REGULATED INDUSTRIES COMMISSION

FRAMEWORK AND APPROACH

FOR THE PRICE REVIEW 2008 – 2012

WATER AND SEWERAGE SECTOR

October 2007

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1. INTRODUCTION

1.1 BACKGROUND AND OBJECTIVE

The Regulated Industries Commission (RIC) under its Act No. 26 of 1998 (Section 48) 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, the work plan, the major issues the review will consider and the issues that will need to be resolved in implementing the regulatory framework for the water and sewerage sector.**

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 rather than the traditional Rate of Return methodology. 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. However, in 1998 in accordance with the WASA Act, a special water improvement rate of $4.00 per cubic metre was implemented at the Point Lisas Industrial Estate. Thus, industrial customers at the estate pay $7.50 per cubic metre, which includes the then existing charge of $3.50 per cubic metre for industrial customers.

The RIC is required to assess the Water and Sewerage Authority's (WASA's) submission for price review against principles outlined in the RIC's Act and decide whether the review is warranted or it may determine the matter by modifying the existing principle or establishing a new principle (Sections 49 and 50). In deciding whether to approve WASA's prices, 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" (Section 6). 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.

The first step in the review process is the submission of service provider's Business Plan detailing fully 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 must be deliverable over the regulatory control period. The forecasts of demand must be reasonable and reflect the best available information.

Broadly, the RIC's approach to this review 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 services. The final step involves determining 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 49 of the RIC Act specifies the procedure to be followed for establishing the principles and methodologies for determining rates and charges for services as follows:

- a written notice to the RIC requesting a review of the principle or rate in such manner and accompanied by such information as specified in Section 49 (2);
- the notice to be published in the Gazette and at least one daily newspaper;
- the RIC shall consult with stakeholders and other parties not later than three months after receipt of the notice;
- the RIC shall notify the service provider in writing where it is of the opinion that a review is not warranted;
- the RIC may determine the matter by modifying the existing principle or establishing a new principle; and
- the period between the date of the notice and a determination by the RIC shall not exceed six months.

In deciding whether to approve or specify the price arrangements, the RIC must be satisfied that they provide the service provider with 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;
- factors that would encourage maximum efficiency and economical use of resources; and
- national environmental policy.

1.3 RIC'S APPROACH TO CONSULTATION

In deciding on standards of service and pricing matters, the RIC is required to consult. 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, has been developed based on the valuable experience from the last price control review for the electricity transmission and distribution (T&TEC) sector and 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 and radio.
- **Public-at-large Outreach** – comprising of consultations and 'Question and Answer' sessions with audiences in all major areas in the country.

The RIC will provide various opportunities to encourage wide participation and intends to keep stakeholders informed of progress through its Quarterly Newsletter, through regular website updates and, through the print and electronic media. The RIC will establish a dedicated area on its website for easy access to information and documents. The RIC will also encourage interested stakeholders to be added to its database to receive e-mails about upcoming events and activities. The RIC will also provide (on request)

copies of all consultative and other documents. The RIC will ensure that written documents are easy to read, relevant to audiences and widely available.

The RIC will also host **stakeholder information days** during the price review process to encourage more focused debate, as well as provide more direct opportunities to explain and hear views of stakeholders. These days will be timed around key events and/or to cover a specific issue and during the main stages of the review process. The RIC will also publish a short paper in advance of the scheduled events, outlining the important issues for discussion. Such occasions will also be used to inform stakeholders about upcoming events and activities and about progress against the price review timelines. In essence, there are a number of ways in which the RIC will provide stakeholders with an opportunity to comment. These are: the stakeholder information days; the publication of technical papers; the holding of workshops and forums, including national consultations; and the period for representations after the publication of the draft determination.

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 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.

2. REVIEW AND CONSULTATION PROCESS

The RIC's key regulatory activities associated with the review of charges 2008-2012 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. Importantly, it gives insight into the volume of work that lies behind the RIC's final determination.

2.1 INFORMATION REQUIREMENTS: BUSINESS PLAN 2008 - 2012

A key element of the process for the review of charges 2008-2012 is the submission by WASA of its draft and final Business Plan for the 2008-2012 regulatory review period. The Business Plan forms a 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 document, Information Requirements: Business Plan 2008-2012, is a public document and is available at the RIC's office and on its website **(www.ric.org.tt).**

The Business Plan sets out detailed descriptions of the information that the RIC requires, 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 allow 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 form the basis of the RIC's assessment of the revenue requirements of WASA for the regulatory control period. The Business Plan, in short, is a service provider's statement of its strategy for the future and sets objectives and outputs to be achieved.

2.2 GOVERNMENT/SHAREHOLDER INPUT

The RIC has a statutory duty to consult with service providers 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 in the provision of services. 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.

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

2.3 EXTERNAL ADVICE

Nearly every aspect of the RIC's work-plan outlined in this document will be delivered using in-house resources. However, the RIC may seek independent specialist advice to assist in its determination of an appropriate methodology to value the assets of WASA as well as to advise on the appropriateness of the investments proposed for the control period. This is cost-effective and ensures that the RIC's work benefits from the fresh perspective of external experts.

2.4 STAKEHOLDER PARTICIPATION

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

- **Quarterly Newsletters**
- **Website 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.
- **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.

- **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**.

2.5 TIMETABLE OF ACTIVITIES

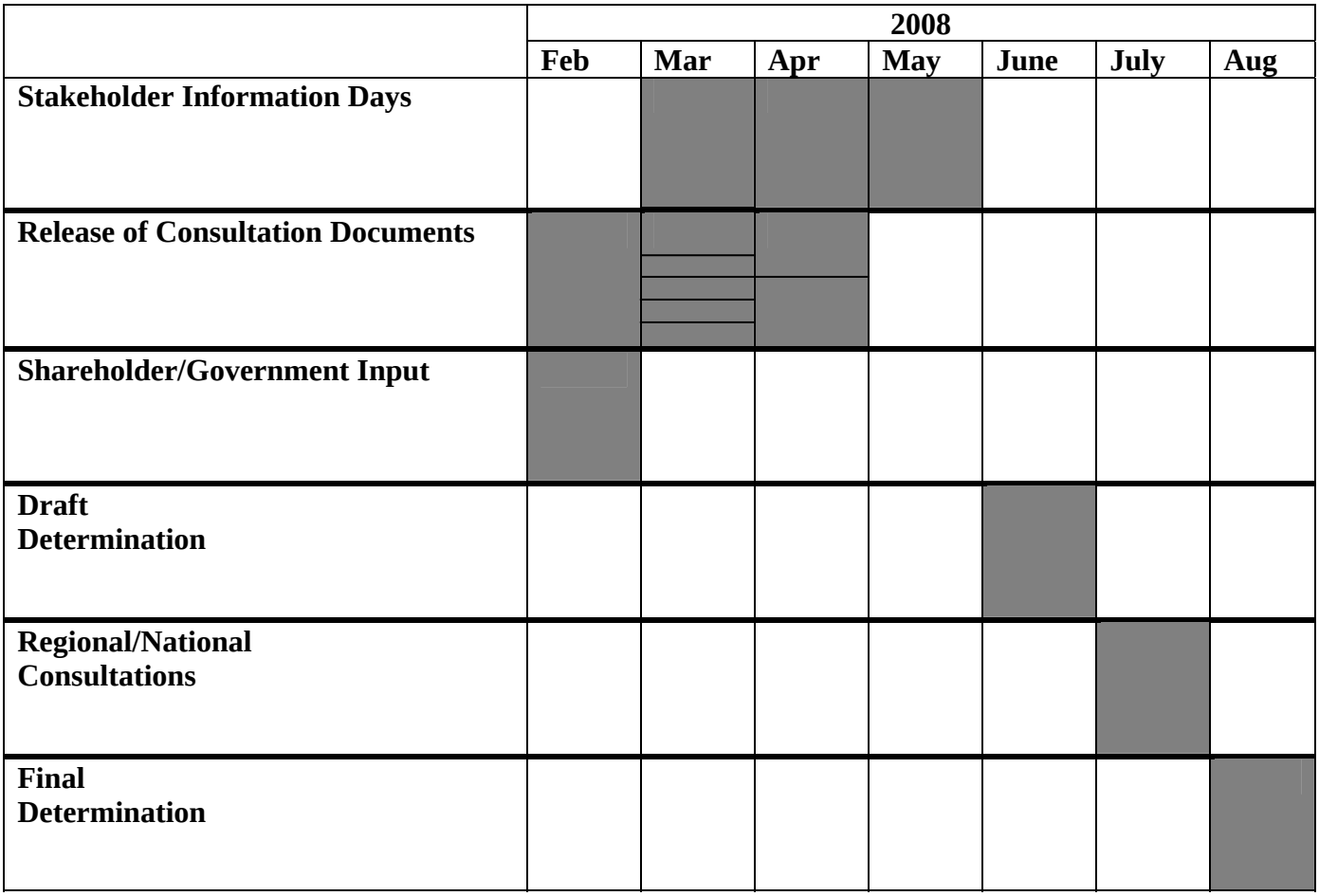
A detailed timetable of regulatory activities is shown in **Table 1** below, while **Figure 1** highlights the key activities.

Table 1 – Proposed Timetable of Regulatory Activities for the Rate Review

Activity	Timeframe
1. Finalization of document "Information Requirements: Business Plan 2008-2012".	January 2007
2. Submission of Draft Business Plan 2008-2012 by WASA.	April 2007
3. Submission of the Final Draft Business Plan 2008-2012 by WASA.	November 2007
4. Publication of the document "Framework and Approach for the Price Review 2008-2012".	October 2007
5. **Release** of consultative document, "RIC's Social Policy and Strategy for Water Regulation".	November 2007
6. **Release** of consultative document, "Water Demand Forecasting and Supply/Demand Balance".	February 2008
7. Formal Letter to Shareholder (Government) seeking its initial views (input) on public policy considerations and investment priorities for the Water and Wastewater Sector.	February 2008
8. **Release** of consultative document, "Increasing Wastewater Coverage".	March 2008
9. **Release** of consultative document, "Water Pricing Principles and Measures to Mitigate Impact on Low Income Groups".	March 2008
10. **Release** of consultative document, "Voluntary or Universal Metering – A Way Forward".	March 2008

Activity	Timeframe
11. Stakeholder Information Day.	March 2008
12. **Release** of consultative document, "Performance Monitoring and Reporting Framework and Performance Indicators".	March 2008
13. **Release** of consultative document, "Review of the State of WASA (1995-2006)".	March 2008
14. **Release** of consultative document, "Efficiency Incentives for WASA".	April 2008
15. **Release** of consultative document, "Reducing Non-Revenue Water".	April 2008
16. Workshop on "Financing of Water Sector and Investment Plan".	April 2008
17. Stakeholder Information Day.	April 2008
18. Detailed Input from Shareholder/Minister.	May 2008
19. Meeting with Shareholder (Government).	May 2008
20. Stakeholder Information Day.	May 2008
21. **Publication/Release** of Draft Determination.	June 2008
22. Stakeholder Workshops in Port-of-Spain, Arima, Chaguanas, San Fernando, Tobago.	June 2008
23. National Consultation on Draft Determination.	July 2008
24. **Release** of RIC's Response to Stakeholder Comments on Draft Determination.	August 2008
25. **Publication/Release** of Final Determination.	August 2008

Figure 1 – Timetable of Key Activities for the Price Review 2008 - 2012



Note: Lines in the blocks show number of documents/consultations.

3. RIC'S REGULATORY FRAMEWORK

3.1 BACKGROUND

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

Consequently, regulation seeks to ensure that customers enjoy value for money by establishing a tight budgetary constraint on the service providers, while ensuring quality of service. The tight budgetary constraint should focus the attention of the service provider on delivering efficiency improvements. Establishing targets and monitoring performance also becomes central to regulation. This monitoring should, at the minimum, take two forms; on-going collection and analysis of information on costs, investment, asset management and customer service, among other things, and frequent publication of reports.

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

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 not only incentive regulation, but for the application of a price cap (RPI-X) form of regulation in shaping its approach to future rate reviews. Incentive regulation uses rewards and penalties to induce the service provider to achieve desired goals where the service provider is afforded some discretion in achieving goals.

The remainder of this document broadly highlights the major issues that will be central to the finalization of the determination. 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.

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 service providers. This is one of the most important factors in determining the overall performance of the utility and the level of benefits delivered to customers.

The RIC Act gives clear support to the use of incentive regulation, using a price-cap approach, rather than rate of return regulation. However, various forms of price control fall under the general rubric of the price-cap approach, and are compatible with incentive-based regulation. Consequently, the RIC has flexibility in the choice of the form of the price control to be adopted.

There are two major categories of price control under the broad price-cap approach[*]:

- Revenue cap approach; and
- Price cap approach.

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.

[*] Variations of these forms of control have been adopted in a range of jurisdictions and are presented in **Figure 2.**

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.

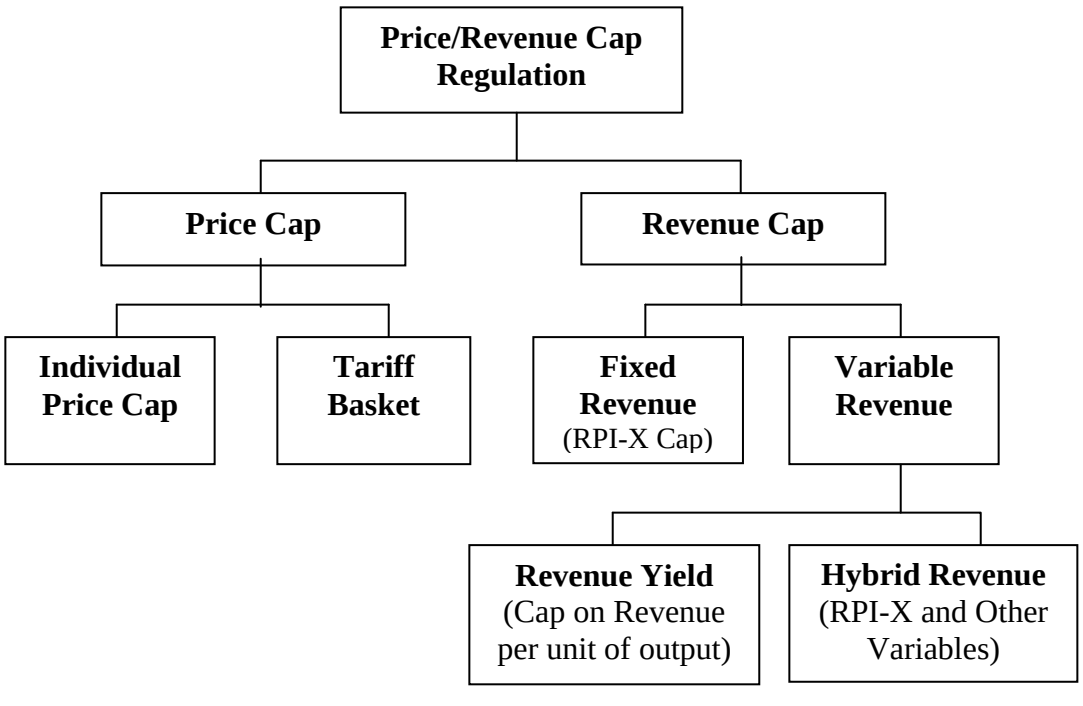
Hybrid forms of Control

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 off set 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.

Figure 2 - Forms of Price Control



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 the service provider. For the electricity transmission and distribution service provider (T&TEC), the RIC opted to use a fixed (total) revenue cap in the first regulatory control period, on the basis that the revenue cap would provide an appropriate balance of risk between customers and service provider, incentives to reduce costs, and the operational flexibility to meet service objectives.

The RIC considers that there is merit in adopting a fixed (total) revenue cap for the first regulatory control period but 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 access incentives provided and 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 delivered 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) A Universal Metering Programme.

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, both (ii) and (iii) have associated high costs and 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 the service provider 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. The emphasis on quality is not misplaced. 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 high 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 can be taken into consideration in regulation through the establishment and enforcement of quality standards. Quality of service monitoring programmes therefore complement price regulation.

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.

This requires the RIC to set out in detail the areas of service that it will measure and how they will be measured. The RIC will endeavour to ensure that it measures the factors that are important to customers and that they can understand the RIC's analysis of WASA's performance. This detailed and rigorous monitoring will ensure that the RIC has fulfilled its statutory duty.

4.2 BROAD MECHANISMS FOR REGULATING SERVICES

The RIC, in its deliberations on promoting all-round efficiency in this sector will consider a number of incentive mechanisms focused on improving the level and quality of service provided by WASA to all its customers. 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 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, or else it increases 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);
- 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 to be provided by the service provider 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.

The RIC uses a system of Guaranteed and Overall Standards.

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

Overall Standards: Though not resulting in compulsory payments where infringed, these standards seek to provide for consumers, a 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.

Based on extensive public consultations and comments, the RIC has already proposed Guaranteed and Overall Standards governing quality of service for the water sector. These will be finalised and thereupon gazetted, thus making them official.

4.3 OTHER MECHANISMS

Performance Reporting

Performance Reporting serves as an incentive to improve the quality of service provided by the service provider, as it requires it 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 present performance, given other service providers' performance and international benchmarks, while at the same time making it possible to compare present with past performance.

Service providers that are made to report on a specific set of measures, as with comparative benchmarking, are held to higher levels of accountability and transparency. This requirement informs customers and regulators of baseline levels of performance, whilst providing data and information that can further be used in standards setting and other regulatory functions. Customers are, therefore, given an opportunity to participate in the regulatory process and are empowered to present complaints with higher levels of confidence in cases of service provider underperformance. An effective performance reporting mechanism is characterised by: data that are reliable and obtained easily; indicators that are representative of the service provided; routine and independent audits of information provided; and presentation of the information in a meaningful manner such that consumers are able to understand and interpret the report.

The RIC, has used this mechanism in the electricity sector and has in fact already drafted a document identifying and describing the indicators to be used for the water and

wastewater sector in its performance reporting. These indicators are of four types: technical, administrative, quality of service and financial indicators. As part of its overall regulatory activities for the price review 2008-2012, the RIC will release this document for public comment before finalizing the document.

The RIC invites comments on the appropriateness of the above-proposed schemes for establishing and monitoring standards, as well as any other related issues.

5. SETTING PRICE LIMITS AND ASSESSING EXPENDITURE

5.1 INTRODUCTION

Regulation aims to set price controls at a level that allows the service provider to cover its reasonable costs, but no more, over the regulatory control period. Estimating reasonable costs is not straightforward because the service provider may be inefficient and in some cases, the current tariffs may be well below cost of service. Increasing tariffs to a level that covers reasonable costs is always socially and politically challenging.

Setting price limits requires complex and detailed analysis. 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 contains a number of specific requirements that the RIC needs to follow when setting out the principles on which rates chargeable by service providers should be based, as well as a number of 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.

Section 67, sub-sections (3) and (4) mandate that when establishing principles, the RIC must 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

The first step in determining price/revenue controls is to establish the allowable revenue of the service provider 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.

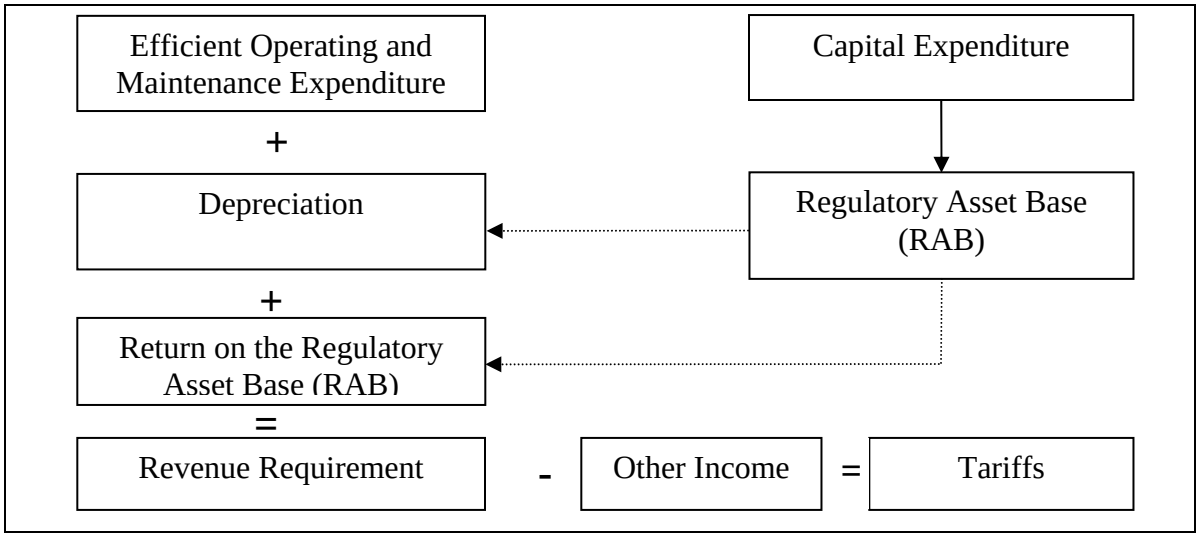
Although the RIC Act provides no specific guidance on the exact approach to be used, it embodies a strong presumption that both service provider-specific costs and comparative data should be the main basis for determining the revenue requirements [Sections 67 (2) (3) and (4)]. By setting regulated revenue 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** 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 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. 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 regarded as a running cost. Costs such as depreciation, interest payments and maintenance of the asset base are not included in Opex. WASA's Opex for 2004 accounted for some 73% of its total expenditure and revenue was just about 48% of Opex. The RIC will use Opex breakdown to facilitate comparisons with other water utilities.

Briefly, the expenditure review process involves the following stages:

- **Set up stage** – the preparation of a document, "**Information Requirements: Business Plan 2007-2011**" 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 and demand forecasts.

In evaluating the current levels of operating costs, 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; and conduct detailed analysis of; wages and salaries, overtime, billing and collections, crew sizes, bad and doubtful debt,

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 2006 statutory accounts;
- identify exceptional and atypical costs and subtract them from total Opex;
- assess whether there is anything unusual about WASA's 2006 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 a judgment on the extent to which service providers can improve their efficiency and what rate of efficiency improvements are achievable. Benchmarking

also provides an indication of the levels of efficient operating, maintenance and capital expenditure. The RIC will have to be satisfied that the service provider 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:

Total Allowable Operating Expenditure	=	Baseline Operating expenditure
	±	Assessed changes in baseline Opex
	+	New Opex
	-	Efficiencies
	+	Impact of annual inflation

The price review 2008-2012 is only the commencement of the regulatory process. 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.**

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 capital value (RCV) and a return of the RCV (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 the service provider'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 against previous Capex programmes, current approval status of proposed projects, the service provider'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 backlog in investment 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 may present a significant challenge under the current environment.

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 on the following broad categories:

- Water and Wastewater Infrastructure (all assets below ground);
- Water and Wastewater Non-infrastructure (all assets above ground); and
- Support services (corporate and other Capex).

The proposed investment plan can 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.

Furthermore, 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 intends to procure the services of an independent consulting firm to assist the Commission in its determination of an appropriate methodology to value the assets of WASA as well as to advise on the appropriateness of the investments proposed for the regulatory control period. This approach is similar to what transpired when the RIC reviewed prices in the electricity transmission and distribution sector. 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 take a closer look as to whether the service provider has in place adequate asset management systems. Key elements of good asset management include the establishment of asset databases, the use of GIS and SCADA systems, 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;**
- **the factors the RIC should take into account to ensure deliverability of the investment programme;**
- **the RIC's proposal to procure the service of an independent consultant to advise on the appropriateness of Capex; and**
- **the RIC's proposal for introducing an incentive mechanism for outperformance of Capex.**

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 and declining service. To avoid such a situation, it is important and advisable to commence by accurately measuring 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

	Depreciation plus a Return on Assets Approach	**Infrastructure Renewals Accounting plus a Return on Assets Approach**	**Cash Needs Approach**
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.

5.5.1 Depreciation

The effectiveness and value of assets decline over time and customers should bear these costs as they receive the benefits from use of these assets. Asset replacement costs will continue to have a major impact on customers' bills. Broadly, there are two methods of dealing with asset consumption. **Depreciation** is the common accounting approach for recognizing the loss in value as assets wear out. There are a number of methods for allocating depreciation – Straight Line, Accelerated or Units of Production. However, depreciation is not necessarily well suited as a measure for water and wastewater infrastructure as these assets are repaired and renewed in sections.

Renewals Annuity Accounting can address this problem, where a network of asset is viewed as a single system, the service potential of which is maintained in perpetuity through regularly planned maintenance and renewal programmes and, therefore, does not need to be depreciated.

The water and sewerage sector has two broad types of asset:

- **infrastructure assets** (essentially the underground water mains and sewers). These assets have very long lives and it is generally difficult to assess these lives accurately. The whole infrastructure network is treated as a single system and replaced in parts as different elements come to the end of their useful lives. Therefore, many regulators in the water industry utilize an **infrastructural renewal charge** (i.e. the cost of maintaining and replacing underground assets) which is charged to a service provider's revenue each year and not included in the regulatory capital value.

- **Non-infrastructure assets** (i.e. above ground assets such as treatment plants, offices, vehicles, computers, etc.). Depreciation is the mechanism used to recognize the declining value of assets over time. This is the cost that should be borne by customers as they receive the benefit from use of these assets. However, establishing the appropriate charge for an asset involves three elements:

estimating the assets' useful life; valuing the assets; and choosing a depreciation method.

5.5.2 Regulatory Capital Value

An advantage of categorizing water industry assets into infrastructure and non-infrastructure is the use of regulatory capital value (RCV) in the setting of prices, where an appropriate rate of return can be allowed on the above ground (non-infrastructure) asset base. This value will change over time to reflect the ageing of assets and investment in new assets. The product of the RCV and the allowed rate of return will give the total return allowed on the RCV. This ensures that customers only contribute towards those assets that have been created and which are providing a benefit to customers. Furthermore, the allowance for depreciation on non-infrastructure assets and the Infrastructure Renewal Charge ensures that sufficient funds are available to replace assets that are at the end of their useful lives. Additionally, monitoring of the RCV and the ratio of total debt to RCV provides a useful indicator of the financial performance of the water sector.

5.5.3 Setting an Initial RCV

There are four broad approaches (an accounting approach, a market value approach, a discounted cash flow approach and a comparator approach) that regulators can use to establish the initial RCV. However, setting the value of existing assets is not easy and a number of approaches have been used. For a public corporation, the regulators often use an accounting (asset based) approach. In the UK, the regulatory value of existing assets in the water sector was set at around 10% of the current cost book value of the assets. Another approach used by some regulators is to set the RCV of existing assets equal to the amount of debt that had to be serviced. Sometimes a more practical approach has been used by regulators whereby the initial value is set based on the profits generated under current tariffs.

5.5.4 Setting the Allowed Rate of Return

Regulators set an allowed rate of return (generally referred to as the cost of capital) to reflect current and expected market conditions. The service provider may choose a mix of debt and equity funding, but its rate of return is capped. The return is generally derived by calculating the Weighted Average Cost of Capital (WACC) (i.e. cost of debt and equity capital). Generally, the cost of equity is estimated by the Capital Asset Pricing Model (CAPM).

Assessing the WACC for a public corporation is problematic. This is because the regulator cannot easily observe costs of debt or equity and, moreover, estimating the market value is difficult. In most cases, WASA does not borrow at commercial rates nor does it borrow directly from the capital markets. It may generate surpluses and, therefore, can have retained earnings. However, these retained earnings differ from retained earnings in the private sector in that they are not reinvested with the specific goal of generating increased surpluses in the future.

Consequently, the RIC would be required to consider some other approaches for assessing the allowed cost of capital. Among them applying an average of observed historic real borrowing costs in which case it would be inappropriate to allow extra costs associated with embedded debt to be recovered from customers. The RIC may use benchmark assumptions about financing arrangements of comparator utilities rather than use the service provider's actual position. The use of this approach allows the service provider to benefit from innovative (and more efficient) financing decisions, while protecting customers against any inefficient financing decisions. It also provides the comparability across the utilities/sectors. Finally, the RIC may use the fixed Government bond rate as the allowed rate of return.

5.5.5 Depreciation and Additions to the RCV

The value of the RCV changes over time to reflect efficient new investment and depreciation of existing assets. It is important therefore that only appropriate and efficiently procured capital investment is added to the RCV. Secondly, since the RCV is

central to revenue determination, it is important that initial established RCV continues to be representative of the value of the service provider's asset base. The process of adjusting the RCV from its starting value to reflect changes in the asset base is known as "rolling forward". The RCV is adjusted each year to take account of inflation to ensure the value does not decrease in real terms.

5.5.6 Debt Burden and Funding

WASA is technically insolvent (cash negative), that is, it spends more than it earns. As debt increases, so too will the total financing expenses which currently (2004) stands at $330.6 million or 26.7% of total expenditure. WASA has to invest consistently high amounts not only to maintain its assets but to meet growing demand and also has to cover significant operating costs. **Table 3** below summarizes WASA's expenditure and its financing expenses for the years 2000/2001 to 2006/2007.

Table 3 – WASA's Expenditure and Debt Profile

Fiscal Years	2000/2001 Audited	2001/2002 Audited	2002/2003 Draft Audited	2003/2004 Draft Audited	2004/2005 Unaudited	2005/2006 Budget	2006/2007 Forecast
Operating Expenditure ($Mn)	641	647	815	908	1,044	1,118	1,191
Operating Deficits ($Mn)	238	246	406	471	578	610	682
Financing Expenses ($Mn)	195	246	301	331	318	334	399
Value of New Loans ($Mn)	0	330	465	416	1,248	809	0

As the table shows, WASA's financing expenses have been increasing significantly over the years because WASA's revenue is insufficient to cover the operating costs, capital investment and interest charges. When setting prices under the RCV method, revenue is allowed only after an asset has been added. If interest obligations increase quicker than

the allowed revenue, the service provider's financial position will worsen at a faster rate. Such an approach penalizes future customers thereby leading to intergenerational inequality, as it is generally agreed that a generation should pay the full cost of service that it consumes. Managing debt at a prudent and sustainable level is therefore critical.

WASA's debt burden and its current financial situation raise the issue of debt write-off/debt commutation. It is important to note however, that debt commutation has cost implications for taxpayers and WASA's customers. Even if there were significant benefits in lower water charges from debt write-off/commutation, it is unlikely that this would benefit all customers equally because debt commutation is likely to benefit the non-domestic sector more than households.

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

- **the most appropriate approach to depreciation in the water sector;**
- **the most appropriate method for assessing the annual reduction in value of assets in the sector;**
- **the use of RCV in the setting of prices for non-infrastructure assets;**
- **the appropriateness of accounting (asset based) approach for establishing the initial RCV;**
- **the most appropriate approach for assessing the allowed cost of capital; and**
- **the most appropriate approach for dealing with current high cost of WASA's debt.**

6. INCENTIVE MECHANISMS

6.1 INTRODUCTION

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.

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 the sector. Some of these approaches have already been discussed in Section 3 above.

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 entity 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 timing incentive 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, in the next review period, of the efficiencies achieved during the first control period.

Consequently, regulators have 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 period to reflect differences between actual and forecast costs of service provision. Service providers 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 the service provider 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. Consequently, 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. Regulators require service providers to explicitly identify these potential 'notified items' and the RIC, as it did in the case of T&TEC, will require WASA to do the same.

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;
- service providers have 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. 2-3 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 performance benchmarks (e.g. annual targets for the reduction of unaccounted for water, leakage, employee costs, etc.) as markers against which the service provider'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 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

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 noted above, the RIC Act contains a number of other regulatory principles that relate specifically to the establishment of price controls.

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 water and wastewater services in Trinidad and Tobago has resulted in the following:

- Current price of water is significantly lower in relation to the cost that is incurred on its provision. On average in 2004, prices recovered approximately 35% of total costs or 48% of the operating and maintenance costs, thus raising serious concerns about the financial viability and sustainability of WASA. It means that the most basic requirement of any water tariff, i.e. to raise enough revenues to cover the cost of service provision, is not met. In fact, WASA has **never** made a profit during its 42 years of existence.

- Underpricing has resulted in poor services and reduced incentives to expand the coverage and network. Only around 20% of the population has 24/7 water supply, UFW is around 55% and the cost of intermittent water supplies for households is very high. The average capital cost for installing pumps, tanks and other equipment is estimated at $5,300 per household.

- The objective of large-scale subsidization of water on grounds of affordability by the poor has not been achieved. In fact, the rural and poor households and those with insufficient access pay about 10 times more for water. The main beneficiaries of large-scale subsidization have been about 20% of the population, including higher income households. Cheaper services also encourage those with easy access to use them excessively.

- Underpricing affects State finances either by absorbing the losses or by reducing 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, once again, less than optimal resources for expansion/rehabilitation and, at least, ad hoc development of the network system.

In short, underpricing of water and wastewater services has not only affected the financial viability and sustainability of the utility, but has resulted in wasteful usage of water and impeded the expansion of service and reduced the coverage especially of rural and poor 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. The result is a low level equilibrium characterized by low tariffs, low investment, poor service and limits on access, especially for poor and rural households.

7.2 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
(ii) Pumping and conveyance
(iii) Treatment
(iv) Transmission
(v) Distribution
(vi) Billing and collection
(vii) Customer service
(viii) Accounting and finance
(ix) Administration

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[1]:

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

[1] 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.

7.3 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 water 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** – Guaranteed minimum amount of water to all consumers regardless of income.

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 4** below. The RIC will be guided by its legislative framework when designing a tariff structure.

Table 4 – RIC Act Objectives of Tariff Determination

Objective in the Act	Mechanism to meet the Objective

• To promote efficiency and economy **[Sections 6(1) (d) and 6(3) (a)]**	- Recovery of only reasonable costs of operation from customers. - Providing incentives through tariff for good performance. - Designing tariff that promotes optimum level of consumption and avoids wastage. - Promoting quality of supply and service to customers.
• Ensure the financial viability and sustainability **[Section 6(1) (c) and 67(3) (a) (b)]**	- Recovery of reasonable costs of operation and maintenance. - Recovery of capital costs including a reasonable return on investment. - Stable revenue stream.
• Tariff should be fair, just and non-discriminatory **[Section 6(3) (b) (c)]**	- Tariff should reflect the cost of supply of service provision. - No discrimination against any consumer(s) so as to burden with unjustified costs. - Cost of providing different services should be shown separately.
• Ability of consumers to pay rates **[Section 67(1) (c)]**	- Promoting social equity. - Provision of targeted subsidies for lower income groups.

Overall, the existing pricing system and structures are largely inadequate and unsustainable and point to some directions 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[2]. 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. Fourthly, there is the issue of metering of residential customers. While the merit of metering is widely 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

[2] Non-revenue water comprises free water (including illegal connections), distributional losses and unaccounted for water.

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 guards 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.

7.4 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.

The 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.

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.

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

- **the appropriateness on the cost allocation methodologies;**
- **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;**
- **best way to price miscellaneous services; and**
- **whether the introduction of new miscellaneous services be restricted to the commencement of each regulatory control period.**