

Section 1. Cost accounting and accounting separation

The Recommendation concerns the implementation of “Cost accounting” and “Accounting separation” for regulatory purposes. This Section is meant to provide guidance to help NRAs to develop such systems in a practical way.

A. COST ACCOUNTING

The purpose of imposing an obligation regarding the set up of a cost accounting system is to ensure that fair, pro-competitive and transparent criteria are followed by notified operators in allocating their costs to services.

A cost accounting system is therefore a set of rules to ensure the attribution and allocation of revenues, costs, assets, liabilities and capital employed to individual activities and services, in particular considering direct and indirect operating costs of services as well as past and future expenses.

More precisely, a cost accounting system will be made of ways to establish a recordkeeping mechanism, keep track of costs and identify operational expenditures such as equipment maintenance. The major resulting benefit should be a transparent illustration of the relation between costs and prices, as the system should be able to break costs down in order to ensure that costs allocated to regulated services do not result in cross subsidies, excessive prices and, in general, that costs are efficiently incurred.

Besides, cost-based financing systems rely on the accumulation of accurate and reliable cost data. Without such data, it would be difficult to determine the costs of providing services or to assign costs to the users.

A cost accounting system will have to be prepared in the following way:

- Identification of the directly attributable costs;
- Identification of indirectly attributable costs;
- Evaluation of capital employed;
- Development of rules of allocation of common and joint cost to services.
- Definition of transfer charges

The method for allocating common costs could have a relevant impact on the price of the regulated services provided by the operator(s) subject to cost accounting obligations. When using a forward-looking approach, the current value of the network assets will have to be assessed using the methodology illustrated in section 3 of this Annex.

The distinction between direct and indirect cost is well established in the accounting practice. These concepts were also mentioned in the regulatory framework of 1998¹ and in a cost study² which clearly states a distinction between directly attributable, indirectly attributable, and unattributable costs along the following lines:

a) Directly attributable costs

Directly attributable costs are those costs that can be directly and unambiguously related to a product or service. Directly attributable costs include the following:

- (annualised) costs of equipment specific to the service and directly related costs such as installation: for equipment costs, in order to determine the annual costs of providing a particular service, the cost of productive capital employed must be established;
- network related operating costs (such as maintenance). For operating costs, the prime elements are those concerned with maintaining the network and providing, rearranging or ceasing service to customers.

b) Indirectly attributable costs

Indirectly attributable costs are those costs that can be apportioned to products or services on a measured non-arbitrary basis reflecting the relationship of the costs with directly attributable costs. They include many network costs such as transmission equipment which will be shared by services using cost-building parameters, like the appropriate routing factors. Other network costs such as, in the fixed network, the accommodation costs associated with exchanges of a local exchange (such as site costs) may be shared by the access and core networks, provided that the cost drivers are clearly identified by the NRA.

Both directly and indirectly attributable costs can fall into one of two categories. First, costs of inputs that vary with the level of output, so that even if the output of more than one service requires this input, the extent to which a single service causes the costs can be calculated. Second, there are assets and operating costs which are fixed with respect to the level of output but which are service specific.

c) Unattributable costs

Unattributable costs are those costs which can only be attributed on an arbitrary basis.

¹ See for example Directive 98/10/EC of the European Parliament and of the Council, Article 18; Commission Recommendation of 8 April 1998 on interconnection in a liberalised environment (Part 2 – Accounting separation and cost accounting).

² Study on the preparation of an adaptable bottom-up costing model for interconnection and access pricing in European Union Countries – A final report For Information Society Directorate-General of the European Commission by Europe Economics, April 2000.

d) Evaluation of capital employed

The evaluation of capital employed will be done at historical costs (derived from mean book value – see the “cost of capital” section) when using HCA, or at current costs when using a forward looking approach (for the latter case, see section 2 of this annex)

e) Rules for cost allocation of common/joint costs

A clear methodology must be used for allocating costs between regulated activities and “other” (non-regulated) activities of the notified operator and to allocate costs to each activity in a proportionate and objective way. Typically, costs which cannot be directly assigned to specific services within either regulated or non regulated activities will be described as common costs. Common costs shall be grouped into homogeneous cost categories designed to facilitate the proper allocation of costs to specific services between an operator's regulated and non regulated activities. Each cost category shall be allocated between regulated and non regulated activities in accordance with the following hierarchy:

- (i) Whenever possible, common cost categories have to be allocated based upon direct analysis of the origin of the cost themselves.
- (ii) When direct analysis is not possible, common cost categories shall be allocated based upon an indirect, cost-causative linkage to another cost category (or group of cost categories) for which a direct assignment or allocation is available.
- (iii) When neither direct nor indirect measures of cost allocation can be found, the cost category shall be allocated based upon a cost driver computed by using the ratio of all expenses directly assigned or attributed to regulated and nonregulated activities.

Services included in the definition of universal service shall bear no more than a reasonable, and clearly identified, to avoid double-counting, share of the joint and common costs of facilities used to provide those services.

f) Definition of transfer charges

Principles to be applied by notified operators to take into account the costs of products or services that are used internally should be transparent and satisfactory.

A system of transfer charges should be applied to services and products provided from one business (for example, in the fixed network, Local Access-Network, Core Network and Retail) to another.

There should be a clear rationale for the transfer charges used and each charge should be supportable. Charges should be non-discriminatory and there should be transparency of transfer charges in the separate accounts.

The transfer charges for internal usage should be determined as the product of usage and unit charges. The charge for internal usage should be equivalent to the charge that would be levied if the product or service were sold externally rather than internally.

For accounting separation purposes, it should be assumed that a notified operator's Retail business pays the same charge for the same service.

There shall be consistency of treatment of transfer charges from year to year. Any change should be transparent and satisfactory to the NRA.

B. ACCOUNTING SEPARATION

Using accounting separation, an NRA imposes on the notified operator a set of rules on how accounting information (including financial information³) should be collected and reported. The transfer charges from one business to another within the organisation can be thus explicitly identified. This allows to enforce non-discrimination, to monitor the profitability of particular businesses or services and to identify cross subsidies.

Accounting separation can also ensure a systematic division of costs between retail and network, and help to ensure that the cost base for interconnection/access charges includes only relevant costs. It also provides a sound basis for the production of robust cost information on the main retail services to inform future decisions on retail price controls.

Separated accounts are prepared in order to provide financial information about regulated businesses for use by the regulator, the industry, consumers and other stakeholders. They provide information that is more focused than that contained in statutory accounts as they relate to the regulated businesses or activities, whereas statutory accounts relate to the regulated company as a whole and are more focused on the requirements of investors only.

Nevertheless, in order to facilitate the verification of compliance with obligations of transparency and non-discrimination of SMP operators, the regulatory framework empowers the NRAs to require that all accounting records, including data on revenues received from third parties, are provided to them on request (Access Directive, Article 11.2).

Furthermore, NRAs are empowered to request all the information⁴, including financial information, necessary for the NRAs to ensure conformity with the provisions of the regulatory framework. The undertakings concerned have to

³ In this context the terms will be used interchangeably unless specified otherwise.

⁴ Article 5(1), Framework Directive.

provide the requested information promptly on request and to the timescales and the level of detail required by the NRA. Since the NRA could need to have a broad picture of the cost structures of an operator designated as having SMP in a specific market, the information provided would allow the NRA to check the correctness of cost information of products in markets on which cost accounting obligations have been imposed. However, provisions of the framework provide a basis for an NRA to gather accounting separation information in respect of non-SMP markets only insofar as an NRA can justify that the provision of such information is necessary for the NRA to carry out its responsibilities under other provisions of the framework.

Accounting separation requirements could be developed starting from historical cost accounting “HCA”; in order to send improved competitive signals to the market, a forward looking cost approach, based on current cost accounting [“CCA”], should be developed as well.

If a national regulator decides to impose accounting separation the following specifications shall be defined:

- Which business units have to be separated with an own balance-sheet, profit and loss statement, capital employed and the main cost drivers information, such as minutes, lines and/or full time equivalent or labour cost. The operator(s) subject to accounting separation obligations should provide available information for the whole undertaking (to ensure that common and joint costs are not covered twice). The not regulated business segments can be subject to different granularity levels, according to the proportionality principle.
- The services which shall be present in the accounting separation. The availability of detailed, separated account is important to enable the auditor to verify the adequacy and correctness of the financial statements prepared by the operator.
- An indication of how the average cost per component is allocated to the specific access/interconnection.
- Detailed, public guidelines for the cost base (HCA; CCA) and cost methodology to use for cost allocation (Fully distributed cost or FDC; Long run incremental cost or LRIC; others)

In the following paragraphs, some examples of accounting separation for the major types of networks (fixed, mobile) and for Conditional Access System (CAS), covered in the new regulatory framework, are provided; and; also, a sample table (for the fixed network; a similar table can be developed for the mobile network), illustrating the cost per component allocation to the services, is presented. These examples refer to cases in which an operator is notified as having significant market power in the relevant market and the NRA decides to impose obligations for accounting separation and/or cost accounting on these markets; or, as in the case of CAS, in order to apply the relevant provisions of Community law.

a) Example of accounting separation for the Fixed network

The Business Units under accounting separation should be at least articulated using “Wholesale”, “Retail” (further articulated over the national relevant markets) and “Other activities”. Wholesale could be separated in “Core” and “Access”

- Core-Network (circuit and packet switched infrastructure). The Core-Network covers the provision of interconnection services, transit and conveyance services and carrier’s carrier services.
- Access-Network (local loop infrastructure) The Access Network covers the provision of connections to the end users between the end users premises and the core network.⁵, including leased lines to intermediate users such as other operators.
- Retail The Retail business covers the activities mainly related to the commercial provision of electronic communications services, such as fixed telephony and leased lines to end users.
- Other Activities covers other activities provided by the notified operator which may include un-regulated activities as well as other type of regulated activities. Accounts for regulated and un-regulated activities need to be kept separate. Such accounts may help to ensure that unfair cross-subsidy between regulated and un-regulated services do not take place, at the expense of competition or to the detriment of market conditions.

Table A1) Fixed Network accounting separation scheme

Services	Wholesale	Transfer charge to /from	Retail	Other activities	
Service 1	Core Network				
Service 2 (etc.)	Access Network				

b) Example of accounting separation for the Mobile network:

The Business Units under accounting separation should be at least articulated using “Wholesale”, “Retail” (further articulated over the national relevant markets) and “Other activities”. Transmission should cover the costs of frequencies (one-off, and annual fees), sites, base stations. The Switching/Circuits aggregate will include all other network components.

⁵ This will include those components of the network which are not traffic sensitive and are dedicated to a particular customer including, for example, the local loops and the line cards and ports located at concentrators and/or exchanges.

The accounting separation should be able to cover at least the following services:

- Fixed to mobile calls
- Mobile to mobile off-net calls
- International Roaming calls

Table B1) Mobile Network accounting separation scheme

Services	Wholesale (Transmission, Switching, Circuits)	Transfer charge to /from	Retail	Other activities	
F/M calls					
M/M offnet calls					
Int'l roaming 6					

c) Example of accounting separation for CAS (Conditional access systems)

The accounting separation is aimed to ensure fair access to Conditional Access Systems as provided by art. 6 of the Access Directive, Annex I.

In practice, according to such annex, all operators of conditional access who provide access services to digital television and radio services and whose access services broadcasters depend on to reach any group of potential viewers or listeners are to keep separate financial accounts regarding their activity as conditional access providers.

CAS Providers are requested to identify and separate CAS activities from all other activities.

d) Average cost of network component

⁶ Roaming could be conceived as a network service rather than as a end user service; still, it is possible to prepare separated accounting data for national/international roaming so that excessive prices can be ascertained whether necessary.

The publication by the notified operator of sufficiently detailed cost statements showing the average cost of network components will increase transparency and raise confidence on the part of competitors, that there are no anti-competitive cross-subsidies.

The table d1) provides an example (other examples for other networks can be provided) in this regard.

SAMPLE STATEMENT OF COSTS OF NETWORK SERVICES (FIXED NETWORK)

	TRAFFIC SENSITIVE	NON-LENGTH DEPENDANT	LENGTH DEPENDANT	
	Subscriber unit Primary Switch Secondary Switch	RSU to Primary/ Secondary Link Primary to Primary Link Primary to Secondary Link Secondary to Secondary Link	RSU to Primary/ Secondary Link Primary to Primary Link Primary to Secondary Link Secondary to Secondary Link	Gradient peak Gradient off peak Conveyance cost p Conveyance cost off-p.
Average costs (Eurocent/min.) Total costs Usage Factors (routing or percentages) Retail Services Local calls Local internet calls Interdistrict calls National calls International RIO services Call termination Call origination Transit (etc.)				

Section 2 - Principles for cost causality, drivers definition and attribution methodologies

This section sets out the principles that should be followed in order to allocate costs, capital employed and revenues for the purposes of cost accounting and accounting separation.

Costing systems should allow the allocation of costs to unbundled network components, in particular to determine the cost of unbundled interconnection and access services, as shown in the sample table in Section 1.

Electronic communications services are characterized by high proportion of joint and common costs, thus clear cost attribution and allocation to individual services and or to network elements is fundamental to improve transparency and improving the quality of information provided by costing systems used for regulatory purposes. Ideally, costing system should allocate at least 90% of the costs on the basis of direct or indirect cost-causation.

2.1 Principles for cost causality

Identifying different types of costs and attributing these cost to individual services is an essential and complex issue. It is believed that allocations should be based on cost causality, objectivity, consistency and transparency.

The principle of causality implies that costs and revenues are allocated, directly or indirectly, to the services that “cause” the costs (and revenues) to arise. This requires the implementation of appropriate and detailed cost allocation methodologies. In practice, this requires that operators:

- Review and justify each item of cost, capital employed and revenue;
- Establish the driver that caused each item to arise; and
- Use the driver to allocate each item to individual businesses /activities/ network components or services

All allocations may be subject to review by NRAs. To this end, a detailed list of the cost drivers should be delivered to NRA for assessment, in advance of the financial statement preparation.

Each item of cost and revenue must be allocated to the products and services provided by operators. In case of revenues, it is anticipated that most of them can be thoroughly allocated directly to those products or services to which they are related. This is not the case for costs, however, because a relatively high proportion of the costs of operators are shared between different products and services. Several approaches can be followed to calculate (indirect) costs:

Fully distributed cost

The Fully Distributed Cost (FDC) approach allocates costs that are directly and not directly attributed to services or products according to measures such as activity based costing, samples and surveys, revenues or price-proportional mark-ups.

Long Run Incremental cost

The Long run incremental cost (LRIC⁷) approach allocates cost that are directly or indirectly attributed to services or products, often using cost volume relationships. More information on this approach is provided in Section 8 of this Annex.

2.2 Cost allocation methodology: Activity-based costing

Being the direct cost attributed, some elasticity inherent to FDC approach can be reduced through allocation methodologies, such as activity-based costing (ABC), that allow the establishment of stronger causal relations between costs and services or products. ABC views the services and products as a series of activities, each of which consumes resources and therefore generates costs. This methodology, based on the cause of costs (cost drivers), traces and allocates costs through the activities performed and establishes a clear cause-and-effect relation between activities, their associated costs and the resulting output from those activities.

ABC introduces an intermediate stage of activities, enabling some costs - that would otherwise be allocated in a less direct way - to be attributed to the services that cause them to occur. This enables a higher proportion of indirect costs to be allocated in an objective fashion to outputs. Nevertheless, with ABC it will generally not be possible to allocate all costs to services via activities, and hence some costs will remain to be apportioned to outputs in a relative arbitrary manner.

Once direct and indirectly attributable costs have been allocated to particular services on the basis of causality, the remaining costs might be allocated based using several approaches, namely equal proportionate mark-ups or apportionment based on revenues /other costs / input - output share where costs are not assigned to activities to the extent to which they “cause” the cost, although for specific objectives some may be more appropriate than others. In a well-defined costing system these remaining costs should be kept to a minimum, not exceeding 10% of the total costs.

2.3 The cost allocation process

Figure 1 illustrates a typical cost allocation process. It should be noted that actual allocation processes may vary depending on the entity’s organisational structure, the way(s) in which financial/operating data are captured and cost standards used, and will be considerably more complex and involved than Figure 1 implies. It is important to note, however, that the ultimate aim of allocating costs is the same.

⁷ Throughout the text, the terms LRIC/LRAIC are used but should always be intended as Long Run Average Incremental Cost (LRAIC)

Regardless of the source, a key factor, which will influence the ultimate usefulness of the costing information, is the level of detail at which costs are initially captured. A high level of disaggregated detail - without prejudice to principles of proportionality and materiality – should be applied. The initial costing information should also refer to all relevant services/products provided by the company, independently of its status in other markets.

The costing information held by these systems may be divided between operating costs, capital costs and accounting entries such as depreciation.

Costs may be attributed either directly to services or to cost pools called network components, related functions or other functions. These are defined as follows:

Table 2.1

Services	These are the costs that can be directly identified with a particular service. For these purposes, the term “service” refers both to end-user services (e.g. the provision of pay-phones) and intermediate services (e.g. network services).
Network components	This pool contains the costs relating to the various components of transmission, switching and other network plant and systems. The costs will be in respect of network components that cannot be attributed directly to a particular service as they are utilised in the provision of a number of services.
Related functions	This pool contains the costs of functions necessary for the provision of services to the customer such as billing, maintenance, and customer services.
Other functions	This pool contains the costs of functions that are not related to the provision of particular services but are an important part of the operations of the company. Examples of such costs include planning, personnel and general finance.

As noted, there are a series of steps which allocate cost pools in a tiered approach to eventually allocate costs to services. These step allocations are performed using appropriate drivers. Each step is summarised below:

Table 2.2

Step 1	The allocation of other functions across related functions, network elements and services.
Step 2	The allocation of the related function costs to services and the network elements.
Step 3	The allocation of network components to services.
Step 4	The grouping of services into businesses (as defined for the purposes of accounting separation).

Each of the allocation steps illustrated above could involve a number of detailed sub-steps, particularly if the initial capture of cost information is at an aggregated level. Where it is possible to perform an allocation via a number of direct or indirect attributions this is preferable to allocation through a single arbitrary step.

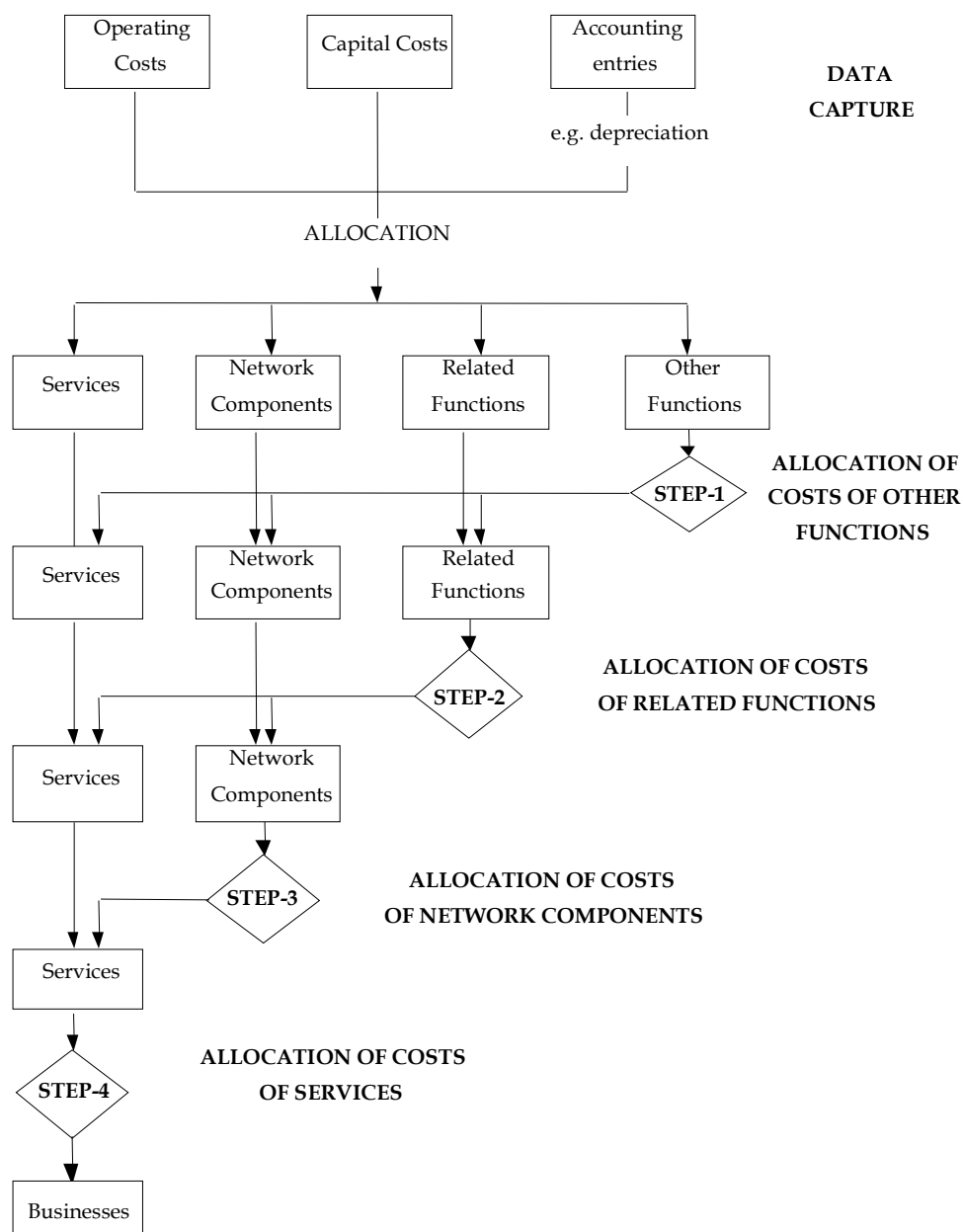


Figure 1 – A typical cost allocation process

The attribution methodologies should be comprehensively documented so as to be transparent to NRAs. A description of attribution methodologies should also be published by the notified operator.

Notified operators may need to use survey and sampling techniques such as pattern of usage of network element for each type of product/network service, staff activity data and engineering information in order to allocate costs (including capital costs) to the services that they provide and, subsequently, to the businesses defined for the purposes of accounting separation. For example, periodic analysis of the tasks undertaken by staff in customer call centres may be used to determine the amount of time spent by those staff on different tasks. This information may then be used to allocate - either directly or indirectly - the costs associated with the staff to the services provided by the operator.

The fundamental objective is to arrive at an appropriate basis of attribution to comply with the principle of causation.

Where standard costs are used, it should be based either on generally accepted statistical techniques or other methods, which would result in accurate attribution of costs and revenues. Periodically reviews and updates should also be carried-out. In general though the use of standard costs should be kept to a minimum.

Cost drivers definitions and calculations must be subject to review by NRAs, and the methodology used for survey and sampling techniques should be made available to the NRA.

2.4 Operating costs

The cost allocation process previously outlined relates, in principle, to both operating and capital costs, including depreciation, of operators.

Table 2.3 below provides a summary of possible allocation and attribution methods for operating costs under the following headings:

- Depreciation of network elements;
- Provision, installation and maintenance costs;
- Network planning and development costs;
- Network management costs;
- Marketing and sales costs;
- Billing and collection costs;
- Operator services costs;
- Directory services costs;
- Payments to other operators; and
- Support costs.

These headings are purely illustrative and are not intended to reflect the way in which operators are expected to record costs. They are intended to provide high-level guidance

only. Individual operators will need to develop cost allocation procedures specific to the way in which they currently capture and record costs, and to refine these over time, as appropriate.

The final column of the Tables provides an indication of the principal businesses to which it might be expected that the majority of the operating costs in question would be allocated.

These broad businesses should be detailed in order to consider the services/activities provided by operators in the relevant markets.

2.5 Capital employed

Table 2.4 provides a summary of possible allocation methods for different items of capital employed, together with an indication of the principal businesses to which it might be expected that the majority of each item would be allocated. The application of these and, as appropriate, other methods will determine the capital values of different regulated activities.

The table is not intended to be an exhaustive list of items that might be classified as capital employed nor of the methods for allocating them to different activities.

The Table proposes one approach to the treatment of working capital in the calculation of capital employed. There are, however, other approaches which may be equally valid. In practice, there are two principles that ought to be applied when considering the treatment of individual items of working capital for the purposes of separate accounting. They are as follows:

- There should be consistency between the treatment of assets and their associated costs and revenues; and
- Inclusion or exclusion of individual items ought, in principle, to have a corresponding impact on the WACC. These two effects (i.e. the decision to include or exclude items and the corresponding adjustment to the WACC) offset each other in terms of their overall effect on the absolute return required by operators.

2.6 Revenues

It is expected that revenues can be directly allocated to the products and services to which they relate based on accounting records and billing system information. In those cases where direct allocation based on accounting records or billing system data is not possible, revenues should be attributed on the basis of causation.

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Table 2.3. Methods of allocating operating costs ⁽¹⁾

Category of Operating cost	Description	Possible Method of Allocation	Principal Businesses
Depreciation	Depreciation	The allocation of depreciation should follow the allocation of the fixed assets to which it relates (see Section 5).	All
Provision and installation of equipment	Payroll costs	Direct to network components/other plant where possible; otherwise allocate based on the time spent carrying out installation work.	Wholesale
	Installation, contract and maintenance costs	Direct to network components/other plant on the basis of the plant installed or maintained where possible.	Wholesale
Maintenance and repair costs	Payroll costs	Direct to network components/other plant where possible; otherwise allocate based on the time spent carrying out installation work.	Wholesale
	Other costs	Direct to network components/other plant where possible.	Wholesale
Network planning and developments costs	Payroll and external costs	Direct to network components/other plant where possible.	Wholesale
Network management costs	Payroll costs	Allocate to network components/other plant on the basis of the time spent by staff to manage each type of plant.	Wholesale
	Other costs	Allocate to network components/other plant on the basis of the plant managed, where possible.	Wholesale
Marketing and sales costs	Payroll	Direct to products and services where possible; otherwise allocate between products based on labour time.	Retail
	Cost of sales of equipment	Allocate to customer equipment services within "Other activities".	Other Activities

Category of Operating cost	Description	Possible Method of Allocation	Principal Businesses
	Publicity Promotions Market research Distributors fees Other costs	Direct to products and services where possible. Otherwise, for those costs where multiple services are being marketed or promoted, cost should be attributed to the related services on a reasonable basis.	Retail
Billing and collection costs	Payroll costs	Direct to products and services where possible; otherwise allocate between products based on labour time.	Retail (some costs to Wholesale)
	Other billing costs (incl. Bad debts)	Direct to products and services where possible; otherwise allocate between products based on usage (e.g. number of bills produced).	Retail (some costs to Wholesale)
Operator services costs	Payroll costs	Direct to services where possible. The costs of staff that carry out tasks for several operator services should be allocated to the related operator services based on time spent on different tasks.	Retail
Directory services costs	Payroll and other costs	Direct to products and services.	Retail
Payments to other operators	Out-payments for outgoing international traffic	Direct to products and services.	Retail
	Payments for interconnection agreements	Direct to products and services.	Retail
Support costs	Human resources function costs	HR function costs should be allocated to the staff that are overseen by the HR function and allocated using the same basis as the payroll costs of HR staff.	All
	Finance and other head office support functions	If related specifically to a product, service or business allocate accordingly.	All
	Building costs and rent	Costs should be allocated in the same way as land and buildings (see Section 5).	All

Category of Operating cost	Description	Possible Method of Allocation	Principal Businesses
	General computing/IT costs	Allocate to the applications run by the operator on the basis of the use of the computers to support each application. Costs allocated to applications can then be attributed to those products and services that they support.	All

⁽¹⁾ Residual unattributable costs should be identified by operators and their treatment considered separately by NRAs.

Table 2.4 Methods of allocating capital employed for the fixed network (examples for the mobile network could be developed as well) ⁽¹⁾

Category of assets and liabilities	Description	Possible Method of Allocation	Principal Businesses
<u>Tangible assets</u>			
<i>Primary Plant-</i>			
Switching equipment	Local switching equipment	Direct to access or network components where possible. Otherwise allocate to Local Access-Network services and to network components on the basis of the relevant cost of the equipment dedicated to provide customer lines and of the parts dedicated to switch traffic, respectively. Local switch network components can be allocated to products and services based on seconds of use.	Core Network (some costs to Local Access-Network)
	Tandem switching equipment	Direct to network components where possible, otherwise allocate based on seconds of use.	Core Network
	International switching equipment	Direct to network components where possible, otherwise allocate based on seconds of use.	Core Network
	Switching equipment for special services networks	Direct to core network components where appropriate/required by regulation or to the specific services provided by other networks – e.g. data transmission switching equipment should be allocated directly to data transmission services.	Core Network, Other activities
	Other switching equipment	Direct to network services where possible, otherwise allocate to other switching network components on the basis of the use of the equipment.	Core Network

Category of assets and liabilities	Description	Possible Method of Allocation	Principal Businesses
Transmission equipment	Traffic-sensitive transmission equipment	Direct to network components where possible, otherwise allocate based on the usage of circuits.	Core Network
	Cable and wire	Direct to access or network components where possible, otherwise allocate to components based on the amount of cable used to provide different services.	Local Access-Network, Core Network
	Local loop equipment	Direct to products where possible (e.g. separately identifiable ISDN access equipment), otherwise allocate between access services based on line usage.	Local Access-Network
	Radio and satellite equipment	Direct to network components where possible, otherwise allocate based on the usage of channels.	Core Network
	Transmission equipment for special services networks	Direct to the specific non-PSTN/non-ISDN services provided by the network – e.g. data transmission equipment directly allocated to data transmission services.	Core Network
	International/submarine cable	Direct to network components where possible, otherwise allocate based on usage.	Core Network
Other primary network assets	Special network plant	Plant and equipment that is used solely to provide one specific service should be allocated directly to the relevant services. Examples may include: <input type="checkbox"/> Intelligent networks equipment; <input type="checkbox"/> Data transmission equipment; <input type="checkbox"/> Multimedia equipment.	Core Network Other activities
	Customer premises equipment	Direct to products and services.	Other activities

Category of assets and liabilities	Description	Possible Method of Allocation	Principal Businesses
<i>Support Plant</i>	Public payphones and related equipment	Direct to service.	Retail
	Ducting	Ducting can be allocated to the cable and wire that it supports and allocated to products in the same way as cable and wire.	Local Access-Network, Core Network
	Power equipment	Allocate to primary plant groups on the basis of the use of power equipment to support each plant– e.g. kilowatts per hour. Assets should then be allocated to products in the same way as the relevant primary plant groups.	Local Access-Network, Core Network
	Network management systems	Allocate to primary plant of the different networks provided on the basis of the use of the systems to support each plant – e.g. time spent to control local exchanges, tandem exchanges and international exchanges. Costs should be attributed to products and services in the same way as the related primary plant group.	Core Network
	Land and buildings	Allocate to products, services and network components on the basis of the space occupied (i.e. floor space) to support each product, service or network component.	All
	General computers	Allocate to the applications run by the operator on the basis of the use of the computers to support each application. Costs allocated to applications can then be attributed to those products and services that they support.	All
Non-network fixed assets	Motor vehicles	Allocate to the products and network components based on usage.	All
	Furniture and office equipment	Allocate to the products and network components based on usage.	All

Table 2.4 Methods of allocating capital employed (cont.)*

Category of assets and liabilities	Description	Possible Method of Allocation	Principal Businesses
<u>Intangible fixed assets</u>	Intangible fixed assets	Direct to products where possible. Any residual or unattributable assets will need to be allocated on an arbitrary basis, to be agreed with the NRA.	All
<u>Working capital</u>	Fixed asset investments: Pure financial investments Investments in unrelated activities Other investments	Direct to "Other activities". Direct to "Other activities". Direct to the services to which the investments are related, otherwise allocate based on usage.	Other activities Other activities All
	Short-term investments (including cash at bank and in hand)	Direct to businesses where possible, otherwise allocate based on the operational requirements of each business.	All
	Stocks	Stocks should be allocated directly to products and services.	All
	Trade debtors/receivables	Trade debtors may be allocated to products and services based on billing system information where possible. Unattributable balances will need to be allocated on an arbitrary basis, to be agreed with the NRA.	All
	Other debtors/receivables	Other debtors/receivables should be apportioned to products and services if possible. Unattributable balances will need to be allocated on an arbitrary basis, to be agreed with the NRA.	All

	Trade creditors	Trade creditors should be allocated directly to products and services if possible. Unattributable trade creditors will need to be allocated on an arbitrary basis, to be agreed with the NRA.	All
	Long term provisions	Direct to the activities that give rise to the provisions in question.	All
	Liabilities for taxation and dividends	No allocation required. Instead average liabilities should be taken into account when considering the operational cash requirements of each business (see “Short-term investments”)	All

* Residual unattributable costs should be specifically identified by operators and their treatment considered separately by NRAs.

Annex to the “Draft ERG Opinion on the proposed Review of the Recommendation on cost accounting and accounting separation” – Draft text prepared for consultation by the IRG WG RA

Section 3. Current cost accounting – guidelines for implementation

When using a forward looking costing methodology, an evaluation of the current value of the network assets shall be performed. It is suggested that the methodology and criteria for the evaluation of network assets at current value are set by the NRA after a public consultation with market players.

One study prepared for the Commission stated that “To a new entrant operator about to build a network, current costs will generally equate to costs of new equipment. On the other hand, to an incumbent operator current costs may need to be measured with reference to a modern equivalent asset (MEA) with the same, or similar, service potential. This will usually be measured by adjusting the cost of a modern asset for functionality, capacity and so on to give the adjusted replacement cost.

The MEA asset valuation of an incumbent operator may, therefore, differ from the replacement cost valuation of a new entrant – even though both are attempting to measure current costs. This is likely to be important when trying to reconcile the results of any bottom-up model with the results on an incumbent operator..⁸”

The key aspect of current cost methodology is that it requires firms to update the value of assets to reflect their current value (in a process that according to the methodology in use may explicitly take into account inflation and other factors, or not).

However, it must be noted that several factors contribute to the differences in cost changes across assets. The unit costs of real estate, cable, electronic equipment such as switches and routers, capital and other major inputs can escalate at rates that diverge greatly from the overall rate of inflation, depending, among other things, on the rates of economic growth and unemployment, the business cycle and the availability of funds in international capital markets and the rate of technological progress in electronic equipment.

For practical purposes (consistency, transparency and comparability) though, only some factors can be taken into account in the various application of the current cost methodology. It is important that the NRA in charge of its application renders transparent and explicit the factors employed in its CCA valuations and cost modelling and that the parameters and the factors used are illustrated and submitted to public consultation before adopting the methodology.

As stated several times in the text, the use of current cost evaluation is intended to replicate the approach of a competitor in a market, which, willing to contend

⁸ Study on the preparation of an adaptable bottom-up costing model for interconnection and access pricing in European Union Countries – A final report For Information Society Directorate-General of the European Commission by Europe Economics, April 2000.

shares or profits in that market, has to offer services at a price that allows him to recover current costs.

In the absence of regulation, while certain goods are valued at current costs by definition (es., labour), some other goods can be valued paid at current costs if they are purchased on the market (ie new equipment) or at historical costs (if they are used by the notified operator for instance).

When access and interconnection are regulated, if current cost is used to re-evaluate the network assets of the notified operator, then these assets will be offered to the new entrants in a modality which more closely resembles the situation in a competitive market. While it is up to each NRA to decide which obligations shall be imposed on the operators, if a decision is taken regarding current cost methodology then it is important that such a decision is consistent, albeit not identical, across the single European market. To this end some guidelines are hereby provided for application.

3.1 Calculation of current cost asset values

A key element of the current cost methodology is the valuation of network assets. Network assets subject to re-evaluation –should be transparently and jointly identified by the operator and the NRAs. In order to keep data manageable, the large data set that typifies electronic communications network operators, could be regrouped under relatively few homogenous cost (asset) categories. Network assets could then be valued (reclassified) according to the following considerations and decision rules:

Net replacement cost

The net replacement cost is the cost of replacing the asset with another asset of similar characteristics and age. Assets with Net book value equal to zero, i.e. fully depreciated in a top-down model, but still in use, are normally valued, for current cost accounting purposes, at a Net replacement cost equal to zero. For bottom-up models, other approaches may be used (such as a fixed percentage of asset depreciation)

A key element is the calculation of the replacement cost of the asset. Replacement cost can simply be the cost today of replacing the asset with an identical one. However, when technology is changing rapidly, the existing asset may no longer be replaceable (e.g. it is no longer produced). In this case it is necessary to calculate the modern equivalent asset ('MEA') value which is the value of an asset with the same level of capacity and functionality as the existing asset. The issues relating to the calculation of MEA values for electronic communications operators are considered further below.

Deprival value

Deprival value ('DV') represents the recoverable value of the asset to the organisation; that is, the higher between the economic value the asset is likely to generate and the net realisable value ('NRV') of the asset if it were sold.

Economic value

Economic value ('EV') is a measure of the value of an asset based on the net present value of future cash flows.

The valuation rules can be summarised as follows:

- if $EV > NRV$, the company will keep the asset in its current use;
- if $NRV > EV$, the company 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.

Therefore the deprival value or recoverable amount of the asset is the higher between EV and NRV. The current cost therefore is the lower of its deprival value and the net replacement cost. That is, the lower of the amount the company could recover from the asset and the cost to the company to replace the asset with an identical one.

3.2. Modern equivalent asset valuation

The adoption of CCA methodologies in electronic communications is complicated by the rate of technological change in the industry. This has implications in both identifying suitable replacement costs for old technology assets and ensuring the assets exhibit the same levels of functionality and capability. Examples of technological issues for providers of electronic communications networks include:

- copper versus fibre cables,
- analogue versus digital switches,
- PDH transmission technology versus SDH technology,
- etc.

The new technologies are usually far superior to the old technologies in terms of functionality and efficiency. However, since MEA values are required to reflect assets of equivalent capacity and functionality, it is necessary to make adjustments to the current purchase price and also the related operating costs - for example, the new asset may require less maintenance, less energy and may need less space.

3.3 Current cost accounting adjustments

There are two different approaches to CCA. The approaches differ in their definition of 'capital maintenance'. That is, the way in which the capital of the company is viewed when determining profit.

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

- operating capital maintenance ('OCM') considers the operating capability of the company. Capital maintenance under this approach requires the company 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 that a sufficient amount has been put to maintain the physical capability of the asset.

- financial capital maintenance ('FCM') considers the financial capital of the company 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 (12). In this approach, revenues become profits after that a sufficient amount has been put to maintain the financial value of the asset (or the business)

Provided that both these approaches are used within the regulatory practice and therefore any of the two can be used within current cost methodology to ultimately derive the charges for regulated services, it has to be highlighted that the effect of such a choice are not the same.

3.4. The main adjustments under OCM

As set out above, this concept is concerned with the maintenance of the productive capacity of the operator. One of the signification adjustments relates to the revaluation of fixed assets to current cost. Due to this revaluation additional adjustments are then required to restate depreciation amounts. These are identified below.

Revaluation of fixed assets

Under OCM the gross book value of assets is revaluated to take account of specific price changes in the price of assets and changes in technology. One way of calculating the current cost of assets is to apply specific price indices to the existing gross book value of assets. These may be derived from the company's procurement department. Alternatively, modern equivalent asset ('MEA') valuation methods may be used. These base the value of assets on the

current cost of modern equivalent assets subject to cost 'abatements'. These abatements are discussed further below.

Supplementary depreciation

The depreciation charge for the year is calculated on the basis of the new asset valuations. This ensures that the current cost of fixed assets consumed during the year is charged against revenue. For each asset, or group of assets, the OCM depreciation charge - assuming straight line depreciation - can be derived by dividing the gross replacement cost by asset life.

Supplementary depreciation is the difference between historical cost depreciation and current cost depreciation charge. It may be positive or negative depending on whether the value of assets is rising or falling. It is a charge against profits in the profit and loss account.

Illustration of these concepts

The tables below illustrate the above concepts for an asset purchased for EURO 10.000. The assumed life of the asset is four years. For the sake of simplicity, it is assumed that the asset is depreciated on a straight line basis. In Table 1 it is assumed that the cost of replacing the asset falls by 10 % per annum. Table 2, on the other hand, assumes that the cost of replacement increases by 5 % per annum.

Table 1

Replacement cost falling by 10 % per annum

Year	Current Cost	Depreciation					
		Current cost	Historical	Supplementary	Cumulative	'Required'	Backlog
0	10 000						
1	9 000	2 250,00	2 500,00	(250,00)	2 250,00	2 250,00	Nil
2	8 100	2 025,00	2 500,00	(475,00)	4 275,00	4 050,00	(225,00)
3	7 290	1 822,50	2 500,00	(677,50)	5 872,50	5 467,50	(405,00)
4	6 561	1 640,25	2 500,00	(859,75)	7 107,75	6 561,00	(546,75)

Table 2

Replacement cost rising by 5 % per annum

Year	Current Cost	Depreciation					
		Current cost	Historical	Supplementary	Cumulative	'Required'	Backlog
0	10 000,00						
1	10 500,00	2 625,00	2 500,00	125,00	2 625,00	2 625,00	Nil
2	11 025,00	2 756,25	2 500,00	256,25	5 381,25	5 512,50	131,25
3	11 576,25	2 894,06	2 500,00	394,06	8 406,56	8 682,19	275,63
4	12 155,06	3 038,77	2 500,00	538,77	11 720,96	12 155,06	434,10

Derivation/explanation:

- current cost is the gross replacement cost of the asset,
- current cost depreciation is derived as the gross replacement cost divided by the asset life,
- historical cost depreciation is the original acquisition cost divided by the asset life,
- supplementary depreciation is the additional depreciation charged as a result of revaluing the asset (it can also be derived as current cost depreciation less historical cost depreciation),
- cumulative depreciation is the sum of cumulative current cost depreciation at the end of the previous period, backlog depreciation for the previous period and current cost depreciation for the current period. This is equivalent to the required depreciation at the end of the previous plus current cost depreciation for the current period,
-
- 'required' depreciation is the cumulative depreciation that would have been charged given the current cost of the asset - in other words, it is the difference between the gross and net replacement cost of the asset, and
- backlog depreciation is the difference between required depreciation and cumulative depreciation.

3.5. Further adjustments under financial capital maintenance (FCM)

Under FCM there are similar adjustments to be made as in the OCM concept concerning the revaluation of fixed assets and supplementary depreciation. However, under FCM some of the treatments in terms of profit and loss need to be further adjusted to take into account of holding gains or losses that arise due to the effect of asset-specific price change on the current cost value of assets and the effect of general inflation on shareholders' funds .

3.6. The choice of capital maintenance concept

The above discussion has set out the main adjustments required to historical cost accounts in order to derive current cost information using OCM and FCM. It has been included to reflect the fact that where LRAIC is used as the basis for cost oriented charges, , assets are valued at their market value (or current cost). The use of current cost information is therefore a key aspect in helping to determine appropriate access/ interconnection charges and special attention should be provided to the choice of capital maintenance as employed by an efficient operator.

If OCM was used to determine charges, the revenue requirement would be derived as the sum of operating costs, historical cost depreciation, supplementary depreciation and a return on net assets. Under FCM, the revenue requirement would be the sum of operating costs, historical cost depreciation, supplementary depreciation and a return on net assets less holding gains/losses plus the adjustment to shareholders' funds. Required revenue therefore differs depending on the capital maintenance concept used.

Section 4. The Cost of capital and Capital Employed

Recital (20) of the Access Directive states that “when a national regulatory authority calculates costs incurred in establishing a service mandated under this Directive, it is appropriate to allow a reasonable return on the capital employed including appropriate labour and building costs, with the value of capital adjusted where necessary to reflect the current valuation of assets and efficiency of operations”.

Art. (13.1) of the Access Directive requires that National regulatory authorities [(when imposing obligations relating to cost recovery and price controls, including obligations for cost orientation of prices and obligations concerning cost accounting systems, for the provision of specific types of interconnection and/or access,] shall take into account the investments made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account the risks involved.

In order to derive a reasonable return on capital employed, the determinants of the level of this return are:

- the cost of capital; and
- a capital value.

There must be consistency between the measure of capital employed on which the cost of capital is based and the measure of capital employed reported in the accounting separation obligations eventually imposed by NRAs according to the Access Directive.

This will enable comparison of the actual percentage returns earned by operators from their regulated activities with the cost of capital allowed by NRAs when reviewing charges for these activities. The need for consistency and the implications of this for the allocation of items of capital employed are the focus of this section.

4.1 Cost of Capital

The cost of capital of operators should reflect the opportunity cost of funds invested in network components and other related assets. It conventionally reflects the following:

- the (weighted) average cost of debt for the different forms of debt held by each operator;
- the cost of equity as measured by the returns that shareholders require in order to invest in the network, given the associated risks; and
- the values of debt and equity.

This information can then be used to determine the weighted average cost of capital (WACC) using the following formula:

$$WACC = r_e \cdot E / (D+E) + r_d \cdot D / (D+E)$$

where r_e is the cost of equity, r_d is the cost of debt, E is the total value of equity and D is the total value of interest-bearing debt.

When considering the taxation level in the formula, that can be written as:

$$WACC \quad \text{before tax} = \frac{R_E}{1 - t_E} \times \frac{E}{E + D} + R_D \times \frac{D}{E + D}$$

where:

R_E : cost of equity;

R_D : cost of debt;

E: Equity;

D: Debt;

E/D: Equity / debt ratio;

t_E : taxation

The Capital Asset Pricing Model, when adopted⁹, provides the formula for the cost of equity R_E :

$$R_E = R_F + \beta_E \times P_M$$

Where:

R_F : risk free rate;

β_E : relative to market risk;

P_m : market premium

The calculation of the WACC for an individual operator *in total* would be relatively straightforward – notwithstanding that there is scope for discussion about the precise derivation and value of inputs into the WACC formulas.

⁹ If CAPM is not used, then the formula could be written as: $R_E = R_F + P_M$

R_F : risk free rate; P_M : premium for risk (that might either be a market risk premium or – if available – a specific premium of a company or of an activity).

The NRA will then have to consider several options for each parameter. The most important thing is the transparency of the process followed. Amongst the many possible considerations, the following list provide an indicative example of the elements to be evaluated by the NRA:

Equity: the quantity (or average) of outstanding shares in the year (s) of application, it can be calculated using economic (market) values or book values;

Debt: Gross debt (or debt less cash if the unlevered Beta of comparable companies is then used), it can be calculated using economic (market) values or book values

Equity/Debt ratio: it can be calculated using the current ratio or an optimal ratio, provided that they reflect reasonable consistency in the period of time considered for the analysis.

Cost of debt: it should result from a weighted average of the various costs of debt outstanding, or, alternatively, from the sum of risk free activities and a default spread based on long term credit rating

Equity risk premium: the premium (ie the premium that the marginal investor expects for choosing to invest in equity and not in risk free investments) is in principle a forward-looking measure of investor expectations, but can be derived from historic actual differences between stocks and bonds using the relevant stock market of the company as a reference. The use of long historical series is generally recommended as well, unless such series refer predominantly to a very different risk profile (es before/after liberalization) of the market (or of the operator)

Risk free rate: normally treasury bonds with a long duration (10-30 years) are used. Typically, regulators may adopt several alternatives in determining the appropriate maturity of government bonds.

- 1) To base the maturity on the lifetime of the most relevant assets used in providing the regulated service. This reflects the planning horizon of investors in those assets;
- 2) To base the maturity on the duration of the regulatory determination.
- 3) To use the same bond term used to measure the market risk premium;

Beta: the volatility of the operators' share should be valued against one national index; an average of the Beta resulting from a benchmark of national and international index (ie TLX) could be used as well (the choice of the index should reflect the characteristics /preferences of a well diversified marginal investor);

Asset Beta (a measure of relative business risk alone, as the financial risk of leverage (ie debt) is excluded from asset betas)

Debt Beta (a measure of financial risk alone)

Relevered Beta (a measure of Beta which considers taxation effects and use an optimal debt/equity ratio)

Taxation: it should be the level of taxation incurred by the company applied for the year(s) of application

Once the parameters have been set, NRAs may need to consider whether application of the global cost of capital represented by the WACC is appropriate for the regulated activities of notified operators. If so, the WACC *in total* could be used for the purpose of determining the relevant cost-oriented charges.

Otherwise, NRAs may take into account that different risks premiums normally apply to different activities, which could be reflected in different costs of equity ' r_e '¹⁰, even if the financial structure is the same. If so, there could be a different WACC for each business line or disaggregated activity such as core/access network, mobile, conditional access or cable TV or international services.

4.2 The WACC and capital value

The WACC must be applied to a capital value for network components and other related assets in order to determine the return that needs to be recovered through access/ interconnection charges. While it may be easy to identify the values of debt and equity for an operator as a whole, it is not easy to do so for each of its constituent activities. This is because decisions about debt finance are largely corporate decisions determined by a number of factors, such as current cash-flow/borrowing conditions, historical borrowing facilities and tax planning considerations. Hence, the debt position of the corporate may not relate specifically to the funding requirements of individual activities. An alternative approach to determining the capital value for regulated activities (such as access/ interconnection) is therefore required.

One approach is provided by the following balance sheet identity:

Shareholders' funds (i.e. equity) + Debt = Net Assets excluding debt¹¹

It follows that the capital values of regulated activities can be determined by apportioning net assets or capital employed. This apportionment should be carried out on a causal basis and under current valuation methodologies.

¹⁰ Financial economics, and actual investor behaviour, teach that the cost of equity ' r_e ' is equal to the cost of risk-free debt plus a risk premium depending on the underlying activity and on the financial market used. Activities with higher competition usually carry higher risk.. The cost of debt ' r_d ' also varies between activities between companies, but - for a given financial market - not as much as the cost of equity ' r_e '. As for the capital structure (E and D), it should also reflect the balance sheet of each main activity. Where there is only one main balance sheet for several activities, it is acceptable to assume the same capital structure for these activities. In this context, the cost of debt ' r_d ' can normally be assumed the same for all activities, unless they have markedly different balance sheets.

¹¹ i.e. fixed assets + current assets – creditors (excluding debt) - provisions.

4.3 Capital employed

Table 2.4 provides a summary of possible allocation methods for different items of capital employed, together with an indication of the principal businesses to which it might be expected that the majority of each item would be allocated. The application of these and, as appropriate, other methods will determine the capital values of different regulated activities.

The table is not intended to be an exhaustive list of items that might be classified as capital employed nor of the methods for allocating them to different activities.

For price-setting purposes, NRAs and operators will be concerned with average capital employed during any period rather than with capital employed at a single point in time such as the end of the financial year. This is because a “snap-shot” at any one point in time may not be representative of the average level of capital employed by operators. Specifically, working capital balances at a single point in time may not be representative of average working capital requirements over an extended period. The separate accounts of operators should therefore show average capital employed, rather than year-end balances, calculated using a geometric average between the beginning and the end of the fiscal year.

4.4 The need for consistency in the treatment of working capital

Table 2.4 proposes one approach to the treatment of working capital in the calculation of capital employed. There are, however, other approaches which may be equally valid. In practice, there are two principles that ought to be applied when considering the treatment of individual items of working capital for the purposes of separate accounting. They are as follows:

- There should be consistency between the treatment of assets and their associated costs and revenues; and
- Inclusion or exclusion of individual items ought, in principle, to have a corresponding impact on the WACC. These two effects (i.e. the decision to include or exclude items and the corresponding adjustment to the WACC) offset each other in terms of their overall effect on the absolute return required by operators.

Section 5 . Qualitative Characteristics of accounting information

The purpose of this section is to provide guidance and explanatory material on the qualitative characteristics that an NRA would expect from the information prepared and presented by notified operators under any cost accounting or accounting separation obligations. These characteristics also provide an analytical framework that can be used in specifying financial information

According to Article 13 of Access Directive, the burden of proof that charges are derived from costs including a reasonable rate of return on investment shall lie with the operator concerned. Additionally, NRAs may require a notified operator to provide full justification for its prices. Consequently, undertakings notified as having SMP in a specific market to which an obligation of cost orientation is imposed, are required to - by means of implementation of an accounting system according to NRAs provisions - produce regulatory financial statements to demonstrate compliance.

5.1 Basis of preparation

On the whole, accounting principles that apply to the preparation of general purpose financial statements under national or international accounting standards can form the basis of regulatory reporting. It is important that the preparer of any set of financial statements fully understands these principles and that these are comprehensive. One way for an NRA to ensure this happens is to explicitly require International Accounting Standards (IAS, see Commission Regulation No 1725/2003¹²) to apply in the absence of regulatory accounting guidelines.

Nevertheless, regulatory accounting information should be prepared in accordance with a set of principles, policies and procedures set out by NRAs, either when initially defining the system or as a result of an audit process, reviews and investigations and a subsequent decision. These principles and procedures could include the following:

a) Regulatory accounting principles

¹² Commission Regulation No 1725/2003 of 29 September 2003 adopting certain international accounting standards in accordance with Regulation (EC) No 1606/2002 of the European Parliament and of the Council, OJ L161, 13.10.2003. The European Commission has adopted this Regulation endorsing International Accounting Standards (IASs), including related interpretations (SICs), and therefore confirming their requirement for their compulsory use from 2005 under the terms of the general IAS Regulation adopted by the European Parliament and the Council in 2002.

These principles establish the key doctrines to be applied in the preparation of regulatory accounting information. They should include, inter alia, the principles of cost causality, objectivity, transparency and consistency.

b) Methods for attributing costs, revenues, assets and liabilities

A description of the attribution methodologies used to fully allocated revenues, costs, assets, liabilities and capital employed.

b) Basis for transfer charging

A description of the basis used to set transfer charge between disaggregated regulatory services as required under accounting separation obligations. Typically this will prescribe methodologies for ensuring that an operator charges itself on the same basis as other operators offering similar services where there is a regulatory requirement to do so

d) Accounting policies

These policies follow the form used for the preparation of standard statutory accounts and will include, for example, details of fixed asset depreciation periods and the treatment of relevant research and development costs. The basis on which assets are valued (e.g. asset lives and depreciation methods) will be included as accounting policies.

e) Costing methodologies

A description of the methodologies used to prepare costs, including reference to cost base and standards, allocation methodologies, identification and treatment of shared and common costs.

These basis for preparation need to be sufficiently detailed and comprehensive so as to ensure that the operator and the independent auditor can apply them consistently and thoroughly.

In addition to this, for an NRA to meet its objectives, regulatory financial information should be relevant, reliable, comparable, and substantial

5.2 Relevance

Information is relevant if it has the ability to influence the economic decisions of users and is provided in time to influence those decisions. An NRA will often be required to investigate economically complex issues and make important regulatory decisions. An NRA therefore will wish to ensure that qualitative characteristic of relevance is applied as a selection criteria at all stages of the regulatory financial reporting process. In practice this may mean closely defining the basis of preparation, the form and content of the statements and verification processes, prior to their use for regulatory decisions

Relevant information has predictive value (if it helps users to evaluate or assess present and future events) or confirmatory value (if it helps users to confirm or correct their past evaluations and assessments) or both. The presentation of this information can significantly enhance a users ability to assess it. For example, if unusual or infrequent items of gains or losses are disclosed appropriately.

5.3 Reliability

There are a number of criteria that can be applied to test if information is reliable such as:

- It can depend upon users to represent faithfully what it purports to represent;
- is it free from deliberate or systematic bias;
- is it free from material error;
- is it complete (subject to materiality tests);
- has a degree of caution (i.e. prudence) been applied in exercising judgement and making the necessary estimates;
- it is signed by a legal representative or it represents a formal expert opinion

5.4 Comparability

Information in an undertaking's financial statements gains greatly in usefulness if it can be compared with similar information for other reporting periods in order to identify trends and differences. This aspect is particularly valuable to NRAs where comparable information is used to assess the impact of competition or establish cost trends for price control purposes.

Comparability is usually achieved through a combination of consistency and disclosure of accounting policies. In a regulatory environment this would include regulatory accounting treatments such as cost attribution methodologies. Full transparency of these policies and other methodologies used to prepare regulatory financial statements is therefore important.

Comparability implies consistency over time in the way in which a regulated undertaking prepares and reports financial information. For instance, changes to the regulatory aggregates and sub-aggregates should only take place after NRA's approval. As indicated above, disclosure of the basis of preparation together with any changes and of the effect of such changes enhances the usefulness of the data.

5.5 Materiality

The information provided by the operator should be enough to allow for a transparent cost allocation, based on the principle of cost-causality. The threshold of materiality, that is the amount of common costs which are allocated on a discretionary (proportional) basis at the end of the cost allocation cycle should be the lowest possible and, in general, not exceed 10% of the total of the costs.

There is also another concept of materiality. In the application of a current cost methodology, having identified a set of network assets to be re-evaluated using CCA, it could happen that it is not possible or advisable to re-evaluate all of the classes identified. In this case, in general the materiality level (that is, the values of

classes maintained at HCA) should not exceed 15% of the total of the asset subject to CCA reclassification.

5.6 Data integrity and maintenance

Data used for regulatory statements must respond to integrity requirements, ie they must be demonstrably (under the responsibility of the firm's legal representative) the data originally presented in the information system of the audited firm, when the first "company audit" was performed for the same fiscal year of application. Data integrity must also result by the availability of electronic support or paper that enables the auditor to perform tests and verifications and allow him to begin the audit with confidence on the audited data.

Bearing in mind NRA's duties and tasks, financial information can be required and should be made available by operators on a periodic basis (at least annually), in order to monitor the compliance with regulatory obligations, and on request, for investigation and analysis of specific situations regarding non-compliance of regulatory obligations and possible anti-competitive behaviours. Additionally, financial information should be kept for a period of 5 years, allowing to trace significant evolutions of costs, revenues and outputs and evaluate the effects on costs of applying possible different criteria and methods.

If the relevant data is put offline after a reasonable period of time (that is, data is removed from dedicated information systems in use by the operator), it should at least be possible to submit to the auditor documents (printouts or other material) certified by a high-ranking responsible, which would at least allow the auditor to perform some test on data relevant at some time for the year of verification, although it would be impossible to test the system with the original data.

6. Transparency, confidentiality, market-related limitations and publication of accounting data and methodologies

NRA's access to the undertakings accounting data

The regulatory framework makes several explicit recalls to the need to implement and maintain transparency mechanism. First of all, the NRA and the auditor should have access to all information (including confidential information) needed to fulfill their respective tasks related to compliance with the requirements of non-discrimination, cost accounting, price controls and accounting separation.

NRAs and auditors are required to ensure the confidentiality of such information in accordance with Community and national rules on business confidentiality, in particular as regards third parties and competitors.

In view of the above and to the extent that the request for information from the undertaking is proportionate to the performance of the task of ensuring conformity with the provisions of the Directives concerning cost accounting and accounting separation, Article 5(1) of the Framework Directive requires Member States to grant NRAs the powers they need to obtain all such information from the undertaking concerned, including financial information and sets out rules for confidentiality regarding the information to be given to third parties..

In addition, the Article referred to above states that Member States shall ensure that undertakings providing electronic communications networks and services provide all the information necessary for the NRA to ensure conformity with the provisions of, or decisions made in accordance with, the regulatory framework.

6.1 Confidentiality

In addition to this, some indications should be provided as long as the interested parties or the general public disclosure is foreseen.

In a competitive marketplace, notified operators might feel that they could potentially be placed at a competitive disadvantage, especially as it pertains to their non-regulated services, if sensitive information is not kept confidential by NRAs requesting or mandating disclosure of certain accounting data.

Confidentiality is certainly an issue that needs to be addressed in order to assure notified operators that really sensitive information provided to the NRAs will remain confidential and not made public, potentially putting the notified operator at a competitive disadvantage. For those NRAs who recognize notified operators' concerns regarding confidentiality, it is important to set up procedures that allow an operator to file certain information as confidential in order to meet this concern.

6.2 Publication of accounting data and methodologies

The complement to the principles referred to in the above sections is the publication of data and methodologies. As already pointed out in the previous paragraph, where information is confidential in nature, NRAs are required to ensure the confidentiality of such information in accordance with Community and national rules on business confidentiality (Article 5.3 of the Framework Directive). However, to the extent that these rules are respected, a number of provisions of the regulatory framework aim at increasing public access to accounting data and methodologies. In particular,

- under Article 5.4 of the Framework Directive Article, the NRAs are granted the power to publish all information that would contribute to an open and competitive market.

- Article 9 of the Access Directive allows the NRA, in accordance with the provisions of Article 8 of the same Directive, to impose obligations for transparency in relation to interconnection and/or access, requiring operator to make public specific accounting information. In this respect, the NRA may specify the manner in which the information is made public (type of publication, cost, etc).

- According to Article 11.2 of the Access Directive, accounting records may be published for the general audience as would contribute to an open and competitive market, rather than solely making financial information publicly available (which might imply that only interested parties are entitled to get access to the information under specific conditions).

- According to Article 11.4 of the Access Directive where the implementation of a cost accounting system is mandated in order to support price controls, a description of this system is made publicly available, showing at least the main categories under which costs are grouped and the rules used for the allocation of costs.

Section 7.3 below covers the information to be included in the statement concerning compliance to be published annually, in the event the implementation of costs accounting systems is mandated and the operator has an obligation regarding price controls.

6.3 Relevant market related limitations

There is a question of how financial information fits with economic market definitions.

The Framework Regulations require NRAs to define relevant markets, in particular the relevant geographic markets within their country,. This obligation applies to both the relevant markets identified in the Relevant Markets Recommendation and to additional relevant markets that NRAs may consider to merit investigation (i.e., so-called “Article 7” markets).

Obligations of accounting separation and/or cost accounting systems may be imposed, to electronic communication operators notified as having SMP in a

relevant market. Therefore it will be necessary to (i) identify costs associated to the services provided in SMP markets and to (ii) evaluate and measure the impact of the costs incurred in non-SMP markets on the costs of regulated services/products in SMP markets.

In compliance with the accounting separation requirements previously illustrated in this Annex (Section 1), NRAs may consider that, to assist in monitoring compliance with non-discrimination and transparency principles and to investigate potential anti-competitive behaviors, more disaggregated sets of accounts, or with accounts with more granularity, or further clarification should be prepared, on request, by the operator.

For activities concerning markets where operators were notified as having SMP a separate account shall be prepared if so requested by the NRA. Activities not subject to regulation may be aggregated in a common account (“Other activities”), and reconciled back to the statutory accounts.

In general it should be possible for an NRA to monitor the evolution of a non regulated service using accounting information, by requesting proportionate and fair accounting information to the firm. However, provisions of the framework (Art. 5 of FD) provide a basis for an NRA to gather accounting separation information in respect of non-SMP markets only insofar as an NRA can justify that the provision of such information is necessary for the NRA to carry out its responsibilities under other provisions of the framework.

NRA’s access to the books and records regarding non-regulated services, ie outside the market identified by NRAs at national level for notification of SMP operators, as they pertain to regulated services transactions is a key element in several proceedings. In particular, the *level* of access to non-regulated services books and records is a key issue.

Some NRAs may contend that open access of all books and records of non-regulated services is necessary and required. Operators may contend that while the NRA may have access to *jurisdictional* transactions (*i.e.*, those transactions with an impact on the cost of regulated services) between the regulated and non-regulated operations, transactions not pertaining to regulated operations should not be subject to regulator review.

In general, information gathering powers for non-SMP markets have to be exerted in a proportionate manner in order to properly and effectively apply an accounting separation obligation on an SMP operator in a duly identified SMP market.

6.4 Principles

- NRA’s may require operators having SMP in relevant markets to have financial accounting and reporting arrangements which are relevant, reliable, comparable, understandable (comprehensive) and substantial. Such financial

information/reporting arrangements should be capable of supplying financial information on either a historic and/or forward looking/current cost basis and attributing costs to the services supplied on an appropriate basis. In particular, costs are attributed to a service only if they are necessarily incurred in the course of providing the service (either alone or in combination with other services).

- Certain communications companies are also characterised by being vertically integrated, with large service/products portfolios, with significant joint and common cost and can avail of significant economies of scale and scope. Notified operators of this type may operate in markets where they are subject to SMP obligations as well as competitive markets. Thus, the division of services and products, and the corresponding costs, capital employed and revenues, between the different markets should be reflected in costing systems and coherence and integrity of information should be assured. Where such particular costs form part of the cost of service in a market where a notified operator has SMP, NRAs need to have visibility as to the basis of and amount of allocation across all services.

	SMP Product	Non SMP Product 1	Non SMP Product 2
LRIC @service level	X		
Common cost 1		X	
Common cost 2			X
Common cost 3	X		

X = NRA to understand about entire cost

- NRAs need to be able to ascertain to what extent services in markets where notified operators do not have SMP ('non-SMP markets) may impact on services supplied in SMP markets. In order to determine the information required for regulatory purposes, it is necessary to explore the nature of the costs incurred by activities undertaken in the course of supplying a service (or combination of services).
- Detailed financial information relating to markets not having SMP designation is of relevance to NRAs in so far as it demonstrates the non discriminatory allocation of costs . To this end, controls related to services supplied in SMP markets must demonstrate that the transfer charges paid from the downstream units of the notified operators to the wholesale units of the same operator are similar to those paid by the competitors present in the same downstream market. Such controls may include the use of 'control totals' for the aggregate of services supplied to non SMP markets if some suspect of unfair cross—subsidization exists. Failure to do this could result in costs which should be charged to a competitive market being charged to a regulated

market with appropriate increases in prices and loss in welfare for consumers or in reverse could result in predatory prices or cross subsidies.

- The financial accounting and reporting arrangements of the notified operator must ensure that it can demonstrate that:
 - the resulting costs for a given service have been properly and appropriately derived from the entirety of financial information relating to all services; and the separation for accounting purposes of the relevant market, its services and any individually identified activities has been properly and appropriately carried out;
 - the completeness of the financial data relating to services supplied in SMP markets is verifiable; and
 - in order to provide assurance as to the reliability of financial information, such information should be traceable, ie enough evidence exists that is sufficient to enable the auditor to follow the path leading to original information in the general ledger.

Section 7. Reporting requirements and verification

This section outlines the periodic reporting framework and publication issues concerning the auditor's control and the statement of compliance.

Pursuant to the guidelines further defined in the present document, cost accounting systems must produce financial information with the degree of detail taken as necessary to demonstrate compliance with the principle of non-discrimination and transparency, adequately identifying and attributing revenues, costs and volumes for the several activities performed by the operator.

Such accounting information should be made available in a promptly manner to the NRA.

Good presentation of regulatory accounts ensures that the essential messages of the financial statements are communicated clearly and effectively and in as simple and straightforward a manner as possible. The presentation of information in financial statements involves some degree of abstraction and aggregation. If this process is carried out in an orderly manner, greater knowledge will result because such a presentation will satisfy the various regulatory objectives such as demonstrating that charges are cost-orientated or the absence of undue discrimination.

Accounting reports comprise supporting notes that amplify and explain the financial statements. Both the financial statements and the supporting notes form an integrated whole.

The following financial information should be prepared and published (subject to confidentiality and national law obligations)

- Profit and Loss statement;
- Capital employed statement (namely, detailing form of calculating and value of parameters used);
- Consolidation and reconciliation with statutory accounts or other source of costing information;
- Non-discrimination notes (namely, detailing transfer charges);
- Audit opinion;
- Description of accounting principles, policies methodologies and procedures used, namely regarding the cost allocation methodologies;
- Compliance with EC and national regulations statement;

Reporting formats, which may follow standard statutory accounting design, should be defined in advance by NRAs, with consultation with operators.

7.1. Reporting period

Publication should take place at least on an annual basis, and as soon as possible after the end of the accounting year. It would be desirable to establish that no later than two months after the completion of the audit, the publication of the statement takes place.

Some time can be spared by asking the operator to submit a detailed set of documents to the auditor in advance of actual verification procedures, so that the auditor can get acquainted with procedures and documents typology.

Operators should be capable of reporting on-demand or within a stricter timeframe, when required by NRAs for specific circumstances, in particular for investigations on eventual anti-competitive practices

7.2. Audit scope and verification

The questions of the audit scope, given its regulatory purposes the main of which is to provide confidence and transparency to the market and the end users, must be relatively wide and in general go beyond the traditional audit scopes performed on the ordinary financial statements. To this end, some guidance is provided here to the:

- i) scope of the audit, timing, powers and obligations of the controlling entity;
- ii) elements to be covered in the audit;
- iii) ensure that elements of the mandate of the auditor are clearly established so to ensure harmonization across Member states.
- iv) the controlling entity

Guidance on the elements above apply regardless of the company that carries out the annual audit, which can be both the NRA itself (provided it has the necessary qualified staff) or another qualified body, independent of the operator concerned (as stated by Recital 21 of the Access Directive and Recital 27 of the Universal Service Directive).

i) Scope and definition of audit

To audit means to go through the process of examining and verifying a company's regulatory accounting reports and supporting documents. This includes systematic (formal) accounting revision checking, as well as an examination of whether the rules set out by the NRA are correctly applied.

A further concern, relating to the states requiring an audit, is the definition of the term "audit". In the classic sense this term would imply performing procedures on a test basis which would give the auditor an appropriate level of assurance that information is correct.

It is part of the auditor task anyway to adopt any due diligence to the verification, that allows him or the NRA or both to increase the public understanding of the audited accounting practice.

If a formal verification is normally required (in the form of a “fairly represents” statement), in some cases an “agreed-upon procedure” engagement is likely the lowest cost and best option, particularly given the possibly qualitative nature of some NRA’s requirements.

A tangible economic cost exists for operators required to undergo an audit or other procedures surrounding their compliance with rules covering non regulated sectors, which must be considered within the proportionality assessment

ii) elements to be covered in the audit

The main elements to be covered in the audit are the following: a) the scope of costs included in the model and the scope of costs allocated to regulated product; b) the reconciliation between cost model and statutory accounts; c) correctness of figures, including operational data: volumes, technological parameters; d) methodologies used regarding amortization, cost capitalization, allocation and for the evaluation of the assets (e.g. current costs).; e) transfer charges in separated accounts; f) reconciliation between the cost model and the separated accounts.

iii) mandate of the auditor

The mandate of the auditor should be clearly established so to ensure that the relevant aspects of the auditing process are well defined and transparent. In this regard, the NRA should publish a description of the main elements of the mandate, such as the following:

- I) the controlling company should have access to all parts of the model, supporting documents, source systems and related documentation;
- II) the undertaking subject to verification should make appropriate resources available in order to provide explanations to questions arising during the review;
- III) the responsibility of the controlling company should be clearly defined regarding certification and confidentiality;
- IV) the description should include the number of man-days required to perform the audit¹³.

iv) the controlling entity

When the verification of the compliance with a cost accounting system is mandated in order to support price controls or retail controls, the compliance should be ensured by a qualified body, independent from the operator concerned. The NRAs

¹³ Though the human resources allocated to the verification process may vary according to the operator and will have to be established on a case-by-case, regulatory audits might require a significant number of man-days).

may itself undertake the annual control provided it has the necessary qualified staff. The Commission Recommendation on statutory auditors' independence¹⁴, establish a sound framework against which independence could be tested, where relevant.

7.3. Publication of information

The audit results should be made publicly available, respecting national and Community laws on business confidentiality restrictions.

Regulatory accounting information serves NRAs, but also others that may be affected by regulatory decisions based on that information, such as competitors, investors and consumers. Moreover, publication of information may contribute to an open and competitive market, as recognised by Commission, and also to add credibility to the regulatory accounting system.

However, full disclosure may be restricted by national and Community rules regarding commercial confidentiality. It is recommended that NRAs, having taken the opinion of operators, define what information can be considered as confidential and should not be made available. Statement of compliance with Community and national legislation, audit opinion and description of accounting principles, policies methodologies and procedures used, namely the cost allocation methodologies, should not be considered confidential.

The elements to be included in the annual statement of compliance should include the conclusions of the controlling body, all identified irregularities and recommendations made by the auditor (with a description of the corresponding effects), the full description of the verification methodology followed and at least some aggregate financial and accounting data (CCA adjustments, main assumptions made on allocation keys, level of costs allocated, the level of granularity of the model, etc.).

Publication of the statement of compliance and of the audit results should be in a form easily accessible by interested parties, such as paper form or on CD-ROM, and on the operator's or NRAs website.

¹⁴ Commission Recommendation of 16 May 2002, Statutory Auditor's Independence in the EU: A Set of fundamental principles, OJ L 191/22, 19.7.2002.

Section 8 - Long Run Incremental Cost

8.1: Concept and economic rationale of long run incremental cost

When using a forward looking approach, the NRA will need, after having reassessed the value of network assets at current costs, to implement a cost methodology based on long run increments (in the services provided by the operator subject to cost accounting obligations). To this end, a long run incremental cost methodology is here illustrated, firstly under the theoretical aspect and secondly under the practical point of view.

8.1.1 Incremental cost concept

From an economic point of view, the incremental cost is the increase in total costs following the introduction of the increment. The increment can take several forms. A product or group of products could be defined as the increment, but also a single unit of production.

The costs associated with the smallest possible increment is equal to marginal cost, which is defined as the increase in total costs following the introduction of an infinitely small unit of production. The costs associated with the largest possible increment are equal to total costs of all activities. In that case, the increment would be defined as the whole range of products.

Mathematically, the incremental cost can be defined as the total costs associated with total production including the increment minus the total costs associated with total production excluding the increment.

8.1.2 Economic rationale

In economic theory, the optimal method of setting tariffs is the method that causes the least distortion in the market. Using marginal cost as a basis for determining tariff levels is generally considered as providing the economically (welfare) optimal incentives. In the case of access services, new entrants deciding on whether or not to replicate (part of) the notified operator's network get the right incentives: they will only replicate and operate (part of) the network if they can do this more efficiently than the notified operator. This is because a new entrant will only decide to replicate and operate itself if the entrant can do this at a cost lower than the tariff to be paid to the notified operator.

Marginal cost, although theoretically being the most economically sound cost base, is not very practical when setting tariffs. Applying marginal cost implies choosing an infinitely small increment. It may be virtually impossible to define an adequately small increment. Furthermore, using a larger increment may be preferred to ensure

that the resulting incremental cost data is fit for purpose. In a tariff-setting context, this means that the resulting data should be able to demonstrate that charges are based on cost.

For the purpose of setting tariffs, application of incremental cost is widely considered an acceptable proxy for marginal cost. It provides the parties involved with the same economically sound incentives as marginal cost does. Furthermore, the concept of incremental cost is much more practical to use than marginal cost.

When applying a long run perspective, all costs are assumed to be variable. This implies that long run incremental cost takes capital as a variable factor of production. That way, long run incremental cost provides decision makers with the correct cost base for making investment decisions. This is particularly important in the capital-intensive electronic communications market, which is characterized by significant investment costs and the long term nature of assets.

8.1.3 Imposition of LRIC cost modelling

Long run incremental cost is often used as a basis for setting tariffs for electronic communications services. Practical implementation ranges from all sorts of services, although the LRIC concept is most widely applied in the context of setting tariffs for access / interconnection services. These are the tariffs the network-based operator (in a regulatory environment, usually the incumbent) is allowed to charge to other parties wishing to make use of its network.

National regulatory authorities have several options at their disposal regarding the imposition of price control and cost accounting obligations. Imposition of cost-oriented prices that are based on LRIC is one, of the options to choose from. A high degree of transparency in the adoption of any cost methodology is desired and will aid in gaining the support of the parties involved.

The ERG/EC Common Position on Remedies provides guidance on the situations that warrant the use of price control and cost accounting obligations. Setting prices based on LRIC cost modeling is one of the more developed methodologies that national regulatory authorities can consider when assessing the most appropriate price control and cost accounting obligation.

In general, the national regulatory authority will have to consider whether the market characteristics are such that application of LRIC best reflects the twin aims of protecting consumers (by promoting competition in services) where replication is not considered feasible and of supporting economically feasible investment when replication is possible.

In situations where replicability of infrastructure is deemed economically infeasible, the use of existing facilities of the regulated operator should be encouraged. This could be achieved by setting prices for (access) services close or equal to the efficient costs of providing the service. LRIC cost modeling could be applied to determine this efficient cost level. A national regulatory authority could use a

bottom-up approach to determine the LRIC cost of an efficient operator. Another possibility is using a top-down approach, which starts with the actual costs of the regulated operator, and to adjust for inefficiencies.

As LRIC cost modeling allows assumptions to be made on input parameters, it can also be applied, where warranted, in market situations where replicability of infrastructure is considered economically feasible. These parameters include the application of ‘allowable’ inefficiencies (i.e. costs which the regulated operator can recover with its prices), the reasonable rate of return the operator is allowed to include in its prices and the amount of common costs that can be recovered. With the choices made on these parameters, a national regulatory authority can convey the right incentives to market parties to achieve the twin aims as described above.

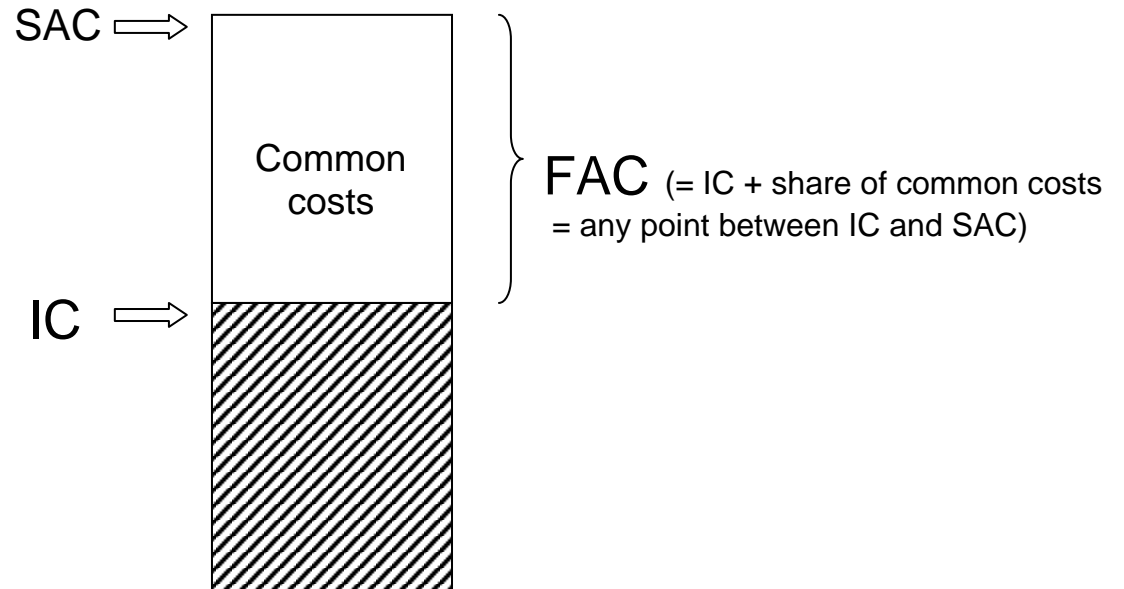
8.1.4 Relation between IC, SAC and FAC

The stand-alone cost (SAC) of an increment is the cost incurred in providing that increment by itself, on the basis that no other increments are provided. Accordingly, all common costs that would be incurred if the increment considered were the only increment to be produced are included in the SAC of the increment.

The fully allocated cost (FAC) of an increment is the cost incurred in providing that increment, on the basis that none of the operator’s costs are left unallocated. This means that part of the common costs is allocated to the increment involved. This allocation can be done in various ways, but is typically done with some (proportional) relation to the (direct) costs that are already allocated.

The concepts of (LR)IC, FAC and SAC are related. IC is sometimes referred to as a price floor. Setting a price below IC would mean that not even all incremental costs would be recovered. SAC is considered a price ceiling. A price above SAC would mean that an amount in excess of the IC plus all of the relevant common costs would be recovered. FAC is ‘somewhere’ between the IC floor and SAC ceiling, as in the case of FAC a part of the common costs is allocated to the increment. The following figure captures the relationship between the cost concepts:

In a regulatory environment where LRIC cost allocation results in a range (LRIC to SAC) rather than in a specific LRIC price (including a specific mark-up for common costs), a first test for ensuring that prices are cost-oriented is to check whether they are between the IC floor and the SAC ceiling. However, in a situation where the prices of more products and services are based on IC (including a mark-up for common costs), this first test alone is not sufficient to demonstrate cost-orientation. For example, if all prices were set at SAC, incremental and common costs would be more than recovered. Therefore, another test might be considered necessary. This is the combinatorial test, whereby the aggregate revenue of services straddling the common costs is compared to the LRIC and SAC of these services measured as a single increment. Potentially, a large number of combinatorial tests may need to be carried out.

1 Figure 2

8.2 Practical implementation of LRIC cost modelling

8.2.1 Introduction

When a national regulatory authority has decided that the use of LRIC is appropriate, it will have to develop and implement a LRIC cost model. This entails a multitude of choices regarding, e.g., the size of the relevant increment, time horizon, allocation of common costs, and the network topology to be modeled.

In this part of the annex, a few of the most important issues that national regulatory authorities encounter while implementing LRIC are discussed. This part draws heavily on the Principles of implementation and best practice regarding FL-LRIC cost modeling (hereafter: LRIC PIBs), which the IRG issued on 24 November 2000. The recent ERG consultation concerning these PIBs has resulted in a number of responses by interested parties. These responses have been taken into account in this annex. The more detailed issues will be dealt with in the review of the LRIC PIBs, which the IRG intends to publish later this year.

In general, an NRA planning to have operators adopt a LRIC methodology should provide at least the following indications:

- A general description of the model (top-down, bottom up) to be adopted, ie its purposes and the services to be featured in the model;
- Operational Definitions
- Main methodological assumptions, expressed in terms of costs and services evolution (increments), and the main cost categories
- Criteria for the LRIC methodology applications;
- A detailed process scheme for the cost calculations in LRIC;
- The main cost-volume relationships to be used in the model;
- Features of specific (fixed, mobile) networks;
- Main expected outputs;
- A timing for the implementation of the model.

In particular, the main definitions will cover:

8.2.2 Long Run and Forward Looking

Use of LRIC requires a long run view of costs, meaning that the costing methodology should take all costs as being variable. In other words: the ‘long run’ is defined as the time horizon within which the operator can undertake capital investment or divestment to increase or decrease the capacity of its existing productive assets. Thus a very long time horizon is observed in which all costs, including investment capital and all costs related to network capacity, are potentially variable.

In applying LRIC cost modeling, forward-looking costs are the appropriate cost base. Where the regulatory objective is to mimic the workings of a competitive market these forward- looking costs should reflect resource costs. In a competitive environment operators may not be able to set the price for every product in order to fully recover its incurred or historic cost, since they have to respond to market prices, which can lie well below historic costs. They cannot therefore work according to historic cost since reversing investments is, for the main part, either not possible or only possible at a loss. An operator should therefore only be able to recover costs necessary for maintaining future real-asset values in a competitive market. This implies that the basis for asset valuation is the replacement cost of an asset as derived from the application of current cost accounting (CCA) methodologies.

In practice, the concept of forward-looking costs requires that assets are valued using the cost of replacement with the modern equivalent asset (MEA). The MEA is the lowest cost asset, providing at least equivalent functionality and output as the asset being valued. The MEA will generally incorporate the latest available and proven technology, and will therefore be the asset that a new entrant might be expected to employ.

8.2.3 Network topology

The network design in the LRIC model depends on what assumptions are made on network topology. One of the key decisions to be made in LRIC cost modeling is related to the question whether to adopt a ‘scorched node’ or a ‘scorched earth’ approach. In a top down modeling environment this is a decision between whether or not to allow the notified operator to base its costs on the existing network topology (scorched node) or on an ideal network topology that would meet the demands of a fully efficient operator (scorched earth). In a bottom up modeling environment this is a decision between whether or not the bottom up model should

take into account the existing network topology (scorched node), or that the costs in the model should be based on an ideal topology (scorched earth).

Designing and agreeing an optimal network topology is not a straightforward and uncontentious task. Because of reasons of feasibility, it is appropriate and reasonable to adhere to a bounded rationality approach, and thus to take the existing network topology as the starting point for the cost allocation process. Such a scorched node approach would imply that the technology at and in between existing switching nodes is optimized to meet the demands of a forward-looking efficient operator (e.g., this could mean the replacement of an analogue tandem switch and possibly also the replacement of a host switch by a remote concentrator).

It is appropriate and reasonable to modify the scorched node approach in order to replicate a more efficient network topology than is currently in place. Such a modified scorched node approach could imply taking the existing topology as starting point, followed by an elimination of inefficiencies. This may involve changing the number or types of network elements that are located at the nodes to simplify and decrease the cost of the switching hierarchy. Other important issues in this respect are how to deal with spare capacity in the network and the existence of stranded costs. These issues will be further dealt with in the review of the LRIC PIBs.

8.2.4 Relevant increment

LRIC cost modeling includes only those costs that are caused by the provision of a defined increment of output (or, alternatively, those costs that are saved when the defined increment of output is no longer provided). This implies that in LRIC cost modeling a decision has to be made concerning this relevant increment. In principle, there are an infinite number of different sized increments that could be measured, which can be grouped into an individual or collection of products, services, components or elements.

It is important that increments are defined in such a way that the resulting incremental cost data is fit for purpose, i.e. that the outputs can be used to demonstrate that charges are cost orientated. This requires that LRIC data is appropriately disaggregated to a product or service level.

Another relevant factor for defining the increment are the key external and internal cost drivers. Identifying these main cost drivers will assist the process of defining increments. An example, in the case of regulated telecommunications companies, is that one may want to treat 'access' and 'conveyance' as two separate increments since for access the costs are driven by the number of physical lines and for conveyance the costs are largely driven by traffic.

However, defining only two increments – 'access' and 'conveyance' – could result in a high aggregation level of cost data that may not provide the information necessary to demonstrate cost orientation. Therefore, to ensure that LRIC data is fit for purpose, it may be necessary to derive subsets of the main increments to enable

LRIC data to be calculated at a lower level (such as the core components of the network). However, there are practical and methodological limitations to defining increments at a too narrow or too detailed a level. LRIC models can be large and complex requiring significant expertise and computing resources to operate effectively. Generally, the smaller the increments being considered, the more detailed and resource intensive the cost modelling has to be.

National regulatory authorities will need to define the relevant increment that strikes the balance between, on the one hand, the disaggregated level needed to demonstrate cost orientation and, on the other hand, the disaggregated level that can be practically implemented. The earlier-mentioned review of the LRIC PIBs will provide more guidance on the definition of the relevant increment and will deal with related issues such as Total Element LRIC (TELRIC) versus Total Service LRIC (TSLRIC), applying LRIC to the access and core network, whether unregulated services should be included in the increment, and the differences in the application of LRIC for mobile and fixed networks.

8.2.5 Cost Volume Relationships (CVRs)

In LRIC-modelling, cost drivers can be used to identify cost volume relationships (CVRs). A cost driver is the factor or event that causes a cost to be incurred, while a CVR describes how costs change as the volume of the cost driver changes. The aim of identifying a CVR is to be able to demonstrate how costs change as the volume of the cost driver is altered.

8.2.6 Allocation of common costs

The term ‘common costs’ defines costs which cannot be directly assigned to specific services within either regulated or non regulated activities. An increase in the production of one product or service could increase total common costs, but the increase is typically not proportional. Therefore, the common costs associated with a combined production of several products or services are smaller than the sum of the common costs that would be incurred if the same products or services were produced separately.

When applying incremental cost, common costs are only recovered by the increment insofar as an increase in common costs can be directly attributed to the increment. This generally means that the increment incurs a disproportionately small share of the common cost. If all products and services were to be priced equal to incremental cost, a significant part of the common costs may not be recovered.

In a regulatory environment, it is generally accepted that the increment covers a reasonable proportion of the common costs. However, a direct relation between the increment and the associated common costs is lacking. Economic theory has come

up with a number of methods to allocate common costs. Two of the most important are discussed below¹⁵.

1. Ramsey Pricing

Ramsey pricing is one solution for determining the allocation of common costs. This method determines the allocation over multiple products given the condition that all common costs have to be recovered. To reach this allocation, one has to take account of the impact of tariff changes of the products involved on the operator's profitability.

Products with low demand elasticity generate only limited welfare losses if a significant mark-up in the tariffs is imposed. Hence, with Ramsey Pricing, these products bear a larger share of the common costs.

Ramsey pricing is rarely used in practice where regulation is concerned. An important reason for this is that this method is practically unfeasible due to the complex and dynamic information requirements on demand elasticities. Furthermore, Ramsey pricing may lead to price-setting that is detrimental for competition. Often, the services with the highest demand elasticity are those where competition is most intense. Not allocating common costs to these services results in relatively low prices, which may prove to be too low for competitors. Also, allowing the common costs to be allocated entirely to non-competitive (low demand elasticity) services might lead to conflicts with universal service obligations.

2. Equal Proportionate Mark-Up (EPMU)

A more practical way of allocating common costs, is applying the EPMU method. Using this method, common costs are recovered in proportion to the incremental (direct) cost already allocated to the separate products and services. The advantage of this method is that it is generally easy to implement and use.

Disadvantage is that the allocation of common costs may not be related to the relative use of common cost by the separate products or services, which could make the allocation rather arbitrary. This may not be optimal from a welfare perspective, and could introduce adverse incentives for the producing and consuming parties involved.

The risk of arbitrary, and therefore potentially, sub-optimal allocation of common costs, however, should be considered less harmful than the detrimental competitive effects that Ramsey pricing could cause. Therefore, in a market situation where the SMP operator has the ability to profitably and long-term cross-subsidize competitive services with supernormal margins in non-competitive services, EPMU is the preferred method.

¹⁵ Another method for the allocation of common costs is the Efficient Component Pricing Rule (ECPR). With ECPR, allocation is based on opportunity costs.