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European Benchmark of the pricing of bundles – methodology guidelines

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Contents

Executive Summary

In the context of convergence and an increasing number of fixed-mobile mergers, markets are evolving towards convergent telecommunications products including fixed services (fixed broadband, fixed voice and TV) as well as mobile services (mobile broadband, voice and SMS). Following this trend, in more and more countries, the most competitive prices are set for triple and quadruple bundles, with fixed voice usually included in fixed broadband services and a growing rate of mobile services included in bundles with fixed services.

Therefore, stand-alone benchmarking can no longer reflect the full reality of the offers that customers face today, and the price for stand-alone services is no longer a good proxy on how prices are evolving in a number of countries.

The European Commission (EC) in its Broadband Internet Access Costs (BIAC) study[1] covers double and triple play fixed bundles, based on a methodology that reflects the ERG opinion from 2008[2]. However, the current methodology does not address bundles with mobile services and the fixed bundle types compared are no longer representative in most European countries.

For mobile broadband price service, the EC conducts a separate study[3], comparing standalone mobile services only.

In this document, BEREC, in cooperation with the EC, is providing guidelines on the methodology in order to address fixed and mobile services bundled. The new guidelines include amendments to current methodologies and a new approach to compare retail bundle prices, including convergent bundles and prices for typical household consumption.

As in the current BIAC studies, in these guidelines a 'basket approach' is applied to compare bundled offers. BEREC received information from NRAs about on usage (not only on which bundles people take but also regarding the average usage per service), so that converged baskets can be defined properly.

The methodology guidelines include a proposal for a household (HH) approach in order not only to address bundles with mobile services but also a range of consumption of the different services. A set of 17 representative households[4] plus stand-alone broadband service categories are identified with different usage patterns: low, medium, high and very high. Given the pace of developments in the electronic communications sector, and the Digital Agenda objectives, BEREC does not define specific values or ranges for the consumption pattern at this point. BEREC will update the statistical information in due course, in order to ensure that the most recent data is used to determine the consumption patterns as per the new methodology, which should be operative in 2019.

The document also comprises proposed changes to certain other aspects of the current methodology, concerning the standard contract duration, the discount rate to be applied to non-

[1] https://ec.europa.eu/digital-single-market/en/news/fixed-broadband-prices-europe-2016
[2] ERG (08) 44 Final BB Retail Prices Methodology 081017.
[3] https://ec.europa.eu/digital-single-market/en/news/mobile-broadband-prices-europe-2017
[4] Representative HH refers to typical European households as far as electronic communication services are concerned.

recurring charges, the exclusion of selective discounts for mobile voice and SMS from the collection and the determination of a representative country result.

1. Introduction

The market for telecommunications services is characterized by increasing convergence. In a number of countries, the end-user has been purchasing multiple telecommunications services in so-called multi-play offers or "packs". Multi-play products with mobile components have become very popular. Quadruple play offers, which comprise fixed broadband (FBB), television, fixed telephony and mobile services, or, in general, offers with a mobile component included, currently represent more than 1/3 of total broadband subscriptions.

The current EC methodologies for the comparison of broadband prices date to the beginning of 2015[5]. Since then, the fixed broadband BIAC study baskets remained unchanged whilst in the mobile broadband study baskets have increased reflecting the updates of the OECD methodologies on wireless Broadband Price Baskets[6].

However, European markets have evolved substantially. According to the European Digital Scoreboard data, the uptake of fast broadband (≥30 Mbit/s) has more than doubled (from 15.9% of households in 2015 to 33.5% in 2017), the uptake of ultrafast broadband (≥100 Mbit/s) has tripled (from 4.65% to 15.4% in the same period) and since 2015 the penetration of mobile broadband has grown from 66.7% to 90.2% of individuals.

Whilst the bundling of fixed services continues to be a common feature of most national markets, there have been important changes in the kinds of bundles sold across Europe. In some countries, convergent bundles, combining fixed and mobile services have grown substantially in number, and in 2017, 34.9% of the fixed broadband lines are sold bundled with mobile services (indicator retrieved from the information submitted by 21 NRAs).

For all these reasons, BEREC has considered the need to review the set of existing baskets used in the existing EC price methodologies so that they better reflect the current European situation and the diversity of European markets.

The report is structured as follows: Section 2 gives an overview on the current benchmark studies published by the European Commission and the methodological aspects eligible for revision. Section 3 sets out a number of guidelines for a benchmarking methodology based on household consumption. Section 4 presents the European subscription and consumption data based on a BEREC survey, in order to allow the consideration of consumption patterns for representative households. In Section 5, changes to other aspects of the current methodology are discussed. Section 6 concludes. The Annexes contains further information on the basket and usage

[5] https://ec.europa.eu/digital-single-market/en/news/fixed-broadband-prices-country-february-2015 and https://ec.europa.eu/digital-single-market/en/news/mobile-broadband-prices-europe-2017

[6] OECD (2009) “Methodology for Constructing Wireless Broadband Price Baskets”, OECD Digital Economy Papers, No. 205, OECD Publishing. http://dx.doi.org/10.1787/5k92wd5kw0nw-en and its (2012) update.

parameters of current methodologies and what could remain unchanged and statistical data on the usage by country (confidential).

2. Current BIAC Studies

On an annual basis, the European Commission publishes two pricing benchmarks, one dedicated to Fixed Broadband (Broadband Internet Access Costs or BIAC)[1] and the other to Mobile Broadband[3]. The scope of these reports is to collect, analyse, and compare residential offers to see what consumers are paying in actual terms throughout the duration of a contract (the costs to consumers may include extra charges (such as equipment or others) if necessary). The comparison is made across the EU28 countries as well as a selection of other countries (Canada, Iceland, Japan, South Korea, Liechtenstein, Norway, the former Yugoslav Republic of Macedonia, Turkey, Switzerland and three states of the USA).

2.1. Fixed Broadband BIAC

For the Fixed Broadband BIAC, the aim is to compare the various standalone and bundled fixed broadband offers, and determine the least expensive offer for the various service offerings and speed basket composition as shown in the tables below.

Table 1 - Fixed BB BIAC - service types

Service	Description
Standalone broadband	Fixed broadband only service offers
Double Play with Tel	Offers composed of fixed broadband and fixed telephony
Double Play with TV	Offers composed of fixed broadband and pay TV
Triple Play +	Offers composed of three and more electronic communication services but fixed broadband is one of those services.

Table 2 - Fixed BB BIAC - Speed categories

Speed categories
144+kbps – 1Mbps
1+Mbps – 2Mbps
2+Mbps – 4Mbps
4+Mbps – 8Mbps
8+Mbps – 12Mbps
12+Mbps – 30Mbps
30+Mbps – 100Mbps
100+Mbps

The Commission's methodology follows the OECD 2012 approach, which is based on the analysis of varying speed baskets that represent a set of predefined consumption patterns (specifically, the OECD consumption patterns). More details on the BIAC baskets composition can be found in Annex I[7].

Given the defined baskets (Annex I), the Commission captures the retail offers marketed by the largest operators that collectively hold at least 90% market share of the fixed broadband market per country. The offers captured for the analysis need to reflect the standalone and bundled services and each of these offers per operator is evaluated per basket. The average monthly cost is calculated for each service and the speed range combination following the formula presented in Equation 1. Only the least expensive tariff plan that meets the requirements in a given country is reported.

Equation 1: Fixed BB BIAC - Average monthly cost equation

$$Total\ average\ monthly\ cost = \begin{pmatrix} Monthly\ Recurring\ charges \\ +Overage\ charges + \\ Recurring\ extra\ charges \end{pmatrix} + \frac{(One\ off\ charges - Discounts)}{Standard\ Contract\ Duration\ (months)}$$

2.2. Mobile Broadband BIAC

Similar to the Fixed Broadband study, the Mobile Broadband Price study extends the same approach to mobile broadband offers consumed using a handset and tablet / dongle. This study also applies OECD usage baskets and focuses on six consumption patterns that combine various data (for laptops, tablets and handsets) and voice/SMS volumes.

Table 3 - Mobile BB BIAC / OECD baskets

Baskets	Laptop (Data Volumes)	Tablet (Data Volumes)	Handset (Data Volumes + Voice/SMS basket)
1	500 MB	250 MB	100 MB + 30 calls basket
2	1 GB	500 MB	500 MB + 100 calls basket
3	2 GB	1 GB	1 GB + 300 calls basket
4	5 GB	2 GB	2 GB + 900 calls basket
5	10 GB	5 GB	2 GB + 100 calls basket
6	20 GB	10 GB	5 GB + 100 calls basket

Source: Mobile Broadband Prices in Europe 2017, Empirica and TÜV Rheinland for the European Commission.

[7] By end of 2017, OECD published a report in which the telecommunication price baskets ("Revised OECD Telecommunication Price Baskets") were reviewed based on actual consumption. The scope of these changes is to reflect the ongoing developments of the consumption patterns and hence the baskets reflect more realistically the demand that exist today.

In the case of the handset baskets, further parameters are required to determine the true cost of each offer, such as the number of calls, their average duration (and total minutes, whether they are on-net or off-net, etc. The Commission's study uses the same parameters adopted by the OECD (see Annex I).

The evaluation of the least expensive offer per basket closely follows the approach used in the Fixed Broadband study. However, there are several differences: first, only offers provided by those operators whose market shares sum up to more than 70% are taken into account; second, costs related to equipment (such as mobile handsets or dongles used with laptops) are also included. The handset type varies according to the basket: Baskets 1 to 3 include a basic smartphone while for baskets 4 to 6 an advanced smartphone is used. Note that if prices without handsets are available, these are taken into account.

2.3. Methodological aspects eligible for revision

Considering the OECD baskets in reference to the European markets, BEREC has identified a number of aspects that we consider important to be revised because of their effect on the BIAC reports' outcome, especially in relation to the European markets:

(i) Additional baskets should be added which include fixed-mobile bundles in order to reflect the increased demand for such products in many European countries. BEREC suggests a household approach to fixed-mobile bundles in section 3 of this document.

(ii) The basket values (download speeds, data volumes, minutes, SMS, etc.) should be adapted in order to better reflect demand in European markets. Section 4 shows averages of bundle subscription and consumption data for several European countries.

(iii) In section 5, BEREC suggests four other changes to the methodology related to the standard contract duration, the discount rate to be applied to non-recurring charges, the exclusion of selective discounts for mobile voice and SMS from the collection and the determination of a representative country result.

3. The household approach

As set out above, the current studies could use a number of aspects that are constantly evolving in European markets. In 2017, 34.9% of the European fixed broadband lines were sold bundled with mobile service (results of the underlying BEREC questionnaire). Moreover, in some countries, the bundling of fixed and mobile services, typically "hand-held" mobile broadband and voice, is an important feature of those markets. For example, in Spain, Portugal and Belgium, more than 40% of the fixed broadband lines are bundled in such way. In view of the above, the current basket methodology used for benchmarking does not properly reflect the prices faced by many European consumers.

In consideration of the limitations faced by the existing methodologies, this document puts forward a number of guidelines to a benchmarking methodology that measures the cost borne by typical

European households as far as electronic communication services are concerned. A new methodology based on household consumption would provide a more realistic snapshot of prices across the EU, as it would allow a more accurate comparison of offers in countries where mobile and fixed broadband services are bundled and countries where they are not.

As to the current fixed broadband BIAC methodology, fixed-mobile bundled offers of some countries are being compared to "fixed only" bundled offers. Alternatively, a methodology based on household consumption that combines (if necessary) several services in order to determine a single (total) cost, will improve the current situation by allowing a "like-for-like" comparison[8] and, in some cases, provide a more comprehensive picture by incorporating more countries in the benchmarking.

Moreover, such a methodology should also provide some continuity to the existing indicators, as not all representative households consume mobile broadband services. In such cases, the notion of a representative household may not depart from the basket definition incorporated in the fixed broadband BIAC reports. Indeed, the profiles for some representative households in section 4.3 are similar to the current baskets used by the EC.

BEREC suggests to continue monitoring standalone fixed broadband services and standalone mobile broadband services[9] for several reasons. For fixed broadband, a first reason for keeping the analysis of standalone services is that in many countries those are still mainly purchased (and sold). A second reason is that the price of standalone fixed broadband services constitutes an entry-level cost for European consumers (i.e. the minimum expense any user needs to bear for fixed broadband access). For mobile broadband (either dongle/tablet or handheld MBB with mobile voice), the main reason to continue this practice is that across Europe there are still many consumers who purchase these services unbundled from fixed services.

Finally, the comparison of household costs will also be informative and in the general interest, as it would allow to recognise the cost borne by European households in consuming electronic communication services.

3.1. Some general methodological considerations

Some elements of the methodology proposed in this report will imply a change of the EC approach to comparing broadband prices. Yet, as mentioned, the methodology does not represent a total break from the current BIAC methodologies, because it will still consider stand-alone broadband services and some bundles of fixed services including fixed broadband.

Moreover, many of the options and choices of the existing BIAC studies suit the new methodology well. For example, the criteria used in the BIAC reports to determine which specific broadband and mobile services should be considered, along with the procedures used to normalise prices, sufficiently guarantee that the new cross-country comparison will be valid. Also, BEREC

[8] The comparison will be similar across all countries where the similar products will be considered to evaluate the least expensive household consumption basket.
[9] Standalone mobile offers include dongles/tablets/modem offers and offers of mobile broadband and mobile voice to be consumed with phones.

considers that the geographical scope and criteria for selecting the providers used in the current methodology should not be altered. A full description of the current BIAC technical details that will remain unchanged in the new methodology can be found in Annex 2.

Another matter that BEREC has taken into account while developing this proposal, is the sizeable costs of collecting tariff data for such a wide set of countries and providers. BEREC thinks that the methodology proposed in these Guidelines can be implemented using the same information already collected and used by the EC, plus 4 play bundle offers, meaning that data for standalone fixed voice or stand-alone pay TV services do not need to be collected.

3.2. Services to consider in the Household approach and standalone services

The following points summarise BEREC's considerations with respect to representative households as well as standalone fixed broadband services and standalone mobile broadband services.

a) **All representative households should include fixed voice and fixed broadband** consumption. This is because most European households that use fixed broadband do also subscribe to a fixed voice service. According to BEREC data, in 2017, 75% of fixed broadband lines in Europe were sold bundled with fixed voice.

b) The main characteristic that differentiates fixed broadband offers is the download speed. For representative households, fixed broadband **speed categories should be reduced from 8 to 4 (low, medium, high, very high)** in order to ensure that each speed category is populated with sufficient observations to make the result representative. The reduction to a limited number of speed categories will also contribute to the readability of the report. For continuity with existing BIAC statistics, for standalone fixed broadband services a "very low" category shall also be included if there are sufficient countries with such pattern[10].

c) **One single fixed voice consumer pattern should be used across all representative households**. This is mainly for the sake of simplicity but also because in many countries, when fixed broadband is bundled with fixed voice, the offer includes unlimited national voice minutes.

d) **Voice traffic for roaming and with an international destination is not being considered for the moment.** Currently, most offers do not include international traffic in their flat rate plans and the consumption of international voice per user is low compared to domestic services. Most NRAs have not collected tariff data of international voice. However, NRAs will have to monitor the intra-EU calls and SMS markets as of 15 May 2019 pursuant to the amended TSM Regulation.

[10] BEREC considers that categories for which the number of countries is below 8 should not be considered by the EC.

e) Some representative **households should include mobile broadband**. In these cases, handheld services, which are the most common in Europe, should be considered and coupled with domestic mobile voice traffic. The representative households with mobile broadband should have one or two active SIM cards.

f) **The main characteristic that differentiates mobile broadband offers is the data cap or mobile data volume allowance**. Given the large number of mobile baskets used in the current methodology, for representative households, BEREC proposes to take a more prudent approach and only take into account **three categories: low, medium, high**. For continuity with the current BIAC studies, stand-alone mobile broadband services should have more categories: very low, low, medium, high, very high, as long as there are sufficient observations in each category[10].

g) Regarding mobile broadband, although some operators may advertise differences in speeds due to the use of one access technology or another, **BEREC considers this should not be the focus of the benchmark**. As in current benchmark study, mobile service products need to be at least 3G (3G, 4G, LTE and LTE Advanced).

h) **SMS should not be considered in the comparison**. Their exclusion is based on its diminishing relevance in most European countries, the fact that they are not a significant driver of operators' mobile offers and finally, that in many countries they are being substituted by online messaging.

i) For representative households, BEREC considers that **there is a positive relationship between the usage of mobile broadband and mobile voice**. Indeed, in general offers with high MBB allowances are coupled with larger allowances with voice, to the benefit of more intensive users.

j) The representative **HH should be considered with and without pay TV**. In reference to TV services, BEREC does not consider (as in the BIAC methodology) it necessary to distinguish between different kinds of television services across baskets. There are wide variations in the type, amount and quality of TV services included in European services and the fast changing offers make it difficult to develop reliable categories.

k) Given these difficulties and the fact that content is not an electronic communication service, BEREC considers that it is best only **to take into consideration whether an offer includes multi-channel TV services (more than 5 channels) or not**. This, coupled with the criteria to use the lowest price in selecting the best country offers, implies that the offers included in the final comparisons will mostly be entry-level, this is offers with basic television services and where the main drivers of pricing will be electronic communication services.

3.3. Representative households and stand-alone broadband baskets

The following tables include a description of the representative households and stand-alone broadband service categories. Out of the list of 17 representative HH (table 4), eight types include

fixed services and nine include both fixed and mobile services; the households that BEREC proposes also capture three intensities of use: low, medium, high and very high usage.

Section 4 provides some relevant statistics and considerations that should be taken into account when deciding on consumption patterns for the representative households and stand-alone broadband services.

Given the pace of developments in the electronic communications sector, and the Digital Agenda objectives, BEREC does not define specific values or ranges for the consumption pattern at this point. BEREC will update the statistical information in due course, in order to ensure that the most recent data is used to determine the consumption patterns using the new methodology, which will be operative in 2019.

Table 4 - Representative households[11]

Representative households		FBB range	FV	Number of SIM cards	Mobile BB range	Mobile Voice range	TV
FBB+FV	HH1	L	yes	0			no
	HH2	M	yes	0			no
	HH3	H	yes	0			no
	HH4	VH	yes	0			no
FBB+FV+TV	HH5	L	yes	0			yes
	HH6	M	yes	0			yes
	HH7	H	yes	0			yes
	HH8	VH	yes	0			yes
Low and Medium FBB+FV+MV+ MBB (+TV)	HH9	L	yes	1	L	L	no
	HH10	M	yes	1	L	L	no
	HH11	M	yes	2	M	M	no
	HH12	M	yes	1	M	M	yes
High and very high FBB+FV+MV+ MBB(+TV)	HH13	H	yes	1	M	M	no
	HH14	H	yes	1	H	H	no
	HH15	H	yes	1	H	H	yes
	HH16	H	yes	2	H	H	yes
	HH17	VH	yes	1	H	H	yes

FBB – Fixed broadband; FV – Fixed voice; TV – Pay-TV; MBB – Mobile Broadband
L – Low; M – Medium; H – High; VH – Very High

As mentioned in section 3.2, for those households with mobile broadband, handheld services should be considered and coupled with some domestic mobile voice traffic. The fixed voice pattern should be the same in all representative households.

[11] For the number of SIM cards, the maximum value considered is 2 because the EU average of number living in a household is around 2.4. By considering 2 SIM cards, BEREC is also taking into account large households in its comparison.

Both for standalone FBB offerings as MBB, a lower usage level should be considered. Thus, for FBB standalone offers 5 different baskets should be considered as well as for MBB broadband consumed using a tablet/modem/data card. For handheld Mobile baskets, BEREC proposes to benchmark seven baskets, including mobile voice and broadband, with different usage patterns.

Table 5 - Fixed broadband and mobile stand-alone baskets

FBB and MBB stand-alone services						
FBB		Tablet/modem/datacard		Individual handheld Mobile baskets		
				Name	MBB	MV
Name	Speed	Name	Datacap	I1	VL	L
FBB1	VL	MBB1	VL	I2	L	L
FBB2	L	MBB2	L	I3	M	M
FBB3	M	MBB3	M	I4	H	H
FBB4	H	MBB4	H	I5	VH	H
FBB5	VH	MBB5	VH	I6	H	L
				I7	VH	M

FBB – Fixed broadband; MV – Fixed voice; MBB – Mobile Broadband; I – Individual handheld mobile basket
VL- Very low; L – Low; M – Medium; H – High; VH – Very High

3.4. The benchmarking of costs of representative households

Whereas the previous BIAC studies compare the cost of a certain usage basket over a set of countries' offers, the household approach defines the services demanded of a given representative household and then identifies those offers that can be combined to satisfy these needs. From all the possible options, BEREC suggests to capture the option that is least expensive.

Therefore, it makes sense to consider bundled offers that cater for all of the representative household's specified needs in the comparison. However, bundles that address all the representative HH requirements do not necessarily exist in all European countries and in practice, households may (need to) satisfy their needs by contracting separate offers (bundled or unbundled). Therefore, BEREC suggests to consider combinations of different offers as well: for example, by adding the relevant mobile component price (available from the mobile broadband data) to the relevant fixed broadband bundled price one may fulfil the requirements of a representative households that consumes fixed and mobile broadband (HH9 to HH17).

When a mobile offer is required to complete the household needs, the selection criteria for satisfying should be to minimize its cost, subject to the given usage profile. This methodology allows for combining offers from different operators which fulfil the relevant needs of a household in each country, potentially satisfy their demands by purchasing services from two different operators.

Indeed, customers show flexibility regarding the combination of packages provided by different operators to satisfy their demand. This behaviour has been observed in European markets, with a prime example being a customer that purchases its fixed services from operator A and complements these with mobile telephony (and/or broadband) provided by operator B. This combination could possibly be cheaper than a bundled package covering all services provided by a single operator. Hence, further refinement is required to capture these offers and compare them with bundles to identify the least expensive offer in the market.

Finally, for combinations of offers, the total cost borne by the representative household results from the sum of several prices. Table 6 specifies the kinds of offers and combinations of offers that should be considered for each representative household.

Table 6 - Offers that may cover representative household needs and that shall be considered in the methodology

Services in HH	Representative household	Offers to be compared
FBB+FV	HH1	Comparison of 2- play bundles: FBB+FV
	HH2	
	HH3	
	HH4	
FBB+FV+ TV	HH5	Comparison of 3-play bundles: FBB+FV+TV
	HH6	
	HH7	
	HH8	
Low and Medium FBB/FV+ MBB/MV	HH9	Comparison of: 3-play bundles (FBB+FV+MBB+MV, 1 SIM card) and 2-play (FBB+FV) coupled with a MBB+MV offer
	HH10	
	HH11	Comparison of: 3-play bundles (FBB+FV+MBB+MV, 2 SIM card) and 2-play (FBB+FV) coupled with 2 MBB+MV offer
	HH12	Comparison of: 4-play bundles (FBB+FV+TV+MBB+MV, 1 SIM card) and 3-play bundles (FBB+FV+TV) coupled with a MBB+MV offer
High and very high FBB/FV + MBB/MV	HH13	Comparison of: 3-play bundles (FBB+FV+MBB+MV, 1 SIM card) and 2-play bundles (FBB+FV) coupled with a MBB+MV offer
	HH14	
	HH15	Comparison of: 4-play bundles (FBB+FV+TV+MBB+MV, 1 SIM cards) and 3-play bundles (FBB+FV+TV) coupled with a MBB+MV offers
	HH16	Comparison of: 4-play bundles (FBB+FV+TV+MBB+MV, 2 SIM card) and 3-play bundles (FBB+FV+TV) coupled with 2 MBB+MV offer
	HH17	Comparison of: 4-play bundles (FBB+FV+TV+MBB+MV, 1 SIM cards) and 3-play bundles (FBB+FV+TV) coupled with a MBB+MV offers

According to the results of the questionnaire, a handful of countries may not have suitable combinations of fixed bundles and mobile services to cater for the needs of some of the representative HH. These are the countries where fixed broadband is not bundled with fixed voice. Using the household approach to determine total costs for these countries would require additional information on fixed voice services. For his reason, BEREC proposes to exclude these countries from the household analysis, without prejudice to their inclusion in the stand alone broadband analyses.

4. European subscription and consumption data

In order to allow the consideration of consumption patterns for representative households and standalone fixed and mobile broadband baskets, BEREC has considered the following information sources:

- BEREC questionnaire on consumption and take-up information with responses of 24 NRAs for 2017 (25 for 2016). It includes information on:
    - fixed broadband speeds and fixed broadband number of lines;
    - mobile broadband capacity and number of lines (differentiating between handset and dongles);
    - mobile and fixed telephony usage (minutes, number of calls and call duration);
    - SMS usage; and,
    - the number and type of bundles[12].
- The European digital scoreboard statistics on fixed broadband speeds.

These sources provide consumption and sales information that is important for the definition of consumption patterns and categories. For the definition of fixed broadband categories, BEREC identified the most common speed tiers for fixed broadband and the most common bundles in European countries. For mobile broadband, as the main differentiating feature of European offers is “included data volumes”, BEREC has collected information on the GB allowance per month and subscriber/line, distinguishing between mobile broadband for handsets and mobile broadband to be used with laptops, modems and tablets. For voice pattern, the proposed usage profiles are based on the average consumption of a European user (average of national figures).

Whilst the collected data does not entail full European coverage, it provides good evidence, as the number of countries for which data could be collected is large[13] and because these countries are quite varied, as proven by the ranges of some indicators.

This evidence can be used to draw some conclusions on the consumption levels incorporated in the existing BIAC studies and the levels that should characterize the new methodology guidelines. However, since the EC price studies shall be updated in 2019 BEREC suggests to use more recent data on consumption and subscriptions to define and specify the volumes that characterise each representative household and stand-alone basket.

[12] See Annex 3 for reference.
[13] For example, the NRA’s providing complete information of the bundling of fixed broadband represent approximately 60% of the lines in Europe.

Bundling

The bundling of fixed broadband with other services is widely spread in Europe. Averaging the indicators provided by 21 NRA's, we conclude that, in 2017 the average percentage of fixed broadband lines which were sold bundled with other services was 74.1%, those bundled with fixed voice services accounted for 57.5% of the total, and 21.8% were bundled with mobile services (Table 7).

Table 7 - Bundling of FBB with other services, averages of national indicators

Percentage of fixed broadband lines that are:	Average	Median	Min	Max
Sold bundled	74.1%	80.5%	41.0%	98.0%
Sold bundled with fixed voice	57.5%	65.6%	4.7%	98.5%
Sold bundled with mobile services	21.8%	14.3%	0%	80.7%

Source: BEREC questionnaire, 22 countries, 2017

However, national markets vary in size, and if considering the ratio of bundles including fixed voice or mobile elements over the total number of fixed broadband lines in Europe (proxied by the information provided to BEREC by 21 NRAs), almost 35% of fixed broadband lines are bundled with a mobile element and 3 of every 4 are bundled with fixed voice (Table 8).

Table 8 – Bundling of fixed broadband lines (European ratio)

:	Bundled	Bundled with fixed voice	Bundled with mobile
2017	83.5 %	75%	34.9%
2016	81.8%	73.7%	31.4%

Source: BEREC questionnaire, 21 countries in 2016, 21 countries, 2017

With respect to the types of bundles, the most common bundle in European countries is the 3-play bundle with fixed broadband, fixed voice and TV. For 13 countries, this is a relevant bundle since the share of these bundles over all fixed broadband bundles within that country is higher than 15%. Applying this rule, the 4-play option (which includes mobile services) and the 2-play option, fixed broadband and television, are also common[14] (Table 9).

[14] The current BIAC study considers baskets for standalone fixed broadband and bundles of FBB+FV, FBB+FV+TV and FBB+TV, which are the most common bundles of fixed components.

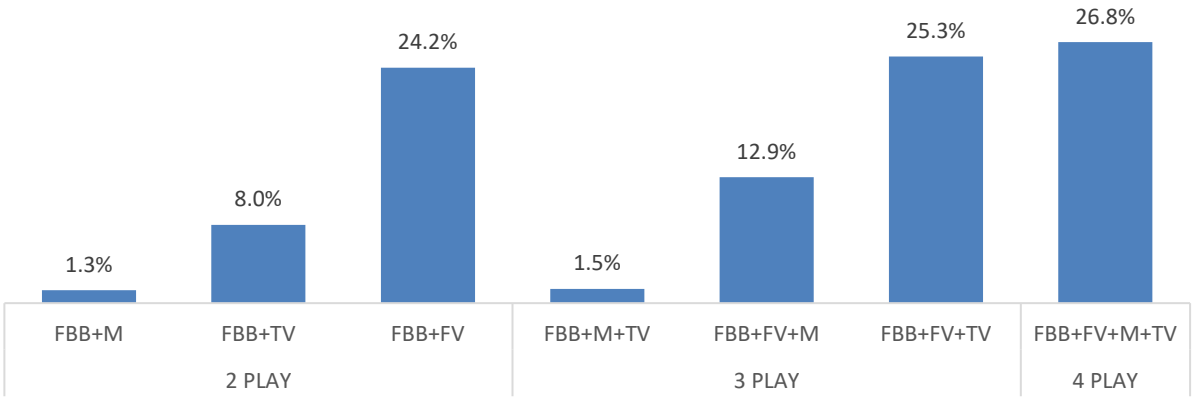
Table 9 - Type of bundles with FBB service (2017)

	2 PLAY BUNDLE			3 PLAY BUNDLE			4 PLAY BUNDLE
	FBB+TV	FBB+FV	FBB+M	FBB+FV +TV	FBB+M+ TV	FBB+FV +M	FBB+FV+ M+TV
Percentage of bundles over total bundles with fixed broadband in Europe	8.0%	24.2%	1.3%	25.3%	1.5%	12.9%	26.8%
Number of European countries for which the ratio of bundles in each category over total bundles exceeds 15%	9	7	1	13	0	5	10

Source: BEREC questionnaire, 20 countries, 2017

If one takes into consideration the ratio of bundles of each type over the total number of bundles with FBB in Europe (proxied by the information provided to BEREC by 20 NRAs), one can see that almost 30% of the bundles are 4-play offers, whilst one quarter are bundles of the three fixed services (FBB+FV+TV).

Figure 1 - Percentage of bundles over total bundles with fixed broadband in Europe



Source: BEREC questionnaire, 20 countries, 2017

Fixed broadband subscription data by speed

As mentioned, BEREC has identified the most common speed tiers for fixed broadband. According to the Digital Agenda data (Table 10), there are 29 European countries for which at least 15% of their broadband lines are in the category “Less than 30 Mbit/s”. For “>100 Mbit/s” the number is 21. The results of BEREC’s questionnaire show that the speed range “<10 Mbit/s” is still relevant in (at least) 8 out of 18 countries (Table 11), but it is the one with the lowest numbers.

Table 10 - Number of countries for which the share of broadband lines in the speed tier is above 15%.

Less than 30 Mbps	30 Mbps to 100 Mbps	>100 Mbps
29	20	21

Source: EC Digital Scoreboard (July 2017), (29 countries)

Table 11 - Number of countries for which the share of broadband lines in the speed tier is above 15%.

<10 Mbps	10 Mbps to 30 Mbps	30 Mbps to 100 Mbps	>100 Mbps
8	14	12	12

Source: BEREC Questionnaire, (2017), (18 countries)

Moreover, the Digital Agenda objectives for coverage and take-up are as follows: by 2020, all citizens should have access to next generation networks providing speeds above 30 Mbps and half of the European households should use access with a speed above 100 Mbps.

Given the lower uptake of low speed baskets and the fact that European countries are working towards the Digital Agenda objectives, BEREC's would propose to aggregate some of the baskets with low broadband speeds of the current BIAC study into a single category. Another possibility would be to ignore those baskets should future data tell us that these speeds are not relevant anymore. On the other hand, BEREC would suggest splitting the current BIAC category of 30 Mbps to 100 Mbps into two separate categories, so that the offers compared in each basket are more similar.

Moreover, BEREC has considered that while most fixed broadband tariffs are unlimited, there are still some (mainly entry-level) tariffs with a data cap. BEREC therefore suggests to keeping a data cap for the lower speed tiers in order not to exclude these tariffs (which would be the case if unlimited data volume was required).

Mobile broadband

In the case of mobile broadband, the average consumption of data volume per month and subscriber has to be distinguished by handset and card/modem/tablet users. While the average consumption on handsets is 2.2 GB/month, the average consumption on cards/modems/tablets is 13.6 GB/month (see Table 12).

Table 12 - Mobile broadband consumption (GB per month and subscriber, 2017)

	Handset	Card/tablet
Number of countries	*12*	*13*
Average	2.2	13.6
Median	1.8	11.4
Min	1.1	1.1
Max	4.1	51.5

Source: BEREC questionnaire, 2017

In light of these consumption differences, and also because handset offers are typically bundled with mobile voice (and/or SMS), BEREC concludes than it is necessary to differentiate the two kinds of offers: handset and cards/modems/tablets.

With regard to the distinction between tablets and laptops (as currently used in the mobile broadband price study), BEREC observes that the commercial offers of operators do not distinguish between mobile broadband for tablets and laptops. Because of this, BEREC suggests not to distinguish baskets on this characteristic.

In addition, mobile broadband consumption increases substantially from year to year. In the EU, its penetration has grown from 83.8% in July 2016 to 90.2% one year later (Digital Scoreboard). According to BEREC's questionnaire, the consumption per user and month has grown by 66%, from 2.4 GB/month in 2016 to 3.9 in 2017.

In view of the collected data, BEREC suggests to update the current baskets used in the mobile broadband comparisons by removing some of the baskets with very small capacity limits and to incorporate some baskets with capacities on the very high end.

Voice consumption patterns

The average number of fixed national voice minutes is 107 per user/month. However, BEREC would suggest to use a smaller volume of minutes in the updated baskets. The reason for this is that in some countries fixed voice usage is much lower than the average and prices per minute are high. In these cases a high number of minutes would lead to high bundle prices which, however, would not be relevant since such a large amount of minutes is not used in practice.

Table 13 - Fixed voice consumption (averages of national indicators)

	Minutes per month and subscriber	Calls per month and subscriber
Total Fixed Voice Traffic with a National Destination	107	27
Of which, with fixed destination	84	18
Of which, with mobile destination	23	9

Source: BEREC questionnaire, 20 countries, 2017

For mobile voice the current mobile broadband price comparison is based on the 2012 OECD baskets which incorporate 4 voice and SMS profiles to characterise the profiles of different users. Table 13 summarises the average traffic patterns of mobile voice in European countries. The average number of mobile national voice minutes is 157 per user/month, of which 86 on-net and

58 to other mobile networks (off-net). European averages seem low compared to some of the traffic patterns included in the OECD baskets[15].

Table 14 - Mobile voice consumption (averages of national indicators)

	Minutes per month and subscriber	Calls per month and subscriber
Total Mobile Voice Traffic with a national Destination	157	73
Of which, with mobile destination on-net	86	42
Of which, with mobile destination off-net	58	27
Of which, with fixed destination	12	5

Source: BEREC questionnaire, 20 countries, 2017

Regarding SMS, the OECD baskets incorporate six different patterns, ranging from 0 to 350 SMS per user and month. The use of SMS has been declining in the last years, mainly due to the use of Over-the-Top (OTT) messenger services, and the average number of SMS currently stands at 55 (Table 15). SMS usage is likely to decline further and in some countries SMS may no longer be part of the respective bundles.

Table 15 - SMS consumption (averages of national indicators)

	Number per month and subscriber
Total SMS	55
Of which, on-net	35
Of which, off-net	20

Source: BEREC questionnaire, 23 countries, 2017

5. Changes to other aspects of the current methodology

Following the completion of the tariff data collection, the dataset is adjusted or normalised before results are calculated, in accordance with the rules set forth in Annex II. This allows for a calculation of a standard monthly price for each tariff plan, taking into account both non-recurring and recurring / monthly charges, usage charges, contract duration, pre-paid model, billing unit duration, minimum call duration, discounts and other commercial characteristics of the offer.

In addition to the suggestions listed in previous sections, which are mainly related to the household concept and consumption patterns, BEREC also proposes changes to four other aspects of the current methodologies. These concern (1) the standard contract duration, (2) the

[15] See Annex I for reference.

discount rate to be applied to non-recurring charges, (3) selective discounts for mobile voice/SMS and (4) the way to determine a representative country result.

Standard Contract Duration

BEREC proposes to apply a standard contract duration (SCD) of 24 months instead of the 36 months used in the current pricing studies. In most countries, the actual contract duration is 24 months and if we considered a longer contract period than 24 months, the costs incurred by the customer to extend the use of a service for another 12 months would need to be taken into account in order to make such offers comparable with the less common tariff plans that feature a contract duration of 36 months.

This would result in higher costs, while this would not reflect widespread commercial business practices in many countries. A rational consumer would go for the cheapest contract, even if it has a longer duration. Moreover, operators consider the 24 months period as appropriate for recovering costs, including equipment depreciation. Prices charged by operators are already defined in order to recover the cost of investment in SCD (i.e. 24 months).

Discount rate to be applied to non-recurring charges

Using the SCD and the discount rate, non-recurring charges are converted to a "spread charge", i.e., a constant monthly amount over the SCD, in such a way that the net present value of the spread charge equals the total of non-recurring charges incurred at the beginning of the contract.

Given the current economic climate, and following previous practice, a discount rate of zero should be applied[16]. This is also in line with the OECD distribution rule, which is implicitly zero percent discounting - distributing fixed costs proportionately over 36 months.

Selective discounts for mobile voice and SMS

The current Mobile BB pricing study takes into account the impact of selective discount plans on consumer costs. Selective discounts allow users to specify a certain number of recipients to which calls and/or messages will be free or discounted.

However, these tariffs are losing importance in most countries due to the elimination of on-net / off-net tariffs and thus, BEREC proposes to disregard selective discounts.

Determination of a representative country result

[16] However, the discount rate can be updated if there are changes in the economy.

As to the methodology currently applied by the Commission for the fixed and mobile pricing benchmarks, the result is only based on the **cheapest tariff plan that meets the usage requirements**. A benefit of sticking to this approach is that results could be easily compared with results of previous years. Consistent price evolution time series could be developed since the way the country result is determined would not be altered. However, it can be questioned whether the selected offers may not be representative and, therefore, jeopardize the validity of the country result. It is e.g. possible that the selected product is not available on a nationwide basis and/or only purchased by a relatively small group of customers. Yet, BEREC believes that by considering only large operators in the study, which have the highest nationwide market shares, representatives and consistency is anyway sufficiently addressed.

However, in order to provide an adequate picture of the general pricing level in a certain country other options can be considered:

Option 1 - arithmetic average of the cheapest offer of each selected operator

A way to better reflect the general pricing level and make the benchmark more robust is to base the result of each of the household service components and standalone baskets on the arithmetic average of the cheapest offer of each selected operator (**option 1a**). A variant of this approach consists of ranking offers across all operators ascendingly and to determine the result as the arithmetic average of e.g. the three cheapest or - alternatively - the lowest priced offers that jointly represent a certain percentage of all offers (**option 1b**). This latter option can be considered as more neutral in the absence of weighting factors such as operator market share information or the actual take-up of tariff plans. This change in methodology would in each case not require any additional efforts or costs as far as data collection is concerned.

Option 2 - weighted average of the cheapest offer of each operator, in function of market share

In order to increase the validity of the results even more, the Commission should consider to determine the result as the weighted average of the cheapest offer of each selected operator in a certain country, as a function of the market share of these selected operators in a given service market. This approach has already been put in practice by e.g. Teligen for its pricing benchmarks for Ofcom and BIPT and recently in the framework of the study “Actual Consumer Practices and Operators’ Offers for Intra-EU Calls”[17] prepared for the EC. Market share information is generally available among NRA’s and therefore no additional efforts or costs would be required.

Since this information is confidential by nature, it would only be used for calculation purposes and obviously not be published. If NRA’s were not in a position to share precise market share information with the third party to which the execution of the pricing benchmark is assigned, market share ranges could be provided instead. E.g. if the market share of a certain operator amounts to 33%, the market share could be reported to be within the [30-40%] range. For the calculation, the middle value of the range (35%) could be applied as a proxy value in that case.

If this approach were to be retained, rules should be defined on which market share to apply if convergent offers would not be available in a certain country to fulfil the requirements of a certain household type. In such a case, the fixed and mobile components (that are not necessarily

[17] EC, Study on intra-EU calls.

provided by the same operator) should be weighted by the market share of the operator in question in the fixed and mobile service market respectively. However, this approach has disadvantages and may be difficult to implement, as it requires the collection of additional and confidential data on market shares at operator level. Furthermore, these market shares are different by consumption basket (e.g. a fibre operator may lead in the high-end segment, which would not be reflected in the overall national market shares and the average price would, therefore, be distorted).

Option 3 - weighted average of the cheapest offer of each operator with respect to actual take-up of tariff plan

Full representativeness can in principle only be achieved by determining the result based on the weighted average of the cheapest offer of each operator with respect to the actual take-up of a certain tariff plan i.e. the number of subscribers. BEREC does however not recommend this approach since it would involve important additional data collection by NRAs, while such subscriber data may not always be available in a consistent way across the EU.

6. Conclusions

Electronic communications markets are constantly evolving and adopting the latest technologies and services. Such developments need to be captured and reflected in any studies especially when dealing with prices. The guidelines provided by BEREC in this report reflect these changes and provide several revisions of the methodologies used in the current studies to capture the reality of the electronic communications market, both in the present and the near future.

In 2017, our survey reveals that 34.9% of the European fixed broadband lines were sold bundled with mobile service. Moreover, in some countries, bundling of fixed and mobile services, typically “hand-held” mobile broadband and voice, is an important feature of ECS markets. It makes sense to include those bundles to properly reflect the prices faced by many European consumers.

BEREC considers a methodology based on household consumption to accurately reflect the prices of electronic communication services across the EU. The proposed methodology allows a more accurate comparison of offers in countries where mobile and fixed broadband services are bundled and countries where they are not.

The methodology set out in these guidelines defines 17 representative households (in addition to stand-alone broadband services) with different usage patterns: low, medium, high and very high. Given the pace of developments in the electronic communications sector, and the Digital Agenda objectives, BEREC does not define specific values or ranges for the consumption pattern at this point. BEREC will update the statistical information in due course in order to ensure that the most recent data is used to determine the consumption patterns using the new methodology, which should be operative in 2019.

Nevertheless, in order to allow the consideration of consumption patterns for representative households and standalone fixed and mobile broadband baskets, the document also includes the European subscription and consumption data based on a BEREC survey.

All 17 representative households should include fixed voice and fixed broadband and some households include mobile voice and broadband (with one or two SIM cards) and/or TV. For those households with mobile broadband, handheld services should be considered and coupled with domestic mobile voice traffic.

Both for standalone FBB offerings as MBB, a lower usage level should be considered. Thus, for FBB standalone offers 5 different baskets should be considered as well as for MBB broadband consumed using a tablet/modem/data card. For handheld Mobile baskets, BEREC proposes to benchmark seven baskets, including mobile voice and broadband, with different usage patterns.

This household approach defines the needs of a given representative household and then identifies those offers that can be combined to satisfy these needs. From all the possible options, BEREC suggests to capture the option that represents the least expensive bundles that address all the representative HH requirements. Such bundles do however not necessarily exist in all European countries and in practice, households may (need to) satisfy their needs by contracting separate offers (bundled or unbundled). Therefore, BEREC suggests to consider combinations of different offers as well. When a mobile offer is required to satisfy the household needs, the selection of this offer should be determined in such a way that total costs of are minimized while the overall requirements of the profile in question are still fulfilled. This methodology allows for combining offers from different operators.

As to the methodology currently applied by the Commission for the fixed and mobile pricing benchmarks, results of each of the household service components and standalone baskets are based on the cheapest tariff plan in a given country that meets the usage requirements. However, other options can be considered in order to adequately reflect the general pricing level in a certain country and make the benchmark more robust. BEREC proposes to experiment with different metrics such as the simple average of each operator's cheapest offer or the average of the cheapest X percent of offers across all operators in a given country.

The document also comprises proposed changes to certain other aspects of the current methodology, concerning the standard contract duration, the discount rate to be applied to non-recurring charges, the exclusion of selective discounts for mobile voice and SMS from the collection and the determination of a representative country result.

Annex I: Current BIAC studies – basket and usage parameters

Table 16 - Fixed BB BIAC - OECD Basket composition

Baskets	Fixed Broadband		Fixed Telephony			TV
	Advertised Download Speeds	Data volume (GB)	Daytime minutes towards fixed networks	Daytime minutes towards mobile networks	Average connection time (min)	Type of package
1	144+kbps – 1Mbps	1	70	30	5	Basic TV package
2	1+Mbps – 2Mbps	2				
3	2+Mbps – 4Mbps	5				
4	4+Mbps – 8Mbps	5				
5	8+Mbps – 12Mbps	10				
6	12+Mbps – 30Mbps	10				
7	30+Mbps – 100Mbps	30				
8	100+Mbps	30				

Source: EC, Fixed Broadband Prices in Europe 2016

Table 17: Mobile BB BIAC - Basket Distribution

Volume per Month	Total calls per month	Call Distribution				SMS
		Mobile to Fixed	On-net	Off-net	Voicemail	
30 calls basket	30	16%	55%	25%	4%	100
100 calls basket	100	17%	52%	28%	3%	140
300 calls basket	300	14%	46%	37%	3%	225
900 calls basket	900	14%	55%	28%	3%	350

Source: EC, Mobile Broadband Prices in Europe 2017

Table 18: Mobile BB BIAC - Voice Call Distribution

Baskets	Day	Evening	Weekend
30 calls basket	46%	29%	25%
100 calls basket	51%	26%	23%
300 calls basket	49%	32%	19%
900 calls basket	49%	32%	19%

Source: EC, Mobile Broadband Prices in Europe 2017

Table 19: Mobile BB BIAC - SMS Distribution

Baskets	Peak	Off-Peak	On-net	Off-net
30 calls basket	66%	34%	53%	47%
100 calls basket	66%	34%	51%	49%
300 calls basket	66%	34%	50%	50%
900 calls basket	66%	34%	50%	50%

Source: EC, Mobile Broadband Prices in Europe 2017

Table 20: Mobile BB BIAC - Voice call durations

Baskets	Mobile to Fixed	On-net	Off-net	Voicemail
30 calls basket	2.0	1.6	1.7	0.9
100 calls basket	2.1	1.9	1.8	1.0
300 calls basket	2.0	2.0	1.8	1.0
900 calls basket	1.9	2.1	1.9	1.1

Source: EC, Mobile Broadband Prices in Europe 2017

Annex II: Current BIAC studies - what remains unchanged

Geographical scope of the study

This pricing benchmark covers the EU-28 countries and a selection of non-European countries i.e., Switzerland, Iceland, Norway, Japan, South Korea, Canada and three states of the USA – California, Colorado and New York. Note: BEREC don't have any data collected (that was used for the profiling) for the non-European countries.

Provider and service selection

The operators are chosen based on market share information. For FBB and bundles with a FBB component, the share in the FBB market should be taken into account. For the pricing benchmark of mobile standalone services, the share in the mobile market should be considered.

For FBB, the ISP's covered should have a cumulative market share of at least 80% in a given service market and up to a maximum of five ISPs: In addition, all incumbent operators should be included, even where these are no longer in the top five in terms of market share. Also, for countries where one incumbent ISP have a sufficient market share alone and where the next largest ISP is a new entrant, the new entrant ISP should be included in the ISP sample.

In respect of sampling MNOs criteria are that at least the two largest MNOs be included for each country. Operator size is based on the number of mobile broadband subscriptions an operator reports. If the combined market share of the two largest operators is less than 70%, the third largest operator should also be included.

If no separate information is available for the residential market, the total market share shall be considered.

For each of the ISPs/MNO selected, all the products offered to residential consumers should be identified which consist of or contained fixed or mobile broadband internet access, whether stand-alone or combined with any type of value-adding service or feature.

The current methodology does not require additional data collection compared to previous BB Price studies.

Fixed broadband services should be supplied to homes via xDSL, cable modem, FTTx, satellite or fixed wireless systems while mobile service products need to be at least 3G (3G, 4G, LTE and LTE Advanced).

Regarding fixed services, the value-adding provision of fixed voice telephony and/or television should be singled out for full sampling and analysis. The resulting four selected fixed service bundles are:

- fixed broadband internet access, either provided alone (Single Play) or combined with
- either fixed voice telephony or television (Double Play) or
- both fixed telephony and television (Triple Play)

In addition, mobile services are also to be included as an additional service, resulting in 5 selected fixed-mobile 4P bundles and another 5 fixed-mobile 3P (without TV).

Mobile services offers shall be collected for modem/tablet and for handsets. Mobile handset offers include voice minutes and SMS while modem/tablet are standalone offers.

Where the same product - a product in the same selected service bundle and providing the same download speed (if FBB) - is offered in different variants, and where it is clear which of the variants was the least expensive - usually that with the least value-adding features - then only the least expensive variant should be included in the sample.

All offer data should be collected from online sources hosted by the ISP/MNO offering the service concerned. Only offers which are purchasable on the website of the respective provider should be included into the sample.

Product inclusion criteria

For each of the ISPs/MNO selected, all the products offered to residential consumers should be identified which consist of or contain fixed and/or mobile broadband internet access, whether stand-alone or combined with any type of value-adding service or feature.

For product selection, the inclusion criteria are the following:

- Only offers advertised on the operator's website should be included.
- Packages which degrade or stop internet access when the usage allowance is exceeded shall be included only in baskets whose average user requires a volume/time covered by the allowance. Packages which allow extension with a new price or overage charge should be included for baskets whose average user requirements exceed the allowance.
- For all packages, tariffs included should be exclusively residential, single user offers, excepting mobile offers with more than one SIM-Card. Offers with multiple SIM cards shall be included only if no extra charge was made for the additional SIM cards.
- Business offers will not be considered.
- Discounts or other commercial advantages visible on the ISP/MNO websites should be taken into account both
    - in determining the way to calculate the normalised monthly price and
    - to apply current rules whether to include an offer in the comparison.
- Where the same product - a product in the same selected service bundle and providing the same download speed - is offered in different variants, and where it is clear which of the variants is the least expensive - usually that with the least value-adding features - then only the least expensive variant shall be included in the sample.
- Fixed broadband services should be supplied to homes via xDSL, cable modem, FTTx, satellite or fixed wireless systems while mobile offers have to be at least 3G (3G, 4G, LTE and LTE advanced).

- Offers in which use of television is restricted in time or in volume or where less than 5 free channels are offered as television should be treated as no television service.

In particular, for mobile product selection, the inclusion criteria will be the same as Mobile BB Price Study and are the following:

- Neither wireless access for fixed use (e.g. LTE at home) nor Wi-Fi hotspot access should be considered to be mobile wireless broadband.
- An offer must provide access to the greater Internet via HTTP. Therefore offers are to be excluded which are a "walled garden", provide email-only services or where access to websites, content, and applications is limited to those "offered directly by the MNO and customised for that operator's network and devices".
- Any discount brands offered by MNOs are only to be included when the MNO’s website contains a clear link to the discount brand.
- Both prepaid and post-paid tariffs are to be included.
- The price for an offer may not include the provision of a laptop, netbook, notebook or tablet device.
- Handset-based offers will be taken to be such permitting voice telephony, regardless of whether a smartphone or other device was bundled into the offer or only a SIM card provided.
- Packages will be taken into account in which the price for the service includes an upfront or integrated charge for a modem, e.g. as stick or dongle, provided the customer cannot receive the same service without the device.
- No offers should be included which limit time of use in any way: "The methodology will exclude those offers with time-based limitations, for example by the number of monthly hours of use, or daily or weekly offers. Only those offers where the allowance can be freely used over a whole month will be considered. Therefore, the number of hours or days of use per month are not parameters in the methodology."
- For each mobile broadband product, information should be collected on all the data items required to apply the adapted BEREC rules, in particular to be able to allocate each such offer to the correct mobile broadband basket and to carry out calculation of the normalised monthly price.

Discounts, recurring charges and equipment

The standard broadband/bundle prices should takes fully into account the impact on consumers of

- any non-recurring / one-off charges and depreciation;

- the recurring / monthly and usage-dependent charges and
- applicable discounts or surcharges to either type of charge

On completion of the data collection, the dataset will be analysed to adjust or normalise the prices calculated, following these and further rules, and according to the detail of offer conditions. This will allow a standard monthly price to be determined for each offer which takes fully into account both non-recurring and recurring / monthly charges, and usage charges, adjusted or normalised for mode of capping, contract duration, pre-paid model, billing unit duration, discounts and other commercial characteristics.

Non-recurring charges include initial cost elements, such as activation, installation, sending costs, buying or renting of material (smartphone, modem, software,), equipment purchase, etc. Non-recurring or one-off charges should be included at constant net present value using the standard contract duration (SCD) and an appropriate discount rate.

All charges a customer cannot avoid including, for instance, contributions to Universal Service provision or TV contributions for settling author rights and local taxes or fees should be taken fully into account as part of the tariff.

Normalisation is required for contracts being longer or shorter than SCD.

Recurring charges include phone line rental and cable TV fee and any other charge which the customer necessarily incurs to receive the offered service. The recorded recurring charge is a monthly charge. Regular charges for periods other than a month should be converted proportionately to a recurring the charge for one month. Irregular charges should be treated as a mixture of recurring charge and non-recurring charge.

Where prices differ by payment method, the lowest price shall be considered, regardless of the payment or billing method specified.

Discounts should be recorded which applied to all customers, and applied on the first day of the Price Reference Period, ensuring a proper reflection of the cost of the service to an average customer, purchasing then, and retaining the service for the standard contract duration.

Discounts given by providers on up-front (non-recurring) charges, e.g. equipment, activation and/or installation charges, and / or on the recurring charges, monthly fee or other time-based charge should be taken into account, creating a (negative) price component, using depreciation techniques where necessary.

The rules for taking discounts into account are:

- For promotional discounts, that is, only valid for a limited period, the full value of a discount should be applied regardless of any opinion as to whether the discount is one-off or likely to be repeated.
- Discounts for ordering online should be applied in full.

- Where discounts are offered or extra charges applied for billing and payment method (e-invoicing, electronic payment, direct debit, paper billing, cash, credit card, cheque, etc.), the least expensive option should be applied, regardless of which payment or billing method is linked to this price.

- Targeted discounts applicable only to certain types of customers such as students or disabled people, and discounts for grouped subscriptions should not be included.

- All commercial advantages (e.g. with promotional intent) which directly affect the price or the basket classification, including but not limited to free call minutes, increased download limits, or increased download speeds, should be taken into account. Commercial advantages which had no effect on price or basket classification, such as access to Wi-Fi hotspots, should be recorded, but not included in price normalisation.

- Finally, discounts only applicable in the first period after contract conclusion, e.g. in the first month of a contract, should be taken into account but averaged over the SCD of 36 months.

Broadband router, mobile broadband modems, digital set-top boxes and DVRs should be included and amortized over a period of time in order to attribute a monthly cost.

For offers with the option to either buy or rent the required **equipment**, the cheaper of the two options should be used. Usually, due to the extrapolation on the SCD of 24 months, buying the required equipment is less expensive than renting it.

For each service available with a bundled handset, where possible, the offer prices should be captured for both a basic handset and a high-price handset. For this purpose, a list of manufacturers' models assigned to the basic and high-price handset categories should be generated in advance of fieldwork. Where the same service was available without a handset ("SIM only"), this price shall be captured in the database.

This is necessary because this equipment is often inseparable from the service price, as operators frequently include subsidized or “free” equipment within the subscription (mobile handset or wi-fi router).

Price normalisation

Normalisation of advertised prices is necessary to provide comparability across offers which have different price components, and/or usage rules with relevance to the cost incurred.

Normalisation was predominantly necessary in cases where services included volume or time capping. Applying the normalisation techniques and parameters defined here, a standard monthly price was determined for each offer. This is designed to be equivalent to the actual cost to a customer using the offered service who complied with a specified usage profile.

- BEREC provides the data per user profile basket to weight each of the offer price components, enabling an analysis to arrive consistently at the expected monthly charge for the typical consumer in each basket.

- Offers which are limited in volume for **internet access or time for telephony** or both must be normalised to reflect the additional costs to consumers of regularly exceeding the threshold. These thresholds were compared with a standard user profile, and where usage in the profile exceeded the particular usage limit, the surcharge was calculated and added as a price component. For broadband services, overage costs cover additional volume and for telephony services, the surcharge was for the additional costs charged for exceeding call time thresholds.

  Normalisation is applied where the volume limit of an offer was below the user profile value and exceeding the limit led not to service degradation but to additional charges. In such cases the cost of the profile volume was adjusted based on prices advertised for exceeding the volume threshold, whether or not the charges were applied automatically or only on request.

  In some cases, a maximal charge was advertised for additional time or download volume, or the total invoice was limited to some maximum. If this maximum charge was lower than the normalised charge, the maximum charge was taken.

- Offers which imposed volume limits but without the customer being able to request (and pay for) continued provision at the same quality, were only included if the ISP continued to offer access, at reduced speed, and the prominently displayed reduced speed exceeded 0.144 Mbps. For profiles which breached the volume limit, the offer was reclassified in the speed basket appropriate to the speed after limit breach.

- Prices for services including fixed telephony were normalised by applying a single user profile (to be defined).

- All baskets are defined first and foremost by a monthly volume of uploaded or downloaded data considered typical for users, reflecting usage patterns. The broadband user profiles shown in chapter 4.1 specify how usage volume is believed to be linked to the offer speed basket.

- The calculation of a normalised offer price in **mobile telephony baskets**, as defined in mobile BB Price study (following OECD (2010)), proceeds by deducting the value of call and message allowances included in the package from the usage element of the basket, up to the value of actual usage. The normalisation used in the current Mobile BB Price study for mobile calls billing units and minimum call length should continue to be applied in subsequent studies.