capex allowances and ex-post actual efficient capex.

Key issues for consultation

5.25 Key questions relating to the treatment of capex at this review include the following:

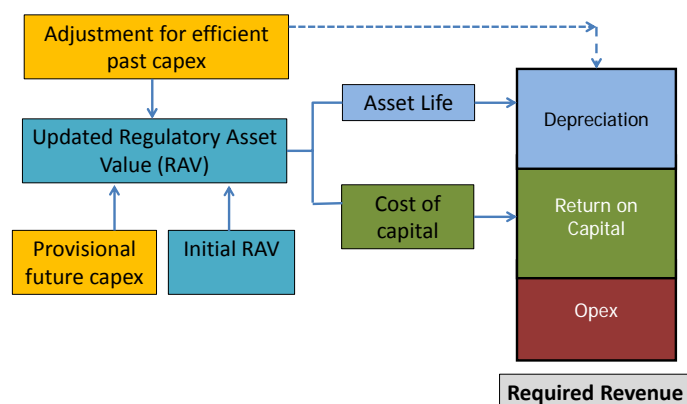
- (a) Are there any views on the work to date or planned for ex-post capex reviews for 2012-2013 and 2014-2015?
- (b) Are there any views on the proposed approach and plan for ex-ante capex review and approval to set firm capex allowance for the RC1 period?
- (c) Are there other changes which should be considered at this review in relation to the regulation of capex?

6. Financial issues

Introduction

- 6.1 Section 5 discusses the levels of capex which would be prudent to be allowed to support an efficient business and the objectives described in sections 2 and 3. This section discusses how these capex should be financed through price control revenue.
- 6.2 Because capex relates to assets that have an economic life of many years, it is generally appropriate to allow for the recovery of these costs over an extended period of time. This can be accomplished by allowing these costs to be capitalised and added to the regulatory asset value (RAV) with an annual allowance for depreciation. In order to finance the unamortised portion of the RAV, it is also appropriate to allow the licensee to earn a return or cost of capital on this net asset value.
- 6.3 This section considers the calculation of the RAV and the appropriate allowances for regulatory depreciation and returns – two of the three key building blocks used to establish the overall level of core price control revenue. It also raises key issues for consultation for the new price controls for 2018 onwards.

Figure 6.1: Financial issues in price control calculations



Regulatory depreciation

Current price control arrangements

- 6.4 For the price control calculations, the regulatory depreciation allowance for any year is calculated as the sum of the depreciation on the existing RAV at the start of the price control period and the depreciation on the future capex allowance made at the price control review. The calculation of regulatory depreciation requires assumptions about capitalisation policy, depreciation profiles and asset lives for the company. To date, the Bureau has assumed that the approach to capitalisation policy used in the companies' SBAs should also be used for price control purposes and that it is appropriate to use straight line depreciation. Assumptions with respect to asset lives used to date are summarised in the table below.

Table 6.1: Asset life assumptions at previous price control reviews

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

Source: Bureau

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

6.5 Once the initial RAV or the new capex is fully depreciated at the end of the respective life shown in the above table then there are no further allowances for depreciation or returns for that tranche of assets.

Defining depreciation as capital charge without inflation

6.6 In Abu Dhabi, the purpose of the depreciation allowance is to enable the network companies to recover and repay the capital investment to fund providers. Depreciation is complemented by the return on capital element of the building blocks, which remunerates the fund providers for the time value of money and the financing costs in terms of interest and profit payments.

6.7 As discussed in section 2, the regulator and funding model has not been implemented as originally envisaged and the Government funding has not been repaid. To fully address these issues for the future price controls, regulatory depreciation allowance will be explicitly defined as a capital cost recovery tool to repay the principal or original amount of capital investment (to distinguish it from accounting depreciation expense or fund for asset replacement). The immediate consequence of this explicit clarification is that depreciation no longer needs to be indexed against inflation. The time value of money and inflation protection for capital investment would be provided by the return on capital component of price control revenue.

6.8 Our current thinking is to continue with the straight-line method for regulatory depreciation for the new price controls.

Review of asset life assumptions

6.9 As discussed in section 2, the increasing network and production costs (particularly when the nuclear power plants start operating), together with the tariff reforms and movement towards cost-reflective tariffs, will over the next few years increase significantly the stakeholders' scrutiny and pressure to control and reduce costs in the sector, and consequently the MAR and subsidy requirement.

6.10 In this context, the Bureau considers that it is opportune to review the price control assumptions for asset lives, to ensure that these assumptions are aligned with the actual

economic useful life of the assets, and that any associated allowed revenue reflects accurately how the benefits from these assets are observed over time.

- 6.11 Given the current assumptions for new assets (currently 30 years for electricity and water, 50 years for wastewater), the Bureau expects that this review is likely to result in longer asset life assumptions for the future price controls, which will in the short term represent lower annual depreciation allowances and hence MAR.
- 6.12 The Bureau's is considering whether any extended asset life assumption should apply to new and existing assets, or only to new investments. For example, Ofgem has recently extended its asset life assumption for new electricity transmission and distribution assets to 45 years.
- 6.13 The determination of the asset life assumptions for depreciation purposes (for existing and new assets) will require an analysis of the life of the network assets in the companies, either for each individual asset, for categories of assets, or for the overall asset base. While network companies can provide asset categories and asset values, the assessment of the useful asset life is complex, and would require an expert assessment of the main categories of individual assets in the light of current technology, market conditions and asset conditions (characteristics of materials, installation, weather, ground conditions). The Bureau is therefore planning to use the expert advisers which we plan to appoint to assess the future opex projections also to conduct the required analysis, and provide advice on the weighted average asset life assumption for the next price controls.

Updating RAVs

- 6.14 To calculate the RAVs for the next price control period, the Bureau intends to use an approach consistent with that adopted during previous price control reviews, adapted to include the introduction of the ex-ante capex reviews. This would involve making calculations for each year since the start of 2012:
- (a) For the PC4 and PC5 periods, it would be necessary to align previous provisional capex allowances for regulatory depreciation with the approved efficient capex for the two last years of PC4 period (2012-2013) and for the first two years of PC5 (2014-2015) at this price control review, as discussed in section 5. The capex adjustment for the last two years of PC5 (2016-2017) would be made at a future date when the efficiency assessment is undertaken for these years.
 - (b) For the RC1 period (2018 onwards), the RAVs will be updated for the firm capex allowances approved through the planned ex-ante capex review discussed in section 5.
- 6.15 In practice, the above adjustments to the RAVs will be made as follows:
- (a) For 2012-2013, adjustments can be made by calculating the opening RAV for 2018 (i.e. the first year of the PC6 control period) from the RAV calculated for the end of 2017 at the last review by adding the difference between efficient and provisional PC4 capex (net of accumulated regulatory depreciation) from the time such capex was spent up to the end of 2017. It will also be necessary to make an adjustment for financing costs of the differences between the efficient and

provisional capex for 2012-2013, until the start of the new price controls in 2018. This adjustment for foregone financing costs can be either made to the RAV (as was done for PC1 capex financing costs) or remunerated as additional revenue over the RC1 period (as has been done since PC2).

- (b) The same approach as described above can be applied to the updating the RAVs for PC5 capex to the extent they are reviewed for capex efficiency prior to issue of the RC1 Final Proposals in 2017. We anticipate that by this stage the Bureau will have completed the capex efficiency reviews for 2014 and 2015.
- (c) For the RC1 period, the RAV will be calculated by adding the firm capex allowances resulting from the ex-ante capex review, and subtracting the forecasted regulatory depreciation for each year of the RC1 period. The capex allowances, RAV and regulatory depreciation will be adjusted in future following any capex review which the Bureau will undertake, as discussed in section 5.

6.16 As mentioned earlier for the explicit definition as capital repayment charge, there will be no inflation indexation of the regulatory depreciation for the future price controls. In order to have a consistent opening RAV for RC1 at the beginning of 2018, it will be necessary to update the closing RAV for 2017 (from the PC5 final proposals) to remove inflation from the depreciation allowances since 1999.

Cost of capital

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

Overall framework

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

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

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

6.19 Important features of this approach to WCC calculation can be summarised as follows.

- (a) The **cost of debt** is estimated by adding a suitable corporate debt premium to a risk-free rate:

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

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

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

- (c) In addition to CAPM, there are other approaches such as Dividend Growth Model and Arbitrage Pricing Theory that can be applied to estimate the cost of equity. Nevertheless, CAPM remains the method that is most widely used by regulators, businesses and investors for estimating the cost of equity.
- (d) The **risk-free rate** represents the return available from a riskless form of investment, typically estimated as the return on government bonds.
- (e) **Debt premium** measures the additional return on debt required over and above the risk-free rate by a given business subject to uncertain cash flows and default risks.
- (f) **Market risk premium** is the extra return required by investors in the stock market as a whole for investment in equities compared to the risk-free rate.
- (g) The **equity beta** measures the riskiness of a given investment (i.e. shares of a specific business) relative to the average level of risk in the equity market.
- (h) Estimates of the cost of debt and equity need to be made in a way which is consistent with the assumptions on gearing. In many jurisdictions, there are tax advantages associated with higher levels of gearing, but also disadvantages as high levels of leverage create increasing risks of bankruptcy. The trade-off between these factors can create an optimal level of gearing, which takes advantages of the tax shield created by debt finance to the point where these incremental advantages are offset by the increased risk of financial failure.

6.20 The cost of capital can be expressed in different ways, for example, in real or nominal terms, and in pre-tax or post-tax form. Regulators vary in the way they express and use cost of capital. It is important for the cost of capital to be consistent with the price control calculations. If a post-tax cost of capital is used, the tax payments the company is expected to make must be included as part of the costs it is allowed to recover through the price controls. In Abu Dhabi, there are no taxes on corporate profits at present and so the pre-tax and the post-tax measures of cost of capital are therefore equal. Further, we used a real cost of capital in setting the price controls and inflation protection was provided by adjusting the MAR for the UAE CPI.

Approach to date

6.21 In view of the limited size and liquidity of debt and equity markets in the Emirate of Abu Dhabi, the Bureau's previous estimates of the cost of capital have drawn heavily on the estimates of cost of capital components used by regulators of similar businesses in the UK and Australia. The Bureau used a real post-tax cost of capital of 6% for setting the PC1 and PC2 controls for water and electricity companies. For PC3 and PC4, a cost of capital of 5% and 4.5% respectively was used for all four network companies.

6.22 For PC5 controls, we considered that a range of 3.8% to 7.3% for the real cost of capital with a mid-point average of 5.5% would be appropriate. This was based on evidence from regulatory decisions or proposals in the UK and Australia as well as those of the UAE and Bahrain Telecommunication Regulatory Authorities (TRAs) at the time. Based on that evidence, we adopted a real cost of capital of 5.50% for PC5 as per the calculations set out below.

Table 6.2: PC5 cost of capital calculations (real terms)

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

Considerations for RC1

- 6.23 To date, the return on capital has been estimated for price control purposes based on actual and benchmark rate of returns or WACCs observed in the international, regional and local capital markets as well as those used by overseas and local/regional utility regulators. This has been driven mainly by limited information about the actual returns agreed by the companies or ADWEA with the Government and other fund providers (the Bureau's previous estimates of WACC took account of such actual cost of funding information to the extent possible).
- 6.24 Going forward, the Bureau's current thinking is to base the WACC on the actual cost of funding provided by the Government and other fund providers to the network companies. Under this framework, establishing the actual cost of funding will require sourcing or estimating separately the actual cost debt and the actual cost of equity:
- (a) The actual cost of debt should be relatively straight forward to estimate, as it results from the interest set out in the agreements with banks or the Government. In the case of Government and shareholder loans, currently there are no agreed or specified repayment and interest terms. We therefore seek views from the stakeholders on the appropriate interest rate (not exceeding the market rates) which can be proposed for the Government and shareholder loans as well as used for the price control calculations. One option could be to look at the interest rates for Government loans provided to other projects in Abu Dhabi.
 - (b) The return on equity would need to be estimated from the capital market data and other regulatory decisions. The Bureau can continue to apply the same research and estimation methods as it has employed to date to the cost of equity based on overseas regulatory decisions and local and regional capital market data (taking account, where practicable, of the Government ownership of the sector companies).
- 6.25 In line with the practice in other jurisdictions and the Bureau's approach to date, our current thinking is to continue with estimating and using a real WACC in setting the price controls and applying annual inflation indexation to the return on capital component of MAR as discussed in section 3.

Key issues for consultation

- 6.26 Key issues for consultation on the matters discussed in this section include the following:

- (a) What are stakeholders' views on the approach discussed above to define and calculate the regulatory depreciation and update the RAVs?
- (b) Do the stakeholders agree that it is opportune to review the assumptions for asset lives in the price controls?
- (c) Should the Bureau estimate the WACC based on the actual cost of funding and reflecting the Government ownership? Specifically, whether cost of debt should be based on the actual interest rates on the loans provided to the companies by the Government, shareholders and banks, provided they do not exceed the market rates?
- (d) Does the existing approach to estimate the cost of equity using Capital Asset Pricing Model (CAPM) and both overseas and local capital market data remain appropriate?
- (e) Should the Bureau continue estimating and using the cost of capital in real terms for price control calculations and applying annual inflation indexation to the return on capital component of MAR during the control period?

7. Incentives

Introduction

- 7.1 The price controls for all the four network companies include a Performance Incentive Scheme (PIS) designed to encourage appropriate quality of service, outputs and performance. Under this scheme, companies are rewarded for improved service and output performance, and are penalised for deteriorating performance on an annual basis against a set of pre-defined performance indicators.
- 7.2 The performance indicators for each licensee have precise definitions, targets and incentive rates, and an automatic annual revenue adjustment for performance via a term “Q” in the MAR formulae. Companies are required to appoint an independent Technical Assessor (TA) with the Bureau’s approval to verify the accuracy of the information required for calculation of a number of performance indicators.

Figure 7.1: How performance incentive scheme works?



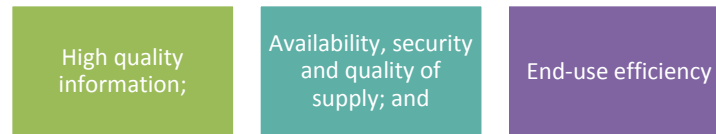
- 7.3 It is common practice for regulators to use incentives to promote appropriate behaviours from the regulated firms. Companies will rationally choose the options which best maximise their objectives, although these may sometimes not align with the maximisation of the Government’s interests or the customer welfare. Incentive-based regulation generally, and the PIS under price controls in particular, aim to bridge this potential gap, by inducing the companies’ efforts in achieving the desired outcomes.
- 7.4 A performance incentive will only be effective when the reward is greater than the cost to achieve the desired level of performance or output. However, it is necessary to maintain an appropriate balance in the use and design of financial incentives, so that companies are not incentivised to take unnecessary risks or to focus on the incentivised areas to the detriment of non-incentivised areas. There are other aspects which may impact the effectiveness of incentives. Incentives should be simple, objective, measurable, controllable and transparent.
- 7.5 Having this view, we propose continuing with the concept of performance incentives. We propose to use this price control review to look at what can be improved in the current framework, either more holistically in terms of considering the key areas for developing incentives, or in more detail by reviewing specific incentives or their design features.
- 7.6 This section starts by providing some background about the incentives in the current price controls and the Regulatory Instructions and Guidance (RIG) developed to date. We then discuss the strategic areas for developing incentives in the next control period, the potential alterations to the existing incentives, and some incentives design features.

Incentives in the current price controls

Current incentives and focus areas

7.7 The existing price controls include incentives in three key areas, as shown below:

Figure 7.2: Three key areas of current incentives



7.8 The incentive for high quality information aims to lead the companies to provide timely and quality information to the Bureau, which is essential for effective regulation.

7.9 Consistent with the provision of essential utility services, licensees currently face appropriate incentives for network availability, security and quality of supply. There are also licence conditions relating to the security standards for the development of networks.

7.10 AADC and ADDC have an incentive to promote consumer's efficient use of water and electricity. This is a particularly important area as the water and electricity consumptions per capita in the Emirate are relatively high, and the final customer tariffs remain heavily subsidised and do not provide sufficient signals for efficient use of water and electricity.

7.11 **Table 7.1** lists all incentives implemented under the current price controls:

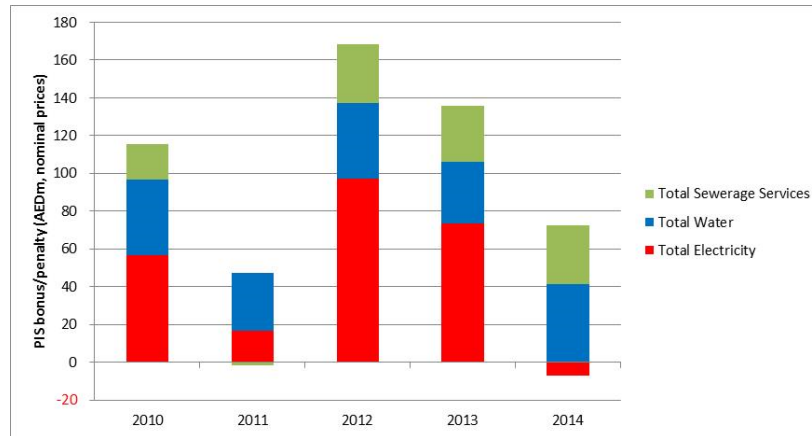
Table 7.1: Incentives in the current price controls

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

Notes: "✓" represents an incentive introduced prior to PC5; "☑" represents a new incentive introduced in PC5.

7.12 Figure 7.1 presents the overall level of financial bonus/penalty realised by the companies under the PIS over the last five years. Overall, the companies' performance on incentives has been positive, with the companies receiving bonus year-on-year in each business segment (the only exception being the electricity sector in 2014, where the level of aggregate penalties is higher than the level of bonus). Network companies may have received a financial bonus on some performance indicators, and a financial penalty on other indicators. The chart below presents the net aggregate effect of all incentives, broken down by sector.

Figure 7.3: Network companies' aggregate bonus or penalties under PIS, 2010-2014



Changes introduced in the last review

7.13 At the last price control review, a number of changes were made to the incentives arrangements for PC5 (in addition to resetting the incentive rates and certain targets):

- (a) The concept of Category B indicators was removed. These indicators were not fully developed with an automatic annual MAR adjustment but were monitored for exceptional performance for a potential financial adjustment at the next review.
- (b) On availability, security and quality of supply, new incentives were introduced for:
 - (i) removal of timed water supply (for AADC and ADDC);
 - (ii) interface metering and security of water supply (both for TRANSCO); and
 - (iii) biosolids reuse (for ADSSC).
- (c) In relation to the provision of high quality information, a single incentive merging two previous separate incentives for SBAs and PCRs was introduced, as the SBAs now include PCRs in accordance with the issued RAGs. Further, the new incentive was more symmetrical and included a financial bonus as well. On TRANSCO's proposal to rely on its statutory obligations, information incentives were put in abeyance for TRANSCO (subject to satisfactory performance).
- (d) The previous incentive on end-use efficiency was replaced by an incentive for the development of an overall strategy and action plan (with specific targets and milestones on end-use efficiency over the medium to long term) by AADC and ADDC. Once this strategy and action plan is fully developed, the companies and

the Bureau are expected to discuss additional incentives and funding requirements to implement the approved strategy and action plan.

- (e) The cap on the financial impact of each incentive was reduced from 1% to 0.5% of the MAR, to ensure a balanced set of incentives and to help protect the licensees from any undue business risk.
- (f) We also adopted a flexible arrangement to allow introduction of further incentives, following consultation with the stakeholders, during the PC5 period in other specific areas (further discussed below).
- (g) In PC5, we also introduced the concept of RIG, which the Bureau can issue from time to time, following consultation, to provide detailed guidance on the measurement and interpretation of individual performance indicators if necessary.

New incentives for development during the PC5 period

7.14 The PC5 final proposals identified the following five key areas for development of new incentives during the PC5 period, in addition to other areas where the sector justified the need and benefits.

- (a) asset management;
- (b) customer service;
- (c) transmission system operator (TSO);
- (d) DSM initiatives and schemes; and
- (e) carbon accounting.

7.15 The progress in developing incentives in each of these areas has been very limited to date. The Bureau proposes to use this review to progress the work in the development of these five areas, or any other new incentives areas proposed by the sector. It is important that the incentives are developed in a consistent manner and overall are compatible with the objectives of the price control review.

Regulatory Instruction and Guidance (RIG)

7.16 In the PC5 Final Proposals, the Bureau indicated that it can, where necessary, issue and/or amend RIGs to provide detailed guidance on the individual performance indicators, so as to address emerging issues and incorporate lessons learnt.

7.17 The RIG documents represent a useful tool which the Bureau has already used in the past, even before the PC5 development:

- (a) We have one RIG which was published in 2006, on the customer interruptions reporting (linked with SAIFI and SAIDI incentives).
- (b) The Bureau has updated this customer interruptions reporting RIG, which has recently been issued.

- (c) In 2014, we worked with ADSSC to publish a RIG on the methodology to measure the mass of biosolids for the implementation of the biosolids reuse incentive.
- (d) We also developed and issued a RIG in December 2015 for the DSM strategy and action plan incentive, to formalise the feedback provided to AADC and ADDC since the development stages of PC5 and to explain our requirements for the contents and the level of robustness of such strategy and action plan.

7.18 RIG documents are an important element of the implementation of an incentive, where it has been identified that the additional instructions and guidance are required and will be useful to enable the companies to perform adequately and effectively discharge their obligations under the licence. In this sense, we welcome feedback from the sector on how useful and effective the existing RIG documents have been, how this tool could be improved in the future, and which existing or new incentives may require RIG.

Key areas for incentives development and implementation

7.19 This price control review is a good opportunity to strategically consider the main areas where incentives should focus. Without prejudice to the three key areas where the existing incentives focus, there may be other areas of the network businesses which need to be incentivised for improvement. The Bureau welcomes the stakeholders to discuss the priority areas for improvements over the next price control period, with the view to inform the development of the incentives framework, and in particular of any new incentives.

7.20 To inform this discussion, below are some areas which we consider may be important in the future development of the sector and the regulatory framework. These are not exhaustive in anyway, and we seek stakeholders' views about these or any other improvement priority areas for the sector.

- (a) Over the years, sustainable development has acquired more and more relevance for the water, wastewater and electricity sectors, and also for regulation. Regulators globally are including the environment as part of their concerns, decisions and, in many cases, incentives framework. Sustainability is also an area with growing importance in Abu Dhabi. The current incentive for DSM is a step in the right direction to address sustainability from one perspective. We have also identified carbon accounting as one key areas of incentives for development.
- (b) Customer service is a traditional focus area of regulators. Globally, the focus of regulation and incentives is shifting more from performance or outputs towards customer satisfaction. We have also identified it as one of the areas for future development of incentives. This area has become more important than ever after the recent customer tariff reforms, as discussed in section 2. Incentives can be introduced to improve customer complaints handling and response time, timely submission of HSE incident reports, implement service standards, and improve customer satisfaction (as evident by independent surveys). In late 2015, we created a workgroup for improving the regulatory framework and sector practices on customer services, and this review is timely to address this important area.

- (c) The practices and performance of the sector on connecting new customers may be another potential area for future development of incentives.
- 7.21 While the strategic consideration of the areas for future incentives is imperative, it is equally important to maintain an incentives framework that is coherent, simple, and a good use of limited resources. The incentive scheme should therefore comprise a robust but necessary limited set of incentives, to ensure focus on the key results.
- 7.22 We consider that any new focal areas for incentives, and/or the development of new incentives, should to the extent possible be aligned with:
- (a) the government objectives for the sector;
 - (b) the recently published Bureau's forward plan and its regulatory performance measures;
 - (c) reflect the outcomes of any ongoing Bureau initiatives (e.g. focus on overall licence compliance and customer service); and
 - (d) where appropriate, recognise the performance contract the licensees have with the Government through their strategic plans and reporting.

Potential improvements to the existing incentives

- 7.23 In addition to identifying and developing new incentive areas, we need to consider any potential improvements to the existing incentives. This may be through changes to the definition of the performance indicator, its scope, the design of the incentive, or the removal of the incentive (with or without a replacement incentive). Some potential improvements to the existing incentives in all three existing incentives areas are discussed below.

Incentives for high quality information

- 7.24 Network companies have licence requirements to prepare and send to Bureau (and in certain instances to make available to other interested parties) a range of information. These requirements are enhanced by obligations to have certain information audited, independently verified and/or approved by the Bureau.
- 7.25 The PIS reinforces these arrangements with a system of penalties and rewards for the timely provision of two key information submission subject to certain basic quality tests:
- (a) SBAs (including PCRs) with an external financial auditor's certificate, a director's certificate and a report by an independent TA; and
 - (b) AIS with a report by the TA.
- 7.26 Companies have exhibited a systematic good performance on these two incentives by timely information submissions, though the quality of AIS has not been impressive. The network companies appear to have now reached a sustained standard in the submission of these regulatory statements in a timely manner. This raises the question whether these incentives are the best tools to encourage continued quality improvement in the

future. This is supported by TRANSCO's self-selection to provide the required standard of timeliness and quality without the financial incentive.

- 7.27 Views are invited on the following key questions about the best way to promote quality of their information over future years with or without incentives:
- (a) How the arrangements for review by the TA and auditors can be developed further to improve the quality of information? Should they be appointed by the Bureau instead of companies? Whether they should be reporting to a panel of the Bureau and companies representatives? Should the information and guidance package for the TA be put together by the relevant licensee rather than the Bureau, while the Bureau only reviews such package and provides guidance on the contents of the TA report?
 - (b) Should the TA requirement be removed and instead the company's board of directors be responsible for quality assurance (which may hire a TA itself), along with integral sign-off by the relevant data owners and managers?

Incentives for availability, security and quality of supply

- 7.28 The regulation of the availability, security and quality of supply involves a range of different regulations and licence conditions, as well as the PIS. All network companies are governed by a number of important laws, regulations, industry codes and licence conditions. In the case of ADSSC, these include the Trade Effluent Control Regulations and the Recycled Water and Biosolids Regulations. For water and electricity network companies, these include Transmission Codes, Distribution Codes, Metering and Data Exchange Codes, Water Quality Regulations and Water Supply Regulations.
- 7.29 There are also licence conditions that prescribe network security standards and require network companies to produce a five or seven year planning statement. There are also a number of licence conditions which apply to AADC, ADDC and ADSSC, covering customer service standards and regulations.
- 7.30 The following table lists the current availability, security and quality of supply incentives. These incentives, with the calculation method, incentive rates and targets, are set out in the companies' licences and further clarified in any relevant RIGs.

Table 7.2: Current availability, security and quality of supply indicators

Company	Electricity	Water	Wastewater
AADC / ADDC	System Average Interruption Duration Index (SAIDI)	Water Quality	
	System Average Interruption Frequency Index (SAIFI)	Distribution Loss Reduction (DLR)	
	Distribution Loss Reduction (DLR)	Interface Metering (IM)	
	Interface Metering (IM)	Removal of timed water supply	
TRANSCO	System Availability	Water Quality	
	Energy Lost	System Availability	
	Interface Metering (IM)	Interface Metering (IM)	
		Security of supply	
ADSSC			Biosolids reuse

7.31 It will be appropriate to consider how best to enhance these incentives for optimal performance. Below we consider a number of topics in this area, which are not exhaustive and we welcome feedback about these and any other relevant topics:

- (a) TRANSCO has steadily achieved high levels of water and electricity system availability. While it is important to keep monitoring system availability, the level of sustained performance achieved may not warrant an incentive in this area for future.
- (b) TRANSCO's performance on energy lost indicator has shown some volatility over the years, which in some cases has been significant. The net Q term for this indicator since 2007 is slightly positive, with the number of years where TRANSCO over-performed or under-performed being almost the same. The Bureau seeks views on how this indicator can be improved or whether this indicator should be removed for future years.
- (c) Our discussion with TRANSCO shows that it has concerns about the design of the incentive on security of water supply. This review is a good opportunity to improve this incentive and for TRANSCO to make proposals in this direction.
- (d) The transmission system operator (TSO) function of TRANSCO is one of the areas where an incentive was proposed for development during the PC5 period. The actual design of the incentive has been developed by a consultant as part of the Bureau's work on economic despatch. This incentive aims at promoting transparency and optimality of despatch and scheduling decisions of TRANSCO. However, there has been very limited progress in the implementation of this incentive to date. The Bureau considers this an important area, with significant financial and security implications for the sector, and understands that TRANSCO is currently facing temporary implementation difficulties in relation to this incentive. The Bureau expects that any implementation difficulties should not prevent the incentive to be tested and fully functioning from the first day of the new price control period. We are however concerned with a trial run which TRANSCO conducted in 2015 to collect some data for TSO function, without due consideration of its cost implications for the sector and customers. We are gathering information about this event and considering appropriate financial adjustment to price controls to reimburse the additional costs incurred by the sector and to incentivise TRANSCO to avoid such occurrence in future.
- (e) Asset management is another incentive area proposed for development under the PC5 period. Good asset stewardship is important for ensuring the network reliability and availability and security of supply. Previous discussions with the sector have signalled that certification to an international standard could be incentivised to improve asset management processes. The network companies are at different stages of the implementation of such certification. While supportive of obtaining this certification, we consider it more important to focus on the results of companies' asset management practices. We are willing to consider developing and incentivising asset health and load indicators, which are consistent with good practices in this area used in other jurisdictions.

- (f) On the distribution businesses, there may be an opportunity to develop some new incentives to cover other areas of availability, quality and security of supply. Demand forecasting, water pressure of supply, or water system availability are a few examples. Current incentives for system losses and leakage also have rooms for improvement. Views are sought on the key priorities for improvements in the distribution businesses.
- (g) In relation to the wastewater sector, the Bureau introduced an incentive on the reuse of biosolids for ADSSC, though it appears that the first year has seen no progress on this matter (no biosolids were reused in 2014 and ADSSC did not meet the incentive target). The Bureau remains convinced that this is an important area, and welcomes ADSSC to provide some background on its performance, on its action plan over the remainder of the PC5 period, and any views on how the incentive may be improved. We are also willing to consider other potential incentives for the wastewater sector – for example, on recycled water and energy consumption efficiency - and welcomes ADSSC views in this respect.

Incentives for efficient use of water and electricity

- 7.32 At the last price control review, the Bureau implemented a DSM incentive, under which the distribution companies were required to develop a DSM strategy and action plan to the satisfaction of the Bureau. The Bureau also included in PC5 specific opex allowances for the distribution companies to build capabilities on DSM. We also intended to develop incentives for implementation of the DSM strategy and action plan.
- 7.33 It will be appropriate to consider how best to improve the effectiveness of these arrangements as part of this review. We expect that the two distribution companies will be able to satisfactorily conclude their DSM strategy and action plan documents, and are open to discuss with the sector on how best to progress and promote end user efficiency.

Design and calibration of incentives

- 7.34 The previous sub-sections have focussed on either the high level areas for incentives or specific details of individual incentives. This sub-section discusses the design of incentives, which may apply across the range of incentives.

Types of incentives

- 7.35 All the existing incentives provide the companies with a financial bonus or penalty for good or poor performance. For each incentive, the annual financial incentive is capped at 0.5% of the MAR and, for a given incentive, any potential bonus is symmetric to any potential penalty. Some incentives have a dead-band, which corresponds to an interval of performance of the company for which there is no bonus or penalty.
- 7.36 Financial incentives, by linking directly the level of performance of the company to its costs and profits, tend to be more powerful in promoting the desired behaviour from the regulated company. However, there may be some situations where a non-financial

incentive may be more appropriate, for example where a new incentive is being introduced but there is uncertainty about its measurement or outcomes.

- 7.37 Reputational incentives (e.g. league tables) are one type of non-financial incentives that regulators often use in these situations (other examples include investigations and processes). The Bureau would like to receive views from the industry on the net benefits of introducing reputational incentives, and on which performance areas (new or existing) this type of incentives should be applied.

Amount of financial incentives

- 7.38 Financial incentives have a direct impact on companies (through their impact on returns and profits) and customers (via higher tariffs). Situations should be avoided where companies may be excessively rewarded, which would be detrimental to consumers, or excessively penalised, which could put the companies' financial position at risk.
- 7.39 The level of the financial incentive can normally be estimated through an assessment of the costs incurred to meet the desired performance, or through the value that the required level of performance will bring to consumers, though these (and especially the latter) may be difficult to measure and precisely define.
- 7.40 One example of the utilisation of the latter concept in regulation is the value of loss load (VOLL) approach. The VOLL enables to proxy the value that customer would be willing to pay to avoid losing the energy service, and is commonly used by other regulators and network companies in conjunction with energy loss indicators to improve the reliability and availability of the water and electricity networks.
- 7.41 We are interested in discussing with the sector how the financial incentives can better reflect the cost to improve and the customer willingness to pay for the improved services, whether the amounts should more mechanistically be determined with reference to the MAR, or whether we could apply both approaches, splitting them by different incentives. Both approaches have advantages and disadvantages and both are used widely. In either case, a cap on individual incentive or an overall cap on the incentives would still be desirable to protect companies' financial position and customers' interests.

Symmetry of financial incentives

- 7.42 In general, all incentives are currently symmetric in that they have both bonuses and penalties and the maximum potential penalty is the same as the maximum potential bonus that a company may receive. However, in some cases, cost to deliver or improve performance is already built in the opex allowances of the price controls. In these circumstances, providing a bonus could be considered as rewarding twice the companies for the same result. On the other hand, a penalty for failure to meet the required standards could be interpreted as removing (entirely or partially) the cost allowance initially provided, removal of which could be justified because the company could not deliver the required performance or incentive. The Bureau is considering whether an asymmetric approach is more appropriate, by applying a penalty-only scheme either to all or some of the performance incentives, and welcomes the sector to express their views on this matter.

Dead-band of performance

7.43 Issues such as the level of financial incentives and the symmetry of the approach and particularly the performance measurement errors and the (lack of) robustness of performance indicator may lead to increased risks for the companies and the customers. Dead-bands (and a cap on the level of each incentive) represent tools used by the Bureau in the price controls to ensure an appropriate balance of level of risk for the network companies through the incentives framework. Dead-bands define the range of performance where a company is not subject to any financial bonus or penalty. We welcome input from the sector about the effectiveness of these tools and how they can be improved for the next price control period.

Aggregation of multiple indicators

7.44 Under the current incentives framework, all the incentives are measured and assessed individually (with water quality representing a potential exception to an extent, as it comprises and index of multiple indicators).

7.45 An alternative approach may be to consider the use of aggregated performance measures to incentivise improvements. This is a practice that has been used in the past in other jurisdictions, such as Overall Performance Assessment (OPA) employed by Ofwat and WICS in the UK. As a theoretical example, indicators related with asset health indicators could be aggregated into one single incentive, which could have the benefit of enabling the companies to compensate less accomplished performance on one indicator by strong performance on other indicator, and still improve the overall system and provide an overall measure of performance for ease of reporting and comparison.

7.46 A challenge with this approach however is that it requires a detailed understanding of trade-offs between different results, degree of substitution and level of complementarity between different indicators. Another challenge of this approach is that it will focus the companies' attention on the overall score, which may lead to certain areas being continuously favoured to the detriment of others.

7.47 One option which we can explore is to allow trade-offs and apply this approach to all the performance indicators which are not linked to financial incentives (and thus linking this area with the development of reputational incentives, further discussed above).

Incentive targets

7.48 Many of the existing financial incentives relating to availability, security and quality of supply are linked to year-on-year rolling targets, whereby the company's performance on the indicator in the previous year is used as the target for the following year.

7.49 The Bureau expects that over time, with the continuous monitoring of the performance indicators, a higher degree of information is obtained which will enable setting absolute targets to replace progressively the existing rolling targets. We did this for the transmission system availability indicator at the last review. As an example, the Bureau considers that SAIDI and SAIFI, given the historical data set built over time, may be incentives where there is now sufficient information for resetting the indicators in this price control review based on absolute performance targets. The Bureau seeks views on

these and other incentives that could potentially be moved from rolling to absolute targets.

- 7.50 Where existing incentives already include absolute targets, we would like to hear from the sector about how appropriate these targets have been in driving appropriate performance in their businesses, and whether any adjustment would be necessary within this review.

Key issues for consultation

- 7.51 Whether the following new key areas for improvements and incentives are relevant and appropriate for development over the next price control period? Which other areas require improvement and whether these should be incentivised?

- (a) Sustainable development, including environmental, carbon accounting and DSM indicators;
- (b) Customer services; and
- (c) Connection of new customers.

- 7.52 In relation to the incentives for high quality information:

- (a) Whether these incentives are the best tools to encourage timely provision of information in the future? Should the financial incentives be discontinued given TRANSCO's precedence and more established systems for timely information?
- (b) How the arrangements for review by the TA and auditors can be developed further to improve the quality of information? Should the TA be appointed by the Bureau instead of by the companies? Whether the TA should be reporting to a panel of the Bureau and companies representatives? Should the information and guidance package for the TA be put together by the relevant licensee rather than the Bureau, while the Bureau only reviews such package and provides guidance on the contents of the TA report?
- (c) Should the TA requirement be removed and instead the company's board of directors be made responsible for quality assurance (which may hire a TA itself), along with integral sign-off by the relevant data owners and managers?

- 7.53 In relation to the availability, security and quality of supply incentives:

- (a) Given the performance achieved or design issues, whether incentives for the system availability, energy loss or security of water supply should be improved or removed for TRANSCO?
- (b) Whether TRANSCO is ready to implement the TSO incentive (and overall KPIs) that has already been developed (i.e. through 2014 RSB study), or should we consider closer reviews and improvement actions for TSO function?
- (c) Whether an outputs focused approach such as the development of asset health and asset utilisation indexes is opportune to improve asset management practices?

- (d) Which of the existing incentives are not performing as expected and why?
 - (e) Which of the existing incentives for the distribution network businesses should be improved and how? Whether new incentives should be considered in areas such as demand forecasting, water pressure of supply, water system availability and system losses and leakage for distribution companies?
 - (f) How the biosolids reuse incentive should be improved to ensure a positive response from ADSSC? What other potential incentives for the wastewater sector should be considered for future? Should the recycled water and energy consumption efficiency be targeted for future incentives?
- 7.54 How the end user efficiency should be improved? How the DSM incentive arrangements can be further developed to deliver more tangible and timely results?
- 7.55 Whether introducing reputational incentives (non-financial incentives) is beneficial and pragmatic in Abu Dhabi? What are the candidate performance areas for this type of incentives? Whether this should be an area where an aggregate index for the potential indicators can be developed for monitoring, reporting and comparison?
- 7.56 Whether the amount of financial incentives should / can be determined based on the company's cost of performance improvements or the customers' willingness to pay, or whether the present approach of setting financial incentives as a proportion of the MAR (currently set at 0.5% for each indicator) should be used in the future?
- 7.57 Whether an asymmetric design of incentives is more appropriate, by applying a penalty-only scheme either to all or some of the performance incentives? How useful the performance dead-bands (where no bonus or penalty applies) have been and how they can be improved for future?
- 7.58 Where existing incentives include absolute targets, how appropriate these targets have been in driving appropriate performance? Would any adjustment be necessary within this review? Which incentives could potentially be moved from year-on-year rolling targets to the absolute targets and how absolute targets should be determined?
- 7.59 How useful and effective the existing RIG documents have been, how this tool could be improved in the future, and which existing or new incentives may require RIG?