CONSULTATION DOCUMENT

REGULATED INDUSTRIES COMMISSION

SHARING OF THE BENEFITS OF EFFICIENCY GAINS AND EFFICIENCY CARRYOVER MECHANISMS

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Responding to this Document

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1. INTRODUCTION

1.1 BACKGROUND

The RIC is required by law to review and set price controls for service providers under its purview. In its Issues Paper **"Setting Price Control: Framework and Approach"**, the RIC detailed the major elements of the overall framework and approach in conducting the rate review exercise. In addition, the RIC sought comments on the approach to sharing of benefits during the regulatory control period, as well as on the approach and merits of an efficiency carryover mechanism. The RIC also indicated in that Issues Paper that it would release for public comments further consultation papers dealing with specific regulatory issues, including an efficiency carryover mechanism.

Accordingly, this Consultation paper discusses the appropriate incentive mechanism to be adopted as part of the price control review.

An efficiency carryover mechanism is the means whereby the incentive to make efficiency gains by a service provider is enhanced by permitting it to carry over gains from one regulatory period to the next. Customers benefit in lower prices in the medium and long-term, when the efficiency gains are passed through.

The essence of incentive regulation involves offering the regulated service provider an incentive to improve its efficiency within a regulatory period. However, the incentive to improve is likely to be undermined if the service provider believes its out-performance will be immediately passed on to customers. Incorporating an efficiency carryover mechanism within the regulatory regime will ensure that the service provider has an on-going incentive to make efficiency improvements. The incorporation of such a mechanism reduces regulatory risk and increases regulatory commitment, which is essential for the system of incentive regulation to function optimally.

1.2 Structure of the Document

The remainder of this document is structured as follows:

- **Section 2** examines various incentive mechanisms and sharing options for efficiency gains.

- **Section 3** discusses the main aspects of the design of the efficiency carryover mechanism, including:
  - the design criteria
  - the measuring efficiency gains
  - the appropriate sharing ratio
  - the symmetrical treatment of gains and losses
  - the design of an efficiency carryover mechanism and advantages of different approaches.

- **Section 4** deals with the Unders-and-Overs account and residual balances in the revenue requirement.

- **Section 5** summarizes the issues for consultation.

2. VARIOUS INCENTIVE MECHANISMS AND SHARING OF GAINS

2.1 Incentives for Efficiency Improvement

Incentive regulation has been a key part of utility regulation for the past twenty years. It has alternatively been referred to as RPI[1]-X Regulation, Performance Based Regulation or Price Cap Regulation. The names are basically intended to signal a departure from traditional Cost of Service Regulation, otherwise known as Rate of Return Regulation.

1 RPI refers to the Retail Price Index, which is a common measure of inflation.

In essence incentive regulation involves two equally important aspects:

- offering the service provider an incentive to outperform the X-factor; and

- fair sharing with consumers the benefits greater than the value implied by the X-factor.

There are various effective incentive mechanisms which have been generally adopted, including:

(i) **X-Factor** – setting a price path for the duration of the regulatory period on the basis of forward looking revenue requirements and then allowing service providers to retain any benefits from out-performance;

(ii) **Efficiency Carryover Mechanism** – enhancing incentives to achieve efficiencies within the regulatory period by allowing service providers to carryover these gains into the next regulatory period i.e. retaining the gains for a fixed number of years;

(iii) **Financial Incentives for Service Performance** – there are two approaches under this scheme:

- ***Guaranteed Payments*** – where the service provider is required to make guaranteed payments to customers who receive service below certain targets,

- ***Performance Incentive Mechanism (S-Factor)*** – where the service standards incentive mechanism is included in the price control equation (S-Factor), thus providing an incentive for the firm to increase service levels by allowing the entity to collect additional revenue once targets are surpassed;

(iv) **Performance Reporting –** reporting and auditing the performance against various indicators, thereby increasing the accountability and transparency of service providers.

The guaranteed payment scheme and S factor mechanisms focus on rewarding (penalizing) service providers for improved (reduced) levels of service during the regulatory period. The other measure to ensure incentives for efficient behaviour is by providing incentives for **reducing costs**.

The RPI-X regulation provides incentives for service providers to improve their efficiency by reducing expenditure and retaining revenue above the levels forecasted by regulators. However, this approach does not in itself provide the optimal incentives to minimize costs because prices are generally realigned with costs at the beginning of each regulatory period. Consequently, the incentives to achieve efficiencies decline in the last years of a regulatory period. One approach for addressing this issue is to design a mechanism that provides service providers with the same reward for an efficiency gain, irrespective of when the particular gain is made. The design of such a mechanism is the main theme of this document. Indeed, structuring incentives so that the service providers are rewarded for achieving efficiencies on a range of relevant performance dimensions will be the major objective of the first price review.

Incentive Regulation plans are generally characterized by a definite plan period (e.g. five years), an inflationary adjustment, a productivity adjustment (or anticipated efficiency gains) and a way to share monetary gains between utilities and customers and/or reward (or penalize) for quality of service changes. Incentive Regulation is meant to provide service providers with incentives that are similar to competitive market forces and thus service providers change their behaviour accordingly.

Essentially, the application of incentive regulation involves the determination of two main issues:

- a process for the establishment of forward looking revenue targets within the regulatory period; and
- a framework for sharing the benefits of efficiency gains against the benchmarks underpinning those revenue targets.

In determining these, careful attention is required to preserve the incentives for long term cost efficiency while ensuring that the benefits ultimately go to customers. The price controls prevent the service providers from raising prices above the price cap level. However, during the price control period, the service provider is free to vary its costs. The incentives to seek and find efficiency gains arise from the opportunity for the service provider to keep any unanticipated savings made during the control period. The regulator can subsequently pass these savings to customers in the next price period by way of price cuts.

2.2 Sources of Gains (Losses) and their Treatment

The divergence between forecast and actual profitability may be due to:

- **variation in revenue** – revenue is higher or lower than forecast;
- **variation in operating and maintenance expenditure (Opex)**;
- **variation in capital expenditure (Capex)**; and
- **variation in the Cost of Capital.**

The magnitude and potential for each of the above variables to deviate from the forecast are likely to be different and as a result their treatment will be different.

Broadly, it is reasonable to assume that:

- variation between forecast and actual revenue is likely to be as a result of exogenous factors and should be **corrected at the beginning** of the price review;

- variation between forecast and actual Opex is likely to be from efficiency gains and should be carried forward and **phased over** the next review period;

- variation in Capex is likely to result from under-spending or deferrals and should be **corrected at the beginning** of the price review; and

- variation in cost of capital is likely to be beyond the control of service providers and consequently should be **corrected at the beginning** of the price review.

2.3 Sharing the Benefits

Benefit sharing is central to the concept of incentive-based regulation. Benefit sharing will be discussed under the following two situations.

2.3.1 Sharing Benefits from the X-Factor Out-performance

If at the time of a new price review a service provider makes savings above those embedded in the X-factor it will want to know what proportion of the additional gains produced by its extra exertions it will retain at the end of each review period and for how long. The issue of benefit sharing thus arises.

When a regulated firm is able to make efficiency savings above those reasonably expected as provided in the X-factor, these gains can arise from two primary sources[2]:

- those arising from management's initiatives; and
- those due to exogenous factors such as demand growth, changes in interest rates or windfalls.

These sets of gains are normally associated with the out-performance of the X-factor and the regulator needs to consider:

[2] Gains can also arise by reductions in service standards, by delaying or avoiding necessary expenditure or gross errors in estimates of capital and operating costs at the time of the review.

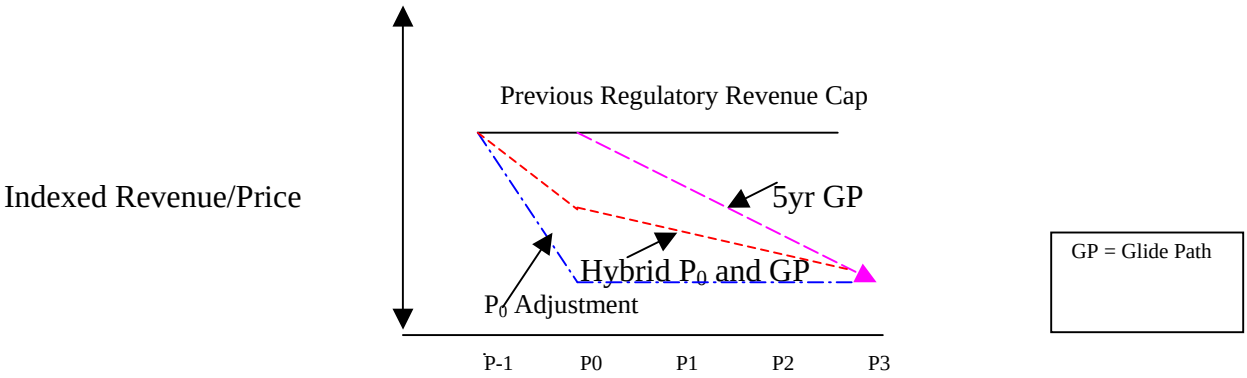
- the extent to which out-performance of the X-factor should be shared with customers or retained by the firm;
- the period over which it should be shared with customers; and
- the profile of the sharing arrangements.

There are **two broad options** that may be utilized to share the benefits of the out-performance of the X-factor with customers:

- **One-off reductions** (P_0 Adjustment) – Here, gains in excess of those stipulated by the X-factor in the current period are passed directly on to customers in the development of new price controls, and a new X-factor is set for the new price control period. Under this approach, the service provider has little incentive to invest in efficiency enhancements towards the end of the regulatory period; and
- Phased option – Here, gains are passed to customers over a period of years to provide stronger incentives. This approach is generally referred to as **glide path mechanism**. Another variation under this option is what is referred to as **'gains maintenance'**. Gains maintenance (rolling or fixed carryover) allows the service provider to retain the **full gains** for each year for a pre-specified period unconnected to any review period whereupon gains can be passed to customers in a one-off or phased price reduction. However, a rolling or fixed carryover usually does not extend past one subsequent regulatory period.

In practice, the options are often combined for example, a glide path could incorporate a one-off reduction at the start of the period or it could return the benefit over a longer period (e.g. ten years) or a shorter period. **Figure 1** illustrates possible adjustment options.

Figure 1: Possible adjustment mechanisms



The RIC's initial thinking, subject to considerations of the responses to this paper, is that it is inclined to utilize P_o Adjustment to share the out performance of the X-factor for the first price control period. However, the RIC may utilise a combination of P_o Adjustment and gradual adjustment if it considers it necessary to limit the rate of change in prices to consumers or the cash flow impact on service provider.

2.3.2 Revenue/Profit Sharing

One by-product of a revenue cap is the possibility of earning excessive profits if the electricity sold increases rapidly (possibly due to unforeseen growth or gaming at the time of setting the price control). However, the possibility of earning excessive profits is limited because any over or under recovery will be corrected-for through the Under-and-Overs account discussed in Section 4.2 below. Other incentives, through Efficiency Carryover Mechanisms for operating and capital expenditure, can lead to reduction in costs. However, continuing public ownership may place a limit on the efficiency improvements that may be achieved. Therefore, while excessive profits is unlikely to be

an issue at least in the short term, it is possible to design the regulatory system in such a way as to further reduce such possibility.

There are several examples of this type of approach. Two commonly discussed approaches in the literature are *profit sharing* and *sliding scale adjustments*. Profit sharing works on an annual basis within the RPI-X framework. A profit threshold is generally set for the service provider and if actual profit exceeds the threshold, a proportion is returned to consumers. Sometimes what is proposed is an asymmetric sliding scale, where the upside is shared but not the downside. Furthermore, different levels of sharing may be proposed so that the incentives for the service providers are tapered as shown below:

Percentage of Share	**< 12%**	**12 – 15%**	**15 – 18 %**	**> 18%**
Consumers	0	25	50	75
Service Provider	100	75	50	25

These mechanisms have been generally criticized as:

- they weaken incentives to reduce costs;
- they pose difficulties for determining normal profit levels, threshold levels and the sharing formula; and
- they make service providers concentrate on annual profit outcomes.

Comments are invited on:

- **The merits of sharing options and the benefits of the out-performance of the X-factor.**
- **The appropriateness of profit sharing mechanisms.**

3. EFFICIENCY CARRYOVER MECHANISMS

As indicated above, the service providers have incentives under the RPI-X regulatory regime to achieve efficiency gains in the early years of a regulatory period, as they would anticipate any gains being passed to consumers in the form of lower prices at the start of the next regulatory period. An efficiency carryover

mechanism[3] can remove the incentive that would otherwise exist to defer the implementation of efficiencies from one regulatory period to the next. This will be in the long-term interests of consumers, as the service providers will not be influenced by the regulatory cycle to continuously achieve efficiencies. The greater the incentives for service providers to make efficiency savings, the lower the cost of providing utility services.

The efficiency carryover schemes are designed to pursue narrower objectives than the X-factor form of incentive. The aim is to highlight specific aspects of the operation (operating costs, capital expenditure) of the service provider and to achieve an outcome that would not necessarily result from a broader incentive scheme.

3.1 Design Criteria

The key issue in designing the efficiency carryover mechanism lies in finding the right balance between providing incentives for continued efficiency improvements by the firm and sharing the rewards of efficiency improvements with consumers. Of primary importance here is the existence of clear rules for sharing, in the next review period, of the efficiencies achieved during the first control period.

Consequently, the 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;

[3] It should be noted that this being the first regulatory period, the application of an efficiency carryover mechanism will not have any practical implications for prices until the second regulatory period.

- there should be minimal or 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.

In practice, the design and operation of the efficiency carryover mechanisms can be complex and a number of issues need to be addressed. They include:

- whether carryover mechanisms should apply to both operating expenditure and capital expenditure and whether there should be a completely separate mechanism for both. Ofwat[4] maintains complete separation of treatment between operating and capital expenditure and under performance in one area is not used to offset over performance in another area. In contrast, the Essential Services Commission (ESC), the regulator in Victoria, Australia, considers combined gains or losses calculated for capital expenditure plus operating and maintenance expenditure;
- 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, that is how the efficiency carryover interrelates with the rest of the regulatory framework – some regulators seek to balance the financial incentive to achieve efficiency savings with a financial incentive (S factor) to pursue service improvements by adjusting the price cap to reflect actual performance against service and reliability targets; and

4 Office of Water Services, the economic regulator for water and waste-water services in England and Wales.

- what assumptions should be made about expenditure in the final year of the regulatory period given that actual expenditure in the final year may not be known prior to a price decision for the next regulatory period, thereby creating a one year lag in handling out and under-performance. The final year of the previous period only being taken account of at the subsequent periodic review and no out performance being assumed to take place at the current review.

These issues are discussed in detail below.

Are there any other matters that need to be considered in the design of an efficiency carryover mechanism?

3.2 Management Induced versus External Efficiency Gains

Efficiency gains may be achieved as a result of specific management initiatives or as a result of factors external to the firm. Thus, assuming that service standards have been met, operating cost variations will reflect movements in input prices, variations in demand (output), and the effect of management decisions. Given that the underlying objective of incentive regulation is to provide continuous incentives to improve efficiency, it can be argued that the service provider should be able to retain a greater proportion of management induced efficiency gains, as this would encourage management to continue to implement efficiency improving measures, which will eventually benefit customers in the form of lower prices.

However, where there is evidence to suggest that gains are as a result of events outside of the control of the service provider, then these gains should be passed on to customers at the outset of the next price control period in the form of lower prices.

The differential treatment of gains, whilst important and desirable, is likely to impose problems of distinguishing between these two types of gains in practice and of resources that will be needed to undertake such an exercise on the part of the regulator. On the one hand the additional costs of information gathering and analysis may outweigh the benefits of sophisticated analysis. On the other hand, if the regulator adopts broad assumptions and rules of thumb about the sources of such gains, it risks either over or under rewarding service providers for their efforts. Under rewarding will dampen incentives to make efficiency gains and over-rewarding the service provider will disadvantage customers.

Given that this is the first review under the new pricing regime and that the resources that would be directed towards identifying the different sources of gains, **the RIC does not consider the differential treatment of management induced and external gains to be desirable.**

There is a further issue that requires consideration and it is whether there should be adjustments to the measure of efficiency from changes in external cost drivers, that is, from changes in demand and changes in the scope of services. Such changes in cost drivers and resultant expenditure can have significant negative (or positive) impact on the efficiency carryover of the service provider. One way of dealing with such external factors is by adjusting prior year forecasts to take into account for any differences in demand or in scope of obligations. Different regulators have treated changes in external drivers differently, depending upon the significance of these changes. Although mindful of changes brought about by external factor, **the RIC is not inclined to introduce any adjustment mechanism in its first price review.**

Should the RIC differentiate between management induced and externally induced efficiency gains?

Is there a practical and cost-effective method of distinguishing between management and externally induced gains?

Should adjustment to the efficiency carryover be allowed to take account of changes in demand and scope?

3.3 Length of Retention Period and Sharing Ratio

3.3.1 Length of Retention Period

A balance needs to be struck between incentives for out-performance and passing the benefits of such out-performance too quickly back to customers. It is generally argued that the service provider should be able to retain all gains, whether controllable or otherwise, earned within each review period for the duration of that period. If price limits were set on the basis of clawing back excess profits during the period, then the principal purpose of incentive regulation would be undermined. Controls would become controls on profits and not prices. There would be a shift towards a cost-plus mentality and incentives to pursue efficiencies would be reduced and/or completely eliminated towards the end of the regulatory period. Moreover, most regulators favour an approach whereby the firm is allowed to keep efficiency savings/out-performance achieved in the current regulatory period for at least some period into the subsequent regulatory period. However, it can be argued that longer periods would also delay the passing on to customers the benefits of out-performance until the extended period has elapsed. Additionally, the longer the period, the longer prices will differ from underlying costs, resulting in a reduction in allocative efficiency. Thus the regulator needs to balance both sets of interests.

It is critical that efficiency savings generated during a regulatory period be retained totally by the service provider in that regulatory period. Any out-performance is shared in the regulatory period(s) after they are generated. For example, efficiency savings generated in the initial regulatory period would be

shared in the subsequent regulatory period (and possibly in regulatory periods after that).

3.3.2 Sharing Ratio

The length of the retention period also impacts on the sharing ratio. However, there is no pre-determined optimal sharing ratio for efficiency gains. The most appropriate sharing ratio will depend on the assumptions made with respect to the impact on service provider's incentives to make efficiency gains as the sharing ratio changes. Increasing the share of efficiency gains retained by service providers, enhances their incentive to make gains, and therefore the total cost savings that they achieve. This in turn increases benefits to customers by way of lower prices. A 50:50 sharing of gains between customers and service providers can be considered fair only if one assumes a linear relationship, i.e. incentives increase in proportion with the share of gains retained. In the final analysis, the RIC will therefore consider the trade-off between the extent of the efficiency gains made and the speed with which those savings are passed on to customers.

Should T&TEC be allowed to keep efficiency gains for more than one subsequent regulatory period?

What should be the most appropriate criteria for determining the sharing ratio?

3.4 Measuring Efficiency Gains

One of the issues in designing an efficiency carryover mechanism is the measuring and defining of efficiencies.

3.4.1 Categories of Efficiencies

Given the system specific issues of T&TEC's network, the RIC has identified three major categories of inputs that it must have regard to in the design of an efficiency carryover mechanism[5]:

(i) Operating expenditure (Opex);

(ii) Capital expenditure (Capex); and

(iii) System losses.

The measurement and treatment of efficiency gains in relation to operating and capital expenditure are discussed below. The measurement and incentive mechanisms for managing systems losses forms part of another document, **Incentive Mechanisms for Managing Transmission and Distribution Losses**, which is also being released for public consultation.

3.4.2 Measurement of Efficiency Gains

In order to implement an efficiency carryover mechanism, it is important and necessary to determine how efficiency will be measured in practice.

For this price control efficiency gain will be defined as the difference between the established expenditure forecasts for capital and operating expenditure at the outset of the regulatory control period, and actual capital and operating expenditure outcome over the same period. This approach to efficiency measurement is generally adopted by regulators. At the same time, a regulator must ascertain whether the service the customer received over the review period was consistent with the assumptions applied in setting the revenue or price cap. Therefore regulators have also established policies for revising these expectations up or down to reflect non-trivial changes in requirements (logging-up or down) or failures to deliver specified outputs on time.

[5] Some regulators tend to include asset utilization as an input item in the measurement of efficiency gains. However, the asset utilization should really be considered when determining the benchmarks for operating and capital expenditure.

For operating expenditure, efficiency savings are usually measured on an incremental basis, as business initiatives to reduce operating costs usually result in permanent reduction in operating costs and therefore gains in any one year are an improvement in efficiency over and above the improvements that have already been achieved in previous years. Where the gains in efficiency are temporary, this method will offset incremental loss of efficiency in one year, for example, against gain(s) of other years even though actual operating expenditure remains below the forecast level, thereby ensuring that the service provider does not benefit from temporary efficiency gains in perpetuity.

In respect of capital expenditure, the treatment of efficiency gain (loss) is different from that for operating expenditure in that capital expenditure tends to be discrete between years and an under-spend in one year implies a reduction in the cost of financing rather than a permanent reduction in future capital expenditure.

Ofwat makes capital expenditure incentive payments through the regulatory asset base (RAB), implying that the service provider receives depreciation **in addition** to the return on capital efficiency saving. In contrast, the ESC, the regulator in Victoria, Australia, calculates capital expenditure incentive payments as the regulatory weighted average cost of capital (WACC) multiplied by the difference in that year's capital expenditure compared to the original benchmark forecast. There is no adjustment for differences in depreciation. The main argument is that an allowance for changes in depreciation would increase the complexity of the carryover mechanism. However, the exclusion of depreciation payments from any incentive mechanism implies that capital efficiency savings made early in a regulatory period are more rewarding than similar savings made later in the period. **The RIC is inclined to favour the approach adopted by Ofwat, as there should be consistency in treatment of gains from one year to the next.**

The RIC invites comments on its proposed approach for measuring efficiency gains or any other approach for the measurement of efficiency gains.

3.5 Symmetrical Treatment of Gains and Losses and Treatment of Negative Carryover Amounts

It may be argued that given T&TEC's current financial state, it is premature to speak about potential out-performance in the first regulatory period, rather some may argue that it is more likely for T&TEC to incur efficiency losses. Thus the question arises whether or not efficiency losses should be excluded from the carryover amount. **The RIC believes that efficiency losses should not be disregarded from the calculation of an efficiency carryover amount.** Otherwise, the efficiency carryover mechanism will send wrong signal to service providers and they will have incentives to defer expenditure from one year to the next so as to claim gains in some years (which would be retained under the mechanism) and losses in other years (which would not be carried over in future years). Therefore, in order to avoid this perverse incentive, **gains and losses should be treated symmetrically.**

There is another issue that needs to be resolved and that is if gains (losses) under capital and operating expenditure should be combined or treated separately.

Although there is no one preferred approach taken by regulators, two approaches are more common. The Essential Services Commission (ESC), South Australia, combines gains or losses calculated for capital expenditure plus operating expenditure to determine the overall gains or losses for any one year. Additionally, the ESC sets a floor on the carryover amount in any one year (that is there is no negative carryover in any year of a future regulatory period). Where the combined carryover from operating and maintenance expenditure is negative, the carryover is set at zero for that year, and the implied negative value is used to offset any positive gain in the following year. Finally, any accrued negative carryover amount at the end of the regulatory period is taken into account in setting the forecast for the following regulatory period.

Ofwat maintains completely separate treatment of operating and capital expenditure payments and over-performance in one area is not used to offset underperformance in another area but instead is capped at zero.

The main argument in favour of treating operating and capital expenditure separately is that the method of reward differs in each case. There are also merits in the establishment of a zero floor on carryover amounts (i.e. no negative carryovers). To do otherwise would mean that the negative amounts would need to be subtracted from the revenue forecasts established by the regulator and can reduce the service provider's required revenue to a level which can easily jeopardize the financial viability of the service provider.

Comments are invited on:

- ***the symmetrical treatment of gains and losses;***
- ***the treatment of negative carryover amounts; and***
- ***maintaining a separate treatment of operating and capital expenditure.***

3.6 Design of an Efficiency Carryover Mechanism

There are several ways of designing an efficiency carryover mechanism. The challenge, however, is to ensure that the service providers continue to have an incentive to improve their performance and that the benefits of efficiency gains are passed on to customers.

The two most common efficiency carryover mechanisms are:

- the Rolling Carryover Mechanism; and
- the Glide Path Mechanism.

3.6.1 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. The efficiency gains (losses) are calculated by comparing actual expenditure against established forecasts for each year of the regulatory period. An example of a rolling carryover mechanism for operating expenditure is provided in **Table 1**.

Table 1: Rolling Carryover Mechanism for Operating Expenditure

	$									
YEAR	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Benchmark Forecast	100	100	100	100	100					
Actual Expenditure	80	80	70	80	80					
Under-spend (Over-spend)	20	20	30	20	20					
Incremental Efficiency Gain (loss)	20	0	10	0	0					
Efficiency Carryover										
-Year 1	-	20	20	20	20	20				
-Year 2	-	-	0	0	0	0	0			
-Year 3	-	-	-	10	10	10	10	10		
-Year 4	-	-	-	-	0	0	0	0	0	
-Year 5	-	-	-	-	-	0	0	0	0	0
Total Efficiency retained	**20**	**20**	**30**	**30**	**30**	**30**	**10**	**10**	**0**	**0**

In the above example, the benchmark operating expenditure established by the regulator is $100 per year for the first regulatory period. An efficiency gain of $20 in the first year is retained for five years following the year in which the gain is made. In year 2 there is **no additional gain**, so the firm earns no incentive payment for that year. In year 3 the firm makes an additional efficiency gain of $10, which it is able to retain until the third year of the subsequent regulatory period.

As indicated above, an incremental approach to calculating operating cost efficiencies would imply that gains are permanent. Where the savings turn out to be temporary, this approach will result in an offsetting incremental loss of efficiency (even if actual operating expenditure remains below the benchmark) as illustrated in year 4 in **Table 2.** The efficiency carryover mechanism will still result in the service provider receiving a positive carryover amount overall for the period, but the carryover amount reflects only the value of the incremental saving. Details of actual rolling carryover mechanisms employed by some of the regulators are shown in **Appendix I**.

Table 2: Calculation of Efficiency Gain/Loss on an Incremental Basis

			$		
YEAR	**1**	**2**	**3**	**4**	**5**
Benchmark Forecast	100	100	100	100	100
Actual Operating Expenditure	80	80	70	80	80
Under spend (overspend)	20	20	30	20	20
Efficiency Gain (loss) calculated on an incremental basis	20	0	10	-10	0

3.6.2 Glide Path Mechanism

Under a Glide Path Mechanism, gains (losses) are calculated by comparing actual expenditure achieved 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. **Table 3** is an example of a glide path mechanism.

Table 3: Glide Path Mechanism

	$									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Benchmark Forecast	100	100	100	100	100	70	70	70	70	70
Actual Expenditure	80	80	70	70	70					
Under spend (Overspend)	20	20	30	30	30					
Efficiency Gain (Loss)					30					
% of Gain (Loss) retained					100	80	60	40	20	0
Efficiency Carryover					30	24	18	12	6	0

In the above example, forecasted (benchmark) operating expenditure is $100 per year for the five years of the regulatory period. In the last year of the first regulatory control period, the service provider spends $70 and thus achieves a gain of $30. In the last year of the second regulatory period, the operating expenditure forecasts are reduced to $70, which is equal to the actual operating expenditure for the last year of the first regulatory period. The efficiency gains achieved in the first regulatory period are phased out over the subsequent period at a decreasing rate per year.

In relation to **capital expenditure**, efficiency gains and losses are measured in the same way under a glide path mechanism as under a rolling carryover mechanism. The total gains made within the regulatory period are glided out over the subsequent regulatory period in a manner similar to that described with respect to operating expenditure. However, under this approach the service provider does not have an equal incentive to achieve efficiency gains in each year of the regulatory period, as gains made in the initial years are glided out over the whole of subsequent period at a decreasing rate, not just the first few years as they would under a rolling carryover mechanism. This continues to provide the service provider with an incentive to make efficiency gains in capital expenditure in the early years within a regulatory period. An example of One-off Reduction in capital expenditure is provided in **Table 4**.

Table 4: Rolling Carryover Mechanism –
One-off Reduction in Capital Expenditure

	$									
YEAR	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Benchmark Forecast	200	200	200	200	200					
Actual Expenditure	180	200	200	200	200					
Under-spend (Over-spend)	20	0	0	0	0					
Incremental Efficiency Gain (loss)*****	**2**	**0**	**0**	**0**	**0**					
Efficiency Carryover										
-Year 1	**-**	**2**	**2**	**2**	**2**	**2**				
-Year 2	-	-	0	0	0	0	0			
-Year 3	-	-	-	0	0	0	0	0		
-Year 4	-	-	-	-	0	0	0	0	0	
-Year 5	-	-	-	-	-	0	0	0	0	0
Total Efficiency retained	**2**	**2**	**2**	**2**	**2**	**2**	**0**	**0**	**0**	**0**

*** Assuming a discount factor of 10%.**

Comments are invited on the merits of the use of a rolling carryover mechanism vs a glide path mechanism as the preferred method for carrying forward efficiency gains.

4. CORRECTION FACTORS

In the determination of the allowed revenues of service providers, some special factors may need to be included in the price control formula to deal with particular circumstances. These are referred to as correction factors. For example, under the average revenue yield form of control, there may be significant potential for divergence between the forecast and actual revenue.

4.1 Error Correction

An error correction factor may be included to deal with forecast variation over the life of the price control period. The purpose of an error correction factor is to make adjustments for any corrections in key assumptions utilized in the

calculation of allowed revenue year on year. Although these built in adjustments have been recognized as a means of managing risk, their use is relatively rare.

4.2 Unders-and-Overs Account

The use of an Unders-and-Overs account is relatively common to deal with the service provider collecting more or less revenue than was allowed, perhaps because of under or over forecasting. In such circumstances, the actual revenue collected will either exceed or fall short of revenue entitlement requirement. A regulator can, therefore, utilize a correction mechanism to adjust for under or over recovery. Any variation in revenue can be monitored and recorded in a notional unders-and-overs account. If the amount in the account falls or exceeds certain levels, the service provider will be required to take some rectifying measures. A surplus would usually be returned to consumers. Allowing the service provider to carry the cumulative balance in the account into the next price period is another option. Alternatively, the regulator can specify certain actions to be taken by the service provider if the balance in the unders-and-overs account deviates from pre-allowed revenue targets, for example:

- **Less than ± 2 percent** – the service provider is required to notify the regulator within 30 days of year-end.

- **Between ± 2 and ± 5 percent** – the service provider must notify with an action plan to resolve the balance within the term of the price path.

- **Between ± 5 and ± 10 percent** – the service provider must notify with an action plan to reduce the tariffs.

Comments are invited on the proposal of using a correction factor in the price control formula and on the appropriate means of dealing with any residual balances in the revenue requirement.

5. CONCLUSIONS AND SUMMARY ISSUES FOR CONSULTATION

5.1 Conclusions

The RIC proposes to provide every incentive to the service provider that outperforms targets since this benefits both the service provider and consumers. Based on the above discussion of different issues, the RIC's initial thinking, subject to consideration of the responses to this consultation paper, is that its approach for the first control period might contain the under-mentioned main elements.

- **Sharing the benefits from the X-Factor Out-Performance**
  The RIC proposes to utilize P_o Adjustment to share the out-performance of the X-factor arising from exogenous factors such as unanticipated demand growth.

- **Efficiency Carryover Mechanism**
  - There should be no retrospective claw back of efficiency gains.

  - The differential treatment of management induced and external gains are not considered to be desirable.

  - No adjustments are to be made to the original forecasts to account for unforeseen items.

  - The treatment of efficiency gains and losses should be symmetrical.

  - The efficiency gains from underspending on capital or operating expenditure should be retained for five years from the year in which the gains were made, regardless of when the gains were made, to ensure an equal incentive to make gains in each year of the control period.

- An efficiency gain in operating and maintenance expenditure in any year is treated as a permanent reduction in the level of recurrent operating and maintenance expenditure compared to the forecast expenditure for those years.

- The efficiency gain in capital expenditure is taken as the regulatory WACC multiplied by the difference in that year's capital expenditure against the original forecast.

- **Error Correction**

  The use of an error correction factor to make adjustments for any corrections in key assumptions is not being encouraged.

- **Unders-and-Overs Account**

  The use of an Unders-and-Overs account to deal with collecting more or less revenue than was allowed should be included in the price control and the service provider would be required to take rectifying measures if the balance in the account deviates from pre-allowed revenue targets.

5.2 Issues for Consultation

The RIC seeks views on the issues raised in this consultation document, and on the specific issues including the following:

- ***The merits and sharing options of the benefits of the out-performance of the X-factor.***

- ***Matters that need to be considered in the design of an efficiency carryover mechanism.***

- ***Differentiation between management induced and externally induced efficiency gains.***

- ***A Practical and cost-effective method of distinguishing between management and externally induced gains.***

- ***Should adjustment to the efficiency carryover be allowed to take account of changes in demand and scope?***

- ***Should T&TEC be allowed to keep efficiency gains for more than one subsequent regulatory period?***

- ***The most appropriate criteria for determining the sharing ratio.***

- ***The proposed approach for measuring efficiency gains or any other approach for the measurement of efficiency gains.***

- ***The symmetrical treatment of gains and losses.***

- ***The treatment of negative carryover amounts.***

- ***Maintaining a separate treatment of operating and capital expenditure.***

- ***The merits of the use of a rolling carryover mechanism vs a glide path mechanism as the preferred method for carrying forward efficiency gains.***

- ***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.***

APPENDIX I

Operating Expenditure – a simple worked example

Example A1.1 – a simple worked example													
Operating Expenditure		AMP2		AMP3 period					AMP4 period				
Financial year		1998 £m	1999 £m	2000 £m	2001 £m	2002 £m	2003 £m	2004 £m	2005 £m	2006 £m	2007 £m	2008 £m	2009 3m
1	**Initial regulatory assumption**	280	275	270	265	265	260	255					
2	+/- logging-up or down		-	-	-	-	-	-					
3	Less shortfalls		-	-	-	-	-	-					
4	**Revised regulatory expectation**	280	275	270	265	265	260	255					
5	Actual Expenditure	280	265	255	250	240	230	?					
6	Less atypical & exceptional costs		-	-	-	-	-	-					
7	Less any cross-subsidy adjustment		-	-	-	-	-	-					
8	**Adjusted actual expenditure**	280	265	255	250	240	230	?					
9	Out-performance	0	10	15	15	25	30	?					
10	Out-performance (setting negatives to zero)	0	10	15	15	25	30	?					
11	**Incremental out-performance in 1999/00** (see line 19)		10	10	10	10	10						
12	**Incremental out-performance In 2000/01**			5	5	5	5	5					
13	**Incremental out-performance In 2001/02**				0	0	0	0	0				
14	**Incremental out-performance In 2002/03**					10	10	10	10	10			
15	**Incremental out-performance In 2003/04**						5	5	5	5	5		
16	**Incremental out-performance in 2004/05**							OP?	?	?	?	?	
17	**UNADJUSTED INCENTIVE ALLOWANCE**								15	15	5		
18	**Adjustment to recover incremental out-performance from 1999-00 in**								-10				
19	**FINAL INCENTIVE ALLOWANCE**								5	15	5		

Source: Ofwat

APPENDIX II

Ofwat - The Capital Expenditure Rolling Incentive Mechanism

Example A2.1 – the current capital expenditure rolling incentive mechanism

	Capital Expenditure	AMP2		AMP3 period					AMP4 period				
	Financial year	1998 £m	1999 £m	2000 £m	2001 £m	2002 £m	2003 £m	2004 £m	2005 £m	2006 £m	2007 £m	2008 £m	2009 3m
1	**Revised regulatory expectation**		**349**	**373**	**371**	**361**	**352**	**345**					
2	**Actual expenditure**		**259**	**259**	**272**	**302**	**294**	**?**					
3	Difference (out-performance shown as +ve)		90	114	99	59	58						
4	Infrastructure renewals provision movement		-6	1	-5	-6	-4						
5	CCD adjustment		-14	-14	-9	-4	-2						
6	**Annual out-performance**		70	101	85	49	52						
7	**Out-performance in 1999-2000**		**70**	**70**	**70**	**70**	**70**	**70**					
8	**Out-performance in 2000-01**			**101**	**101**	**101**	**101**	**101**	**101**				
9	**Out-performance in 2001-02**				**85**	**85**	**85**	**85**	**85**	**85**			
10	**Out-performance in 2002-03**					**49**	**49**	**49**	**49**	**49**	**49**		
11	**Out-performance in 2003-04**						**52**	**52**	**52**	**52**	**52**	**52**	
12	**Accumulative out-performance**		**70**	**171**	**256**	**305**	**357**	**357**	**287**	**186**	**101**	**52**	
13	Rewards for out-performance		**In current price limits**						**To be included in future Ks by leaving in the RCV**				
14	**Reductions to opening RCV year by year to remove out-performance (un-smoothed)**								**-70**	**-101**	**-85**	**-49**	**-52**
15	Net Present Value of reductions in RCV using a discount rate 4.75%								313				
16	**Reductions to opening RCV year by year to remove out-performance (smoothed to give equivalent NPV)**								**-72**	**-72**	**-72**	**-72**	**-72**

Notes:

Row 4 Calculated as the difference between the movement assumed in the 1999 final determination and the actual movement reported in the June Return. The infrastructure renewals accrual movement is calculated as the difference between the infrastructure renewals charge and infrastructure renewals expenditure.

Row 5 Calculated as the difference in actual capital expenditure divided by a weighted average asset life. This gives the depreciation adjustment for one year. The annual adjustment is then multiplied by the number of years remaining until the end of the price setting period and that allowed in the final determination. For example in 1999-2000:

Capital expenditure difference	90
Divide by average asset life	90 /32 = 2.8
Multiply by 5 (as 5 years remain from 1999-00 to 2004-05)	2.8 x 5 = 14

Source: Ofwat