C O N S U L T A T I O N D O C U M E N T

REGULATED INDUSTRIES COMMISSION

# APPROACHES TO DETERMINING REGULATORY DEPRECIATION ALLOWANCES

**Classification** : Consultation Document
**Distribution** : Stakeholders/Public
**Reference No.** : FIN/0205
**Publication Date** : May 2005

| TABLE OF CONTENTS | | Page No. |
|---|---|---|


| | | |
|---|---|---|
| **1.** | **INTRODUCTION** | 2 |
| | 1.1 Background | 2 |
| | 1.2 Purpose of the Document | 3 |
| | 1.3 Structure of the Document | 3 |
| **2.** | **DEPRECIATION** | **3** |
| | Components of Depreciation | 3 |
| **3.** | **REGULATORY AND ACCOUNTING DEFINITIONS OF DEPRECIATION** | **6** |
| | 3.1 Accounting Definition of Depreciation | 6 |
| | 3.2 Regulatory Definition of Depreciation | 6 |
| **4.** | **METHODS OF DEPRECIATION** | **7** |
| | 4.1 Assessment Principles for the Evaluation of Regulatory Depreciation | 7 |
| | 4.2 Elements of Depreciation | 8 |
| | 4.3 Depreciation Methodologies | 8 |
| | 4.3.1 Straight Line Depreciation | 8 |
| | 4.3.2 Reducing Balance Depreciation | 9 |
| | 4.3.3 Current Cost Depreciation | 10 |
| | 4.3.4 Economic Depreciation | 11 |
| | 4.3.5 Renewals Expenditure | 12 |
| | 4.4 International Practice | 12 |
| | 4.5 RIC's Preferred Approach | 13 |
| **5.** | **DEPRECIATION CHARGE** | **14** |
| | 5.1 Assessment of the Depreciation Charge | 14 |
| | 5.2 Asset Life Adjustments | 15 |
| | 5.3 Fully Written Down Assets | 16 |
| | 5.4 Stranding of Assets | 16 |
| | 5.5 Salvage and Cost of Removal | 17 |
| | 5.6 Approach used by the United Kingdom and Jamaica | 18 |
| | 5.7 Asset Lives and Depreciation Rates – A Comparison | 20 |
| **6.** | **ASSET BASE** | **22** |
| **7.** | **SUMMARY QUESTIONS FOR CONSULTATION** | **22** |

**Responding to this Document**

All persons wishing to comment on this document are invited to submit their comments by **June 30, 2005**. Responses should be sent by post, fax or e-mail to:

Executive Director
Regulated Industries Commission
Furness House – 1st & 3rd Floors
Cor. Wrightson Road and Independence Square
Port-of-Spain, Trinidad
Postal Address: P.O. Box 1001, Port-of-Spain, Trinidad

| | | |
|---|---|---|
| **Tel.** | **:** | 1(868) 627-0821; 627-0503; 625-5384 |
| **Fax** | **:** | 1(868) 624-2027 |
| **Email** | **:** | ricoffice@ric.org.tt |
| **Website** | **:** | www.ric.org.tt |


All responses will normally be published on the RIC's website unless there are good reasons why they must remain confidential. Confidentiality must be indicated.

A copy of this document and other RIC publications are available from the RIC's website (www.ric.org.tt).

# 1. INTRODUCTION

## 1.1 Background

International Accounting Standard (IAS) 16 defines depreciation as the systematic allocation of the depreciable amount of an asset over its useful life. The depreciable amount is the initial cost of an asset less its residual value estimated at the date of acquisition. Assuming tariffs cover the cost of service inclusive of depreciation, it can also be considered as a method by which invested capital is returned to equity investors over the anticipated economic life of assets.

Depreciation is an allowable expense for the purpose of tariff computation [Section 67 (4) of the Regulated Industries Commission Act. No. 26 of 1998]. The amount of revenue, which a service provider needs to recover from its customers, is calculated to ensure that it has sufficient income to:

- finance new capital expenditure;
- continue to operate and maintain its network;
- cover annual depreciation; and
- provide a reasonable return on the capital invested (the rate base).

Depreciation is critical to the determination of financial and operational capacity of service providers. The application of depreciation policy must give confidence to service providers that depreciation charges will be sufficient to cover return of capital.

Depreciation can account for a significant proportion of the total costs and hence of prices customers pay for electricity. Consequently, any overstatement in depreciation leads to higher prices for customers and added value for shareholders. The central issue is the pattern of recovery and period over which the invested capital should be returned. The RIC Act provides no specific guidance on this central issue.

### 1.2 Purpose of the Document

The main purpose of this document is to:

- consult on the most suitable approach to calculating depreciation profiles; and
- consult on asset lives for different types of assets.

### 1.3 Structure of the Document

The remainder of the document is structured as follows:

- Section 2 discusses the concept of depreciation;
- Section 3 discusses the relevant objectives regulators pursue when determining tariffs;
- Section 4 deals with the various methods used to determine the depreciation of assets;
- Section 5 deals with the depreciation charge and discusses international practice; and
- Section 6 briefly discusses the valuation of the initial capital base.

## 2. DEPRECIATION

Depreciation can also be defined as the measure of wearing out, consumption or other reduction in the useful economic life of an asset, whether arising from use, passage of time or obsolescence through technological or market changes. An asset is defined as a resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity.

**Components of Depreciation**

2.1 Depreciation, as applied to depreciable utility plant, means the loss in *service value* not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence and changes in demand.

2.2 Following on from the definition of depreciation given above, an explanation of its components follows:

**(a)** **Service value (Depreciable value)** means the difference between *original cost* and *net salvage value* of utility plant.

**(b)** **Original cost**, as applied to utility plant, means the cost of such property to the person first devoting it to public service. When an entity constructs its own utility facilities, original cost includes direct costs (land acquisition, construction materials and supplies, construction equipment and construction labour) as well as other costs, inclusive of capitalised financing costs and overhead allocation of directly attributable general expenses which are incurred, at least in part, due to the construction activities (such as administrative payroll, engineering design, employee pension and VAT).

It should be noted that service value is very specifically linked to original cost. Depreciation accounting is the recovery of the original cost of assets and not the economic, market or any other non-original cost measures of value. The original cost of assets can be taken as its *historic cost*, which represents the amount of cash or cash equivalents paid or the fair value of the consideration given to acquire them at the time of their acquisition.

Other bases of valuing assets have been employed to differing degrees and in varying combinations in computing depreciation charges. They include the following:

**Current cost**. Assets are carried at the amount of cash or cash equivalents that would have been paid if the same or an equivalent asset were acquired at today's market rates.

**Realisable (Settlement) value**. Assets are carried at the amount of cash or cash equivalents that could be obtained by selling the asset in an orderly disposal.

**Present value**. Assets are carried at the present discounted value of the future net cash inflows that the item is expected to generate in the normal course of business.

**(c)** **Net salvage value (Realisable value)** means the *salvage value* of property retired less the *cost of removal*.

Where;

**Salvage value** is the amount received from property retired, less any expenses incurred in connection with the sale or in preparing the property for sale.

**Cost of removal** is the cost of demolishing, dismantling, tearing down or otherwise removing utility plant, including the cost of transportation and handling incidental thereto.

**(d)** **Service life (Useful life)** means the time between the date the utility plant is commissioned and the date of its retirement. If depreciation is accounted for on a production basis rather than on a time basis, then service life should be measured in terms of the appropriate unit of production.

## 3. REGULATORY AND ACCOUNTING DEFINITIONS OF DEPRECIATION

### 3.1 Accounting Definition of Depreciation

International Accounting Standard 16 defines depreciation as the systematic allocation of the depreciable amount of an asset over its useful life.

In an accounting context, depreciation seeks to allocate an asset's cost over its useful economic life. An asset's cost should be allocated in a manner, which reflects the pattern its economic benefits are consumed in generating revenues. In so doing, the accruals or matching concept is adhered to, whereby an entity's revenues are matched against those expenses incurred in generating them. This allocation of asset cost, which is treated as an item of expenditure, is termed depreciation.

### 3.2 Regulatory Definition of Depreciation

There are two regulatory views of depreciation. The first is that it seeks to recover the capital cost of investment in assets. Thus depreciation is often referred to as capital recovery. These funds form part of the equity of an entity and can be regarded as a return of capital. The return of capital view is consistent with the use of the regulatory asset base as the basis for assessing the investment in the firm, attributable to shareholders.

The second view (which has been expounded by some regulators) is that it represents a replacement of capital or a charge for the replacement of assets consumed[1]. The replacement view denotes a measurement of the investment by the firm in real assets and therefore suggests that depreciation should be

[1] For the treatment of depreciation, three views are generally expressed: the first is that it represents a cash flow for repayment of loan; the second is that it represents a return of capital subscribed; and the third is that it represents a replacement of capital or a charge for the replacement of the assets consumed.

- Office of the Rail Regulator, 1995, Railtrack's Access Charges for Franchised Passenger Services: The Future Level of Charges, Policy Statement, London.
- Central Electricity Regulatory Commission, 2003, Terms and Conditions of Tariff, Discussion Paper, New Delhi, India.

calculated on the basis of the current cost of assets and thus should finance, over time, expected expenditure for the renewal/maintenance of assets. In fact, "…it is widely argued that over a long term there should be a close approximation between renewal/maintenance expenditure and depreciation of assets"[1].

It is the RIC's position that where current cost depreciation is adopted, maintenance expenditure should not be allowed in the revenue requirement, as this expenditure should be catered for in the current cost depreciation charge (refer to section 4.3.3).

***The RIC invites comments on:***

- ***The allowance of maintenance expenditure in the revenue requirement where current cost depreciation is adopted.***

# 4. METHODS OF DEPRECIATION

## 4.1 Assessment Principles for the Evaluation of Regulatory Depreciation

The purpose of the depreciation allowance for tariff setting is specific, that is, it is an input into the determination of regulated charges. Consequently, the appropriate choice of a method for the determination of regulatory depreciation allowances must take into consideration a number of factors, including:

- **Efficient investment –** that is, the regulated charges should be designed such that service providers would expect to recover the cost of efficient investment to provide the service over the long term;

- **Efficient pricing –** that is, the charges should signal to customers the relative scarcity of resources and that average charges should limit the scope for unnecessarily high returns for service providers;

- **Efficient production** – that is, the regulatory regime should provide incentives to invest and operate efficiently, and that on-going operation and maintenance ought to be undertaken in a least-cost manner;

- **Price stability and intergenerational equity** – that is, relatively stable charges over the longer term and equitable intertemporal allocation of costs across customer classes;

- **Administrative simplicity**

- **Consistency and certainty** – that is, as far as possible, there should be consistency in decisions across time. The ease with which an approach can be replicated over time is an important contributor to certainty and consistency.

## 4.2 Elements of Depreciation

There are three elements necessary for computing depreciation:

(i) the depreciation method;

(ii) the depreciation rate; and

(iii) the base on which the rate is to be applied.

## 4.3 Depreciation Methodologies

There are five approaches to depreciation, which have been widely adopted by regulatory regimes. The following provides an insight into these approaches.

### 4.3.1 Straight Line Depreciation (computed on the Historic Cost of assets)

Under the straight-line method of depreciation, an asset's historic cost, less its estimated residual value, is allocated in equal portions over its useful life. This reflects the assumption that an asset's economic benefits are consumed in equal proportions over its useful life.

The straight-line depreciation rate, which is applied to the historic cost of an asset to yield the depreciation charge, is computed as shown below:

Depreciation Rate = 1 / n, where n is the asset’s useful life

This method allows a utility company to recover the capital cost of an asset, from its customer base, in equal proportions over the asset’s useful life. The asset’s cost is, therefore, evenly spread over a utility company’s present and future customer base. This has the effect of contributing to stable utility rates over time. Straight-line depreciation is also easy to apply, based on verifiable asset costs and is equitable to both present and future customers. Additionally, the straight-line method is extensively applied in most regulatory jurisdictions.

4.3.2 **Reducing Balance Depreciation (computed on the Historic Cost of assets)**

This method is based on the assumption that more of an asset’s economic benefits are consumed in the earlier years of its useful life rather than in equal proportions. The reducing balance method therefore allocates more of an asset’s historic cost in the earlier years of the asset’s life, resulting in higher depreciation charges in the earlier years and lower depreciation charges in the latter years. The depreciation rate is computed as shown below and applied to an asset’s closing net book value to yield the depreciation charge:

Depreciation Rate = $1 - \sqrt[n]{(\text{residual value/cost})}$, where n is the asset’s useful life

The reducing balance method results in a utility company’s present customer base bearing more of an asset’s cost in comparison to its future customers. This method has the effect of contributing to higher utility rates in earlier years. Reducing balance depreciation, like straight-line depreciation, is easy to apply, and it is computed upon verifiable costs. The obsolescence problem is given due recognition because more of an asset’s depreciable value is charged in earlier years.

A small percentage of utilities abroad use this method, mainly to promote ecologically friendly technologies such as wind, solar, geothermal projects, and for nuclear power plants. There is, however, the risk that if investors are allowed to recover their investment upfront they will have a reduced incentive to maintain and operate the asset efficiently. Finally, consumers would be adversely affected with current consumers paying a higher proportion of an asset’s cost.

4.3.3 **Current Cost Depreciation (computed on the Replacement Cost of assets)**

Replacement cost represents the cost, which would be incurred in acquiring a similar asset of equal productive capability.

Current cost depreciation is computed upon the replacement cost of an asset using the following depreciation rate:

Depreciation Rate = 1 / n, where n is the asset’s useful life

A key element of current cost depreciation is the periodic assessment of the replacement cost of assets in order to ensure that depreciation charges are computed upon the present cost of assets.

As mentioned previously, some regulators prefer this approach to depreciation. It is argued that the historic cost of an asset, with the passage of time, may not equate to its replacement cost due to inflation, particularly where assets have long useful lives. Therefore, depreciation charges, and by extension utility rates, computed upon an asset’s historic cost, would not reflect the current cost of assets consumed in providing utility service. Consequently, one can expect that current cost depreciation charges would be substantially higher than depreciation charges computed upon historic cost.

The financial effect of this would impact on both the utility company and the customer base. Current cost depreciation would allow a utility company to recover the capital cost of an asset over a shorter time period as depreciation charges allowed in the revenue requirement would tend to be larger than those computed upon historic cost. Also, when one considers the long lives of utility assets, a utility company may even recover in excess of what it paid for an asset. Therefore the regulator must first consider whether it is fair to allow the customer base to continue to pay for an asset after its historic cost has been recovered; and second the negative impact current cost depreciation would have on utility rates.

### 4.3.4 **Economic Depreciation**

Economic depreciation is a measure of the change in the market value of an asset from one year to the next. The market value may be approximated by the change in the asset's service potential. This form of depreciation is, therefore, driven by the income generating ability of an asset and it will not generally correspond with accounting depreciation.

It is computed by calculating, in present value terms, the difference in an asset's revenue cash flows, from one period to another.

Economic depreciation charges are influenced by factors such as the rate of technological change and the extent of unanticipated demand changes, which affect an asset's income generating ability. In circumstances where an asset's income generation ability is significantly impaired, usually referred to as "economic stranding", accelerated depreciation is allowed. When this occurs an investor's risk of economic stranding is effectively passed on to the customer base through increased utility rates. However, it is argued that this may not be equitable to the customer base, as investors in a monopoly environment should be made to bear the risk of economic stranding and not be compensated for assets, which become stranded.

This method of depreciation is not only complex and imprecise but it introduces an element of volatility into utility rates, since it becomes difficult to predict the occurrence of economic stranding and the resultant accelerated depreciation charges, which may follow.

### 4.3.5 Renewals Expenditure

Renewals expenditure is based upon projections of maintenance expenditure required on an asset, or group of assets, in order to maintain current levels of output. These projections are made over a number of years and are charged, on an annual basis, against profits.

On a periodic basis, projected maintenance expenditure is compared against actual maintenance expenditure and where there are differences, adjustments are made to the balance sheet.

Renewals expenditure differs from depreciation methods, which seek to allocate an asset's cost over its useful life. This method has been applied to groups of assets, such as infrastructure assets (also referred to as below ground assets), which cannot be easily separated into individual assets, each with its own useful life. It is based on the premise that infrastructure assets have an infinite life span and that it would be erroneous to depreciate them over a finite lifespan.

It is an objective method of recovering an asset's cost based upon verifiable maintenance expenditure and does not rely on assumptions about asset lives or patterns of consumption of economic benefits. Further, it has the effect of contributing to higher utility rates over time, as an asset requires increasing levels of maintenance expenditure as it ages. The data requirements for this method are also large.

## 4.4 International Practice

The straight-line method is the commonly used method internationally for accounting and regulatory purposes. Some hydroelectric utilities follow the renewals annuity approach but this is not the norm. The United States regulators allow straight-line depreciation on the rate base using historical cost net book value. Ofgem, the electricity regulator of the UK, allows depreciation on the floatation value (1990/91) of assets, while allowing new capital expenditure to be added to the regulatory asset base at cost. Ofwat, the water regulator of the UK, allows current cost depreciation on its non-infrastructure assets and renewals expenditure on its infrastructure assets. In respect of underground (infrastructure) assets, it allows the regulatory asset base to be enhanced in real terms only to the extent that investment exceeds the renewal charge, or the depreciation charge.

## 4.5 RIC's Preferred Approach

The discussion of alternative depreciation profiles highlights the need for flexibility, as there is no single depreciation method, which is always the most appropriate. Having considered the advantages and disadvantages of different methods, the RIC is inclined to use the straight-line method computed upon the historic cost of assets for the first price control period and it will invite service providers to present alternative depreciation profiles at the next price control period. Some of the main advantages of the straight-line method are:

- Its ability to generate reasonably constant charges over the long term.

- Its simplicity – it is based on verifiable asset costs and is equitable to both present and future customers.

- It is consistent with economic efficiency, although the precise implications of economic efficiency are unclear.

- Its consistency with what has been done in the past.

- It reduces the adverse implications for the time path of prices that result from switching methods and also the regulatory compliance costs that are likely to increase.

- The ability to apply this method more consistently across all asset classes (i.e. both short and long lived assets).

- Its wide acceptance both locally and internationally.

***The RIC invites comments on:***

- ***The most appropriate regulatory depreciation method,***
- ***The appropriateness of relying on the service providers to propose any alternative depreciation method to the straight- line approach,***
- ***The adoption of alternative methods to depreciation such as renewals expenditure.***

## 5. DEPRECIATION CHARGE

### 5.1 Assessment of the Depreciation Charge

An assessment of the depreciation rate and the amount of depreciation to be charged are based on the following:

- The value of the asset;
- The expected useful economic life of the depreciable asset; and
- The estimated residual value of the depreciable asset.

Depreciation charges are spread out over the economic life of the asset, that is, the period over which economic benefits are expected to flow from the asset. The economic life[2] is the shortest of the legal, physical, technical and commercial lives.[3] For a network asset, the economic life will be, to a great extent, governed

[2] Some regulators have argued that the lives chosen should even be the lesser of economic life, safe life or life before becoming obsolete or redundant.

[3] Henderson S. and Peirson G., "Issues in Financial Accounting":

- Physical Life – the asset may be physically worn out and be reduced to scrap.
- Legal Life – the life of a leased asset is limited to the lease period.

by technical or physical factors.  Some of the main factors that determine the economic life of network assets include:

- Robustness of the original design of the assets and materials and methods used in their construction;
- Asset aging due to mechanical and/or technical stress;
- Routine and preventative maintenance;
- Environmental conditions;
- Amount of use or degree of loading; and
- Suitability for refurbishment, up rating or upgrade for continued use.

The major concerns for the regulator is the treatment and the role of regulatory depreciation for addressing four (4) main areas:

- Asset life adjustment;
- Fully written down assets;
- Stranding of assets; and
- Salvage and cost of removal.

## 5.2 Asset Life Adjustments

Changing or retrospective application of the extension of depreciable lives has implications for the calculation of depreciation.

It is understandable that the service provider is likely to have the relevant information to assess the reasonableness of asset lives and therefore, it should be left to the service provider's discretion to revise the depreciable lives of assets. However, the RIC strongly believes that it would be inappropriate to apply a change in estimate **retrospectively**, creating inequities between past and future customers.

---

- Commercial Life – the present value of the operating and maintenance expenditure may exceed the cost of replacement.
- Technical Life – a technically superior asset may supercede the old asset.

***The RIC seeks views on changing or retrospective application of the extension of depreciable lives.***

## 5.3 Fully Written Down Assets

The standard asset lives used to calculate regulatory depreciation are invariably based on estimated average lives. Consequently, some assets will have physical lives in excess of the average. Furthermore, in some cases, assets which have been fully or substantially written down, continue to be technically useful and form an integral part of the earning capacity of service providers. The issue for the regulator is the treatment of assets for depreciation purposes, which have been fully or substantially written down but continue to form part of the earning capacity of service providers.

Any premature replacement of technically sound assets will lead to over investment and requests for premature additional capital expenditure at the expense of customers.

***The RIC seeks views on the premature replacement of technically sound assets.***

## 5.4 Stranding of Assets

The regulatory stranding of assets refers to the process by which the regulator may adjust depreciation charges allowed in the revenue requirement to reflect its views about the decline in the economic life of assets. Alternatively, the regulator may disallow depreciation charges and not compensate the service provider for inefficient investment through the depreciation allowance.

The threat of regulatory stranding is generally to encourage efficient investment at the time it is undertaken and to provide incentives to maximise the use of assets. However, the use of regulatory imposed stranding has been criticised on the ground that it is neither the most appropriate tool for addressing concerns about the efficiency of new investment nor for providing incentives to maximise the use of assets.

Where an asset is deemed an efficient investment in light of available information at the time of its acquisition and becomes unused or under-utilised, the RIC is in support of the regulatory stranding of the asset.

***The RIC invites comments on the regulatory imposed stranding of assets, and on the role of regulatory depreciation for addressing concerns about future asset stranding.***

**5.5 Salvage and Cost of Removal**

Salvage and cost of removal are generally included in depreciation charges. However, under regulatory accounting, considerable discretion exists regarding the extent of their inclusion. Some regulators treat salvage and cost of removal separately from depreciation rates.

Some regulators require recovery of net salvage to be from those ratepayers served during the five years *following* the receipt of the salvage. Others require recovery of the net salvage for transmission, distribution and general plant to be from the ratepayers served over the remaining life of the property *that replaced the property* for which the salvage was received and the cost of removal was incurred. Finally, there are still other regulators who take the position that such recovery should never be allowed.

The extent to which net salvage is reflected in depreciation rates determines which generation of ratepayer will receive credit for salvage and pay for costs of removal, and the magnitude of the depreciation-related revenue requirements over the life of the property.

***The RIC invites comments on the inclusion of salvage and cost of removal in depreciation charges.***

## 5.6 Approach used by the United Kingdom and Jamaica

The depreciation rate in most countries is derived on the basis of the accounting definition of depreciation. International experience also suggests that most utilities follow the same depreciation method for tariff determination. **Table 1** below shows average rates of depreciation for some of the utilities. The approaches adopted by the UK and Jamaica are briefly discussed below.

**United Kingdom**

***Vesting Assets***

Ofgem (the regulator for Britain's gas and electricity industries) used differing depreciation rates between assets that existed at the time of floatation of DNOs (1990/91), termed vesting assets, and those acquired subsequently. At privatisation, the floatation values of DNOs did not differ significantly from the book values of their assets. As such, the vesting assets were valued at the floatation values of the DNOs and this was written off on a uniform annual basis over ten to fifteen years, dependent upon the average age of each DNOs assets at vesting.

***Post Vesting Assets***

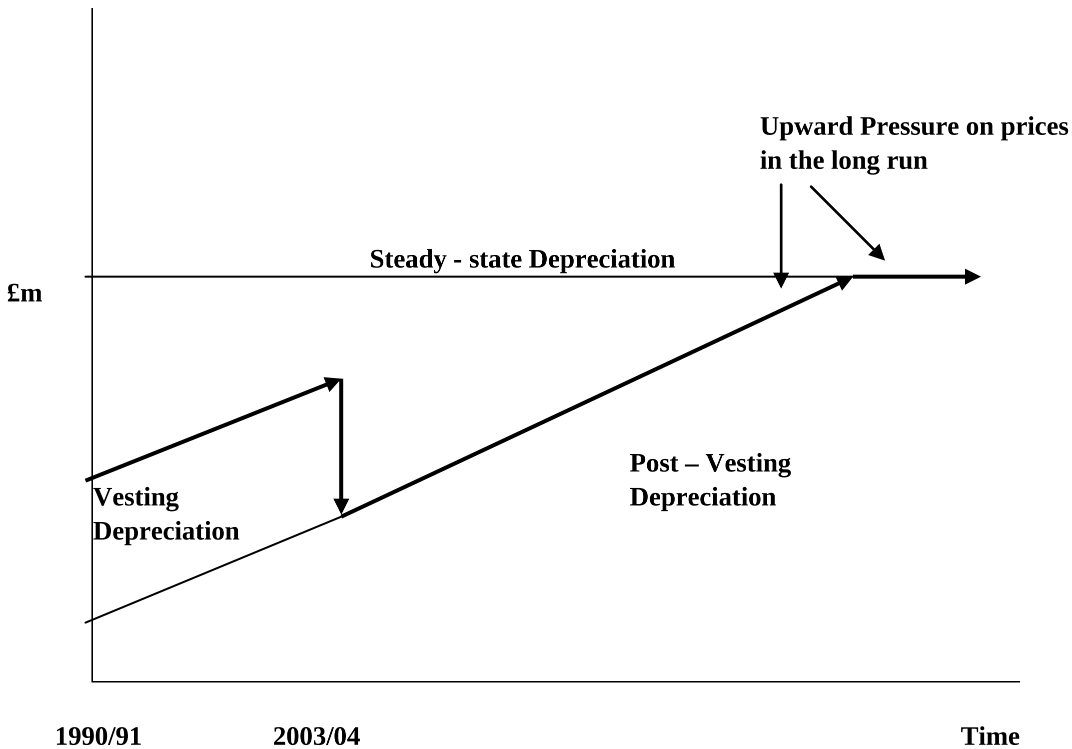
Assets, which were acquired subsequent to floatation, were written off on a uniform annual basis over a period of thirty-three years. This reflected the accounting treatment at the time of depreciating assets at three per cent per annum.

***Cliff Face Effect***

As mentioned previously vesting assets were written off on a uniform annual basis over a period of ten to fifteen years. At the end of this period, in and around 2003/04, depreciation allowances on vesting assets for some UK companies (excluding Scottish) were exhausted, causing a significant fall in their depreciation charges, referred to as the cliff face effect.

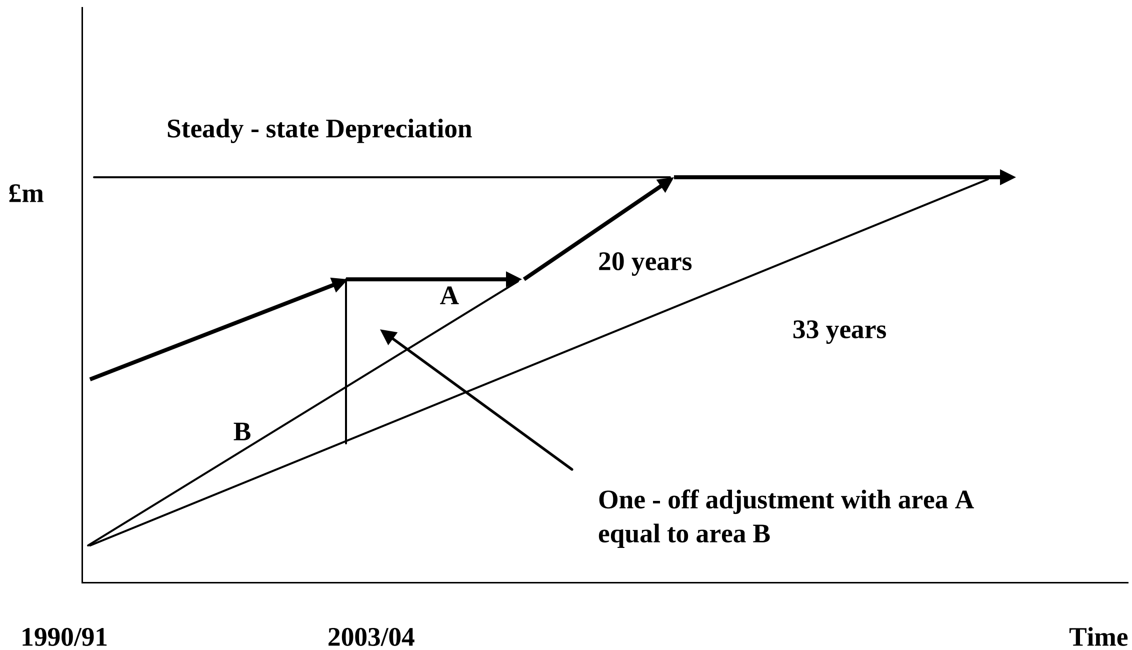
In the longer term, however, depreciation charges on post vesting assets would increase over time, thereby placing upward pressure on prices to consumers. **See Figure 1.**

**Figure 1: Depreciation Profiles Using Current Assumptions On Asset Lives**




In order to smooth the depreciation allowance for those companies that experienced the cliff face effect, an adjustment was made to post vesting assets. This adjustment involved switching to a shorter asset life from thirty-three years to twenty years, once vesting assets were fully depreciated. The difference in asset values between a thirty-three year asset life and a twenty-year asset life was calculated and added to the depreciation spread over a fifteen-year period in equal instalments. **See Figure 2.**

**Figure 2: Depreciation Profiles With Asset Lives Tilted To 20 Years**




**Scottish Companies**

The privatisation values of the two Scottish DNOs were calculated on a different basis to the other DNOs. A twenty-year asset life was assumed for vesting assets and a thirty-eight year asset life for post vesting assets.

**Jamaica**

Schedule 4 of the Jamaican Public Service Company Limited All-Island Electricity License, 2001 sets out the depreciation rates, to be applied on a straight-line basis, in computing depreciation on assets. These rates are prescribed for various classes of assets and are computed upon standard asset lives. JPS values its specialised plant & equipment on the replacement cost basis and its land & buildings at historic cost.

## 5.7 Asset Lives and Depreciation Rates – A Comparison

The correct determination of expected life is important as asset renewal expenditures are determined mainly by the expected lives of the assets. The impact of assuming different asset lives for projecting future capital expenditure is significant. Locally, there is no official guidance regarding standard lives of the electricity network. However, a comparison (**Table 1 and Appendix I**) of the asset lives with international norms suggests that the asset lives for most assets of T&TEC is close to the international levels. The only significant difference arises in a very few items and it may be due largely to local conditions/practice. Any reduction (increase) of the depreciation rate will have the impact of reducing (increasing) cash flows to support debt servicing. However, the impact will vary depending on the capital structure used for financing and the term of the loan.

**Table 1 – Average Depreciation Rate Comparison for Various Utilities**

| Utility/Country | Asset Category | | | | |
|---|---|---|---|---|---|
| | Land/ Building | Generation | Transmission & Distribution | Other | Total Average |
| National Grid U.K. | 2.0% | 3.4% (Plant and Machinery) | | 7.9% | 3.7% |
| Scottish Hydro Electric | 2.2% | 3.0% | 3.1% | 7.5% | 3.5% |
| Hydro-Electric Australia | - | 2.0% | 4.0 – 5.0% | 16.0 – 18.0% | 3.1% |
| National Power U.K. | 3.8% | 4.5% | | 4.5% | 4.4% |
| Scottish Power | 3.7% | 2.4% | | 5.9% | 2.8% |
| PowerGen U.K. | - | 2.7% | 1.1% | 7.8% | 2.6% |
| United Networks, New Zealand | - | - | - | - | 3.2% |
| Gener. S.A. Chile | - | - | - | - | 3.2% |
| India | - | 3.4 – 8.24% | 3.4 – 8.24% | 8.24 – 21.55% | 3.5 – 7.84% |
| Jamaica | 2.0% | 2.86 – 4.17% | 3.33 – 4.0% | 4.0 – 14.3% | - |
| T&TEC | 2.0 – 3.33% | 5.0% | 2.5 – 6.67% | 4.0 – 25.0% | - |

***The RIC invites comments on the appropriateness of adopting the asset lives established/used by the service provider.***

## 6. ASSET BASE

The third ingredient necessary for computing depreciation that is, the valuation of the initial capital base is a central and critical issue in the determination of a reasonable future price path for service providers. There are three main methods in vogue for valuing the asset base: cost-based; market value-based; and economic-based.

The market-based and economic-based approaches use a number of subjective factors and also suffer from a problem of circularity. The cost-based methods have the advantage in that they are based on more objective valuations used for financial reporting purposes. They also more accurately reflect the economic cost of service consumption.

Given the critical importance of the asset base, the RIC will be publishing a separate paper for public consultation.

## 7. SUMMARY QUESTIONS FOR CONSULTATION

Throughout this paper, the RIC has identified a number of issues for comment. The range of issues identified is not intended to be exhaustive and stakeholders are encouraged to identify any further issues for consideration.

- ***The RIC invites comments on:***
  - ***The allowance of maintenance expenditure in the revenue requirement where current cost depreciation is adopted,***
  - ***The most appropriate regulatory depreciation method,***
  - ***The appropriateness of relying on the service providers to propose any alternative depreciation method to the straight- line approach,***
  - ***The adoption of alternative methods to depreciation such as renewals expenditure.***

- ***The RIC seeks views on changing or retrospective application of the extension of depreciable lives.***

- ***The RIC seeks views on the premature replacement of technically sound assets.***

- ***The RIC invites comments on the regulatory imposed stranding of assets, and on the role of regulatory depreciation for addressing concerns about future asset stranding.***

- ***The RIC invites comments on the inclusion of salvage and cost of removal in depreciation charges.***

- ***The RIC invites comments on the appropriateness of adopting the asset lives established by the service provider.***

## APPENDIX 1

**Average Depreciation Rate Comparison for T&TEC and Jamaica**

| Class of Assets | Depreciation Rate (%) | | Standard Useful Life (Years) | |
|---|---|---|---|---|
| | T&TEC | Jamaica | T&TEC | Jamaica |
| Land - Leasehold | 2.0 | 2.0 | 50 | 50 |
| Buildings | 3.33 | 2.0 | 30 | 50 |
| **Generating Assets:** | | | | |
| - Steam Production Plant | - | 4.0 | - | 25 |
| - Hydraulic Production Plant | - | 2.86 | - | 35 |
| - Diesel Generators | 5.0 | 4.0 | 20 | 25 |
| - Gas Turbine | - | 4.17 | - | 24 |
| **Transmission Assets:** | | **4** | | **25** |
| - Control gear/Switchgear | 4.0 | | 25 | |
| - Transformers | 4.0 | | 25 | |
| **Distribution Assets:** | | | | |
| - Overhead Mains | 3.33 | 3.33 | 30 | 30 |
| - Underground Mains | 2.5 | 3.33 | 40 | 30 |
| - Submarine Cables | 6.67 | - | 15 | - |
| - Meters | 6.67 | 3.33 | 15 | 30 |
| **Other:** | | | | |
| - Street lights | 5.0 | 3.33 | 20 | 30 |
| - Test Equipment | 6.67 | 4.0 | 15 | 25 |
| - Supervisory Control System | 4.0 | 4.0 | 25 | 25 |
| - Electronic Equipment | 10.0 | 4.0 | 10 | 25 |
| - Communication Equipment | 20.0 | 6.65 | 5 | 15 |
| - Computer Equipment | 16.67 | 5.0 | 6 | 20 |
| - Furniture & Office Equipment | 10.0 | 5 | 10 | 20 |
| - Automobiles | 25.0 | 14.3 | 4 | 7 |