IRG PUBLIC CONSULTATION DOCUMENT

# Principles of Implementation and Best Practice regarding the use of current cost accounting methodologies as applied to electronic communication activities

*National Regulatory Authorities (NRAs) implement the regulatory framework laid down in EU and national law. These principles of implementation and best practice (PIBs) have been devised by IRG to assist in the process of harmonizing the implementation of remedies in IRG member states. The NRAs are committed to implement these principles wherever possible.*

**Consultation document**

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## Introduction

On 11 February 2002 the European Union adopted new guidelines for the electronic communications sector. These guidelines set out a new framework for the regulation of electronic communication networks and services and amongst others request National Regulatory Authorities (NRAs) to investigate competition in relevant national markets, if necessary imposing regulatory obligations on undertakings that dominate those markets. Member States of the European Union have to implement this new regulatory framework into their national legislation.

The Independent Regulators Group (IRG) supports the process of harmonizing the implementation of the new framework and adopts Principles of Implementation and Best Practice (PIBs) that support this process. Within this process, the PIBs on the use of current cost accounting (CCA) as applied to electronic communication activities give guidance to NRAs for a common approach to the application of CCA concepts and methodologies.

# Principles of Implementation and Best Practice regarding the use of current cost accounting methodologies as applied to electronic communication activities

The term “current cost accounting” (CCA) covers a broad range of cost accounting concepts which NRAs may apply in a variety of different circumstances to provide information to support different regulatory objectives. The principles below have, therefore, been ordered in four groups to provide some contextual basis and to reflect the nature of the principle (e.g. where the principle has broad application or a specific or narrow use):

1. PIBs generally applicable to the use of CCA.
2. CCA PIBs more generally applicable to bottom-up or “clean sheet” models.
3. CCA PIBs more generally applicable to accounting data or “top-down” financial models.
4. CCA PIBs relating to transparency and related issues.

The scope of methodologies used by NRAs to prepare and report on financial information can range in a spectrum from the strict application of CCA rules to an operator's financial or statutory accounts through to bottom-up models constructed from a set of engineering and demand assumptions. In practice most NRAs have adopted a variety of hybrid model solutions that are positioned between these two extremes. The position within this spectrum can also be influenced by regulatory policy objectives. A combination of approaches may be used to compare and contrast the information prepared from these methods. This combination of choices means that generalised application of all the principles below is not necessarily applicable in all circumstances *and each should be read in conjunction with the supporting material in this document*.

**IRG has adopted the following principles with regard to the use of current cost accounting methodologies as applied to electronic communication activities:**

***PIBs generally applicable to the use of CCA:***

**PIB 1:**

IRG acknowledges that the use and application of CCA is supported and encouraged by the European regulatory framework (including relevant European Directives, EC Recommendations, ERG Remedies and other PIBs) and that consistent interpretation and application of CCA methodologies can make an important contribution to improved harmonisation. IRG therefore recognises that financial information prepared using CCA methodologies have an important role to play in regulatory decision making.

**PIB 2:**

IRG recognises that the term CCA covers a variety of methodologies involving complex and interrelated assessments and judgements which can yield different results. The options chosen will be determined by the NRAs policy objectives and that, to assist transparency and understanding, practitioners should ensure that users of financial information prepared using CCA methodologies are appropriately informed of the basis of preparation (i.e. data sources, processes and procedures), the relationship of those methodologies with the regulatory objective(s) and key assumptions.

**PIB 4:**

IRG recognises the use of CCA is primarily concerned with the valuation of fixed assets and that the type of valuation methodology applied to different asset types is objectively justified and supported by relevant evidence (i.e. current purchase or construction prices and relevant indices).

**PIB 5:**

IRG recognises the importance of ensuring that, where Modern Equivalent Asset (MEA) valuations are used, the choice of replacement or alternative asset(s) used for the valuation are appropriate, and potential valuation adjustments (e.g. for productive capacity, operating cost savings and additional functionality) are fully considered in deriving the MEA valuation.

**PIB 8:**

IRG recognises that holding gains or losses created by the use of CCA need to be reviewed and the implications of different treatments of these CCA adjustments properly assessed against regulatory objectives. The choice of capital maintenance concept (operational or financial) should be consistent with the regulatory policy objective although one capital maintenance concept should be used for reporting purposes.

***CCA PIB more generally applicable to bottom-up or "clean sheet" models:***

**PIB 3:**

When using a bottom-up model, NRAs calculate the costs of an efficient operator with efficient and optimised network infrastructures.

IRG believes, in respect of bottom-up models, that the choice of CCA asset depreciation periods and profiles is unconstrained by those used in the historical cost accounts, but these choices can be informed by the information available from the operators' accounting and operational systems. NRAs should choose CCA asset depreciation periods and profiles that reflect the economic life of the assets.

***CCA PIBs more generally applicable to accounting data or "top-down" financial models:***

**PIB 6:**

IRG considers that the choice of method used to calculate net replacement costs (NRC) is assessed against the quality of asset information available and the materiality of the result. NRC methods should be kept under review so that improvements in cost data and asset information can be incorporated in future calculations.

**PIB 7:**

IRG believes that there are a number of detailed aspects to the use of CCA that potentially could materially affect the results or outputs and therefore recognises the key role of validation and review procedures. Such factors could include, for example:

(i) The use of MEAs in forward looking financial models; NRAs should consider the implications on forward looking financial models of productive and efficiency assumptions reflected (or not) in the MEA valuation;

(ii) asset values being artificially inflated by allowing a valuation of surplus capacity.

NRAs should analyse the value of capacity that is in surplus to normal requirements and exclude the excess capacity from the relevant regulatory cost base;

(iii) the use of off-balance sheet finance and leasing arrangements that may distort asset ownership and valuations;

NRAs may need to take account of asset financing and operational arrangements which, as reflected in the financial statements of the operator, do not allow full visibility of the asset base or provide adequate clarity of ownership.

**PIB 12:**

IRG believes, in respect of top-down or accounting based models, that CCA accounting rules for asset lives can, as a starting point, be consistent with the policies used by the operator in preparing its financial or statutory accounts. However, estimated asset lives for accounting purposes applied historically may not provide an appropriate economic cost base for regulatory decisions. Where these lives, including for example fully depreciated assets that remain in use, conflict with regulatory objectives then objective alternative depreciation profiles should be considered.

***CCA PIBs relating to transparency and related issues:***

**PIB 9:**

IRG believes that published regulatory financial statements or similar statements should contain full disclosure of CCA adjustments (depreciation, holding gains/losses and other) where CCA is used as the basis of preparation.

**PIB 10:**

IRG recognises that for the use of CCA to be acceptable it is necessary for the CCA methodologies, systems, processes and outputs to be sufficiently robust and comprehensive so as to allow an independent audit or validation to be undertaken.

**PIB 11:**

When transitioning between Historic Cost Accounting (HCA) based financial data and CCA based financial data, IRG believes that detailed analysis and review of material changes in the cost base may be required before making regulatory decisions based on CCA outputs so that transitional or windfall adjustments are explicitly identified and taken into account.

## Contents

# Section 1

# Executive Summary

Deriving suitable asset values for use in regulatory decision-making is an issue that most NRAs face regularly. There are a number of approaches to this problem and the debate is not just confined to the regulation of communication activities or even utility regulation. Assessing the current and future financial performance of a business, including placing a value on the entity's asset base, is clearly a key topic for many stakeholders including the investment community, shareholders, competitors and management teams. This PIB does not attempt to address the whole of this broad and complex topic but is specifically aimed at providing guidance and assistance to NRAs and other interested parties in the application of one valuation concept (current cost accounting) in the context of regulation of communication activities.

This document sets out a number of principles that:

- enhance the transparency of the basis on which financial information is prepared for regulatory purposes;
- explain the key aspects of current cost accounting (CCA) as applied to communications networks;
- assist National Regulatory Authorities (NRAs) in the implementation and development of CCA; and
- provide practitioners and other stakeholders with further guidance on the practical application of CCA for regulatory purposes as applied to communications networks.

CCA is a recognised part of a NRAs toolkit and has already been successfully deployed across Europe. This document builds on this experience and clarifies some of the arguments that underpin different implementation issues. The PIBs have been structured to highlight;

- Generic principles that underpin the use of CCA in any context,
- Principles that are more applicable to top-down or accounting models. NRAs may derive regulatory financial statements from an operator's actual cost data which would normally be prepared on an historic cost basis. There are a number of specific PIBs that address some of the issues raised by the source of data available in this situation and the calculation of CCA adjustments.
- Principles that are more applicable to bottom-up or "engineering" models. Bottom-up models are more likely to be populated with cost data derived from current observed asset values. With this approach, key assumptions and judgements such as asset lives can be re-evaluated and applied without reference to pre-existing accounting policies.
- Other principles
  NRAs may face specific implementation or one-off issues that are not covered

in the categories above. For example, where transitioning from regulatory cost data based on historic cost accounting rule to CCA based data.

It is also important to recognise that there are a number of choices to be made in the detailed application of CCA, and a NRA will make those choices consistent with its regulatory objectives. Financial information prepared under CCA methodologies therefore needs careful interpretation and skilled application in support of regulatory decisions.

This document highlights the technical and often complex nature of CCA and the judgements and assessments inherent in its application. This is also the first set of CCA PIBs to be published specifically on this topic, and it is the intention of the IRG to regularly review and enhance these PIBs as long as CCA remains an important asset valuation concept and implementation experience of the NRA community grows.

# Section 2
# Background and scope

## Background

National Regulatory Authorities (NRAs) request, analyse, use, examine and interpret a broad range of financial information in carrying out their roles and responsibilities. Current Cost Accounting (CCA) describes a set of accounting methodologies and policies that provide measures of financial performance and cost analysis that are commonly used in analysing and reporting financial information on regulated business activities. CCA addresses many of the shortcomings and limitations of historical cost accounting traditionally used in the preparation of a company's formal or statutory accounts.

Conceptually CCA can be applied to any business activity but is particularly relevant in the electronic communications sector where the delivery of services in wholesale markets is often only possible over extensive and capital intensive infrastructures built, in some cases, over very long periods. These networks can also be subject to rapid technological change and significant real price changes. Financial information prepared using HCA policies may therefore result in asset values not reflecting the value of that asset to the business because the asset can be acquired at today's prices for a cost significantly above or below the book value in the operator's accounts. As a result, measures of profit are also distorted.

Although the use of CCA will often provide a relevant cost base for regulatory decision making, it is an accounting, not a costing methodology and will, therefore, often be used in conjunction with an attribution system (to allocate or apportion costs to particular activities, services or products) and Long Run Incremental Cost (LRIC) models. [1]

## Purpose and scope of the PIBs

The purpose of this document is to provide stakeholders with detailed guidance and examples of the application of CCA in a regulatory context as applied to electronic communications markets. It has been prepared by the IRG to assist NRAs in the implementation and/or application of a technically complex topic. It is not, and does not attempt to be, a definitive accounting standard or practice note but a detailed implementation document that supplements relevant European Community and ERG statements and other documentation on this aspect of the new regulatory framework.

An important source of information on CCA methodologies are the general accounting guidance and standards developed in the mid 1980s to deal with the affects of high levels of inflation in financial or statutory accounts. It is also recognised that real price changes[2] for key assets, particularly real price reductions, can also significantly affect the current values of assets and hence reported profits or losses. In the electronic communications sector, NRAs observe:

- significant real price changes driven by rapid technological advancement such as the use of IP data transmission technologies and fibre cables;

1 http://www.erg.eu.int/doc/publications/consult_accounting_sep/erg_05_29_erg_cp_rec_as_and_cas_final.pdf
2 Real price changes means in this context the extent to which asset prices increase or decrease relative to general price inflation.

- very long economic lives for specific asset types (such as land, buildings, ducts and cabling,) which means that relatively small inflation levels or real price changes can materially affect asset values over time even though there may be only small technological change.

## Content of the document

This paper is structured as follows:

*Section 3: The Regulatory Context*

This section sets out the relationship and interaction of this document with other regulatory statements and documentation. It also explains how this document can be used and the key issues it is intended to address.

*Section 4: The mechanics of CCA*

This section sets out a base example that will be used to illustrate various aspects of CCA concepts. It also describes some of the key modelling assumptions taking typical issues faced by practitioners. The section also describes the use of CCA concepts in various cost modelling scenarios such as bottom-up modelling and options open to NRAs in the application of those scenarios.

*Section 5: Valuation basis*

This section describes in more detail various approaches to asset valuation and depreciation calculations. It also looks at some specific valuation issues relating to electronic communications infrastructures.

*Section 6: Capital maintenance*

This section discusses the two capital maintenance concepts and regulatory policy implications.

*Section 7: Presentation and disclosure*

This section deals with issues of transparency with regard to the preparation and presentation of current cost accounts including some suggested pro-forma profit and loss accounts and mean capital employed statements.

*Section 8: Validation and audit*

This section discusses some of the issues that may arise in providing independent validation or audit of current cost accounting information.

*Section 9: Transition and other issues*

This section looks at issues that may arise when implementing CCA for the first time or transitioning from pricing and costing regimes based on costs prepared on a different basis such as HCA.

# Section 3
# The Regulatory Context

## Relationship with other regulatory documents

The European Directives relating to the regulatory framework for electronic communications envisage use of a range of information, including financial information, to inform and direct NRAs in performing their duties and responsibilities.

The primary Directives where financial information will be critical are the Access Directive (2002/19/EC ), the Universal Service Directive ( 2002/22/EC ) and the Framework Directive ( 2002/21/EC ).

More specifically, recital 20 to the Access Directive (2002/19/EC) refers to "…the value of capital adjusted where necessary to reflect the current valuation of assets and efficiency of operations.". Article 13 also refers to NRAs ensuring that any cost recovery mechanism serves to promote efficiency and sustainable competition which implies the use of costing methodologies that reflect current asset values. Guidance on more specific implementation issues is set out in a Recommendation published by the European Commission on 13 September 2005. This Recommendation supports the use of CCA and asset valuation principles and states in “Whereas (3)” that:

> “It is recommended that national regulatory authorities, having adopted a decision on a cost accounting system based on current costs set clear deadlines and a base year for their notified operators’ implementation of new cost accounting systems based on current costs.”
>
> “Evaluation of network assets at forward-looking or current value of an efficient operator, that is, estimating the costs faced by equivalent operators if the market were vigorously competitive, is a key element of the “current cost accounting” (CCA) methodology.”

In addition, the European Regulators Group has published a paper "ERG Common Position on the approach to Appropriate Remedies in the new regulatory framework - ERG (03) 30rev1" which refers to the use of CCA in the context of establishing appropriate remedies where an operator has significant market power. The ERG has also published a common position: "Guidelines for implementing the Commission Recommendation C (2005) 3480 on Accounting Separation & Cost Accounting Systems under the regulatory framework for electronic communications" which dedicates over 7 pages to the topic of CCA.

This document therefore is positioned as a detailed guidance paper fully consistent with, and complementary to, the current regulatory framework.

**PIB 1:**

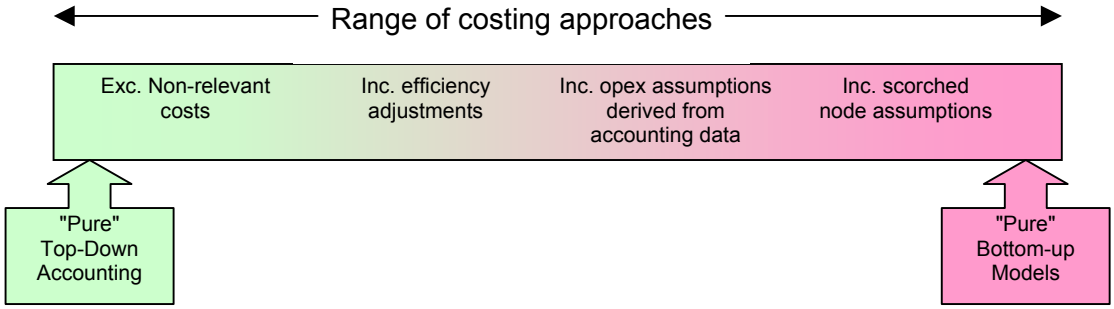
**IRG acknowledges that the use and application of CCA is supported and encouraged by the European regulatory framework (including relevant European Directives, EC Recommendations, ERG Remedies and other PIBs) and that consistent interpretation and application of CCA methodologies can make an important contribution to improved harmonisation. IRG therefore recognises that financial information prepared using CCA methodologies has an important role to play in regulatory decision making.**

## Setting CCA into regulatory context

NRAs will require high quality and relevant financial information in carrying out a variety of their duties and responsibilities such as when assessing market power, establishing non-discrimination or cost orientation obligations, setting price controls and investigating complaints of anti-competitive behaviour. CCA is recognised as providing one relevant view of costs but this data should be aligned with the regulatory tool used and transparent to stakeholders.

Recent analysis shows that 21 out of 29 NRAs use, or are soon to adopt, CCA methodologies as the cost base for their work in wholesale fixed network markets. This extensive and growing use of CCA confirms its value in informing regulatory decisions and also provides a valuable source of knowledge and experience that has been incorporated in this document.

One important aspect of CCA is that its implementation across a spectrum of cost based approaches used by NRAs involves important choices of the relevant methodologies to apply that are consistent with the regulatory objectives. The diagram below illustrates this point:




It is possible that a NRA may wish to derive cost information from both top-down and bottom-up approaches where, for example, it is important that the principal source of financial data is sense checked against alternative methodologies or where one approach may lead to a bias in the outputs.

**But why are NRAs' needs for robust cost data not satisfied by generally accepted accounting rules?**

CCA based financial information offers significant insights and benefits to NRAs compared with historical cost accounting (HCA) based information which is the accepted standard basis for the preparation of statutory accounts for corporate entities. It is widely recognised[3] that HCA accounts are not a good basis on which to base forward looking economic decisions. For example, HCA asset values recorded at cost reflect past investment decisions which may, in the current competitive environment, give sub optimal asset mixes or embedded use of inefficient legacy technologies. Other limitations of HCA can be that:

- reported results may be distorted by matching current revenues with costs incurred at an earlier date;
- the amounts in the balance sheet/mean capital employed in respect of assets may not be a realistic, up-to-date measure of the resources employed in the business;
- calculations to measure return on capital employed may be misleading;
- the interpretation of operating results may be distorted or misinformed because holding gains/losses are not identified;
- there is no explicit recognition of holding gains or losses; and
- a misleading impression of the trend in performance over time may be given.

The concepts behind CCA are intended to compute a value on the asset base which gives a "value to the business". This should result in asset values and measures of profit similar to those reflecting the prevailing market conditions and more reliably informing regulatory decisions. However, a balance sheet/mean capital employed statement prepared on a current cost basis is not intended to be a valuation statement as far as the business or part of the business is concerned. The value of a business as a whole is often determined by different factors, such as the assumed pattern of future earnings or dividends.

## Deriving the regulatory cost base - choosing the appropriate CCA methodology

NRAs will typically require high quality and relevant financial information when assessing market power, establishing non-discrimination or cost orientation obligations and setting price controls. CCA is recognised as providing one relevant view of costs but this data should be aligned with the regulatory tool used and fully transparent to stakeholders. This section shows the way in which CCA may interact with a variety of financial models.

3 For example, see chapters 11 and 21 of Horngren, Foster and Datar, where the relevance of costs as indicated by the financial records and the cost system of the company (often based on historical cost information) is discussed in the context of making decisions, for example related to pricing, outsourcing or investments. C.T. Horngren, S.M. Datar, and G. Foster, Cost accounting, a managerial emphasis, Prentice Hall, 11th edition, 2003.

## Interactions with other regulatory models

NRAs refer to the use of CCA in a number of different costing and accounting scenarios. It is essential that the reader fully understands what "type" of CCA is being applied, the implications of this choice on the results and the inherent strengths and weaknesses of that approach. The diagram below is a very simplified illustration of how CCA plays a central role in the spectrum of cost modelling approaches used by NRAs.

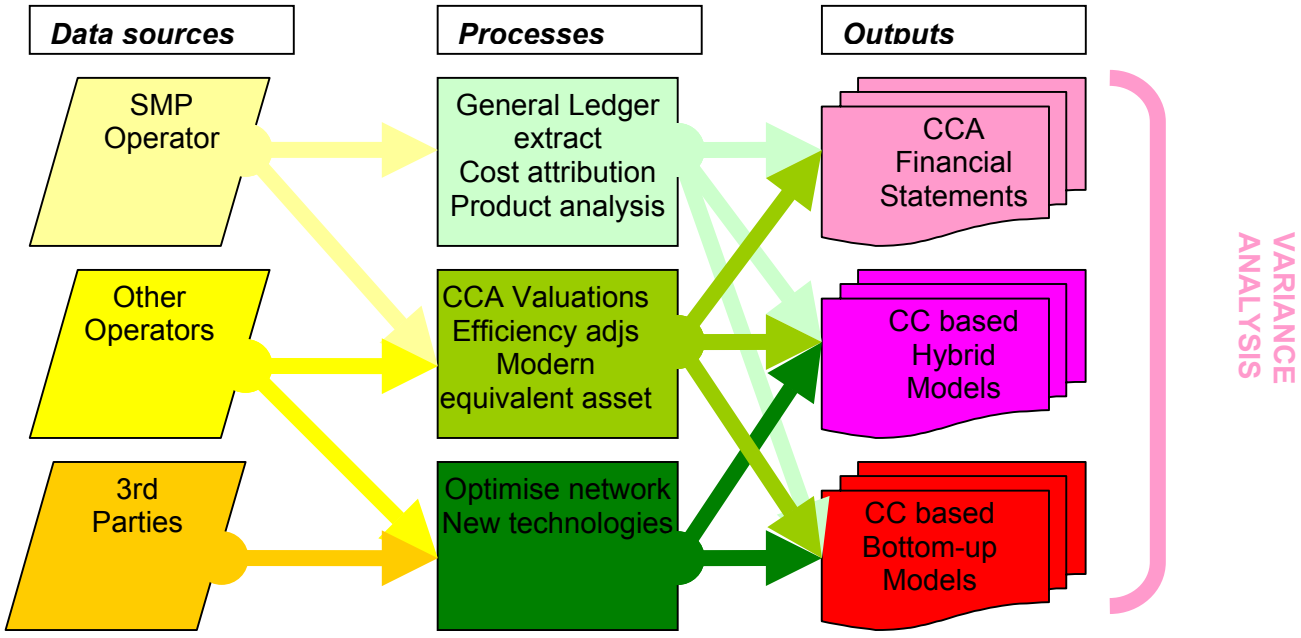
This diagram illustrates that the inputs to three commonly used approaches to the preparation of financial information can all use CCA methodologies. These approaches can be characterised as follows:

- CCA based Financial Statements (or "top-down approach) – familiar accounting statements (profit & loss account, mean capital employed) prepared using generally accepted accounting standards incorporating CCA concepts. These statements can be prepared for the whole, or part of, a business.

- Current cost based hybrid models – financial models that utilise a mix of data and assumptions ranging from actual company information to other sources such as efficiency adjustments.

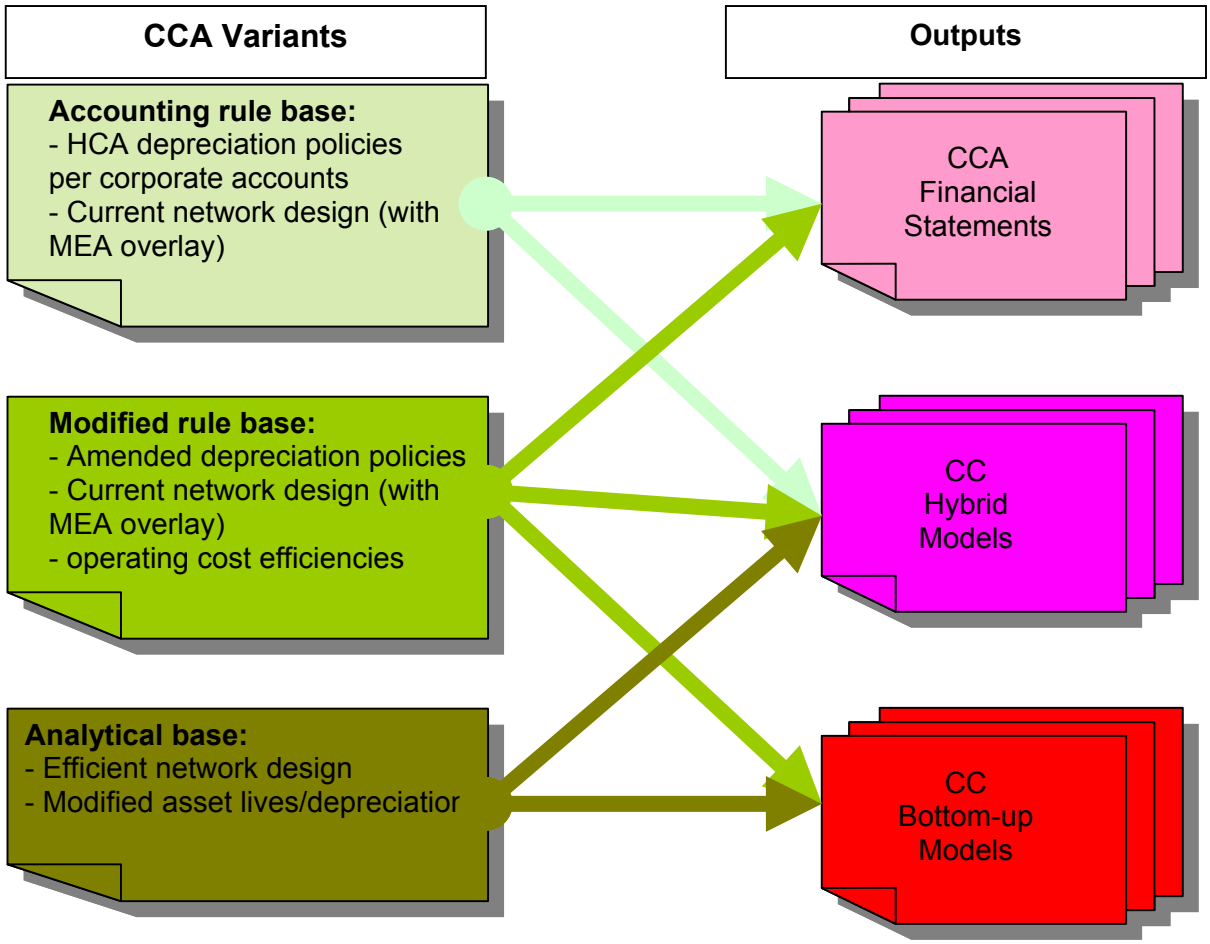
- Current cost based bottom-up models – sometimes described as "engineering" models or a "clean sheet" approach, these models apply current efficient network design criteria to create a network against which costs can be calculated.

However, the financial statements prepared from the operators' accounts (not subject to modelling assumptions or efficiency adjustments) are likely to show different results from bottom-up or top-down modelling results. It is important therefore that the preparation of financial statements and models is transparent in the way in which CCA methodologies are applied and that, where possible, variance analysis or reconciliation is carried out so that the affect of CCA is understood.



However, it cannot be assumed that CCA is applied in the same way to the different types of financial statement and models shown above. These financial statements and models are usually prepared using different assumptions and incorporate, as shown above, data from a variety of sources.

The diagram below illustrates some different variant types of CCA and where they may be applied:




It can be seen therefore that the term CCA may be used to describe the use of "current" costs but the underlying assumptions and basis of preparation may be different. It is very important that users of the financial statements/models understand these differences.

Although the above diagram is a simplification of NRAs' potential analysis of costs, it illustrates the importance of aligning this analysis with regulatory policy outcomes. For example, taking the above diagram:

| ***Depreciation profile*** | ***Regulatory position/policy*** |
|---|---|
| *A: "Accounting rule base"* | NRA satisfied that HCA asset lives fairly reflect economic lives and profile (e.g. straight-line) is also representative of asset "consumption". |

| | |
|---|---|
| *B: "Modified rule base"* | Accounting asset lives do not necessarily reflect economic lives because, for example, national accounting rules apply a broad brush generic depreciation period for certain types of asset. NRA would then reconsider and possibly overlay with revised asset life and appropriate profile. |
| *C: "Analytical base"* | Assets in use do not reflect efficient operator in configuration, technology, etc., therefore NRA constructs model base using latest technologies with estimated asset lives and profiles (costs of new efficient operator). |

The choices above illustrate how NRAs may wish to apply different criteria to derive a depreciation cost stream that more closely reflects the economic use of fixed assets so that pricing decisions are better informed.

It is not possible, therefore, in this PIB be too detailed about the use of CCA but to describe and illustrate the concepts in a way that allows NRAs, notified operators, other stakeholders and independent observers to gain further insight into the practical application of CCA and make informed decisions about financial information prepared using these concepts.

**PIB 2:**

**IRG recognises that the term CCA covers a variety of methodologies involving complex and interrelated assessments and judgements which can yield different results. The options chosen will be determined by the NRAs' policy objectives and that, to assist transparency and understanding, practitioners should ensure that users of financial information prepared using CCA methodologies are appropriately informed of the basis of preparation (i.e. data sources, processes and procedures), the relationship of those methodologies with the regulatory objective(s), and key assumptions.**

# Section 4

# The mechanics of CCA

The purpose of this chapter is to present an example to illustrate the mechanics of current cost accounting. This example will be used throughout this document to illustrate various aspects of CCA.

In Section 2 reference was made to the development of current costing accounting methodologies in the 1980s to deal with the effects of high levels of inflation on statutory accounts. The example presented on page 12 is based on the techniques of the current cost accounting theory. As a result of this, the example relates primarily to situations characterized in Section 3 as 'CCA Financial Statements' or top down models. This means that the example could have been derived from the books of an operator. As a result of this, not all the calculations presented in the example are necessary or useful in hybrid models or a bottom up model. Therefore, on page 16 we present a view on the use of CCA in the context of bottom up models.

## Background of the example

### Assets in the example

Communications networks may contain a wide variety of assets with significant variations in economic asset life. The table below presents five asset categories categorized by depreciation period. The examples given in each category are indicative. Any type of assets, whether they contain 'old' technologies such as PSTN, or whether they relate to modern technologies such as IP or 3G, can be valued using CCA methodologies.

| | *Asset category* | *Illustrative depreciation period* | *Asset characteristics/examples* |
|---|---|---|---|
| A | indefinite | not applicable | Some asset categories (such as land) may not be 'consumed' in the provision of services or do not show systematic reductions in value as a result of using it and therefore may not be subject to depreciation. |
| B | very long | 60-80 years | Significant engineering works (such as ducts) may have very long economic lives. |
| C | long | 20-40 years | Generally assets where a finite economic life is expected, but due to longevity of assets this may be difficult to estimate precisely. Replacement programmes may provide evidence of actual usage profile (such as copper drops). |
| D | medium | 5-15 years | The economic life of assets in this category is normally more straightforward to estimate. Heavy equipment may fall into this category. |
| E | short | 2-5 years | Often applicable to computer technologies where technological progress is rapid and regular replacement programmes are essential to maintain functionality and performance. |

It is possible that an operator has assets in use which are fully depreciated (which of course cannot apply to assets from category A, since they are not depreciated). This is not unusual, but it can cause difficulties when evaluating assets. Therefore, our example also includes a category F, fully depreciated assets.

The model only deals with the influence of CCA on the valuation and costs of fixed assets. It is unlikely that other types of assets, such as working capital, and other factors influencing asset values, such as foreign exchange adjustments, need to form part of an NRA's view of the relevant regulatory cost base of an operator, although NRAs may wish to review the potential materiality of these issues.

## Assumptions

The example assumes that the operator holds assets in each of the categories A to F. Assets are depreciated using straight line depreciation, except for asset category A, which is not depreciated, and category F, which is already fully depreciated.

| *Asset category* | *Asset example* | *Asset life* | *Depreciation period* | *Depreciation profile* |
|---|---|---|---|---|
| A | land | indefinite | indefinite | not applicable |
| B | duct | very long | 60 years | straight line |
| C | cabling | long | 30 years | straight line |
| D | power equipment | medium | 10 years | straight line |
| E | IT equipment | short | 2 years | straight line |
| F | any from category B/C/D/E | assets remain in use, although estimated economic life is exceeded | not applicable | not applicable |

For simplicity, with respect to asset categories B to E the example assumes an even flow of new investment which replaces the depreciated amount (value of asset 'consumed' in the year) with no overall increase in capacity of the operator. This would reflect a mature business with even flows of investment across all asset categories. In addition, we assume no residual values, so assets are depreciated to zero for the estimated (and for these purposes actual) economic life. As a result of these assumptions, net book values in a historical cost environment equal fifty per cent of gross book values (in other words: assets are half depreciated), and the net book values remain at the same level throughout the years.

## Base asset movement schedule

Based on the assumptions presented above an asset movement schedule in a historical cost accounting (HCA) environment for one financial year can be derived:

| | *A* | *B* | *C* | *D* | *E* | *F* | *Total* |
|---|---|---|---|---|---|---|---|
| Gross book value | 100 | 600 | 300 | 100 | 40 | 200 | 1340 |
| Accounting depreciation | 0 | – 300 | – 150 | – 50 | – 20 | – 200 | – 720 |
| Opening net book value | 100 | 300 | 150 | 50 | 20 | 0 | 620 |
| Investment | 0 | + 10 | + 10 | + 10 | + 20 | 0 | + 50 |
| Depreciation | 0 | – 10 | – 10 | – 10 | – 20 | 0 | – 50 |
| Closing net book value | 100 | 300 | 150 | 50 | 20 | 0 | 620 |

## The effects of (real) price changes

If however we take this example and reflect real price movements on the asset base the valuations in the books will look significantly different. Real price movements

refer to changes in value above inflation. Assume, for simplicity, that inflation is zero. Further assume that land (A) and ducts (B) experience a 5% increase in value each year, while power equipment (D) and IT equipment (E) are subject to a 10% and 20% respectively decrease of value annually and that cabling (C) is not subject to real price changes. For simplicity we assume that the fully depreciated assets in category F are part of category C, so price change equals 0%.

*Gross and net book values / Five year time frame*

This will result in the following gross replacement costs:[4]

| *Asset category* | *Price change* | *Gross replacement costs* | | | | |
|---|---|---|---|---|---|---|
| | | *Year 1* | *Year 2* | *Year 3* | *Year 4* | *Year 5* |
| A | +5% | 100 | 105 | 110 | 116 | 122 |
| B | +5% | 600 | 630 | 662 | 695 | 729 |
| C | 0% | 300 | 300 | 300 | 300 | 300 |
| D | –10% | 100 | 90 | 81 | 73 | 66 |
| E | –20% | 40 | 32 | 26 | 20 | 16 |
| F | 0% | 200 | 200 | 200 | 200 | 200 |
| Totals | | 1.340 | 1.357 | 1.378 | 1.404 | 1.433 |

Cumulative depreciation for each asset category is presented in the following table:

| *Asset category* | *Price change* | *Cumulative depreciation* | | | | |
|---|---|---|---|---|---|---|
| | | *Year 1* | *Year 2* | *Year 3* | *Year 4* | *Year 5* |
| A | +5% | 0 | 0 | 0 | 0 | 0 |
| B | +5% | 300 | 315 | 331 | 347 | 365 |
| C | 0% | 150 | 150 | 150 | 150 | 150 |
| D | –10% | 50 | 45 | 41 | 36 | 33 |
| E | –20% | 20 | 16 | 13 | 10 | 8 |
| F | 0% | 200 | 200 | 200 | 200 | 200 |
| Totals | | 720 | 726 | 734 | 744 | 756 |

Net replacement costs (NRC), then, equals gross replacement costs minus cumulative depreciation:

| *Asset category* | *Price change* | *Net replacement cost* | | | | |
|---|---|---|---|---|---|---|
| | | *Year 1* | *Year 2* | *Year 3* | *Year 4* | *Year 5* |
| A | +5% | 100 | 105 | 110 | 116 | 122 |
| B | +5% | 300 | 315 | 331 | 347 | 365 |
| C | 0% | 150 | 150 | 150 | 150 | 150 |
| D | –10% | 50 | 45 | 40 | 36 | 33 |
| E | –20% | 20 | 16 | 13 | 10 | 8 |
| F * | 0% | 0 | 0 | 0 | 0 | 0 |
| Totals | | 620 | 631 | 644 | 660 | 677 |

Small rounding errors

For fully depreciated assets, the net replacement cost is nil. So in fact no evaluation of the effects of real price changes is necessary, and their value will be nil independent of the price changes in the asset category.

This example seems to indicate only marginal changes in total NRC and relatively small changes in the accumulated deprecation. This is caused by the fact that the fictitious operator in the example holds assets which are subject to price increases as well as assets which are subject to price decreases. This will be a common finding in practice. However, it is unlikely that any particular communications service will use a

4 The term replacement costs will be explained in more detail in the next Section.

mix of assets where positive and negative real price movements approximately balance each other. Thus, after allocating costs to services, an NRA may find that some services are more subject to the effect of price changes than others, depending on the asset mix used to produce that particular service.

## Impact on a single year

As an example, if we take the category B assets from above for year 3 and look at the profit and loss impact of the CCA approach compared against HCA, then first it is necessary to calculate the asset valuation:

| | | *CCA* | | *HCA* |
|---|---|---|---|---|
| Opening NRC/NBV | | 315 | | 300 |
| New investment | | 11 | | 11 |
| Annual depreciation charge | | | | |
| -HCA | | | | -10 |
| -CCA | | -11 | | |
| Holding gain | | 31 | | |
| Closing NRC/NBV | | 331 | | 301 |

When current costing is applied on existing assets, as in this example, a gain or loss in value of the assets will be generated, due to the changes in price levels. This results in a holding gain or loss. In the case of asset B there is a holding gain, since the price increased. The holding gain of asset B equals 31,5 (5%*630). In cases of price decreases, there will be a holding loss.

Due to changes in price levels, the annual CCA depreciation charge will change. The annual depreciation charge equals the gross book value divided by the asset life (straight line depreciation with zero residual value). This results in the following:

- in the historical cost model 601,5 / 60 = 10,025. Note that the gross book value includes the investment of year 2 (+10,5) and 3 (+11,03).
- 661,50 / 60 = 11,025.

When the value of assets has changed, the cumulative depreciation in the past years may be too high or too low. In case of price increases, as is the case with asset B, additional depreciation has to be made, as can be seen by the fact that the current cost annual depreciation in year 3 (11) is higher than the (current cost) annual depreciation in year 2 (10,5). This results in a backlog depreciation of 16 (60 years of depreciation of 0,5 each year, of which half should be taken into account, since the assets are half depreciated). The backlog depreciation can be understood as a correction to the holding gain or loss. In case of a holding gain, part of the holding gain should have been depreciated already, so an additional depreciation has to be made. In case of a holding loss, too much has been depreciated, so there is a negative depreciation adjustment.

Note that investments take place against the value at the moment of the investment, which is by definition the current costs at the moment of investment. This is also the case when historical cost accounting is used. So under both methodologies the investment equals 11.[5]

The costs within these two approaches would be as follows:

5 More precisely 11,03.

| | *CCA OCM* | *CCA FCM* | | *HCA* |
|---|---|---|---|---|
| Depreciation | 11 | 11 | | 10 |
| Holding gain | | -31 | | |
| Backlog | 16 | 16 | | |
| Cost of capital (10%) | 33 | 33 | | 30 |
| Cost (included in the profit and loss statement or in the cost price calculation) | 60 | 29 | | 40 |

An NRA has to choose whether to consider the holding gain or loss resulting from the revaluation of the assets as a cost to be included in the profit and loss statement, or as attribute it to owner's equity. This relates to the FCM method and the OCM method. These methods will be explained in Section 6. An upward revaluation of assets, as in this example, generates a holding gain. When a holding gain is included in the profit and loss statement, it actually registers as a profit. However, a downward revaluation of the assets, as is the case with assets D and E, generates a holding loss, which increases costs included in the profit and loss statement (see also the table below).

Year 3 for all assets is presented in the following table:

| | *A* | *B* | *C* | *D* | *E* | *F* |
|---|---|---|---|---|---|---|
| **Balance sheet** | | | | | | |
| opening NBV | 110 | 315 | 150 | 45 | 16 | 0 |
| holding gain or loss | 5 | 31 | 0 | -9 | -6 | 0 |
| annual deprecation | 0 | -11 | -10 | -8 | -13 | 0 |
| investment | 0 | 11 | 10 | 8 | 13 | 0 |
| backlog | 0 | -16 | 0 | 4 | 3 | 0 |
| *Closing NBV* | 115 | 331 | 150 | 40 | 13 | 0 |
| | | | | | | |
| **Costs** | | | | | | |
| depreciation | 0 | -11 | -10 | -8 | -13 | 0 |
| backlog | 0 | -16 | 0 | -4 | -3 | 0 |
| capital costs | -12 | -33 | -15 | -4 | -1 | 0 |
| *Costs under OCM* | -12 | -60 | -25 | -8 | -11 | 0 |
| | | | | | | |
| holding gain or loss | 5 | 31 | 0 | -9 | -6 | 0 |
| *Costs under FCM* | -6 | -29 | -25 | -17 | -17 | 0 |

This simple example illustrates how the basis of preparation (HCA or CCA) combined with the choice of capital maintenance concept can result in very different cost profiles. These differences can also raise fundamental costing and pricing issues if regulatory decisions are based on different methodologies (i.e. where NRAs move from HCA based financial data to CCA).

## Conclusions

To summarize the example above, the following effects can result from using CCA, when price levels rise (fall):

- the value of the asset base is higher (lower) which will be used in the context of calculation cost of capital. Thus the cost of capital included in the profit and loss statement, or in the cost prices and charges based on it will be higher (lower).
- the increase (decrease) in asset value generates higher (lower) annual depreciation, which will be included in the profit and loss statement and the cost prices.
- an increase (decrease) in asset value generates a holding gain (loss), which may be included in the asset valuation, or may be included in the profit and loss

statement (this relates to the choice of using OCM or FCM, which is discussed in section 6). Depending on the choice this will influence either the asset value or cost levels.

The example above presents the type of calculations that are needed in the context of CCA. It would be expected however that in practice the fixed asset records, depreciation charges and CCA calculations would be significantly more complex and extensive.

Further, as noted before, the example makes no assumptions about the technologies applied and can be used in any business model scenario. It is important to stress that the stage of development of the business can be very important and that the simple model used here is probably closer to the core PSTN activities of a traditional ex-incumbent operator rather than relatively new 3G mobile network operators which are at a much earlier stage in their development.

## Current costing and bottom up LRIC models

In the example presented before on page 12, current cost accounting is applied to a set of assets registered in the operator's books. In contrast to using an operator's asset base as in top down models, an NRA can choose to use a 'CCA bottom up model', such as a LRIC model.

Bottom up modelling refers to the approach of modelling a new network, as if the operator would build a new network today. This means that an up to date network using current technology and using an efficient network layout can be modelled. Such modelling requires a lot of assumptions being made. Just to mention a few: which technology will be used in the model,and what network layout will be used (e.g. the most efficient network layout possible, which is the scorched earth approach, or using the network layout of the operator, which is the scorched node approach). In addition assumptions need to be made about current and future volumes to be handled by the network, as well as asset life, etc.

The asset base in a bottom up model may differ from the actual asset base used by the operator. One difference is that an efficient network is modelled, which means that it does not include inefficient or unused assets, as may be the case in the operator's existing network. In addition, other technologies may be used, creating other cost profiles. Further, the NRA may assume that a new network is built from scratch. This means that all assets are new, thus the opening net book value will equal the gross book value. This also means that there will be no fully depreciated assets in use, as may be observed in the HCA books of an operator (see asset category F in the example on page 12).

The selection of a depreciation methodology is essential for the calculation of annual costs. The choice of the depreciation methodology should ideally be the one which best reflects economic depreciation; this implies that holdings gains and holdings losses, which follow from changes in asset prices, should be taken into account. Typically, bottom-up models annualise capital costs using annuities (the annuity includes both the depreciation and capital charge and often will be "tilted"), although it also has the functionality to annualise capital costs in a number of different ways. A tilted annuity calculates an annuity charge that changes between years at the same rate as the price of the asset is expected to change. This results in declining annualisation charges if prices are expected to fall over time; for a large enough tilt the slope of the depreciation profile will also be negative. As with a standard annuity,

the tilted annuity should still result in charges that, after discounting, recover the asset's purchase price and financing costs. The tilted annuity approach has the advantage that the annualisation charge is independent of the age of the asset. The fact that the bottom up model is modelling new assets therefore becomes less of an issue.

In the example related to top down models presented in Section 4.2 top, gross replacement costs have been derived using the operator's asset register as point of departure. Here, when calculating costs bottom up, the point of departure is the current and future (which in this case is assumed to be unchanged) demand for network services and the number of assets necessary to produce the demanded volumes.

Assume that the necessary amount of assets in category B (duct) is ten units (km) less in a optimised network compared to the real network, whereas calculations show that the optimised network will need five units of asset category F instead of twenty. This will result in the following gross replacement costs for year 3:

| *Asset category* | *Top Down* | *Top Down* | *Bottom Up* | *Bottom Up* | *Bottom Up* |
|---|---|---|---|---|---|
| | *GRC* | *Number of units* | *Number of units* | *Price per unit (year 3)* | *GRC* |
| A | 110 | 5 | 5 | 22 | 110 |
| B | 662 | 100 | 90 | 6,63 | 597 |
| C | 300 | 30 | 30 | 10 | 300 |
| D | 81 | 10 | 10 | 8,1 | 81 |
| E | 26 | 10 | 10 | 2,6 | 26 |
| F | 200 | 20 | 5 | 6,63 | 33 |
| Totals | 1379 | | | | 1147 |

In this example, the gross replacement cost in the bottom up model is 17 per cent lower than in the top down model.

The next step is to calculate annual cost (depreciation charge and cost of capital). This example is using tilted annuity, whereas price trends, assets lives and cost of capital (10%) is the same as in the previous examples.

| *Asset category* | *Top Down* | *Bottom Up* | *Bottom Up* | *Bottom Up* | *Bottom Up* |
|---|---|---|---|---|---|
| | *GRC* | *GRC* | *Asset life* | *Price trend* | *Annual cost* |
| A | 110 | 110 | 999 | 5% | 6 |
| B | 662 | 596,7 | 60 | 5% | 32 |
| C | 300 | 300 | 30 | 0% | 32 |
| D | 81 | 81 | 10 | -10% | 19 |
| E | 26 | 26 | 2 | -20% | 17 |
| F | 200 | 33 | 30 | 0% | 4 |
| Totals | 1379 | 1147 | | 1147 | 108 |

**PIB 3**

**When using a BU model, NRAs calculate the costs of an efficient operator with efficient and optimised network infrastructures.**

**IRG believes, in respect of bottom-up models, that the choice of CCA asset depreciation periods and profiles is unconstrained by those used in the historical cost accounts, but these choices can be informed by the information available from the operator's accounting and operational systems. NRAs should choose CCA asset depreciation periods and profiles that reflect the economic life of the assets.**

# Section 5
# Valuation Basis

## Introduction

Measuring gross and net asset values under CCA tends, in practice, to start with an assessment of the replacement costs of the asset. Assets which are readily tradable in the open market – perhaps standard office accommodation or vehicles - could use the realisable approach (open market valuation). However, assets forming core communication infrastructure are not usually traded in open markets.

## Theoretical value assessment

The current cost (CC) of an asset is the lower of its net replacement cost (RC) and its recoverable amount that is the higher of its net realisable value (NRV) and its economic value (EV). This rule is based on the assumption that:

- If the EV > NRV, the operator will keep the asset in current use;
- If NRV > EV, the operator will sell the asset now as the proceeds from the sale would exceed the economic value that it would be expected to generate from its continued use.

If these amounts are graded depending upon whether they are the highest (H), lowest (L) or the medium (M) of the three, there are six possible orders. These, and the current cost for each, are shown below:

| RC | NRV | EV | CC |
|---|---|---|---|
| L | M | H | RC |
| L | H | M | RC |
| M | L | H | RC |
| M | H | L | RC |
| H | L | M | EV |
| H | M | L | NRV |

Where the replacement cost methodology is used it is important to distinguish between those assets which would be replaced with the same technology and those where an alternative technology would be used. For assets which would be replaced with a near identical asset, it would be reasonable for the valuation to be based either on an absolute valuation methodology or on an indexation approach. The former involves examining the volume of equipment used in the network and multiplying it by the current asset price. However deriving the procurement cost of an asset could be materially affected by, amongst other things, purchase volumes (where, for example, there may be significant volume discounts). It is reasonable to assume normal procurement volumes in this situation even though higher volumes may indicate lower unit prices. An alternative methodology involves adjusting the historic valuation by an asset price index for the period between acquisition and the current date.

A feature of communications networks is that in some cases new technologies may have been developed since the existing asset was installed so that the replacement asset may feature improvements in functionality or lower lifetime costs. In this case the Modern Equivalent Asset (MEA) valuation approach, as described here, should be used. There may be cases where the functionality of equipment has changed. These differences should be reflected in the value attributed to equipment.

## Valuation Methodologies

In top-down models, where a valuation of assets in a current asset base is required, there are four main bases for valuing assets in a CCA framework. A bottom-up model is generally to refer to MEA or absolute valuation methodologies:

- historic costs;
- Indexation;
- absolute valuation; and
- Modern equivalent asset.

### Historic costs

This method of valuation uses the historical cost (i.e. the original purchase price) and could be used where there has been no material change in asset price between purchase date and valuation date, or where the asset life is short and assessing real price changes would not result in a material difference to the asset value. For example, historic costs could possibly be used in the case of desktop computers which companies would often depreciate over fairly short lives and these assets may not demonstrate significant improvements in functionality over that time.

### Indexation

The indexation approach applies appropriate indices to the historical cost of the assets and is suitable for situations where there is little technological change but real price changes are material. The main example where indexation can be applied could be land and buildings. The choice and calculation of the index is however critical and finding or constructing reliable and robust indices are not trivial tasks. It is also important to verify that the base value is correct for this purpose. Indexation has the advantage that it does not require an inventory of equipment whereas absolute valuation does.

### Absolute valuation

This is used when there is some technological change but the asset concerned can still be purchased in a similar form. It involves multiplying the existing quantity by the current acquisition price. This method would be preferred to indexation since, for example:

- The asset may be comprised of a number of separate elements requiring different indices particularly as the importance of these elements may vary over time.
- The resulting valuation will be based on assets in use and not dependent on the accuracy of the book values of assets.

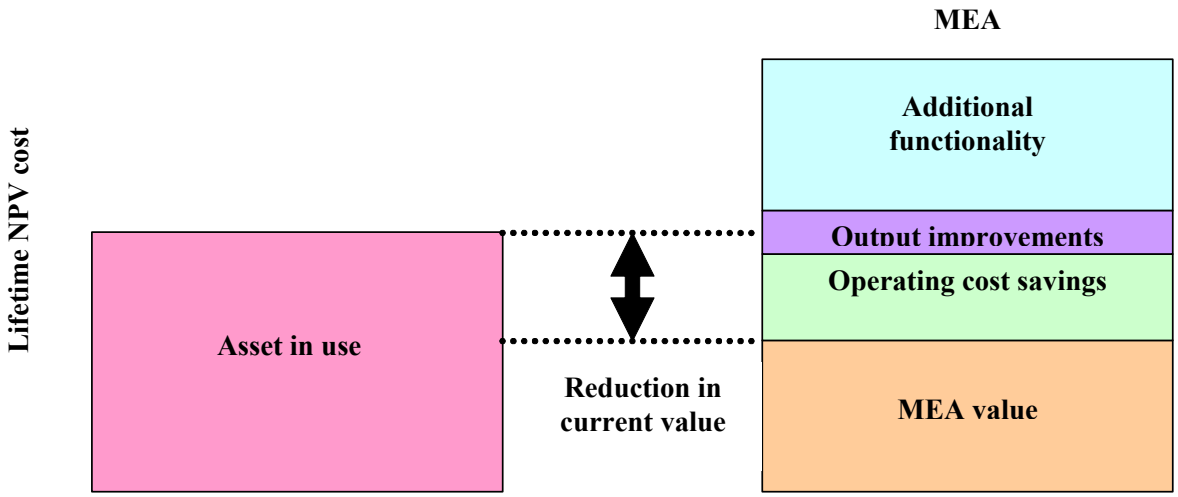
This method requires the accurate recording and maintenance of an asset register.

### Modern equivalent asset (MEA)

This is a standard approach to asset valuation where technology has changed (for example resulting in significant improvements in productive efficiency, functionality or operating cost reductions) and the asset in use cannot be purchased in the form currently utilised by the operator. In such cases, the aim is to derive the cost of a

functionally identical modern asset. This method of valuation can be used for analogue based switching and transmission equipment where digital equipment is the obvious replacement technology. MEA may also be applicable where significant advances have been made in older digital technologies.

An important point is that any significant change in the functionality of the MEA means that the latter provides the services of the existing asset plus something extra. Hence, for valuation purposes, the value of the modern equivalent asset should be calculated taking into account the fact that the existing asset does not possess the extra functionality and different operating costs. A related point is that the aim of CCA valuation should be to reflect the economic value of the asset (which is determined by the associated future revenues less operating costs). This whole life discounted cash flow cost approach means that if, for example, the operating costs of the existing asset are materially different –i.e. higher or lower than those of the MEA, it is necessary to adjust the valuation accordingly. This can be represented as follows:




In this schematic example:

*Additional functionality* – represents the value of additional functionality provided by the modern equivalent asset but not present in the asset in use. An example may be caller ID facilities.

*Operating cost savings* – represents the value of operating cost savings arising from the use of MEA. For example, new IT equipment may be more power efficient.

*Output improvements* – the MEA may simply be capable of providing more of the same outputs.

*MEA value* – represents the value to be placed on the asset in use. If this value exceeds the current asset in use value then it is unlikely to represent the appropriate value for CCA purposes.

There are in practice significant difficulties in estimating the abatement factors for some of these MEA issues. However, without close scrutiny of the assumptions that underpin the MEA valuations, there is the probability that CCA asset values of networks in use will be overvalued because insufficient emphasis is given to the abatement of capital costs for additional functionality or lower operating costs.

## Spare and surplus capacity and assets

In applying CCA it is important to develop an approach to assets that are not fully utilised or used at all. This is because there may be assets that are captured by valuation methodologies that are redundant or surplus to the current and foreseeable future needs of the products and services being costed and, therefore, potentially excluded from the valuation. It is very unlikely however that any network utilises all of its assets 100% of the time. Also, engineering design parameters will tend to allow for growth and expansion as well as unavoidable modularity (e.g. certain assets can only be efficiently procured with minimum capacity specifications or in "bundles").

Evaluating the extent and materiality of spare or surplus capacity is more of an issue in top-down models where the quality and detail of asset records may be insufficient to support valuation calculations. In bottom-up models, the implied assumption is that the parameters used to determine the stock of assets will allow for normal engineering planning assumptions and therefore redundant assets would be excluded.

**PIB 4**

**IRG recognises the use of CCA is primarily concerned with the valuation of fixed assets and that the type of valuation methodology applied to different asset types is objectively justified and supported by relevant evidence (i.e. current purchase or construction prices, and relevant indices).**

**PIB 5**

**IRG recognises the importance of ensuring that, where MEA valuations are used, the choice of replacement or alternative asset(s) used for the valuation are appropriate and potential valuation adjustments (e.g. for productive capacity, operating cost savings and additional functionality) are fully considered in deriving the MEA valuation.**

## Calculating gross/net replacement costs and depreciation profiles

### Gross replacement cost (GRC)

The gross replacement cost of an asset is its full economic value calculated using a relevant valuation methodology before depreciation.

The GRC can be calculated in a number of ways. The valuation process could use open market value or various forms of indexation. Although the current cost of an asset is often its net current replacement cost, this does not mean that it can be assumed that the asset would be replaced by an identical asset, as this will seldom be the case. Indeed, it may be that identical assets are no longer available. It is the replacement of the 'service potential', or capacity to produce similar useful output or service, which is assumed.

A gross replacement cost would approximate to the value of a brand new network providing the same level of functionality and capacity as the existing network using assumptions for modern equivalent assets or alternative valuation methodologies.

## Net replacement cost (NRC)

NRC calculations are required so that balance sheet values can be derived and CCA depreciation/holding gains/losses calculated. These calculations for an operator will reflect the different ages and depreciation profiles of the assets in use. A more stylised approach may be adopted for bottom-up models such as the use of annuities to derive depreciation flows over time. A NRC will also give more appropriate measures of profitability such as the return on capital employed.

The following refers predominantly to top-down or accounting based models. The current cost depreciation charge can be calculated in the same way as the historical depreciation charge, except that it is current cost rather than historical cost which is being depreciated. As such, the same depreciation methods and asset lives as are used in the historical cost accounts should be used. Therefore, assets with Net Book Value equal to zero, i.e. fully depreciated under HCA, but still in use, are normally valued, for current cost accounting purposes, at a net replacement cost equal to zero.

There are a number of methodologies which could be used for this purpose:

- The NPV methodology
- Application of the historic cost ratio of net to gross book value
- The roll forward methodology
- Detailed estimation from the financial records

## The NPV methodology

Essentially this method involves estimating the NPV of the asset at the end of each year based on cumulated expected discounted cash flows (economic depreciation is the difference between these cash flows at the end of one year and at the end of the next year). A further issue is that whereas the application of this methodology may make a significant difference to the profile of net replacement costs over the lifetime of a single asset where there are multiple vintages to be considered, as in a top-down model, it is likely to generate similar results to the rolling forward methodology.

Application of the historic ratio method of NBV (net book value) to GBV (gross book value)

A second and much more straightforward approach is to multiply gross replacement costs by the NBV/GBV ratio. This approach will generate accurate results where there have been only small real price changes and/or even flows of new investment but will otherwise result in biased outcomes. For example, where the asset price has been increasing in value the NBV/GBV approach will overestimate asset values; where the asset price has been decreasing in value the NBV/GBV approach will underestimate asset values.

### Roll forward methodology

The roll forward methodology calculates the net asset valuation as the gross asset valuation less cumulated current cost depreciation. To generate the gross asset statement the following procedure is used:

*(i) multiply the gross replacement cost at the start of the year by the square root of (1+ Asset price inflation during the year)*
*(ii) add capital expenditure during the year*
*(iii) subtract the gross values of disposals*
*(iv) multiply sum of i)-iii) by the square root of (1+Asset price inflation during the year).*

An analogous procedure can be used to generate the cumulated current cost depreciation statements. The rolling forward procedure produces accurate results except where there are fully depreciated assets. Where these are significant an alternative should be used.

## Detailed estimation from the financial records

The final methodology uses as a starting point the gross replacement cost of equipment (by class of asset) for each vintage of equipment. The valuation for individual years is then multiplied by remaining lifetime over book lifetime. Thus, if the equipment has a GRC of £2m, was purchased 8 years ago and has a 10 year asset life, its net replacement cost of £2m x (10-8)/10 =£0.4m. This is the preferred method where investment cycles are uneven and/or long life assets are involved. HCA fixed assets records would normally be expected to provide sufficient information to apply this method.

**PIB 6:**

**IRG considers that the choice of method used to calculate net replacement costs (NRC) is assessed against the quality of asset information available and the materiality of the result. NRC methods should be kept under review so that improvements in cost data and asset information can be incorporated in future calculations.**

## Other specific valuation issues

As discussed earlier one of the steps involved in the calculation of MEA values is the potential for an adjustment to reflect different operating cost profiles. There are a number of other factors which NRAs may consider in deriving or reviewing CCA valuations. The following is a non exhaustive list of other issues which an NRA may consider:

- Maintenance & Repairs: When assets are upgraded and revalued to a newer more modern equivalent (not necessarily using an MEA) it would then follow that these assets may require less ongoing maintenance and repairs, which will result in reduced operating costs which should be reflected in the CCA valuation.

- Surplus or spare capacity: Illustrations of this aspect, briefly described above, could be:

- Where poor long term investment decisions did not foresee significant shifts in demand or technology.
- Where buildings were designed to accommodate electro/mechanical switching equipment which has been replaced by digital equipment occupying significantly reduced footprints. As a result the CCA value of buildings can be reduced to reflect the smaller footprint although the larger buildings (with surplus areas) continue to be used.

- Redundant capacity/decommission costs: If decommissioning costs are incurred in taking redundant assets out of service, it would be expected that these costs are offset against the scrap or resale value of those assets. The impact of these adjustments would be expected to be immaterial and normally ignored for valuation purposes.

- Systems valuations: systems containing a mix of plant types should be valued as a whole. If the mix is out of balance or developed inefficiently, the valuation should take account of these factors by adjusting for inefficiencies.

- Leasing – companies could have entered into leasing arrangement in the past and under different economic conditions i.e. a telco may have entered into a long term lease for a building, some years back when there was less demand for building in large urban areas and the cost of the lease would have been at the going rate at the time of negotiation. Subsequently the cost of the building and the value of the lease could have increased in value. The value of such leases should reflect the risk and reward carried by the telco taking account, for example, of the telco's freedom to realise the increase in value of the lease.

- Off balance sheet financing: it is possible that operators utilise assets that sit off balance sheet either through finance leases or other methods. NRA will wish to determine if these assets should be reflected in the regulatory asset base depending on factors such as the nature of the financing instrument or the risk or reward attached to movements in the asset value.

**PIB 7:**

**IRG believes that there are a number of detailed aspects to the use of CCA that potentially could materially affect the results or outputs and therefore recognises the key role of validation and review procedures. Such factors could include, for example:**

**(i) the use of MEAs in forward looking financial models;**

**NRAs should consider the implications on forward looking financial models of productive and efficiency assumptions reflected (or not) in the MEA valuation.**

**(ii) asset values being artificially inflated by allowing a valuation of surplus capacity;**

**NRAs should analyse the value of capacity that is in surplus to normal requirements and exclude the excess capacity from the relevant regulatory cost base.**

**(iii) the use of off-balance sheet finance and leasing arrangements that may distort asset ownership and valuations.**

**NRAs may need to take account of asset financing and operational arrangements which, as reflected in the financial statements of the operator, do not allow full visibility of the asset base or provide adequate clarity of ownership.**

# Section 6
# Capital Maintenance

## Introduction

Before explaining the calculation and issues relating to capital maintenance concepts, it is briefly worth revisiting the ERG Opinion on the European Commission's Recommendation on cost accounting and accounting separation which describes the two main concepts as follows:

"Capital can either be viewed in operational terms (i.e. as the operator's capacity to produce its services) or in financial terms (i.e. as the value of shareholders' equity). These concepts are known respectively as operating capital maintenance (OCM) and financial capital maintenance (FCM):

- OCM considers the operating capability of the operator is maintained. Capital maintenance under this approach requires the operator to have as much operating capability – or productive capacity – at the end of the period as at the beginning. In this approach, revenues become profits after a sufficient amount has been provided to maintain the physical capability of the asset.

- FCM considers the financial capacity of the operator is maintained in current price terms. Capital is assumed to be maintained if shareholders' funds at the end of the period are maintained in real terms at the same level as at the beginning of the period. In this approach, revenues become profits after a sufficient amount has been provided to maintain the financial value of the asset (or the operator)."

Other sections of this document describe the ways in which assets may be valued, net book values calculated and deprecation derived. However, accounting profit is in essence the difference between the opening and closing capital of a company, and so a profit arises only after provision has been made for the maintenance of capital. This capital can be viewed either in financial terms or in terms of "operating capital" of the company. Under the financial capital maintenance concept (sometimes referred to as the real terms system), any real increase or decrease in the current costs of assets forms part of reported total gains or losses.

## Outline explanation of the two basic approaches

### Explanation of OCM

As explained above, accounting profit is in essence the difference between the opening and closing capital of a company. "Operating capital" can be expressed in a number of ways, although it is usual to express it as the productive capacity of the company's assets in terms of the volume of services and products capable of being produced (the "volume concept of operating capital").

Applying this capital maintenance concept to a communications company means that the interpretation and measurement of productive capacity is vital particularly where technologies and products are changing relatively rapidly.

Under OCM, where assets increase in value in real terms, the net profit will suffer (in comparison to HCA reported profits) from additional depreciation charges although

the shareholders capital will improve because holding gains are accounted for in reserves.

## Explanation of FCM

FCM, sometimes referred to as the "real terms" system of accounting, measures whether a company's financial capital (i.e. shareholders' funds) is maintained in real terms. Any real increase or decrease in the current costs of assets therefore forms part of reported total gains/losses. This contrasts with the OCM approach where such gains or losses are taken direct to current cost reserves.

## Discussion on choice of method

In practice, the only significance accounting difference between OCM and FCM is the treatment of holding gains or losses. What is important from a regulatory stance therefore is that regulatory policy recognises that the use of CCA also implies recognition of and understanding of holding gains/losses and the potential for these adjustments on regulatory decisions.

Holding gains (or losses) can be calculated as follows:
*Gross holding gain* $= GRC_{closing} - GRC_{opening} -$ *additions* $+$ *disposals (at current cost)*[6]

*Net holding gain* $=$ *Gross holding gain* $-$ *backlog depreciation.*

In deciding on the appropriate capital maintenance concept, a NRA will want to consider, in the context of its regulatory objectives:

a) the treatment of holding/gains losses for reporting purposes and
b) the appropriate methodological approach in the application of holding gains/losses to its decisions.

This is a complex issue with potentially significant importance on price control decisions. At this stage in the development of CCA by NRAs and the linkage to other aspects of regulatory policy, it is not considered appropriate to provide definitive guidance on what concept to use in specified circumstances. However, it is expected that this topic could be explored further if this document were to be reviewed in the future when analysis could call on a greater body of NRAs' experience in the application of CCA.

**PIB 8:**

**IRG recognises that holding gains or losses created by the use of CCA need to be reviewed and the implications of different treatments of these CCA adjustments properly assessed against regulatory objectives. The choice of capital maintenance concept (operational or financial) should be consistent with the regulatory policy objective although one capital maintenance concept should be used for reporting purposes.**

6 The GBV of disposals is multiplied by the ratio GRCopening / GBVopening for the asset concerned.

# Section 7

# Presentation and disclosure

Disclosing financial information in a clear and informative way has always been a challenge for practitioners. CCA is a technically complex topic but, as explained in this document, is often used or referred to in determining important regulatory decisions such as price controls or investigations into alleged anti-competitive behaviour such as margin squeeze. Therefore, adequate disclosure of financial information prepared on a CCA basis in a form that is clear, unambiguous and explains fully the basis of preparation cannot be understated.

This information will also be accessed by a variety of interested parties for a variety of reasons. This PIB does not attempt to second guess or analyse all of these needs but indicates some of the key aspects of CCA that a user would wish to understand.

The ERG has set out the main principles to apply in determining appropriate levels of disclosure and the form of that disclosure in its "Opinion on the Proposed Review of the Recommendation on Cost Accounting and Accounting Separation" In summary, the key principles relating to presentation and disclosure are:

*Transparency:*
An operator shall ensure that any data, information, description material or explanatory document used in the preparation of regulatory financial information is prepared to a standard that allows a suitably informed reader to gain a clear understanding of that information etc. For example, in the case of CCA this will mean full access to and explanations for the basis of valuation and sources of indices (if used).

*Commercial confidentiality:*
Certain aspects of the data used in preparing CCA based financial data may be considered commercially sensitive and rules applied to other information can equally be applied here. There may, for example, be legitimate sensitivities with equipment manufacturers about detailed current asset purchase costs.

## Specific disclosures

This section sets out some of the specific aspects of CCA where disclosure could be relevant or necessary to adequately inform the reader.

### Expensed or profit & loss items

Most expensed items will be recorded on a "current" basis in the HCA books and so no CCA adjustments are necessary. CCA will normally generate adjustments to HCA entries directly related to asset values where CCA results in a value different from the HCA book value. These adjustments fall into three main categories:

***CCA depreciation:***
A result of amending net HCA asset book values to CCA values will be to generate a revised depreciation stream. This is normally reflected in the profit and loss account by showing the adjustment (positive or negative) to normal HCA depreciation.

***Holding gain/loss***
Holding gains/losses are passed through the profit and loss account when the financial capital maintenance method is used. These adjustments are important indicators of the relative cost movements of assets and should be disclosed separately.

***Other adjustments***
It may be the case that other amendments are made to the basis of preparation (for example to the asset life) resulting in adjustments that cannot be categorised under the two headings above. It is recommended that these are identified and possibly disclosed separately.

***Mean capital employed (MCE) statements***
As long as it is clearly stated that the MCE statements have been prepared on a CCA basis it is not normally expected that CCA adjustments would be shown. It may be expected however that supporting subsidiary information such as the asset movement schedule would include separate disclosure of the depreciation adjustment for example.

NRAs are normally interested in the assets employed in the provision of communication services and will not necessarily require the preparation of a full balance sheet. Therefore many CCA adjustments such as the holding gain/loss under the operating capital maintenance concept will not be shown.

The disclosure of CCA adjustments discussed above is normally only relevant where CCA is applied to the preparation of top-down financial statements where the data is sourced from and reconcilable to HCA records. Where current costs are used in the preparation of one-off bespoke or bottom-up models using stand-alone inputs, it is usually not possible to extract this information. Top-down models do however allow better access and visibility of the detailed calculations and methodologies used.

**PIB 9:**

**IRG believes that published regulatory financial statements or similar statements should contain full disclosure of CCA adjustments (depreciation, holding gains/losses and other) where CCA is used as the basis of preparation.**

## Section 8

# Validation and audit

NRAs will wish to ensure that any financial information presented to it has been prepared to the highest standards using appropriate methodologies. It may also be necessary to validate or audit the information. Information prepared using CCA concepts presents additional challenges to reviewers or auditors as it often requires the preparer to make judgements and assessments beyond those used to prepare HCA information.

Where CCA accounts are prepared, for top-down reporting purposes, in a form similar to under generally accepted accounting practices (HCA "statutory" accounts) it can be expected that an audit opinion to the "fairly presents" standard can be requested. These accounts would be reconcilable to the statutory accounts and use the same source data such as the fixed asset system.

Where, however, CCA concepts are used in a more selective manner, say to assist the preparation of a bottom-up "stand-alone" model, it may be possible to review some of the cost inputs but a formal audit opinion would not normally be possible.

***PIB 10:***

***IRG recognises that for the use of CCA to be acceptable it is necessary for the CCA methodologies, systems, processes and outputs to be sufficiently robust and comprehensive so as to allow an independent audit or validation to be undertaken.***

# Section 9

# Transition and other issues

## Moving from HCA to CCA

Where NRAs have previously used HCA based financial data for regulatory decision such as price controls and then move to CCA based information, it is important that all parties understand the main differences in the underlying financial data resulting from this change. This may not be obvious because overall outputs may look similar but, for example, could potentially hide significant one-off CCA adjustments (such as holding losses) offset by CCA depreciation adjustments. The choice of capital maintenance concept will also influence the disclosure and treatment of holding gains or losses.

It is also important that cost recovery profiles and pricing decisions are not mixed or confused with CCA cost information. For example if significant holding gains accrued whilst HCA data was used are not identified and reflected in a pricing decision it is possible that NRAs will allow excess returns over asset lifetimes.

These transition or windfall gains or losses could be treated as follows:

- *Write off to the P&L in the year of revaluation:*

  This may be appropriate if the changes are immaterial or, if not, adjustments relating to prior periods should be separately identified. It is important that returns are measured on a consistent basis with no distortions caused by prior period activity.

- *Amortise and write gains/losses off over remainder of the assets' life or other appropriate period:*

  This may be an approach used when assessing the pricing options rather than preparing financial statements. There is little conceptual basis to this approach but NRAs may accept that part of prior year CCA adjustments are relevant for forward looking pricing decisions.

- *Ignore these holding gains/losses:*

  It would be acceptable for these transition adjustments to be excluded from forward looking price decisions as this would more closely represent behaviour in a competitive market.

Whatever choice an NRA makes it is clearly important the rationale and calculations are transparent to interested parties.

## Fully or under/over depreciated assets

Whatever approach is used to determine an asset's NRC, it is necessary to estimate the economic life of the asset. Top-down models may take as a starting position the estimated life used in the preparation of a company's statutory or management accounts. Bottom-up models however could take data from a variety of sources such as benchmark information, economic asset life calculations or actual accounting data.

In addition a choice has to be made on the time profile of depreciation charges. Where, for example, an asset is known to depreciate faster in the early stages of its

life, it may be prudent to front load depreciation charges. Conversely, it may be the case that the modularity of an asset may mean that it is "consumed" less (or produces well below its design capability) in the early stages of its life and therefore depreciation can be "back loaded" to reflect greater use of the asset later in its life.

Another common issue is that networks, typically fixed networks, often contain assets with very long lives and this fact combined with prudent accounting policies mean that certain categories of assets may be fully depreciated in the books of the telco. This may complicate regulatory decisions where previous price controls may have used the accounting lives but current and future cost profiles do not include a depreciation charge for fully depreciated assets even if those assets remain in use. These costs may already have been recovered in the past so allowing future recovery will allow double cost recovery but assets in use suggest they retain some economic value that, if not reflected in pricing decision, may send incorrect economic signals to the market.

It is important that NRAs and other stakeholders understand the implications of choice of asset life and depreciation profile on cost accounting and pricing models. For top-down models, this would normally mean that the judgements taken for accounting purposes are used as the base case and assessed against regulatory objectives. These may need adjustment, for example where the accounting records are required to be prepared against an arbitrary methodology specified by other authorities (i.e. for tax purposes).

**PIB 11:**

**When transitioning between HCA based financial data and CCA based financial data, IRG believes that detailed analysis and review of material changes in the cost base may be required before making regulatory decisions based on CCA outputs so that transitional or windfall adjustments are explicitly identified and taken into account.**

**PIB 12:**

**IRG believes, in respect of top-down or accounting based models, that CCA accounting rules for asset lives can, as a starting point, be consistent with the policies used by the operator in preparing its financial or statutory accounts. However, estimated asset lives for accounting purposes applied historically may not provide an appropriate economic cost base for regulatory decisions. Where these lives, including for example fully depreciated assets that remain in use, conflict with regulatory objectives then objective alternative depreciation profiles should be considered.**

# Annex A

# Additional worked example

The following is a more detailed example of the calculation of CCA depreciation for illustrative purposes.

- The *yearly asset depreciation* (index C of the illustrative sheet) is calculated on the basis of the current gross value of the asset and is equal to the ratio of its current gross value to its lifetime. (a)

- The *yearly required accumulated depreciation* (index D) is equal to the sum of the asset depreciations which should have been put in provision under the assumption of an initial acquisition equal to the asset current value at that time.

- The *yearly supplementary depreciation* (index F) is equal to the difference between the depreciation calculated on the current gross value and the depreciation calculated on the historical gross value (the initial acquisition value of the asset). The supplementary depreciation is positive in the case of an increase of the asset value as new and negative if decreasing. (b)

- The *yearly accumulated depreciation* is equal to the sum of the effective asset depreciations recorded to date since the acquisition. In other words, this depreciation is equal to the sum of the yearly asset depreciations based on yearly current gross values.

- The *backlog* is equal to the difference between the *yearly accumulated depreciation* and the *yearly required accumulated depreciation* (index G). (c)

| Year | Index | Calculation | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Current gross value at the end of year N | A | | **1000** | 1020 | 1040 | 1061 | 1082 | 1104 | 1126 | 1149 | 1172 | 1195 | 1219 |
| | | | | | | | | | | | | | |
| Historic straight-line depreciation - Year N | B | Initial investment Year 0 / Lifetime | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Asset depreciation - Year N | C | Current gross value Year N / Lifetime | | 102 | 104 | 106 | 108 | 110 | 113 | 115 | 117 | 120 | 122 |
| Required accumulated depreciation - Year N | D | C Year N x Number of years N | | 102 | 208 | 318 | 433 | 552 | 676 | 804 | 937 | 1076 | 1219 |
| | | | | | | | | | | | | | |
| **Current cost accounting** | | | | | | | | | | | | | |
| Historic straight-line depreciation - Year N | E | B | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Supplementary depreciation - Year N | F | C - B | | 2 | 4 | 6 | 8 | 10 | 13 | 15 | 17 | 20 | 22 |
| Backlog - Year N | G | D - Sum of asset depreciations from Year 0-to-date - Sum of backlogs from Year 1-to-Year N-1 | | | 2 | 4 | 6 | 9 | 11 | 14 | 16 | 19 | 22 |
| **Current cost depreciation** | **H** | **E + F + G** | | **102** | **106** | **110** | **115** | **119** | **124** | **128** | **133** | **138** | **143** |

*Example of a 20% positive asset revaluation, for an asset of 1000 as acquisition value and depreciated on 10 years*

| Year | Index | Calculation | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Current gross value at the end of year N | A | | **1000** | 900 | 810 | 729 | 656 | 590 | 531 | 478 | 430 | 387 | 349 |
| | | | | | | | | | | | | | |
| Historic straight-line depreciation - Year N | B | Initial investment Year 0 / Lifetime | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Asset depreciation - Year N | C | Current gross value Year N / Lifetime | | 90 | 81 | 73 | 66 | 59 | 53 | 48 | 43 | 39 | 35 |
| Required accumulated depreciation - Year N | D | C Year N x Number of years N | | 90 | 162 | 219 | 262 | 295 | 319 | 335 | 344 | 349 | 349 |
| | | | | | | | | | | | | | |
| **Current cost accounting** | | | | | | | | | | | | | |
| Historic straight-line depreciation - Year N | E | B | | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Supplementary depreciation - Year N | F | C - B | | -10 | -19 | -27 | -34 | -41 | -47 | -52 | -57 | -61 | -65 |
| Backlog - Year N | G | D - Sum of asset depreciations from Year 0-to-date - Sum of backlogs from Year 1-to-Year N-1 | | | -9 | -16 | -22 | -26 | -30 | -32 | -33 | -34 | -35 |
| **Current cost depreciation** | **H** | **E + F + G** | | **90** | **72** | **57** | **44** | **33** | **24** | **16** | **10** | **4** | **0** |

*Example of a 10% negative asset revaluation, for an asset of 1000 as acquisition value and depreciated on 10 years*

The yearly provision for assets depreciation is recorded in P&L losses and is equal to the sum of the yearly assets depreciations based on (a), (b) and (c).

The yearly net value of the assets base is recorded in the balance sheet and is equal to the difference between the sum of the yearly assets depreciation based on (a), (b) and (c), and the assets gross value.

In a well-understanding and simplifying aim, *Current cost depreciation* will be retained as the (a+b+c) sum (index H) and *Historical cost depreciation* as the straight-line historical depreciation.

It has to be noticed that the historical assets base on which is usually applied the yearly WACC rate in an HCA is replaced by the current assets base in a CCA. The cost of capital remains the same whatever the capital maintenance method retained.

## Annex B

## GLOSSARY

| | |
|---|---|
| **Attribution system** | *The processes, systems, procedures used to apportion and allocate an operator's revenues, costs, assets and liabilities to its activities, businesses, components, services and products.* |
| **Book value (include in explanation gross and net)** | *The amount recorded in the accounting records of the operator in respect of fixed assets normally including acquisition and commissioning costs plus, if appropriate, internal costs incurred in bringing the asset into use. The net book value represents the gross value less amortisation, depreciation or impairment values recorded during the estimated economic life of the asset.* |
| **Costing methodology** | *Describes the order and way in which procedures and methods are applied to derive and attribute costs.* |
| **Current cost accounting (CCA)** | *An accounting basis that recognises and incorporates the affects of changing prices over time.* |
| **Financial capital maintenance** | *A CCA accounting concept that considers the maintenance of a company's financial capital in real terms.* |
| **Fully allocated costs (FAC)** | *Describes a costing methodology by which all relevant costs are attributed to defined outputs such as products and services. The principle of cost causality is often applied to support this methodology. Also referred to as "fully distributed costs" (FDC).* |
| **Historical cost accounting (HCA):** | *An accounting basis where transactions are recorded and reported at their initial transaction value. Traditionally used as the main basis of reporting for statutory and management purposes.* |
| **Holding gains and losses** | *The adjustment necessary to reflect the increase or decrease in asset values resulting from real price changes.* |
| **Long Run Incremental Cost (LRIC)** | *The cost of producing a specified additional increment (normally an activity, service or product) in the long run (the period over which all costs are variable) assuming at least one other increment is produced.* |
| **Operational capital maintenance** | *The alternative to financial capital maintenance where the productive capacity of the business is maintained.* |
| **Replacement costs** | *The value of an asset if it were to be replaced by a modern asset providing the same functionality.* |
| **Supplementary depreciation** | *The accounting adjustment necessary to reflect a different flow of depreciation following the revaluation of an asset using CCA methodologies.* |

## Abbreviations

| | |
|---|---|
| **CCA** | current cost accounting |
| **FAC** | fully allocated costs |
| **GBV** | gross book value |
| **GRC** | gross replacement costs |
| **ERG** | European Regulators Group |
| **FCM** | financial capital maintenance |
| **HCA** | historical cost accounting |
| **IRG** | International Regulator Group |
| **LRIC** | long run incremental costs |
| **MCA** | mean capital employed |
| **MEA** | mean equivalent asset |
| **NBV** | net book value |
| **NPV** | net present value |
| **NRA** | national regulatory authority |
| **NRC** | net replacement costs |
| **NRV** | net realizable value |
| **OCM** | operating capital maintenance |
| **PIB** | principles of implementation and best practice |
| **SMP** | significant market power |

End of document.