Body of European Regulators for Electronic Communications

BEREC

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Regulatory Accounting in Practice 2015

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Contents

1. Executive summary

This is the eleventh annual report in a series summarising the findings of a detailed survey of regulatory accounting frameworks across Europe. The information has been gathered from National Regulatory Authorities (NRAs) and covers the implementation of regulatory cost accounting methodologies, which include allocation as well as annualisation methodologies[1], systems and processes.

These regulatory accounting frameworks provide NRAs with financial information essential to facilitate some of their significant regulatory decisions such as setting price controls, monitoring compliance with *ex ante* obligations (such as cost orientation of charges and non-discrimination) and informing market reviews.

The document provides an up-to-date factual report on the regulatory accounting frameworks implemented by NRAs and an assessment of the level of consistency achieved. The report sets out an overview of the regulatory accounting frameworks updated to April 2015 and also illustrates, where possible, trends and comparisons with data collected each year, starting from 2006.

The report develops a deeper analysis that concentrates on the Wholesale Line Rental (WLR) service and the following key wholesale markets: Wholesale Local Access (Market 3a), Wholesale Central Access (Market 3b) and Wholesale high quality access (Market 4). Moreover an analysis is given of the cost base and allocation methodologies used for fixed (Market 1) and mobile (Market 2) termination markets.[2]

Furthermore, as in last years' report, to emphasise factors influencing NRAs regulatory strategy, additional structural data (e.g. population, market structure, infrastructure) have been collected from NRAs. Not surprisingly, considerable differences in the market/competitive situation as well as infrastructure in place can be observed between (and within) the responding countries reflecting different external and technical requirements which NRAs need to take into account.

The report also looks at annualisation methodologies provided by respondent NRAs. As in last year's report, accounting information for some products in Market 3a, such as copper access (including LLU, SA, SLU), fibre access (LLU, VULA), dark fibre access and duct access have been analysed.

[1] The report is more precise with regard to the "labelling" of the areas covered, however this does not imply a change of the cost (accounting) methodologies covered, i.e. continuity of the time series is ensured.
[2] The report takes into account the new version of the relevant market recommendation as adopted by the Commission on 9th October 2014 (2014/710/EU).

As of last year the report includes a section on actual implementation of the Termination Rates Recommendation 2009/396 of 7 May 2009.

Moreover, this year the report includes a further analysis about the implementation of the Recommendation 2013/466/EU on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment of 11 September 2013 with regard to costing methodologies and price level.

This year the report will provide some element about WACC parameters used in different markets and the modification occurred with respect to the previous survey done in 2013.

Key findings

The overall picture is relatively stable in comparison to last year with just a small number of changes by NRAs since last year. There are clear preferences for price control methods (cost orientation alone or in combination with price cap), cost base (current cost accounting – CCA) and allocation methodologies (mainly long run incremental costs (LR(A)IC) with fully distributed costs (FDC) preferred only in a few markets). The degree of consistent application of methodologies continues to be high and accommodates the use of elements or parameters that reflect national circumstances. These findings reflect the primary cost base or allocation methodology selected by a NRA but do not bring out situations where a NRA would strengthen its financial analysis by comparing outcomes from one principal methodology with alternative approaches such as comparing bottom-up models with top-down or incurred costs. For all markets except Market 1/2007 - and to a lesser extent in Markets 3b and 4 - the combination of CCA and (FL) LR(A)IC is the most favoured approach, in particular this combination is preferred in the termination markets (Market 1 and Market 2), where the LRIC approach often takes the form of pure LRIC to comply with the Recommendation 2009/396/EC on termination rates.

The analysis over time of the key wholesale markets – Local Access (Market 3a), Central Access for mass-market products (Market 3b) and High quality Access (Market 4) – has shown a clear preference for cost orientation, a trend towards CCA and a fairly even distribution of LRIC and FDC accounting methods. Slightly different results are observed for Wholesale Line Rental, where retail minus is the favoured price control method, HCA (historical cost accounting) and CCA are used quite in the same proportion and FDC is clearly the preferred choice of allocation methodology.

Taking into account the information detailed for different products in Market 3a, it results that cost orientation is the preferred price control method for all products under analysis. As far as

the allocation methodology is concerned, LR(A)IC is prevailing by far for all products except duct access products where also FDC is observed.

Regarding the WACC, the survey and the update provided in this report shows that while NRAs use near identical methods and parameters for determining the WACC, the value of these parameters and the ensuing WACC naturally differs reflecting national financial market conditions. This is due to the underlying calculations that are based on economic and financial market circumstances as well as tax and inflation rates in the individual European countries. Furthermore, the regulatory periods and therefore the update periods for the WACC parameters differ in each country.

Overall the 2015 data confirms the trend towards an increasingly consistent approach to regulatory accounting approaches and a stabilisation in the application of particular methods for cost valuation or cost allocation among NRAs. The latter indicates that NRAs are providing predictable and stable regulatory environments in their countries.

Future development

Good progress has been made in developing effective regulatory accounting frameworks to meet the needs of NRAs. However, this is a complex and highly technical topic which requires regular maintenance and enhanced implementation of the regulatory accounting framework as competition develops, technology improves and new regulatory challenges emerge.

2. Introduction

2.1 Background

The BEREC Regulatory Accounting EWG has been gathering and reporting data from National Regulatory Authorities (NRAs) with the aim of describing how regulatory accounting systems are implemented in Member States with respect to cost-orientation or non-discrimination obligations or to assist price control decisions. This is the eleventh annual report summarising the results of this survey.

The report has been updated since 2005 in order to monitor the level and trend in harmonisation of regulatory accounting systems across Europe over time.[3] By the end of the first quarter 2006 several countries had completed the first round of the market reviews for the 18 markets listed in the 2003 Recommendation; therefore it was possible to start evaluating how various Member States implemented the obligations provided for by articles 10, 11 and 13 of the Access Directive (for wholesale markets), by article 17 of the Universal Service Directive (for retail markets) and the principles contained in the new European Commission Recommendation on Cost Accounting and Accounting Separation of September 2005.[4] Subsequently, as the Commission issued the 2007 Recommendation that reduced the number of markets susceptible to ex ante regulation, the Report focused gradually on a lower number of markets and more recently on how Member States implemented the principles of the Commission Recommendation on consistent non-discrimination obligations and costing methodologies.[5]

Generally speaking, previous years' reports showed a clear trend towards an increasingly consistent approach to regulatory accounting approaches among BEREC countries. This trend is further confirmed by the 2015 data, though with signs of stabilising at a high level of applying

[3] - IRG (05) 24 Regulatory accounting in practice 2005.
- ERG (06) 23 Regulatory accounting in practice 2006.
- ERG (07) 22 Regulatory accounting in practice 2007.
- ERG (08) 47 Regulatory accounting in practice 2008.
- ERG (09) 41 Regulatory accounting in practice 2009.
- BoR (10) 48 Regulatory accounting in practice 2010.
- BoR (11) 34 Regulatory accounting in practice 2011.
- BoR (12) 78 Regulatory accounting in practice 2012.
- BoR (13) 110 Regulatory accounting in practice 2013.
- BoR (14) 114 Regulatory accounting in practice 2014.

[4] Recommendation 2005/698/EC replacing Recommendation 98/322/EC on Accounting Separation and Cost Accounting of 8 April 1998. In September 2005 the ERG published a Common Position containing "Guidelines on implementing the EC Recommendation 2005/698/EC", cf. document ERG (05) 29.

[5] The Commission has worked on a new recommendation covering "Costing methodologies for key wholesale access prices". BEREC has provided detailed input to the public consultation, cf. Document BoR (11) 65. Furthermore it has submitted the BEREC Opinion on the draft recommendation on non-discrimination and costing methodologies on March 26th 2013, cf. Document BoR (13) 41. The Commission has published the new "Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (2013/466/EU)" (C(2013) 5761) on 11 September 2013.

particular methods for cost valuation or cost allocation. The latter indicates that NRAs are providing predictable and stable regulatory environments in their countries.

2.2 Current report

This report provides an update on the status of regulatory accounting systems across Europe. It monitors how regulatory accounting methods and models have been developed as a consequence of the adoption by NRAs of decisions regarding market analyses. This year's report confirms the trend towards the consistent implementation of accounting methods and models already observed during the last few years.

The report benefits from information collected from 31 authorities (listed in Annex 1) with most NRAs responding to the majority of the questions, thus providing a solid base for further analysis. The information provided in this report refers to those markets for which the market analyses are either concluded or under consultation. The report reflects, therefore, also measures which are planned to be implemented by the end of 2015, although the final decisions may still be subject to further consultations and may therefore still be part of the next market analysis rounds.

2.3 The data collection process

NRAs can, in principle, use a variety of objective and appropriate regulatory accounting methodologies depending on their market analysis[6], however NRAs should aim at following regulatory best practice.

In order to obtain a general view of cost accounting systems across Europe, the Regulatory Accounting EWG has collected a broad range of data since 2005, including, *inter alia*, a comparison between the cost-base (e.g. historical cost versus current cost) and the allocation methodology (e.g. fully distributed cost – FDC – or long run incremental cost – LRIC) chosen by different NRAs.

Such data, providing a valuable source of information, form a database, which is an informal data exchange tool among NRAs.[7] It includes the following information:

- cost base;
- accounting system/allocation methodology;
- price control method;
- auditing process;
- WACC calculation methodology; and

[6] For an exhaustive explanation of how to implement a regulatory accounting system see the ERG (05) 29 "Common position on EC Recommendation on Cost accounting systems and accounting separation under the regulatory framework for electronic communications" (2005/698/EC). Cf. also BEREC response to the Commission's questionnaire on costing methodologies for key wholesale access products in electronic communications, BoR (11) 65.

[7] The database contains confidential information and therefore is not published.

- remedies imposed on Significant Market Power (SMP) operators.

In order to improve data comparability the following pre-defined options were included in the data request:

For the Cost base:

- *HCA Family (Historical Cost Accounting)*
- *CCA Family (Current Cost Accounting and Forward Looking – Current Cost Accounting)*
- *Other cost base methodologies that do not appear in the above definitions*

For the Accounting System / Cost Model[8]:

- *LRIC, LRAIC (Long Run Incremental costs, Long Run Average Incremental costs)*
- *FDC (Fully Distributed Costs)*

For the Price control method:

- *Cost orientation (alone)*
- *Price Cap (alone)*
- *Retail Minus*
- *Cost orientation and Price cap*
- *Benchmarking*
- *Benchmarking in compliance with Rec. 2013/466/EU of 11 Sept 2013*
- *ERT (economic replicability test) as laid down in Rec. 2013/466/EU*
- *Other price control methods that do not appear in the above definition.*

Besides the above mentioned data, countries have provided further information regarding the approach used to develop cost models (e.g. Top-Down (TD) or Bottom-Up (BU)).

Data for other markets not listed in the 2014 EC Recommendation[9] on relevant markets, as susceptible to *ex ante* regulation, are also collected.

Finally, in order to simplify the data presentation and also to respect the confidentiality request made by some NRAs for certain data, this report, as in the previous years, does not present and comment all the data collected. The report concentrates on the markets listed in the 2014 Recommendation, which are typically subject to regulatory accounting remedies.

[8] According to Recommendation 2005/698/EC "*The purpose of imposing an obligation to implement a cost accounting system is to ensure that fair, objective and transparent criteria are followed by notified operators in allocating their costs to services in situations where they are subject to obligations for price controls or cost-oriented prices.*"

[9] Recommendation 2014/710/EU.

3. Outline of the Results

3.1 A snapshot of 2015 regulatory accounting data

The information collected for the Regulatory Accounting Report has been referred, until 2013 data collection, to the 18 markets listed in the Recommendation 2003/311/EC. In December 2007, this Recommendation was substituted by a new Recommendation (2007/879/EC) which, following the evolution observed in electronic communication markets over recent years, revised the list of relevant markets of the previous one and reduced the list of markets susceptible to *ex ante* regulation to seven, one at the retail level[10] and the other six at the wholesale level.[11]
In October 2014 the Commission issued another Recommendation which further reduced the number of markets, by eliminating the retail market from the list of markets susceptible to ex ante regulation and reducing the number of wholesale markets to four (Appendix A.4).[12]

As, for most NRAs, the remedies referred to deleted markets – that is to say to the retail fixed line access market and the wholesale fixed call origination market – were adopted before the 2014 Recommendation has become effective. Since the process of market review requires time, so that in many cases a final decision is not yet available, data referred to those markets have been still collected and presented in this report.

The following figures show a snapshot of the "Price control method", the "Cost base" (incl. the "Annualisation methodology") and the "Allocation methodology" used in the year 2015 for regulated markets listed in the new Recommendation. Moreover the analysis show results for Market 1 and 2 of EC 2007 Recommendation and the WLR service.

3.1.1 Price control method

Figure 1 below gives an overview of the price control methods used to regulate the markets listed in the EC 2014 Recommendation in the year 2015. Moreover Markets 1/2007 and 2/2007 and WLR service have been included. In order to better reflect the actual price control methods, BEREC has further streamlined the possible price control options.

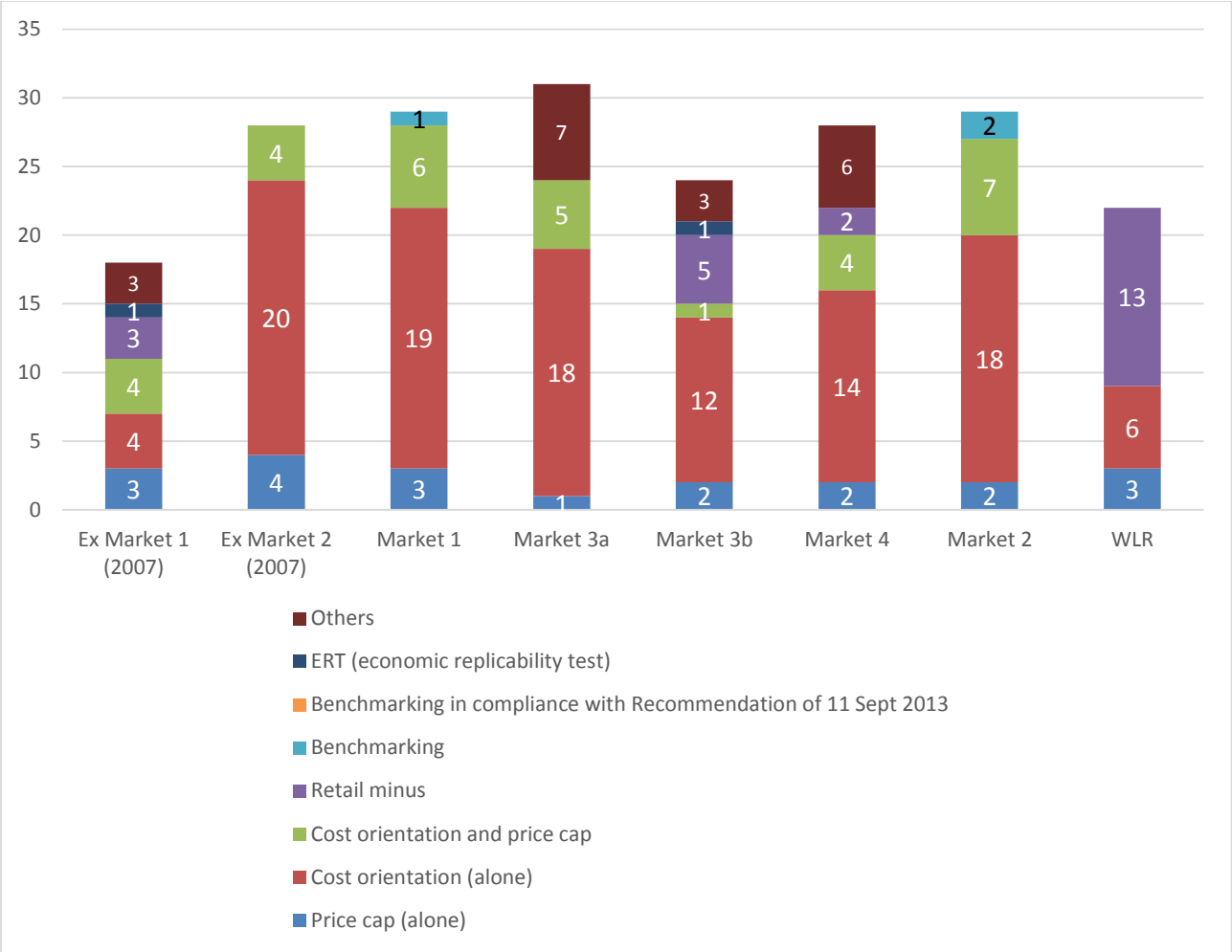
[10] Market 1: "*Access to the public telephone network at a fixed location for residential and non-residential customers*" (Markets 1 and 2 of 2003/311/EC Recommendation).
[11] Market 2: "*Call origination on the public telephone network provided at a fixed location*" (Market 8 of 2003/311/EC Recommendation) ; Market 3: "*Call termination on individual public telephone networks provided at a fixed location*" (Markets 9 of 2003/311/EC Recommendation); Market 4: "*Wholesale network infrastructure access at a fixed location*" (Markets 11 of 2003/311/EC Recommendation); Market 5: "*Wholesale broadband access*" (Markets 12 of 2003/311/EC Recommendation); Market 6: "*Wholesale terminating segments of leased lines*" (Markets 13 of 2003/311/EC Recommendation) and Market 7: "*Voice call termination on individual mobile networks*" (Markets 16 of 2003/311/EC Recommendation).
[12] Market 1: "*Wholesale call termination on individual public telephone networks provided at fixed location*"; Market 2: "*Wholesale voice call termination on individual mobile networks*; Market 3a: "*Wholesale local access provided at fixed location*"; Market 3b: "*Wholesale central access provided at fixed location for mass-market product*"; Market 4: "*Wholesale high quality access provided at fixed location*".

Figure 1 shows that cost orientation remains the most commonly used price control method in wholesale markets. In Market 3b (Wholesale Central Access), the Retail Minus as in the previous year remains a method applied by five NRAs to set prices and it is mainly used in WLR services (by 13 out of 24 NRA). Another common price control method used in wholesale markets is cost orientation accompanied by a *price cap*. The situation is different for Market 1/2007 where a variety of methods are being used.[13]

Compared to 2014 data, where "Benchmarking" was adopted by one NRA only in Market 2/2007, by two NRAs in Market 1 and by three NRAs in Market 2, in 2015 "Benchmarking" is applied only by one NRA in Market 1 and by two NRAs in Market 2.

[13] For market 3a, when more than one price control method is used between different products (LLU, SA, SLU, fibre access LLU, VULA, dark fibre access, duct access), the price control method of the country has been classified as "Others".

Figure 1 – Price control method used in 2015 in the Markets listed in Recommendation 2014/710/EU, in Market 1 and 2/2007 and for the WLR service

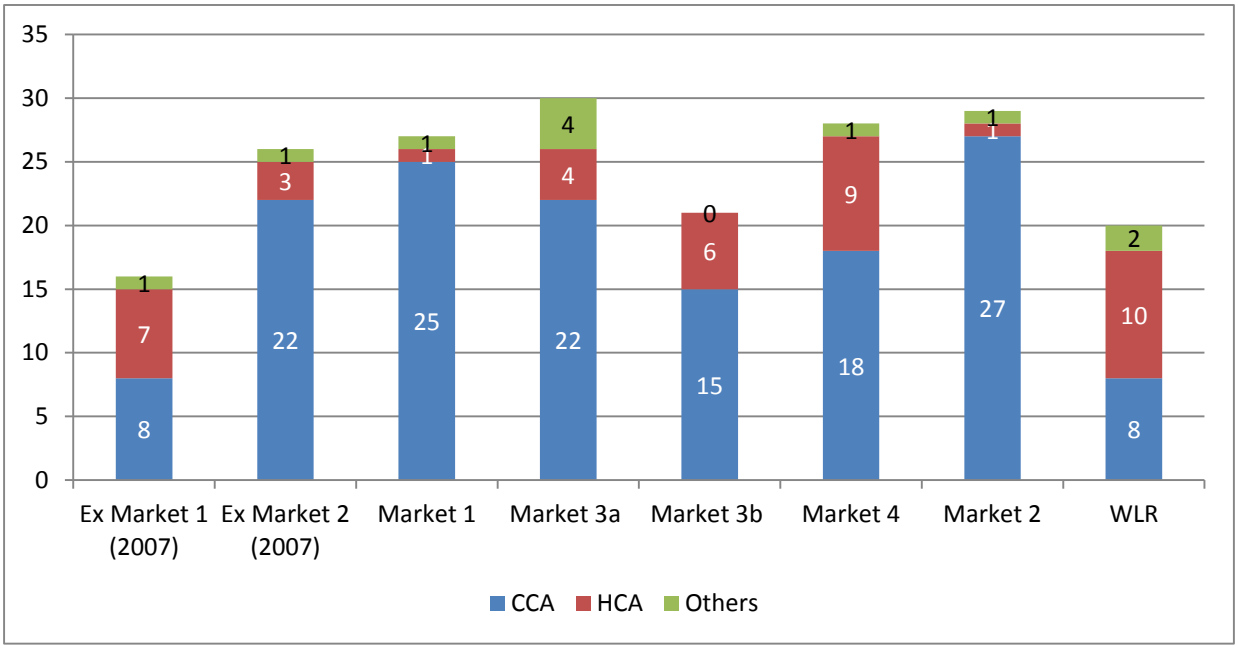


Source: BEREC RA database 2015

3.1.2 Cost base, annualisation methods and allocation methodologies

As far as the cost base is concerned, Figure 2 shows that in 2015 CCA is again by far the most commonly used methodology for all markets. Exemptions on this are Market 1/2007 and WLR where HCA is also frequently being used.

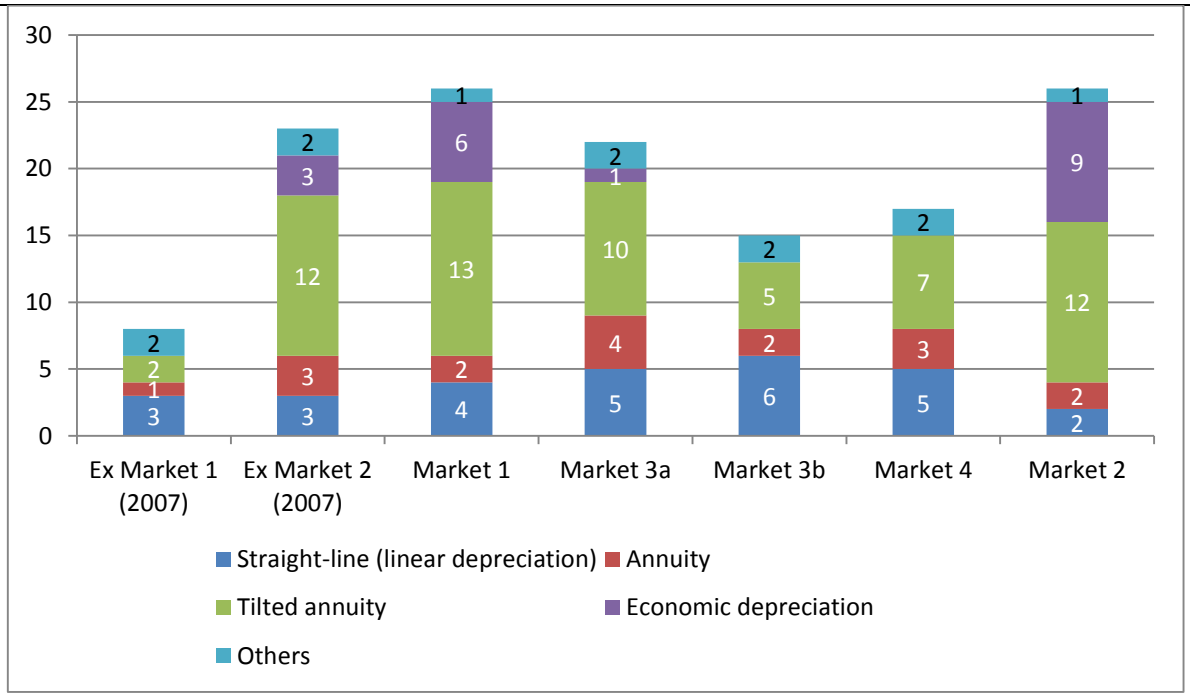
Figure 2 – Cost base used in 2015 in the Markets listed in Recommendation 2014/710/EU, in Market 1 and 2/2007 and for the WLR service



Source: BEREC RA database 2015

Figure 3 shows the annualisation methodology chosen by NRAs when using CCA as cost base.

Figure 3 – Annualisation methodology used in 2015 in the markets listed in Recommendation 2014/710/EU, in Market 1 and 2/2007

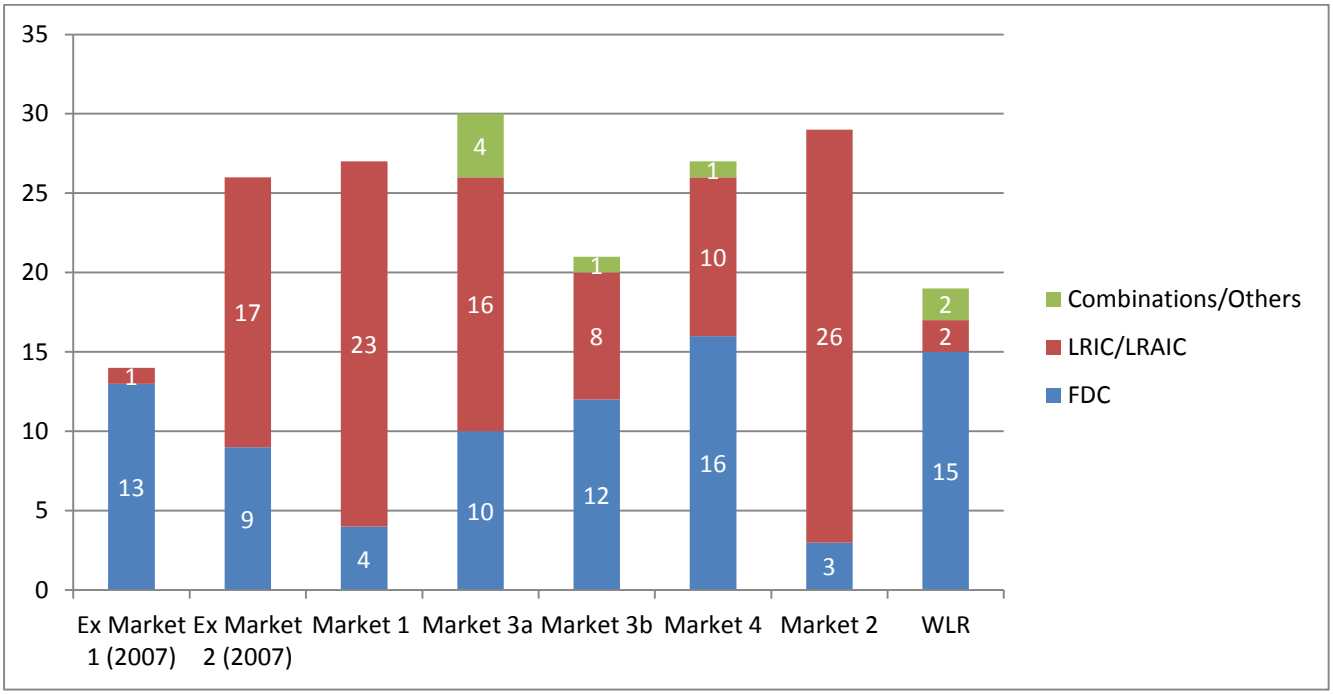


Source: BEREC RA database 2015

The figure shows that the most widespread annualisation methodology used in wholesale markets is the “Tilted annuity”, while economic depreciation is adopted by some NRAs mainly in termination markets.

As far as the allocation methodology is concerned, as shown in Figure 4 the LRIC/LRAIC methodology is mainly used in case of termination markets, where the pure LRIC is the main variant, instead FDC is the prevailing methodology for access Markets 3b and 4,the retail market (Market 1/2007) and for WLR.

Figure 4 – Allocation methodology used in 2015 in the Markets listed in Recommendation 2014/710/EU, in Market 1 and 2/2007 and for the WLR service



Source: BEREC RA database 2015

NRAs were also required to give details on the treatment of fully depreciated assets. In general it can be said that in countries where the FDC methodology is in use, fully depreciated assets are generally excluded from the cost base, since their value has already been recovered through past depreciation or because there is no mechanism to control whether there are depreciated assets in use by the SMP operator. Alternatively, they have a zero value in the financial accounting system or are replaced by new assets using the estimated lifetime of the new asset. In one country the case of assets being fully depreciated does not occur since by applying CCA/OCM, gross replacement costs are used and the efficient asset base is re-valued with current prices and then written off.

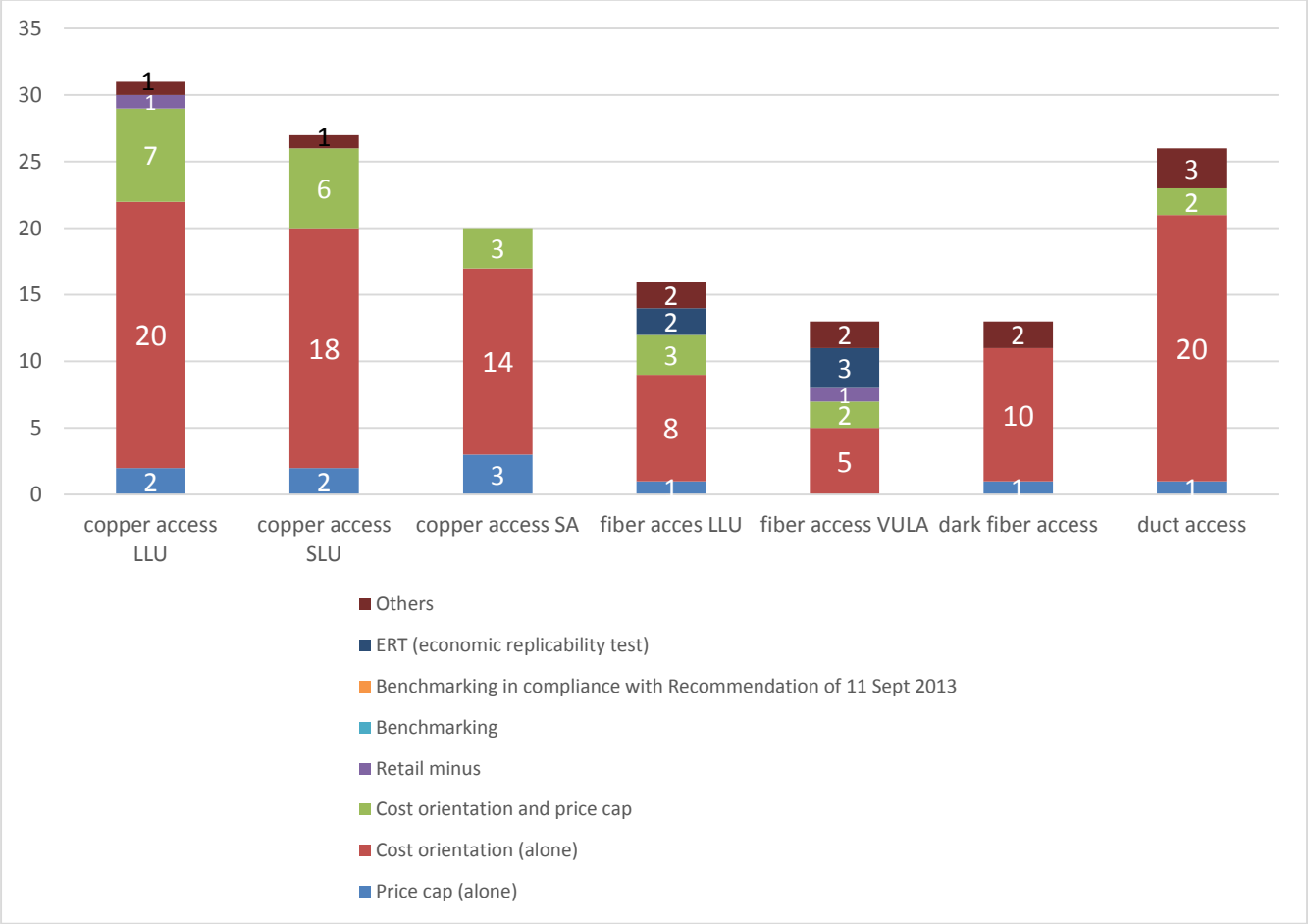
3.2 Focus on Market 3a

Also this year the data collection focused on important products in the Wholesale Local Access: 1) copper access (including LLU, SA, SLU); 2) fibre access (LLU, VULA); 3) dark fibre access and 4) duct access.

NRAs were asked to detail the price control method, the cost base and the allocation methodology for the above products. Taking into account only those countries with no missing data for the detailed products, cost orientation is the most commonly used price control method for all products. When "Others" is declared for LLU, SLU and VULA a "costband" is identified as price control methodology; for dark fibre and duct access some NRA specified that the price is primarily subject to commercial negotiation. If negotiations are unsuccessful, the NRA intervenes and can decide on a cost-oriented price and reasonable conditions. In one case the pricing should follow a fair and reasonable principle. In some cases there is no price regulation, in particular on dark fibre and VULA (only 14 NRA out of 31). For VULA there are also different methods of price regulation like Economic Replicability Test, retail minus (28%) and others[14] (14%) with respect to the standard method, such as price cap and cost orientation. None of the NRAs indicated that Benchmarking was being used as a price control method in this market.

[14] When other has been declared, NRAs declared a fair and reasonable price or a cost band.

Figure 5 – Price control method declared in 2015 for some products in Market 3a

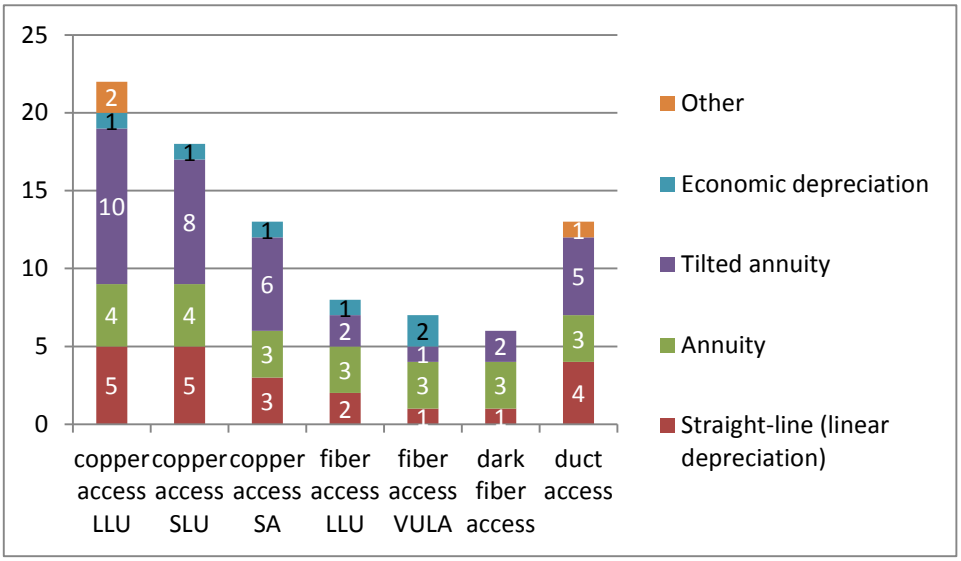


Source: BEREC RA database 2015

In Figure 6[15] the specific annualisation methodology when CCA or Other has been declared as cost base is also shown and in this case "tilted annuity" is the cost annualisation methodology mostly used for copper services and duct access, for other services also other methods are in use, like "annuity" and specifically "economic depreciation" in case of VULA.

[15] The data illustrated includes also the cases where a cost base and an annualization method has been declared even if no cost orientation is declared as a price methodology.

Figure 6 – Annualisation method declared in 2015 for some products in Market 3a

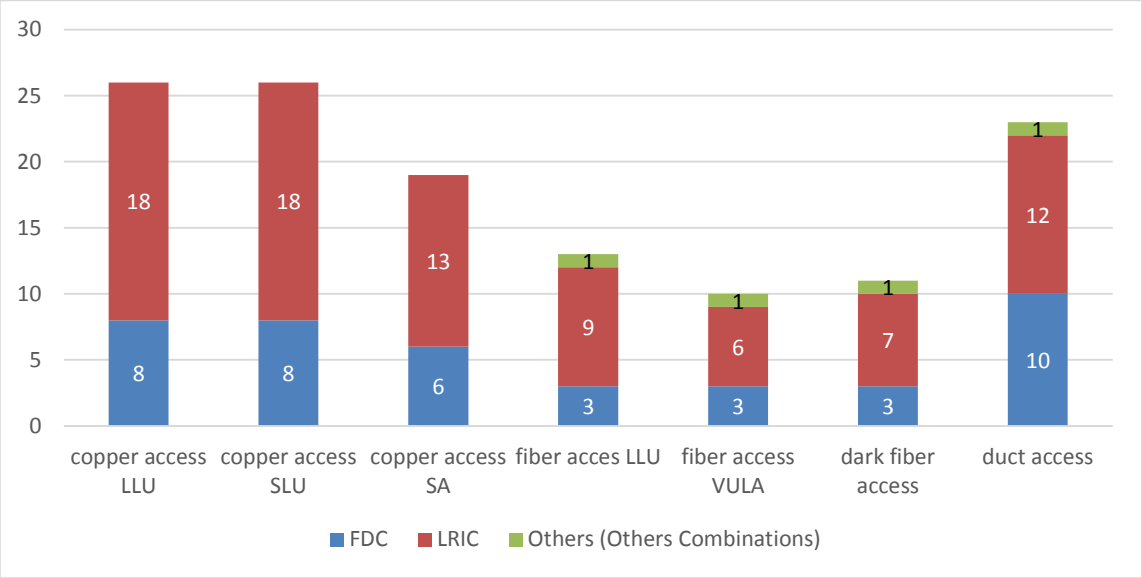


Source: BEREC RA database 2015

** Cost Base is referred to all asset base except legacy civil engineering.*

As far as the allocation methodology (Figure 7) for different products in Market 3a is concerned, data analysis shows that FDC is also used for copper access LLU, copper access SLU and duct access, while LRIC is widespread for all products in Market 3a.

Figure 7 – Allocation methodology declared in 2015 for some products in Market 3a



Source: BEREC RA database 2015

3.3 Markets outside the scope of 2007 and 2014 EC Recommendation

In some countries, markets not listed in the 2007 and 2014 Recommendation are susceptible to *ex ante* regulation and are still regulated, as NRAs assessed that they are not yet competitive.

NRAs declared to regulate in particular Market 18 2003/311/EC Recommendation (11 NRAs), followed by Market 3, 5, 10 and 15 2003/311/EC Recommendation (2 NRAs). One NRA also impose remedies on SMS termination.

3.4 Cost base, allocation methodology and price control method over time

While in the previous paragraphs a snapshot of the current situation (year 2015) in the various markets has been illustrated as far as price control, cost base, allocation methodology, annualisation methodologies and treatment of fully depreciated assets are concerned, the following paragraphs illustrate the development of regulatory accounting practices across Europe over time. Specifically the paragraphs illustrate the evolution of accounting and price control remedies over time, concentrating on WLR service and on the following three wholesale markets listed in the EC Recommendation as susceptible to *ex ante* regulation: Wholesale Local Access (including shared or fully unbundled access) at a fixed location (Market 3a), Wholesale Central Access at fixed location (Market 3b) and Wholesale high quality access provided at fixed location (Market 4).

In order to present a reliable trend analysis, data have only been included where respondent NRAs provided information for at least eight years. Therefore the number of countries analysed

may vary[16] and differ from the number of countries taken into account in the previous paragraphs.

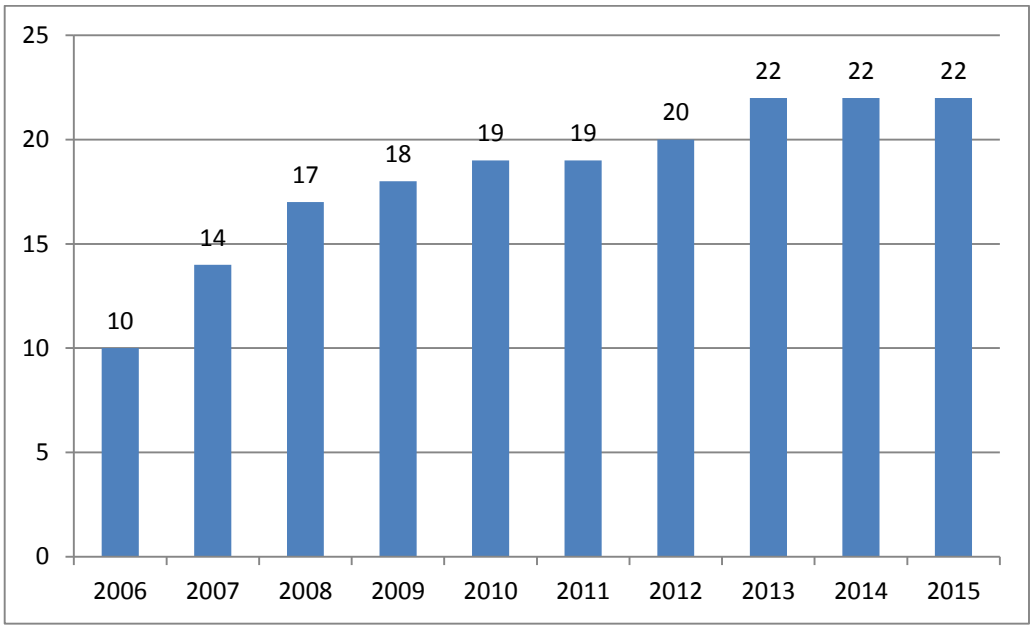
As far as the cost base and the allocation methodology are concerned, it is often the case that a NRA, when setting up its regulatory accounting framework for the fixed notified operator/s, will apply a consistent cost base and accounting methodology to all regulated fixed markets. In the following paragraphs it is therefore to be expected that those countries that moved for example from HCA to CCA, did that for all relevant markets.

3.4.1 Wholesale Line Rental

Wholesale Line Rental services are those services enabling alternative operators to enter the retail narrowband access market without sustaining the high investments required by ULL services, hence bearing a lower risk. Moreover, the WLR obligation benefits final customers allowing them a larger choice among different access providers.

The number of countries in which the WLR obligation is in force has increased over time. In 10 countries, the WLR obligation has been in place since 2006, but the number increased considerably (17 countries) three years later. In 2015, in homogenous terms 22 countries had a WLR offer (Figure 8).

Figure 8 – Number of Countries with WLR obligation by year



Source: BEREC RA database 2015
Number of countries: From 30 in 2006 to 31 in 2015

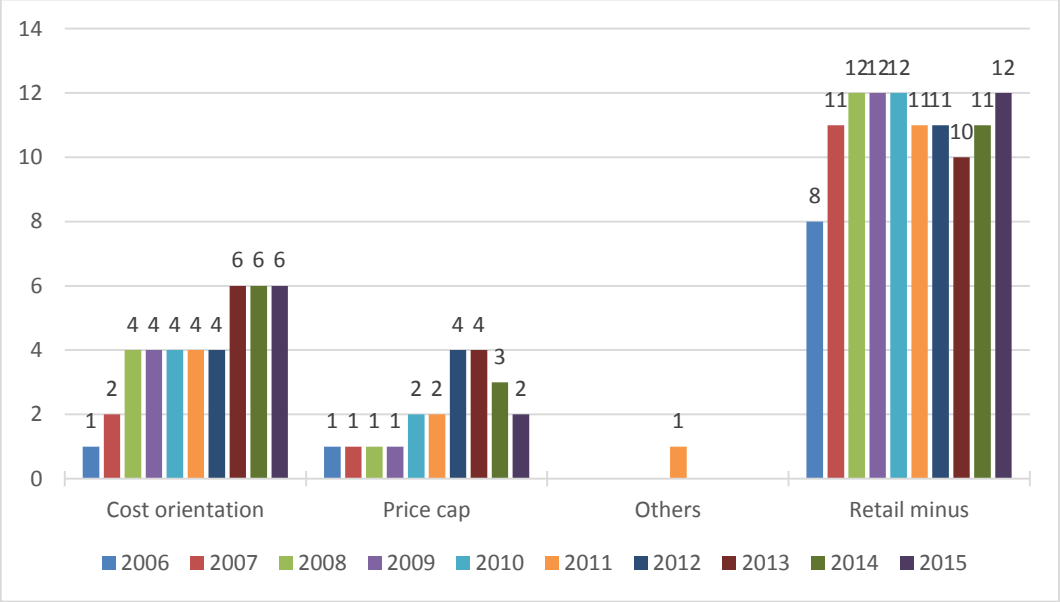
[16]The actual number of countries considered is reported in the footnote below each figure.

Trend analysis:

Price control method

The most used price control method for WLR is retail minus, declared in 2015 by 12 NRAs out of 22 that declared to have a WLR reference offer. It was also the most common methodology in previous years (Figure 9). Two NRAs did not impose any price control method as the offer is provided on a voluntary basis.

Figure 9 – Price Control Method for Wholesale Line Rental



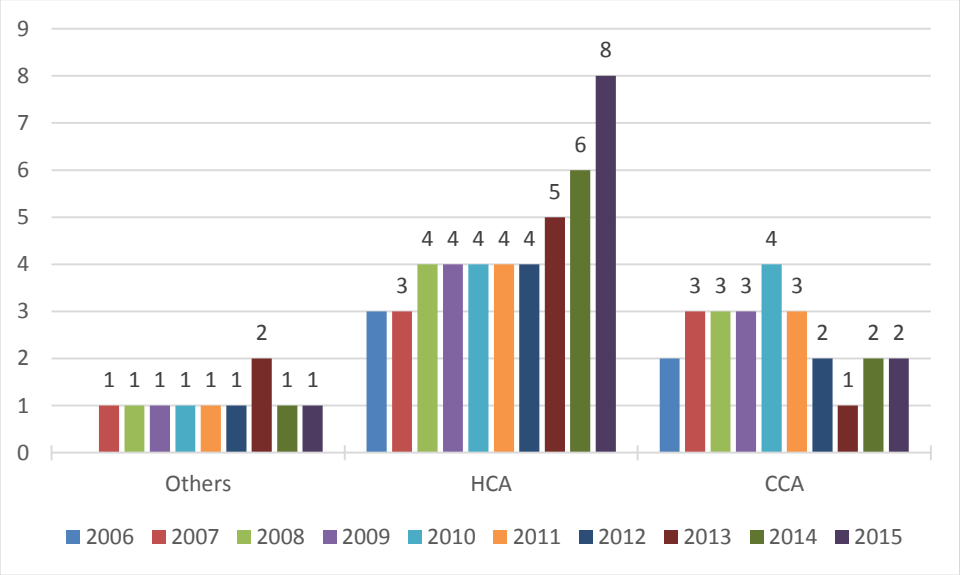
Source: BEREC RA database 2015
Number of countries: From 10 in 2006 to 20 in 2015

From 2014 to 2015, in homogeneous term (considering the group of 27 countries that had responded to the questionnaire since 2006), only one NRA changed the price control method for WLR, increasing the number of countries with a retail minus price control method. In 2006 10 had imposed a price control method, with respect to 20 in 2015. Over the years two NRAs passed from retail minus to price cap and then to cost orientation, one NRA passed from retail minus to price cap, one from cost orientation to retail minus. The other NRAs remained with the same methodology and the recurrent kind of price control method chosen by most NRAs was retail minus with four exceptions over the years, such as cost orientation (3) and price cap (1).

Cost base

Taking into account only those NRAs declaring to impose retail minus as price control method for the WLR service, it can be observed that, as far as the cost base is concerned, the preferred cost base in 2015, as in previous years, is HCA (Figure 10).

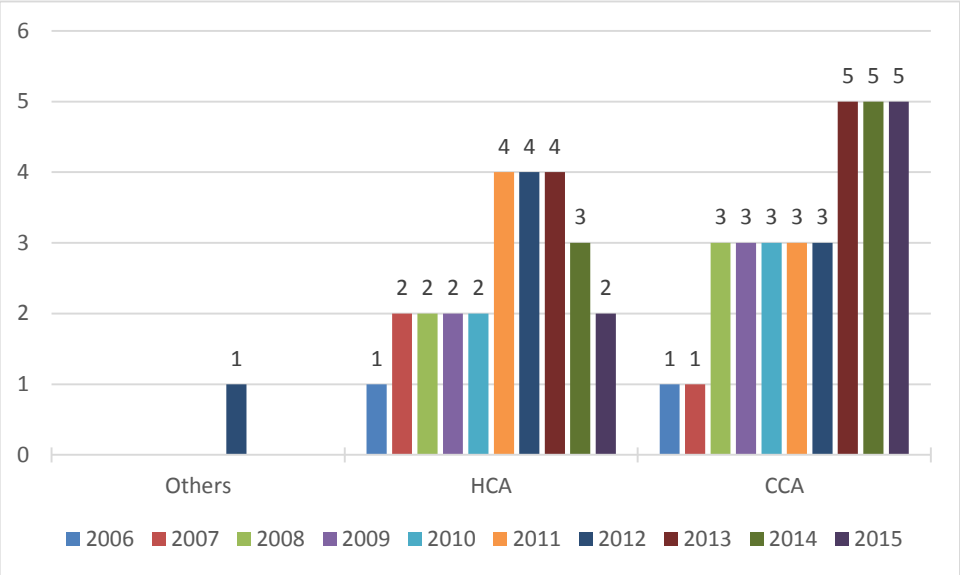
Figure 10 – Cost Base for Wholesale Line Rental for countries with Retail Minus as Price Control Method



Source: BEREC RA database 2015
Number of countries: From 5 in 2006 to maximum 11 in 2015

Considering the case of remaining kinds of price control methods (i.e. cost orientation, price cap and others) for the WLR obligation, it can be observed that CCA is the most recurrent cost base in the last years (Figure 11).

Figure 11 – Cost Base for Wholesale Line Rental for Countries with other kinds of Price Control Method

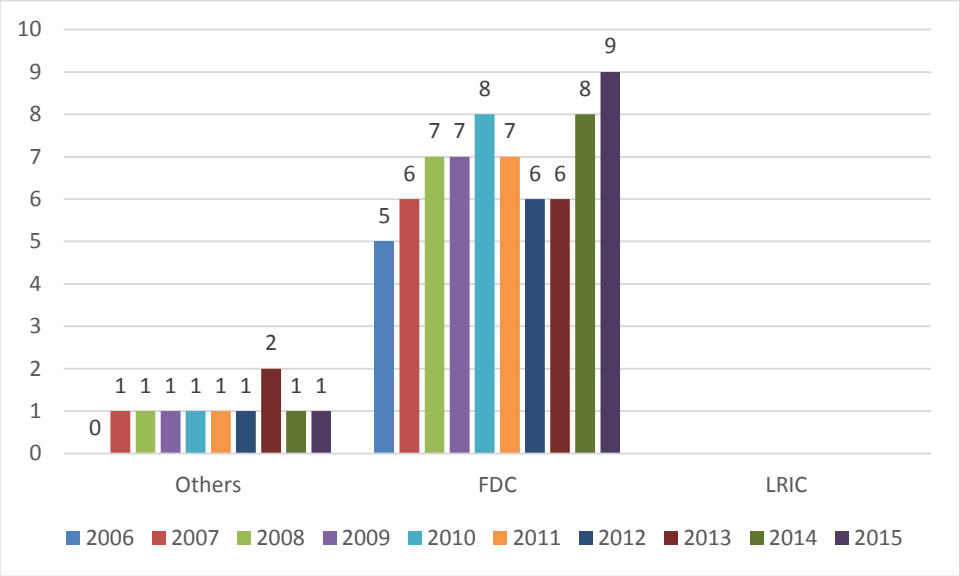


Source: BEREC RA database 2015
Number of countries: From 1 for 2006 to 7 for 2015

Allocation methodology

There is clear evidence that FDC is the preferred allocation methodology (Figure 12) for those countries with retail minus as price control method. As a matter of fact its use has increased since 2006. Other allocation methodologies have also been declared since 2007.

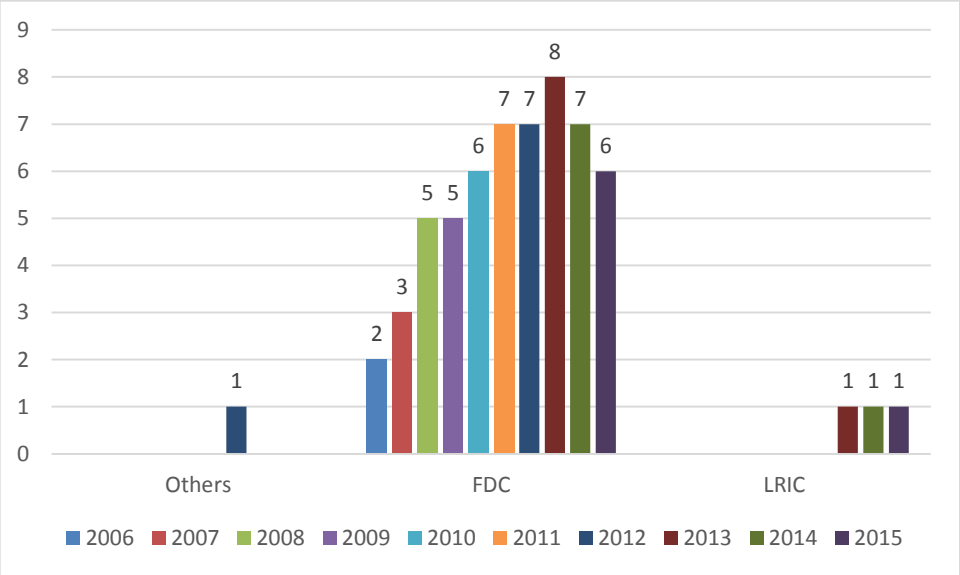
Figure 12 – Allocation Methodology for Wholesale Line Rental for countries with Retail Minus as Price Control Method



Source: BEREC RA database 2015
Number of countries: From 5 in 2006 to maximum 10 in 2015

Taking into account those NRAs declaring to impose the WLR obligation with other kinds of price control methods, it can be observed that in this case FDC is the preferred allocation methodology and its use has increased over time until 2013 (Figure 13).

Figure 13 – Allocation Methodology for Wholesale Line Rental for countries with other types of Price Control Method



Source: BEREC RA database 2015
Number of countries: From 2 in 2006 to 7 in 2015

<u>Key points for Wholesale Line Rental:</u> Retail minus is the preferred price control method, while FDC is the most popular allocation methodology. Moreover, the number of countries using HCA as cost base exceeds those using CCA over time in case retail minus is the price control method.

3.4.2 Wholesale local access (Market 3a)

The 2014 Recommendation on relevant markets defines Market 3a as the market for "*wholesale local access provided at fixed location*". Previously, in the 2007 Recommendation, it was the market for "*wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location*" (Market 4/2007).

For most NRAs Market 3a and Market 4/2007 are still the same. For some NRAs the market definition is still pending, moreover one NRA includes VULA, previously included in Market 5/2007, in the Market 3a product definition. Typically NRAs define SMP operators as the national incumbent with the exception of one NRA who defined sub-national geographic markets identifying the corresponding local incumbent operators as having SMP.

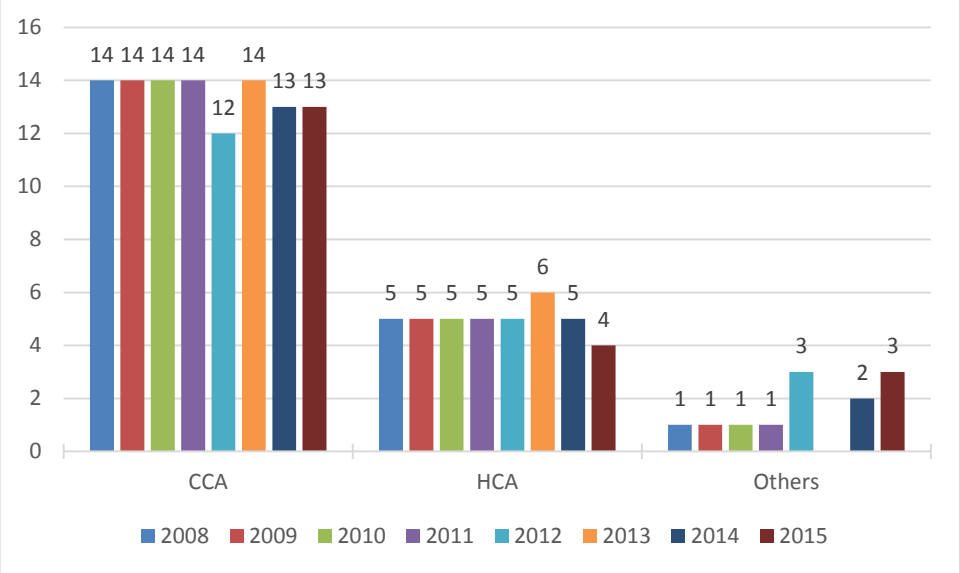
Trend analysis:

Cost base

CCA is the cost base declared by 22 NRAs taking part in the survey for year 2015 (see Figure 2). Unlike Figure 2, which is based on data for the countries that answered the 2015 BEREC questionnaire, the figure below gives an insight into how the choice of cost base has changed over time, taking into account only data provided by 20 NRAs each year since 2008. Figure 14 shows a quite stable situation. In this market, CCA is by far the most commonly used cost base methodology and the number of countries using this method has remained stable since 2008, with a slight decrease in the last years. Also the number of countries using HCA has remained quite stable since 2008.[17]

[17] The change of two countries in 2012 and 2015 to "other" is due to the treatment of data. In particular two countries declaring to use CCA and HCA together have been treated as "other". One country declaring to use different cost base according to the different products in market 3a has been treated as "other".

Figure 14 – Cost Base for Wholesale local access at a fixed location (Mkt 3a)



Source: BEREC RA database 2015
Number of countries: 20

It is important to observe that the change of cost base (from HCA to CCA) is particularly relevant for this market. Unlike other markets, where a high percentage of total costs is represented by network equipment subject to technical progress, in the wholesale local access at a fixed location market the highest percentage of costs is related to duct civil engineering which inherently has a very long economic life and is not subject to significant technological progress. Broadly speaking this may imply that the expected reduction in real terms of asset values - which is normally observed in other markets when adopting a CCA approach mainly due to technical progress reducing equipment costs (e.g. routers are generally cheaper than switches)[18] - is not necessarily observed in the unbundled access market. Moreover, according to some observers, the use of CCA is likely to remain relevant in a time of roll-out of fibre access networks and could send better investment signals to promote infrastructure-based competition as well as investment in infrastructure. Finally, the effect of declining copper lines will impact on the level of costs.

It is worth noting that the 2013 Recommendation on consistent non-discrimination and costing methodologies (2013/466/EU) should further reinforce the changing from HCA to CCA for this market (except for the reusable legacy civil engineering assets which should be valued on the basis of the indexation method).

[18] For the NGN core network it is generally acknowledged that NGN technology has produced cost savings to a considerable extent (cf. e.g. ERG IP-Interconnection Report 2007 and ERG Common Statement on Regulatory Principles of IP-IC/NGN Core – A work program towards a Common Position, ERG (08)26 – Oct 2008, pp. 21, pp. 82).

If these considerations are correct they may have an impact on all the other access services that use the same assets to provide ULL services.

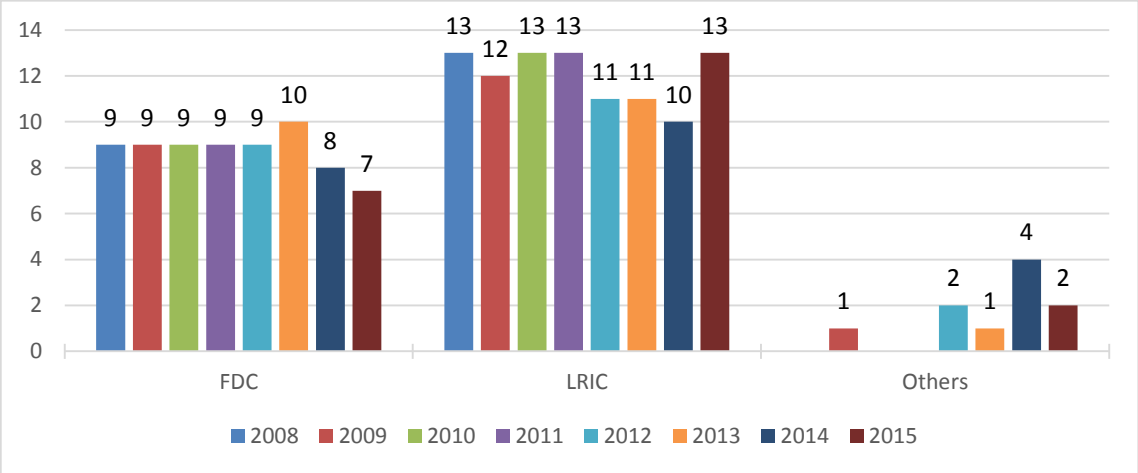
Generally speaking, countries still using HCA in this market use the same cost base for other fixed wholesale markets.

Allocation methodology

Figure 4 shows that LRIC/LRAIC is mainly adopted in 2015. Following the BoR (11) 65 this trend shows that countries are moving towards cost signals based on an economic approach instead of an accounting one. This trend is in line with the approach promoted by the Recommendation on consistent non-discrimination and costing methodologies (2013/466/EU) in charge from October 2013.

Taking into account only those countries providing information since 2008 (which is less than the number of countries in Figure 4) LRIC appears to be the most recurrent allocation methodology, as observed in Figure 15.

Figure 15 – Allocation Methodology for Wholesale local access at a fixed location (Mkt 3a)



Source: BEREC RA database 2015
Number of countries: 22

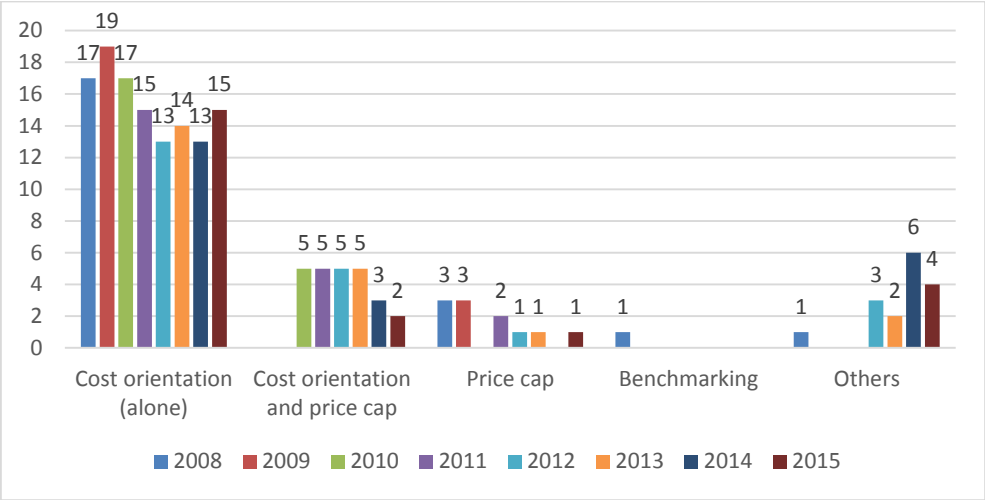
Price control method

The most common price control method in 2015 in the Wholesale local access at a fixed location market is by far cost orientation (Figure 1), which is declared by 24 NRAs (although for 5 NRAs it is combined with price cap).

Figure 16 provides a picture of how this method changed over time, taking into account 22 countries participating in the data collection since 2008. It can be observed that cost orientation alone or together with price cap is also the preferred price control method by NRAs over time. During the eight years period considered almost half of the NRAs taken into account have

changed their price control method. Inside this group two NRAs moved from price cap to cost orientation alone, another started with cost orientation alone and moved to other methods like cost orientation and price cap, or only price cap as well as “other” methods.

Figure 16 – Price Control Method for Wholesale local access at a fixed location (Mkt 3a)



Source: BEREC RA database 2015
Number of countries: 22

Key points for Market 3a: Over time CCA is the preferred cost base combined with LRIC as the allocation methodology and cost orientation as the price control method. This trend is in line with the NGA Recommendation adopted in September 2010 and, in particular, the 2013 Recommendation on consistent non-discrimination and costing methodologies is reinforcing this trend.

3.4.3 Wholesale central access (Market 3b)

The 2014 EC Recommendation on relevant markets defines Market 3b as the market for *“wholesale central access provided at a fixed location for mass-market products”*.

In this market all the analysed countries are the ones which notified at least one operator (typically the national incumbent) as SMP; a geographical approach to the regulation is also pursued by some NRAs. The most part of NRAs considered the previous market definition approach to be still valid, other NRAs declared that a decision about the market definition is still in progress. One NRA declared that part of Market 5/2007 could be included in Market 4.

Trend analysis:

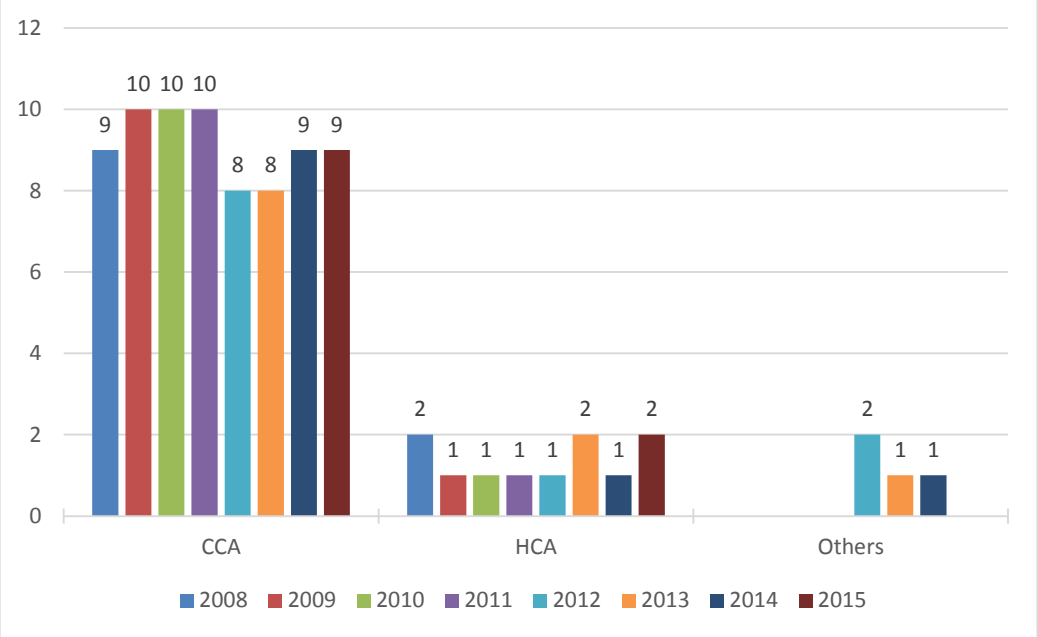
Cost base

Figure 17 shows data for 11 countries that have provided relevant information since 2008 and, as such, this is less than the number of countries in Figure 2.

The market for wholesale central access shows a similar trend to that of the unbundled local loop market in terms of the cost base used. Furthermore, it can be observed that CCA is by far the most commonly used cost base methodology.

This market is characterised by the prevailing use of network elements subject to rapid technological change, whose asset value in real terms can be expected to decrease over time using a CCA cost base. During the year the cost base remained substantially stable, only one NRA moved from HCA to CCA and back to HCA.

Figure 17 – Cost Base for Wholesale central access (Mkt 3b)

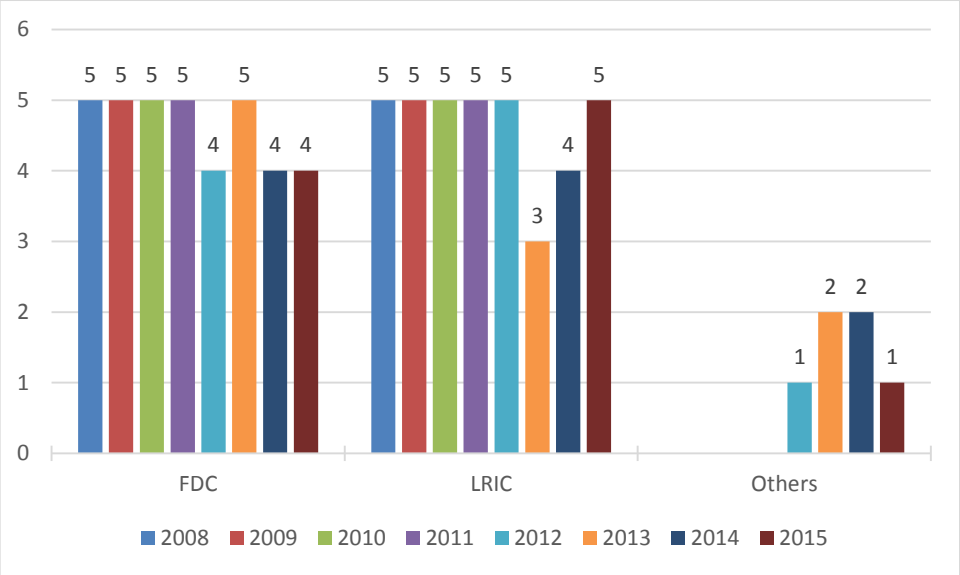


Source: BEREC RA database 2015
Number of countries: 11

Allocation methodology

Figure 18 shows the allocation methodology used in the wholesale central access market by 10 countries since 2008. It can be seen that the number of countries using FDC is decreasing compared to last year while the number of countries using LRIC increased by one. When "others" is indicated it includes also the case of "combinations". During the year, the allocation method used by NRAs seems quite stable, 3 NRA changed the allocation methodology: one passing from LRIC/LRAIC to FDC, one from FDC to LRIC/LRAIC and one from LRAIC to a combination of different allocation methods.

Figure 18 – Allocation Methodology for Wholesale central access (Mkt 3b)

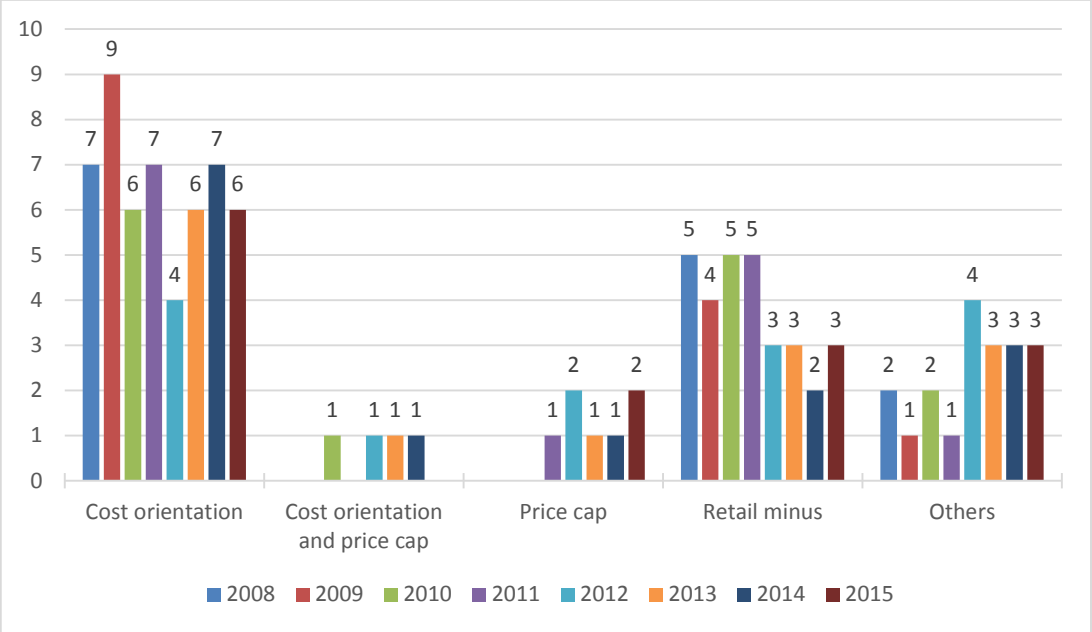


Source: BEREC RA database 2015
Number of countries: 10

Price control method

The most commonly used price control methods in 2015 in the wholesale central access market are still cost orientation and retail minus (Figure 1), declared by 12 and 5 NRAs, respectively. However, taking into account 14 countries answering the questionnaire since 2008 (Figure 19), mixed results can be observed in terms of trends due to the fact that many NRAs (9 NRA of the 14 included) changed the price control method over time passing respectively from retail minus to cost orientation (2); from cost orientation to price cap (1); from cost orientation to retail minus (1); from cost orientation to others (i.e. ex post control) (2); one from “others” to price cap.

Figure 19 – Price Control Method for Wholesale Central Access (Mkt 3b)



Source: BEREC RA database 2015
Number of countries: 14

<u>Key points for Market 3b:</u> CCA is, by far, the most common cost base over time. As far as the allocation methodology is concerned, the number of countries using LRIC is almost the same as those using FDC, while cost orientation is chosen as main price control method over the years.

3.4.4 Wholesale high-quality access provided at a fixed location (Market 4)

The 2014 Recommendation on relevant markets defines Market 4 as the market for "*Wholesale high-quality access provided at fixed location*". This market, although redefined by the Commission, is considered by most NRAs to be the same as the previous Market 6 of the 2007 Recommendation, that is to say, the wholesale terminating segments of leased lines. Moreover some NRA are concluding their market analysis procedure, therefore the decision about the market definition is not final yet; one NRA considers that Market 4 will include part of Market 5/2007.

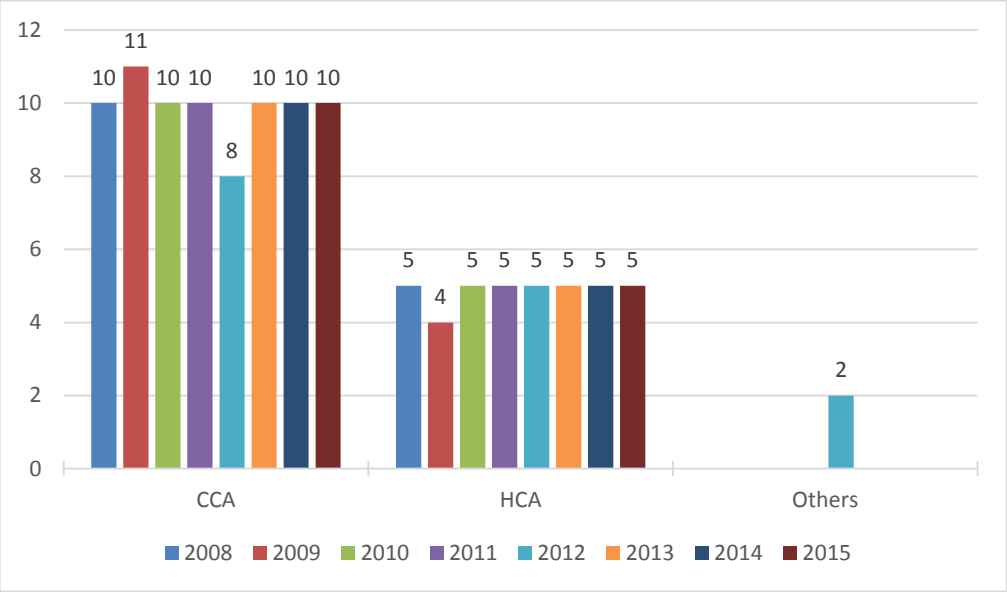
Trend analysis:

Cost base

Figure 20 shows the countries adopting CCA, HCA or a combination of other methodologies to set wholesale high quality access provided at fixed location from 2008 to 2015. It could be said that in 2013 one NRA moved from other to CCA, while the number of NRAs declaring to use

HCA has remained stable over time. This picture has not changed in 2015. Only two NRAs in the eight year period changed the cost base one from CCA to HCA and one vice versa.

Figure 20 – Cost Base for Wholesale High Quality Access at fixed location (Mkt 4)



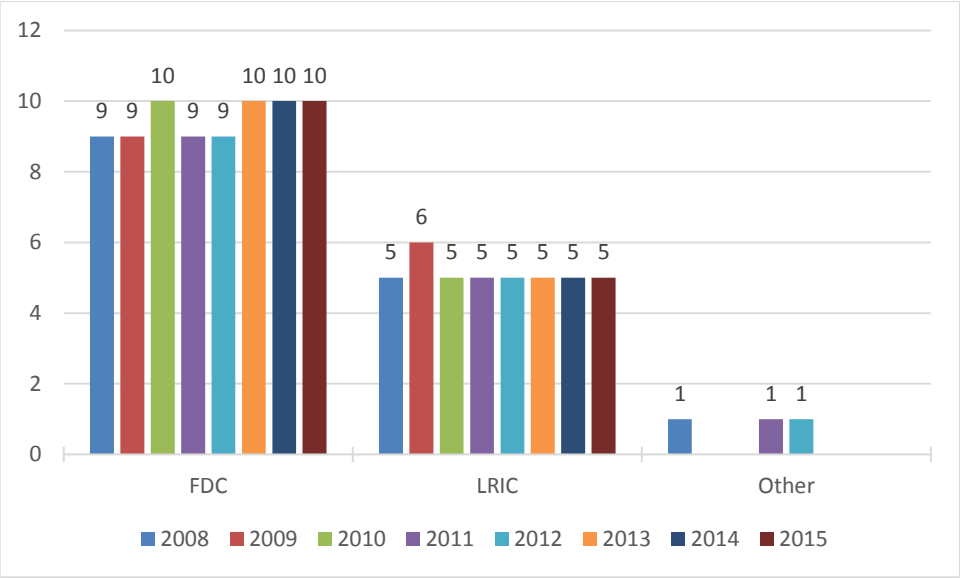
Source: BEREC RA database 2015
Number of countries: 15

Allocation methodology

Figure 21 shows the number of countries adopting LRIC, FDC or other mixed allocation methodologies in the wholesale high quality access market for the eight year period under analysis.

The most common allocation methodology in this market observed since 2008 is FDC. At the same time, the number of countries using LRIC has remained stable.

Figure 21 – Allocation Methodology for Wholesale High Quality Access at fixed location (Mkt 4)

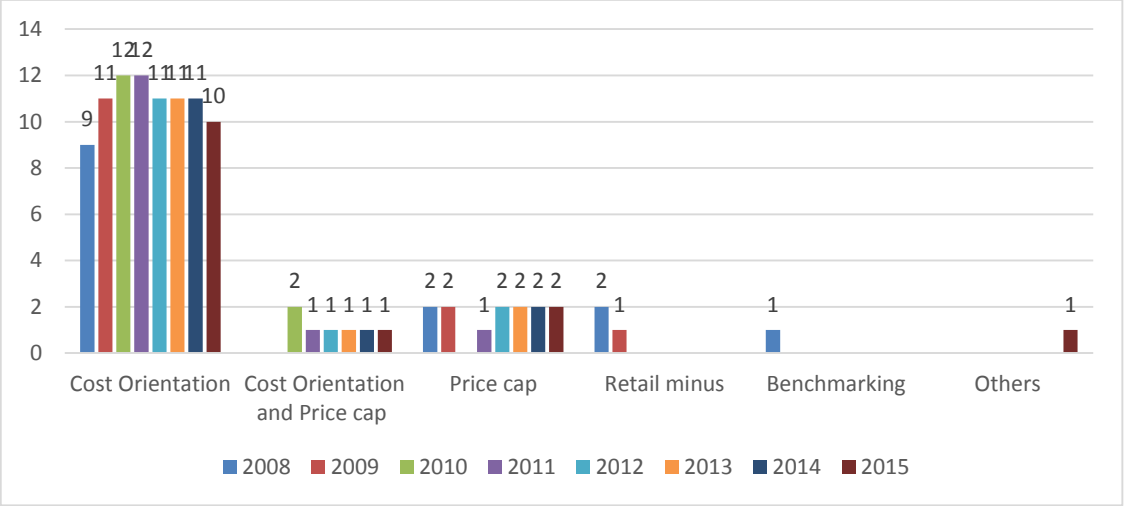


Source: BEREC RA database 2015
Number of countries: 15

Price control method

Taking into account the 14 countries whose data have been collected since 2008, it can be observed in Figure 22 that cost orientation increased in 2009 (from 9 to 11 countries) due to the change of 2 NRAs respectively from benchmarking and retail minus; therefore in 2009 retail minus disappeared from the 13 countries under observation. The trend for applying price cap has remained stable since 2010. No changes in price control method are observed in 2015 for those NRAs considered even if one NRA moved from a cost orientation methodology to a combination of cost orientation and retail minus one (w.r.t. pure Ethernet). Three NRAs have changed their price control method in the eight years taken into account.

Figure 22 – Price Control Method for High Quality Access at fixed location (Mkt 4)



Source: BEREC RA database 2015
Number of countries: 14

<u>Key points for Market 4:</u> FDC is the prevailing allocation methodology over time. Cost orientation is the recurrent price control methodology in this market both in the current year and over time. CCA is the preferred cost base.

3.4.5 Implementation of the EC Recommendation on non-discrimination and costing methodologies

This section gives an overview of the implementation of the "Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (2013/466/EU)" of 11 September 2013, with regard to costing methodologies.

To this end, the data collection has included, as the previous release of the report, some questions on this topic. NRAs were asked if, in light of the Recommendation, they adopted the related costing methodology in order to deal with the migration of customers from copper to NGA services. The majority of NRAs that answered this question, in total 24, referred to Markets 3a, nine of which reply "*yes*". Out of these nine, 4 NRAs have implemented or considered the costing methodology actually implemented to be in line with the Recommendation. Two of these state that the approach used complies with the Recommendation in the sense that, in practical terms, it gives the same or similar results in many respects, as the Commission's Recommendation indications: although these NRAs have not used a BU-LRIC+ hypothetical NGA access model they have used the exception of Recommend 40 to continue with the existing methodology. Moreover five NRAs have already planned to be in line with the Recommendation with their final decisions due during 2015 or at least by the end of 2016.

It is worth noting that some other NRAs that have not yet decided to apply the EC Recommendation, envisaged that the models that are in use need to be updated to be in line with the Recommendation. In every case all NRAs plan to take a decision at least at the end of 2016.

The questionnaire also included a question on the outcome of the application of the Recommendation in terms of prices for the fully unbundled copper local loop. For NRAs that have declared to be in line with the application of the Recommendation, the rental fee in two cases is lower with respect to the price band indicated by the Recommendation.[19]

Following the Recommendation, NRAs should adopt a BU-LRIC+ costing methodology that estimates the current cost that a hypothetical efficient operator would incur to build a modern efficient network, which is an NGA network (recommend 31). When modelling an NGA network, NRAs should define a hypothetical efficient NGA network, capable of delivering the Digital Agenda for Europe (DAE) targets set out in terms of bandwidth, coverage and take-up, which consists wholly or partly of optical elements (recommend 32).

Concerning this topic, 12 NRAs report that they have developed a hybrid copper and NGA BU-LRIC model, whereas 7 NRAs have developed distinct models for NGA only and copper only. Moreover, 3 NRAs consider their cost model to be in line with recommend 32 of the Recommendation, in terms of the capability to deliver the DAE targets.

In compliance with recommends 33-34 of the Recommendation, all assets of the modelled network should be evaluated on the basis of replacement costs, except for reusable legacy civil engineering assets, that should be valued on the basis of the indexation method, starting from the regulatory accounting value, or/and on the basis of a benchmark of best practices in comparable Member States. Following recommend 36 of the Recommendation, the lifetime of the civil engineering assets should be set at a duration corresponding to the expected period of time during which the asset is useful to the demand profile (normally not less than 40 years in the case of ducts).

Concerning this last topic, 6 NRAs, out of the 24 which adopt CCA as cost base for LLU copper service, determine the Regulatory Asset Base of reusable civil infrastructures taking into account the depreciation already occurred, using information from the incumbent's regulatory asset base. Specifically, two NRAs use a renewal accounting method, two NRAs take a net replacement cost from the top down model of the incumbent and then adjust the remaining life time in accordance with recommend 36. Two NRAs are adapting the BU-LRIC model to be compliant with the recommend 33-34.

[19] "*Rental access price for the full unbundled copper local loop within a band between €8 and €10 (net of all taxes) expressed in 2012 prices (the price band)*".

In conclusion, it is worth noting that, with the exception of 4 NRAs, who consider their current approach to be already in line with the Recommendation, most NRAs are still developing their costing methodology and assessing the level of compliance with the Recommendation.

3.5 Termination Markets

3.5.1 Fixed call termination (Market 1)

The 2014 Recommendation on relevant markets defines Market 1 as "Wholesale *call termination on individual public telephone networks provided at fixed location*" and identifies a relevant market for each operator. It is common, therefore, to see both incumbents and alternative operators having been notified as SMP operators.

However, as explained in the ERG Common Position on symmetry[20], a clear distinction can be observed between remedies imposed on incumbents on one side, and remedies imposed on other authorised operators (OAOs) on the other side. In particular, OAOs are often regulated less strictly than the incumbent and are not usually subject to accounting separation, price control and cost accounting obligations. The obligations related to tariff setting for OAOs often take the form of "fair and reasonable", "non-abusive" prices or "delayed reciprocity".

However, the data on cost base and price control evolution over time in this section refers to incumbent operators. Unlike Figures 2 and 4, which show data only for those countries participating in the 2015 survey, the figures below show data for those NRAs that have provided the relevant information since 2008.

Trend analysis:

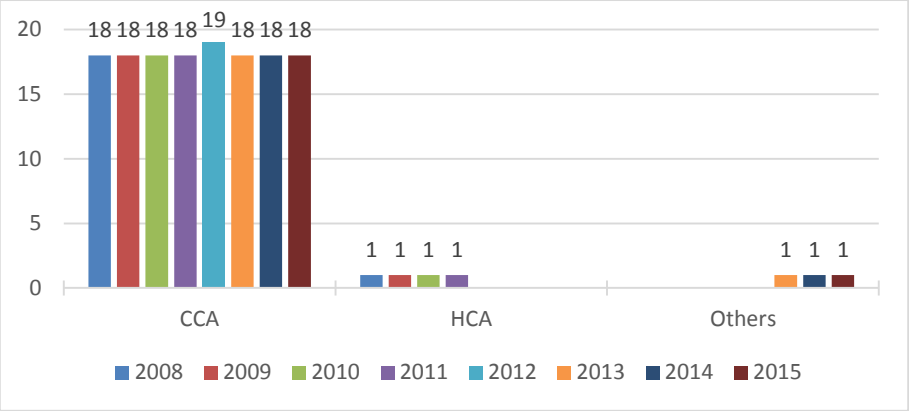
Cost base

Figure 23 shows the absolute number of countries adopting CCA or HCA to set incumbent's fixed terminating charges in the eight year period under observation.

It shows that the most common cost base for fixed networks is CCA. It has to be noted that such a result is stable over time, as in fixed networks HCA had already been replaced with CCA by the majority of Member States since 2005. The cost base is substantially constant for the majority of the NRAs only two NRAs moved one from HCA to CCA (2011-2012) and one from CCA to "Others" (Economic Depreciation) (2012-2013).

[20] ERG (07) 83 Common Position on symmetry of fixed call termination rates and symmetry of mobile call termination rates.

Figure 23 – Cost Base for Fixed Call Termination (Mkt 1)



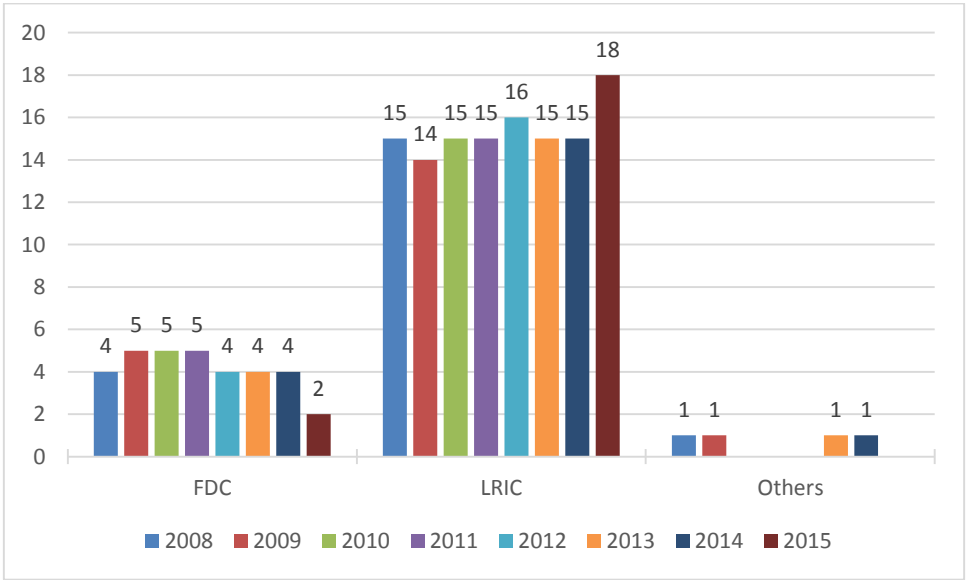
Source: BEREC RA database 2015
Number of countries: 19

Allocation methodology

Figure 24 shows the number of countries using LRIC, FDC or other mixed methodologies for fixed termination services from 2008 to 2015.

In particular, it can be observed that, although in 2013 two countries declared a change in the accounting methodology respectively from LRIC to FDC and to other allocation methodologies, in 2015 some other countries have moved to LRIC from FDC for determining fixed termination tariffs. In any case since the beginning of the observation period LRIC remains by far the most commonly used allocation methodology.

Figure 24 – Allocation methodologies for Fixed Call Termination (Mkt 1)



Source: BEREC RA database 2015
Number of countries: 20

<u>Key points for Market 1:</u> CCA is the preferred cost base for this market combined with LRIC as the allocation methodology. This trend is more evident now that a greater number of countries is implementing the EC Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC).

3.5.2 Mobile call termination (Market 2)

The 2014 EC Recommendation on relevant markets defines Market 2 as "*Wholesale Voice call termination on individual mobile networks*". In all countries all mobile operators have been found to be SMP in the termination market and, stemming from the second round of market analysis, in some countries also MVNO (Mobile Virtual Network Operators) have been declared SMP operators. Definitions in Market 2 are unchanged in comparison to Market 7 of the 2007 EC Recommendation.

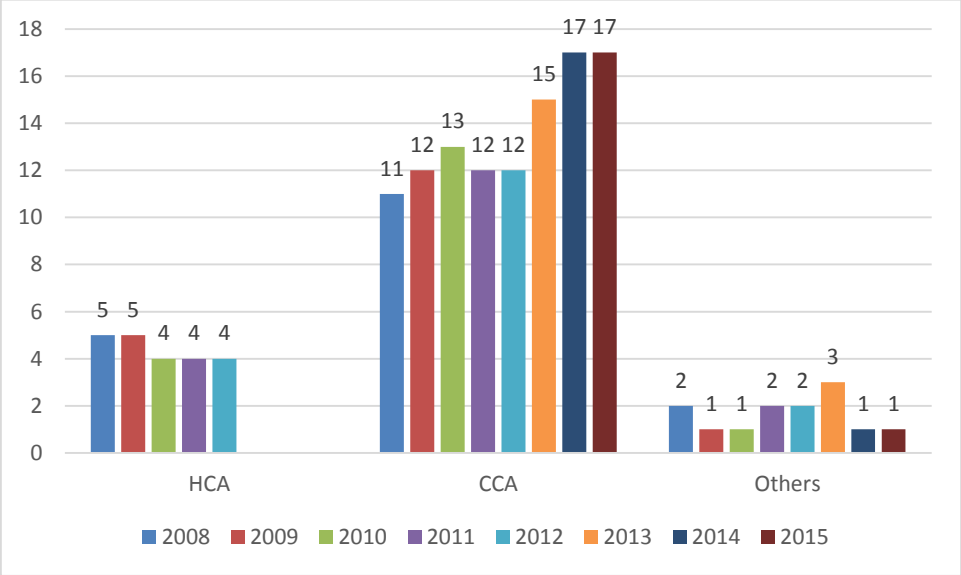
Unlike Figures 2 and 4, the figures below show data for those NRAs that have been providing the relevant information since 2008, therefore they show data for 18 countries.

Trend analysis:

Cost base

Figure 25 shows the number of countries adopting CCA, HCA or a combination of methodologies to set mobile terminating charges from 2008 till 2015. Since 2008 the most commonly used cost base for mobile networks has been CCA. In 2013 this number has increased from 12 to 15 NRAs out of 18. Application of HCA has also remained stable till 2012 while none of the NRAs indicate to use HCA since 2013.

Figure 25 – Cost Base for Mobile Call Termination (Mkt 2)



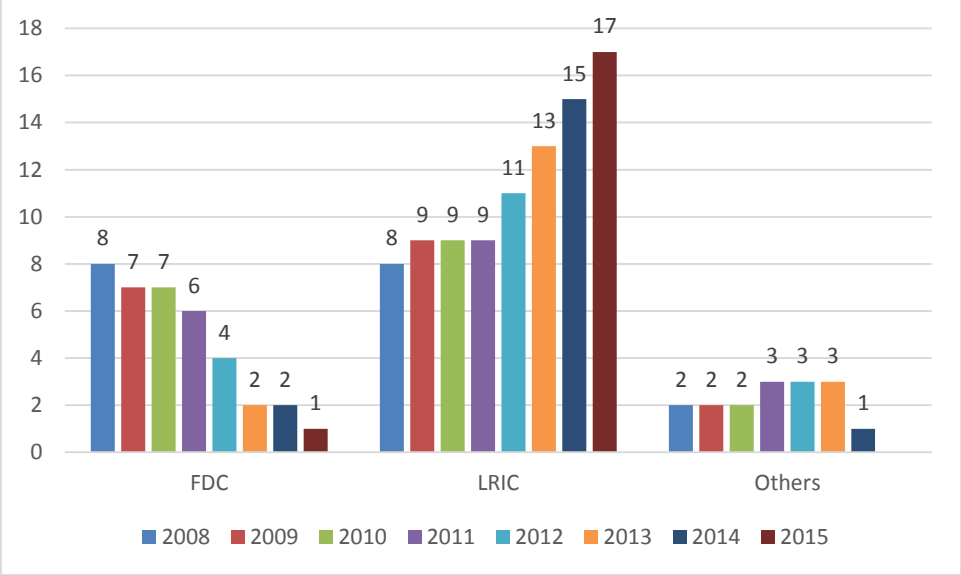
Source: BEREC RA database 2015
Number of countries: 18

Allocation methodology

Figure 26 shows the number of countries using LRIC, FDC or other mixed methodologies for call termination in mobile networks during the eight year period.

In the mobile sector the most commonly used allocation methodology is LRIC. The number of countries using LRIC methodology increased from 8 countries in 2008 to 9 countries in 2009 and has remained stable since 2011, showing a strong increase over the last three years to 17 in 2015. Over the same period, the number of countries using FDC has been decreasing. Most NRAs changed methodology passing from FDC to LRIC, and specifically to pure LRIC.

Figure 26 – Accounting methodology for Mobile Call Termination (Mkt 2)



Source: BEREC RA database 2015
Number of countries: 18

In conclusion, the analysis of the mobile termination market shows a stabilisation at a high level in the use of both CCA and LRIC.

<u>Key points for Market 2:</u> CCA is the preferred cost base for this market combined with LRIC or LR(A)IC variant as the main allocation methodology. The trend analysis suggests that the development of costing tools is still relatively new, but is in the process of being reinforced with the ongoing implementation of the EC Recommendation on the Regulatory Treatment of Fixed and Mobile Terminations Rates in the EU (2009/396/EC) where CCA and LR(A)IC (and more specifically BU-LRIC) is foreseen as a first option.

3.6 Implementation of the Termination Rate Recommendation of 7 May 2009

This paragraph provides an overview of the level of implementation of the Commission Recommendation on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC), using also data contained in the BEREC Report "Fixed and mobile termination rates in EU – January 2015", prepared by the BEREC Benchmarking EWG in cooperation with the BEREC Termination Rates EWG and the BEREC Office.[21]

Data from the previous Berec Report shows that, for the fixed termination market, 32 countries out of 35 providing data declared that symmetry in rates has already been reached. In two cases there is no symmetry in fixed termination rates, while 1 NRA declared that symmetry is partially applied.

As far as the model used by NRAs is concerned, 17 countries out of 35 with a valid answer have declared that a pure BU-LRIC model has been implemented; 3 out of 35 countries use benchmarking. In one case the BU-LRIC rate will enter in force in the near future.

One of the effects of the implementation of the TR Recommendation is that from 2012 to 2015 the simple EU average of TRs in the incumbent's fixed network at the three fixed interconnection layers decreased on average by 35 per cent: the highest reduction can be observed for layer 3 (-46 per cent, from 0.80 €-cent/min in 2012 (doc. BoR(12)56) to 0.43 €-cent/min in 2015 (doc. BoR(15)72)).

For the mobile termination market the analysis shows that in almost all the countries (33 out of 36 providing data) symmetry has already been reached.

As far as the model used by the NRAs is concerned, it can be observed that 20 countries out of 36 have declared that a pure BU-LRIC model has been implemented, while 7 countries declared to use benchmarking.

From 1st January 2012 to 1st January 2015 the simple EU average of MTRs decreased by 61 per cent (from 4.03 €-cent/min in 2012 (doc. BoR(12)56) to 1.55 €-cent/min (doc. BoR(15)72)). Also for mobile termination, this result can be considered as one of the effects of the implementation of the TR Recommendation.

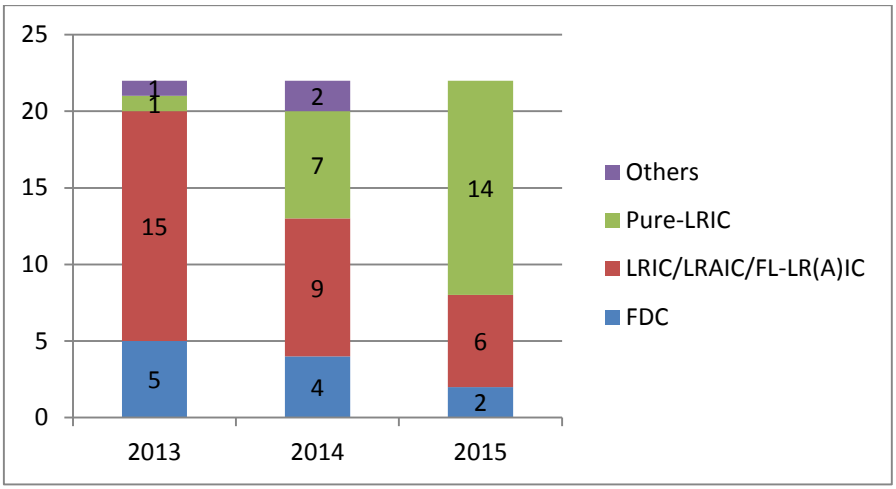
In light of the Commission Recommendation on Termination Rates (2009/396/EC) which had to be applied as of 2013 a more specific view about the cost allocation methodology applied since 2013 is also given in Figures 27 and 28 for all NRAs of EU Member States[22] that provided information about the cost accounting methodology applied in the last three years of the data

[21] Request for information sent to all NRAs refers, in general, to data as of 1st January 2015. Thirty six (36) NRAs provided data.

[22] Three non-EU countries have not been included in the analysis for Market 1 and one non- EU country has not been included in the analysis for Market 2.

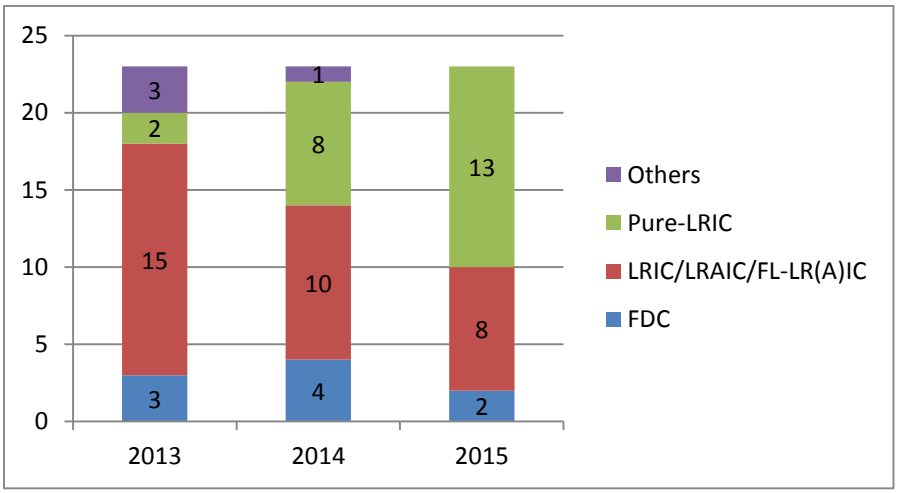
collection process in Market 1 and 2. The pictures confirm a growing adoption of a pure LRIC approach in both markets as recommended.

Figure 27 – Accounting methodology for Fixed and Mobile Call Termination in EU countries (Mkt 1)



Source: BEREC RA database 2015
Number of countries: 22

Figure 28 – Accounting methodology for Mobile Call Termination in EU countries (Mkt 2)



Source: BEREC RA database 2015
Number of countries: 23

3.7 Combination of cost base and allocation methodology – all markets

Figure 27 shows the combinations of cost base and accounting methodologies applied by NRAs.[23] There are four main combinations:

- CCA and pure LRIC[24];
- CCA and (FL)-LR(A)IC[25];
- CCA/FDC;
- HCA/FDC.

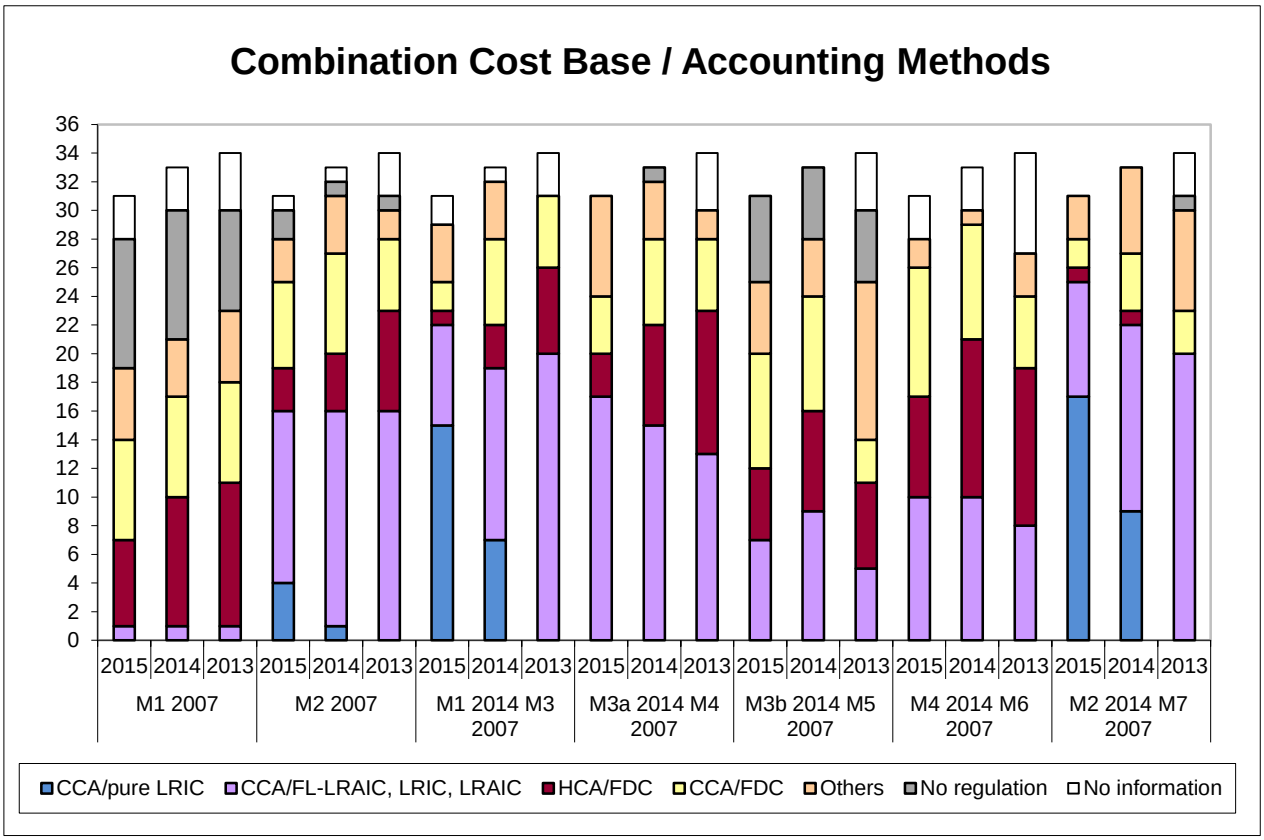
The following can be observed in 2015 in comparison to the two previous years:

- Market 1/2007: In this market which is not (or ex-post) regulated in 9 countries (9 in 2014 and 7 in 2013), 32 per cent of respondents apply HCA/FDC and 37 per cent CCA/FDC (HCA/FDC was applied by 43 per cent in 2014 and 2013 and CCA/FDC was applied by 33 per cent in 2014 and 30 per cent in 2013[26]). In 2015, 26 per cent apply "other" methods, 3 of which have a price cap and one applies retail minus.
- Market 2/2007: The still predominant, but decreasing combination is CCA/LR(A)IC. In 2015 43 per cent of respondents apply this method (48 per cent in 2014 and 53 per cent in 2013). Increasing is the combination CCA/pure LRIC with 14 per cent applying it in 2014, compared to only 3 per cent in 2014[27]. The second most popular combination CCA/FDC is applied in by 21 per cent of respondents in 2015 in comparison to 23 per cent in 2014 and 17 per cent in 2013. Of the 3 NRAs with an "others" answer 2 apply a "price cap"; 2 countries do not regulate this market.
- Market 1 2014-Market 3/2007: In 2015 the combination CCA/pure LRIC is applied by 52 per cent of respondents (22 per cent in 2014[28]and CCA/LR(A)IC by a further 24 per cent – (38 per cent in 2014 and 65 per cent in 2013). Benchmarking is applied by 2 and a price cap by 1 of the 4 NRAs who belong to the "other" category in 2015.
- Market 3a 2014-Market 4/2007: A majority of 55 per cent of all respondents apply CCA/LR(A)IC in 2015, similar to previous years (47 per cent in 2014 and 43 per cent in 2013). Of the 7 respondents (23 per cent) in the "others" category in 2015 one applies a price cap and one retail minus.

[23] This paragraph uses data collected by the RA EWG updated to April 2015. Possible inconsistencies with data in the previous paragraph arise from the different time periods used for collecting data.
[24] The combination CCA/pure LRIC has been added as a separate category to the 2014 Report since several NRAs had adopted a pure BU-LRIC approach in line with the Recommendation 2009/396/EC on Termination Rates in wholesale fixed call termination and mobile call termination markets.
[25] Referred to as CCA/LR(A)IC from hereon, the "FL" will be omitted.
[26] This value has been calculated from the total excluding the categories "not regulated" and "no information".
[27] This category did not exist in 2013.
[28] This category did not exist in 2013.

- Market 3b 2014-Market 5/2007: In 2015 the combination CCA/LR(A)IC is applied by 28 per cent of respondents (32 per cent in 2014 and 20 per cent in 2013), HCA/FDC by 20 per cent (25 per cent in 2014 and 24 per cent in 2013) and CCA/FDC by 32 per cent (29 per cent in 2014 and 12 per cent in 2013). The market is not regulated in 6 countries.
- Market 4 2014-Market 6/2007: In 2015 the combinations CCA/LR(A)IC (applied by 36 per cent of respondents), HCA/FDC (applied by 25 per cent of respondents) and CCA/FDC (applied by 32 per cent of respondents) are relatively evenly spread (similar to previous years with 33/37/27 per cent in 2014 and 30/41/19 per cent in 2013). One of the 2 respondents in the "other" category applies retail minus.
- Market 2 2014-Market 7/2007: In 2015 a majority of 55 per cent of NRAs apply CCA/pure LRIC (27 per cent in 2014[29]) while CCA LR(A)IC is applied by 26 per cent of respondents (39 per cent in 2014 and 67 per cent in 2013); of the 3 NRAs in the "other" category, 2 apply benchmarking, based on countries who have adopted a pure BU-LRIC methodology.

Figure 29 – Combination Cost Base / Accounting Methods



Source: BEREC RA database 2013, 2014 and 2015
Please note that the number of responses recorded varies within the years: 31 in 2015, 33 in 2014 and 34 in 2013. In 2015, 2 new respondents are included (not participants of previous year's reports).

[29] This category did not exist in 2013.

4. Additional Information: structural data

This section serves to identify main structural differences within European countries, for example the competitive and market situation in each country, population and population density indicators as well as existing telecommunications infrastructure. These structural differences may have an influence on NRAs regulation strategy and therefore the choice of price control method.

However, it should be pointed out that there are a number of other important factors influencing NRAs regulation strategy (such as e.g. the national broadband strategy).

Data collected from NRAs and other sources[30] are the following:

[30] EU Working document "Broadband Access in the EU, situation at 1 July 2014"; Fischer Weltalmanach 2015; ITU study "fixed telephone subscriptions 2013".

Table 1 - Structural Data Information collected from NRAs

1	Market situation[31]
1.1	fixed broadband penetration (subscription as a % of population)
1.2	fixed broadband subscriptions: % of cable modems (DOCSIS 3.0 included)
1.3	fixed broadband subscriptions: % of DSL lines (VDSL included)
1.4	fixed broadband subscriptions: % FTTH/B
1.5	mobile broadband penetration (all active users as a % of population)
2	Population and surface area per country[32]
2.1	number of inhabitants
2.2	number of inhabitants biggest city
2.3	% of total population (main metropolis population density)
2.4	number of inhabitants three biggest cities
2.5	% of total population (metro population density)
2.6	country area in sqkm
2.7	number of inhabitants per sqkm
3	Subscriber lines[33]
3.1	total number of active physical lines
3.2	ITU fixed telephone lines (active) 2013[34]
3.3	ITU fixed telephone lines per 100 inhabitants 2013[35]
4	MDF
	total number
5	Street cabinets
	total number
6	Local loop (MDF to customer site)
6.1	total average length in m (total copper pair m per active access)
6.2	average trench m per active subscriber line (total length of cable conduit + buried cable / active physical lines)
7	Distribution cable (street cabinet to customer site)
	total average length in m (total copper pair m per active access)
8	Civil engineering
8.1	% of feeder cable (MDF to street cabinet): cable conduit/buried cable[36]
8.2	% of distribution cable (street cabinet to customer site): cable conduit/buried cable[37]
8.3	% feeder/distribution cable (proportion of copper pair m) [38]
9	Duct/infrastructure sharing
9.1	% of duct sharing with other services
9.2	% of duct sharing per feeder/distribution cable
9.3	average cost saving (estimate)

[31] Data source: EU Working document “Broadband Access in the EU, situation at 1 July 2014” for MT, LU, CY, EE, LV, SI, LT, HR, SK, IE, BG, FI, AT, DK, HU, PT, CZ, EL, SE, BE, RO, NL, PL, ES, IT, UK, FR, DE and NRA information all other countries.

[32] Data source: Fischer Weltalmanach 2015.

[33] The publicly available ITU information serves as a reality check on 3.1.

[34] Source: International Telecommunication Union (ITU), 2013 data. Definition: number of active (registered activity in the last 3 months) lines connecting the subscriber's terminal equipment to the PSTN.
Statistics provided by the International Telecommunication Union (ITU), 2013 data.

[35] Source: International Telecommunication Union (ITU), 2013 data.

[36] Within the feeder cable: the relation of cable conduit in a cable canal/cable duct to cable conduit in the ground without a cable canal (i.e. 40% of cable is in a cable canal, 60% is not in a cable canal).

[37] Within the distribution cable: the relation of cable conduit in a cable canal/cable duct to cable conduit in the ground without a cable canal (i.e. 40% of cable is in a cable canal, 60% is not in a cable canal).

[38] Calculated as follows: (1) Length of the local sub-loop/length local loop = percentage of the distribution-part of the local loop (local sub-loop) (2) Percentage of the feeder-part of the local loop = 1 – the percentage of the distribution-part of the local loop.

A total of 29 countries have provided information on structural data.

Information on Market situation, Population and country size data as well as subscriber lines stem from publicly available data and can thus be shown for each individual country.

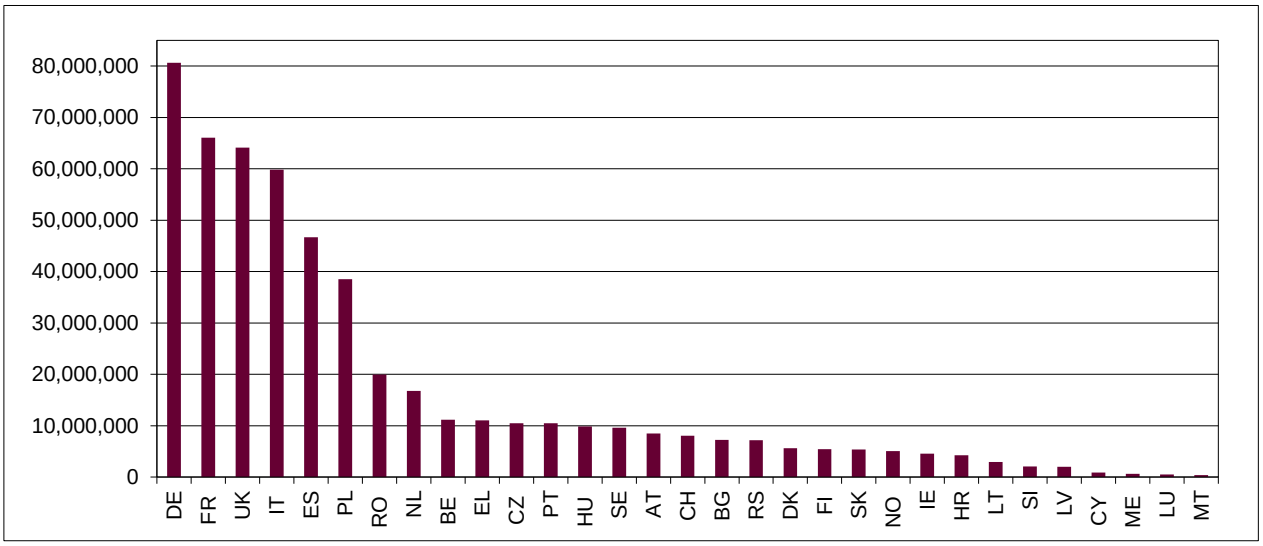
All other data are the latest available data from NRAs and will be presented in an anonymous form.

Population and country size

Naturally this data has remained largely unchanged in comparison to last year's data.

When looking at total population data (i.e. the total number of inhabitants per country): 23 countries have less than or around 10 million inhabitants (AT, BE, BG, CH, CY, CZ, DK, EL, FI, HR, HU, IE, LT, LU, LV, ME, MT, NO, PT, RS, SE, SI, SK), 3 countries have between 15 and 40 million inhabitants (NL, PL, RO) and 5 have more than 40 million inhabitants (DE, ES, FR, IT, UK).

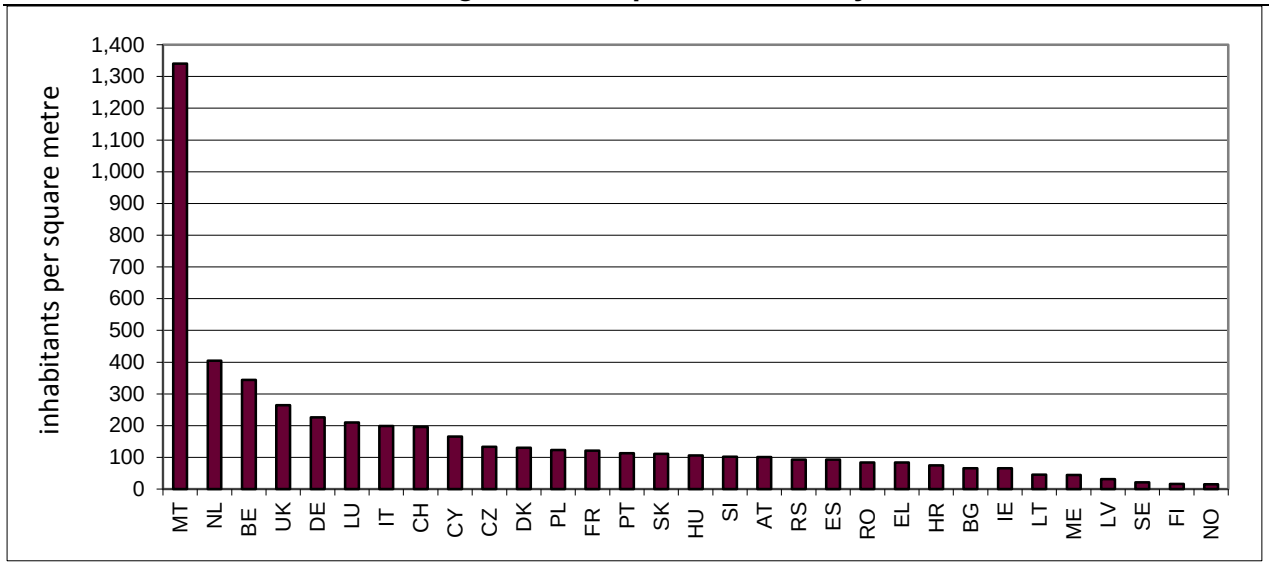
Figure 30 - Total Population



Source: Fischer Weltalmanach 2015

In terms of population density (i.e. the number of inhabitants per square kilometre), 18 countries have around or less than 100 people per square km (AT, BG, EL, ES, FI, HR, HU, IE, IS, LT, LV, ME, MK, NO, RO, RS, SE, SI), 11 countries have 100 to 200 people per square km (AT, CH, CY, CZ, DK, FR, HU, IT, PL, PT, SK) and 6 countries more than 200 people per square km (BE, DE, LU, MT, NL, UK).

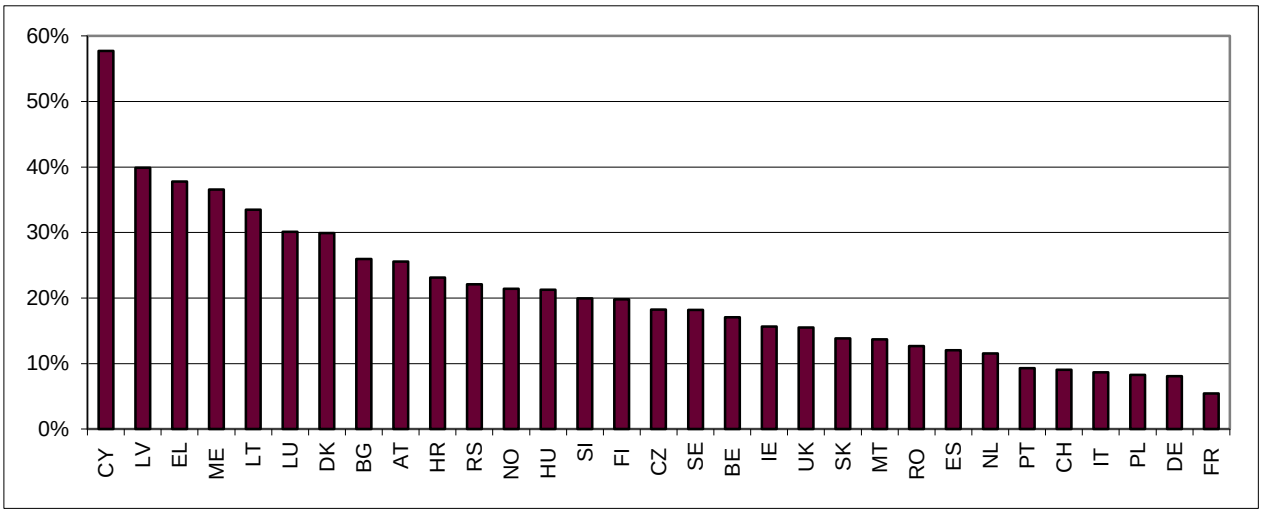
Figure 31 - Population Density



Source: Fischer Weltalmanach 2015

Looking at the population density of the main metropolitan areas (i.e. the number of inhabitants in the three biggest cities) as a percentage of the total population it is interesting to note that Baltic and South-Eastern European countries have the highest metro population density while in many of the larger countries like Germany, Spain, France, Poland and the United Kingdom this measure is rather low. 18 countries have a metro population density of less than or just on 20 per cent (BE, CH, CZ, DE, ES, FI, FR, IE, IT, MT, NL, PL, PT, RO, SE, SI, SK, UK), 7 countries between 20 and 30 per cent (AT, BG, DK, HR, HU, NO, RS) and 6 countries above 30 per cent (CY, LV, EL, ME, LT, LU).

Figure 32 - Metro Population Density

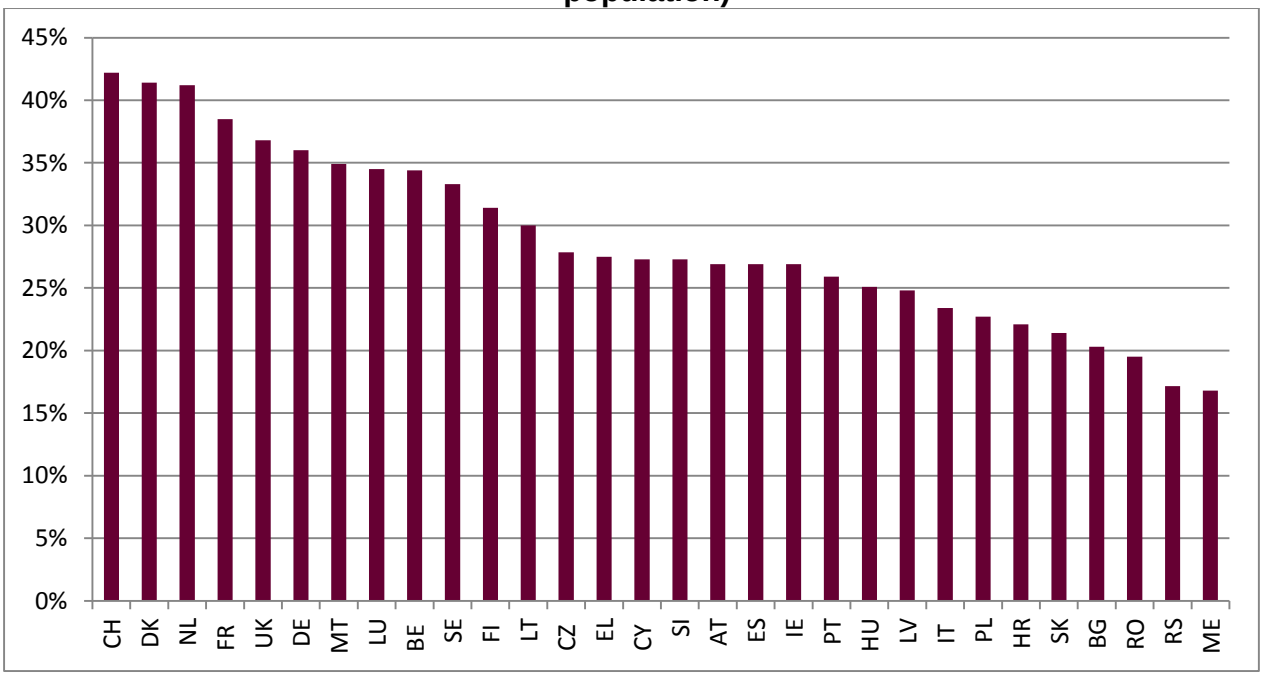


Source: Fischer Weltalmanach 2015

Market and competitive situation

The market and competitive situation within the different countries shows considerable disparity. The fixed broadband penetration[39], representing subscriptions as a percentage of the total population, varies between 16,8 per cent and 42,2 per cent. 12 countries have a penetration rate of above 30 per cent (LT, FI, SE, BE, LU, MT, DE, UK, FR, NL, DK, CH).

Figure 33 - Fixed Broadband Penetration (subscription as a percentage of the population)

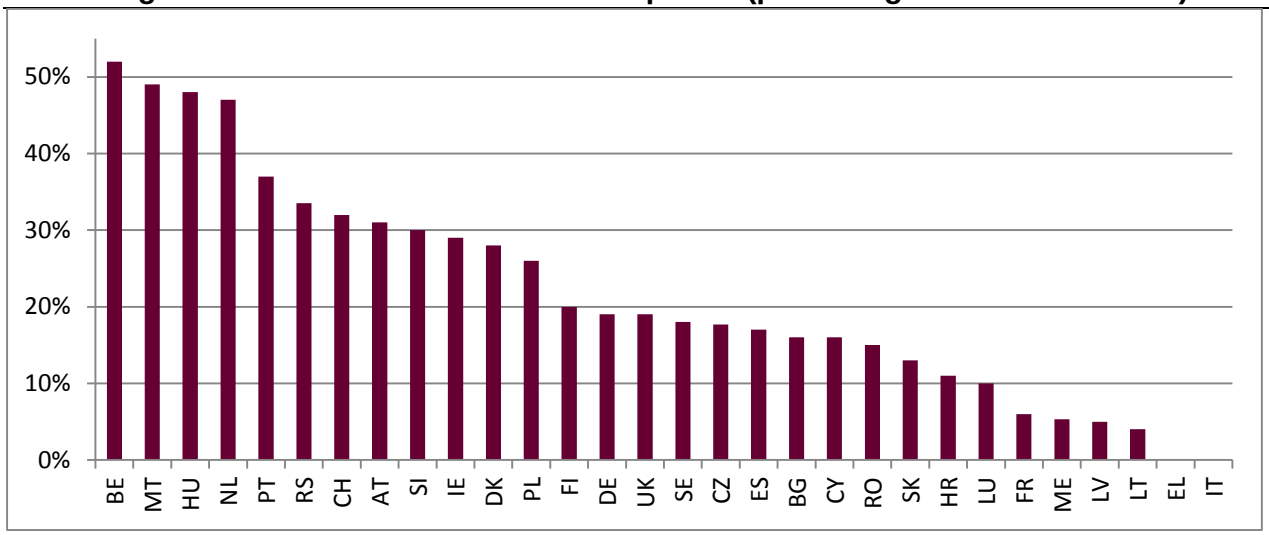


Source: EU Working document "Broadband Access in the EU, situation at 1 July 2014 / BEREC RA Database 2015"

[39] No information was available from NO.

The fixed broadband subscriptions[40], as a percentage of cable modems (DOCSIS 3.0 included) range from 0 per cent to 52 per cent. In 8 countries it is between 20 and 30 per cent (PL, DK, IE, SI, AT, CH, RS, PT) and in 4 countries the percentage is higher than 40 per cent (NL, HU, MT, BE).

Figure 34 - Fixed Broadband Subscriptions (percentage of cable modems)

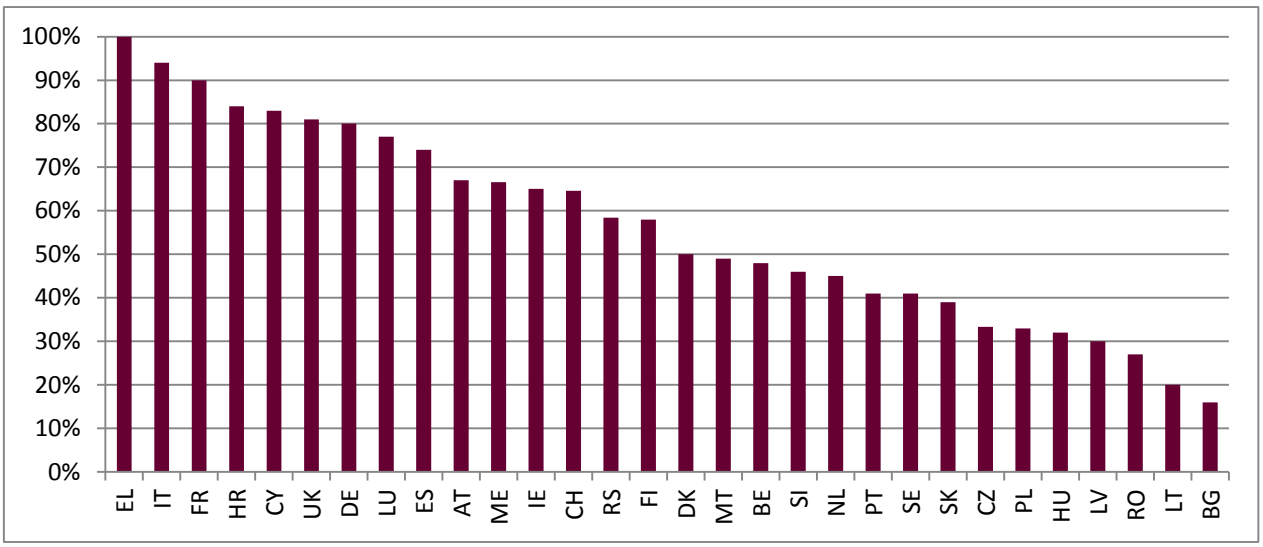


Source: EU Working document "Broadband Access in the EU, situation at 1 July 2014 / BEREC RA database 2015"

[40] No information was available from NO.

The fixed broadband subscriptions[41] as a percentage of DSL lines (VDSL included) range from 16 per cent to 100 per cent. In 9 countries the percentage is higher than 70 per cent (ES, LU, DE, UK, CY, HR, FR, IT, EL).

Figure 35 - Fixed Broadband Subscriptions (percentage of DSL lines)

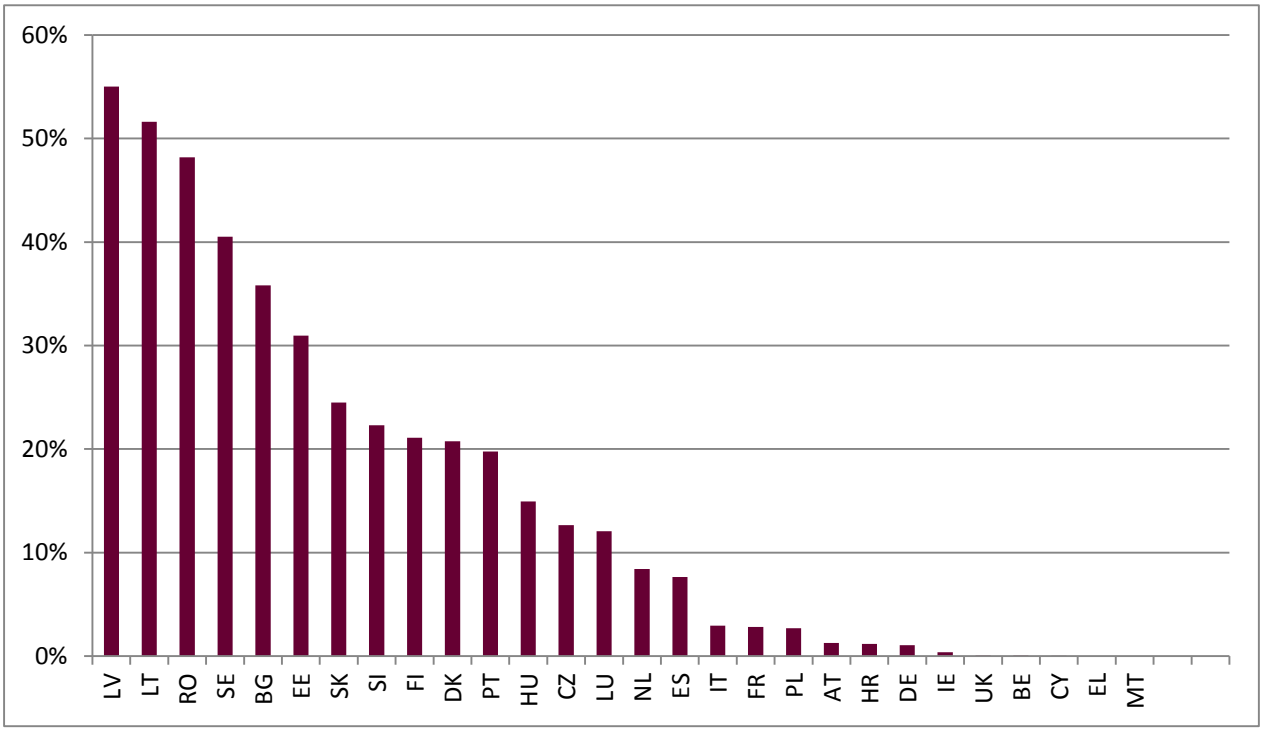


Source: EU Working document "Broadband Access in the EU, situation at 1 July 2014 / BEREC RA Database 2015"

The fixed broadband subscriptions as a percentage of FTTH/B[42] ranges from 0 per cent to 55 per cent. 6 countries have a percentage higher than 30 per cent (LV, LT, RO, SE, BG, EE).

[41] No information was available from NO.
[42] No information from CH, ME, NO, RS.

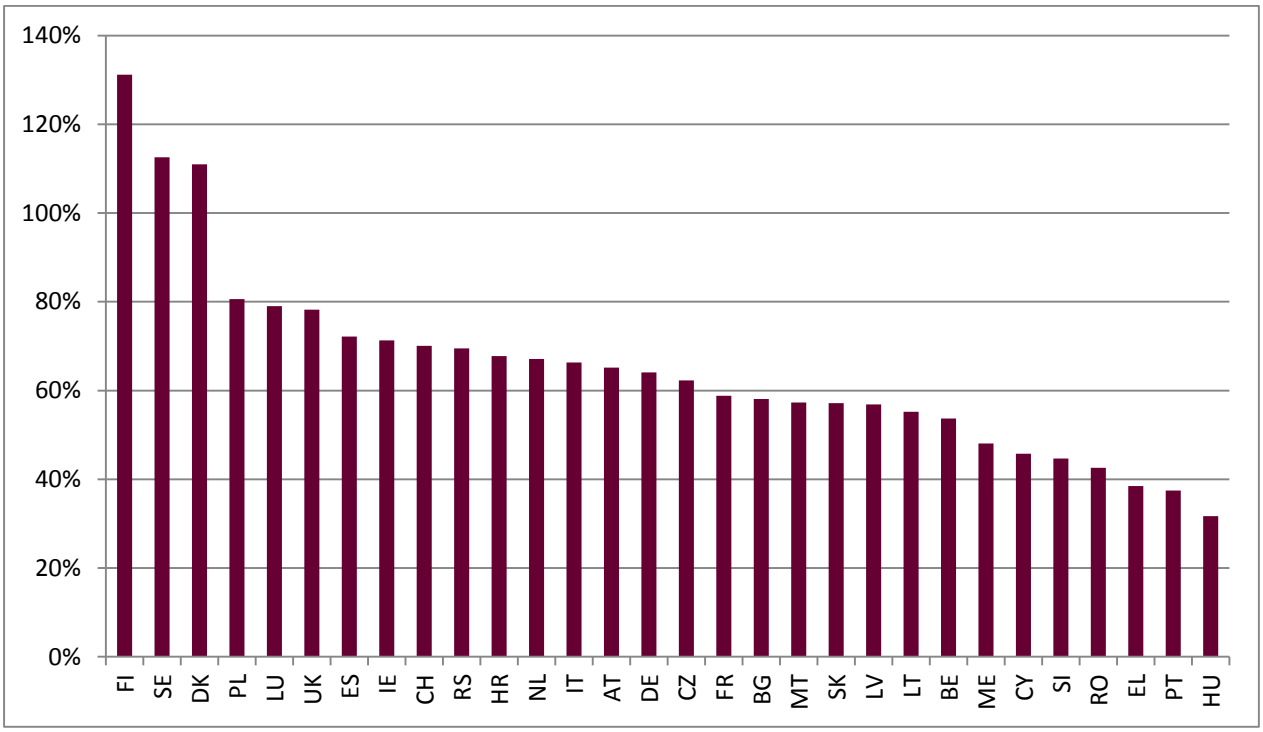
Figure 36 - Fixed Broadband Subscriptions (percentage of FTTH/B)



Source: EU Working document "Broadband Access in the EU, situation at 1 July 2014 / BEREC RA Database 2015"

The mobile broadband penetration[43], representing all active users as a percentage of the total population, ranges from 31,7 per cent to 131,2 per cent. 9 countries have a penetration which is higher than 70 per cent.

Figure 37 - Mobile Broadband Penetration



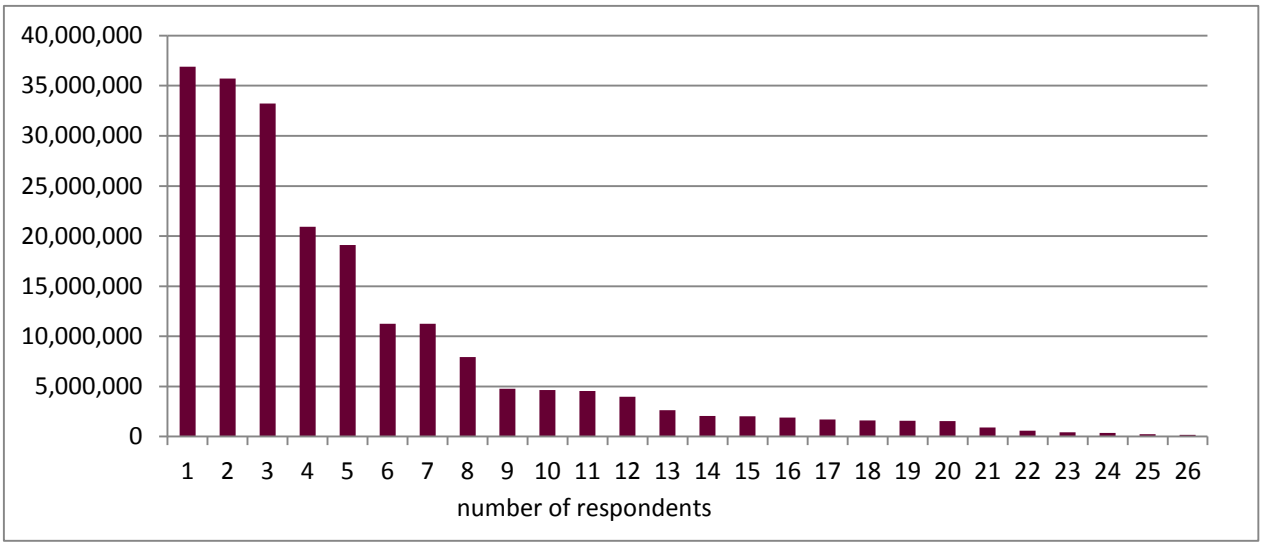
Source: EU Working document "Broadband Access in the EU, situation at 1 July 2014 / BEREC RA database 2015"

[43] No information available from NO.

It should be pointed out that, while the fixed and mobile broadband penetration continues to increase, this is not necessarily associated with increasing average revenues.

The total number of active physical subscriber lines[44] ranges from 168.000 to more than 36 million active physical lines (usually in correlation with the size of the country).

Figure 38 - Active Physical Lines



Source: BEREC RA database 2015

Network infrastructure

Not many NRAs have provided information on their country's network infrastructure, i.e. the numbers of MDF, street cabinets, length of local loop, feeder or distribution cable. This data is highly dependent on:

- the size and shape of the country,
- the number and density of its inhabitants,
- the infrastructure in use.

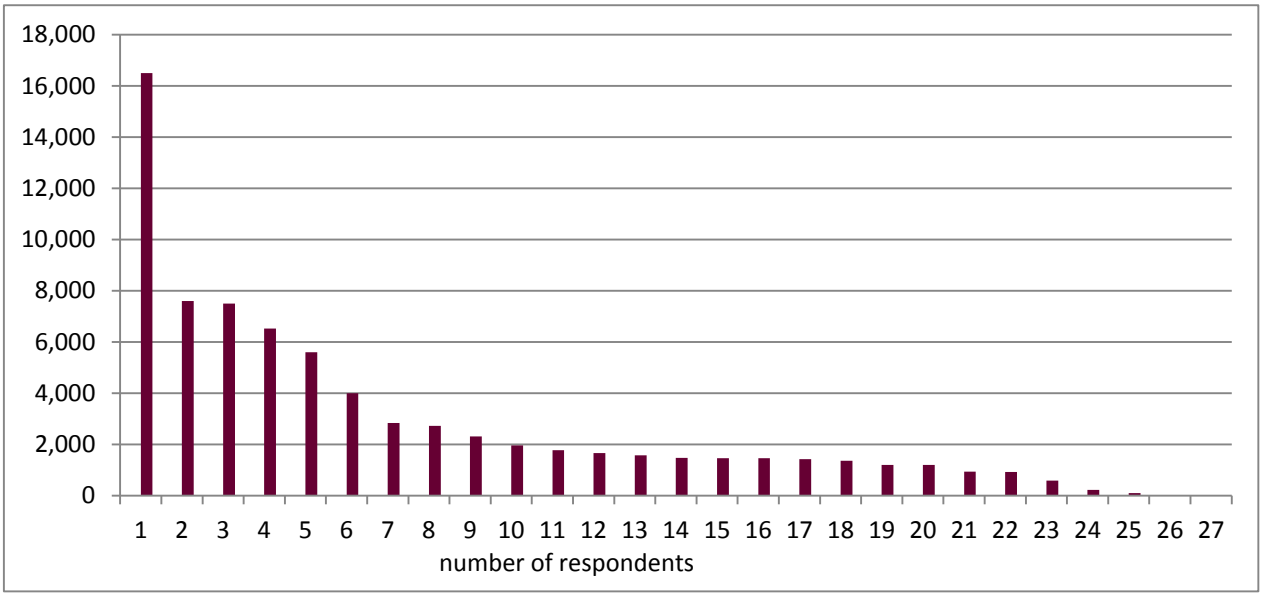
Some countries also have a proportion of poles in their access networks which are not recorded in this survey.

Large variations are observed between countries. The data does not show much change from last year's data; a change will naturally only be observed if significant changes in the access infrastructure occur (i.e. All-IP network rollout).

[44] 2 countries' data are 2012 data, 5 countries have not provided information.

The total number of MDF[45] ranges from a minimum of 15 to a maximum of 16.500 MDF nationwide.

Figure 39 - Number of MDF

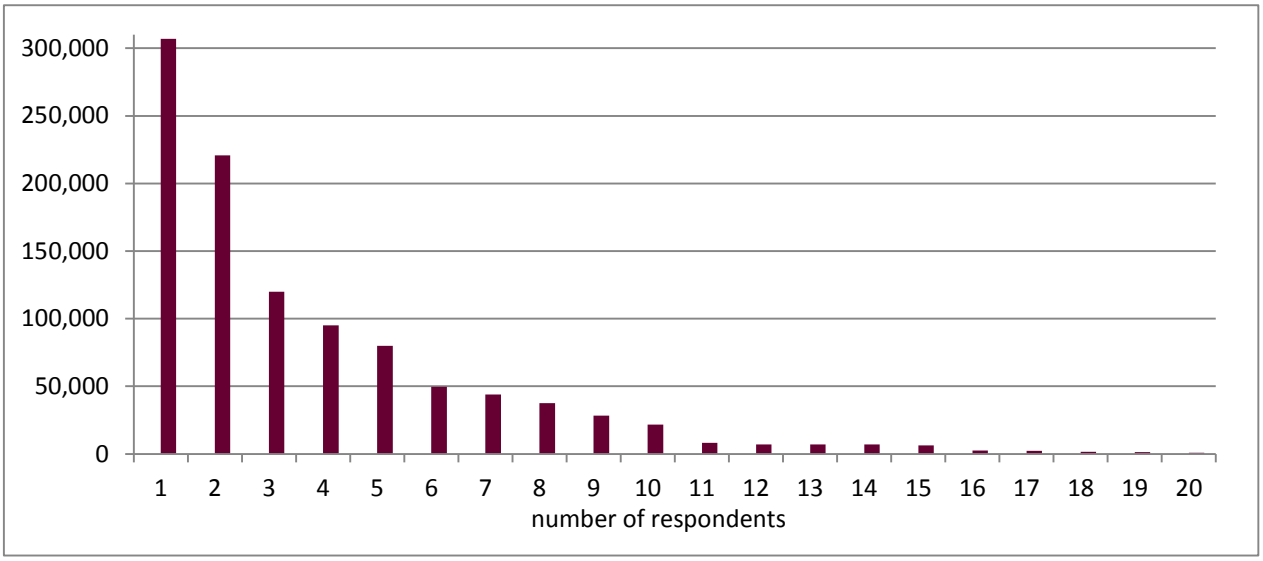


Source: BEREC RA database 2015

[45] 4 countries have not provided information. 1 country's data is from 2013, 1 country uses modelled data.

The number of street cabinets[46] range from a minimum of 600 to a maximum of more than 300.000 cabinets nationwide.

Figure 40 - Number of Street Cabinets

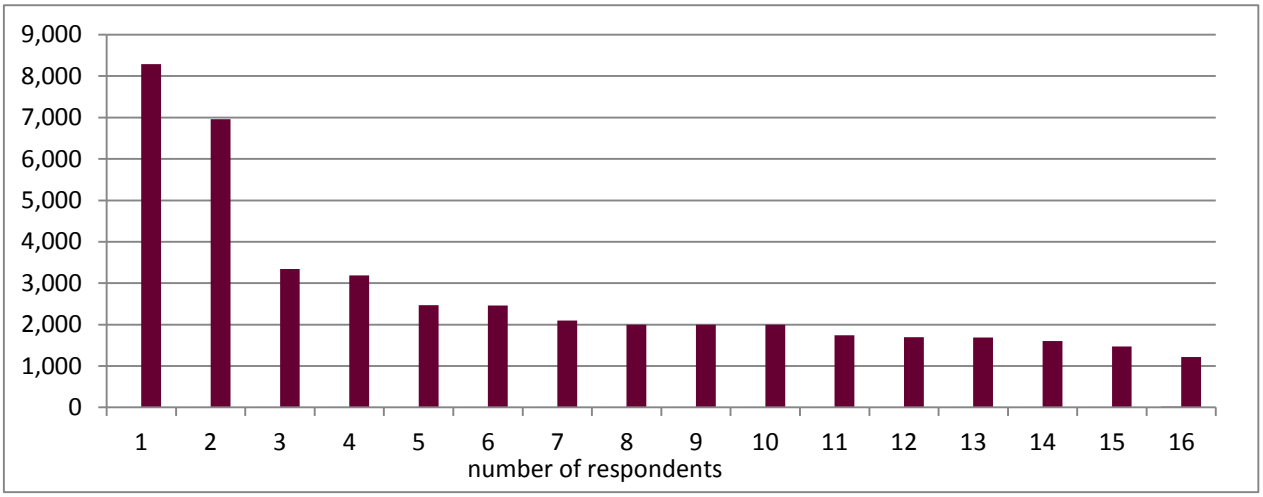


Source: BEREC RA database 2015

[46] 10 NRAs have not provided information on the number of street cabinets. 1 NRA's information is based on 2013 data1 NRA has provided modelled data, which renders street cabinets obsolete since it uses a full FTTH P2P model.

The total average length of the local loop[47] is between a minimum of 1.218 and a maximum of over 8.000 metres.

Figure 41 - Local Loop: Average Length in Metres

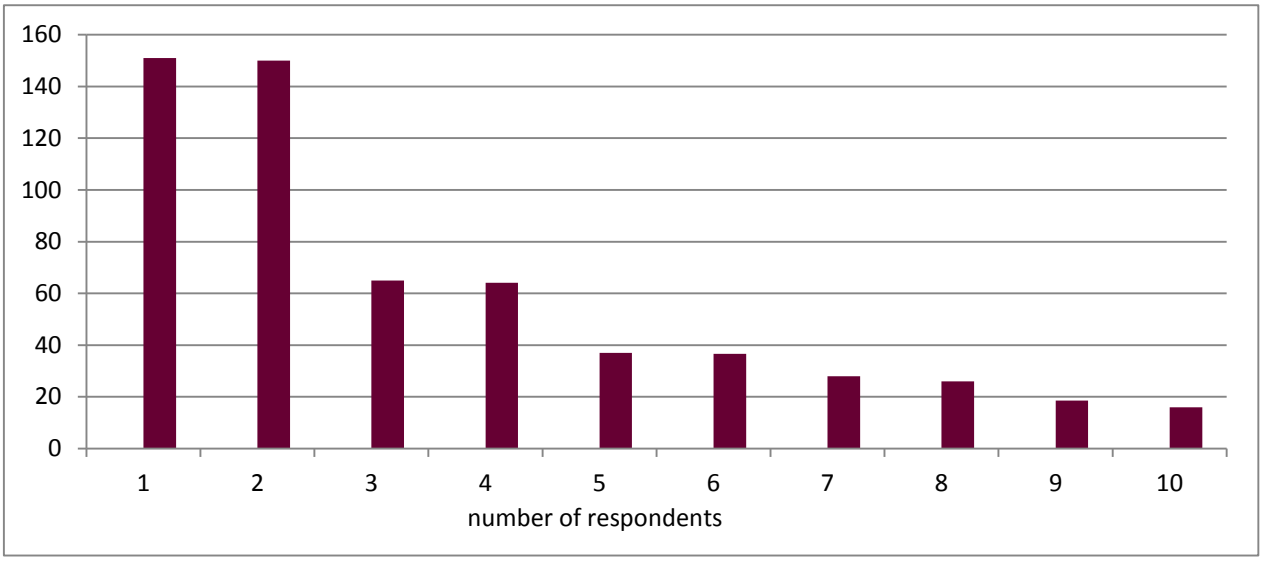


Source: BEREC RA database 2015

[47] 15 NRAs have not provided information on the length of the local loop. 2 NRAs have provided a range: the maximum has been used. 1 NRA's information is based on 2013 data, 1 NRA's data is a weighted average of active and free lines.

The average trench metre per active subscriber line[48] is between a minimum of 16 and a maximum of more than 150 metres.

Figure 42 - Average Trench Metre

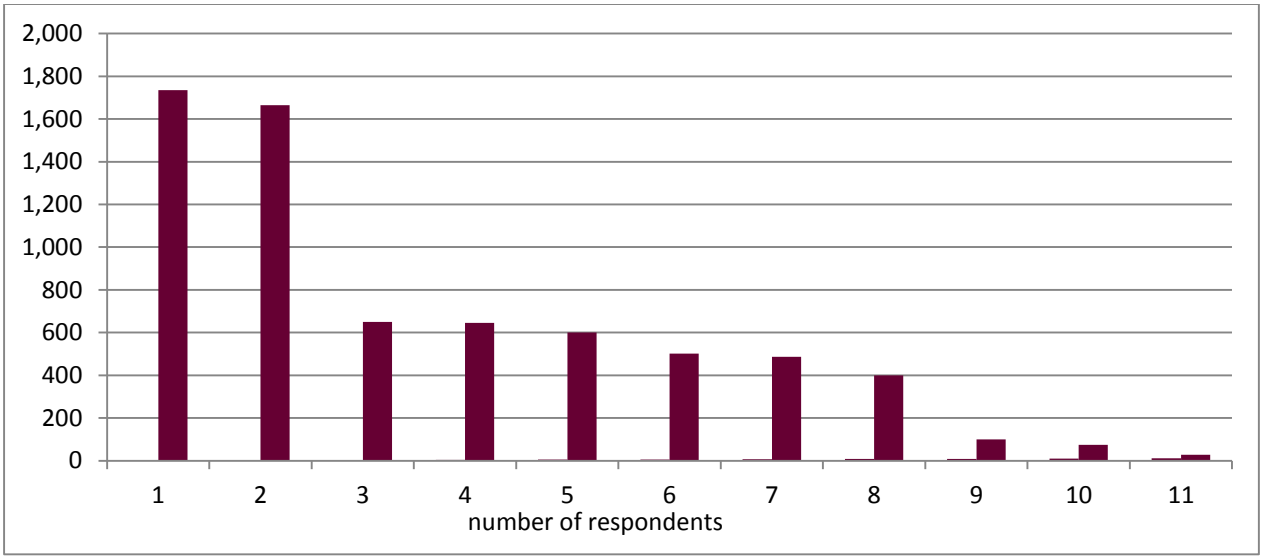


Source: BEREC RA database 2015

[48] 21 NRAs have not provided information. 1 NRA's data is from 2010. 1 NRA's data has been left out because it seems implausible.

The total average length of the distribution cable[49] is between a minimum of 29 and a maximum of around 1.735 metres.

Figure 43 - Distribution Cable: Average Length in Metres



Source: BEREC RA database 2015

Civil engineering and duct sharing

There are two important cost components within the telecommunications industry: civil engineering and duct sharing. Unfortunately only few NRAs have provided information on these topics, limiting the representativeness of the analysed values.

When looking at the proportion of cables laid in cable ducts to cables laid in the ground within the feeder cable[50] (which makes a difference in terms of cost), the percentage of cables in cable ducts ranges from 0 per cent to 100 per cent, i.e. in 2 countries all (copper) cables are buried and in another all cables are in cable ducts. 1 NRA specified that there is a difference between copper and fibre: fibre is predominantly (80 per cent) run in cable ducts whereas copper is predominantly buried. Another NRA specified that the proportion changes considerably depending on urban and rural areas (0 to 30 per cent cable conduit and 50 to 95 per cent buried cable). 1 NRA specified 15 per cent to be cable conduit and 85 per cent buried cable.

The same disparity is observed when looking at the proportion of cables laid in cable ducts to cables laid in the ground within the distribution cable[51], i.e. the percentage of cables in cable ducts ranges from 0 per cent to 100 per cent. In one country the relation is another 0-5 cable

[49] 20 NRAs did not provide information on the total average length. 1 NRA provided a range: the maximum is shown.
[50] 7 NRAs replied, however only 4 answers were conclusive.
[51] 6 NRAs replied, however only 4 answers were conclusive.

conduit to 15-90 per cent buried cable, depending on urban or rural areas (rest are poles). In one country the proportion is around 3 per cent cable conduit to 97 per cent buried cable.

The proportion of feeder to distribution cable[52] was stated by one country to be 95 to 5 per cent and by another to be around 64 to 36 per cent.

Duct sharing with other services[53] was stated to be unavailable in 2 countries. In one country it amounts to less than 10 per cent, in other countries it is between 20 and 50 per cent.

In terms of the percentage of duct sharing per feeder and distribution cables[54] one NRA has stated 22 per cent (feeder cable) and 51 per cent (distribution cable), another 41 per cent (feeder cable) and 59 per cent (distribution cable). Another NRA evenly distributes duct sharing (50/50) between feeder and distribution cables.

The average cost saving[55] for the telecommunications provider was around 10 per cent (feeder cable) and around 20 per cent (distribution cable). In a second country the average saving is 25 per cent, shared equally between utility and telecommunications provider, in another a cost saving of 50 per cent is specified.

Of course the percentage of duct sharing and cost saving was nil for the countries where duct sharing is not available.

[52] 6 NRAs replied, however only 2 answers were conclusive.
[53] 6 NRAs replied.
[54] 4 NRAs provided information, in one country the percentage is 0.
[55] 5 NRAs provided information, in 2 countries it is nil, one answer was not conclusive.

5. The main motivation behind the choice of the costing methodology

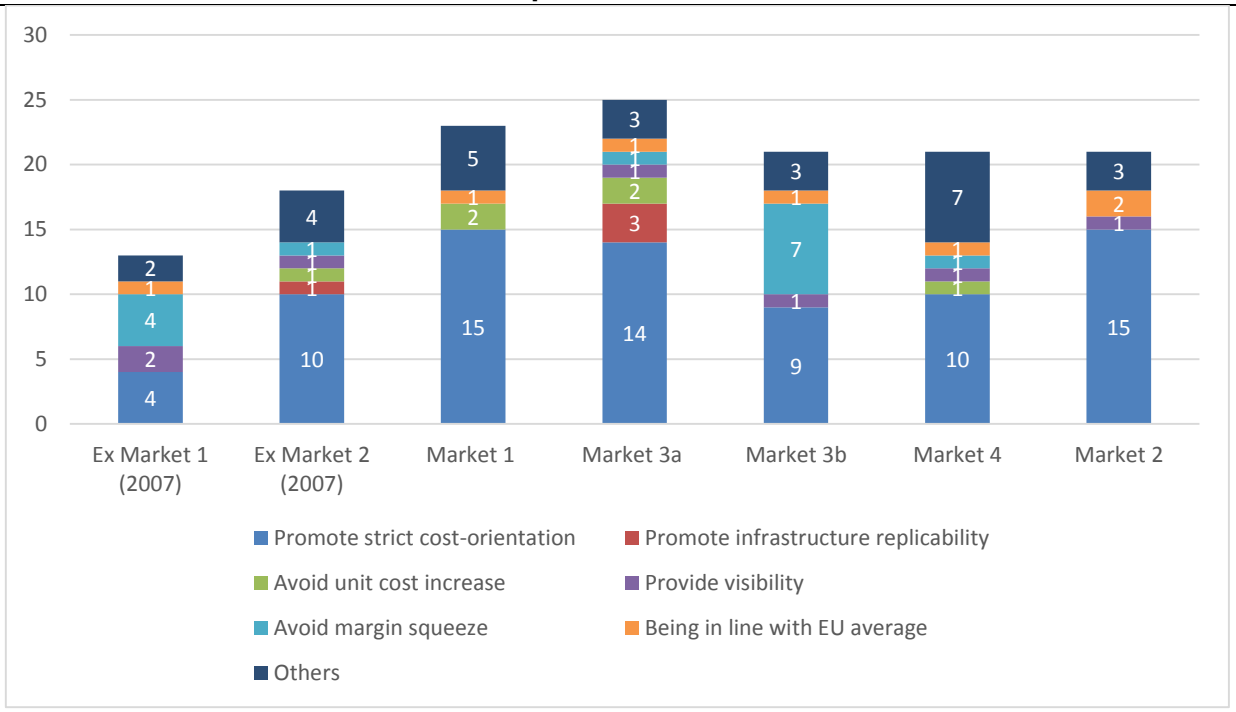
There may be of course several objectives that a NRA has to balance in arriving at a decision about a pricing approach. For a deeper explanation about these choices and the reasons for selecting them, readers should refer to the relevant statements/publications from each NRA. However, as last year, data concerning the "main" motivation behind the choice of the costing methodology has been included in the report.[56] In practice, this data was collected by adding another variable to each market sheet in the questionnaire. However, in order to make the new data useful for comparisons and statistics some predefined alternatives were given from which NRAs could choose. These predefined alternatives were: "promote strict cost orientation", "promote infrastructure replicability", "avoid unit cost increase", "provide visibility", "avoid margin squeeze", "being in line with EU average" and "others" (in cases where the NRA chooses this alternative, they were asked to give more detailed comments). Moreover, for the markets in the new Recommendation, in case more than one objective is pursued, the questionnaire gives the opportunity to rank and explain the principles behind the rationale.

Answers were given by 13 to 25 NRAs depending on the market in question. Figure 44 shows the main motivations expressed by the NRAs in each market. Figure 45 shows a deeper analysis about the products in Market 3a (ULL, SLU, SA, fiber LLU, VULA, dark fibre, duct access).

As can be seen in figure 44, some NRAs (the percentage varies between 12% and 33% for all markets except Market 3a)[57] chose the "others" alternative as the main motivation behind the chosen costing methodology.

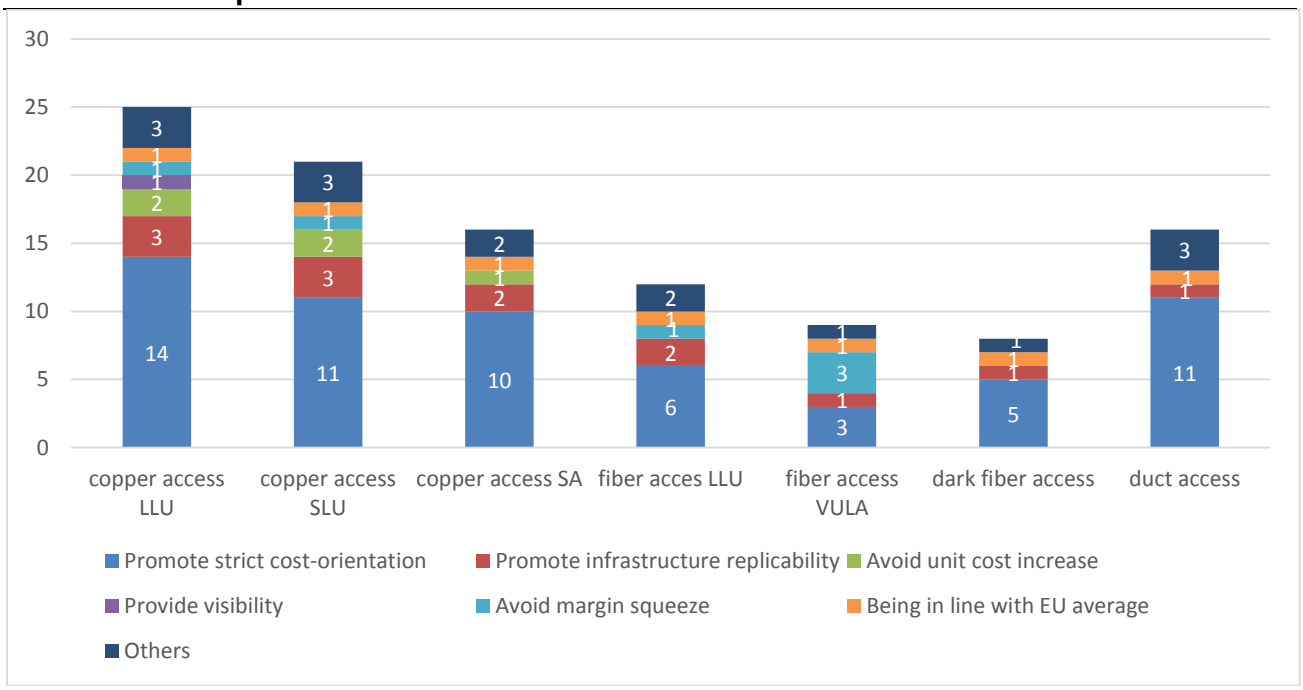
[56] Cf. also BEREC input to the consultation on "costing methodologies", doc. BoR (11) 65.
[57] Since there are several products/services and therefore different answers for the "motivation" variable in Market 3a, the analysis for this market has been restricted to "copper access (including LLU, SA, SLU)".

Figure 44 – The main motivation behind the choice of the costing methodology 2014/710/EU plus Market 1 and 2/2007



Source: BEREC RA database 2015

Figure 45 – The main motivation behind the choice of the costing methodology for some products in the Market 3a of the Recommendation 2014/710/EC



Source: BEREC RA database 2015

Moreover, on the basis of the detailed comments it seems that in most cases the motivation behind the choice of costing methodology was a combination of the given list of alternatives. A

general ranking of the option has not been provided but from the comments received we can understand that the “strict cost orientation” is the instrument to promote competition and, at the same time, stimulate investments and increase consumer benefit, rather than following the “Recommendation on ND obligations and costing methodologies”.

The table below shows the various combinations of motivation with respect to the different markets.

	Market 1	Market 2	Market 3a	Market 3b	Market 4
Promote strict cost-orientation	i)Promote competition through the reduction of network effect; ii) elimination of the excessive profits and cross subsidisation; iii) Promote benefit to consumers; iv) consistency and harmonization at the European level; iv) Avoid margin squeeze; v) No prioritizing objective	i)Promote competition (3)[58] through the reduction of network effect; ii) elimination of the excessive profits and cross subsidisation; iii) Promote benefit to consumers (4); iv) consistency and harmonization at the European level; iv) Avoid margin squeeze; v) No prioritizing objective; vi) Promote efficiency; vii) Promote investment	i) Promote competition (2) without hindering investment; ii) promote benefit to consumers (2); iii) no prioritizing objective; iv) promote investment v) be compliant with EC Recommendation (2)	Avoid margin squeeze	i) Avoid margin squeeze; ii) Promote competition without hindering investment; iii) promote benefit to consumers
Promote infrastructure replicability	-	-	-	-	-
Avoid unit cost increase			i) Promote competition; ii) Promote infrastructure replicability; iii) Promote investment; iv) Promote efficient use of infrastructure.		
Provide visibility					
Avoid margin squeeze				i) Promote competition; ii) Promote investment iii)Following the rational of Recommendation	
Being in line with EU average		i) Promote benefits to the consumer ii) promote efficiency.			
Others	i)Follow EC Recommendation; ii) Promote efficient use of infrastructure;	i)Promote competition; ii) Provide efficient build or buy signals (promote infrastructure competition); iii) account for technological progress; iv) Following National Court decision	i)Promote competition; ii) Provide efficient build or buy signals (promote infrastructure competition) iii) Account for technological progress; iv) Follow the recommendations of EC to ensure correct incentive for build or buy; iv) Promote efficient use of infrastructure;	i) Avoid excessive prices; ii))Promote competition; iii) Provide efficient build or buy signals (promote infrastructure competition) iii) Account for technological progress;	

In Market 3a (LLU) “strict cost orientation” is related to improving competition and consumers benefit. One NRA indicated as a main objective of cost orientation also to “avoid unit cost increase” in order to promote infrastructure replicability.

For Market 3b the promotion of "strict cost orientation" is also associated with avoiding excessive wholesale price and margin squeeze.[59] Moreover when "avoid margin squeeze" is the main motivation also promoting competition and investment are mentioned. When "other" is indicated as a main motivation in this market, the rationale is also to follow the EC Recommendation.

For Market 4 "promote strict cost orientation" is also related to avoiding excessive wholesale price, and promoting benefit to consumers and competition.

For the termination markets (Market 1 and 2) the objective "to promote strict cost orientation" is imposed to prevent excessive prices and price squeeze.

In some cases motivations outside the predefined list have been provided (i.e. "account for technological progress", "providing build or buy signals").

It is interesting to note that the objective "to promote strict cost orientation" is the main motivation for the choice of the costing methodology in almost every market (except in Market 1/2007 and Market 3b). This alternative, for example, has been chosen by 15 NRAs in Markets 1 and 2.

On the basis of respondent's answers a strict cost orientation as an objective covers all three combinations of cost base and accounting methodology used by most NRAs (CCA and LR(A)IC, CCA/FDC, HCA/FDC). Generally, it seems that there were multiple ways to achieve a certain regulatory objective.

Other main motivations in choosing a costing methodology, especially in Market 3b, is to "avoid margin squeeze".[60]

The alternative "being in line with EU average" was chosen by only 2 NRAs in Market 2, when in other markets it was selected by 1 NRA. The alternatives "avoid unit cost increase" and "provide visibility" were not so common.

It is worth to be mentioned that for some NRAs the main motivation behind the choice of the costing methodology varies according to the different products in Market 3a as shown in figure 45. As a matter of fact for duct access service one NRA declared that the main motivation was to "promote infrastructure replicability" while for most respondents the main motivation is to "promote strict cost orientation". For fibre access (LLU,) two NRAs declared "promote infrastructure replicability".

Overall it can be concluded that NRAs pursue the objective of effective price control measures mainly by setting strict cost-oriented prices as this is considered to be the best way to achieve the overarching objectives of Art. 8 Framework Directive (2002/21/EC). Hardly any NRA motivated its choice of costing methodology with the option "avoid unit cost increase" which

[58] Number of NRA that indicate the same objective.
[59] The motivation "Promote strict cost orientation" is pursued trough cost orientation as well as cost orientation associated with price cap.
[60] Berec Guidance on the regulatory accounting approach to the economic replicability test (i.e. *ex-ante*/sector specific margin squeeze tests).

shows clearly that NRAs are not thinking from the end ("*reverse engineering*", i.e. setting a fixed price not allowing cost variations), but are rather setting prices following a cost concept they consider the best to reach the objectives of the Regulatory Framework (even if this includes allowing cost increases). Although, cost-orientation may be interpreted differently, it has to be mentioned that NRAs consider different cost concepts appropriate to achieve the objectives of the Regulatory Framework exercising their discretion in order to regulate their national markets effectively.

6. WACC

According to Article 13 of the Access Directive, when imposing obligations relating to cost recovery and price controls, NRA shall take into account the investments made by the SMP operator and allow a reasonable rate of return on adequate capital employed, taking into account the risks involved. This "rate of return" is typically determined using the Weighted Average Cost of Capital (WACC) formula.

During the years the Regulatory Accounting EWG has collected some information about the estimated WACC used by all the NRA in each regulated market (i.e. nominal value and WACC type[61]). In BoR (13) 110, an extensive and complex survey has been carried out on the subject of WACC[62] confirming that nearly all NRAs use the CAPM (Capital Asset Pricing Model) to evaluate the equity rate of return from which they derive the WACC as a weighted average of the cost of debt and the cost of equity. In the same survey detailed information has been collected on the determination and the values of the parameters used by each NRA in their WACC calculation such as: i) the equity or asset beta, ii) the market risk premium, iii) the risk free rate, iv) the debt premium, v) the average tax rate and vi) the inflation rate. In the 2013 Regulatory Accounting Report, although information on all seven markets of the 2007 Recommendation was gathered, it was decided to concentrate the WACC analysis on the fixed and the mobile network markets, i.e. Market 4/2007 and Market 7/2007.

Since the study is too elaborate to be replicated each year, NRAs were asked to update some information provided in the study for the 2013 Report. In particular they were asked if the parameters' values had changed from the previous collection data and the main motivations behind such change.

[61] For example "before tax real", "before tax nominal". etc.
[62] Annex to the 2013 RA Report "Cost of Capital in Europe – Cost of Capital Parameters in 27 European Coutnries" (Data as of 1st January 2012).

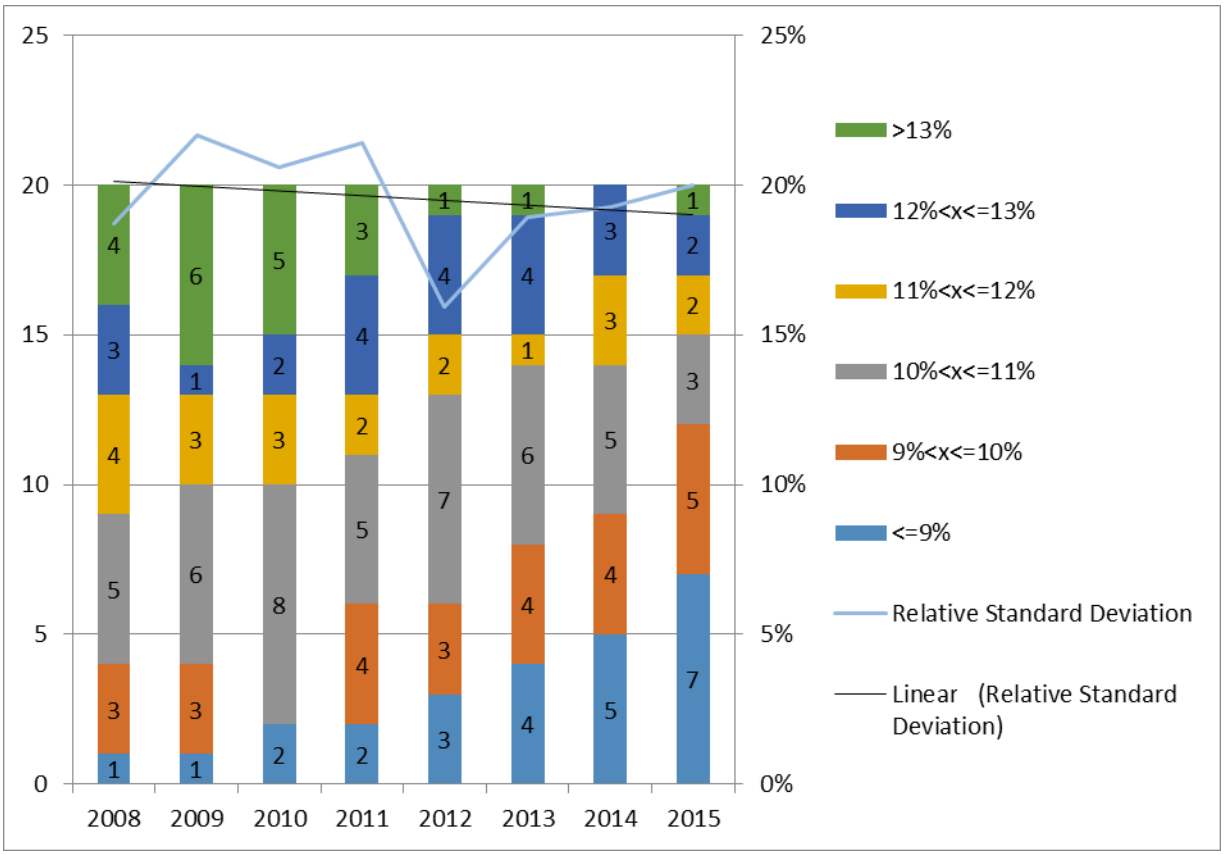
9 NRAs out of 31 that replied to the questionnaire did not change the WACC for both fixed local access market (Market 3a/2014) and mobile termination markets (Market 2/2014). The NRAs which modified the WACC value provided some explanation of their choice. With respect to the fixed access market (Market 3a/2014), 6 NRAs argued that the modifications apply to all parameters. One NRA explained that an update is effected every year, except for the parameter "gearing ratio", thus reflecting the development of (national) financial markets and in order to simulate the conditions that a competitor willing to enter the market today would face; two NRAs argued that the regulatory period from previous revisions was expired. Three more NRAs explained that the Equity Risk premium (ERP) and the cost of debt are the main parameters implying the WACC value modification from 2012. For the ERP these three NRAs estimated a reduction during this period due to stable bond rates and stable financial conditions; one NRA moreover explained that the same parameter has increased from 2014 and 2015 due to the modification of the methodology used for evaluating the average bond rate from a window time of 3 years to 5 years. On the other hand, one of these NRA explained that the cost of debt increased as a consequence of a credit risk premium effect due to the financial crisis. One NRA explained the reduction of WACC due to a reduction of the equity beta alone. Similar considerations have been provided by NRAs for the mobile market.

The distribution of the WACC value over time is given for Market 3a/2014 for a sub set of 20 NRAs that have provided data from 2008 on the "nominal pre-tax" WACC (Figure 46).[63] At the same time, the relative standard deviation (standard deviation respect to the arithmetic average value) of the WACC value is represented.

The survey and the update provided in this report shows that while NRAs use near identical methods and parameters for determining the WACC, the value of these parameters and the ensuing WACC naturally differs. This is due to the underlying calculations that are based on economic and financial market circumstances as well as tax and inflation rates in the individual European countries. Furthermore, the regulatory periods and therefore the update periods for the WACC parameters differ in each country.

[63] Two more NRAs that express the WACC in real terms have not been included in the figure.

Figure 46 – Distribution of the nominal pre-tax WACC in Market 3a/2014

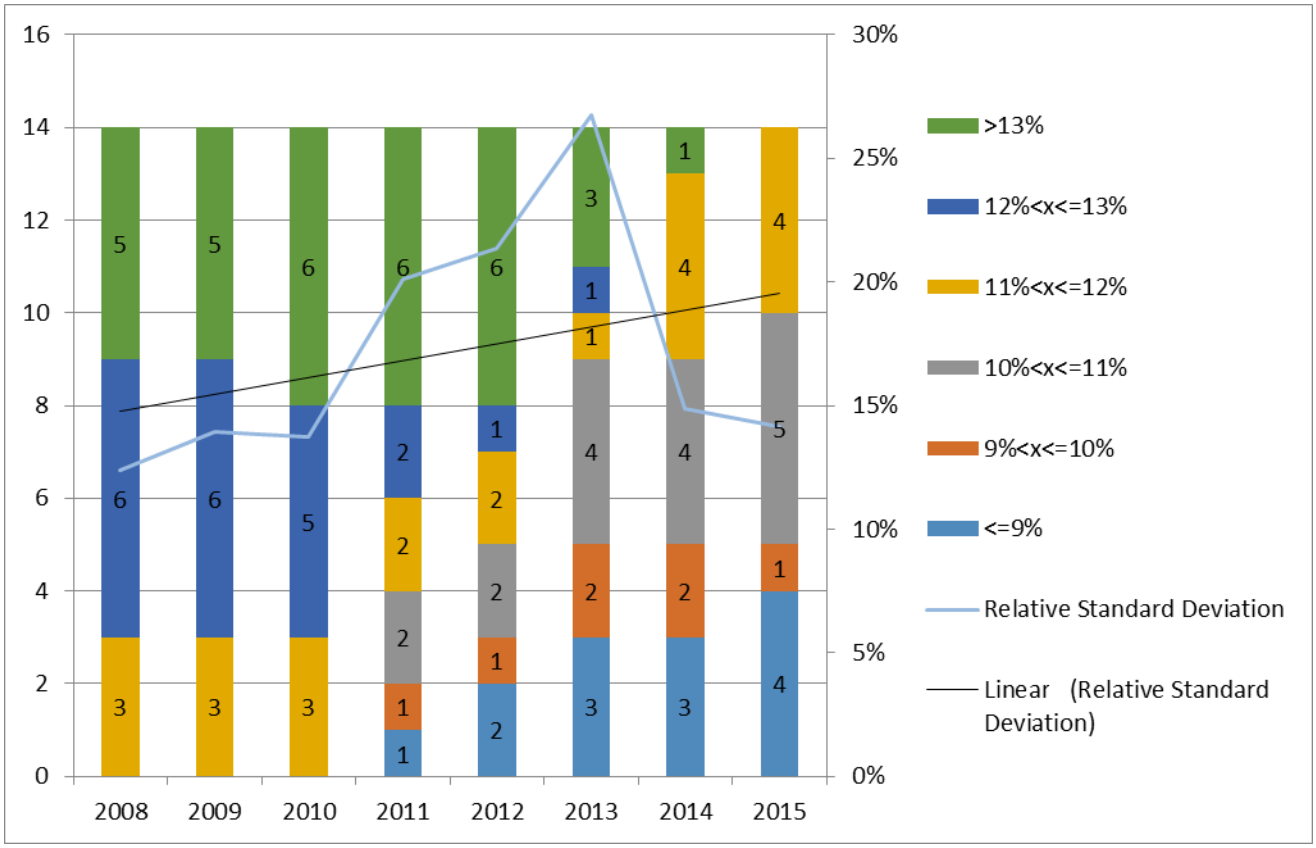


Source: BEREC RA database 2015
Number of countries: 20

In Figure 47 the distribution of the "nominal per-tax" WACC value over time is given for Market 2/2014 for a sub set of 14 NRAs.[64] The relative standard deviation (standard deviation respect to the arithmetic average value) of the WACC value is represented, showing a reduction tendency compared to Market 3a/2014 in the last two years.

[64] Two more NRAs that express the WACC in real terms have not been included in the figure.

Figure 47 – Distribution of the nominal pre-tax WACC in Market 2/2014



Source: BEREC RA database 2015
Number of countries: 14

Key points for WACC: The short survey indicates that nearly all NRAs use the same methodology, i.e. the CAPM for determining the equity rate of return. Differences of the cost of capital thus reflect differences in national financial market conditions.

A.1 Countries participating in the 2015 survey

1.	Austria
2.	Belgium
3.	Bulgaria
4.	Croatia
5.	Cyprus
6.	Czech Republic
7.	Denmark
8.	Finland
9.	France
10.	Germany
11.	Greece
12.	Hungary
13.	Ireland
14.	Italy
15.	Latvia
16.	Lithuania
17.	Luxemburg
18.	Malta
19.	Montenegro
20.	Norway
21.	Poland
22.	Portugal
23.	Republic of Serbia
24.	Romania
25.	Slovakia
26.	Slovenia
27.	Spain
28	Sweden
29.	Switzerland
30.	The Netherlands
31.	United Kingdom

A.2 References

- COMMISSION RECOMMENDATION of 19 September 2005 on accounting separation and cost accounting systems under the regulatory framework for electronic communications (2005/698/EC).
- COMMISSION RECOMMENDATION of 7 May 2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU (2009/396/EC).
- COMMISSION RECOMMENDATION of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (2013/466/EU).
- COMMISSION RECOMMENDATION of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (2014/710/EU).
- ERG (05) 29 Common position on EC Recommendation on Cost accounting and accounting separation, published in September 2005, available on http://berec.europa.eu/documents/erg/index_en.htm.
- IRG (05) 24 Regulatory accounting in practice 2005, available on http://www.irg.eu/template20.jsp?categoryId=260350&contentId=543311.
- ERG (06) 23 Regulatory accounting in practice 2006.
- ERG (07) 22 Regulatory Accounting in Practice Report 2007.
- ERG (08) 47 Regulatory Accounting in Practice Report 2008.
- ERG (09) 41 Regulatory Accounting in Practice Report 2009.
- BoR (10) 48 Regulatory Accounting in Practice Report 2010.
- BoR (11) 34 Regulatory Accounting in Practice Report 2011.
- BoR (12) 78 Regulatory Accounting in Practice Report 2012.
- BoR (13) 110 Regulatory Accounting in Practice Report 2013.
- BoR (14) 114 Regulatory Accounting in Practice Report 2014.
- BoR (11) 65 BEREC's response to Commission public consultation on costing methodologies.
- BoR (13) 41 BEREC Opinion on the Commission draft recommendation on non-discrimination and costing methodologies.
- ERG (07) 83 ERG CP on symmetry of fixed call termination rates and on symmetry of mobile call termination rates.
- Fischer, Der neue Fischer Weltalmanach 2015, Frankfurt am Main 2014 (editorial deadline 01.07.2014), www.weltalmanach.de.
- EU Working document "Broadband Access in the EU, situation at 1 July 2014.

A.3 Glossary of terms

General terms

1. **Regulatory cost accounting:** Regulatory cost accounting is an accounting system with specific regulatory rules and conditions under which the costs, the revenues and the capital employed of services and activities have to be recorded. Regulatory cost accounting is often derived from the statutory accounting system of the regulated operator but includes specific regulatory rules and standards in addition to the rules and standards provided for by the Generally Accepted Accounting Principles. The regulatory cost accounting system must respect the principles of cost causality, objectivity, consistency and auditability. A regulatory cost accounting obligation may be imposed by the regulator on operators with significant market power.

2. **Accounting separation:** An accounting separation system is a comprehensive set of accounting policies, procedures and techniques that demonstrates compliance with non-discrimination obligations and the absence of anticompetitive cross-subsidies from a vertically integrated regulated operator. The outputs from such a system must be capable of independent verification (auditable) and fairly present the financial position and relationship (transfer charge arrangements) between the wholesale and retail activity of the vertically integrated operator. As the regulatory cost accounting system, the accounting separation system must respect the principles of cost causality, objectivity, consistency and auditability. An accounting separation obligation may be imposed by the regulator, together with a regulatory cost accounting obligation, on operators with significant market power.

3. **Forward looking cost:** The economic cost of an activity is the actual forward-looking cost of accomplishing that activity in the most efficient possible way, given technological, geographical, and other real world constraints that exist. In contrast to embedded costs, forward-looking costs are those associated with present and future uses of the firm's resources. Only these costs are relevant for making present and future production and investment decisions, for placing resources in alternative uses, and for setting prices for the services to be provided at current time or in the future.[65]

4. **Cost model / Costing methodology:** The cost model / costing methodology contains all the rules and guidelines on how to derive the relevant cost (cost base, depreciation methodology) for regulatory purposes and how to attribute those costs (allocation methods) to the regulated services.

[65] This definition comes directly from the ITU Regulatory Accounting Guide.

Terms related to the cost base and asset valuation methodologies

5. **Cost base:** The cost base is the relevant set of costs that can be attributed, directly or indirectly, to a given activity or to the production of a service. Two main approaches exist in terms of assessment of the cost base:

   5.1. **Top-down:** In a top-down (TD) approach, the accounted costs of the operator's regulatory accounts are used in order to assess the relevant regulatory cost base for a given activity or service or for a set of activities or services. A top-down approach usually implies that the actually incurred costs are taken into account, i.e. without efficiency adjustments.

   5.2. Bottom-up: In a bottom-up (BU) approach, an engineering model which satisfies the expected demand in terms of subscribers and/or traffic for a given service or for a set of services is used in order to assess the relevant regulatory cost base for such service or set of services. A bottom-up approach usually implies calculating the costs an efficient operator would incur.

6. **Capital expenditures (CAPEX):** Capital expenditures are investments in fixed, physical, non-consumable assets, such as infrastructures and equipment.

7. **Capital costs:** Capital costs are the annual costs originated by capital expenditures (CAPEX) and recorded in firm's accounts in the form of annuities. Annuities include two components: depreciation, which correspond to the depreciation of the value of the asset, and cost of capital employed, which corresponds to the cost of holding the capital i.e. the opportunity cost of the sum invested.

8. **Operating expenditures (OPEX):** Operating expenses or operating expenditures are the on-going costs for running a product, business, or system by the firm. In firm's accounts or in bottom-up models, those expenses are the sum of the expenses made over a period of time, generally a year.

9. **Gross replacement costs:** Gross replacement cost (GRC) are the price that would be paid on a given date for an asset bought in the past. It is calculated based on the recorded technical progress rate for such asset. The net replacement cost is equal to the gross replacement cost net of accumulated depreciation.

10. **HCA:** In an historical cost accounting (HCA) approach, the actually incurred costs recorded in the regulated operator's statutory accounts, most often annualized following a straight-line depreciation methodology, are used in order to assess the relevant regulatory cost base. As historical costs may include inefficient investments, incorporate tax optimisation and may especially lack data of the pre-liberalisation era, adjustments might be applied.

11. **CCA:** In a current cost accounting (CCA) approach, the operator's asset base is annualised based on the gross replacement cost of the assets. CCA belongs to the family of constant annualisation methodologies where the depreciation share is stable and the cost of capital share decreases over time, resulting in decreasing annuities. Nevertheless, unlike historical cost accounting, in current cost annualisation methods the amortization is adjusted

according to variations in the price of the assets being considered due to technical progress and general variations in price (inflation). Three main kinds of CCA exist:

11.1. **FCM:** Financial capital maintenance (FCM): CCA FCM aims to maintain the enterprise's financial capital: whatever transpires the sum of the discounted annuities must be equal to the initial investment

11.2. **OCM:** Operating capital maintenance (OCM): under CCA OCM it is the gross replacement value, in other words the current price of an asset with the same productive output, expressed in constant Euros, which is amortised.

11.3. **MEA:** Modern equivalent asset (MEA): refers to assessing costs of a network rolled-out today, i.e. reflecting modern least cost technology instead of legacy technology, as this would be the cost relevant in a competitive market.

Terms related to cost annualization methodologies

12. **Annualisation methodology:** As capital expenditures are intended to create future benefits for the firm, they are annualised in firm's accounts by means of annualisation methodologies. Annualisation methodologies spread investment costs over time based on regulatory assets lives and, for every asset, they result in a series of annualised costs (called annuities), each of which corresponds to the portion of the investment cost allocated to the year.

13. **Straight-line (linear) depreciation:** Straight line depreciation belongs to the family of constant depreciation methodologies. In these methodologies, the depreciation share is stable and the cost of capital share decreases over time which results in decreasing annuities. Constant depreciations not readjusted for price evolution are usually referred to as "linear depreciation".

14. **Annuity:** The annuity methodology calculates the charge that, after discounting, recovers the asset's purchase price and financing costs in equal annual costs. At the beginning, the payment will consist more of capital payments and less of depreciation charges, while over time it will be the opposite, resulting in an upward sloping depreciation schedule (increasing depreciation charges).

15. **Tilted annuity:** The tilted annuity methodology is an annuity methodology where the annuity value changes from year to year at the same rate as the price of the asset is expected to vary. When asset's price is expected to change over time, a tilted annuity methodology would be more appropriate than a flat annuity methodology.

16. **Economic depreciation:** The economic depreciation methodology takes into account both price changes and output changes. It becomes more appropriate when, besides asset's price changes, there is an expectation of changes in output which may affect unit costs evolution.

Terms related to cost allocation methodologies

17. **Allocation methodology:** Allocation methodologies are used to assess the cost of individual services/products in the context of a multi-product firm. The choice of a particular method depends on the objectives and the competitive environment. The implementation of

one particular allocation methodology has a significant impact on the costs of a service/product and, therefore, on the regulated wholesale prices as well.

18. **Fully distributed cost (FDC) / fully allocated cost (FAC):** Using the fully distributed cost or fully allocated cost approach, the total costs of a product or service are taken into account, i.e. the costs actually incurred by the operator. These include a share of the joint and overhead costs, arrived at by applying certain allocation bases. Thus, in contrast to the marginal cost approach, fixed costs independent of output are also taken into consideration. Usually also parts of joint and common cost are included in the calculation.

19. **Long run incremental cost (LRIC):** Long run incremental cost is the cost of producing a specific additional increment of a given service in the long run (the period over which all costs are variable) assuming at least one other increment is produced. It includes all the directly assignable variable economic costs of a specific increment of service, which is usually less than the whole service. In principle, there are an infinite number of different sized increments that could be measured. However, these increments can effectively be grouped into three different categories: 1. a small change in the volume of a particular service; 2. the addition of a whole service; or 3. the addition of a whole group of services.

20. **Long run average incremental cost (LRAIC):** Long run average incremental cost is a form of LRIC where the Increment is a whole group of services. In the context of telecommunications, LRAIC has often been used to set interconnection charges with the increments usually defined as the whole group of services using the core network. These services (PSTN, leased lines, etc.) include those provided by the operator with significant market power, as well as those of interconnecting operators. The costs of the network providing this wider group of services are then divided by all traffic to produce the average incremental cost.

21. **LRIC and its several variations:** The LR(A)IC acronym is also used in conjunction with Forward-Looking (FL) and the plus sign (+). In principle this additions lead to a more specific description of all the elements which add up to the cost model as a whole. In this sense the FL would imply the bottom-up cost base according to a current cost accounting is used and the + would imply that joint and common costs are taken into account in the cost allocation process, too. Incremental costs are generally calculated for an efficient operator.

22. **Stand alone cost (SAC):** Measures the cost of providing a service provided by the operator separately from the other services of the company. SAC includes all directly attributable costs and all shared cost categories related to production of the service, thus including direct variable costs, direct fixed costs, common and joint costs. Under this allocation method, the shared costs are totally supported by the service that is to be provided in isolation.

23. **Embedded direct cost (EDC):** Considers the directly attributable and indirectly attributable volume sensitive and fixed costs as recorded in the books and records of a firm. It therefore measures the embedded cost provided by the statutory accounts and does not question the efficiency involved.

Terms related to price control methodologies

24. **Price control methodology:** The price control methodology designates the approach that regulators adopt in order to set tariffs of regulated services. The most common approaches are cost orientation, retail minus, price-cap and benchmarking.

25. **Cost orientation:** Under cost orientation, the regulated price charged for the provision of a service reflects the underlying relevant regulatory costs, as defined by the regulator.

26. **Retail minus:** Under retail minus, the wholesale price charged for a given service is set in relation to the price of the underlying retail service rather than calculating the wholesale price on the basis of the costs incurred in producing the wholesale service.

27. **Price-cap:** Under price-cap, the regulator sets a cap on the price that the regulated operator may charge for a given service or for a basket of services. The cap may be set based on a top-down or on a bottom-up approach and may evolve according to several economic factors. The basic formula employed to set price caps is CPI – X, where the expected efficiency savings X are subtracted from the rate of inflation, measured by the Consumer Price Index. This price control methodology is intended to provide incentives for efficiency savings, as any savings above the predicted rate X can be kept by the operator and passed on to shareholders. In Europe, price-caps are generally reviewed every three years, corresponding to the length of validity of market analysis.

28. **Benchmarking:** Under benchmarking, the price of a given service is set in relation to the prices of comparable services charged in other countries.

A.4 Markets identified by Recommendation 2014/710/EU

Market 1: Wholesale call termination on individual public telephone networks provided at a fixed location.

Market 2: Wholesale voice call termination on individual mobile networks.

Market 3:

a) Wholesale local access provided at a fixed location.
b) Wholesale central access provided at a fixed location for mass-market products.

Market 4: Wholesale high-quality access provided at a fixed location.