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DEPARTMENT OF ENERGY

# Review of Regulatory Controls for 2023 onwards

## RC2 First Consultation Paper

## Effective Date: 31 March 2021

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# Contents

# *Foreword*

This document marks the commencement of the Department of Energy's (DoE) review of the multi-year, incentive-based price controls that apply to the following water, wastewater, recycled water and electricity companies in the Emirate of Abu Dhabi:

1. Al Ain Distribution Company (AADC);
2. Abu Dhabi Distribution Company (ADDC);
3. Abu Dhabi Sewerage Services Company (ADSSC); and
4. Abu Dhabi Transmission and Despatch Company (TRANSCO);
5. Emirates Water and Electricity Company (EWEC).

The new controls (to be referred to as the "Second Regulatory Controls" or "RC2") for these companies are required to take effect from 1 January 2023, as the current RC1 controls are intended to apply up to the end of 2022.

This first consultation paper describes a number of high-level issues which need to be considered in setting the new RC2 controls for 2023 onwards and on which the views of respondents are sought. Agreeing on the key principles will determine the overall design of the RC2 controls and guide the discussion on the detailed features and calculations of RC2 in the DoE's subsequent consultation and proposal documents planned for publication during 2021-2022.

Written responses to the issues raised in this paper should be sent by **15 May 2021** to the DoE.

The DoE proposes to make responses to the consultation exercise publicly available.

***MOHAMMED BIN JARSH AL FALASI***
***Undersecretary-Department of Energy***

# Executive summary

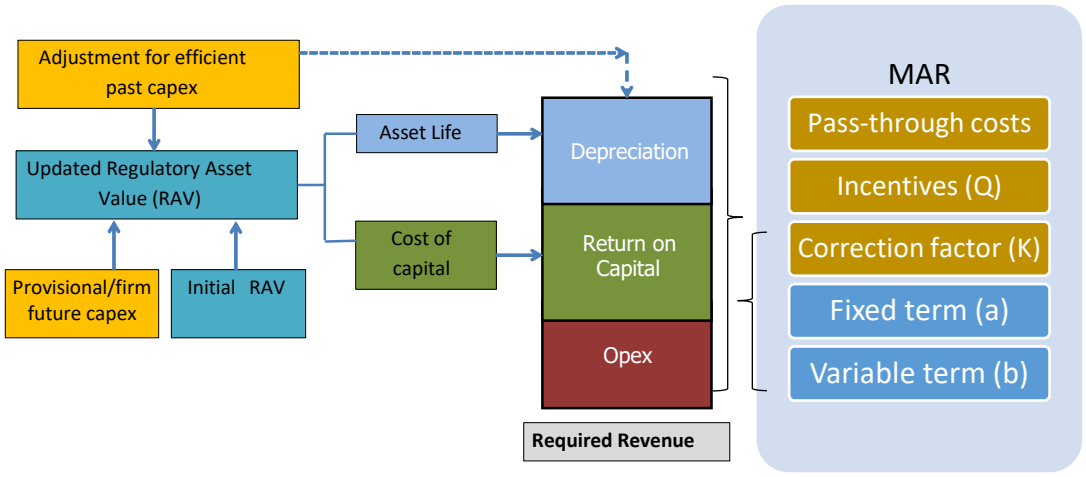
## Introduction (Section 2)

1. The price controls for the water, recycled water, wastewater and electricity businesses of the five monopoly companies (AADC, ADDC, ADSSC, EWEC and TRANSCO) have broadly been in the form of CPI-X revenue caps, defining the 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 no revenue drivers that link MAR with the company's outputs in terms of units and customer numbers:

2. MAR = Pass through costs + a + (b x Revenue driver) + Q + L - K

3. The values of fixed and variable terms (a and b) are notified by the DoE 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 profiling 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.

Figure 1: Building-block approach to revenue requirement and MAR




4. The current price controls (referred to as the "First Regulatory Controls" or "RC1") for the four network companies (AADC, ADDC, ADSSC and TRANSCO) were set to apply for four years, from 1 January 2018 to 31 December 2021, but have been extended due to prevailing Covid-19 pandemic for another year to apply

upto 31 December 2022. The current PC4 price controls for EWEC have also been due for a review for a long time since they were set to apply from 2010.

Figure 2: Multi-year price controls for network companies

| PC1 | PC2 | PC3 | PC4 | PC5 | RC1 | RC2 |
|---|---|---|---|---|---|---|
| 1999-2002 | 2003-2005 | 2006-2009 | 2010-2013 | 2014-2017 | 2018-2022 | 2023 onwards |

5. This first consultation paper explores the key changes that should be made to the overall regulatory regime through the design of new RC2 price controls for these five companies to address any issues the sector may be facing.

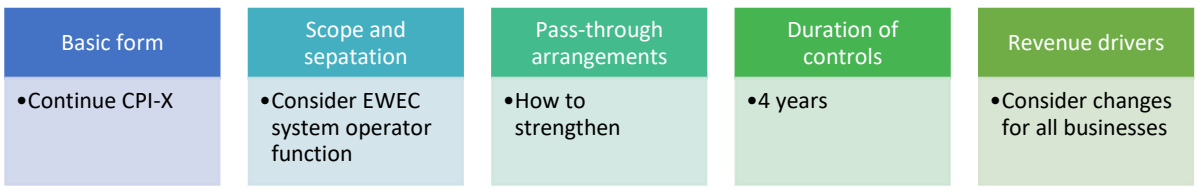
6. We intend to publish our second consultation paper in September 2021. Our draft and final proposals on RC2 are scheduled for publication in March 2022 and September 2022, respectively.

Figure 3: RC2 price control review – indicative timetable


## Form of controls (Section 3)

7. While our initial conclusion is to continue with the broad form of CPI-X revenue caps for RC2 controls, there are certain key questions about the form of controls such as scope, separation, duration and structure of controls that need to be addressed especially in view of the recent and planned changes in the ownership of the price-controlled companies. To date, the price controls have generally been set for 4 years at each price control review and to apply to only licensed activities with separation between water, electricity, wastewater and recycled businesses (with no further granular separation).

Figure 4: RC2 price control review – assessment of form of controls



8. The price controls have been predominantly based on estimating and adjusting input costs with only indirect and implicit links to the outputs. Only the performance incentive scheme (PIS) through the Q factors in MAR formulas provide direct and explicit links to the outputs, though Q factors make only a very small proportion of MAR. The output based regulation (OBR) is another approach to price controls whereby companies' opex and capex allowances or suitable proportions of MAR are linked to, and adjusted for, delivery/non-delivery of explicitly agreed outputs (with pre-set targets). OBR allows greater transparency and control over the outputs the companies should focus to deliver and target their investments. Accordingly, Network companies have agreed with DoE in principle that OBR is the way forward. However, it requires extensive work on the enablers before the sector can embrace this change and a detailed plan and efforts to such work.

9. In light of this, we raise the following key questions for consultation before considering any significant and challenging changes to the regulatory regime:

(a) Is our initial conclusion to retain CPI-X price/revenue controls in the broad form of the existing regulatory arrangements appropriate?

(b) Is DoE's proposal to move towards OBR and proposed plan to work on the OBR enablers during RC2 appropriate? Whether significant changes to the PIS, especially the amount of MAR at risk for incentives and areas of PIS, are required to progress transition to OBR if PIS would be redundant with the adoption of OBR?

(c) Does transfer of AADC, ADDC and TRANSCO to TAQA pose any additional risk, and accordingly, warrant a fundamental change in the regulatory regime for RC2 or sector's plan to move to an OBR for RC3/future?

(d) 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? Should there be a separate price control for EWEC's system operator business or should it be grouped with its procurement business?

(e) 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? How best is to incentivise EWEC to perform its obligations in relation to accurate demand forecasts, capacity planning and fuel purchases to ensure economic purchasing?

(f) Is our initial conclusion appropriate to set RC2 controls for 4 years for all companies with one-time ex-ante capex review, ex-post capex adjustments every two year and annual specific opex allowance adjustments?

(g) Whether existing arrangements for revenue drivers remain appropriate? Should the revenue driver for AADC, ADDC and TRANSCO be changed to peak demand? What should be the revenue driver(s) for recycled water business?

(h) Whether we should retain the existing building-block, net present value based approach to the price control calculations and use a suitable value of X factor (for all the businesses, if necessary), to profile the MAR appropriately over the control period? Should the same approach be adopted for EWEC, which would mean setting allowances for EWEC for all the years of RC2, instead of setting allowance for the first year and then calculate allowance for subsequent years based on annual adjustment mechanism?

## Operating expenditure (Section 4)

10. The 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. Subject to the conclusion on transition to totex approach discussed below, setting of opex allowances 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 RC1, is appropriate to set main opex projections for RC2 for all companies including EWEC? What further changes or improvements are required in this approach?

(b) Whether an approach similar to RC1 is appropriate to set specific provisional allowances (with automatic adjustment mechanism for outturn

results) 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?

## Capital expenditure (Section 5)

11. 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 RC1 has been a combination of ex-post and ex-ante assessments with provisional and firm allowances, respectively, for future capex provided in the price controls.

12. Separate reviews and setting of opex and capex allowances (DoE's approach to-date) may provide an incentive for the companies towards capex bias. It also limits the companies' flexibility for efficient delivery of services. Therefore, DoE is considering whether a transition be made in RC2 towards an alternative approach, whereby opex and capex are assessed on a total expenditure ("totex") basis. This transition can have significant impact on the review methodology and cost allowances provided in the price controls. As EWEC has to date only procurement businesses managing long-term contracts with large cash flows but negligible capex, its price controls has always combined capex with opex to set procurement allowance. A decision would be required on the capex regime for EWEC's system operator function if it is expected to involve significant capex.

13. Under the totex approach, the regulator approves the companies' totex (rather than opex and capex separately), though may still be based on separate assessment of opex and capex. The totex is then split into opex (or fast money) and capex (or slow money) for the purpose of MAR calculations using a capitalisation rate. The key question is whether totex approach is required to address any significant issue such as capex bias in the Sector. It should address specific, well-established (or anticipated) problems and objectives, and not only a change per se.

14. Finally, DoE continues to work extensively with the sector companies to establish a clear, balanced and coordinated long term digitalisation strategy and identify digitalisation investment to accelerate the value which can be unlocked through

improved digitalised customer services and 'smart grid solutions'; enhancing system data availability and data driven analytics to realise improved safety and performance efficiencies in asset management, system control and field operations

15. Therefore, we are seeking the stakeholder's initial views on:

(a) Whether a totex approach is justified for Abu Dhabi sector? What are the problems that it will address, what are the possible risks and challenges, and whether the companies are ready for this transition?

(b) Apart from transition to Totex approach, are there any other changes which should be considered at this review in relation to capex regulation?

(c) How best to incentivise digitalisation planning and investment and importantly the necessary enhanced digitalisation skills and human capital within the sector companies to achieve multiple benefits through specific opex and/or capex or totex allowances, or PIS bonuses? What should be the deliverables, measures and targets for companies to earn such allowances or bonuses?

## Financial issues (Section 6)

16. In the price controls, capex is financed over an estimated average economic life of the assets (40 to 60 years), through inclusion in the regulatory asset value (RAV) and the calculation of allowances for regulatory depreciation and regulatory returns. An estimate of the licensee's cost of capital is used in conjunction with the RAV to calculate regulatory returns. Key issues for consultation on these matters for the new price controls include the following:

(a) What are stakeholders' views on our initial conclusion to continue with the present approach (discussed in section 6 of this document) to calculate the regulatory depreciation and update the RAVs?

(b) Does the existing approach to estimate the real cost of capital as the weighted average cost of capital (WACC) using the Capital Asset Pricing Model (CAPM) for cost of equity and both overseas and local capital market data remain appropriate?

## Performance incentives (Section 7)

17. Under the current price control arrangements, companies are financially rewarded for improved performance, and penalised for deteriorating performance on an annual basis (via Q term of the MAR) in three main areas, namely: (a) provision of high quality information; (b) availability, security and quality of supply and demand forecasting (for EWEC); and (c) customer service (for AADC and ADDC).

Figure 5: RC1 performance incentives


18. The performance indicators incentivised by Q terms are output-based objectives and verifiable measures of companies' performance on an annual basis, tracked against pre-agreed targets. Companies are currently required to appoint an independent Technical Assessor (TA), with the DoE's approval, to verify the accuracy of the information on the companies' performance against the targets, required to determine financial bonus or penalty.

Figure 6: How performance incentive scheme works?


19. A number of important considerations based on companies' recent performance and recent or planned sector reforms raises the following key questions for consultation:

(a) Whether any new key area(s) for improvements and incentives, with precise outputs and targets, are relevant and necessary for, based on the companies' recent performance, sector strategic objectives and any potential transition to OBR?

(b) Whether any of the current incentives for electricity, water and wastewater businesses of companies should be removed or amended to prompt improvements in companies' performance?

(c) How the arrangements for review by the TA and auditors can be developed further to improve the quality of information?

(d) What should be suitable performance indicators for new businesses of companies, namely recycled businesses of AADC and ADDC and system operator businesses of EWEC?

(e) Should the amount of financial incentive for each performance indicator continue to be based on a proportion (currently 0.5%) of MAR, or should it be determined by the company's cost of performance improvements or the customers' willingness to pay?

(f) Should the total financial bonus or penalty continued to be capped at 4 % of the MAR collectively for all incentives or a higher proportion of MAR especially in view of the focus on OBR?

(g) Whether a penalty-only design is more appropriate for either all or some of the performance incentives?

(h) Whether the reputational incentives (including financial ratios) introduced in RC1 for reporting with no financial bonus or penalty has been beneficial? What are the candidate performance areas for this type of incentives?

# 1. Glossary

| | |
|---|---|
| AADC | Al Ain Distribution Company |
| ADDC | Abu Dhabi Distribution Company |
| ADHC | Abu Dhabi Development Holding Company (rebranded as ADQ) |
| ADPower | Abu Dhabi Power Corporation |
| ADSSC | Abu Dhabi Sewage Services Company |
| ADWEA | Abu Dhabi Water and Electricity Authority (now merged within DoE) |
| AIS | Annual Information Submission |
| Capex | Capital Expenditure |
| CAPM | Capital Asset Pricing Model |
| CPI | Consumer Price Index |
| DoE | Department of Energy |
| DoF | Department of Finance |
| DSM | Demand Side Management |
| FTE | Full Time Employee |
| EAD | Environmental Agency of Abu Dhabi |
| EWEC | Emirates Water and Electricity Company, (previously, ADWEC) |
| ISTP | Independent Sewage Treatment Plant |
| KPI | Key Performance Indicator |
| MAR | Maximum Allowed Revenue |
| NPV | Net Present Value |
| OBR | Output Based Regulation |
| O&M | Operation and Maintenance |
| Opex | Operating Expenditure |
| RC1 | First Regulatory Control covering the period 2018-2021 |
| PCR | Price Control Return |
| PIS | Performance Incentive Scheme |
| RWPA | Recycled Water Purchase Agreement |
| RAG | Regulatory Accounting Guideline |
| RAV | Regulatory Asset Value |
| RIG | Regulatory Instructions and Guidance |
| SBA | Separate Business Account |
| STA | Sewage Treatment Agreement |
| TA | Technical Assessor |
| TRANSCO | Abu Dhabi Transmission and Despatch Company |
| WACC | Weighted Average Cost of Capital |

# 2. Introduction

## 2.1 Background

2.1.1 The five companies (AADC, ADDC, ADSSC, EWEC and TRANSCO) in the electricity, water, recycled water and wastewater sector in the Emirate of Abu Dhabi are natural monopolies where competition is limited or impractical. This is in contrast to the electricity generation, water production and sewage treatment where there is competition between bidders to build new generation, desalination and sewage treatment plant. The DoE has therefore established multi-year CPI-X price controls to constrain the market power and to incentivise the performance of these companies:

(a) For EWEC (formerly ADWEC), 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 DoE 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 network companies (AADC, ADDC, TRANSCO and ADSSC) for four years (2010-2013). EWEC's PC4 for its Licensed water and electricity procurement businesses were originally set for 2010-2014, however were structured to apply for longer period, if necessary. DoE initiated the review to set new controls in 2014, however it could not be completed for various reasons including EWEC's review of organisational roles, responsibilities and structure during 2016. Accordingly, EWEC's PC4 is continuing to date.

(d) In 2013, the fifth price controls (PC5) were set for all four network companies to apply for four years (2014-2017).

(e) In 2017, the first regulatory controls (RC1) were set for all four network companies (excluding recycled water business) to apply for four years (2018-2021).

(f) In 2020, the first regulatory controls were set for AADC and ADDC's recycled water business to apply for four years (2018-2021).

(g) In 2020, the DoE extended the RC1 for four network companies' water, recycled water, wastewater and electricity businesses by a year to apply until 2022, due to pandemic and travel restrictions.

2.1.2 These price controls are described in detail in the DoE previous consultation and proposal papers which are available on the DoE's website (www.doe.gov.ae).

**Figure 2.1**: Multi-year price controls for network companies

| PC1 | PC2 | PC3 | PC4 | PC5 | RC1 | RC2 |
|---|---|---|---|---|---|---|
| **1999-2002** | 2003-2005 | 2006-2009 | 2010-2013 | 2014-2017 | 2018-2022 | 2023 onwards |

2.1.3 The current price controls (referred to as "First Regulatory Controls" or "RC1") for the four network companies (AADC, ADDC, ADSSC and TRANSCO) were set to apply for four years, from 1 January 2018 to 31 December 2021, but have been extended due to prevailing Covid-19 pandemic for another year to apply up to 31 December 2022. The current price controls for EWEC have also been due for a review for a long time since they were set to apply from 2010.

## 2.2 The role and duties of the DoE

2.2.1 The Abu Dhabi Department of Energy (DoE) was established in accordance with Law No. 11 of 2018 to implement various programmes, initiatives, and projects with the aim of achieving a sustainable society in the Emirate of Abu Dhabi, through its three roles (a) strategy, (b) policy, and (c) regulation. The DoE replaced Abu Dhabi Water and Electricity Authority (ADWEA) and Regulation and Supervision Bureau (RSB), that were established in 1999 under Law No (2) of 1998.

2.2.2 The Law No 11 of 2018, the Law No (2) of 1998 and the Law No (17) of 2005 define the duties and functions of DoE. Any entity wishing to undertake any of

the defined regulated activities in the Emirate requires a licence from the DoE. 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 regulator, as summarised below:

(a) The primary duty of the DoE as regulator (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 DoE has a number of general duties (Article 54 of Law No.2 of 1998), the most relevant of which in relation to the price control review is to “protect the interest of consumers ……as to the terms and conditions and price of supply (whether consumers are domestic, commercial or industrial)".

(b) The DoE also has a number of general functions (Article 55 of Law No.2 of 1998), including "the regulation of prices charged to consumers ……and the methods by which they are charged."

(c) In carrying out its functions under the Law, the DoE 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.

2.2.3 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.

## 2.3 Sector structure and background

2.3.1 Electricity, water, recycled water and wastewater sectors are responsible for providing water, recycled 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 2019, the sectors provided the following services and supplies:

(a) supplied 77,221 GWh of electricity to neighbouring Emirates and 543,950 customers in the Emirate of Abu Dhabi (via AADC and ADDC, 55,776 GWh);

(b) supplied 254,176 MIG of water to neighbouring Emirates and 407,896 customers in the Emirate of Abu Dhabi (via AADC and ADDC, 226,443 MIG); and

(c) collected and treated 312 million m3 of wastewater from 379,444 customers in the Emirate of Abu Dhabi (via ADSSC).

2.3.2 The water and electricity sector is characterised by a single-buyer structure, where:

(a) EWEC (formerly 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) EWEC also procures gas for supply to the production companies.

(c) EWEC then sells water and electricity:

i. to AADC and ADDC at the Bulk Supply Tariff (BST) as approved by the DoE on an annual basis (referred as EWEC's Licensed Proucurement business): 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 (referred to as Unlicensed Procurement business).

(d) In addition to BST payments to EWEC, the two distribution companies (AADC and ADDC) also pay Transmission Use of System (TUoS) charges and connection charges to TRANSCO.

(e) EWEC, AADC, ADDC and TRANSCO were directly owned by ADWEA until 2017 and recently by AD Power (a subsidiary of ADQ, which in turn is owned by Abu Dhabi Government). During 2020, ADPower transferred the ownership of AADC, ADDC and TRANSCO to one of its subsidiaries, TAQA, a public company listed on Abu Dhabi Stock Exchange. However, system operator function currently sitting in TRANSCO is being transferred to EWEC.

On completion of this transfer, AADC and ADDC will also need to pay their protion of system operator charge to EWEC.

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

2.3.4 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 (EWEC or ADSSC). For AADC, ADDC, ADSSC, EWEC and TRANSCO the annual turnover is capped by its relevant price control.

2.3.5 Effective 1 January 2018, it was decided to unbundle the recycled water sector whereby:

(a) ADSSC is responsible for all activities in the wastewater sector related to the production of recycled water and sale to AADC and ADDC; and

(b) AADC and ADDC are responsible for the distribution and supply of recycled water to end-users in the Emirate of Abu Dhabi.

**Figure 2.2**: Structure of electricity, water, and wastewater sectors

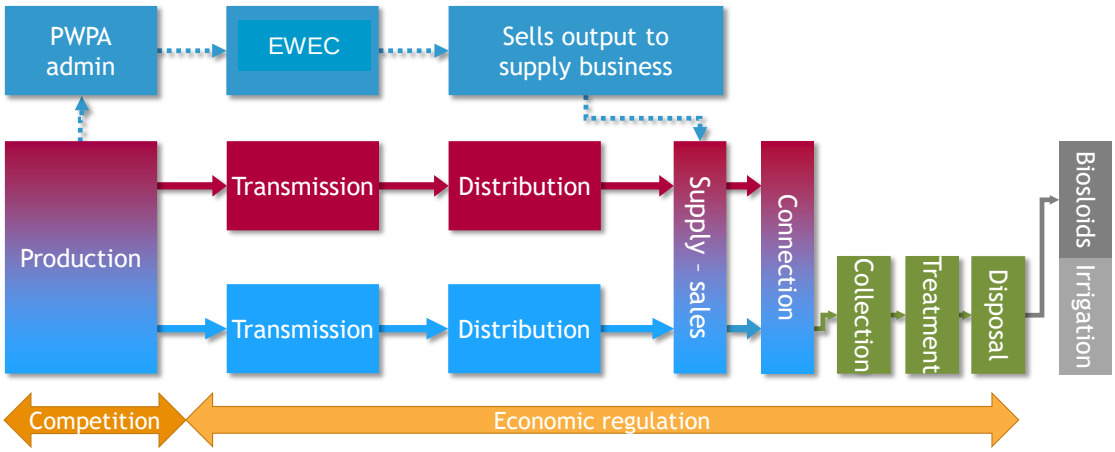



**Figure 2.3**: Structure of recycled water sector

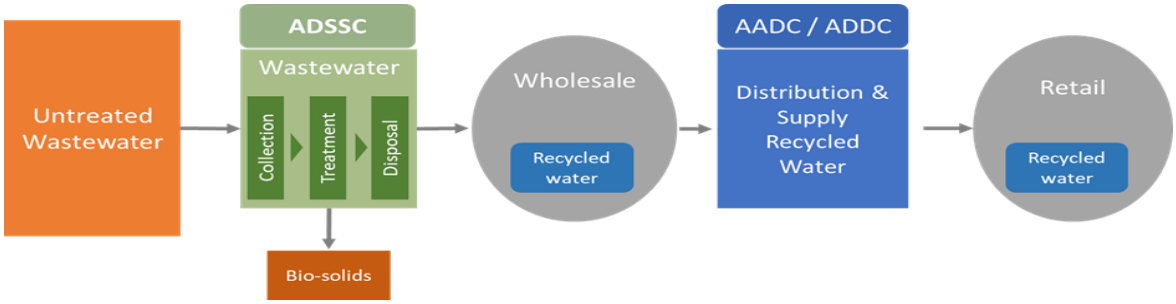
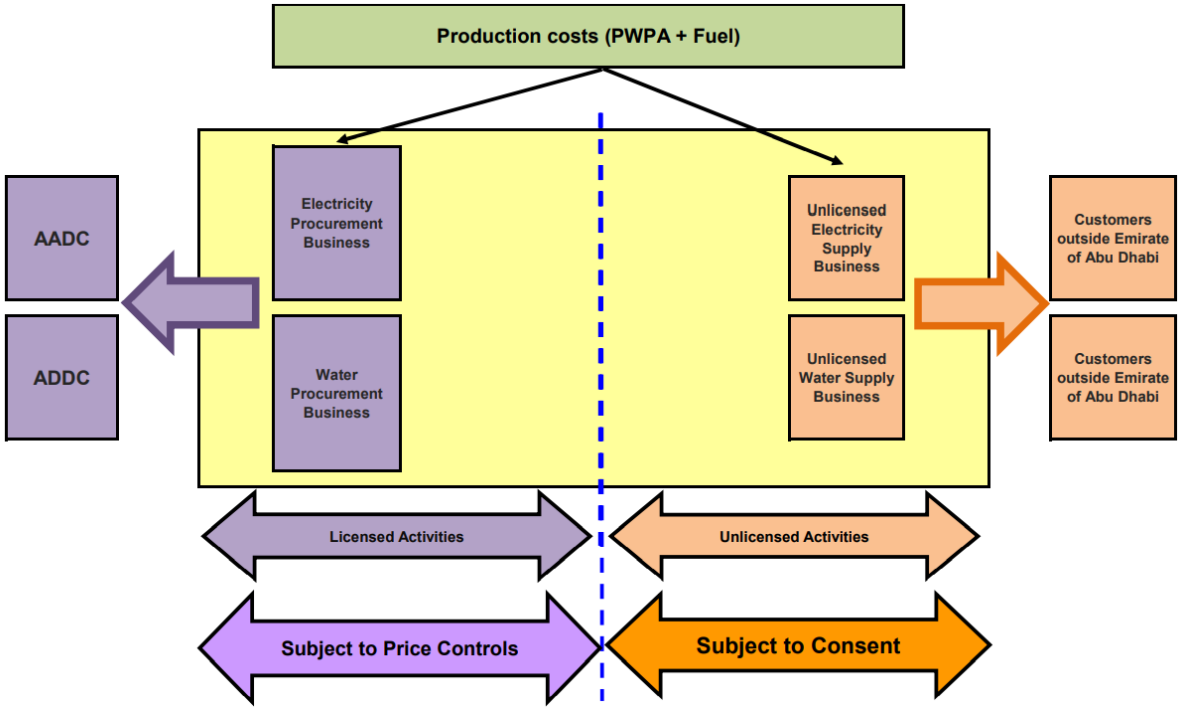



**Figure 2.4**: EWEC's Licensed and Unlicensed Procurement businesses



2.3.6 The turnover for the electricity, water, recycled water 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, recycled water and wastewater sectors. Consequently, the aggregate revenue from these companies together with the revenues from EWEC's exports represent the total turnover for each of the four sectors;

(b) EWEC's main revenue source are BST charges paid by the distribution companies and exports outside Abu Dhabi. Once LDC transfer is completed, EWEC will also start charging its customers for system operator function;

(c) TRANSCO's main revenue source are TUoS charges paid by the distribution companies and EWEC (for exports) for units transmitted over its network;

(d) Distribution companies have two main revenue sources for water and electricity sectors – bills charged to customers and subsidy from government as the customer tariffs are below the economic costs of provision of water and electricity. Currently, distribution companies do not charge customers for recycled water. Their turnover for this business entirely consists of government subsidy; and

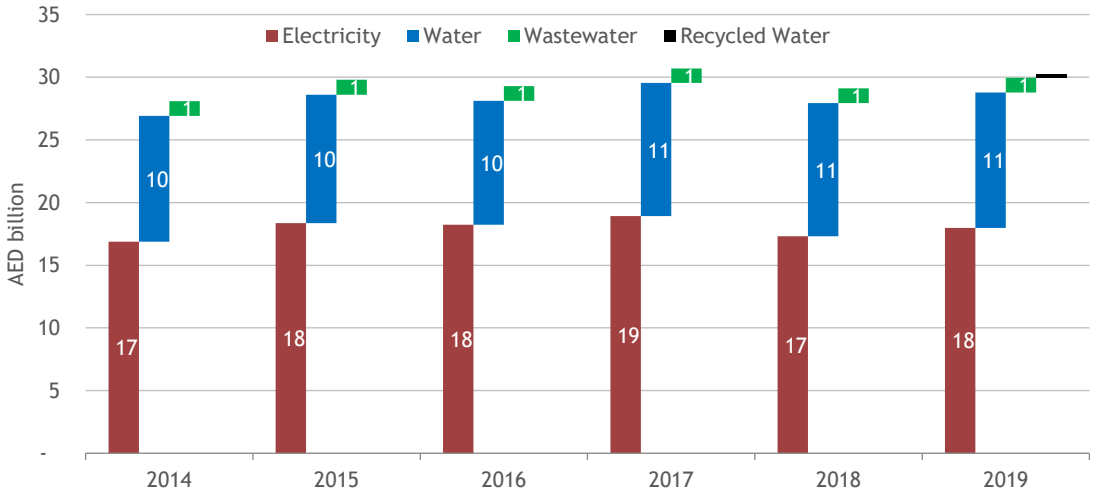
(e) Currently, ADSSC does not charge customers for sewerage services and bulk supply tariff for recycled water. Its turnover entirely consists of government subsidy. As the subsidy is currently less than the MAR, it does not fully cover its total costs.

## 2.4 Sector turnover

2.4.1 Sector turnover has marginally increased over time. Total turnover increased in 2019 to AED 30.2 billion – a rise of 8% from 2014. Underlying this change were increases in electricity turnover of 7%, and water turnover of 8%, driven by the 14% inflation over this period, partly offset by lower allowances on implementation of RC1 and in particular the update of the investment related

components of network companies' revenue (namely depreciation and return on capital).

**Figure 2.5**: Sector total turnover




2.4.2 The turnover for the water and electricity sectors consists of revenue to cover production, transmission and distribution costs. In both sectors, production/generation costs account historically for almost 60% of the turnover. The remaining costs split almost equally between transmission, distribution and supply.

2.4.3 In 2019:

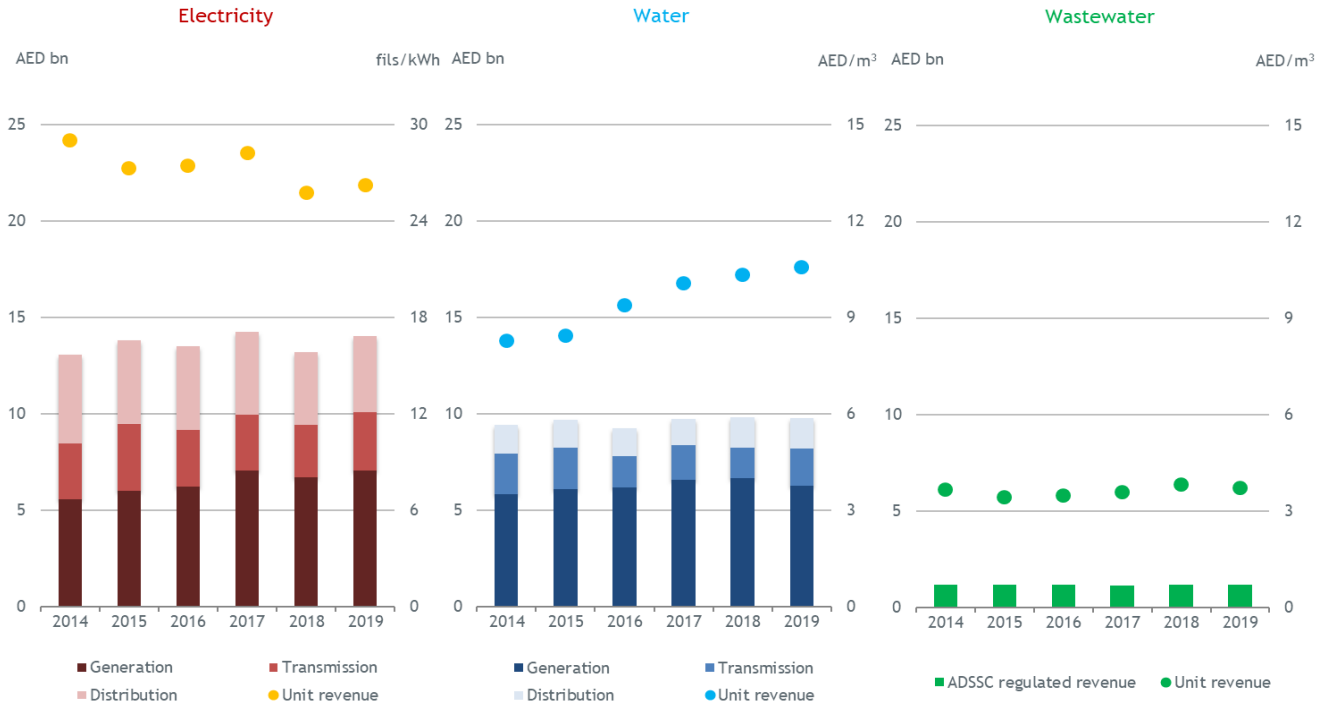
(a) The electricity turnover was AED 18 billion, 4% above the previous year. This was caused mainly by a higher generation costs and increase in the MAR of the network companies due to RC1 interim review and updates of the capex allowances in 2019.

(b) For water, at AED 10.8 billion, the turnover increased by 2% in 2019 due to offsetting results of increase in network costs for the same factors as mentioned above for electricity, but lower production costs.

(c) For wastewater, turnover (composed in almost its entirety by the government subsidy) was down 2% on the preceding year, at AED 1.2 billion.

(d) Finally, in recycled water, turnover starting for the first time in 2019 and composed of the government subsidy, was AED 0.3 billion.

**Figure 2.6**: Turnover by sector (excluding exports)



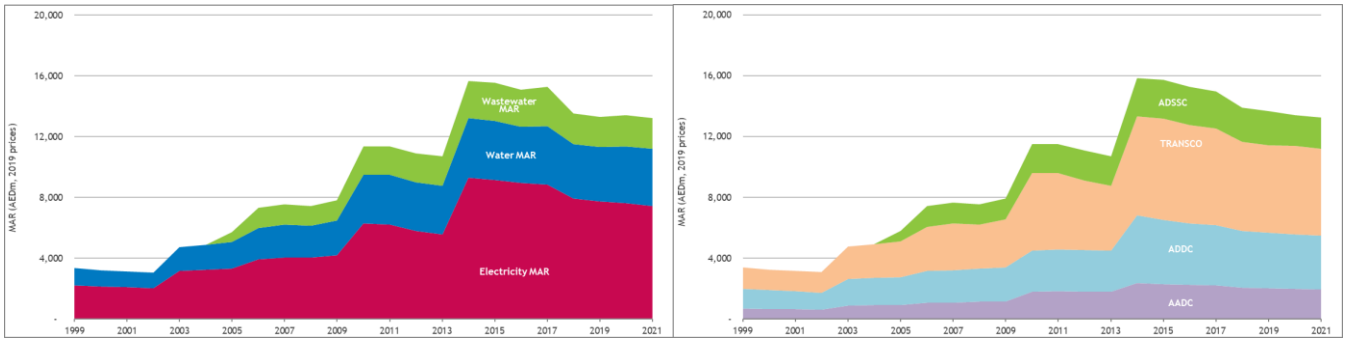

2.4.4 Network MAR charts below show, in AED billion (2019 prices):

(a) significant increases in companies' MARs from one control period to another and decrease from PC5 to RC1;

(b) relatively flat MAR profiles during each control period (resulting from zero value for X factors except for RC1); and

(c) continuing large share of electricity and TRANSCO's MARs in the overall sector MAR.

**Figure 2.7**: Historical and projected network MAR trends over 1999-2021



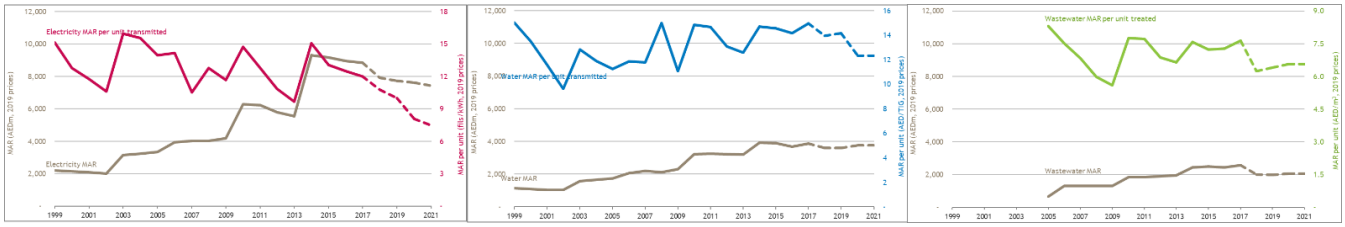

2.4.5 While MARs continue the increasing trend in real terms, increasing demands mean an overall declining trend for the unit costs for electricity, water and

wastewater businesses, as summarised below and presented in the following charts:

(a) Electricity and water MARs per unit transmitted are expected to be 50% and 18% respectively lower by 2021 than that in 1999 (in 2019 prices).

(b) Wastewater MAR per unit treated is expected to be 21% lower by 2021 than in 2005 (in 2019 prices).

**Figure 2.8**: Projected trends of price-controlled MARs




## 2.5 Current price controls

### *Main features*

2.5.1 The price controls for the companies have broadly been in the form of CPI-X revenue caps (except for EWEC's exports outside Abu Dhabi that are not subject to price controls), 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:

(a) The MARs for network companies include a fixed term and one revenue driver (except for recycled water business which does not have any revenue driver) that link MAR with the company's outputs in terms of (i) units transmitted or treated, and (ii) customer numbers. For EWEC, the MAR comprises of the price-controlled procurement cost allowance to allow recovery of EWEC's staff and other operating costs relating to the Licensed Procurement business.

(b) There are separate price controls for the water, recycled water and electricity businesses of AADC, ADDC, TRANSCO and EWEC. For AADC and ADDC, price controls cover both distribution and supply businesses. As discussed above, EWEC's Unlicensed business (water and electricity exports outside Abu Dhabi) are not subject to price control. For ADSSC, a single price

control covers all of its three separate businesses (sewerage, wastewater treatment and disposal).

(c) Costs which are subject to competition or regulation in other parts of the supply chain (e.g. PWPA and fuel costs for EWEC, STA cost for ADSSC, and EWEC's BST, purchase of electricity from AMPC generated from RASCO assets and TRANSCO's TUoS for distribution companies) are treated on a pass-through basis.

(d) Price controls have been set to allow the companies to recover the efficient level of opex, regulatory depreciation and a return on RAV. For EWEC, the price control allows for the recovery of efficient/controlled levels of its staff and operating costs and nominal profit.

(e) Price controls provide incentives for companies to reduce costs since they are allowed to retain the benefit of any efficiency gains (in the form of extra profits) at least until the next price control review. For EWEC, the price control allows full retention of efficiency gains upto 10% deviation of actual costs from the related annual allowance and half of gains over and above 10% limit.

(f) The calculation of regulatory depreciation and returns to the network companies requires the determination of allowed capex. The treatment of capex has been based on combination of ex-ante and ex-post assessments. Under ex-post regime, the companies are given only provisional capex allowances without any or minimal review and approval of capex projects. The firm capex allowance is determined by the DoE's efficiency reviews only after the capex is incurred. However, under the ex-ante approach to capex regulation, a firm allowance is provided to the companies through front-end review of the proposed schemes (with no or limited / focused ex-post review and adjustment).

(g) The network companies' opex allowances for the RC1 period were estimated using a hybrid of top-down and bottom-up approaches. These projections also include various specific cost allowances for additional roles and responsibilities (e.g. Emiratisation, Nationals' training, mega developments, energy costs for additional water pumping) as well as capability building in important areas (DSM, resource resilience, VAT and LARS), subject to proof of

hiring of staff for these activities. Equivalent of opex allowance, EWEC's Procurement allowance was set by DoE for the first year of EWEC's existing price control, PC4. The allowance for subsequent years is automatically adjusted according to a formula that takes into account the inflation and deviation between actual costs and allowance for preceding year.

(h) Regulatory depreciation allowances for AADC, ADDC and TRANSCO's pre-2018 and post-2018 investments have been based on an asset life assumption of 30 years and 40 years, respectively. For ADSSC an asset life assumption of 50 years and 60 years have been applied for pre-2018 and post-2018 investments, respectively. The Weighted Average Cost of Capital (WACC) for network companies 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 DoE's consent (as required by their licences) for instance EWEC's exports of water and electricity outside Abu Dhabi and distribution companies billing services to Municipalities. 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 also include unlicensed activities.

*Performance and output incentives*

2.5.2 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 RC1, the maximum bonus or penalty for network companies' individual performance indicator is capped at 0.5% with an overall cap of 4% of a company's own MAR (i.e. excluding pass-through costs). For EWEC the maximum bonus or penalty cap applies only to its electricity/water peak demand forecast accuracy performance indicators, which is at 1% of EWEC's own procurement allowance (MAR) .

2.5.3 In RC1, incentives were introduced in three main areas: (i) provision of high quality information; (ii) availability, security and service quality; (iii) customer service. The performance indicators incentivised by Q terms are output-based objective and verifiable measures of companies' performance on an annual basis, tracked against pre-agreed targets. Companies are currently required to appoint an independent Technical Assessor (TA), with the DoE's approval, to verify the accuracy of the information on the companies' performance against the targets, required to determine financial bonus or penalty.

*Structure of current price controls*

2.5.4 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:

MAR = Pass through costs + a + (b x Revenue driver) + Q + L – 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). For EWEC, the term 'a' is the procurement allowance set in the price control labelled 'A', as described in paragraph 2.5.5 below.

(c) 'b' is the coefficient (notified value) of revenue driver, expressed in Dirham per unit of the respective revenue driver (except for EWEC and distribution companies' recycled water which did not have any revenue driver in PC4 and RC1, respectively).

(d) 'a' and 'b' (and 'A' for EWEC) are set by the DoE for the first year of the control period and are then automatically adjusted each year according to the following formula:

i. For network companies: adjustment for the UAE Consumer Price Index (CPI) inflation for the previous year and an 'X' factor set by the DoE;

ii. For EWEC, the notified value 'A' is adjusted similar to network companies as above; and as per paragraph 2.5.5. below.as per paragraph 2.5.5 below

(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) 'L' is the License fee charged by DoE to the companies for the year.

(h) 'K' is the correction factor adjusting in year t for any over or under-recovery of revenue in the preceding year t-1 as follows:

$$K_t = (RR_{t-1} - MAR_{t-1}) \times (1 + i_{t-1})$$

where:

(i) **$MAR_{t-1}$** is the MAR for year t-1 calculated using the formula proposed above.

(ii) **$RR_{t-1}$** is the regulated revenue for the year t-1;

(iii) **$i_{t-1}$** is the average specified rate for year t-1 as defined in the licences.

2.5.5 For EWEC, and as depicted in Figure 2.9 below, the notified value 'A' for procurement allowance is adjusted each year for UAE CPI and 'X' factor, similar to network companies as per paragraph 2.5.4(d)(i) above, and for actual cost deviation and performance as follows:

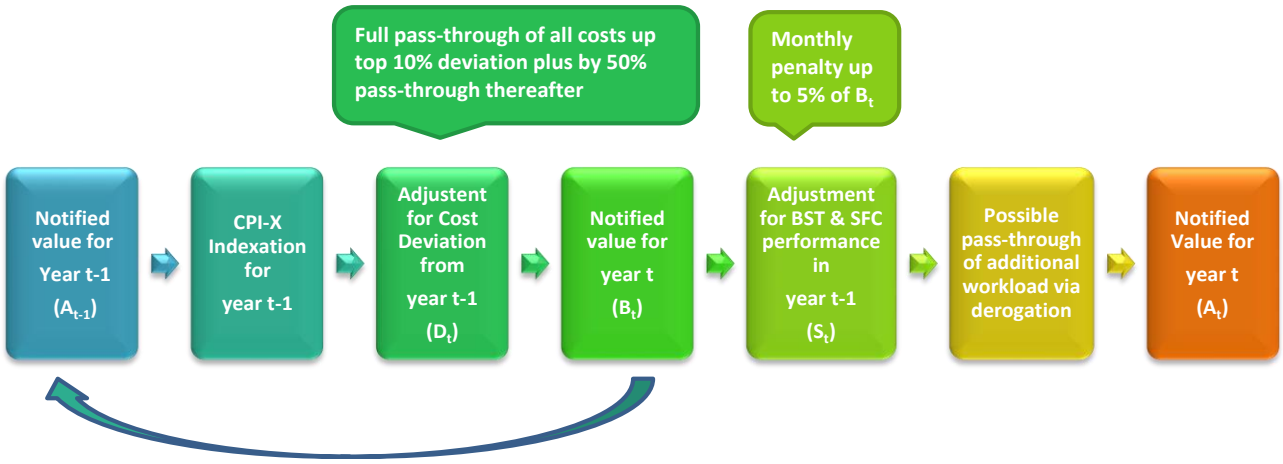
(a) adjusted (i) by 1% upward or downward for each 1% increase or decrease in the actual audited procurement costs in the preceding year compared to the allowed procurement costs for that preceding year, for cost increases / decreases of up to 10%; and (ii) for further cost increase or decrease beyond 10%, by 0.5% upward or downward in the allowed procurement costs for a year for each 1% further increase or decrease, without any cap; and

(b) If the draft Seven Year Planning Statement (aka Statement of Future Capacity (SFC)) or draft Bulk Supply Tariff (BST) (which draft is later approved by the DoE) is not submitted by 31 May or 30 November, respectively, the price-controlled procurement cost for each of EWEC's water and electricity businesses for the following year will be adjusted

downward by 1% for each month of delay in such submission up to a maximum of 5% adjustment in each case.

(c) For any additional workload requested or approved by the DoE, the existing mechanism to allow pass-through of costs using a licence derogation will continue, to the extent such costs are not covered by the automatic mechanism described above.

**Figure 2.9**: Annual adjustments to EWEC's price-controlled procurement costs




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

Table 2.1: Pass-through costs and revenue drivers

| Company | Pass-through items | Revenue driver |
|---|---|---|
| **EWEC Licensed procurement (both water and electricity)** | PWPA costs<br>Fuel costs<br>DoE license fee allowed on a pass-through basis via derogation | Fixed term (procurement allowance) |
| **AADC / ADDC (water recycled water and electricity)** | Water, recycled water and electricity purchases<br>Transmission charges<br>Embedded electricity purchases*<br>DoE license fee | Fixed term<br>Customer numbers** |
| **TRANSCO (both water and electricity)** | Electricity ancillary service costs<br>DoE license fee | Fixed term<br>Metered units transmitted (irrespective of MDEC compliance) |
| **ADSSC** | STA costs**<br>DoE license fee | Fixed term<br>Annual flow at treatment plants |

Notes: All pass-through costs are subject to the relevant licensee's economic purchasing obligations.
**Except for recycled water business, which do not have any revenue driver in RC1.

*Early engagement with stakeholders on RC2*

2.5.7 The DoE shared its proposed high-level timetable for this price control review with the stakeholders via its letters dated 6 December 2020. These letters also shared a number of work streams that would support, and run in parallel to this price control review.

2.5.8 The companies responded to the DoE's letters in December 2020, supporting the DoE's proposed timetable and committing allocation of appropriate resources to support the price control review and related work streams.

## 2.6 Timetable for RC2 review

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

Table 2.2: Timetable for RC2 review

| Approximate date | Task |
|---|---|
| 31 March 2021 | DoE publishes this **First Consultation Paper** |
| 30 April 2021 | Companies to submit 2020 audited Separate Business Accounts (SBAs) |
| 15 May 2021 | Companies to respond to First Consultation Paper |
| September 2021 | DoE publishes **Second Consultation Paper** |
| November 2021 | Companies to respond to Second Consultation Paper |
| March 2022 | DoE publishes **Draft Proposals** |
| April 2022 | Companies to submit 2021 audited SBAs |
| May 2022 | Companies to respond to Draft Proposals |
| September 2022 | DoE publishes **Final Proposals** |
| 1 January 2023 | RC2 takes effect (if Final Proposals accepted) |

2.6.2 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 DoE during 2021-2022, in addition to workshops, presentations and meetings at various stages. It allows the companies about 1-2 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 will well feed into, the main price control review.

## 2.7 Related work streams

2.7.1 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. During 2019-2020, DoE shared the draft of consultant's scope of work with the network companies. The consultant's scope of work has since then updated to reflect the developments during 2020 particularly in relation to the transfer of ownership of AADC, ADDC and TRANSCO to TAQA and planned transfer of system operator function from TRANSCO to EWEC. We are at an advance stage of appointing the consultant and will soon be launching kick-off meetings with the relevant companies to initiate the consultant's work.

*Review of regulatory framework for RC2 and plan for OBR*

2.7.2 This work stream involves studying whether transfer of ownership of AADC, ADDC and TRANSCO to TAQA (a listed company) poses any additional risk and requires any fundamental change in the regulatory framework for RC2 or sector's plan to move to an OBR in RC3/or later.

*RC1 ex-post capex review (2020-2022)*

2.7.3 The revised capex allowances for 2020-2021, set through RC1 interim review are a combination of ex-ante and ex-post allowances, comprising of:

(a) Ex-ante allowance for planned schemes; and

(b) Ex-post allowance for running schemes and non-development projects

2.7.4 Ex-ante capex allowance for planned schemes is subject to ex-post review, if either the scope of work changes or actual capex on the scheme deviates from the allowance by more than 10%. Accordingly, some of these approved schemes may fall under ex-post review.

2.7.5 Capex allowances for running schemes and non-development projects for these years are subject to ex-post review.

2.7.6 DoE extended the RC1 by a year to expire by end of 2022. Since the notified values for 2022 are based on 2021, therefore capex allowances for 2022 are effectively equal to 2021, set on a provisional basis. This means, whole of 2022 allowance is subject to ex-post review.

2.7.7 These reviews will be undertaken as per the plan listed in table 5.3 of this paper.

*RC2 opex and capex reviews*

2.7.8 DOE is considering a transition in RC2 towards an alternative approach, whereby opex and capex are assessed on total expenditure (totex) basis, rather than separate assessments for opex and capex as per the DoE's approach to date. The consultant will work with the DoE and the companies to assess the changes required in the regulatory regime to embrace this change. The consultant will submit its draft and final reports, concluding whether a transition to totex approach should be made at RC2, ahead of the DoE's publication of the RC2 second consultation paper in September 2021.

2.7.9 Depending on the conclusion of this study, the consultant will develop over 2021-2022, either of the following forecasts for RC2 period to be used in the price controls:

(a) Separate reasonable efficient opex and capex forecasts (comprising of ex-ante allowance for new schemes and ex-post allowance for running schemes); or

(b) Reasonable and efficient totex forecasts, broken into fast money (opex part) and slow money (capex part) applying appropriate capitalisation rates for RC2 period.

2.7.10 The consultant will submit its draft and final reports providing above forecasts well ahead of RC2 draft and final proposals in March and September 2022, respectively.

*RC2 Weighted average cost of capital*

2.7.11 The aforementioned consultant's scope of work also includes proposals for appropriate weighted average cost of capital (WACC) that should be used as (a) the allowed rate of return for calculating return on capital in RC2, and (b) as the discount rate for NPV calculations for calibrating the revenues and the respective notified values.

*Output based regulation*

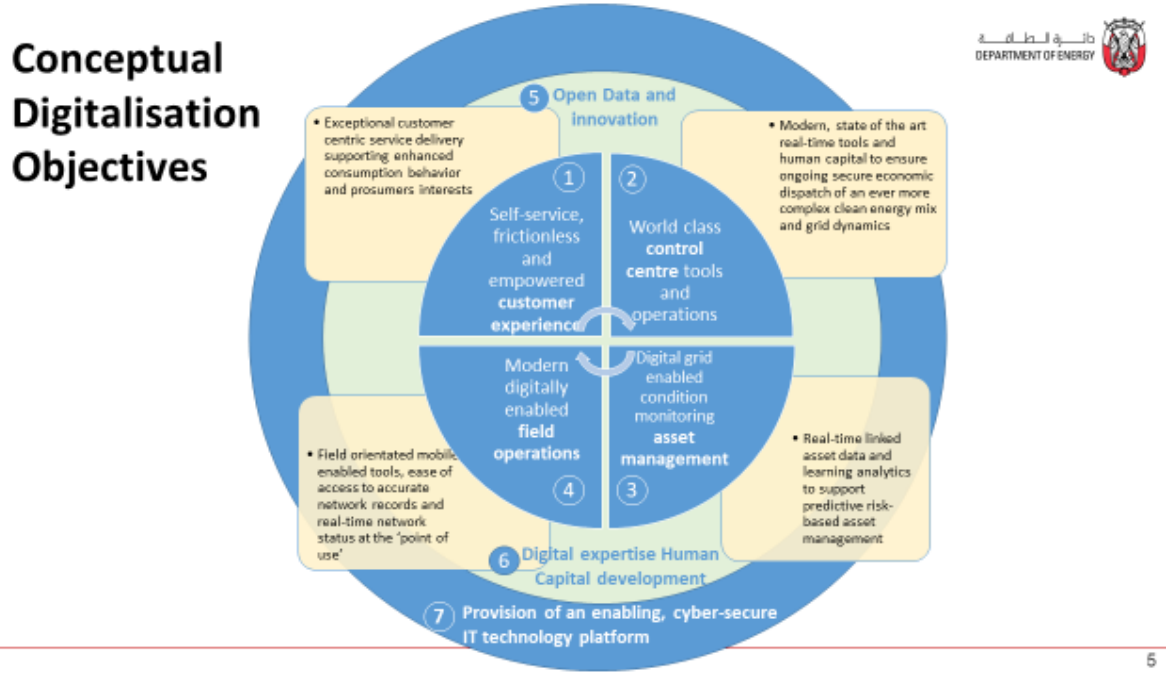
2.7.12 During 2018-2019, DoE extensively consulted with the companies on merits of moving to an output based regulation (OBR). While all the stakeholders

appreciate the benefits OBR can bring to the sector, yet all realise that this move requires extensive work on the enablers, before sector can embrace this change.

2.7.13 Accordingly, the aforementioned consultant's scope of work also includes advising us on selection of appropriate outputs to be used under an OBR regime, mechanism to track and monitor such outputs and changes in regulatory regime and companies' processes that can be made in RC2 for sector's move to OBR in RC3/or later.

*Digitalisation Strategy*

2.7.14 The DoE is working extensively with the sector companies to establish a clear, balanced and coordinated long term digitalisation strategy and identify digitalisation investment to accelerate the value which can be unlocked through improved digitalised customer services and 'smart grid solutions'; enhancing system data availability and data driven analytics to realise improved safety and performace efficiencies in asset management, system control and field operations. In particular, improved customer information and smart-meter roll-out will support sustainability objectives through energy and water efficiency, demand side management (DSM), and sustainability through lower carbon footprint.



2.7.15 This Consultation provides an opportunity for stakeholders to provide feedback on how best to incentivise digitalisation planning and investment and the associated new skill sets and human capital development within the sector companies to achieve multiple benefits through specific opex and/or capex or totex allowances or PIS bonuses? More specifically, the review will focus on what should be the deliverables and targets for companies to receive such allowances or bonuses?

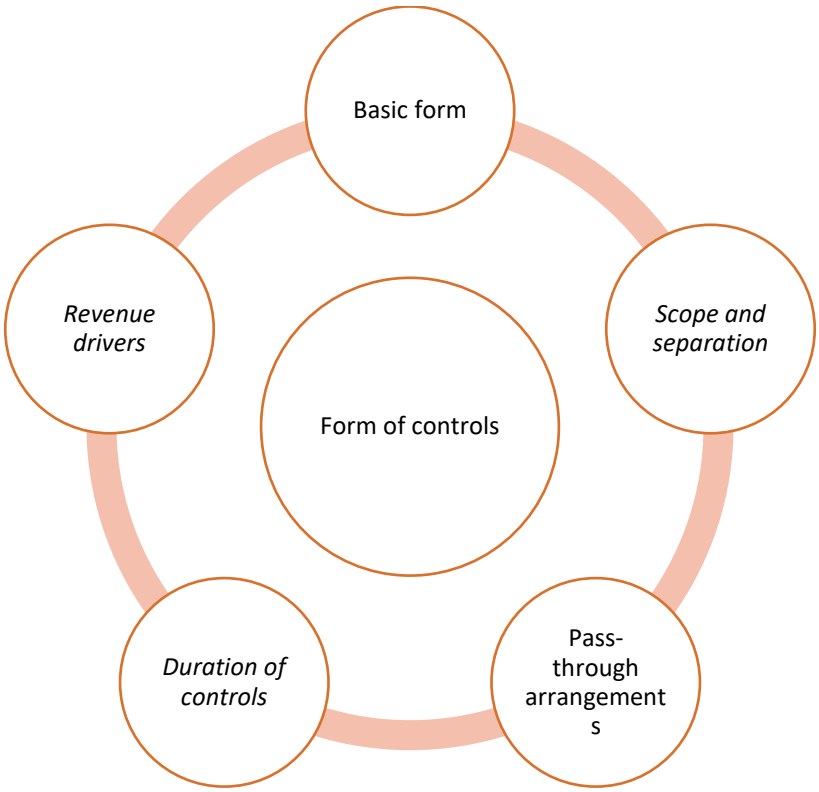
# 3. Form of Controls

## 3.1 Introduction

3.1.1 The main objective of this review and consultation is to design and develop the RC2 price controls for 2023 onwards. This design review 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 the assessed.

3.1.2 The price controls review provides a good opportunity to assess whether the form of the price controls remain appropriate. This section 3 discusses whether the fundamental design of the price controls remains appropriate and whether any changes are required. 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



## 3.2 Basic form of price control

*Existing arrangements*

3.2.1 The main mechanism for the economic regulation of the licensees in the sector has broadly 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 for network companies 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. In the case of EWEC, the CPI-X regulation has applied to its Licensed Procurement costs only, with PWPA and fuel costs allowed a pass-through treatment on an actual basis, subject to economic purchasing obligations.

3.2.2 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 network companies 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*

3.2.3 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. This 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.

3.2.4 However, the existing CPI-X price control regime is primarily an input based regulation where opex and capex allowance are set, without any explicit and firm linkage to the outputs, the companies are required to deliver to earn/retain these allowances. Although, performance incentive scheme (PIS) in the existing price controls include a number of incentives that remunerate/penalise the companies for their performance on the outputs such as SAIDI and SAIFI, yet only a very small proportion of the companies' MAR is linked to these incentives. Nevertheless, even if a greater proportion of the MAR is made subject to adjustments for companies' performance on the outputs through incentives, it will still not achieve the core benefit of an OBR, discussed below.

*Output based regulation (OBR)*

3.2.5 The output based regulation (OBR) is another approach of price controls whereby companies' opex and capex allowances or suitable proportions of MAR are linked to and adjusted for delivery/non-delivery of explicitly agreed outputs (with pre-set targets).

3.2.6 The core benefit of this regime is that it allows greater transparency, and hence control, over the outputs the companies should focus to deliver on and target their investments. For instance, if a distribution company request a significant amount of opex and/or capex to reduce average waiting time to respond to a customer complaint call, the customers (or regulator on behalf of customers) can assess the merits of making this investment and may choose to live with the existing waiting time, saving proposed opex and capex to achieve target improvements. This transparency (and hence control) over investment decisions and the companies' accountability for delivering on the set targets can hardly be achieved through an input based regulation, even if proportion of incentives in the MAR is increased. The OBR however may also need to be assessed in terms of frequency and magnitude of MAR adjustments and any

resulting volatility in revenues, tariffs and subsidy and associated risk exposures for the companies, customers and Government, respectively.

3.2.7 As discussed in section 2, DoE consulted with the network companies, including DoE/Companies exemplar tour to selected UK regulators and companies to study the merits of moving to an OBR and companies' appetite and assess readiness for the OBR during 2018-2019. Despite all the benefits OBR can bring to the sector, all stakeholders appreciate that it requires extensive work on the enablers before the sector can embrace this change, including:

(a) selection of appropriate output indicators to be used for OBR

(b) accurate tracking, monitoring and reporting of these outputs

(c) setting baseline and targets for the outputs

(d) developing and benchmarking cost-output relationships

(e) changes necessary to the companies' business processes

(f) changes necessary to the DOE processes and price control financial models

3.2.8 We are appointing a consultant to advise us on selection of appropriate outputs to be used under an OBR regime, mechanism to track and monitor such outputs, and changes in regulatory regime and companies' processes that can be made in RC2 for sector's move to OBR in RC3 / future.

*Transfer of AADC, ADDC and TRANSCO to TAQA*

3.2.9 EWEC, AADC, ADDC and TRANSCO were directly owned by AD Power (a subsidiary of ADQ, which in turn is owned by Abu Dhabi Government). During 2020, ADPower transferred ownership of AADC, ADDC and TRANSCO to one of its subsidiaries, TAQA, a public company listed on Abu Dhabi Stock Exchange. However, system operator function, currently sitting in TRANSCO, is being transferred to EWEC. This transaction has following implications:

(a) AADC, ADDC and TRANSCO have become part of a listed company, whose natural inclination is profit/value maximisation for its shareholders; and

(b) Price controls for system operator function (currently embedded in TRANSCO's electricity and water price controls) need to be separately set for EWEC.

*Unique nature of EWEC's business and its transformation*

3.2.10 When PC4 was set, EWEC (formerly ADWEC) did not have financial capability to manage uncertainties and risks arising from: its smaller capital base compared to its large cash payments; potential contractual issues relating to generation/production companies' liquidated damages; responsibility for forecasting, planning and procurement of production capacities which have significant impact on the rest of the sector; along with major changes in workload and staff requirements from time to time relative to the size of its business; and trading with other Emirates or countries. Accordingly, EWEC's price control to date has been very different from rest of the monopoly companies, and included a more flexible regulatory arrangement, whereby the allowed procurement costs could be adjusted each year if the circumstances required.

3.2.11 However, more flexible arrangements are being introduced for EWEC. For instance, to address EWEC's concerns over cash-flow shortages, the DoE agreed the introduction of a forward-looking within-year quarterly adjustments, whereby actual revenue is charged/refunded if it was lower/higher than actual costs under PWPA and fuel contracts for first, second and third quarters of each year.

## *Key issues for consultation*

3.2.12 Is our initial conclusion to retain CPI-X price/revenue controls in the broad form of the existing regulatory arrangements appropriate?

3.2.13 Is DoE's proposed plan to work on the OBR enablers during RC2 appropriate? Whether significant changes to the PIS, especially the amount of MAR at risk for incentives and areas of PIS, are required to progress transition to OBR if PIS would be redundant with the adoption of OBR?

3.2.14 Does transfer of AADC, ADDC and TRANSCO to TAQA pose any additional risk and accordingly, warrant a fundamental change in the CPI-X regulatory regime for RC2 or sector's plan to move to an OBR for RC3/future?

## 3.3 Scope and separation of controls

*Existing arrangements*

3.3.1 Currently, there are separate price controls for the water and electricity businesses of AADC, ADDC and TRANSCO, and separate price controls for recycled water businesses of AADC and ADDC. 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.

3.3.2 While the price controls for EWEC cover only its licensed activities (inside the Emirate of Abu Dhabi), the scope of TRANSCO price control includes TRANSCO's electricity and water transmissions activities outside the Emirate of Abu Dhabi due to common network used for both licensed and unlicensed businesses and similarities in investment decisions and other capex processes for both businesses.

3.3.3 AADC, ADDC and ADSSC do not have any business outside Abu Dhabi. Further, the price control for system operator function, currently sitting in TRANSCO, is embedded in TRANSCO's price controls. On transfer of this business to EWEC, a separate price control will need to be set for this business for EWEC.

*Assessment and considerations*

3.3.4 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 DoE and licensees and requires, among others, availability of reliable and accurate information about the separate businesses.

3.3.5 EWEC was formed due to transformation of Abu Dhabi Water and Electricity Company (ADWEC) with a vision to achieve greater integration of the energy sector across UAE.

3.3.6 ADSSC is currently in discussion with AADC and ADDC to procure the billing services from the latter companies' supply businesses. The distribution companies' role in this arrangement is treated as unlicensed but consented activities in accordance with the laws and licences. Therefore, it was discussed and agreed during the RC1 consultation that the costs and revenues related to such unlicensed activities will be excluded from the scope of new price controls of distribution companies with appropriate accounting separation and reporting for these activities (similar to distribution companies' billing services to the Municipalities or any other unlicensed activities in future). The fees 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 to ensure ADSSC meet its economic purchasing obligation and pay only competitive fees. However, it does not require any change in the price controls regime for any of these companies.

*Key issues for consultation*

3.3.7 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? Should there be a separate price control for EWEC's system operator business or should it be grouped with its procurement business?

## 3.4 Cost pass-through arrangements

*Existing arrangements*

3.4.1 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 EWEC's Licensed Procurement Business, the payments under long-term PPA / WPA / PWPA and fuel costs allocated to the Licensed business;

(b) for AADC and ADDC, the bulk power, water and recycled water purchases and transmission charges;

(c) for ADSSC, the payments under relevant long-term STAs;

(d) for TRANSCO, the purchase of ancillary services related to electricity business; and

(e) for all companies, the DoE's annual licence fees.

*Assessment and considerations*

3.4.2 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, the correction factor mechanism of the MAR formula appropriately addresses the cost deviations on an ongoing basis.

3.4.3 For EWEC, the PWPA and fuel costs paid to external parties account for majority of costs incurred by EWEC. These costs amount to nearly half of the sector turnover. To ensure economic purchasing of water and electricity by EWEC, we rely on the competitive tendering undertaken to award PPA/WPA/PWPA contracts, based on the lowest levelised unit costs of electricity and water over the contract term. Given EWEC's lead role in procurement of these costs, incentivising efficient procurement and use of production capacity and fuel needs to be the core heart of EWEC's price control.

*Key issues for consultation*

3.4.4 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? How best is to incentivise EWEC to perform its obligations in relation to accurate demand forecasts, capacity planning and fuel purchases to ensure economic purchasing?

## 3.5 Duration of controls

*Existing arrangements*

3.5.1 Both the PC1 and PC2 controls were set for 3 years, although PC1 was subsequently extended for another year. PC3, PC4 and PC5 controls were set for 4 years (and 4½ years in the case of PC3 controls for ADSSC). The present RC1 controls were initially set for 4 years, but then extended for another year.

**Figure 3.2**: Multi-year price controls for network companies

| PC1 | PC2 | PC3 | PC4 | PC5 | RC1 | RC2 |
|---|---|---|---|---|---|---|
| 1999-2002 | 2003-2005 | 2006-2009 | 2010-2013 | 2014-2017 | 2018-2022 | 2023 onwards |

*Assessment and considerations*

3.5.2 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.

3.5.3 Our choice of a relatively shorter duration for price controls is driven by uncertainties within the sector relating to issues such as demand growth and capex forecasting. Recent price controls have therefore been of a 4-year duration.

3.5.4 In light of the above, the our current thinking is to use a multi-year price control with a control period of 4 years (similar to RC1), with regular reviews and adjustments of costs as discussed in sections 4 and 5 of this paper in relation to the treatment of opex and capex (or totex, if a totex based approach is adopted).

*Key issues for consultation*

3.5.5 Is our initial conclusion appropriate to set RC2 controls for 4 years for all companies with one-time ex-ante capex review, ex-post capex adjustments every two year and annual specific opex allowance adjustments?

## 3.6 Revenue drivers

*Existing arrangements*

3.6.1 As mentioned in Section 2 (Table 2.1), the MAR formulas in Abu Dhabi contain a fixed term and one variable terms involving revenue drivers. At present, each network company or business has one revenue driver (except for EWEC and recycled water price controls of AADC and ADDC, which have no revenue driver) linked to their outputs, such as number of customers served and units transmitted or treated. In each case, the weights of the fixed element and the variable element subject to the revenue driver are in the ratio of 85:15.

*Assessment and considerations*

3.6.2 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.

3.6.3 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) Cost adjustments during the price control period can complicate price controls mechanism that involves revenue drivers; and

(d) Finally, whether the network costs significantly vary with outputs in the short term (i.e. year on year basis), particularly when opex component constitutes approximately ¼ of the MAR.

3.6.4 AADC, ADDC and TRANSCO recently restructured their inter-sector charges (transmission use of system charge - TUoS and distribution use of system charge DUoS) from volume based charge to demand based charge to robustly reflect transmission and distribution systems' primary design consideration i.e meet peak demand rather than total annual quantity of electricity and water. This change may warrant corresponding change in the price controls revenue drivers for these companies (and ADSSC). We welcome the companies to undertake and submit a robust analysis such as regression to show the outputs that are reasonable cost drivers and can be considered for revenue drivers.

*Key issues for consultation*

3.6.5 Whether existing arrangements for revenue drivers remain appropriate? Should the revenue driver for AADC, ADDC and TRANSCO be changed to peak demand? What should be the revenue driver(s) for recycled water business?

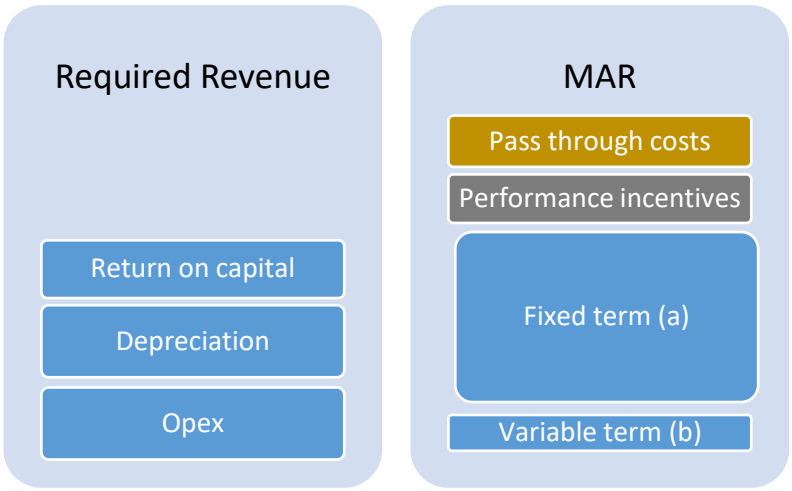
## 3.7 Price control calculations

*Existing arrangements*

3.7.1 At present, the calculations of price control revenue for network companies 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' and 'b' in the MAR formulae for the new price controls, which are 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




3.7.2 To date, the DoE 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 driver and the forecasts of the revenue driver. Projected revenue is controlled and sculptured by selecting base prices (i.e. notified values of 'a' and 'b' in the MAR formulae) and X values. We used value of X factor equal to -3% for electricity businesses in RC1 to smoothen the total sector costs and cost reflective tariffs forecasts. The X-factor was set to zero for other businesses in the current price controls for all other businesses.

3.7.3 For EWEC, the price control calculation focused on the first year of the control period only (2010), instead of covering all the years of the price control period.

The allowance for subsequent years (2011 onwards) was to be calculated during the control period through the annual adjustment mechanism for actual cost deviation. The EWEC's allowance also included a nominal profit margin on its BST turnover forecast over the control period. A profit margin of 0.019% was used based on the real cost of capital of 4.50%, which was estimated for PC4 controls for other sector companies.

### *Assessment and considerations*

3.7.4 The existing approach to price control calculations has worked well, and the companies have experienced application of non-zero X factor in their 2019 MAR calculations. Therefore, our current thinking is to retain the existing approach to the price control calculations and use a suitable value of X factor (for all the businesses, if necessary), to profile the MAR appropriately.

3.7.5 However, there may be an opportunity to set EWEC's allowances for all the years of RC2, instead of setting allowance for 1st year and then calculation of allowance for subsequent years based on annual adjustment mechanism to give EWEC more certainty over 4 years about its procurement allowance, incentivise costs efficiencies and align EWEC's price control calculation with the rest of monopoly companies.

### *Key issues for consultation*

3.7.6 Whether we should retain the existing building-block, net present value based approach to the price control calculations and use a suitable value of X factor (for all the businesses, if necessary), to profile the MAR appropriately over the control period? Should the same approach be adopted for EWEC, which would mean setting allowances for EWEC for all the years of RC2, instead of setting allowance for the first year and then calculate allowance for subsequent years based on annual adjustment mechanism?

# 4. Operating Expenditure

## 4.1 Introduction

4.1.1 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. The following five considerations are 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;

(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 separate business accounts (SBAs) (also referred to as "regulatory accounts") on an going basis and the two remain consistent over the price control period; and

(e) Reporting should be sufficiently enhanced to provide the necessary transparency and to allow demonstrating/verifying whether efficiency objectives are being achieved.

4.1.2 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.

## 4.2 Companies' opex performance to date

4.2.1 The trends in opex of the companies over the periods 2014-2019 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.

4.2.2 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.

4.2.3 A step increase in AADC, ADDC, TRANSCO and EWEC's opex from 2018 to 2019 was due to the following main reasons:

(a) Dissolution of RASCO and transfer of its staff and certain assets to AADC and ADDC effective 1 January 2019, increasing distribution companies' opex by approximately AED 50 million a year and discontinuation of allocation of their costs via management fee for operation and management of RASCO assets amounting to about AED 50 million a year. This increase in opex by AED 100 million is offset by corresponding decrease in generation costs charged by RASCO to the distribution companies;

(b) Transfer of operation and maintenance (O&M) contracts for recycled water business costs to the distribution companies starting 2019;

(c) Completion of metering and billing arrangements between EWEC/ADDC and TRANSCO and consequent billing of around AED 105 million a year to TRANSCO for electricity consumed at its two water pumping stations (one inside and another outside Abu Dhabi) for 2018-2019 – this cost was earlier included in EWEC's generation costs charged to distribution companies. This increase in TRANSCO's opex (consequently transmission costs) is offset by corresponding decrease in EWEC's generation costs charged to distribution companies;

(d) Transformation of EWEC (from ADWEC), resulting in significant increase in its staff and consultancy costs; and

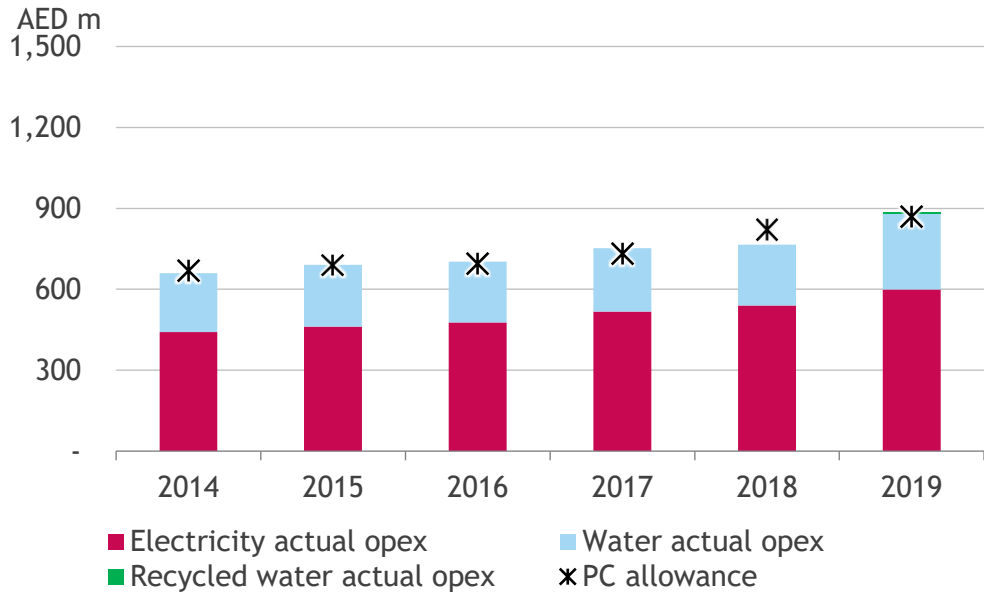
(e) Costs recharged by ADPower for a number of studies carried out for the sector companies.

4.2.4 DoE's consultant will study the reasons for increase in opex in detail to determine legitimacy and efficiency of these costs and impact on the RC2 allowances.

*AADC's opex performance*

4.2.5 The chart below summarises AADC's actual opex against the projections made in setting the price controls for the period 2014-2019 in nominal prices.

**Figure 4.1**: AADC's opex (nominal prices)




Note: PC allowance including DoE service fee charged on a pass-through basis and opex adjustments relating to the relevant year. In practice, Licensees apply opex adjustment in subsequent year MAR in the PCR.

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

(a) over the period 2014-2019, AADC's actual opex increased on average by about 6% per annum;

(b) in 2019, the company's total opex reached AED 885 million, almost 33% above the 2014 level (AED 660 million) and 15% above 2018 level (AED 766 million) and was, AED 15 million or 2% more than the price control target;

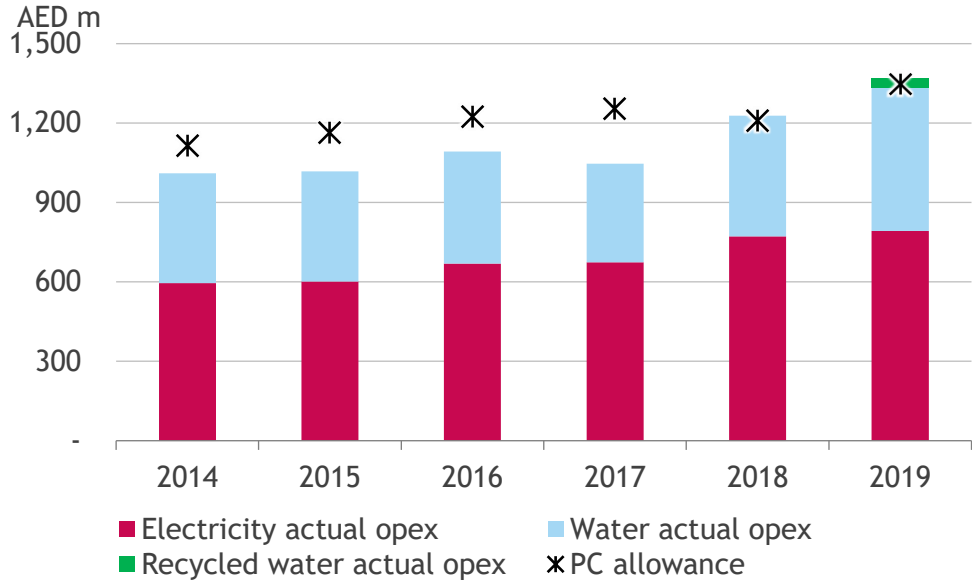
(c) electricity and water businesses account for about 68% and 32%, respectively of the company's total opex; and

(d) staff costs constitute the largest part (about 56%) of opex, followed by administration and other expenses (about 41%).

*ADDC's opex performance*

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

**Figure 4.1** ADDC's opex (nominal prices)




Note: PC allowance including DoE service fee charged on a pass-through basis and opex adjustments relating to the relevant year. In practice, Licensees apply opex adjustment in subsequent year MAR in the PCR.

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

(a) over the period 2014-2019, ADDC's actual opex increased on average by about 6% per annum;

(b) in 2019, the company's total opex reached AED 1,369 million, almost 36% above the 2014 level (AED 1,010 million) and 12% above the 2018 level (AED 1,228 million) and was, AED 24 million or 2% more than the price control target;

(c) electricity, water and recycled water businesses account for about 58%, 39%, and 3% respectively of the company's total opex; and

(d) administration and other expenses constitute the largest part (about 48%) of opex, followed by staff cost (about 44%).

*TRANSCO's opex performance*

4.2.9 Trends in TRANSCO's opex are summarised below:

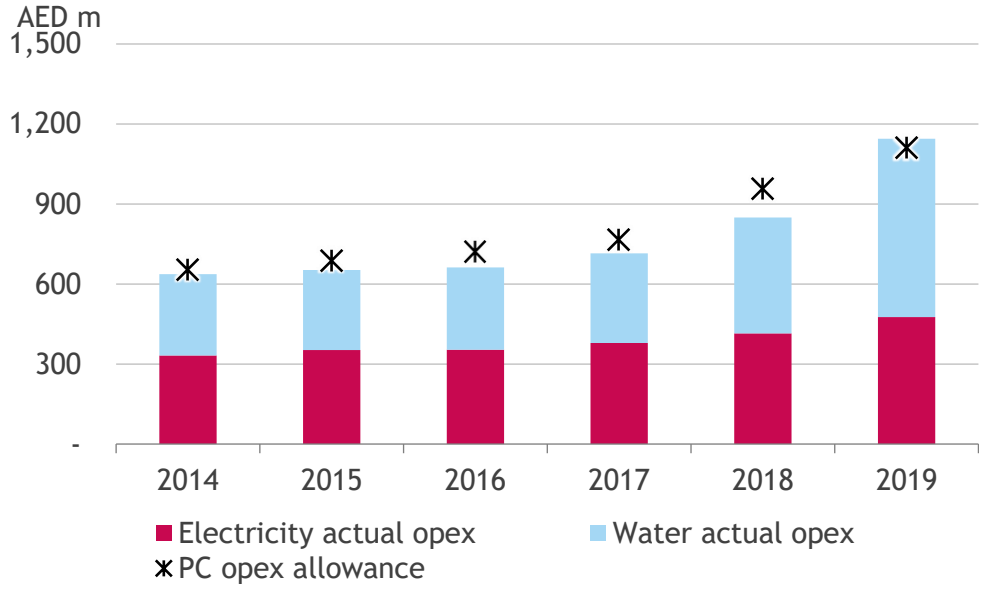
(a) over the period 2014-2019, TRANSCO's actual opex increased on average by about 12% per annum;

(b) in 2019, the company's total opex reached AED 1,145 million, almost 80% above the 2014 level (AED 637 million) and 35% above the 2018 level (AED 850 million) and was AED 35 million or 3% more than the price control target;

(c) electricity and water businesses account for about 42% and 58%, respectively of the company's total opex; and

(d) administration and other expenses constitute the largest part (about 40%) of opex, followed by staff costs and repair and maintenance (about 30% each).

**Figure 4.2**: TRANSCO's opex (nominal prices)




Note: Actual costs and PC allowance for 2019 include certain pumping costs for 2018. PC allowance including DoE service fee charged on a pass-through basis and opex adjustments, recorded in the relevant year these relate to. In practice, Licensees apply opex adjustment in subsequent year MAR in PCR.

*ADSSC's opex performance*

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

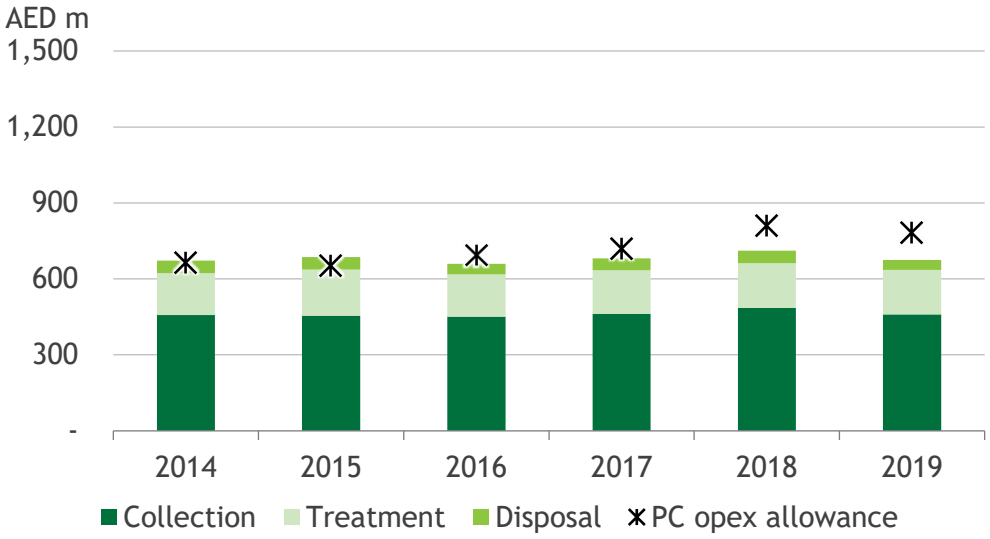
(a) over the period 2014-2019, ADSSC's actual opex remained stable;

(b) in 2019, the company's total opex remained stable at 2015 level at AED 675 million, and was AED 108 million or 14% lower than the price control target;

(c) Sewerage business accounts for the largest part (about 68%) of the company's total opex, followed by wastewater treatment (26%) and disposal (6%); and

(d) staff costs constitute the largest part (about 56%) of opex, followed by the repair, maintenance and consumables (31%) and administration and other expenses (about 12%).

**Figure 4.3**: ADSSC's opex (nominal prices)




Note: PC allowance including DoE service fee charged on a pass-through basis and opex adjustments relating to the relevant year.. In practice, Licensees apply opex adjustment in subsequent year MAR in the PCR.

*EWEC's opex performance*

4.2.11 Trends in EWEC's Licensed Business opex are summarised below:

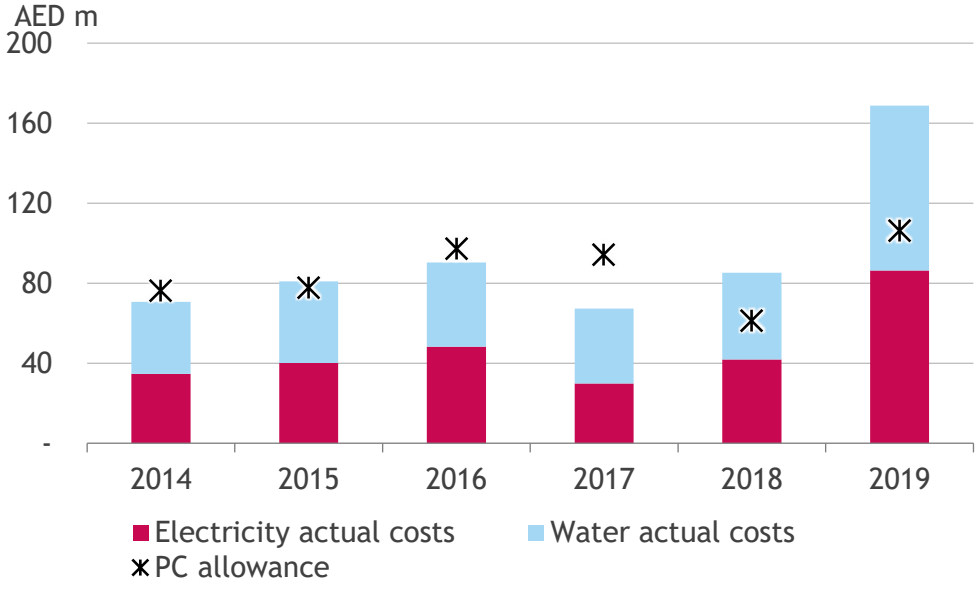
(a) over the period 2014-2019, EWEC's actual opex increased on average by about 19% per annum;

(b) in 2019, the company's total Licensed Business opex reached AED 169 million, almost 139% above the 2014 level (AED 71 million) and was AED 63 million or 59% higher than the price control allowance;

(c) each of electricity and water businesses accounts for about half of the company's total opex; and

(d) administration and other expenses constitute the largest part (about 54%) of opex, followed by staff costs (about 46%).

**Figure 4.4**: EWEC's Licensed Business opex (nominal prices)




Note: PC allowance for 2019 includes additional cost allowances requested by EWEC, which are under DoE review.

## 4.3 Approach to opex projections and allowances

4.3.1 The opex allowances for network companies for the RC1 period were developed in 2017 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 4.4 below:

(a) Establish the company's base level of cost or current recurring controllable cash opex (CC) from 2016 (the most recent actual audited costs)

by excluding non-cash items, cost of discontinuing activities, one-off costs and non-controllable costs (such as the DoE's licence fee);

(b) Roll forward the base level of cost from 2016, (with 2016 actual UAE National staff training costs also excluded), to the start of RC1 period (2018). The opex consultant's final report included a separate allowance for staff training costs of UAE Nationals during RC1;

(c) Develop top-down cost projections (TCP) up to the end of the RC1 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 growth and real annual efficiency gains of 3%-4% a year. These assumptions are based on the sector companies' experience over 2010-2016, as well as evidence from other countries. Demand growth is measured through (i) average growth in units transmitted/distributed/daily wastewater flows, (ii) customer numbers for distribution companies and ADSSC and peak demand for TRANSCO, and (iii) network length;

(d) Establish bottom-up efficient cost (BEC) for the base year (2016) costs using detailed bottom-up benchmarks for efficient costs;

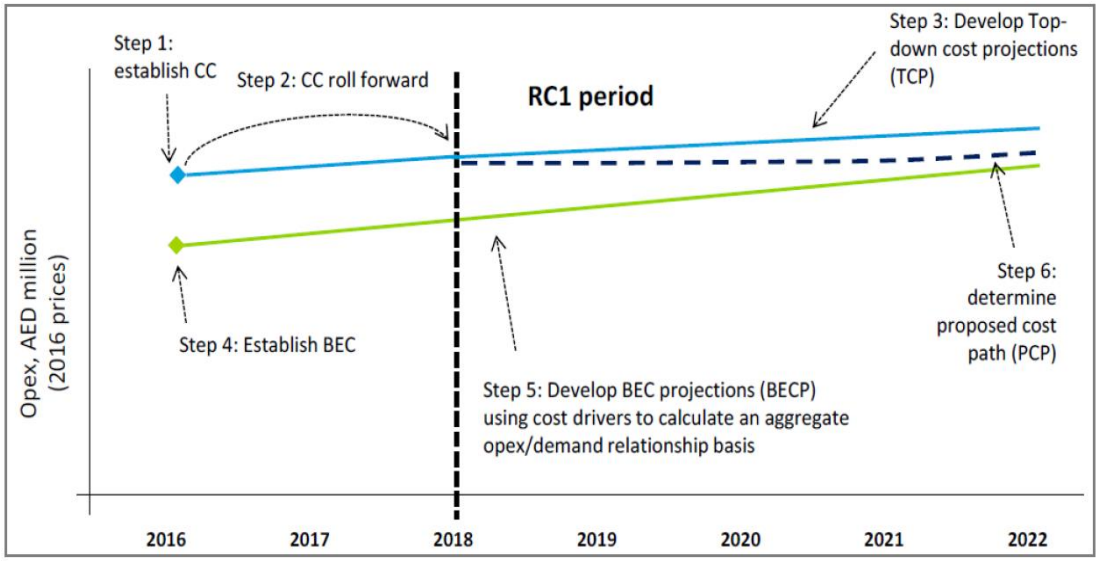
(e) Starting with BEC, develop bottom-up efficient cost projections (BECP) to last year of RC1, based on a set of comparator benchmarks, an assessment of cost-structure and cost/volume relationship using cost drivers for specific costs, and an annual frontier shift efficiency assumption of 1% per annum.

(f) Develop proposed cost path projections (PCP) of reasonable, controllable opex over the RC1 period by (i) adding any specific allowances that result from additional activities such as (VAT, DSM, resource resilience), (ii) and deduct any expected savings from initiatives currently under development (such as STEP tunnel for ADSSC) (iii) allowing a transition path for the company from its expected level of opex in the second year of the RC1 period based on TCP towards the efficient cost level based on BECP, with a linear

catch-up rate of 15% per annum that closes 45% of the gap between TCP and BECP by 2021; and

(g) Set the reasonable cost projection (RCP) for RC1 by adding a reasonable estimate of non-controllable opex (none for RC1) to PCP.

**Figure 4.5**: PC5 opex projections approach




4.3.2 These projections included various specific cost allowances for additional roles and responsibilities (e.g. Emiratisation and training costs, mega developments, energy costs for additional water pumping) as well as capability building in important areas. 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.

4.3.3 By contrast, base level of EWEC's opex (termed as procurement costs) were set equal to the latest actual costs as per the audited SBAs to the extent they were considered reasonable. These costs included operating as well as capital costs such as depreciation. However, the majority of EWEC's costs related to the staff salaries, staff allowances, and administrative expenses.

## 4.4 Key issues for consultation

4.4.1 Whether a hybrid of both a high-level top-down approach and a more detailed bottom-up approach, similar to RC1, is appropriate to set main opex projections for RC2 for all companies including EWEC? What further changes or improvements are required in this approach?

4.4.2 Whether an approach similar to RC1 is appropriate to set specific provisional allowances (with automatic adjustment mechanism for outturn results) 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?

# 5. Capital Expenditure

## 5.1 Introduction

5.1.1 Capex is important for electricity, water, recycled 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. As discussed in section 6, capex is financed in the price controls through depreciation allowances and returns on regulatory asset values (RAVs). The DoE has employed predominantly an ex-post regime but also increasingly an ex-ante regime to the treatment of capex in the price controls.

5.1.2 The treatment of capex discussed in this section applies to the four network companies (AADC, ADDC, ADSSC and TRANSCO). However, this may also apply to EWEC's system operator business if justified by the magnitude of the capex involved.

5.1.3 For recycled water businesses of AADC and ADDC, the first price controls set in 2020 to apply to 2018 onwards (also referred to as "RC1") included only provisional capex allowances, requiring full extent of ex-post capex review.

*Ex-post capex regime*

5.1.4 Until PC5, the treatment of capex was based on an ex-post assessment of efficient capex based on efficiency criteria established by the DoE, 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).

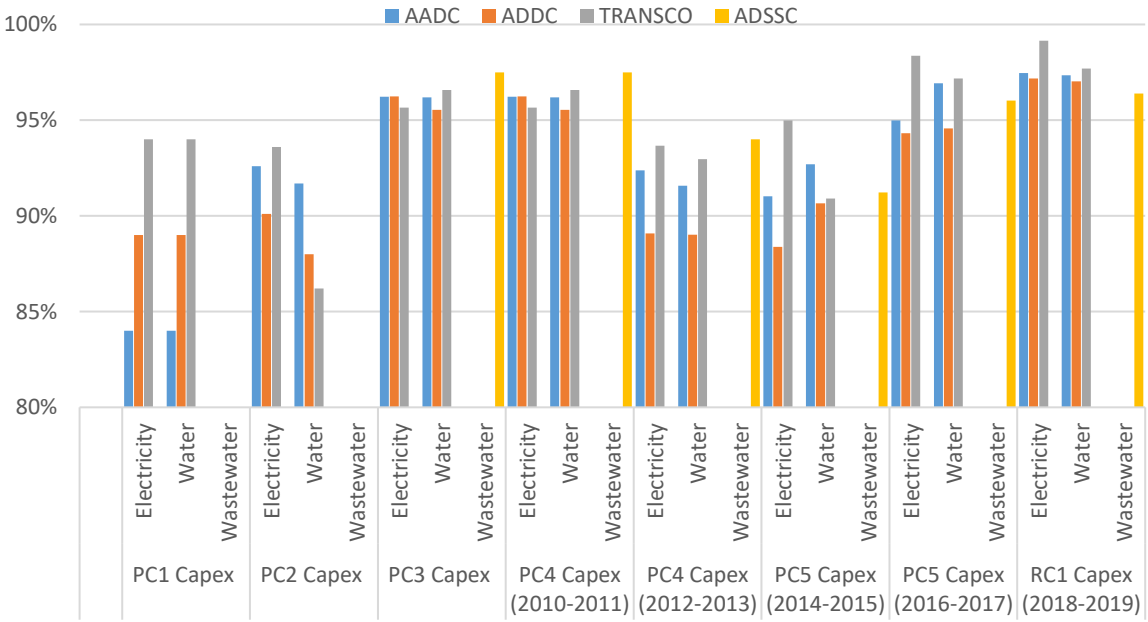
5.1.5 Provisional capex used in setting the price control was solely to facilitate the financing of capex and smoothing of the revenue from one period to another. It was not intended to be indicative of the DoE's views of the appropriate or efficient level of capex. The high level efficiency criteria for capex as established by the DoE 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)?

5.1.6 Ex-post capex efficiency scores that were applied to capex relating to previous price controls are summarised in the table below:

**Figure 5.1**: Network companies' ex-post capex efficiency scores to date




Note: ADDC's electricity scores excluding its 2016 and 2018 BESS capex which separately scored 80.42%.

*Ex-ante capex regime*

5.1.7 To address the limitations of the ex-post approach (capex inefficiencies are identified and companies penalised only after many years from initiation of capex projects), we introduced forward-looking ex-ante approach to capex assessment in RC1. This ex-ante approach involves review of the front-end elements (such as need case, optioneering and budgeting) of the companies'

proposed capex schemes, before any actual spending, to provide firm capex allowance in the price controls. This approach does not involve any ex-post review for an approved scheme at a later stage, unless either the scope of work changes or actual capex deviates from the allowance by more than 10%.

5.1.8 To develop and apply the ex-ante capex regime for the first time in RC1, we undertook extensive engagements with the companies; such as, conducted workshops to develop and agree the framework and timeline, developed and refined information requirement templates, carried out two rounds of review of companies' capex spend profile and business cases, and held meetings with individual companies to further explain our approach and bridge information gaps . This ex-ante review for RC1 was completed in February 2017, but none of the companies was able to justify any major new scheme in this review. As a result, the capex allowances for RC1 were significantly lower than the allowances provided in the previous price controls, and substantially comprised of allowances for running schemes at that time that would need capex spending during 2018 onwards. The table below summarises the original capex allowances provided in RC1:

Table 5.1: RC1 original capex allowances

| AED million, nominal prices | | 2018 | 2019 | 2020 | 2021 | RC1 Total |
|---|---|---|---|---|---|---|
| AADC | Electricity | 771 | 556 | 204 | 138 | 1,669 |
| | Water | 294 | 160 | 69 | 46 | 569 |
| ADDC | Electricity | 541 | 214 | 40 | 9 | 804 |
| | Water | 605 | 440 | 262 | 208 | 1,515 |
| TRANSCO | Electricity | 1,006 | 758 | 337 | 367 | 2,468 |
| | Water | 201 | 172 | 158 | 80 | 611 |
| ADSSC | Total | 1,444 | 1,316 | 1,060 | 1,010 | 4,830 |
| **Total** | | **4,862** | **3,616** | **2,130** | **1,858** | **12,466** |

### *RC1 interim capex review*

5.1.9 The RC1 ex-ante capex review was the first of its kind review in the sector and network companies made efforts of varying degrees to respond. Given the companies' performance during this first ex-ante capex review in RC1, the DoE agreed with the companies to provide further flexibility by planning an interim ex-ante review of the last two years of RC1 period (2020-2021) and resetting the ex-ante allowances for 2020-2021 capex.

5.1.10 Accordingly, an ex-ante review of companies' proposed new schemes for 2020-2021 was carried out during 2020, employing a Technical Assessor. The table below summarises the final capex allowances provided in RC1 interim review:

Table 5.2: RC1 interim review capex allowances

| AED million, nominal prices | | 2018 | 2019 | 2020 | 2021 | RC1 Total |
|---|---|---|---|---|---|---|
| AADC | Electricity | 643 | 540 | 695 | 636 | 2,514 |
| | Water | 110 | 94 | 138 | 142 | 484 |
| ADDC | Electricity | 368 | 579 | 612 | 601 | 2,160 |
| | Water | 241 | 229 | 250 | 284 | 1,003 |
| TRANSCO | Electricity | 931 | 1,051 | 1,251 | 1,255 | 4,487 |
| | Water | 1,453 | 331 | 593 | 500 | 2,877 |
| ADSSC | Total | 605 | 720 | 1,060 | 1,010 | 3,395 |
| **Total** | | **4,351** | **3,544** | **4,598** | **4,427** | **16,920** |

5.1.11 Since the original capex allowances provided in RC1 substantially comprised of allowances for running schemes at that time and a running scheme cannot have a front-end review, therefore approximately whole capex allowance provided in RC1 were, effectively, subject to ex-post reviews. Considering this, the DoE has further accepted network companies' suggestion to treat 2018-2019 capex as provisional ex-post allowance. We also accepted the companies' suggestion to adjusted these allowances based on 2018 actuals and revised estimate for 2019 capex, submitted by the companies during February 2020 so that revised MARs under RC1 interim review would reflect the latest capex spending and forecasts. DoE updated RAV and MAR calculations on completion of this interim review in February 2020.

5.1.12 Although proportion of ex-ante firm allowance in the revised 2020-2021 capex allowances substantially increased from the first time review (at the time of setting RC1), yet the revised capex allowances for 2020-2021 are still a combination of:

(a) 'Ex-ante firm' allowances for planned schemes, meaning the firm capex allowances included in setting the price controls based on front-end or ex-ante review of the schemes, to be subject to ex-post capex review and adjustment only if either the scope of work changes or actual capex deviates from the allowance by more than 10%; and

(b) 'Ex-post provisional' allowances for running schemes and non-development projects, meaning the capex allowances included in setting the price controls on a provisional basis without front-end or ex-ante review of the schemes, to be subject to full ex-post capex review and adjustment.

5.1.13 It is desired and expected that ex-post component of capex allowance (primarily due to running schemes included in the capex) will automatically diminish over time, with the running schemes being completed and most of the new schemes being subject to front end ex-ante reviews.

5.1.14 Ex-ante capex allowance for planned schemes, determined through front-end review of the companies' proposed schemes by the TA, represents a firm capex allowance. Any individual capex scheme with an ex-ante approval is subject to ex-post review, only if either the scope of work changes or actual capex on the scheme deviates from the allowance by more than 10%. Accordingly, some of these approved schemes may fall under ex-post review. Since this TA review did not cover review of the revised capex allowances for running schemes and non-development projects, this component of 2020-2021 revised capex allowance is provisional hence subject to ex-post review.

5.1.15 The application of the above ex-post and ex-ante approaches to capex over each price control period to date is summarised in the following table.

Table 5.3: Treatment of capex in price controls for network companies

| Treatment | PC1 capex | PC2 capex | PC3 capex | PC4 capex | PC5 capex | Original RC1 capex | Extended RC1 capex | RC2 capex |
|---|---|---|---|---|---|---|---|---|
| **Provisional capex allowances** | Included in PC2 | Included in PC2 | Included in PC3 | Included in PC4 | Included in PC5 | No included.<br>However, in RC1 interim review it was agreed to treat 2018-2019 capex as ex-post. | 2022 capex allowance deemed equal to 2021 allowance | Subject of this review |
| **Firm capex allowance** | NA | NA | NA | NA | NA | Included in RC1.<br>Revised in RC1 interim review. | NA | Subject of this review |
| **Capex efficiency review** | Undertaken by DoE in 2004 | Undertaken by independent consultants in 2007 | Undertaken by independent consultants in 2011-2012 | 2010-2011 capex review undertaken by independent consultants;<br>2012-2013 capex review undertaken by DoE | 2014-2015 capex review undertaken by DoE<br>2016-2017 capex review undertaken by TA | 2018-2019 capex reviewed during Q3-Q4 2020.<br>2020-2021 capex review to be decided. | 2022 capex review to be decided. | Subject of this review |
| **Adjustment for efficient capex** | Made in PC3 | Made in PC4 | Made in PC5 | Adjustment for 2010-2011 made in PC5. | Adjustment for 2014-2015 made in RC1.<br>Final adjustment for | Estimate adjustment for 2018-2019 capex made in RC1 interim review. Final | Adjustment for 2022 capex to be decided. | Subject of this review |

| | | | | | |
|---|---|---|---|---|---|
| | | | Adjustment for 2012-2013 made in RC1. | 2016-2017 made in RC1 interim review. | adjustment to be made in 2021/RC2.<br>Adjustment for 2020-2021 capex 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".
TA stands for "Technical Assessor", appointed by the network companies with DoE approval.

5.1.16 Key points to note from the above table are as follows, with the closed or completed elements shown in green shaded cells in the above table:

(a) PC1, PC2, PC3, PC4 and PC5 capex are closed matters requiring no further efficiency adjustment to price controls;

(b) Efficiency assessment of RC1 capex (2018-2019) has been completed in 2020. Accordingly, associated estimate adjustment to price control revenue made at the time of RC1 interim review will need to be updated in 2021 or RC2 for final efficiency scores;

(c) efficiency assessment of RC1 capex (2020-2021) relating to both; (i) running schemes and non-development capex, and (ii) planned schemes with ex-ante allowance if either the scope of work changes or actual capex on the scheme deviates from the allowance by more than 10% will need to be dealt with at a future date;

(d) efficiency assessment of capex for extended part of RC1 (2022) and associated adjustment to price controls will need to be dealt with at a future date; and

(e) an approach to the treatment of RC2 capex needs to be agreed and incorporated into RC2 at this price review.

## 5.2 Treatment of RC1 capex

*RC1 ex-post capex review (2018-2019)*

5.2.1 During the RC1 interim review, DoE allowed provisional revenue adjustment for unearned/unduly earned financing costs relating to 2018-2019 under/overspent capex using 2018 actual and 2019 estimate capex and estimate ex-post efficiency scores for 2018-2019 (score were estimated based on 2016/2017 capex efficiency scores). The ex-post capex efficiency review of these two years has been carried out by the Technical Assessor in 2020. Accordingly,

DoE will need to update the provisional financial adjustment in 2021 or in RC2 for actual capex and final capex efficiency scores.

*RC1 ex-post capex review (2020-2022)*

5.2.2 As explained above the ex-post capex allowances for 2020-2021, allowed in RC1 interim review, are a combination of ex-ante and ex-post allowances, comprising of:

(a) Ex-ante firm allowance for planned schemes;

(b) Ex-post provisional allowance for running schemes and non-development projects

5.2.3 Therefore for 2020-2021, capex efficiency assessment of (a) capex relating to running schemes and non-development capex , and (b) planned schemes with ex-ante allowance where either the scope of work changes or actual capex on the scheme deviates from the allowance by more than 10% will need to be carried out and associated adjustment to price controls be dealt with at a future date.

5.2.4 For 2022 (extended year of RC1), efficiency assessment of whole capex will need to be carried out and associated adjustment to price controls be dealt with at a future date.

## 5.3 Treatment of future capex

*Approach to date*

5.3.1 To date, the DoE has adopted a combination of ex-post and ex-ante approaches to capex treatment in the price controls for future capex at the time of setting price controls in the past. As explained earlier, these approaches included incorporating ‘ex-post provisional’ capex allowances and ‘ex-ante firm’ capex allowances for approved schemes in price controls to facilitate funding capex projects.

*Need for change*

5.3.2 Separate reviews and setting of opex and capex allowances (as part of the DoE's approach to date) may provide an incentive for the companies towards capex bias. It also limits the companies' flexibility for efficient delivery of services, taking advantage of changes in technological environment, whereby less capital-intensive but involving higher opex options may be more viable.

*Current thinking*

5.3.3 Therefore, DOE is considering whether a transition be made in RC2 towards an alternative approach, whereby opex and capex are assessed on total expenditure (totex) basis.

5.3.4 This transition can have significant impact on the review methodology and cost allowances provided in the price controls. As EWEC has to date only procurement businesses managing long-term contracts with large cash flows but negligible capex, its price controls has always combined capex with opex to set procurement allowance. A decision would be required on the capex regime for EWEC's system operator function if it were expected to involve significant capex.

5.3.5 Under the totex approach, the regulator approves the companies' totex (rather than opex and capex separately), though may still be based on separate assessment of opex and capex. The totex is then split into opex (or fast money) and capex (or slow money) for the purpose of MAR calculations using a suitable capitalisation rate. The key question is whether totex approach is required to address any significant issue such as capex bias in the Sector. It should address specific, well-established (or anticipated) problems and objectives, and not only a change per se. We are hiring a consultant for detailed review of these considerations to make an informed conclusion on the transition.

*Digitalisation strategy*

5.3.6 As discussed in section 2, the DoE is working with the sector companies to enhance the digitalisation. This review provides an opportunity for stakeholders to provide feedback on how best to incentivise digitalisation planning and

investment within the sector companies to achieve multiple benefits through specific opex and/or capex or totex allowances or PIS incentives. More specifically, the review will focus on what should be the deliverables and targets for companies to receive such allowances or incentives.

## 5.4 Key issues for consultation

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

(a) Whether a totex approach is justified for Abu Dhabi sector what are the problems that it will address, what are the possible risks and challenges, and whether companies are ready for this transition?

(b) Apart from transition to Totex approach, are there any other changes which should be considered at this review in relation to capex regulation?

(c) How best to incentivise digitalisation planning and investment within the sector companies to achieve multiple benefits through specific opex and/or capex or totex allowances or PIS incentives? What should be the deliverables and targets for companies to receive such allowances or incentives?

# 6. Financial Issues

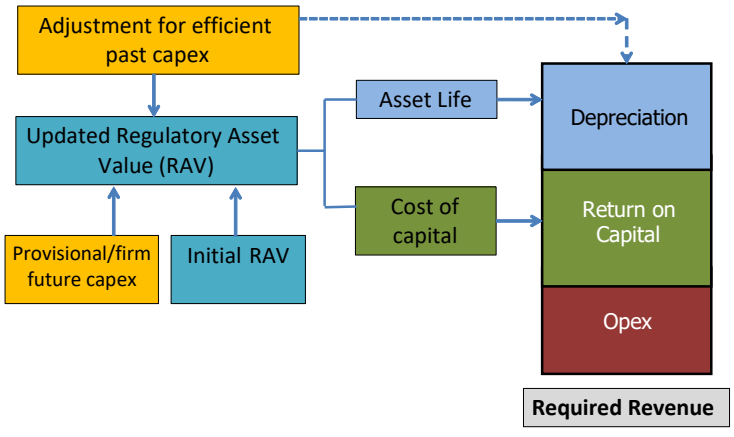
## 6.1 Introduction

6.1.1 This section discusses how capex should be financed through the two major components of the price-controlled revenue; namely, the regulatory depreciation and cost of capital components of the MAR.

6.1.2 Because capex relates to assets that have an economic life of many years, it is 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 RAV.

6.1.3 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 controls.

**Figure 6.1**: Financial issues in price control calculations




## 6.2 Regulatory depreciation

*Current price control arrangements*

6.2.1 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 DoE 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 (and in case of ADDC's battery energy storage system (BESS) agreed with ADDC during 2020) are summarised in the table below.

Table 6.1: Asset life assumptions at previous price control reviews

| | Initial RAV | | | | Life of New Capex | |
|---|---|---|---|---|---|---|
| | RAV Year | RAV AED m | Depreciation AED m | Implied Life years | Pre-2018 capex years | Post-2018 capex Years |
| AADC (E) | 1999 | 1,516.140 | 78.780 | 19.25 | 30 | 40 |
| AADC (W) | 1999 | 129.320 | 3.850 | 33.59 | 30 | 40 |
| AADC (RW) | 2018 | 447 | 9.85 | 45.38 | N/A | 40 |
| ADDC (E) | 1999 | 2,939.200 | 130.950 | 22.45 | 30 | 40 |
| ADDC (E) BESS | 2016/2018 | N/A | N/A | N/A | 15 | 15 |
| ADDC (W) | 1999 | 845.560 | 57.130 | 14.80 | 30 | 40 |
| ADDC (RW) | 2018 | 969 | 26.57 | 36.47 | N/A | 40 |
| TRANSCO (E) | 1999 | 2,907.100 | 115.100 | 25.26 | 30 | 40 |
| TRANSCO (W) | 1999 | 2,053.187 | 113.645 | 18.07 | 30 | 40 |
| **ADSSC** | **2005** | **4,430.479** | **324.923** | **13.64** | **50** | **60** |

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

6.2.2 In the RC1 review, the asset life assumptions have been reviewed and it is not envisaged that these asset life assumptions will be reviewed in RC2.

6.2.3 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.

## 6.3 Updating RAVs

6.3.1 The opening RAV will be updated for every year of the price control period to account for new capex allowances and the total depreciation on the RAV and new capex. The closing RAV of the first year will be the opening RAV of the next year and so on. This approach is consistent with that adopted during previous price control reviews.

6.3.2 However, on the companies' request, the financing costs of the differences between the efficient and provisional capex for PC4 (2012-2013) and PC5 (2014-2017) was remunerated as additional revenue in respective year MAR (a retrospective adjustment to the 2012-2017 MARs via derogation), instead of remuneration over the RC1 period. This was an exceptional case given the magnitude of the adjustment and the fact that it relates to a period of highly subsidised customer tariffs. We do not intend to continue this arrangement in RC2.

## 6.4 Cost of capital

6.4.1 Setting the price controls for network companies requires determining an allowed cost of capital or rate of return which would apply to the RAV each year for financing 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*

6.4.2 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).

6.4.3 Important features of this approach to WACC 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):

Cost of equity = Risk free rate + (Equity beta × 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.

6.4.4 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 use a real

cost of capital in setting the price controls and inflation protection is provided by adjusting the MAR for the UAE CPI.

*Approach to date*

6.4.5 To date, the return on capital has been estimated for price control purposes based on overseas and local/regional utility regulators, cross-checked against regional and local capital market estimates. This approach to rely on overseas / international data is mainly driven by lack of robust capital markets and WACC estimates from the local market.

6.4.6 DoE used data and evidence from the overseas regulatory decisions and proposals, cross-checked against the information available for local and regional estimates, to determine real WACC. Further, we used this data to determine individual components (inputs) to the WACC calculation, instead of using WACC as whole from these sources. To promote and incentivise optimal gearing levels and give an economic signal for the licensees to improve the efficiency of their capital structure, we used optimum gearing level in WACC calculation, instead of relying exclusively on actual gearing of the companies.

6.4.7 During RC1, the DoE also commissioned a study for an independent review of DoE's WACC calculations, presented in the Table below.

Table 6.2: RC1 cost of capital calculations (real terms)

| | Low | High | Mid-Point Average |
|---|---|---|---|
| Risk-free rate (real) | 0.36% | 2.00% | 1.18% |
| Debt premium | 1.00% | 3.64% | 2.32% |
| Cost-of-debt (real) | 1.36% | 5.64% | 3.50% |
| Equity Risk Premium | 4.50% | 7.40% | 5.95% |
| Equity Beta | 0.60 | 0.93 | 0.77 |
| Cost-of-equity (real) | 3.06% | 8.88% | 5.73% |
| Gearing | 45.00% | 65.00% | 55.00% |
| **Cost of capital (real)** | **2.30%** | **6.77%** | **4.50%** |

6.4.8 However, following further consultation with the sector companies, it was finally agreed to adopt a WACC of 4.6% for the RC1.

6.4.9 We plan to hire a consultant to review our existing methodology for WACC calculations and propose an appropriate WACC to be used for RC2.

## 6.5 Key issues for consultation

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

(a) What are stakeholders' views on our initial conclusion to continue with the present approach discussed above to calculate the regulatory depreciation and update the RAVs?

(b) Does the existing approach to estimate the real cost of capital as the weighted average cost of capital (WACC) using the Capital Asset Pricing Model (CAPM) for cost of equity and both overseas and local capital market data remain appropriate?

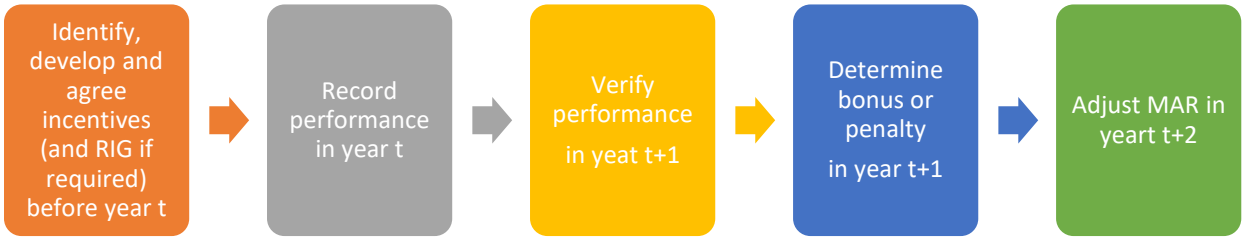
# 7. Incentives

## 7.1 Introduction

7.1.1 Except for recycled water businesses of the distribution companies, the price controls for all the monopoly companies include a Performance Incentive Scheme (PIS) for each business, designed to encourage appropriate quality of service, outputs and performance. Under this scheme, companies are rewarded for improved service and output performance and penalised for deteriorating performance on an annual basis against a set of pre-defined performance indicators.

7.1.2 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 DoE’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?




7.1.3 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.

7.1.4 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 impact the effectiveness of incentives. i.e. they should be simple, objective, measurable, controllable and transparent.

7.1.5 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. However, this remains subject to how the OBR regime is planned and developed, as discussed in section 3.

## 7.2 Incentives in the current price controls

*Current incentives and focus areas*

7.2.1 The existing price controls include incentives in four key areas for network companies and information and peak demand forecasting areas for EWEC, as shown below:

**Figure 7.2**: Four Incentive Categories

7.2.2 The incentive for high quality information aims to lead the companies to provide timely and robust information to the DoE as per their respective price controls and licence, which is essential for effective regulation.

7.2.3 Consistent with the provision of vital utility services, licensees currently face appropriate incentives for network availability, security and quality of supply.

7.2.4 Tables below list all incentives implemented under the current RC1 price controls for network companies and PC4 price controls for EWEC's PC4, respectively:

Table 7.1: Incentives in the current RC1 price controls

| | AADC (E) | AADC (W) | ADDC (E) | ADDC (W) | TRANSCO (E) | TRANSCO (W) | ADSSC |
|---|---|---|---|---|---|---|---|
| **Information** | | | | | | | |
| SBAs (including PCRs as per new RAGs) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| AIS[1] | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Availability, security and service quality** | | | | | | | |
| Water quality | | ✓ | | ✓ | | ✓ | |
| Removal of timed water supply | | ✓ | | | | | |
| Interface metering | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Water meter penetration | | ✓ | | ✓ | | | |
| Security of supply | | | | | | ✓ | |
| Non-revenue water | | ☑ | | ☑ | | | |
| Bypass of ground storage tanks | | ☑ | | ☑ | | | |
| SAIDI | ✓ | | ✓ | | | | |
| SAIFI | ✓ | | ✓ | | | | |
| Distribution loss reduction | ✓ | | ✓ | | | | |
| Unsupplied energy | | | | | ✓ | | |
| System despatch costs | | | | | ☑ | | |
| Biosolids reuse | | | | | | | ✓ |
| Recycled water quality compliance | | | | | | | ☑ |
| **Customer service** | | | | | | | |
| Customer complaints | ☑ | ☑ | ☑ | ☑ | | | ☑ |
| **Reputational and monitored KPIs** | | | | | | | |
| Transmission system availability | | | | | ✓ | ✓ | |
| Financial performance ratios | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Removal of timed water supply | | | | ✓ | | | |
| **Number of existing incentives for RC1** | 6 | 6 | 6 | 5 | 4 | 5 | 3 |
| **Number of new financial incentives for RC1** | 1 | 3 | 2 | 3 | 1 | 0 | 2 |
| **Number of new/existing reputational incentives for RC1** | 1 | 1 | 1 | 2 | 2[2] | 2[2] | 1 |
| **Total number of incentives for RC1** | 8 | 10 | 9 | 10 | 7 | 7 | 6 |

[1] The AIS and respective TA reports regulatory submissions have been discontinued from 2019 onwards.
[2] In addition, transmission system availability and removal of timed water supply, financial incentives under PC5, are now reputational incentive.
"✓" represents an incentive introduced prior to RC1; "☑" represents a new incentive introduced in RC1.

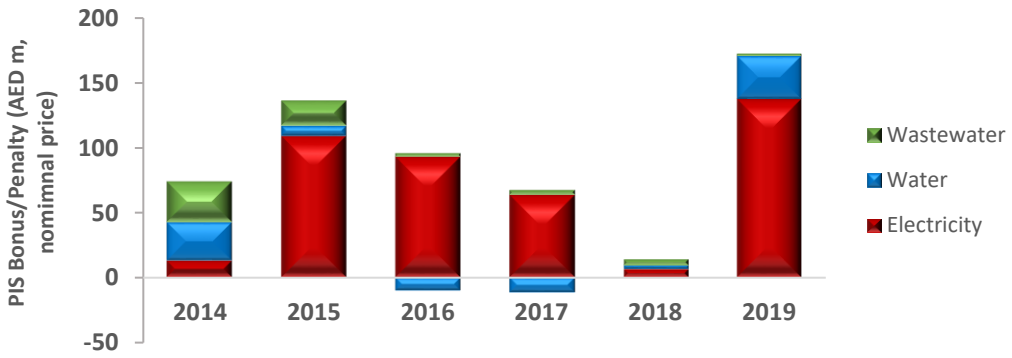
Table 7.2: Incentives in EWEC's current PC4 price controls

| | EWEC (E) | EWEC (W) |
|---|---|---|
| **Information** | | |
| SBAs (including PCRs as per new RAGs) | ✓ | ✓ |
| AIS[1] | ✓ | ✓ |
| **Forecast Demand Accuracy** | | |
| Peak Demand Forecasting Accuracy | ✓ | ✓ |
| **Total number of incentives for RC1** | **3** | **3** |

*[1] The AIS and respective TA reports regulatory submissions have been discontinued from 2019 onwards.*

7.2.5 Figure 7.3 below presents the overall level of financial bonus/penalty realised by the companies under the PIS over the last five years. 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 and capped at 1% for 2014-2015 and at 0.5% of their respective MARs from 2018 onwards (and capped at 1% of MAR for EWEC).

**Figure 7.3**: Companies' aggregate bonus or penalties under PIS, 2014-2019




7.2.6 While the figures show reduction in total PIS bonuses towards 2018, this is not due to the deterioration of companies' overall performance, as many of the technical indicators have either maintained the same level of performance (e.g. Availability and Water Quality) or improved year on year (e.g. SAIDI, SAIFI, interface metering). This reduction in total PIS bonuses is mainly due to the significant reduction in MARs during RC1 MARs (2018-2019) as compared to PC5 (before the capex clawback), and reduction in capping of bonus/penalty from 1% to the 0.5% capping from 2016 onwards. Other factors contributing to

this reduction are the discontinuation of certain incentives such as customer debt and 2016/2017 DSM incentives, upon companies' request, and the compliance issues relating to AADC's/ADDC's 2016 SBAs/PCRs .

7.2.7 In 2019, net bonus increased significantly for electricity and water mainly due to improvements in AADC's/ADDC's electricity distribution loss, TRANSO's unsupplied energy, ADDC's SAIFI and SAIDI and ratio of TA's areas of improvement 'made' in all SBAs/PCRs submissions for performance year 2017.

*Regulatory Instruction and Guidance (RIG)*

7.2.8 As per the RC1 Final Proposals, DoE continued to issue and/or amend RIGs to provide further clarification/guidance on the methodology used for evaluating individual incentives, to address emerging issues and incorporate lessons learnt. The RIGs are consulted with the companies before being issued in accordance with the licenses.

7.2.9 The RIG documents represent a useful tool which the DoE has already used in the past price controls:

(a) Several RIGs were consulted on and published. For example, in 2016, on the customer interruptions reporting (linked with SAIFI and SAIDI incentives) was revised and is in the process of being revised to address emerging matters;

(b) In 2014, we also worked with ADSSC to publish a RIG on the methodology to measure the mass of biosolids for the implementation of the biosolids reuse incentive.

7.2.10 The RIG documents are an important element of the implementation of an incentive, where it has been identified that additional instructions and guidance are required and will be useful to enable the companies to perform adequately and to effectively discharge their obligations under the licence.

## 7.3 Key areas for incentives development and implementation

7.3.1 This price control review is a good opportunity to consider the main areas where incentives should focus. Without prejudice to the four key areas where the existing incentives focus, there may be other areas of the network businesses

which need to be incentivised for improvement, such as enablers for the OBR price controls. The DoE welcomes the stakeholders to discuss the priority areas for improvements over the next price control period, with the view to inform and improve the development of the incentives framework, and in particular of any new incentives.

7.3.2 While the strategic consideration of the areas for future incentives is imperative, it is equally important to maintain an incentives framework that is SMART (i.e. specific, measurable, achievable, relevant, and time-bound), 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 overall compatibility with the objectives of the price control review.

7.3.3 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; and

(b) reflect the outcomes of any ongoing DOE initiatives (e.g. shift to OBR, focus on overall licence compliance and customer service).

## 7.4 Existing RC1 incentives

7.4.1 In addition to identifying and developing new incentive areas, it is important 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, the targets or the removal of the incentive (with or without a replacement incentive). The requirements and scope of the current RC1 incentives are discussed below.

### *Incentives for high quality information*

7.4.2 Network companies and EWEC have licence requirements to prepare and send to DoE (and in certain instances to make available to other interested parties) a range of information and regulatory submissions. These requirements are enhanced by obligations to have certain information audited, independently verified and/or approved by the DoE.

7.4.3 The PIS reinforces these arrangements with a system of penalties and rewards for the timely provision of licence compliant audited SBAs and PCRs with an external financial auditor's certificate, a director's certificate and a report by an independent TA. Companies have improved their performance on these incentives by timely information submissions although the accuracy of the information in compliance with the licence and applicable RAGs and RIGs still requires further improvement. 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 the current design of these incentives are the best tools to encourage continued quality improvement in the future.

*Incentives for availability, security and quality of supply*

7.4.4 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.

7.4.5 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. It will be appropriate to consider how best to enhance these incentives for optimal performance during RC2.

Table 7.3: Current availability, security and quality of supply incentives

| Company | Electricity | Water | Wastewater |
|---|---|---|---|
| AADC / ADDC | System Average Interruption Duration Index (SAIDI)<br>System Average Interruption Frequency Index (SAIFI)<br>Distribution Loss Reduction (DLR)<br>Interface Metering (IM) | Water Quality<br>Interface Metering (IM)<br>Removal of timed water supply<br>Water Meter Penetration<br>Non-Revenue Water<br>Bypass of ground storage tanks | |
| TRANSCO | System Availability<br>Interface Metering (IM) | Water Quality<br>Interface Metering (IM) | |

| | | | |
|---|---|---|---|
| | Unsupplied Energy<br>System Despatch Cost | Security of supply | |
| ADSSC | | | Biosolids reuse<br>Recycled Water Quality Compliance |

*Incentives for Customer Service*

7.4.6 We have introduced in RC1 a new customer service oriented incentive for AADC and ADDC (and will do so for ADSSC when wastewater tariffs are implemented) to improve customer complaints handling and response time, for 'Bill' and 'Generic' complaints. These customer complaints indicators are applied currently to each of AADC's and ADDC's electricity and water businesses.

*Reputational incentives*

7.4.7 We introduced in the RC1 price controls, reputational incentives to both lessen the financial burden and track important areas of business performance. These are listed in the following table for each network company .

Table 7.4: Current Reputational Incentives for network companies

| Company | Electricity | Water | Financial Ratios [1] |
|---|---|---|---|
| AADC | - | - | • Debt service;<br>• Gearing;<br>• Return on equity;<br>• Liquidity; and<br>• Average bill collection period |
| ADDC | - | Removal of timed water supply | |
| TRANSCO | Transmission System Availability | Transmission System Availability | |
| ADSSC | - | - | |

[1] The Financial Ratios apply to all network companies.

7.4.8 These reputational incentives and financial ratios do not have financial bonus or penalty within RC1 but are reported by the network companies and monitored by the DoE. The reporting of this information can create appropriate signals and guidance to the sector and enhance the companies' performance.

## 7.5 Design and calibration of incentives

7.5.1 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*

7.5.2 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 at 4% of the MAR collectively for all incentives. 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.

### *Amount of financial incentives*

7.5.3 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.

7.5.4 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 accurately define and measure.

7.5.5 One example utilised in RC1 is the value of loss load (VOLL) approach for unsupplied energy. 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.

*Symmetry of financial incentives*

7.5.6 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.

*Dead-band of performance*

7.5.7 Dead-bands (and a cap on the level of each incentive) represent tools used by the DoE 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

*Incentive targets*

7.5.8 Many of the existing financial incentives relating to distribution loss, meter penetration, system despatch cost, biosolids reuse and by-pass of ground storage tanks 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.

7.5.9 The DOE 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 SAIFI, SAIDI, removal of timed water supply (for AADC) and security of water supply indicators at the last review.

## 7.6 Key issues for consultation

7.6.1 A number of important considerations based on companies' recent performance and recent or planned sector reforms raises the following key questions for consultation:

(a) Whether any new key area(s) for improvements and incentives, with precise outputs and targets, are relevant and necessary, based on the companies' recent performance, sector strategic objectives and any potential transition to OBR?

(b) Whether any of the current incentives for electricity, water and wastewater businesses of companies should be removed or amended to prompt improvements in companies' performance?

(c) How the arrangements for review by the TA and auditors can be developed further to improve the quality of information?

(d) What should be suitable performance indicators for new businesses of companies, namely recycled businesses of AADC and ADDC and EWEC's system operator businesses?

Should the amount of financial incentive for each performance indicator continue to be based on a proportion (currently 0.5%) of MAR or should it be determined by the company's cost of performance improvements or the customers' willingness to pay?

(e) Should the total financial bonus or penalty continued to be capped at 4 % of the MAR collectively for all incentives or a higher proportion of MAR especially in view of the focus on OBR?

(f) Whether a penalty-only design is more appropriate for either all or some of the performance incentives?

(g) Whether the reputational incentives (including financial ratios) introduced in RC1 for reporting with no financial bonus or penalty has been beneficial? What are the candidate performance areas for this type of incentives?