REGULATED INDUSTRIES COMMISSION

Framework & Approach: Second Regulatory Control Period

November

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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 electricity transmission and distribution sector.**

This is the **second time** that the prices for the electricity transmission and distribution services will be reviewed under the Incentive-based (price cap regulation) approach. The RIC is required to assess the Trinidad and Tobago Electricity Commission's (T&TEC) submission for price review against the principles in the RIC's Act. Specifically, 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 the 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

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

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

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

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

1.3 RIC'S APPROACH TO CONSULTATION

In deciding on standards of service and pricing matters, the RIC is required to consult with stakeholders. The RIC aims to be open and transparent and to consult as effectively as is practicable. The RIC will provide stakeholders with a number of opportunities to get involved. In brief, the RIC's strategy in this regard, has been developed based on the valuable experience from the last price control review for the electricity transmission and distribution 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 various parts of 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 provide stakeholders with numerous opportunities to comment and contribute to the decision-making process. This will be achieved through the **stakeholder information days** during the price review process to encourage more focused debate, as well as provide more direct opportunities to explain and hear the 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 rate review of charges June 01, 2011 – May 31, 2016 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 T&TEC, 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 production of the RIC's final determination.

2.1 INFORMATION REQUIREMENTS: BUSINESS PLAN JUNE 01, 2011 – MAY 31, 2016

A key element of the process for the review of charges June 01, 2011 – May 31, 2016 is the submission by T&TEC of its draft and final Business Plan for the June 01, 2011 – May 31, 2016 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 June 01, 2011 – May 31, 2016, 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 T&TEC's submission. The RIC will review in detail the information provided and will provide further guidance, if necessary, for the submission of T&TEC's final Business Plan which will constitute T&TEC's principal submission for the review of charges and will ultimately form the basis of the RIC's assessment of the revenue requirements of T&TEC for the regulatory control period. The Business Plan, in short, is the 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 T&TEC in the provision of services. The input may cover issues such as public expenditure constraints, investment priorities, the level of capital funding support for T&TEC 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 T&TEC as well as to advise on the appropriateness of the investments proposed for the control period. This approach 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 June 01, 2011 – May 31, 2016".	November 2010
2. Publication of the document "Framework and Approach for the Price Review June 01, 2011 – May 31, 2016".	November 2010
3. Submission of Draft Business Plan June 01, 2011 – May 31, 2016 by T&TEC.	January 2011
4. Submission of the Final Draft Business Plan by T&TEC.	February 2011
5. **Release** of consultative documents:	
6. Formal Letter to Shareholder (Government) seeking its initial views (input) on public policy considerations and investment priorities for the Sector.	February 2011
7. **Release** of consultative document, "Addressing the Affordability of Regulatory Prices".	February 2011
8. Stakeholder Information Day.	March 2011
9. **Release** of consultative document, "Efficiency Incentives for T&TEC".	March 2011
10. Detailed Input from Shareholder/Minister.	March 2011
11. Meeting with Shareholder (Government).	March 2011
12. **Publication/Release** of Draft Determination.	March 2011

Activity	Timeframe
13. Stakeholder Information Day.	April 2011
14. Stakeholder Workshops in Port-of-Spain, Arima, Chaguanas, San Fernando, Tobago.	April 2011
15. National Consultation on Draft Determination.	May 2011
16. **Release** of RIC's Response to Stakeholder Comments on Draft Determination.	May 2011
17. **Publication/Release** of Final Determination.	June 2011

Figure 1 – Timetable of Key Activities for the Price Control Review

	2010	2011				
	Nov	Feb	Mar	Apr	May	June
Stakeholder Information Days						
Release of Consultation Documents						
Shareholder/Government Input						
Draft Determination						
Regional/National Consultations						
Final Determination						

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, to simultaneously encourage service providers to provide a better level of service and reduce costs. The service providers can be encouraged to provide a better level of service through service regulation.

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, etc., 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 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.

As indicated above, 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,

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

the service provider's profit suffers. It is this cost risk and/or opportunity to outperform, that provides a regulated firm with significant incentives to operate more efficiently.

Price Cap Approach

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

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

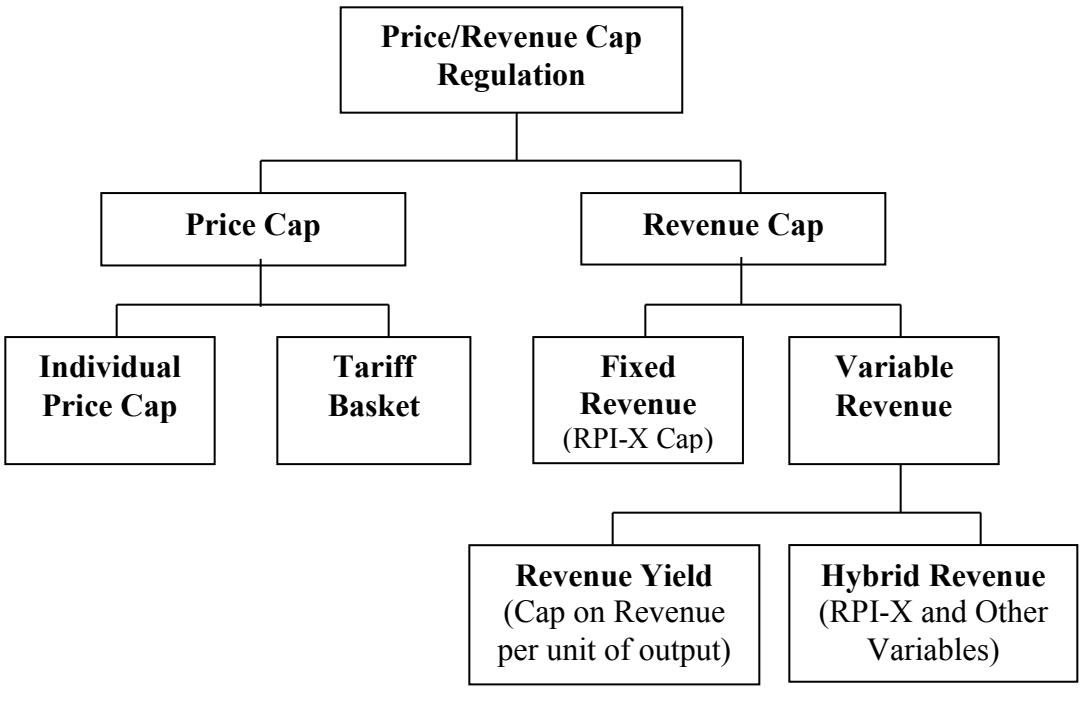
Hybrid forms of Control

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

Another option is to make modifications to the general schemes discussed above or to combine elements from different schemes. The objective of such schemes is to 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 T&TEC, 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 first regulatory control period for the electricity transmission and distribution services, the RIC opted to use a fixed (total) revenue cap, 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 invites comments on the appropriateness of adopting a fixed revenue cap, as well as any other related issues.

3.4 LENGTH OF THE REGULATORY PERIOD

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

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

The potential advantages of a longer regulatory period include:

(i) Greater incentives for service providers to achieve higher levels of efficiency, since the service provider is able to benefit, over the period, from cost savings achieved. These cost savings are only passed to the consumer through rate changes at the next rate review;

(ii) Lower regulatory costs for both the regulator and the regulated service provider;

(iii) Lowered business risk due to a more stable/predictable regulatory environment, which may lead to more prudent investment decisions; and

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

One challenge in adopting a longer regulatory period will be ensuring that all outcomes and deliverables to be 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.

On balance, the RIC considers that there is merit in continuing with a five-year regulatory period for the second 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 electricity services to consumers. Customers must be assured of the quality and value for money of the service they receive. Therefore, the emphasis on quality is paramount and 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 higher price. Under all forms of regulation of monopolies (and more so under incentive regulation), there is the risk that firms may increase profits by lowering the quality of service. Quality issues can be addressed in regulation through the establishment and enforcement of quality standards that are supported by rigorous monitoring programmes. This approach further supports the use of price regulation.

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

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

The RIC is mindful of the factors that are important to customers and will therefore focus on rigorously monitoring and measuring those parameters and provide timely, clear and concise reports on T&TEC's performance. This would facilitate a better understanding of the service provider's operation and ensure the RIC has fulfilled its statutory duties.

4.2 BROAD MECHANISMS FOR REGULATING SERVICES

The RIC, in its deliberations on promoting all-round efficiency in the sector will consider a number of incentive mechanisms focused on improving the level and quality of service provided by T&TEC 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 non-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 the service provider should provide to all customers and the penalties where these standards have not been met or maintained. Thus, where the service provider has failed to provide service at standards deemed acceptable by the regulator, customers are entitled to payments or rebates, the value of which is also set by the regulator. GSL schemes, therefore, provide financial incentives to service providers to maintain acceptable levels of service to customers.

GSL schemes must target critical areas of concern for customers and should seek to protect them from bad service. These schemes are usually revised periodically to cater for improvements in service in the industry, to review the level of compensation or to amend existing standards. GSL schemes seek to incentivise the service provider to address areas of poor performance, usually: billing; 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: While there are no compulsory payments when these standards are breached, they seek to provide for consumers, a service of a particular quality, and refer to areas of service that affect large numbers of, or all customers, thereby making compulsory payment an unfeasible option. Based on extensive public consultations and

comments, the RIC has already implemented Guaranteed and Overall Standards governing quality of service for the electricity sector.

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 relative to that of other service providers and international benchmarks, while at the same time making it possible to compare their 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 the service provider's 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 clear and concise manner such that it promotes better understanding by consumers.

The RIC has already used this mechanism in the electricity sector. 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, the RIC will continue to monitor standards.

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. 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 the RIC, when establishing principles, to have regard to, *inter alia*:

- the funding and ability of the service provider 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 independently 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;
- 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 independently 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 cost-specific 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.

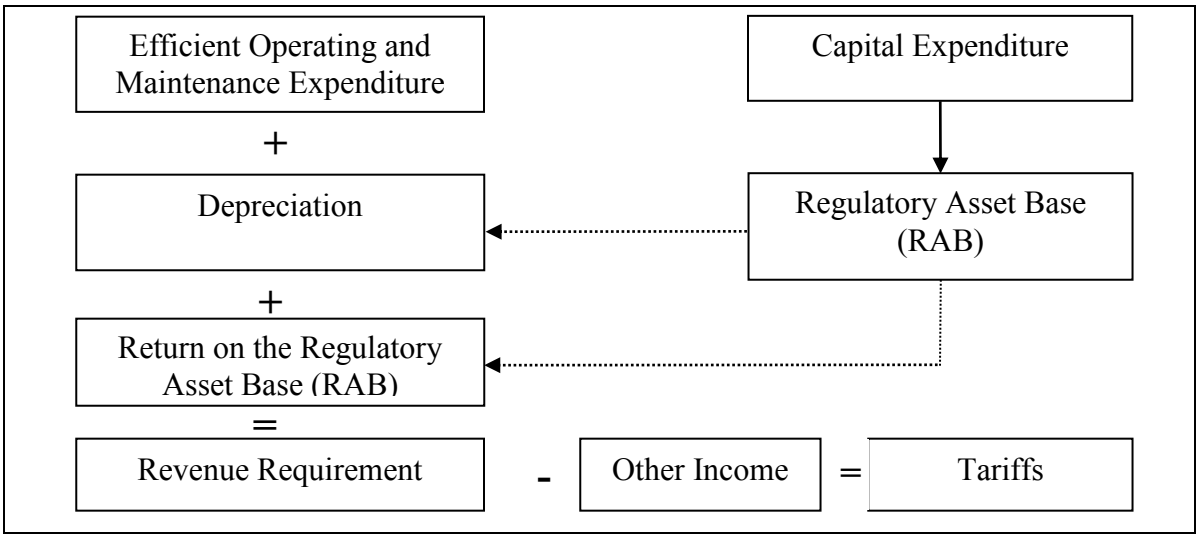
The **cost building-block approach** is the framework typically utilized under a cost-linked approach to the determination of the efficient costs of service providers. The

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. As indicated earlier, estimating the reasonable cost of service is not straightforward. Judgments on the rate at which the service provider can increase efficiency are very challenging. Regulators must also balance the increases in service standards imposed 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 continue to establish the price controls for T&TEC. 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 T&TEC such as labour costs, power, materials, contracted costs, insurance, software licences and vehicle running costs. Provision for bad debt is also a cost component that is regarded as a running cost. Costs such as depreciation, interest payments and maintenance of the asset base are not included in Opex.

Briefly, the expenditure review process involves the following stages:

- **Set up stage** – the preparation of a document, "**Information Requirements: Business Plan**" by the RIC, which provides guidance to T&TEC 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 T&TEC 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 T&TEC's last set of statutory accounts;
- identify exceptional and atypical costs and subtract them from total Opex;
- assess whether there is anything unusual about cost allocation and make appropriate adjustments, if necessary; and
- add "new" Opex to deliver improvements in the supply/demand balance, levels of service to customers, standards, etc., while taking into account potential savings that arise from upgrading works or systems.

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

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

The RIC intends to utilize benchmarking in conjunction with any other relevant information to reach a judgment on the extent to which service providers can improve their efficiency and the rate of efficiency improvement that is achievable. Benchmarking also provides an indication of the levels of efficient operating, maintenance and capital

expenditure. The RIC will have to be satisfied that 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 T&TEC. For the first price control period, 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 and assume that T&TEC 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 T&TEC 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.

During the regulatory control period, the RIC will monitor T&TEC'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 T&TEC'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 T&TEC's performance;**
- **the appropriate approach for assessing the annual rate of efficiency improvements; and**
- **the appropriate approach to monitoring T&TEC'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 asset base (RAB) and a return of the RAB (through regulatory depreciation).

It is incumbent on the regulator to ensure that capital expenditure forecasts are prudent and efficient. Once this has been determined, the regulator must allow the appropriate level of Capex to form part of the revenue requirement of the service provider.

The RIC Act requires the RIC to ensure that the service providers are provided with a sustainable revenue stream that does not reflect monopoly rents or inefficient expenditure and allows the service provider to recover expenditure on renewing and rehabilitating existing assets. The RIC recognizes that a return should be allowed only on the legitimate level of investment that is required to service the scale of operations undertaken by the service provider and must always guard against allowing a return on wastefully applied capital. In establishing Capex requirements for T&TEC, 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 T&TEC'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 has been significant underinvestment in necessary capital projects as a result of lack of investment funds. The RIC is also cognizant of the fact that there is a limit to the size of a capital programme that can be delivered efficiently. Furthermore, total investment is limited by a number of factors, including:

- customer's bills – customers ultimately pay for investment and higher investment will lead to higher bills;
- ability to deliver – a very large investment programme may not be managed effectively by T&TEC; and
- capacity of the market – the capacity of the country to handle a very large investment programme also needs to be considered.

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

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

The RIC's approach to establishing an appropriate Capex for T&TEC will comprise the under-mentioned elements.

Defining the Investment Programme

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

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

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

Investment Programme Review

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

Asset Management

The RIC will 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 T&TEC'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 electricity 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 networks and declining service. To avoid such a situation, it is important and advisable to accurately measure capital costs. Only when true costs are known can informed decisions be made on the extent to which they should be covered by tariffs or by Government subsidies.

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

- The **Regulatory Asset Base (RAB)** which represents the regulator's view of the value of the existing investment in the regulated entity at any point in time. The objective is to provide a revenue stream that has a present value equal to the regulatory asset base;

- **Regulatory Depreciation** which represents the return of the capital that the service provider has invested in the entity over time; and

- The **Regulatory Weighted Average Cost of Capital (WACC)** which is the annual rate of return that investors demand for their investment.

This section examines the issues the RIC will have to address in reaching decisions on these capital components of the revenue requirement.

5.5.1 Determining the Initial Value of the Regulatory Asset Base

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

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

- the ability of the service provider to finance new investment;
- the assurance that the service provider's revenue is sufficient to allow it to maintain the asset in good condition;
- the assurance that tariffs are no higher than is necessary;
- the avoidance of rapid and large increases in tariffs, if possible;

- the assurance that the costs of inefficient or imprudent investments are not borne by customers; and
- the provision of incentives for efficient investment and maintenance.

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

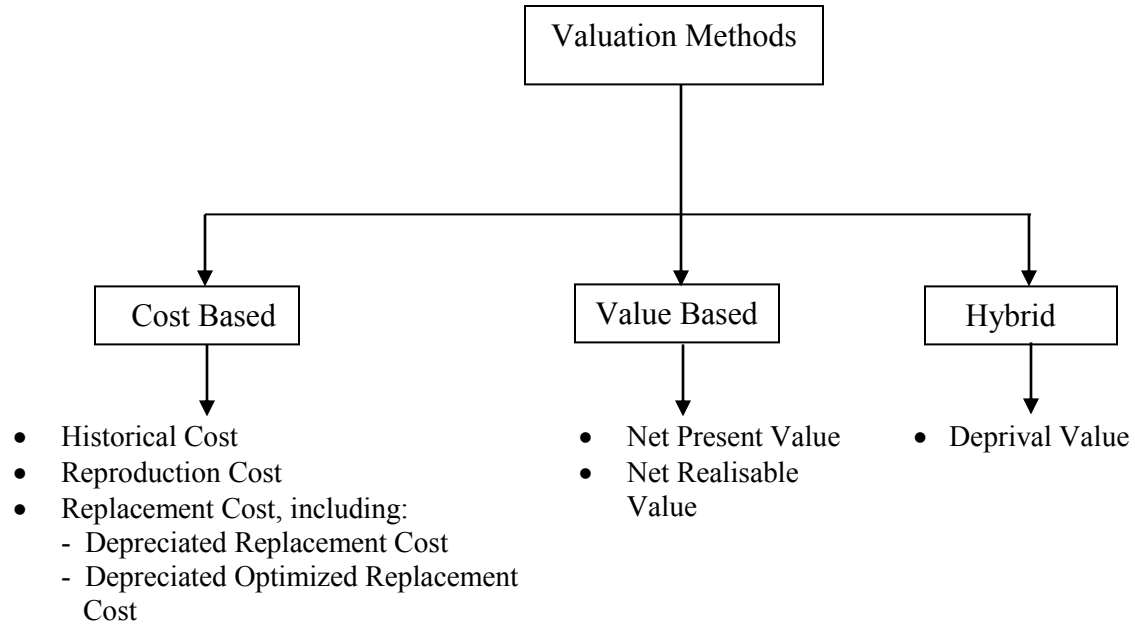
Most network system assets are specialized, and hence their costs are sunk, that is, their opportunity cost is close to zero. Given this issue and other problems of network system assets, the most commonly used valuation approaches are:

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

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

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

Figure 4: Asset Valuation Approach



Currently, T&TEC uses the historical cost approach, which does not take account of the service potential of asset or technological obsolescence. On the other hand, unacceptable price increases could result if the RAB were to reflect, for example, the current cost method.

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

5.5.2 Roll-Forward of the RAB

The opening value of the RAB which has already been established from the first review period, needs to be adjusted to reflect changes for the following review periods. This process is called "roll-forward". Other options include carrying over the initial base unadjusted, reassessing the asset base annually, or reassessing the asset base at the commencement of the next review period. Roll-forward avoids the costs of asset

revaluation. However, there are two main issues in rolling forward assets, that is, the choice of an appropriate index and the timing of the addition of new investment.

(i) Indexing of RAB

Adjusting initial RAB by price changes over time ensures that shareholders earn a reasonable return on investment in real terms. Generally, two methods are used for adjusting the RAB:

- current cost index; and
- indexing by the general purchasing power index, such as RPI.

The current cost index attempts to capture changes in the current cost of replacing the specific assets. The use of such an index can lead to disputes over the identification of an appropriate index. Consequently, RPI is generally used. It is readily available, simpler to use, its use reduces uncertainty and is thought to encourage technical progress.

(ii) Timing of the addition of New Investment

The main issue here is not whether new investment should be included in the RAB, rather it is whether projected or actual expenditure be included in the RAB. The general practice is to add projected investment at the commencement of a regulatory period to determine the price cap and then adjust for actual capital expenditure in the subsequent regulatory period based on one of the following options:

- **Full claw-back** – that is, adjusting the RAB for actual capital expenditure for the past regulatory period and claw-back any excess returns or compensate for over-spend;
- **Partial claw-back** – that is, adjusting the RAB for actual capital expenditure without any claw-back or compensation; and

- **No claw-back in the immediately following regulatory period** – that is, for the second price-cap period, keep the RAB at the level determined by projected investment but during the third period, actual investment is substituted for projected investment.

The above methods all have pros and cons. **Full claw-back** removes the incentives to exaggerate investment but also removes the incentives for capital efficiency. **Partial and No claw-back** provide incentives to economize investment but create incentives to inflate the projected investment. Additionally, **no claw-back** is much more complex to implement. Some jurisdictions add projected capital expenditure to the RAB indexed at half the RPI rate. In short, there are many issues that the RIC will need to resolve in determining the methodology to roll forward the value of the RAB.

Another issue relates to the question of when the new assets should be recognized in the asset base. Should the assets be included in the year that they were commissioned, when the capital expenditure occurred, or when the assets actually came into productive service? Each approach has implications. Many regulators recognize new assets in the year in which the capital expenditure occurred. For modeling purposes, the expenditure may be recognized halfway through that year. This appears to be the simplest and fairest approach.

The RIC invites comments on:

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

5.5.3 Depreciation

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

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

However, the key question is whether depreciation should be based on the RAB or the current cost of assets, as different approaches can be used to serve different regulatory objectives. Depreciation based on current costs will result in higher tariffs in the short term but lower tariffs in the long-run, thus creating intergenerational issues. On the other hand, depreciation based on the RAB will lead to lower tariffs in the short-run but higher tariffs in the long-run as RAB will increase over time towards replacement cost. The RAB approach is more attractive in cases where immediate and significant capital investment is required. The current cost (or replacement cost) to depreciation is attractive where current replacements or renewals are at or below their steady level. There is no one "best" approach to calculating depreciation and under particular circumstances, one depreciation profile might be preferred to another.

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

- the depreciation method;
- the depreciation rate; and

- the base on which the rate is to be applied (discussed in Section 4.3.4.1 of this paper).

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

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

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

The depreciation rate forms the basis upon which the carrying amount of an asset is reduced to reflect the consumption of the asset's economic benefits. In determining the depreciation rate, an asset's useful life is determined and is defined in terms of the asset's expected utility to the enterprise. The economic lives of the assets are

estimated, having regard to the presence of substitutes for the service and potential technological change. However, these issues may be less relevant for the electricity sector in light of the unique and essential nature of these services and the relatively stable technologies involved.

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

5.5.4 Calculating the Cost of Capital

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

Once the RAB has been determined, it is essential therefore to establish the cost of capital. The allowable earnings of an operator should cover the cost of capital of the business. This cost of capital is the supply price of funds (equity and debt) needed to finance operations i.e. its fixed assets and working capital. Linking the rate of return to fixed assets only runs the risk of not providing sufficient revenue to compensate investors for the risks assumed. The common method for determining a fair return on capital employed involves:

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

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

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

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

$$\boldsymbol{WACC} = [(1-g)*r_e]+[g*r_d]$$

Where:

g - is the level of gearing.

r_d - is the cost of debt finance and is measured as risk free rate, r_f , plus a debt premium over this rate, P_d ; and

r_e - is the cost of equity finance.

The use of the WACC approach promotes the efficient allocation of resources by ensuring a state-owned network provider operates under the same financial conditions as a network provider in the private sector and will ensure returns are equal to the opportunity cost of capital.

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

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

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

Where:

r_f - the risk-free rate on treasury securities;

β_e - is the equity beta which measures the relative riskiness of the firm compared to the market;

r_m - is the level of market return; and

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

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

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

Approximations and close comparators are generally used when developed capital markets do not exist. The average asset beta, for example, in infrastructure is around 0.7 for high powered incentive regimes and 0.3 for low powered incentive regimes. The alternative is to use benchmark ratios based on international best practice.

Consequently, there are several aspects in the determination of the WACC that will be subject to public debate, including the basis for determining:

- equity beta for the service providers;
- market risk premium;
- debt premium; and
- capital structure.

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

5.5.5 Cost of Working Capital

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

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

5.5.6 Revenue Requirements and Financial Viability

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

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

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

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

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

Having evaluated the financial viability implications of the proposed revenue estimates, the next step is to establish the annual profile of estimated revenue requirements for the full regulatory period. It must be noted that the estimated

revenue requirements are not “caps” on the allowed return of the service provider because the service provider’s actual return will be higher (lower) than that implied by, for example, WACC utilized to estimate the return on capital, if a service provider introduces efficiency gains that either enhance revenues or reduce costs.

The RIC invites comments on the approach to assess the impact on the future financial viability of service providers.

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.

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 potential outcome by allowing the service provider to keep any efficiency gains for a specified period of time, regardless of when those efficiencies are generated.

The key issue in designing the efficiency carryover mechanism lies in finding the right balance between providing incentives for continued efficiency improvements and sharing the rewards of efficiency improvements with consumers. Of primary importance here is the existence of clear rules for sharing, in the next review period, of the efficiencies achieved during the previous 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
- the assumptions that 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 electricity 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 of management's 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'.

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.

Applying an efficiency carryover mechanism may have limited impact and may not provide sufficient incentives to pursue efficiencies. In fact, increasing efficiency may be a difficult and time-consuming process and may require initial increases in expenditure. Therefore, a hard-line regulatory approach of limiting allowable revenue to the efficient cost of service may be counterproductive. A more pragmatic approach may be to implement a phased programme for improving efficiency or establishing a regime of ex ante performance benchmarks (e.g. annual targets for the reduction of system losses,

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

7. ESTABLISHING PRICE CONTROLS

7.1 INTRODUCTION

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

- that it takes 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 previously, 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 services generally results in many undesirable outcomes. Underpricing of services would not only affect the financial viability and sustainability of the utility, but would result in wasteful usage of the service, thereby impeding the expansion of service. 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. The end result is a low level equilibrium characterized by low tariffs, low investment, poor service and limits on access, especially for poor and rural households.

7.2 OTHER KEY ISSUES UNDER INCENTIVE REGULATION

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

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

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

- **Cost Inflation** - external inflationary increases in the purchase price of inputs used to produce output;

- **Productivity Gains** - whether from improved input productivity or growth; and

- **Cost Passthrough** - where the costs of external changes or shocks are passed through to customers.

Cost Inflation

Ideally, the different components of the service providers' cost base should be indexed using specific deflators. However, traditionally, regulators have adopted the Consumer Price Index (Retail Price Index, RPI) and to lesser extent, Gross

Domestic Product (GDP) deflator, as an overall deflator. Despite known limitations, they remain recognized measures of inflation for macroeconomic policy management and are widely used for general indexation of public and private contracts and charges.
The inflation index should therefore:

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

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

X-Factor and Productivity Gains

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

The key parameters of the RPI - X approach are:

- The initial price at the start of the regulatory period (P_o);

- The rate of required annual efficiency gains (X-factor);

- The length of the regulatory period; and

- The basis for setting P_o and X-factor at the commencement of a regulatory period.

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

Methods for Determining the Value of X-Factor

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

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

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

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

- Net Present Value (NPV) approach with single X-factor – a single X-factor is set to ensure expected revenue equals expected notional revenue requirement, in NPV terms;

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

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

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

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

Cost Passthrough

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

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

An obvious candidate for pass-through may be the conversion and fuel costs to T&TEC, which are approximately 70% of T&TEC's total costs. They are outside T&TEC's control as they are subject to long-term contractual arrangements.

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

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

Correction (Adjustment) Factor

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

Unders and Overs

The regulatory regime based on a revenue cap may include an "unders and overs" account for differences between forecast and actual revenue, as, at the end of the regulatory period, there is likely to be a balance in the service provider's account. The issue for the regulator is how to treat this balance. A correction factor to carry forward the balance is one option. Alternatively, the revenue requirement could be adjusted for the unders and overs. But this may raise two additional issues. One is the length of the period, as this will depend upon the magnitude of the account balance and on the methodology for determining the X-factor. The length of the

period gives rise to inter-generational equity issues. The second issue for the regulator is whether a positive balance, for example, should be treated as a customer capital contribution or as prepaid revenue and incorporated within the allowable revenue over the next regulatory period. A positive balance would reduce RAB or allowable revenue and hence prices. The converse is also true.

Treatment of Capital and Operating Expenditure

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

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

7.3 Contributed Assets and Capital Subsidies

Contributed Assets

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

should be avoided. However, the major issue is to identify what constitutes a contributed asset.

Capital Subsidies

Capital subsidies are a specific form of contributed assets. T&TEC has benefited from subsidies for capital works or capital grants from Government and other agencies such as the Self-Help Commission. Other schemes have also provided assistance for the development/extension of the network systems. The purposes of capital subsidies include the reduction of service costs to a particular consumer group, the meeting of funding shortfalls, etc. Some of the options for dealing with capital subsidies include:

- Recognizing the subsidy as revenue in the period in which it was received and including it in the firm's asset base;

- Treating it as an equity injection, with no consequent changes to pricing arrangements; and

- Amortizing the value of any past grants over the life of the relevant assets, in addition to including the amount as revenue.

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

7.4 Reset and Revocation of a Determination

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

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

Building confidence in the regulatory regime requires that commitments are honored and that the regulators do not behave opportunistically and should resist any pressure for retrospective adjustments if revenue outcomes exceed expectations, as repeated confiscation of the benefits of efficiency improvements combined with uncertainty can contribute to poor performance and poor investment practices.

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

- if there were an exogenous shock (e.g. natural disaster);
- if accurate information were not available when setting the price cap parameters; or

- if distortions in the parameters (e.g. rate of inflation) occur due to rapid unforeseen changes.

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

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

7.5 Tariff Re-balancing and Side Constraints

The purpose of "side constraints" is to limit the variation of tariffs for all or particular customer groups from year to year. For example, a side constraint may limit an annual increase in tariffs to a specific increase over the previous year. Another example may be to impose a price constraint on the first block of consumption, to limit the price increase on the lower income consumers to an affordable level. The regulator can also establish limits on the extent to which a service provider can rebalance individual tariffs within the limits imposed by the price control, so as to ensure that particular customer classes did not experience significant tariff increases in a single year.

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

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

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

- Recover the costs across some or all of the other customers, or

- Fund the deficit from the Government budget.

The RIC invites comments on:

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

7.6 COST ALLOCATION

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

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

- Allocation of costs to functional cost of service categories; and

- Reallocation of functional costs to classes of customers.

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. Examples of classes of customers include: residential; commercial and industrial.

7.7 SETTING THE TARIFF STRUCTURE

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

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 tariffs should be set equal to marginal cost of supply, 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 also cover 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 equitably, i.e. users pay proportionate to the costs they impose on the service provider.

- **Social orientation of electricity service** – the tariff structure should be consistent with the social needs of the society.

- **Simplicity and transparency** – the tariff should be easy to understand and transparent.

- **Other objectives** – the tariff structure should be consistent with meeting Government objectives, as well as, ensure regulatory efficiency (i.e. minimize regulatory intrusion and compliance costs).

The RIC Act contains a number of regulatory objectives that relate specifically to the establishment of price controls. Therefore, the principles/objectives that need to be considered by the RIC while designing the tariff structure have to be consistent with these regulatory objectives. These objectives are detailed in **Table 2** below. The RIC will be guided by its legislative framework when designing a tariff structure.

Table 2 – 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 tariffs for good performance. - Designing tariffs that promote optimum level of consumption and avoid 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)]**	- Tariffs 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.

In setting price controls, 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;
- bringing tariffs to full cost recovery (including a return on capital) levels;
- basing tariff levels on financial viability criteria and managing affordability issues through mechanisms such as a lifeline block in the tariff structure, for consumption-related tariffs, 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;
- 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 electricity needs; and
- promoting direct intervention where there is a marked gap in service delivery.

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

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

7.8 MISCELLANEOUS CHARGES

Miscellaneous Charges are fees charged for non-routine services that are not included under the price control mechanism used to regulate tariffs. In regulating such charges,

the regulator usually attempts to protect consumers by making these charges as cost reflective as possible.

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

There are a number of issues associated with miscellaneous charges:

- the range of miscellaneous services being offered;
- non-flexibility of the current arrangements – that is, there is no automatic mechanism to adjust the list of services without the involvement of the regulator;
- pricing for miscellaneous services – that is, whether the charges should be cost reflective or some other approach be used to allocate costs; and
- the fee structure – that is, the current structure does not provide flexibility for upward adjustment to current charges to reflect changes in the underlying cost of delivering these services.

The RIC invites comments on:

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

8. SUMMARY OF ISSUES FOR CONSULTATION

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

METHODS AND FORMS OF REGULATION

The RIC welcomes comments on:

- ***the above-discussed methods of regulation;***
- ***the broad form of regulation most suited to regulating T&TEC;***
- ***any other alternative regulatory models that stakeholders believe warrant consideration;***
- ***the RIC'S preference to use a revenue cap for the initial regulatory period; and***
- ***the length of the regulatory period.***

QUALITY AND LEVELS OF SERVICE

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

SETTING PRICE LIMITS AND ASSESSING EXPENDITURE

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

- ***the factors the RIC should take into consideration in assessing T&TEC'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 T&TEC's performance;***
- ***the appropriate approach for assessing the annual rate of efficiency improvements;***
- ***the appropriate approach to monitoring T&TEC's performance;***
- ***the factors the RIC should take into consideration in assessing T&TEC'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.***

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

The RIC invites comments on:

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

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

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

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

The RIC invites comments on the approach to assess the impact on the future financial viability of service providers.

INCENTIVE MECHANISMS

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

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

ESTABLISHING PRICE CONTROLS

The RIC seeks comments on the circumstances under which significant changes in costs to the regulated firms may be passed through.
The RIC invites comments on the proposal of using a correction factor in the rate control formula and on the appropriate means of dealing with any residual balances in the revenue requirement or capital and operating expenditure.

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

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

The RIC invites comments on:

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

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

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

The RIC invites comments on:

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