

## **FRAMEWORK & APPROACH**

### **FOR THE PRICE REVIEW:**

**FOR THE CONTROL PERIOD  
2018 – 2023**

**WATER & SEWERAGE  
AUTHORITY**

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This document is one of a series of discussion papers being published as part of the Price Control Review for the Water and Wastewater sector, when the RIC will set charges for the period 2018-2023.

Consultative  
Document

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# 1. INTRODUCTION

## 1.1 BACKGROUND AND OBJECTIVE

The Regulated Industries Commission (RIC), in accordance with Section 48 of its Act No. 26 of 1998, is required to review the principles for determining rates and charges for services under its jurisdiction every (5) years. **This document outlines the RIC's overall process and approach to the price review, and broadly highlights the major issues the RIC will consider in its determination of price controls for the water (distribution) and sewerage sector and the Water and Sewerage Authority (WASA), the sole service provider within the sector.** In dealing with these issues, the RIC may identify its initial thinking/position and any further issues that it considers will assist in the development of its position.

This is the first time that the prices for the water and sewerage services will be reviewed under the Incentive-based (price cap regulation) approach. An important aspect of this review, therefore, will be to establish a firm foundation for economic regulation in the future. The prices for water and sewerage services were last reviewed in 1993<sup>1</sup>. For the Price Review, the RIC is required to assess WASA's submission, that is, its Business Plan, against the principles contained in the RIC's Act. Specifically, Section 6 of the Act requires the RIC to ensure that "the service provided by a service provider operating under prudent and efficient management will be on terms that will allow the service provider to earn sufficient return to finance necessary investment." The RIC must also be satisfied that the interests of customers are taken into account and that prices provide appropriate signals about the cost of providing service.

WASA's Business Plan is expected to provide full details of its forecasts of expenditure and revenue requirements for the regulatory period. These must reflect efficient costs of supply, and the proposed programme of capital works that must be delivered over the

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<sup>1</sup> A Water Improvement Rate is set for the Point Lisas Industrial Estate by the Government of the Republic of Trinidad and Tobago. It was last reviewed in 2011.

regulatory control period. In addition, the forecasts of demand must be reasonable and reflect the best available information.

Broadly, the RIC's approach to the establishment of price controls consists of three steps. The first step involves establishing the service standards. The second step involves assessing each of the key components of revenue to ensure that the service provider earns sufficient revenue to deliver reliable services to its customers. The methodology utilized here is known as the **cost building-block method** or simply **the building block method**. The final step involves determining the tariffs to meet the revenue requirement and the mechanism for controlling changes in the tariffs over the regulatory period.

## **1.2 LEGISLATIVE FRAMEWORK**

In carrying out its functions, the RIC is guided by its legislative framework and is required to have regard to the following objectives:

- the protection of consumer interest with regard to the price, quality and reliability of services;
- the facilitation of efficiency and economy of operations by service providers;
- the facilitation of competition where competition is possible and desirable;
- the facilitation of the financial viability of service providers;
- the need to ensure that regulatory decision-making has regard to current national environmental policy; and
- the fairness and transparency of the price determination.

Further, in respect of price reviews, under Section 67 of the RIC Act, the Regulations provide that the RIC may:

- prescribe the procedure for the conduct of price reviews;
- prescribe forms of accounts and records to be kept by service providers;
- prescribe sanctions for non-compliance; and
- prescribe any matter or thing that is required by the Act to be prescribed.

Some other salient features of the RIC Act are that:

- the tariffs, as determined by the RIC, shall not be amended or modified more than once in any year;
- the service provider must justify a price review by setting out projected revenues against projected expenditure and reasons for any significant changes thereof; and
- the service provider must set out the results of any actions taken to meet the projections of any preceding review.

**Procedure for Price Control Review**

Section 48 and 49 of the RIC Act specifies the procedure to be followed for establishing the principles and methodologies for determining rates and charges for services. In deciding whether to approve or specify the price arrangements, the RIC must be satisfied that the service provider has sufficient revenue over the regulatory period to deliver its services. The revenue must be sufficient to allow the service provider to recover [Section 67 (4)]:

- least-cost operating expenses which may be incurred;
- replacement capital cost expended;
- annual depreciation; and
- return on the rate base.

Section 67 of the Act further requires the RIC to be guided, among other things, by the following:

- funding and ability of the service provider to perform its functions;
- ability of consumers to pay rates;
- the interest of shareholders of the service provider;
- quality and reliability of service, in accordance with appropriate standards; and
- factors that would encourage maximum efficiency and economical use of resources.

### **1.3 RIC'S APPROACH TO CONSULTATION**

In deciding on standards of service and pricing matters, the RIC is required to consult with stakeholders. The RIC aims to be open and transparent and to consult as effectively as is practicable. The RIC will provide stakeholders with a number of opportunities to get involved. In brief, the RIC's strategy in this regard, will have three main elements:

- **Intermediary Outreach** – comprising consultations and meetings with key stakeholders.
- **Media Campaign** – that is, timely articles in newspapers and appearances on TV, radio as well as social media (Face-book, twitter etc).
- **Public-at-large Outreach** – comprising of consultations and 'Question and Answer' sessions with audiences in all major areas in the country.

The RIC's approach to consultation is further detailed in Section 2.3

### **1.4 DOCUMENT STRUCTURE**

This document is structured as follows:

**Section 2** highlights the review and consultative process;

**Section 3** discusses the form of regulation and the length of the regulatory control period;

**Section 4** discusses the RIC's approach to Quality and Levels of Service;

**Section 5** discusses the Building-block approach, which is used to determine the revenue requirement, and approach to assessing Operating and Capital expenditure and Cost of capital;

**Section 6** identifies key issues with respect to incentive mechanisms and dealing with uncertainty/unforeseen events; and

**Section 7** identifies issues related to the development of tariff design/structure and dealing with miscellaneous services.

This document is being released for consultation and the RIC can be contacted at the under-mentioned address:

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**Copies of this document are available from the RIC Information Centre or from our website at [www.ric.org.tt](http://www.ric.org.tt). Comments close at 4:00 p.m. on December 6, 2017.**



## 2. REVIEW AND CONSULTATION PROCESS

The RIC's key regulatory activities and overall administrative process associated with the price review along with a detailed timetable are provided in this section. The timetable highlights all the important dates in the review process, dates by which information is required from WASA, the opportunity for involvement of stakeholders and the dates by which the various areas of the RIC's work that underpin the review will be completed. It also gives insight into the work that underlines the RIC's final decision document known as the final determination.

### 2.1 INFORMATION REQUIREMENTS: BUSINESS PLAN

A key element of the process for the review of charges is the submission by WASA of its Business Plan for the 2018-2023 regulatory control period. The Business Plan forms the basis for the RIC's assessment of the proposed revenue requirement and resulting determination of proposed prices to be applied over the regulatory period in accordance with the requirements of the RIC Act. The service provider's Business Plan must conform to requirements of the RIC document entitled **“Information Requirements: Business Plan,”** which is a public document and is available at the RIC's office and on its website ([www.ric.org.tt](http://www.ric.org.tt)). Specifically, the service provider's Business Plan sets out, in detail, the information that the RIC requires to conduct its review, including financial information, information on the proposed investment programme and expected outcomes.

The draft Business Plan will inform the early stages of the review process and allows initial analysis of WASA's submission. The RIC will review in detail the information provided and will provide further guidance, if necessary, for the submission of WASA's final Business Plan which will constitute WASA's principal submission for the review of charges and will ultimately form the basis of the RIC's assessment of the revenue requirements of WASA for the regulatory control period.

## 2.2 GOVERNMENT/SHAREHOLDER INPUT

The RIC has a statutory duty to consult with the service provider and representatives of consumer interest groups and any other parties it considers as having an interest when setting charges to customers. As shareholder, the Government may have views on the public policy considerations that it requires to be taken into consideration and may set objectives to be achieved by WASA which must be taken into consideration. The input may cover issues such as public expenditure constraints, investment priorities, the level of capital funding support for WASA and subsidies, and debt write off issues, etc.

The RIC will request such input in writing well before the publication of its draft determination.

## 2.3 STAKEHOLDER PARTICIPATION

The RIC, as stated previously, aims to be open and transparent and to consult as effectively as is practicable. The RIC will provide stakeholders with a number of opportunities to get involved. In brief, the RIC's strategy in this regard, will have three main elements:

- **Intermediary Outreach** – comprising consultations and meetings with key stakeholders.
- **Media Campaign** – that is, timely articles in newspapers and appearances on TV, radio as well as social media (Face-book, twitter etc.).
- **Public-at-large Outreach** – comprising of consultations and 'Question and Answer' sessions with audiences in all major areas in the country.

Specifically, the RIC will provide various opportunities to encourage wide participation and intends to keep stakeholders informed of progress through:

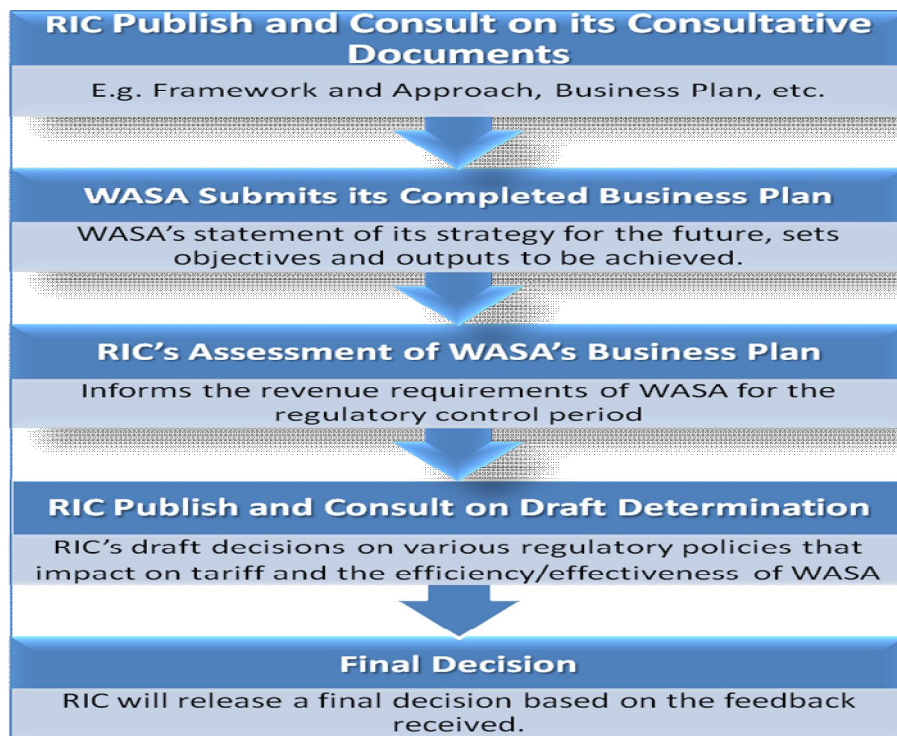
- **Quarterly Newsletters**
- **Website and Social Media Updates** – the RIC will establish a dedicated area on its website and will send e-mails about upcoming events and activities to stakeholders on the RIC's database. The RIC will also utilize social media alerts in this regard.
- **Print and Electronic Media.**

- **Distribution of Written Documents** – the RIC will ensure that written document are easy to read, relevant to audiences and widely available. Further, the RIC will encourage interested stakeholders to be added to its data base to receive documents.
- **Stakeholder Information Days** – the RIC will host stakeholder information days to encourage more focused debate, as well as more direct opportunities to explain and hear views. The RIC will also put out a short paper in advance of these days, outlining the important issues for discussion.
- **Workshops/Forums and National Consultations.**

#### 2.4 ADMINISTRATIVE PROCESS AND TIMETABLE OF ACTIVITIES

The RIC’s overall administrative process for the conduct of the Price Review is shown in **Figure 1** and the timetable of regulatory activities is shown in **Table 1**.

**Figure 1: Administrative Process for the conduct of the Price Review**



**Table 1: Proposed Timetable of Regulatory Activities for the Price Review**

	<b>Activity</b>	<b>Timeframe</b>
1	Publication of document “Information Requirements: Business Plan”.	October 2017
2	Publication of the document “Framework and Approach for the Price Review”.	November 2017
3	Submission of Draft Business Plan by WASA.	December 2017
4	Formal Letter to Shareholder (Government) seeking its initial views (input) on public policy considerations and investment priorities for the Sector.	December 2017
5	Release of consultative documents	February 2018 to March 2018
6	Stakeholder Information Day.	February 2018
7	Meeting with Shareholder (Government).	April 2018
8	Publication/Release of Draft Determination.	May 2018
9	Stakeholder Workshops in Port-of-Spain, Arima, Chaguanas, San Fernando, Tobago.	May 2018 June 2018
10	National Consultation on Draft Determination.	June 2018
11	Release of RIC’s Response to Stakeholder Comments on Draft Determination.	July 2018
12	Publication/Release of Final Determination.	July 2018

### **3. RIC'S REGULATORY FRAMEWORK**

#### **3.1 BACKGROUND**

The RIC's regulatory framework is grounded in its legislative remit which outlines the RIC's mandate with respect to price setting including factors that the RIC needs to pay special attention to in its price setting activities. The legislation also provides guidance on other aspects of the regulatory framework including the form of regulation and the length of the regulatory control period.

The RIC's two overarching functions are to promote the interests of customers and to ensure that the service provider, in this case WASA, is able to earn sufficient return to finance necessary investments. The interests of customers will be promoted by encouraging WASA to become efficient and by promoting the provision of efficient and reliable services. The RIC cannot rely on shareholder pressure in public sector organizations, such as WASA, to improve value for money to customers, neither is there the presence of market forces to drive efficiency in a monopoly environment. This has, therefore, forced the RIC to focus on incentive frameworks to simultaneously encourage WASA to provide a better level of service and reduce costs. WASA can also be encouraged to provide a better level of service through service regulation.

Consequently, regulation, within this context, seeks to ensure that customers get value for money by establishing a tight budgetary constraint on WASA, while ensuring good quality of service. The tight budgetary constraint will encourage WASA to focus on delivering efficiency improvements in its operation. Establishing targets and monitoring performance is a cornerstone to effective regulation. Monitoring should, at the minimum, focus on the collection and analysis of information on costs, investment, asset management and customer service, etc., and frequent publication of performance reports.

The RIC's final determination will set out the maximum amounts WASA can charge its customers, the level of service it must provide and the efficiency improvements that must be achieved over the regulatory control period.

### **3.2 LEGAL REQUIREMENTS**

The RIC Act mandates the RIC to:

- establish the principles and methodologies by which service providers determine rates [Section 6 (1) (h)]; and
- review the principles for determining rates and charges for services every five years (Section 48).

As discussed previously in setting out principles for determining rates, Sections 6 and 67 of the Act require the RIC to have regard to:

- the funding and ability of the service provider to perform its functions;
- the ability of the consumer to pay rates;
- the results of studies of economy and efficiency;
- the standards of service being offered by the service provider;
- the rate of inflation in the economy for any preceding period as may be considered appropriate; and
- future prospective increases in productivity by the service providers.

The RIC has interpreted these sections as giving clear support for the use of incentive regulation and for the application of a price cap (RPI-X) form of regulation in its approach to price reviews. Incentive regulation uses rewards and penalties to induce the service provider to achieve desired goals where WASA is afforded some discretion in achieving those goals.

### **3.3 FORM OF REGULATION**

The first element in developing a price control framework involves the establishment of the form of economic regulation that is to be applied to WASA. This is one of the most important factors in determining the overall performance of the utility and the level of benefits delivered to customers.

As indicated earlier, the RIC Act gives clear support to the use of incentive regulation rather than rate of return regulation. However, various forms of price control fall under

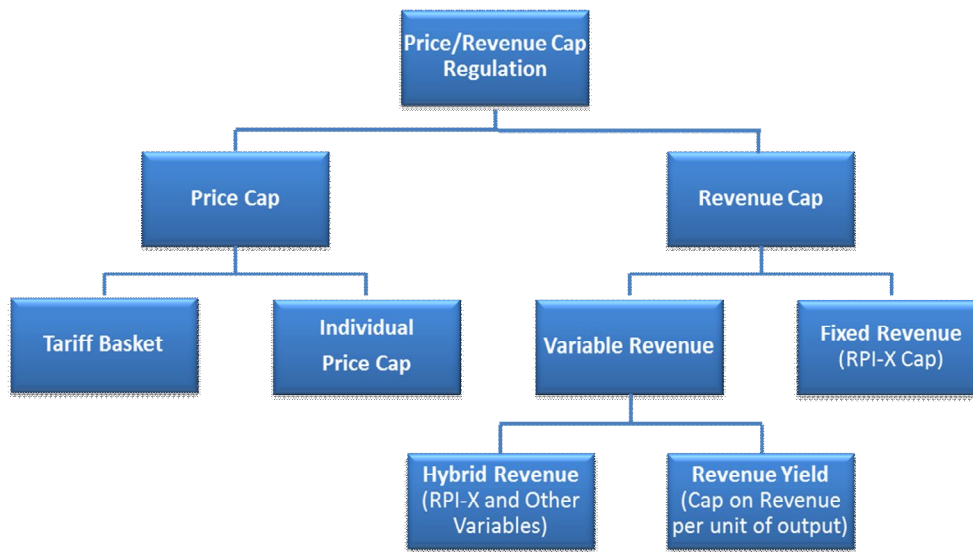
the general rubric of incentive-based regulation. Consequently, the RIC has flexibility in the choice of the form of the price control to be adopted.

There are two primary categories of price controls under the broad price-cap (RPI-X) approach:

- Revenue cap approach;
- Price cap approach; and

Notwithstanding this, regulator can, and often do, combine features of these primary approaches. These forms of price controls are known as hybrid forms of control. In **figure 2** some of the variations of these forms of control that have been adopted in a range of jurisdictions.

**Figure 2: Forms of Price Controls**



### **Revenue Cap Approach**

Under the revenue cap approach, the service provider's gross revenues are limited to a fixed amount for a defined set of services. This fixed amount (cap) is usually subject to an annual adjustment for productivity gains (called the X factor) and inflationary effects. Periodic readjustments assist in scaling revenues appropriately to changes in the customer base of the regulated firm.

Revenue caps may be established for different customer groups, for categories of service or for the entire business. An initial revenue cap for a level of service is set according to traditional rate of return procedures (the “building block” approach for assessing required revenue). Thereafter, real revenue is typically reduced each year by the X-factor until the next review. If the service provider can realize efficiency gains greater than the X-factor then it can keep all or some percentage of such gains over the regulatory period. If not, the service provider’s profit suffers. It is this cost risk and/or opportunity to outperform that provides a regulated firm with significant incentives to operate more efficiently.

### **Price Cap Approach**

Price cap regulation attempts to control price rather than revenue. As in the case of revenue caps, prices are set according to traditional rate of return procedures but the cap is applied to particular prices rather than revenue. Price caps could be either in the form of a weighted average price cap (tariff basket) or a series of separate price controls independent of any total revenue requirement. In setting the weighted average price, the weights can be volume (sales) or value (revenue) and the weights may be fixed by reference to the base year or they may reflect actual quantities with a lag, thereby breaking the link between allowed revenue and the volume. This approach allows for more than one charge, i.e. connection as well as a volume charge. Generally, under this approach, total revenues will track total costs, thus limiting the financial risks faced by service providers.

Price cap regulation provides incentives for cost reduction and productivity improvements. It provides incentives to satisfy demand as well as protection to individual users of services as it assigns most of the risks to the firm. Among the main disadvantages of price caps are the reduced flexibility to adjust prices to maximize efficiency and the incentives to cut costs through reduced service quality. Additionally, the translation of revenue targets into weighted average price controls is not only complex but also subject to errors.



### **Hybrid forms of Control**

Although hybrid controls come in a variety of forms, they generally contain a fixed revenue component combined with annual revenue drivers such as customer numbers, sales and length of network system. Therefore, the development of a cost tracking formula is an integral part of setting hybrid controls. A price cap with automatic pass-through of specific costs is one of the most common forms of hybrid control.

Another option is to make modifications to the general schemes discussed above or to combine elements from different schemes. The objective of such schemes is to offset the weakness of one scheme with the strengths of others.

The main advantages of hybrid controls are: the lowering of disincentive to expand growth in services; the increased incentives to participate in demand management; the moving of revenue closely in line with costs; and the lowering of financial risk of service providers. Overall, hybrid forms of control offer the potential for significant improvements in regulatory effectiveness. The main disadvantages include: the potential difficulty of developing an effective cost tracking formula; the potential to less accurately track incremental costs; and the reduction in incentives to maximize efficiency, since under the hybrid form of control the cap is required to be reset each year of the regulatory period.

In assessing different forms of price control to determine the one most suited for WASA, the RIC will consider the extent to which these forms encourage efficiency, ensure that total revenues track total costs and will examine the implications for risk allocation between customers and WASA. For the electricity transmission and distribution service provider (T&TEC), the RIC had opted to use a fixed (total) revenue cap in its first review, on the basis that the revenue cap would provide an appropriate balance of risk between customers and T&TEC, incentives to reduce costs, and the operational flexibility to meet service objectives. This will also be taken into account when the RIC finalises its decision for WASA, as there are broad similarities between the sectors.

**The RIC invites comments on the appropriateness of adopting a fixed revenue cap for WASA, as well as any other related issues.**

### **3.4 LENGTH OF THE REGULATORY PERIOD**

The duration of the price control period affects the extent to which many of the anticipated outcomes of efficient, accurate and sound regulation are achieved. The service provider must be given enough time to implement the required measures that are expected to provide improved service, performance and productivity. The RIC Act (No. 26 of 1998) specifies in Section 48 that the RIC “review the principles for determining rates and charges for services every five years, or where the licence issued to the service provider prescribes otherwise, at such shorter interval as it may determine.” The Act therefore alludes to the possibility of a control period shorter than the five-year period stipulated.

The RIC therefore, in its determination of the length of the regulatory period must consider its mandate under the Act, as well as the constraints faced by the particular service provider. The RIC should provide the service provider with a fair chance to experience success whilst at the same time preventing the opportunity for short-term gain with little potential for longevity.

The potential advantages of a longer regulatory period include:

- (i) Greater incentives for service providers to achieve higher levels of efficiency, since the service provider is able to benefit, over the period, from cost savings achieved. These cost savings are only passed to the consumer through rate changes at the next rate review;
- (ii) Lower regulatory costs for both the regulator and the regulated service provider;
- (iii) Lowered business risk due to a more stable/predictable regulatory environment, which may lead to more prudent investment decisions; and

- (iv) Predictable regulatory environment which may provide greater assurance to consumers about the extent to which rates can fluctuate during the control period.

One challenge in adopting a longer regulatory period will be ensuring that all outcomes and deliverables to be met by the service provider are identified at the outset of the regulatory control period. This is potentially harder to do for a longer period.

Under a longer regulatory control period, consumers are made to wait longer to benefit from any efficiency gains in operation/production. Further, since the rate setting process to a large extent relies on forecasts of the service provider's costs and other related factors, a longer period holds higher potential for the over or under estimation of these costs (especially for the later years) and consequently of the required/projected revenue. A longer regulatory period also raises issues about how best to deal with the impact of unforeseen events.

In considering the duration of the first regulatory control period for WASA, the RIC will have to weigh the advantages and disadvantages of a longer regulatory period with the following issues:

- (i) The lack of reliable, empirical, audited data for production, consumption and unaccounted for water;
- (ii) A high level of leakage and Unaccounted for Water (UFW); and
- (iii) Lack of a Universal Metering Programme and a consequent low rate of residential metering.

Notably, (i) above has implications for the efficacy of forecasting and concomitant costs, which raises the issue of uncertainty in the longer term and suggests a shorter regulatory period. However, improvement in both (ii) and (iii) have associated high costs; the fact that the implementation of a leakage arrestment programme and universal metering have significant gestation periods before the benefits can be adequately measured, seems to suggest that WASA ought to be given a longer time to put systems in place to address these issues.

**On balance, the RIC considers that there is merit in adopting a five-year regulatory period for the first control period. The RIC welcomes views on this matter, as well as any other related issues.**

## **4. QUALITY AND LEVELS OF SERVICE**

### **4.1 QUALITY OF SERVICE IN ECONOMIC REGULATION**

The price, reliability and the quality of service are the most important aspects of water and wastewater services to consumers. Customers must be assured of the quality and value for money of the service. Therefore, the emphasis on quality is paramount. Beyond the obvious benefits to consumers, quality of service has a broader impact on the economy. Improvement in quality will enhance productivity in all sectors of the economy, help attract new investment and provide better living and working conditions for users. As a result, an important feature of this price review process will be to clearly establish the level of performance and the quality of service standards.

Economic regulation must consider quality together with price. If quality is not maintained, any fall in service quality is economically the equivalent of a higher price. Under all forms of regulation of monopolies (and more so under incentive regulation), there is the risk that firms may increase profits by lowering the quality of service. Quality issues can be addressed through the establishment and enforcement of quality standards that are supported by rigorous monitoring programmes.

Consequently, an important feature of this price review process will be to address both price and service dimensions and clearly establish the level of quality of service standards. The RIC Act mandates the RIC to establish standards for services. Sections 6(e), (f) and (g) of the Act require the RIC, *inter alia*, to:

- prescribe and publish in the Gazette and in at least one daily newspaper circulating in Trinidad and Tobago, standards for services;
- monitor service providers and conduct checks to determine their compliance with the standards; and
- impose such sanctions as it may prescribe for non-compliance with the standards.

The RIC is mindful of the factors that are important to consumers and will therefore focus on rigorously monitoring and measuring those parameters and provide timely, clear and concise reports on WASA's performance. This would facilitate a better understanding of WASA's operation and ensure the RIC has fulfilled its statutory duties.

## **4.2 BROAD MECHANISMS FOR REGULATING SERVICES**

The RIC, in promoting all-round efficiency in the water and wastewater sectors, will consider a number of incentive mechanisms focused on improving the level and quality of service provided by WASA to all its customers. These mechanisms are not mutually exclusive and thus more than one mechanism can operate at a time. The main mechanisms discussed here are:

- The Performance Incentive Mechanism (S-Factor);
- Guaranteed Service Level (GSL) Schemes; and
- Performance Reporting.

### **Performance Incentive Mechanism (S-Factor)**

In an attempt to earn higher profits, a service provider may opt to reduce spending related to provision of adequate standards of service. The regulator can discourage this practice by the inclusion of an S-factor in the price or revenue formula. This S-factor is a service standards incentive mechanism and it directly ties price/revenue to the quality of service provided by the service provider. The S-factor can be positive or negative depending on the extent to which the service provided has maintained compliance with the established quality of service standards. Thus, a high level of compliance ensures a positive S-factor and results in increases to price/revenue, whilst the service provider is penalised where there is low or no compliance via reduced price/revenue.

Although the major objective of an incentive mechanism is to allow the service provider to move closer to an efficient level of service, the regulator must ensure that this mechanism is transparent, adequate and not extremely complex, as it could increase regulatory burden and may not in fact lead to the achievement of anticipated efficiency

targets. Thus, the establishment of an appropriate S-factor has inherent challenges that must be considered. These include:

- The form the S-factor is to assume;
- The choice of indicators to be used to judge service quality;
- Availability of data to be used to support the S-factor determination;
- Determination of an efficient incentive that will improve service quality whilst at the same time have no adverse effects on capital investment, production levels, etc. (economic efficiency); and
- How this mechanism will account for the effects of external events on service quality.

### **Guaranteed Service Level Schemes**

Guaranteed Service Level (GSL) schemes usually outline minimum standards of service the service provider should provide to all customers and the penalties where these standards have not been met or maintained. Thus, where the service provider has failed to provide service at standards deemed acceptable by the regulator, customers are entitled to payments or rebates, the value of which is also set by the regulator. GSL schemes, therefore, provide financial incentives to service providers to maintain acceptable levels of service to customers.

GSL schemes must target critical areas of concern for customers and should seek to protect them from bad service. These schemes are usually revised periodically to cater for improvements in service in the industry, to review the level of compensation or to amend existing standards. GSL schemes seek to incentivise the service provider to address areas of poor performance, usually: billing; water quality; reliability of service; frequency of unplanned service disruptions; and customer service.

There are two types of standards under this Scheme as follows:

**Guaranteed Standards:** Individual customers can seek redress and compensation in those instances where these standards are infringed.

**Overall Standards:** While there are no compulsory payments when these standards are breached, they seek to provide for consumers, a level of service of a particular quality, and refer to areas of service that affect large numbers or all customers, thereby making compulsory payment an unfeasible option.

**The RIC is already in the process of establishing Guaranteed and Overall Standards for WASA.**

### **Performance Reporting**

Performance Reporting serves as an incentive to improve the quality of service provided by the service provider, as it requires the entity to provide information on its performance, vis-à-vis specific indicators, during the regulatory period. The fact that service providers must provide this information motivates them to maintain, if not improve the quality of service provided, since it presents the opportunity for critical appraisal of their performance, relative to that of other service providers and international benchmarks, while at the same time making it possible to compare their performance over time.

An effective performance reporting mechanism is characterised by:

- indicators that are representative of the service provided;
- data that are reliable and obtained easily;
- routine and independent audits of information provided; and
- presentation of the information in a clear and concise manner such that it promotes better understanding by consumers.

As part of its overall regulatory activities for WASA, the RIC will establish and monitor specific performance indicators in key performance areas. The indicators to be used will cover technical, administrative, quality of service and financial indicators. WASA will be required to report on a specific set of measures, which will help increase accountability and improve transparency. Performance reporting by WASA will help inform customers and the RIC of baseline levels of performance, whilst providing data



and information that can further be used in setting standards and other regulatory functions. In essence customers will be given an opportunity to participate more fully in the regulatory process and will be empowered to present complaints with higher levels of confidence in cases of WASA's underperformance.

**The RIC invites comments on the appropriateness of the use of a Performance Incentive Mechanism (S Factor) and Performance Reporting to supplement the Guaranteed Standards Scheme as well as any other related issues.**

## **5. ASSESSING EXPENDITURE & DETERMINING THE REVENUE REQUIREMENT**

### **5.1 PURPOSE OF PRICE CONTROLS**

Regulation aims to set price controls/limits at a level that allows the service provider to cover no more than its reasonable costs to deliver the required level of service to customers over the regulatory control period. This process requires complex and detailed analysis and the RIC needs to make decisions about efficient expenditure requirements for both operating (Opex) and capital (Capex) expenditure over the regulatory period, the appropriate cost of capital, the number and type of current and future customers, etc.

Section 67 of the RIC Act<sup>2</sup> contains a number of specific requirements that needs to be followed when setting out the principles on which rates should be based, as well as specific requirements governing price determinations. In summary, the maximum price/revenue is set by:

- establishing the efficient costs incurred by the service provider, including operating Opex, Capex and the cost of funding capital;
- deciding on the share of these costs to be recovered through user charges, versus being funded by Government;
- calculating the overall revenue requirement for the service provider; and
- calculating prices/revenues and an RPI-X price path for consumers taking account of assumed consumption and the other matters the RIC must consider under its Act.

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<sup>2</sup> Section 67, sub-sections (3) and (4) mandate the RIC, when establishing principles, to have regard to, *inter alia*:

- the funding and ability of the service provide to perform its functions;
- the ability of consumers to pay rates;
- the results of studies of economy and efficiency; and
- least cost operating expenses which may be considered.

The RIC also needs to ensure that the manner in which price controls are established provides incentives for the service provider to pursue efficiency improvements during the regulatory control period.

## **5.2 BUILDING-BLOCK APPROACH**

In order to determine a price/revenue control, it is first necessary to establish the allowable revenue of the service provider, that is, the revenue requirement, on which to base a price control. There are two broad approaches that are used to determine allowable revenue. The first approach (cost-linked) involves linking the service provider's costs to the revenue to be earned or prices to be charged. Therefore, prices will track costs more closely and customers are likely to pay prices near to actual costs of service. The use of this approach has been criticized on the grounds that it requires a high degree of firm-specific information and that it may tend to merge into rate of return regulation.

In the second approach (cost-unlinked), the controls are not directly determined by reference to the costs of the service provider, instead they may be set by reference to the prices or costs of utilities elsewhere. In the determination of the level of costs under this approach, a variety of approaches is utilized including; benchmarking, econometric analysis or frontier methods such as Data Envelopment Analysis and Stochastic Frontier Analysis.

As this cost-unlinked approach allows a greater deviation of prices from the specific costs of service providers, the outcome will be generally consistent with the operation of a competitive market. Furthermore, the rate of efficiency improvement is likely to be higher and the benefits derived therefrom will redound to the benefit of customers. However, there are a number of serious concerns with setting price/revenue controls completely independent of the service provider's costs:

- the approaches used to set prices independent of costs require comprehensive data that are generally not available;

- the benchmarking techniques may not adequately reflect the local service providers' costs, especially as they face significant capital expenditure requirements for network replacement, growth and service standards requirements;
- any reliance on the prices or costs of other utilities may not enable the initial prices to be set at levels which are reasonable, especially given that WASA is currently experiencing large revenue short-falls in its operations;
- the benchmarking techniques used for the estimation of efficient costs are approximate at best, and involve many practical problems and as a result, total reliance should not be placed on them; and
- the degree of certainty required to encourage efficient new investment may not be provided when prices are set completely independent of the service providers' costs.

In light of the above concerns, it is difficult to conceive of circumstances where external benchmarks could become a complete substitute for service provider-specific costs data. A starting point for determining revenue requirements and the rate of change in prices would invariably be determined by reference to the service provider's costs. In fact, there are very few examples of the pure application of either approach and there is likely to be significant advantage in combining the two approaches.

Indeed, while the RIC Act provides no specific guidance on the exact approach to be used, it embodies a strong presumption that both service provider-specific costs and comparative data should be the main basis for determining the revenue requirements [Sections 67 (2) (3) and (4)]. By setting regulated revenue with reference to the service provider's costs, and adjusting with reference to the costs of similar utilities elsewhere, forward looking revenues can be set which deliver strong incentives for future efficiency improvements.

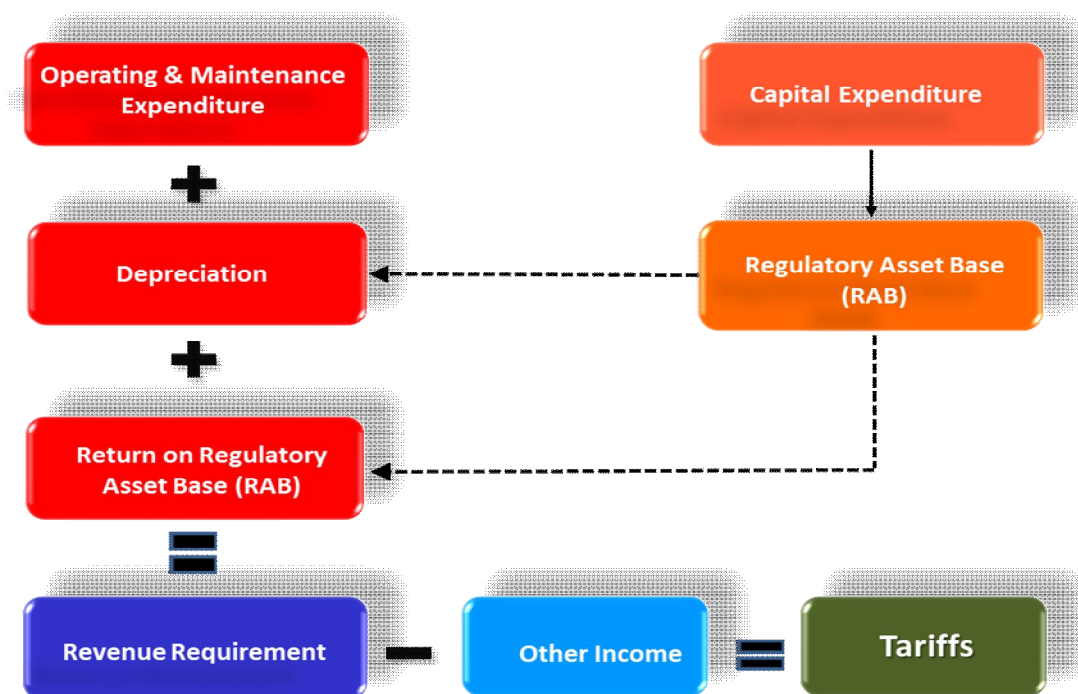
The **cost building-block approach, or simply the building-block approach** as it is commonly referred to, is the framework typically utilized under a cost-linked approach to

the determination of the efficient costs of service providers. The building-block approach determines the expenditure that an efficient service provider would need to incur to provide service over the regulatory control period. The building-block approach is illustrated in **Figure 3**. The building-block approach is consistent with the RIC Act [Section 67(4)] that requires the RIC to have regard to, *inter alia*:

- replacement capital cost expended;
- least-cost operating expenses which may be incurred;
- annual depreciation; and
- return on the rate base.

The sum of these elements of the building-block provides the estimate of the efficient cost of delivering the utility services over the regulatory period. As indicated earlier, estimating the reasonable cost of service is not straightforward. Judgments on the rate at which the service provider can increase efficiency are very challenging. Regulators must also balance the increases in service standards it imposes against their impact on costs.

**Figure 3: Building-block Approach**



**There are clear advantages to be gained from the use of a building-block approach to establish the price controls for WASA. However, the RIC remains open to views from stakeholders on this matter or any other related issues.**

### **5.3 OPERATING EXPENDITURE ASSESSMENT**

Operating expenditure (Opex) comprises day-to-day running costs of WASA such as labour costs, power, materials, contracted costs, insurance, software licences and vehicle running costs. Bad debt is also a cost component that is regarded as a running cost. Costs such as depreciation, interest payments and maintenance of the asset base are not included in Opex.

Briefly, the expenditure review process involves the following stages:

- **Set up stage** – the preparation of a document, “**Information Requirements: Business Plan**” by the RIC to provide guidance to WASA on the information requirements in the consideration of an application for a price review;
- **Facilitation stage** – where the RIC will provide on-going advice to WASA to ensure that the data to be submitted is consistent with the requirements of the Business Plan; and
- **Assessment stage** – where the RIC will assess the data to ensure that expenditure reflects the efficient cost of providing services. The RIC will also compare the various elements of cost of supply with the norms applicable to the industry. It is intended that this would induce the service provider to take appropriate steps to reach acceptable levels of efficiency in a time bound manner. Surpluses resulting from improvements would be shared between customers and the service provider, and act as an incentive.

To support forecasts of Opex, the Business Plan needs to discuss the historical expenditure levels, benchmarking and its use, where appropriate, and demand forecasts.

In evaluating the current levels of operating costs, which is a key component of the revenue requirement, the RIC will pay particular attention to: the main cost drivers; historical cost performance and rate of change of Opex. The RIC will also conduct detailed analysis of; wages and salaries, overtime, billing and collections, crew sizes, bad and doubtful debt, number of employees and the organizational structure, outsourcing, and evidence of productivity improvements. The RIC would seek a detailed justification where the service provider is proposing a significant departure from historical expenditure levels. The RIC will utilize the following process to set the baseline level of Opex:

- review WASA’s last set of statutory accounts;
- identify exceptional and atypical costs and subtract them from total Opex;
- assess whether there is anything unusual about cost allocation and make appropriate adjustments, if necessary; and
- add “new” Opex to deliver improvements in the supply/demand balance, levels of service to customers, standards, etc., while taking into account potential savings that arise from upgrading works or systems.

In order to make reliable like-for-like comparisons, the RIC will also examine all possible uncontrollable costs (that is, costs outside the control of management) and controllable costs. Uncontrollable costs are addressed in what is called “cost pass-through provisions”, which are key components of incentive regulation plans. In fact, mechanisms that treat with uncontrollable costs are not unique to incentive regulation and have existed in the form of automatic adjustment clauses that are often included in rate of return regulation.

When evaluating the proposed expenditure for the regulatory control period, benchmarking will be one of the main tools used to determine the appropriate and efficient levels of expenditure. While there are a variety of price setting methodologies, the RIC Act supports the adoption of some form of RPI-X regulation. The critical issues under this form of regulation are the inclusion of efficiency/productivity requirements

and the setting of the X-factor. There are different approaches to setting the latter. An increasingly favoured approach is through relative efficiency analysis and benchmarking.

The RIC intends to utilize benchmarking in conjunction with any other relevant information to reach an informed judgment on the extent to which WASA can improve its efficiency and what rate of efficiency improvement that is achievable. Benchmarking also provides an indication of the levels of efficient operating, maintenance and capital expenditure. The RIC will have to be satisfied that WASA has reflected anticipated efficiency improvements in its proposals.

In this regard, the final important area that the RIC will consider relates to the annual rate of improvements that it expects from WASA. In the case of T&TEC, the RIC utilized the average efficiency improvements achieved during the five-year period preceding the base year. Another option can be to examine evidence from other utilities about the rate of progress achieved during the first regulatory period and assume that WASA should be able to match the pace of change achieved. Based on the above analysis, the RIC will determine the total allowable Opex that it believes would be sufficient for WASA to carry out its operations for each year of the regulatory period and will be funded through customer charges. The total allowable Opex would be calculated as follows:

$$\begin{aligned} \text{Total Allowable Operating Expenditure} &= \text{Baseline Operating expenditure} \\ &\pm \text{Assessed changes in baseline Opex} \\ &+ \text{New Opex} \\ &- \text{Efficiencies} \\ &+ \text{Impact of annual inflation} \end{aligned}$$

During the regulatory control period, the RIC will monitor WASA's progress in reducing costs and improving levels of service.

**The RIC invites comments on the above matters, as well as other related issues, including:**

- the factors the RIC should take into consideration in assessing WASA's



**forecasts of Opex;**

- **the factors the RIC should take into account when assessing the potential for efficiency improvements;**
- **the approach to benchmarking that will provide the most appropriate method for comparing WASA's performance;**
- **the appropriate approach for assessing the annual rate of efficiency improvements; and**
- **the appropriate approach to monitoring WASA's performance against allowed Opex.**

#### **5.4 CAPEX EXPENDITURE ASSESSMENT**

Capital Expenditure (Capex) forms an important and integral part of the costs of a service provider and contributes significantly to the final prices that customers pay for service. There is also a close link between capital expenditure and quality of supply. Capex is recovered through prices over the life of the asset in the form of a return on the regulatory asset base (RAB) and a return of the RAB (through regulatory depreciation). It is incumbent on the regulator to ensure that capital expenditure forecasts are prudent and efficient. Once this has been determined, the regulator must allow the appropriate level of Capex to form part of the revenue requirement of the service provider.

The RIC Act requires the RIC to ensure that the service providers are provided with a sustainable revenue stream that does not reflect monopoly rents or inefficient expenditure and allows the service provider to recover expenditure on renewing and rehabilitating existing assets. The RIC recognizes that a return should be allowed only on the legitimate level of investment that is required to service the scale of operations undertaken by the service provider and must always guard against allowing a return on wastefully applied capital. In establishing Capex requirements for WASA, the key issues for the RIC are to ensure that:

- Capex reflects an unbiased requirement that would be undertaken by an efficient service provider;
- there is no evidence of unnecessary or inappropriate Capex;

- the service provider quantifies the reduction in Capex through improved efficiency;
- Capex requirements are consistent with the service provider's demand forecasts, service targets and other obligations; and
- the service provider's Capex forecasts are credible in light of the outturn results.

The RIC intends to pay particular attention to key projects proposed in WASA's investment plans, focusing on issues including the project's ability to improve reliability of supply and its ability to meet new demand. The Capex assessment will also include an evaluation of WASA's capacity to undertake the proposed scale and scope of projects and accordingly, its ability to deliver these projects on time and within budget, noting that major projects often require detailed planning and approvals. To assess the capacity to deliver projects, the RIC will consider the actual performance of WASA against previous Capex programmes, current approval status of proposed projects, WASA's project management capability and the availability of internal and external resources to deliver the projects.

All capital projects funded by the government will be 'ring-fenced', meaning that such projects will not form part of the Capex that is considered by the regulator in the revenue requirement. As such, these items of expenditure, while they will proceed, will not be financed through rates and tariffs to ensure that the costs are not recovered twice.

The RIC is aware that there is a significant underinvestment in necessary capital projects as a result of lack of investment funds. The RIC is also cognizant of the fact that there is a limit to the size of a capital programme that can be delivered efficiently. Furthermore, total investment is limited by a number of factors, including:

- customer's bills – customers ultimately pay for investment and higher investment will lead to higher bills;
- ability to deliver – a very large investment programme may not be managed effectively by WASA; and

- capacity of the market – the capacity of the country to handle a very large investment programme also needs to be considered.

In the determination of an appropriate investment programme, the RIC would have to prioritize competing demands for investment and assess investment priorities based on the following principles:

- affordability;
- cost-effectiveness;
- deliverability; and
- sustainability.

The RIC's approach to establishing an appropriate Capex for WASA will comprise the under-mentioned elements.

#### **Defining the Investment Programme**

The RIC would ensure that significant increases in Capex are fully substantiated by supporting information and that the proposed investment plan be split into at least four main elements:

- Capital maintenance/replacement – expenditure to upgrade assets reaching their useful life;
- Supply/demand (growth) – expenditure to service population growth and new development;
- Quality improvements (enhancement) – expenditure to improve service delivery standards; and
- Other – this would include all other capital expenditure.

For ease of reference each investment project should have a unique code, a unique name, a geographical reference, a defined output, detail costing, the expected completion date, and identification of key project milestones.

### **Investment Programme Review**

The RIC may, if it considers it appropriate, procure the services of an independent consulting firm to assist in its determination of the appropriateness of the investments proposed for the regulatory control period. This is an important step in ensuring that the proposed Capex will provide value for money for customers. Also, the incorporation of qualified independent assessments into its deliberations adds credence to the RIC's findings.

### **Asset Management**

The RIC will explore in more detail the adequacy of WASA's asset management systems. Key elements of good asset management include the establishment of asset databases, the use of GIS and SCADA systems, and the establishment of condition assessment and the development of economic decision-making tools to evaluate the most cost-effective means for deciding whether to renew or rehabilitate assets.

**The RIC invites comments on the above issues, as well as other related matters, including:**

- **the factors the RIC should take into consideration in assessing WASA's forecasts of Capex; and**
- **the factors the RIC should take into account to ensure deliverability of the investment programme.**

## **5.5 COST OF CAPITAL AND REGULATORY ASSET BASE**

One of the primary objectives of regulation is to ensure that the service provider is able to finance its operations. Given the capital-intensive nature of the water and wastewater sector, capital related costs, return on capital and return of capital (depreciation), can form a significant component of the revenue requirement. The recovery of the annual costs of financing investments in long-term assets is achieved in two ways:

- the return of capital (depreciation) enables the recovery of the invested capital; and
- the return on the regulatory asset base enables the recovery of the costs related to the providers of equity and debt.

Too often, capital costs are neither recovered through tariffs nor adequately funded by Government. The consequence is deteriorating network infrastructure and declining service. To avoid such a situation, it is important and advisable to accurately measure capital costs. Only when true costs are known can informed decisions be made on the extent to which they should be covered by tariffs or by Government subsidies.

There are a number of ways of calculating capital costs. The three most commonly used approaches in the water sector are:

- depreciation plus a return on assets;
- infrastructure renewals accounting plus a return on assets; and
- cash needs.

**Table 2** below shows how each of the above approaches addresses capital costs.

**Table 2: Approaches to Calculating Capital Costs in the Water Sector**

	<b>Depreciation plus a Return on Assets Approach</b>	<b>Infrastructure Renewals Accounting plus a Return on Assets Approach</b>	<b>Cash Needs Approach</b>
Return of Capital	Depreciation	Infrastructure renewals charge plus depreciation on non-infrastructure assets	Loan principal payments plus cash-financed capital expenditure.
Return on Capital	Cost of capital times asset valuation	Cost of capital times asset valuation	Interest payments on loans

**Adopted from World Bank.**

Therefore, the key components that will be utilized to assess the capital-related costs are:

- The **Regulatory Asset Base (RAB)** which represents the regulator’s view of the value of the existing investment in the regulated entity at a particular point in

time. The objective is to provide a revenue stream that has a present value equal to the regulatory asset base;

- **Regulatory Depreciation** which represents the return of the capital that the service provider has invested in the entity over time; and
- The **Regulatory Weighted Average Cost of Capital (WACC)** which is the annual rate of return that investors demand for their investment.

The remaining sections examine the issues the RIC will have to address in reaching decisions on these capital components of the revenue requirement.

### **5.5.1 Determining the Initial Value of the Regulatory Asset Base**

To estimate both the return on capital and return of capital (depreciation) components of the revenue requirement, the opening value of the regulatory asset base (RAB) must be established. This is the value on which the owners of the business earn a return (return on capital), and the value that is returned to the asset owners over the economic life of the assets (as depreciation).

Numerous methods of valuing assets are available and are used in different circumstances and for different reasons. Some of the regulatory objectives for asset valuation include:

- the ability of the service provider to finance new investment;
- the assurance that the service provider's revenue is sufficient to allow it to maintain the asset in good condition;
- the assurance that tariffs are no higher than is necessary;
- the avoidance of rapid and large increases in tariffs, if possible;
- the assurance that the costs of inefficient or imprudent investments are not borne by customers; and
- the provision of incentives for efficient investment and maintenance.

There are a range of options for valuation of assets. These methods can be characterized under two main approaches; value based and cost based. A third approach, which is sometimes used, considers both value and cost. In reality, the choices are even more complex and there are several sub-categories within each of the approaches shown in **Figure 4**. Furthermore, a mix of the above methodologies may be used. For example, infrastructure assets might be valued using an alternative approach. Additionally, different asset valuation approaches may be used for different purposes within a single regulatory process.

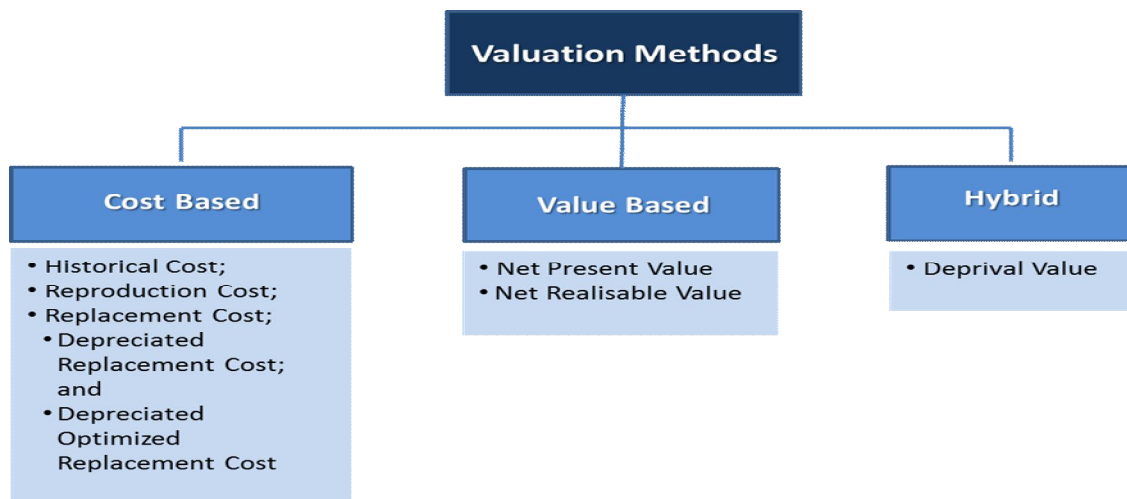
Most network system assets are specialized, and hence their costs are sunk, that is, their opportunity cost is close to zero. Given this issue and other problems of network system assets, the most commonly used valuation approaches are:

- Historical Cost Approach;
- Current Cost Approach;
- Optimized Deprival Value; and
- Net Realizable Value.

The choice of valuation methodology could, among other things, depend on industry specific issues. However, any methodology chosen must:

- support outcomes that are efficient;
- facilitate the identification of excess profits; and
- achieve valuation objectives for regulatory purposes at lowest cost.

**Figure 4: Asset Valuation Approach**



The RIC is cognizant that a historical cost approach does not take account of the service potential of asset or technological obsolescence. On the other hand, unacceptable price increases could result if the RAB were to reflect, for example, the current cost method.

**The RIC invites submissions/comments on the most appropriate asset valuation method for determining the value of assets of WASA, as well as other issues which should be considered as part of the asset valuation process.**

### 5.5.2 Depreciation

Depreciation is an allowable expense for the purpose of tariff calculation and it can account for a significant proportion of the costs. Depreciation can be defined in both accounting and regulatory terms. Depreciation, in accounting terms, measures the consumption of an asset's economic benefits due to wear and tear and obsolescence and is computed on the expected useful life of the asset.

Depreciation, in regulatory terms, may represent either a **return of capital** or a **replacement of capital**, a charge for the replacement of the assets consumed. The return of capital view is consistent with the use of the RAB as the basis for assessing the investment attributable to shareholders. The replacement of capital approach assesses the depreciation charges on the basis of an estimate of the economic life and the current cost of investment.

However, the key question is whether depreciation should be based on the RAB or the current cost of assets, as different approaches can be used to serve different regulatory objectives. Depreciation based on current costs will result in higher tariffs in the short term but lower tariffs in the long-run, thus creating intergenerational issues. On the other hand, depreciation based on the RAB will lead to lower tariffs in the short-run but higher tariffs in the long-run as RAB will increase over time towards replacement cost. The RAB approach is more



attractive in cases where immediate and significant capital investment is required. The current cost (or replacement cost) to depreciation is attractive where current replacements or renewals are at or below their steady level. There is no one “best” approach to calculating depreciation and under particular circumstances, one depreciation profile might be preferred to another.

Irrespective of the approach, there are three issues that must be considered in calculating depreciation:

- the depreciation method;
- the depreciation rate; and
- the base on which the rate is to be applied (discussed in Section 5.5.1).

There are four common depreciation methods. A simple and widely used method is a **Straight Line Method (SLM)**. Under this method, the depreciation is determined by dividing the depreciable cost by estimated years of asset life. The **Double Declining Value** method is used to encourage investments in assets as twice the straight line rate per year is applied to the declining balance each year, thereby allocating most of depreciation in the earlier years of the estimated useful life. The **Sum of the Digits Method** is also an accelerated method of depreciation where the number of years of useful life is added up and the depreciation of each year is in a decreasing progression on a constant base. The **Renewals Annuity Method** considers the infrastructure asset network as an integrated, renewable system to be maintained in perpetuity, rather than a collection of individual assets with its own asset life. This method generates an annuity cash flow that reflects the future cash flow required to maintain the operating capacity of the asset.

Although some utilities have used the renewals annuity method, the main disadvantage is the difficulty of developing realistic long-term asset management plans. Internationally, the Straight Line Method is most commonly used. Its adoption:

- is consistent with economic efficiency;

- may be expected to generate reasonably constant prices over the long-term; and
- is simple and consistent with what is currently being used by WASA.

The depreciation rate forms the basis upon which the carrying amount of an asset is reduced to reflect the consumption of the asset's economic benefits. In determining the depreciation rate, an asset's useful life is determined and is defined in terms of the asset's expected utility to the enterprise. The economic lives of the assets are estimated, having regard to the presence of substitutes for the service and potential technological change. However, these issues may be less relevant for the water and sewerage sector in light of the unique and essential nature of these services and the relatively stable technologies involved.

**The RIC invites comments on the relative merits of the alternative depreciation profiles discussed above and the usefulness of utilizing the straight line method of depreciation.**

### **5.5.3 Calculating the Cost of Capital**

One of the most important parts of the price control review process is the estimation of Weighted Average Cost of Capital (WACC) associated with the provision of utility service. The return on capital component of the building block is calculated by multiplying the WACC by the asset base. The actual rate of return earned by the service provider will depend on the extent to which it is able to outperform the forecasts incorporated in the revenue requirement.

Once the RAB has been determined, it is essential therefore to establish the cost of capital. The allowable earnings of an operator should cover the cost of capital of the business. This cost of capital is the supply price of funds (equity and debt) needed to finance operations i.e. its fixed assets and working capital. Linking the rate of return to fixed assets only runs the risk of not providing sufficient revenue

to compensate investors for the risks assumed. The common method for determining a fair return on capital employed involves:

- estimation of the capital attraction rate for each component of the firm's capital; and
- combination of the various rates into one overall rate in accordance with the percentages each bears to the overall capitalization.

The cost of the capital so established is normally applied to the net assets of the service provider. There are a number of factors that need to be considered in determining the appropriate rate of return:

- the service provider's monopoly status;
- debt/equity ratio;
- returns of other enterprises having corresponding risks;
- the annual revaluation of assets; and
- country risk and vulnerability of the revenue stream to exchange rate movements.

Given the significance of the return on capital in determining the forward looking revenue requirements and the degree of imprecision in its estimation, the assessment of cost of capital generally generates significant controversy during regulatory reviews. The standard approach to computing the Weighted Average Cost of Capital (debt plus equity) is:

$$WACC = [(1-g)*r_e] + [g*r_d]$$

Where:

$g$  - is the level of gearing.

$r_d$  - is the cost of debt finance; and

$r_e$  - is the cost of equity finance.

The use of the WACC approach promotes the efficient allocation of resources by ensuring a state-owned network provider operates under the same financial

conditions as a network provider in the private sector and will ensure returns are equal to the opportunity cost of capital.

There are a number of models used to estimate the cost of equity funds, including the Capital Asset Pricing Model (CAPM), Dividend Growth Model, Price Earnings Ratio and Arbitrage Pricing Theory.

The CAPM is the simplest and most widely adopted method by regulators, where the cost of equity is measured by:

$$r_e = r_f + \beta_e (r_m - r_f)$$

Where:

$r_f$  - the risk-free rate on treasury securities;

$\beta_e$  - is the equity beta which measures the relative riskiness of the firm compared to the market;

$r_m$  - is the level of market return; and

$r_m - r_f$  - is the market risk premium (i.e. the amount of added expected return that investors require to hold a broad portfolio of common stock instead of risk-free treasury securities).

Due to the lack of robust information for many of the parameters, the CAPM estimate is generally supplemented with other methods for estimating the cost of capital, including:

- observations of comparable industry returns;
- arbitrage pricing theory and the dividend growth model; and
- estimates implied by the ratio of an entity's market value to its regulatory asset value.

Approximations and close comparators are generally used when developed capital markets do not exist. The average asset beta, for example, in infrastructure is around

0.7 for high powered incentive regimes and 0.3 for low powered incentive regimes. The alternative is to use benchmark ratios based on international best practice. Consequently, there are several aspects in the determination of the WACC that will be subject to public debate, including the basis for determining:

- equity beta for WASA;
- market risk premium;
- debt premium; and
- capital structure.

**The RIC invites comments on the appropriateness of the above methods for the calculation of the WACC and the determination of cost of equity by the CAPM.**

#### **5.5.4 Cost of Working Capital**

There is an acceptable amount of working capital that a firm needs to maintain in order to fulfill all its commitments between cash inflows and outflows. This amount also includes the inventories which the firm must hold. This is the net working capital i.e. the excess of current assets over current liabilities. It is, therefore, generally suggested that this capital should earn a rate of return equal to the WACC. However, there are a few regulators who do not include an allowance for the cost of maintaining an investment in working capital into the allowable revenue requirement.

**The RIC invites comments on the inclusion of a return on working capital in the revenue requirement.**

### **5.5.5 Revenue Requirements and Financial Viability**

As discussed above, the estimation of the future revenue requirements is achieved by aggregating the four main building blocks, i.e.:

- future projections of operating and maintenance expenditure;
- the return on capital;
- the return of capital (depreciation); and
- an efficiency carryover element (discussed in Section 6).

Having determined these estimates, an annual revenue requirement for each year of the regulatory period can be derived. The regulated revenues estimated by these variables account for the majority of the revenues received by the service provider. However, the RIC will need to be satisfied that the estimated revenue is consistent with the financial viability of WASA, that is, the future cashflow needs are sufficient to cover operations, maintenance and administrative costs, return on capital and return of capital. Therefore, the RIC will undertake the analysis of the implications of the proposed revenue requirements for the financial viability of WASA. The financial analysis will focus on the two main components of viability:

- the ability of WASA to raise and service debt; and
- the ability of WASA to attract capital in the future.

To satisfy the above components of viability, a number of financial ratios are generally analysed. For example, to satisfy the first component, it is necessary to analyse if the cash flows implied by the estimated revenue would sustain WASA. Notwithstanding the intention to assess the financial viability, the RIC must strike the right balance between ensuring financial viability of WASA and protecting consumer interests. However, the financial viability cannot be supported if it is due to risky financial decisions or poor management.

Having evaluated the financial viability implications of the proposed revenue estimates, the next step is to establish the annual profile of estimated revenue

requirements for the full regulatory period. It must be noted that the estimated revenue requirements are not “caps” on the allowed return of the service provider because the service provider’s actual return will be higher (or lower) than that implied, for example, if a service provider introduces efficiency gains that either enhance revenues or reduce costs.

**The RIC invites comments on the approach to assess the impact on the future financial viability of WASA.**

## 6. INCENTIVE MECHANISMS

### 6.1 INCENTIVES FOR EFFICIENCY IMPROVEMENTS

The RIC is required under its Act to be satisfied that price controls provide the service provider with incentives to pursue efficiency improvements. For the transmission and distribution (T&D) electricity sector, the RIC adopted an incentive-based approach that involved a number of aspects:

- setting price controls for a five-year period on the basis of forward-looking forecasts of efficient costs and then allowing the service provider to retain any benefits that arise from out-performance against the forecasts and equally requiring the service provider to bear any losses resulting from its performance during the regulatory control period. Under this approach, a re-opening of the determination will weaken the incentive properties of the framework;
- establishing an “efficiency carryover mechanism” for both Opex and Capex thereby enhancing incentives to achieve efficiencies within the control period by allowing the service provider to retain any efficiency savings for a full five years after the year in which they were achieved and only then requiring the service provider to share a proportion of those savings with customers;
- establishing service standards that were subject to guaranteed service level payments (Guaranteed Service Scheme) if the targets were not met; and
- reporting and auditing the performance of the service provider against a set of performance indicators, thereby motivating the service provider to maintain, if not improve the quality of service provided<sup>3</sup>.

The key issue for the RIC will be to determine the extent to which these mechanisms can be introduced for the water sector and are likely to be appropriate and effective for WASA.

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<sup>3</sup> The Guaranteed Service Scheme and Performance Indicators have already been discussed in Section 4.



## 6.2 EFFICIENCY CARRYOVER MECHANISM

A basic feature of the incentive-based/price cap regulation is that it provides incentives for the service provider to continually improve its efficiency by reducing costs and allowing it to retain the gains achieved for the duration of the price control period. This incentive can be further enhanced through the inclusion of an efficiency carryover mechanism within the price control. There are two broad mechanisms:

- A glide-path mechanism - under a glide path mechanism, gains (losses) are calculated by comparing actual expenditure in the last year of the regulatory period with the benchmark for that year and benchmarks for the next regulatory period are based on the actual expenditure for the last year of the previous regulatory period; and
- A rolling carryover mechanism - under a **rolling carryover mechanism** (at times referred to as a fixed term efficiency carryover mechanism) efficiency gains (losses) are carried over for a specified number of years following the year in which they occurred.

In the absence of an efficiency carryover mechanism, the service provider has a stronger incentive to achieve efficiencies in the earlier part of the control period than it does in the latter part of the control period. The benefits achieved towards the end of the control period would be kept only for a short period, as the regulator seeks to pass these benefits to consumers, through lower prices, at the start of the next price control period. Therefore, the service provider is likely to delay making efficiency gains in the later years of the price control period. The efficiency carryover mechanism removes this potential outcome by allowing the service provider to keep any efficiency gains for a specified period of time, regardless of when those efficiencies are generated.

The key issue in designing the efficiency carryover mechanism lies in finding the right balance between providing incentives for continued efficiency improvements and sharing the rewards of efficiency improvements with consumers. Of primary importance here is the existence of clear rules for sharing of the efficiencies.

Consequently, the RIC has identified certain criteria that should be adhered to:

- the mechanism should be objective, transparent, easy to administer, replicable and must operate in the long-term interests of consumers;
- the mechanism should focus on efficiency gains that can be influenced through managerial decision-making but must also contain adequate penalties for under performance;
- there should be no-reopening of prior period forecasts to maintain the incentive and to stimulate continuous improvements;
- as far as practicable, there should be equal incentives to make efficiency gains in any given year; and
- the efficiency gains should not be at the expense of service standards.

Issues to be considered with respect to efficiency carryover mechanisms, include:

- whether carryover mechanisms should apply to both operating expenditure and capital expenditure and whether there should be a completely separate mechanism for both;
- the length of the retention period – the longer the period the greater the incentive to make efficiency gains;
- the treatment of actual expenditure above forecast – whether penalties should be imposed if costs are exceeded;
- how the regulator should ensure that efficiency gains are not being made at the expense of imprudently deferred maintenance activity; and
- what assumptions should be made about expenditure in the final year of the regulatory period given that actual expenditure in the final year may not be known prior to a price decision for the next regulatory period, thereby creating a one year lag for treating with out-performance and under-performance.

Finally, the RIC will also examine the use of one-off reductions ( $P_0$  Adjustment) at the start of the subsequent price control period as a means of quickly passing on to consumers the benefit of possible gains from the first price control period.

### **6.3 DEALING WITH UNCERTAINTY**

A core tenet of incentive regulation is that once price controls are set, the regulator does not adjust them within the regulatory control period to reflect differences between actual and forecast costs of service provision. WASA must manage any differences between actual and forecast costs during the period. However, like all businesses, the provision of water and sewerage services is subject to external influences and change. Consequently, a price setting methodology, while giving WASA incentives to perform efficiently, must also offer some assurance that unexpected events outside management control or changes to requirements, will be accommodated.

Potential sources of uncertainty for a service provider include:

- changes in obligations (these often include legislative requirements);
- occurrence of natural disasters;
- catastrophic manmade events; and
- actual expenditure being greater than forecast costs and/or changes in expenditure priorities.

It is common for regulators to distinguish between controllable and uncontrollable costs and to further categorize the latter into foreseen and unforeseen uncontrollable costs. In order to cater for foreseen uncontrollable costs, regulators sometimes allow full pass through of these costs in the revenue requirement of the service provider. In the case of unforeseen uncontrollable costs provision can be made within the price cap or revenue cap formula through the inclusion of a Z-factor. Such costs can also be dealt with by some other licensing condition e.g. an interim determination. In order to cope with forecasting errors a few regulators include an error correction mechanism within their price control formula. The purpose of an error correction factor is to make adjustments for any corrections in key assumptions utilized in the calculation of allowed revenue. Although these built in adjustments have been recognized as a means of managing risk, their use is relatively rare as it is felt that this goes against the tenets of incentive regulation.

In certain instances a service provider can cope with uncertainty by re-prioritising or delaying certain expenditure. Therefore, regulators have adopted the view that for an event to be considered for pass-through, it must be material, that is, have the potential to affect the commercial viability of the service provider. Consequently, most regulators apply a **materiality threshold** to limit pass-through to events that have a significant impact on costs while, at the same time, avoiding the risk of introducing a cost-plus regulatory regime.

There are also instances where a service provider is able to identify a “known” item that can have significant impact on its costs, but the precise level of impact is either difficult to quantify in advance of its implementation or cannot be forecasted with precision until plans are substantially finalized. The RIC would require WASA to explicitly identify these potential ‘notified items’.

In reviewing the above issues and deciding on an appropriate adjustment mechanism, the RIC will be cognizant of the following:

- customers are not unduly exposed to risk or price fluctuations;
- WASA has an incentive, wherever possible, to mitigate and plan for such events through appropriate risk management planning processes;
- the event is clearly observable and verifiable; and
- the event is outside the control and not predictable with any certainty.

Finally, if it is decided that it is more appropriate for WASA to have a short price control period e.g. 3-4 years, it may be appropriate to make adjustments at the end of the control period rather than during the period simply because a business may be able to carry such costs for this period.

Given WASA’s current performance and financial situation, applying an efficiency carryover mechanism for the first regulatory control period may have limited impact and may not provide sufficient incentives to pursue efficiencies. In fact, increasing efficiency may be a difficult and time-consuming process and may require initial increases in

expenditure. Therefore, a hard-line regulatory approach of limiting allowable revenue to the efficient cost of service may be counterproductive. A more pragmatic approach may be to implement a phased programme for improving efficiency or establishing a regime of *ex ante* performance benchmarks (e.g. annual targets for the reduction of unaccounted for water, leakage, employee costs, etc.) as markers against which WASA's efficiency improvements and service delivery performance will be monitored.

**The RIC invites comments on the above-discussed matters, as well as other related issues, including:**

- **whether an efficiency carryover mechanism should be applied for the first regulatory period;**
- **how should the efficiency carryover mechanism be designed;**
- **whether there should be limited pass throughs, although there may be scope for reopening of the determination where significant impact of financial viability can be shown;**
- **an appropriate materiality thresholds; and**
- **whether there should be a phased programme for improving efficiency.**

## **7. ESTABLISHING PRICE CONTROLS**

### **7.1 INTRODUCTION**

The final step in the building-block approach is the translation of estimated revenues into an explicit formula/control that emits average price movements over the regulatory period. In approving price controls, the RIC is guided by two overarching considerations under its Act:

- that it take into account the interests of customers, including low income and vulnerable customers; and
- that the service provider will earn sufficient revenue to deliver its obligations/outcomes.

As discussed in Section 5, after estimating the reasonable cost of service, the regulator must translate that cost into the maximum allowed revenue that the service provider can recover. Allowing reasonable revenues to the service provider is critical to providing adequate service. Underpricing of services generally results in many undesirable outcomes:

- It not only affects the financial viability and sustainability of the utility, but results in wasteful usage of the service.
- It impedes the expansion of service provision and reduces the coverage, especially of rural and poor households.
- It affects State finances, since the State either has to absorb the losses of the utility or reduce the necessary capital support for network maintenance and/or capacity expansion.

Where funds may be allocated by Central Government, there is invariably a mismatch between allocation and actual release of funds, thereby leading to less than optimal resources for expansion/rehabilitation and, at minimum, ad hoc development of the network system. The end result is a low level equilibrium characterized by low tariffs, low investment, poor service and limits on access, especially for poor and rural

households. The present situation of WASA where its losses have to be either written off or absorbed by the State or merely allowed to be kept on books is totally unsustainable.

## **7.2 OTHER KEY ISSUES FOR ESTABLISHING PRICE CONTROLS UNDER INCENTIVE REGULATION**

To implement price controls under incentive regulation, the regulator will need to consider and address a number of other issues, including:

- the specification of the formula and consideration of other factors that may be included in the formula;
- the calculation of the X factor;
- the period of regulatory control;
- the sharing of benefits and incentive carryover;
- correction (adjustment) factor; and
- contributed assets and capital subsidies.

An incentive-based approach (e.g. RPI-X) to regulation is formula driven. Therefore, the determination of variables to be included in the formula becomes critical. There are mainly three sources of cost changes in a regulatory period with which price adjustment factors are associated. These are:

- **Cost Inflation** - external inflationary increases in the purchase price of inputs used to produce output;
- **Productivity Gains** - whether from improved input productivity or growth; and
- **Cost Passthrough** - where the costs of external changes or shocks are passed through to customers.

### **Cost Inflation**

Ideally, the different components of the service providers' cost base should be indexed using specific deflators. However, traditionally, regulators have adopted

the Consumer Price Index (CPI), Retail Price Index (RPI), and to lesser extent, Gross Domestic Product (GDP) deflator, as an overall deflator. Despite known inherent limitations, they remain recognized measures of inflation for macroeconomic policy management and are widely used for general indexation of public and private contracts and charges.

The inflation index should therefore:

- attempt to reflect the changes in the industry;
- be broad based such that it reflects changes of a large bundle of goods and services;
- be available from an independent source, on a timely basis; and
- not be subject to manipulation or significant revisions.

Although the RPI possesses most of these features, one of its main disadvantages is that it measures the average price level of domestic output in the economy.

### **X-Factor and Productivity Gains**

The key design issue for both revenue and price caps is the selection of the X-factor. The X-factor provides a service provider with incentives to become efficient. It is an expectation of future productivity gains and the service provider has the discretion as to the effort that it will make to achieve such efficiency gains. The incentive arises from the fact that initial revenues and the revenue process are set at the commencement of the regulatory control period and any efficiency gains over the price control period can be kept by the service provider.

The key parameters of the RPI - X approach are:

- The initial price at the start of the regulatory control period ( $P_0$ );
- The rate of required annual efficiency gains (X-factor);



- The length of the regulatory period; and
- The basis for setting  $P_0$  and X-factor at the commencement of a regulatory period.

There are several approaches to the setting of the X-factor during the regulatory period. One approach is to set a common X-factor for each year of the regulatory control period. Another approach is to allow for a one-off adjustment in the initial year of the regulatory period and then set a fixed X-factor for the remaining years of the price determination. Finally, the X-factor could vary over the entire length of the regulatory period.

### **Methods for Determining the Value of X-Factor**

There are several methods for determining the value of X-factor. These are broadly separated into cost linked (firm specific) or cost unlinked (not directly related to the firm's costs). Under cost linked approaches (at times referred to as subjective or indirect approach), the building-block methods are used to indirectly derive the X-factor. By basing regulatory parameters on firm specific costs, incentives for efficiency can be weakened under cost linked approaches. The cost unlinked approach (sometimes referred to as index-based methods) relies heavily on total factor productivity analysis (TFP). Approaches based on TFP studies have also been referred to as objective approaches or direct approaches, because they tend to minimize the scope for regulatory discretion. Other less common approaches include frontier methods (using analytical tools such as data envelopment analysis and stochastic frontier analysis), econometric benchmarking and engineering economic models.

Generally, the productivity offset or X-factor should take into account a number of factors, including:

- the ability of the regulated firm to finance its operations;

- the capacity of the regulated firm to lower costs without compromising quality of service;
- the future scope for productivity improvements in the regulated firm relative to productivity growth in the economy;
- Consumer Productivity Dividend (stretch factor) i.e. a dividend to consumers resulting from increased incentives for efficiency under incentive regulation;
- the competition adjustment which could be a positive or negative figure; and
- an allowance for a period of adjustment to new rates.

The regulators in some jurisdictions factor into the expenditure the scope for cost reductions and the X-factor is used to “smooth” the price path during the regulatory period. As assumptions about cost reduction and demand growth are already taken into account, the X-factor need not bear any relationship to expected future productivity growth. Broadly, there are three ‘revenue smoothing’ approaches to deliver the notional revenue requirement over the regulatory period:

- Net Present Value (NPV) approach with single X-factor – a single X-factor is set to ensure expected revenue equals expected notional revenue requirement, in NPV terms;
- NPV approach with P-nought (Po) adjustment – an initial X-factor (P-nought) is set to allow prices to rise sufficiently to ensure expected revenue is equal to notional revenue requirements in the first year of the regulatory period, with a second X-factor to apply over the remainder of

the regulatory period; and

- Straight line revenue smoothing (glide path) – a single X-factor is set so that prices change smoothly over the regulatory period in real terms to ensure that the expected revenue in the final year of the regulatory period equals the notional revenue requirements in that year.

The RIC Act imposes a requirement under Section 67(3)(h) which states that the RIC will have regard to future prospective increases in productivity by the service provider when setting out principles on which rates chargeable should be based. Thus, the RIC can adopt whichever method it chooses to determine the X-factor.

**The RIC invites comments on the approach to setting the X-factor.**

### **Cost Pass-through**

A cost pass-through allows a service provider to adjust (upward or downward) its price or revenue cap in response to an increase (or decrease) in an input cost that is beyond the service provider's control. However, such costs may arise from unforeseen events or they can be known upfront. The regulator's function is to provide the regulated entity with incentives to cut costs that are under its control but insulate it from losses and abnormal profits arising from costs that are outside of its control. The categories of costs that may be considered outside of a service provider's control, and thereby eligible for pass-through may include cost changes due to:

- changes in statutory requirements;
- unexpected and easily identifiable events; and
- significant changes in cost drivers.

An obvious candidate for pass-through may be the cost of desalinated water. This is outside of WASA's control and subject to long-term contractual arrangements.

A cost pass-through approach is generally seen as a way of avoiding windfall gains or losses for the regulated firm and does not compromise long-term efficiency incentives. However, it may be seen as shifting the risk associated with a specific input cost from the service provider to the customer.

**The RIC seeks comments on the circumstances under which significant changes in costs to the regulated firms may be passed through.**

### **Correction (Adjustment) Factor**

It is reasonable to include a correction (adjustment) factor in the rate control formula to allow for adjustments arising in the current regulatory period to be carried forward into the next regulatory period. Broadly, there are two situations where the correction factor may be applied, and these are discussed below.

### **Unders and Overs**

The regulatory regime based on a revenue cap may include an “unders and overs” account for differences between forecast and actual revenue, as there is likely to be a balance in the service provider’s account at the end of the regulatory period. The issue for the regulator is how to treat this balance. A correction factor to carry forward the balance is one option. Alternatively, the revenue requirement could be adjusted for the unders and overs. But this may raise two additional issues. One is the length of the period, as this will depend upon the magnitude of the account balance and on the methodology for determining the X-factor. The length of the period gives rise to inter-generational equity issues. The second issue for the regulator is whether a positive balance, for example, should be treated as a customer capital contribution or as prepaid revenue and therefore incorporated within the allowable revenue over the next regulatory period. A positive balance would reduce RAB or allowable revenue and hence prices. The converse is also true.

### **Treatment of Capital and Operating Expenditure**

The second type of situation, in which the regulator may consider using a correction factor, is the treatment of a positive or negative balance of capital and operating expenditure. Once again, the issue arises whether to treat additional expenditure as revenue foregone or to be provided for in the next regulatory period. If it is to be provided for in the next period, then the regulator may use a correction factor to adjust the revenue requirement.

**The RIC invites comments on the proposal of using a correction factor in the rate control formula and on the appropriate means of dealing with any residual balances in the revenue requirement or capital and operating expenditure.**

## **7.3 CONTRIBUTED ASSETS AND CAPITAL SUBSIDIES**

### **Contributed Assets**

Contributed assets are those assets that are funded by a user or group of users for their own benefit or for the collective benefit of users. Types of contributed assets may include an up-front lump sum payment for a specific asset (e.g. a direct up-front capital contribution), an annual capital charge in lieu of an up-front lump sum payment (e.g. a user meeting certain capital costs) and security deposits. It is generally recognized that “double-charging” of contributed assets should be avoided. However, the major issue is to identify what constitutes a contributed asset.

### **Capital Subsidies**

Capital subsidies are a specific form of contributed assets. WASA has benefited from subsidies for capital works or capital grants from Government and other agencies such as the Self-Help Commission. Other schemes have also provided assistance for the development/extension of the network systems. The purposes

of capital subsidies include the reduction of service costs to a particular consumer group, the meeting of funding shortfalls, etc. Some of the options for dealing with capital subsidies include:

- Recognizing the subsidy as revenue in the period in which it was received and including it in the service provider's asset base;
- Treating it as an equity injection, with no consequent changes to pricing arrangements; and
- Amortizing the value of any past grants over the life of the relevant assets, in addition to including the amount as revenue.

**The RIC invites comments on the treatment of contributed assets and capital subsidies.**

#### **7.4 RESET AND REVOCATION OF A DETERMINATION**

Another major issue in incentive regulation is the commitment by the regulator to its price or revenue cap decision. The regulator faces many challenges to maintain commitments under incentive regulation.

First, the setting of price limits applies to a specific time period (i.e. the five year review period). Although details of the regulatory arrangement can be specified within the review period, many of the benefit sharing aspects of incentive regulation relate to regulatory actions at the subsequent review. Therefore, a key issue will be the extent to which current determinations or statements of approach can or should bind the actions of future regulatory decisions.

Building confidence in the regulatory regime requires that commitments are honored and that the regulators do not behave opportunistically and should resist

any pressure for retrospective adjustments if revenue outcomes exceed expectations, as repeated confiscation of the benefits of efficiency improvements combined with uncertainty can contribute to poor performance and poor investment practices.

On the other hand, the regulator may find that the price determination is unworkable and could cause great financial hardship for the regulated firm. Under these circumstances, the regulator may cater for some sort of “reset” or “substantial effect” clause or even an “interim determination” mechanism. A reset may be applied:

- if there were an exogenous shock (e.g. natural disaster);
- if accurate information were not available when setting the price cap parameters; or
- if distortions in the parameters (e.g. rate of inflation) occur due to rapid unforeseen changes.

Section 48 of the RIC Act makes provision for “reset” events but it does not specify any event. It is generally recognized that a service provider should be able to apply for interim determination if there have been changes to its costs and revenues amounting to more than a certain percent of turnover.

**The RIC invites comments on the types of events that might trigger the “reset” of the price determination.**

## **7.5 TARIFF RE-BALANCING AND SIDE CONSTRAINTS**

The purpose of “side constraints” is to limit the variation of tariffs for all or particular customer groups from year to year. For example, a side constraint may limit an annual increase in tariffs to a specific increase over the previous year. Another example may be to impose a price constraint on the first block of

consumption, to limit the price increase on the lower income consumers to an affordable level. The regulator can also establish limits on the extent to which a service provider can rebalance individual tariffs within the limits imposed by the price control, so as to ensure that particular customer classes did not experience significant tariff increases in a single year.

Although the side constraints provide price stability for customers, they are likely to have adverse effects in terms of the ability of the regulated firm to fully recover its revenue requirement.

The side constraints may also be used to establish performance benchmarks to be met by the service provider, such as, for the reduction of system losses, or the reduction of employee costs to certain levels.

The RIC Act requires the RIC to have regard to the ability of consumers to pay rates. Two issues arise from this requirement; the issue of affordability and the design or structure of prices. To the extent that price increases are likely to be onerous in terms of the impact on customer bills, the phasing in of tariffs or limiting the amount by which prices can increase on an annual basis may be possible solutions. Where the service provider is asked to provide a service at a less than efficient or uneconomic price, the service provider will need to propose a mechanism to recover the unrecovered portion of costs. There are at least two options:

- Recover the costs across some or all of the other customers, or
- Fund the deficit from the Government budget.

**The RIC invites comments on:**

- **the appropriateness of side constraints and the circumstances under which they should be applied; and**
- **how the service providers should take into account the interests of customers.**



## 7.6 COST ALLOCATION

Having established the maximum allowed revenue, the next step is to assign responsibility by customer class for total costs based on share of costs, referred to as cost allocation. It includes the determination of a proportion of the total costs of the service provider that is recovered from particular customers or classes of customers, and from particular components of a price (for example, fixed and variable charges) that a customer or class of customers pays for the service.

There are a number of methods of cost allocation. However, the allocation process usually takes place in two steps:

- Allocation of costs to functional cost of service categories; and
- Reallocation of functional costs to classes of customers.

The functional cost of service components in the water sector are generally broken down into the following:

- |                             |                               |
|-----------------------------|-------------------------------|
| (i) Source of supply        | (vi) Billing and collection   |
| (ii) Pumping and conveyance | (vii) Customer service        |
| (iii) Treatment             | (viii) Accounting and finance |
| (iv) Transmission           | (ix) Administration           |
| (v) Distribution            |                               |

After functional cost categories are established for cost of service purposes, it is necessary to allocate each cost pool of functional cost to classes of customers. Several factors that differentiate the cost of providing service among customer classes include<sup>4</sup>:

- demand characteristics – the rate of peak usage to average usage by a class of customer;

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<sup>4</sup> The two commonly proposed methods are the **base-extra capacity approach** where costs are allocated to average day, maximum day and maximum hour components and the **demand-commodity approach**. Both of these methods recognize that cost of serving customers depend not only on the total volume of water used but also on the rate of use or peaking requirements.

- types of mains serving specific customer classes – larger customers being served by larger mains; and
- location of customers – establishing “pressure zones”.

Examples of classes of customers include: residential; commercial, industrial; institutional (schools, hospitals, etc.); and fire protection.

## 7.7 SETTING THE TARIFF STRUCTURE

The final step in the setting of price control is the issue of determining how much each customer or a group of customers should pay. This is determined by the tariff structure. A tariff structure is a set of procedural rules that determine the service conditions and charges for various categories of users.

Broadly, water provision comprises:

- (i) capital improvement works and asset creation – that is, source development, installation of plants and pumping stations and distribution network;
- (ii) operations and maintenance – that is, running and maintaining the system, ensuring a proper distribution of water and minor capital works; and
- (iii) billing, levy and collection of water charges – that is, levy and collection of charges for providing access and selling of water.

Ideally, therefore, regulators may establish separate charges:

- (i) **an infrastructure development charge** to cover the cost of developing or augmenting the secondary and tertiary distribution systems;
- (ii) **a connection fee** to cover the direct cost of connection to the system;
- (iii) **a charge for managing, billing and metering** cost of maintaining the connection; and
- (iv) **a consumption charge** for water to cover the cost of creating and maintaining water abstraction capacity, the primary distribution system and cost of water procurement and operating cost of supply.

The key to pricing, however, is consumption charge for water. Water pricing structures are either **volumetric** (i.e. based on quantity of water used) or **non-volumetric** (i.e. based on measures that are proxies to water consumption). Tariff structures commonly used for **unmetered supplies** are either fixed (flat) charges (e.g. value of property) or charges that vary with the size of water connection.

**Volumetric pricing structures** are also of several types. An **Increasing block (IB)** tariff is a series of prices that increase in steps as consumption increases. IB tariff can contribute to equity by allowing low-income households to pay lower rates. It can promote water conservation and sustainable water use and finally, IB tariff is needed to implement marginal cost principles because marginal costs are expected to rise with total water use.

**Uniform volumetric charge** is a fixed charge per unit of water consumption, which may vary with the category of users. It provides no incentive to conserve and its main merit lies in its simplicity. A **linear water charge** is a charge which rises with every discrete unit of water consumption, not in blocks as under IB tariff. Under a **two-part tariff**, there is a minimum charge for a fixed quantity of water beyond which the charge may either follow an IB structure or a uniform tariff. Conceptually, a minimum charge is in the nature of a rent payable by all users having a water connection, whether or not water is used. The minimum charges are so fixed that they are lower than the tariff rate laid down for the initial block, giving advantage to low consuming households.

The current charges by WASA consist of a one-time charge for a connection, a charge based on the annual rateable value (mainly for the residential customers) and a water consumption charge (based on mainly commercial and industrial metered customers). A water charge from unmetered household is more in the nature of a fee, rather than a charge. Therefore, it promotes inefficient consumer behaviour.

Setting tariffs requires striking a balance between a number of main objectives:

- **Economic efficiency** – Economic efficiency requires that prices should signal to consumers the costs that their decisions to use service impose on the rest of the society. From an economic efficiency perspective, a tariff should create incentives that ensure that users obtain the largest possible aggregate benefits. Although this means that volumetric water charges should be set equal to marginal cost of supplying water, in practice tariffs are commonly set based on average cost or average incremental cost, second best methods, to avoid revenue shortfall.
- **Revenue sufficiency** – The revenue from users should be sufficient to cover operation and maintenance costs and to attract both equity capital and debt financing. Additionally, the revenue stream should be relatively stable (i.e. financial stability).
- **Fairness and Equity** – Tariffs should treat all consumers equally, i.e. users pay proportionate to the costs they impose on the service provider.
- **Social orientation of water service** – The tariff structure should be consistent with the social needs of the society.
- **Simplicity and Transparency** – The tariff should be easy to understand and transparent.
- **Other Objectives** – The tariff structure should be consistent with meeting Government objectives, as well as, ensure regulatory efficiency (i.e. minimize regulatory intrusion and compliance costs).

The RIC Act contains a number of regulatory objectives that relate specifically to the establishment of price controls. Therefore, the principles/objectives that need to be considered while designing the tariff structure by the RIC have to be consistent with these regulatory objectives. These objectives are detailed in **Table 3** below. The RIC will be guided by its legislative framework when designing a tariff structure.

**Table 3: RIC Act Objectives of Tariff Determination**

Objective in the Act	Mechanism to meet the Objective
<ul style="list-style-type: none"> <li>• To promote efficiency and economy [Sections 6(1) (d) and 6(3) (a)]</li> </ul>	<ul style="list-style-type: none"> <li>- Recovery of only reasonable costs of operation from customers.</li> <li>- Providing incentives through tariff for good performance.</li> <li>- Designing tariff that promotes optimum level of consumption and avoids wastage.</li> <li>- Promoting quality of supply and service to customers.</li> </ul>
<ul style="list-style-type: none"> <li>• Ensure the financial viability and sustainability [Section 6(1) (c) and 67(3) (a) (b)]</li> </ul>	<ul style="list-style-type: none"> <li>- Recovery of reasonable costs of operation and maintenance.</li> <li>- Recovery of capital costs including a reasonable return on investment.</li> <li>- Stable revenue stream.</li> </ul>
<ul style="list-style-type: none"> <li>• Tariff should be fair, just and non-discriminatory [Section 6(3) (b) (c)]</li> </ul>	<ul style="list-style-type: none"> <li>- Tariff should reflect the cost of supply of service provision.</li> <li>- No discrimination against any consumer(s) so as to burden with unjustified costs.</li> <li>- Cost of providing different services should be shown separately.</li> </ul>
<ul style="list-style-type: none"> <li>• Ability of consumers to pay rates [Section 67(1) (c)]</li> </ul>	<ul style="list-style-type: none"> <li>- Promoting social equity.</li> <li>- Provision of targeted subsidies for lower income groups.</li> </ul>

Currently, the existing pricing system and structures are largely inadequate and unsustainable and there are a number of issues that need to be considered in developing a framework for reform. The first relates to the relevance and effectiveness of the existing pricing system and tariff structures. A second issue relates to the high proportion of non-revenue water<sup>5</sup>. A third issue is linked to the unbalanced revenue base of WASA, with much of the burden currently being borne by the non-domestic sector. A fourth issue is the lack of metering of residential customers. While the merit of metering is widely

<sup>5</sup> Non-revenue water comprises free water (including illegal connections), distributional losses and unaccounted for water.

accepted, some concerns have been expressed as to the loss in revenue to the service provider in the short-term. This concern may not stand scrutiny as the revenue loss occurs only if all fixed charges are transformed into volumetric charges after metering. Furthermore, experiences of other countries suggest that metering should not be treated in isolation but should form an integral part of the overall price reform and should be promoted on the basis of fairness and as a means of improving operating efficiency and lowering costs. Moreover, transparent information on water consumption and production enables precise calculation of water tariffs according to marginal costs of service provision. Thus, metering protects customers against abuse of power by a utility monopoly, protects the environment with lower use of resources, and thus helps society, as water metering promotes a more responsible attitude towards water use and wastage. Reducing demand also helps to determine the amount of financial resources needed for new treatment plants, pipes and reservoirs. Also, most tariff formulas and subsidy schemes for the poor are based on metering. In fact, as the real costs of water provision rise, the cost-benefit balance of metering moves towards increased metering, on both economic and environmental grounds.

In setting price controls for the first regulatory control period, the RIC will be guided by the following considerations:

- overall, the proposed prices will be established in a way that is consistent with its legislative objectives;
- aim to strike the optimum balance between the often conflicting interests of stakeholders and ensure the best possible value, including price and improved quality of service;
- the proposed prices will aim to provide efficient price signals to customers and promote the sustainable use of water;
- bringing tariffs to full cost recovery (including a return on capital) levels, over time;
- basing tariff levels on financial viability criterion and managing affordability issues through mechanisms such as a lifeline block in a tariff structure for

- consumption-related tariff, provision of explicit subsidies for lower income groups, etc.;
- that the impact of proposed tariffs on customers, especially the lower income and vulnerable groups, is duly taken into account;
  - design tariffs in ways which do not create disincentives for metering;
  - in case of metered usage, the tariff structure will be designed to ensure that the initial block is fixed at a level which corresponds to a level equal to a household's essential water needs; and
  - promoting direct intervention where there is a marked gap in service delivery, for example, the RIC will require WASA to include pro-poor criteria in undertaking investments in water supply projects.

## **7.8 MISCELLANEOUS CHARGES**

Miscellaneous Charges are fees charged for non-routine services that are not included under the price control mechanism used to regulate tariffs. In regulating such charges, the regulator usually attempts to protect consumers by making these charges as cost reflective as possible. These charges are applied for services such as, meter installation, service connection/disconnection, clearance certificate, etc.

The RIC's concern about miscellaneous charges is derived from complaints reported to its Customer Service Department. Although miscellaneous charges do not collectively account for a significant proportion of WASA's total revenue, those charges can have an impact on individual customers, particularly those in low-income groups.

There are a number of issues associated with miscellaneous charges:

- the range of miscellaneous services being offered;
- non-flexibility of the current arrangements – that is, there is no automatic mechanism to adjust the list of services without the involvement of the regulator;
- pricing for miscellaneous services – that is, whether the charges should be cost reflective or some other approach be used to allocate costs; and

- the fee structure – that is, the current structure does not provide flexibility for upward adjustment to current charges to reflect changes in the underlying cost of delivering these services.

**The RIC invites comments on the above-discussed matters, as well as on other related issues, including:**

- **the appropriateness of pricing principles/objectives for large non-domestic customers receiving unique services;**
- **any other tariff structure issues that the RIC should consider;**
- **any other pricing principles that the RIC should have regard to in assessing proposed prices;**
- **how best to structure unmetered water tariffs;**
- **the range of miscellaneous services being offered;**
- **the best way to price miscellaneous services; and**
- **whether the introduction of new miscellaneous services be restricted to the commencement of each regulatory control period.**



## **8. SUMMARY OF ISSUES FOR CONSULTATION**

Throughout this Consultative Document the RIC has identified a number of issues for further comment. The range of issues identified is not intended to be exhaustive and stakeholders are encouraged to identify any further issues that they consider should also be addressed. After receiving the responses, the RIC will then indicate how it intends to resolve the various issues.

### **FORM OF REGULATION**

*The RIC welcomes comments on:*

- *the broad form of regulation most suited to regulating WASA;*
- *any other alternative regulatory models that stakeholders believe warrant consideration;*
- *the RIC'S preference to use a revenue cap for the initial regulatory period; and*
- *the length of the regulatory period.*

### **QUALITY AND LEVELS OF SERVICE**

*The RIC invites comments on the appropriateness of the use of a Performance Incentive Mechanism (S Factor) and Performance Reporting to supplement the Guaranteed Standards Scheme as well as any other related issues.*

### **ASSESSING EXPENDITURE & DETERMINING THE REVENUE REQUIREMENT**

*The RIC invites comments on the matters, as well as other related issues, including:*

- *the factors the RIC should take into consideration in assessing WASA's forecasts of Opex;*

- *the factors the RIC should take into account when assessing the potential for efficiency improvements;*
- *the approach to benchmarking that will provide the most appropriate method for comparing WASA's performance;*
- *the appropriate approach for assessing the annual rate of efficiency improvements;*
- *the appropriate approach to monitoring WASA's performance;*
- *the factors the RIC should take into consideration in assessing WASA's forecasts of Capex; and*
- *the factors the RIC should take into account to ensure deliverability of the investment programme.*

*The RIC invites submissions/comments on:*

- *the most appropriate asset valuation method for determining the value of assets of WASA, as well as other issues which should be considered as part of the asset valuation process.*

*The RIC invites comments on:*

- *the method for including the new investment in the RAB; and*
- *whether capital expenditure should be included in the determination of revenues in the year that it is incurred.*

*The RIC invites comments on:*

- *the relative merits of the alternative depreciation profiles herein-discussed and the usefulness of utilizing the straight line method of depreciation.*

*The RIC invites comments on:*

- *the appropriateness of the methods for the calculation of the WACC and the determination of cost of equity by the CAPM.*

*The RIC invites comments on:*

- *the inclusion of a return on working capital in the revenue requirement.*

*The RIC invites comments on:*

- *the approach to assess the impact on the future financial viability of service providers.*

## **INCENTIVE MECHANISMS**

*The RIC invites comments on the discussed matters, as well as other related issues, including:*

- *whether an efficiency carryover mechanism should be applied;*
- *how the efficiency carryover mechanism should be designed;*
- *whether there should be limited pass throughs, although there may be scope for reopening of the determination where significant impact of financial viability can be shown;*
- *an appropriate materiality threshold; and*
- *whether there should be a phased programme for improving efficiency by establishing ex ante performance benchmarks.*

## **ESTABLISHING PRICE CONTROLS**

*The RIC seeks comments on:*

- *the circumstances under which significant changes in costs to the regulated firms may be passed through.*

*The RIC invites comments on:*

- *the proposal of using a correction factor in the rate control formula and on the appropriate means of dealing with any residual balances in the revenue requirement or capital and operating expenditure.*

*The RIC invites comments on:*

- *the treatment of contributed assets and capital subsidies.*

*The RIC invites comments on:*

- *the types of events that might trigger the “reset” of the price determination.*

*The RIC invites comments on:*

- *the appropriateness of side constraints and the circumstances under which they should be applied; and*
- *how service providers should take into account the interests of customers.*

*The RIC invites comments on the discussed matters, as well as on other related issues, including:*

- *any other tariff structure issues that the RIC should consider; and*
- *any other pricing principles that the RIC should have regard to in assessing proposed prices.*

*The RIC invites comments on:*

- *the best way to price miscellaneous services;*
- *the range of miscellaneous services to be included; and*
- *whether the introduction of new miscellaneous services be restricted to the commencement of each regulatory control period.*