ERG REPORT

Methodology on the proposal for comparison of Broadband Retail Prices

Based on the analysis of strengths and weaknesses of existing approaches

Introduction

0.1 The broadband market is a key driver of the European communication sector. Indeed, in the context of the Lisbon Strategy and, in particular, of the i2010 initiative, the development of this segment has been recognised as one of the main objectives of the European Commission's ('EC') policy for the promotion of the Information Society in the European Union ('EU').

0.2 Given the impact of the broadband development in the whole sector, as an enabler for the uptake of innovative services, the status of this market can provide policy makers and regulators with useful information on the performance of the policy and regulatory measures intended to promote competition and the spread of telecommunications services. To reflect the status of this market and its comparative evolution across countries, different benchmark reports are periodically elaborated at EU and at international levels covering aspects such as penetration, coverage, usage, speed and prices.

0.3 This benchmarking activity is especially relevant in the European Union, where the evolution of the telecommunication sector, in general, and the broadband markets, in particular, is governed by shared policy objectives and by a common regulatory framework. As a consequence, regular reports, such as the *EC Implementation Report*[1], the Communications Committee ('CoCom') report on *Broadband Access in the EU*[2], as well as specific studies[3] covering the comparative analysis of broadband indicators, are published by the European Commission as a relevant way to assess the level of harmonisation across the Member States.

0.4 As evidence of the importance that the Commission attaches to the comparison of market situations across Member States, it should be highlighted that one of the justifications provided by the Commission for the establishment of a European Authority (hereinafter referred as EECMA) was the exchange, dissemination and collection of information and the elaboration of studies in relevant areas.

0.5 In this regard, it is very important that the European Regulators Group ('ERG') demonstrates its capacity not only to agree and adhere to Common Positions ('CPs') but also its willingness to publish its own studies and benchmarks with a view to developing best regulatory practices, thereby contributing to the harmonisation process. As a means of achieving this goal, in 2008 the ERG set up a Project Team ('PT') specifically designed to deal with benchmarking tasks and, in particular, commissioned to work on the elaboration of a common and coherent methodology for the comparison of broadband retail prices.

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1 See the 13th Implementation Report on the Implementation of the Telecommunications Regulatory Package 2007, at: http://ec.europa.eu/information_society/policy/ecomm/library/communications_reports/annualreports/13th/index_en.htm

2 See the latest report COCOM07-50 FINAL, Communications committee working document , *Broadband access in the EU: situation at 1 July 2007*, of 15 October 2008, at: http://ec.europa.eu/information_society/policy/ecomm/doc/implementation_enforcement/broadband_access/Broadband_data_july07_final.pdf.

3 See e.g., Special Eurobarometer e-Communications Household Report (http://ec.europa.eu/public_opinion/archives/eb_special_en.htm) or the study (still in progress) commissioned by the European Commission comparing the *Broadband coverage in Europe* (http://ec.europa.eu/information_society/eeurope/i2010/studies/studies_ongoing).

0.6 As previously noted, several reports can be found that compare the Member States performance in the broadband market. Amongst the various indicators used for such comparisons, special attention should be given to **retail broadband prices**. Aside from providing a valuable source of information about the level of competition in the market, data on retail pricing can explain the measured level of other important indicators such as penetration, coverage and usage in the broadband market.

0.7 Aware of the importance of retail broadband prices, different studies have been developed in Europe to compare broadband retail prices. These include studies by Teligen, Analysis, Quantum or Point Topic produced for some National Regulatory Authorities ('NRA') or for international organisations such as Organisation for Economic Co-operation and Development ('OECD') or International Telecommunications Union ('ITU').

0.8 Nevertheless, as detailed below, the international benchmarking of retail broadband prices gives rise to a number of issues which makes the elaboration of reliable comparisons a significant intricate task. The difficulties faced in order to define a broadband product as homogeneously as possible, in terms of its availability in all the countries included as part of the review, imposes a number of restrictions and assumptions which results in the existence of a heterogeneous landscape of methodologies and studies. These different methodologies, based on different assumptions, provide inevitably a sometimes contradictory picture of the market situation. Thus, whereas one country may perform admirably by virtue of one methodology, the position of the same country can significantly decrease in the ranking obtained by using another methodology.

-Figure 1: Different methodologies, different rankings-

As an example, the situation outlined below, highlights the fact that when the broadband retail prices are compared for a group of countries using two different methodologies different rankings evolve for the same country, where in one case the broadband monthly fee is below the average whilst in the second case, the monthly rental is just above the average.

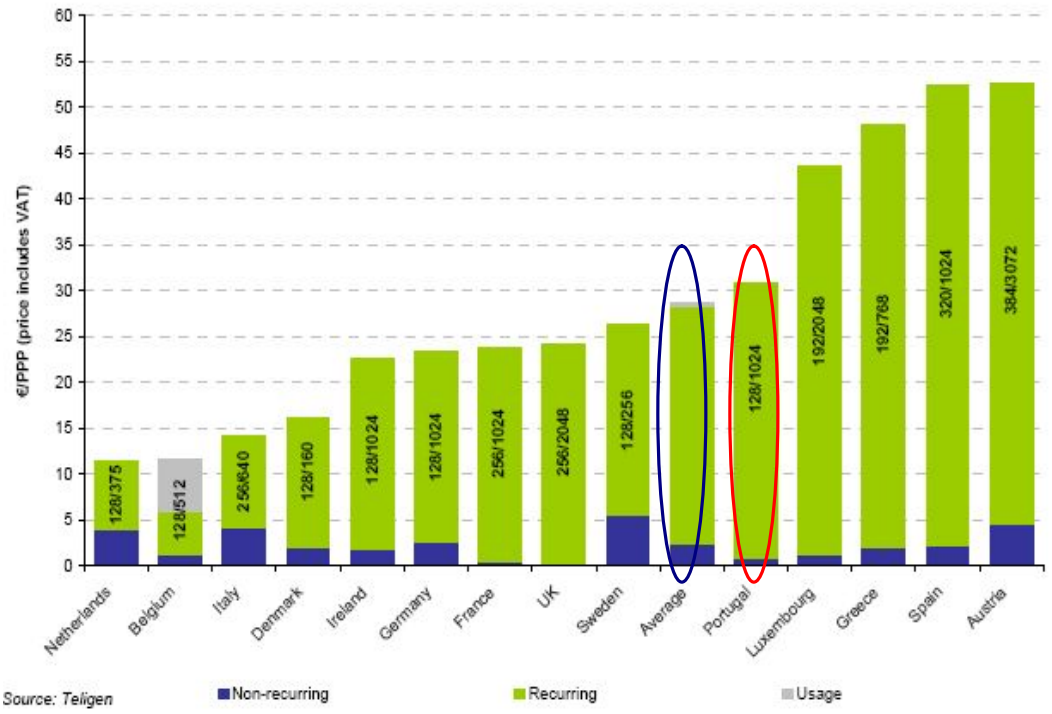
International comparison of broadband prices - Anacom

Minimum monthly fee for broadband- November 2006

Country	Minimum price	
	Price	Ranking
Germany	16.33	10
Austria	15.75	8
Belgium	12.36	2
Denmark	17.06	12
Spain	15.90	9
France	16.64	11
Holland	12.56	4
Ireland	14.87	7
Italy	12.42	3
Luxemburg	19.13	13
Portugal	**14.46**	**5**
United Kingdom	12.27	1
Sweden	14.83	6
Total/Average ex. Portugal	**15.01**	
% difference of Portugal compared to the average	**-3.6%**	

Quarterly Key Data Report on the Irish Communications Market - ComReg

Lowest Monthly Rental ADSL Basket – November 2006



0.9 In order to avoid this situation, there is a need at a European level to elaborate and agree on the common principles that a sound methodology requires to compare broadband retail prices.

0.10 In this context, the contribution of the ERG is essential in order to build an EU common methodology, capable of coping with the heterogeneous situations existing amongst the European broadband retail markets.The ERG initiative in this regard is to ensure the ERG's effectiveness in delivering valuable results to the Commission and to industry in general.

Aim and structure of this document

0.11 Keeping in mind the objective of the ERG with regard to the comparison of broadband retail prices, namely to establish a common and coherent methodology to compare broadband retail prices at an EU level, an initial step is necessary, which is the analysis of the different methodologies that are currently used.

0.12 This document focuses on the preliminary assessments carried out. Basically, it categorises the main elements identified in any methodology and provides the pros and cons of the different approaches which can be used to compare broadband retail prices.

0.13 The first section of the document describes the specific problems faced in comparing broadband retail prices.

0.14 The second section sets out the criteria that are often used in the selection of a comparable set of broadband offers, analysing the pros and cons of each one with some illustrative examples.

0.15 The third section deals with the elements to be included in the price when comparing broadband offers. This section also discusses some price comparison criteria with the associated pros and cons of each one.

0.16 Finally, and following the results of the analysis from previous sections, section 4 provides a list of the principles on which an ERG methodology should be based. It is not the intention of this document to present a complete methodology proposal, but rather to list the elements which should be ideally included in an ERG methodology, so that leaving the detailed specification (or analysis of their feasibility) of each element for a later stage of work.

Section 1

Establishing a comparison of broadband retail prices: difficulties faced

1.1 The aim of comparing the broadband retail prices is to inform the ERG of the position in relation to each of the questions raised below.

- In which European country are users paying the lowest price for the use of broadband services?
- Are users in Country A paying too much for their broadband connection when compared to users in Country B?
- And finally, what is the monthly amount a consumer is willing to pay in order to have access to and use of a broadband connection?

1.2 Notwithstanding the number of studies that have been developed to answer these questions for the European countries, the fact is that their results always appear to be questionable. This is due to the specific difficulties, additional to those encountered in the international price comparison of other products (e.g. apples), associated with broadband retail prices.

A. The definition of the product: what to compare?

1.3 To enable one to compare prices among different countries, the basic rule is that the same products have to be compared e.g. apples from Spain to apples from United Kingdom. This might seem a trivial question but it is clearly not when dealing with the comparison price of broadband services.

1.4 Firstly, there is the initial problem in finding a comparable offer across Member States, due to the fact that **broadband services within the European Union are not homogeneous**. Conversely, the available offers encountered across the Member States present different characteristics i.e. the upload / download speed, whether it is a bundled or standalone broadband offer, whether it is capped or uncapped, whether it includes any subsidy of hardware, etc., which makes the task of selecting the specific product to be compared very complex.

1.5 This limitation imposes on the development of every methodology the need to reduce the sample and decide on the product –internationally available– to be used, i.e. **to set the characteristics to be fulfilled by the broadband offer for ease of comparison**. In practice, this means that obtaining a static picture of the European broadband landscape necessarily restricts the comparison to a concrete group of offers (those which exist in every country) and, therefore, introduces an expected degree of uncertainty.

1.6 Section 2 of the document explores this issue and describes the main product features which can be employed to form a comparable set of products.

1.7 On the other hand, an additional difficulty appears in the case of dynamic comparisons. In addition to the static picture of the EU broadband markets, it is interesting to follow the comparison on a regular time basis (apples from all countries should be comparable in two different periods of time). In this case, a further difficulty arises, which is the **high dynamism of the retail broadband segment**. This means that the main features that define the broadband product may change quickly (speed upgrades, additional services included in the offer, etc.) or even the very product itself may no longer be provided.

1.8 It is therefore necessary that the methodology **takes into account the "time" variable** when designing the criteria for selecting offers. This implies designing mechanisms to mitigate the effect of the possible sensitive changes in the offers selected in the initial stage (non availability of infra-marginal offers and marginal offers introducing prices decreases).

B. The comparison criteria: how to compare?

1.9 Another important issue arising from any methodology is the definition of an adequate criterion to be used in the price comparison, i.e. the concrete price in a country (selected amongst the whole set of prices available) that will be matched against the corresponding price in the other countries.

1.10 Different options exist in this case e.g. using the price of the representative offer, an arithmetical average, a weighted average, the cheapest offer, etc., All of these present disadvantages which may call into question the reliability of the results.

1.11 One of the main problems is the **absence of information about the users' subscriptions** to a broadband offer in the different Member States. Ideally, this information should be available, as it provides information about the representative offer in the market and, therefore, about its relevance for comparable purposes. However, to date, such information is not available in most Member States and approximations are instead used, based on assumptions, more or less plausible, about the correspondence between a specific offer and its representation in the market. This is the case with the use of "best entry price", which is based on the assumption that there is a correlation between low prices and number of subscriptions. Also, using the price of the incumbent operator may be accepted on the assumption that its offer must have national coverage and, therefore, reach a high proportion of the population.

1.12 In conclusion, it must be assumed that, due to the complexity and features of the retail broadband offer, it is necessary to introduce approximations and decide on a set comparison criterion. This, inevitably, will determine the results of the benchmark exercise and it is likely that different criteria result in different outcomes.

1.13 Section 3 of this document sets out further analysis carried out on this issue. This includes a list of the criteria that can be used to build a comparison methodology and an assessment of its validity.

1.14 However, at this point and to illustrate the reality of the situation set out below is an example of concept of "representative price".

-Figure 2: Representative Price-

Consider the following case, which tries to compare prices of a 1Mbs product in Country A and Country B.

In Country A, three different offers exist, of 20€, 25€ and 30€, which correspond, respectively to 50%, 20% and 30% of the users.

In Country B, although the 1Mbs product can be purchased for 5€, only 5% of users have selected it. The rest of users (95%) have subscribed to the 35€ offer.

1 Mbs offer			
Country A		Country B	
Price	Subscriptions	Price	Subscriptions
20 €	50% users	5 €	5% users
25 €	20% users	35 €	95% users
30 €	30% users		

In the absence of information about how representative the different offers are, i.e. the percentage of users subscribing to them, a legitimate conclusion would be that Country B is the cheapest, as one offer of 5€ has been found.

However, looking at the price structures in the two countries, it does not seem reasonable that an offer only subscribed by 5% of population is used to characterise the level of prices in country B. Using the representative price, Country B would have the most expensive prices (35€).

Therefore, the information on the number of subscriptions sets out an ideal means to calculate the price for comparison purposes. In this case, either (i) the most representative price in every country or (ii) a weighted average –with the number of users associated to the offer as the weighting variable–, could be used to make the comparison.

Applying this to our example:

(i) Using the price with the highest percentage of users (20€ for Country A and 35€ for Country B), the cheapest country would be Country A, which seems reasonable.

(ii) Using the weighted average (24€ for Country A and 33.5€ for Country B), Country A again appears to have the lowest prices.

C. Validity of the results

1.15 The previous example highlights the extent to which the results of any comparison depend on the specific criteria applied for the price comparison.

1.16 In general, given the need to fix the product selection and comparison criteria, all the comparisons are subject to limitations and none of them represents accurately the reality of the markets. Indeed, due to the fact that these fixed criteria are based on assumptions and approximations of the methodology, the results of different methodologies will be expected to draw different, or even contradictory, conclusions and rankings.

1.17 In addition, the main problem of a partial comparison methodology is that depending on what characteristics are fixed, some countries may not have offers meeting all the criteria, and then the homogeneous group cannot be established.

1.18 On the other hand, from a dynamic perspective, the outcomes of a specific methodology, repeated over time, can be incomprehensible if the selection criteria do not take into account the time variable.

1.19 Precisely, one of the main objections that can be made based on the range of existing methodologies is the non-recognition of these conclusions. In fact, it must be noted that in a few cases neither the database nor the selection criteria for the compared offers are clearly stated.

1.20 Far from discouraging any possible attempt to establish a sound methodology, this document is aimed at assessing the different and relative strengths and weaknesses of a number of methodologies e.g. OECD, ITU and EC methodologies, in order to understand the relative validity and reliability of their results and to then apply the conclusions as a means of establishing an ERG's common methodology.

Section 2

Selection criteria for broadband offers

2.1 As explained in Section 1, the first step in the design of a methodology consists of sorting offers as homogeneously as possible, in order to obtain a broadband product comparable across different countries.

2.2 In order to achieve that objective, a common set of characteristics to be fulfilled by the broadband product in every country and over time may be fixed as the criteria to select the sample. Amongst others, the speed, the access technology (xDSL, cable, etc.), or whether it is a standalone or bundled offer (with fixed voice, mobile voice, TV) are some of the variables to consider in the selection process described.

2.3 This Section analyses the grounds on which these and other variables may be used as appropriate selection criteria to form groups of homogeneous offers.

A. Geographical Area

2.4 The geographical area refers to the zone the benchmark is focused on. Normally, international benchmarks compare prices between countries, taking into account just one average or representative price per country.

2.5 A geographical distinction among rural/urban areas or unbundled/bundled areas would lead to a more precise and useful benchmark exercise.

2.6 The issue is to agree on the definition or meaning of rural and urban areas. The concept of rural and urban areas e.g. number of population, population density, geographical limits, etc., varies between countries and, moreover, many of them do not collect geographically differentiated data. Therefore, the difficult issue in this case not only regards to the delimitation of the geographical boundaries of rural and urban areas at national level but also to the need of reaching an agreement on that definition amongst countries.

B. Speed

2.7 The speed is the **download/upload transmission rate** of a broadband connection. It can be seen, in terms of consumer perception, as the main differentiating criteria between two different broadband offers. Therefore, this feature will be one of the main variables in the selection of offers for the comparable purposes.

2.8 With regard to the upload speed, as user created content and web 2.0 applications become more and more popular, the incorporation of the upload speed in the methodology could be an illustrative indicator.

2.9 In fact, there are significant price differences for offers with the same downstream speed and different upstream speeds, which may imply that increased upload speed is a significant cost driver. For this reason, the exclusion of upload speeds could harm countries where the upload speeds are higher.

2.10 However, defining speed bands not only by download speed but also by upload speed may reduce the sample (as both the download and the upload speed must exist in all countries) and make it difficult to form groups of broadband offers for certain speed intervals. Besides, upload speeds appear not to be indecisive for the consumers decision on broadband products, especially taking into account the limited development of this application in many countries.

2.11 In this document, the term speed refers to **advertised headline speeds**. Although the alternative, based on the consideration of the actual speed enjoyed by the user, is theoretically also possible, there is no information at an EU level[4] to viably base the comparison on this data.

B.1 Comparing every download speed

2.12 A spontaneous option to compare broadband offers would be to produce comparisons for every download/upload speed.

2.13 This kind of comparison is useful as the actual decisions of operators and consumers are to some degree made on this basis.

2.14 Nevertheless, producing comparisons for every existing speed provides robust and extensive outcomes, but at the same provides non-consistent data, conclusions reached.

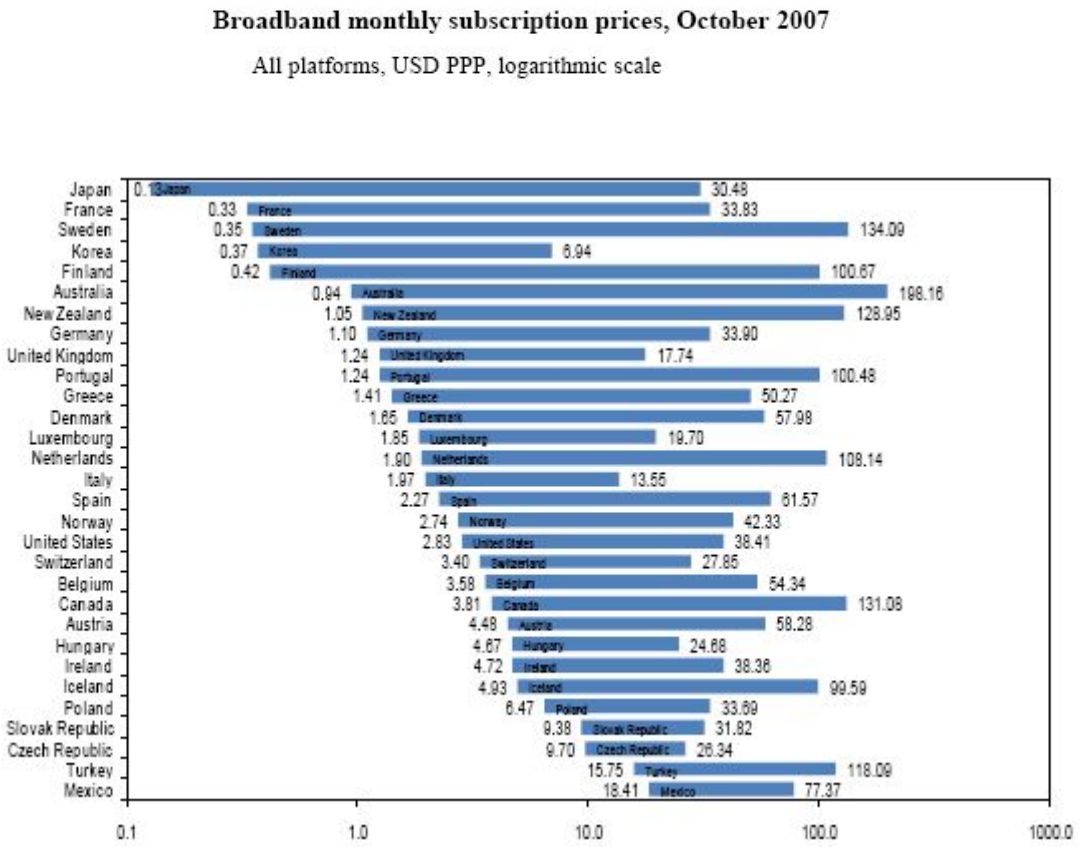
2.15 Moreover the implementation of this option has the disadvantage that not all download/upload speeds are available in all countries. In this case, either the comparison could include only those countries where a specific speed is available, or a simplified alternative needs to be used.

2.16 The following solutions are often adopted:

[4] ANACOM has conducted two studies to determine the actual performance of broadband offers, the most recent being available at: http://www.anacom.pt/render.jsp?contentId=557178. In addition, a research programme to identify actual performance of broadband for consumers is currently being carried out by Ofcom's initiative of the Voluntary Code of Practice.

B.2 Normalised speed to 1Mbps

-Figure 3: Broadband Growth and Policies in OECD Countries, OECD, May 2008-



2.17 One possible option is to use a normalised price per 1Mbps[5]. A normalised price allows for direct price comparisons, overcoming the difficulty of having different speeds across countries.

2.18 However, considering that the relationship between price and speed is not linear (the monthly price per Mbit will normally decrease with increasing bitrates), the offers with higher total bitrates will be favoured and countries offering only "low speeds" will fall behind in the comparison. At the introduction of broadband to the market, the use of a normalised price per 1Mbps could be reasonable, taking into account the small differences in the range of offers available in terms of baseline capacity e.g. 256 Kbps vs. 512 Kbps. However, given the change in capacity among countries since then, as stated by OECD[6], *"this approach may no longer be fruitful"*.

[5] The normalised price is calculated dividing the monthly rental price by the bitrate and dividing this again by 1024 Kbps.

[6] See OECD report Benchmarking broadband prices, 2004.

B.3 Speed bands

-Figure 4:

***Benchmarking broadband prices in the OECD*, OECD, 2004-**

. Broadband offers ranked by capacity, offers less than 1 Mbps, October 2003

Country	Company	Access Type	Plan	Download Speed (Kbps)	Upload Speed (Kbps)	Monthly Charge		Mbytes Included (per month)	Additional Cost per Mbyte		Installation Charge	
						in USD	in USD PPP		in USD	in USD PPP	in USD	in USD PPP
Luxembourg	P&T	ADSL	SpeedSurf-JUNIOR	256	64	43.63	40.44	1000	0.003	0.003	62.25	57.69
Denmark	Tiscali	ADSL	256/256	256	256	44.25	35.24	Unlimited	0.000	0.000	0.00	0.00
Denmark	Telia Stofa	Cable Modem	FlatRate 256/128	256	128	44.85	35.72	Unlimited	0.000	0.000	37.35	29.74
Mexico	Cablevision	Cable Modem	CableLink Kilo	256		46.28	76.04	Unlimited	0.000	0.000	58.43	96.01
Mexico	MVS	Fixed Wireless	MACH2	256		46.28	76.04	Unlimited	0.000	0.000	0.00	0.00
Finland	TeliaSonera	ADSL	shared apartmet access	256		46.41	41.48	Unlimited	0.000	0.000	28.30	25.29
Finland	Elisa	ADSL	shared apartmet access	256	256	46.41	41.48	Unlimited	0.000	0.000	56.59	50.58
Iceland	Siminn (Iceland Telecom)	ADSL	ADSL 256	256	128	47.91	40.45	Unlimited Domestic (100 International)	0.031	0.026	75.25	63.54
Spain	Tiscali	ADSL	ADSL TOP 256	256	128	48.51	54.80	Unlimited	0.000	0.000	0.00	0.00
Greece	FORTHnet	ADSL		256	128	48.53	59.65	Unlimited	0.000	0.000	0.00	0.00
Spain	Wanadoo	ADSL	ADSL Speed	256	128	51.21	57.84	Unlimited	0.000	0.000	0.00	0.00
Spain	Telefónica	ADSL	Linea ADSL 256	256	128	51.30	57.94	Unlimited	0.000	0.000	50.02	56.50
Denmark	TDC	ADSL		256	128	52.49	41.81	Unlimited	0.000	0.000	36.75	29.27

By using four speed bands, the categories of capacity chosen were 10 Mbps to 100 Mbps, 2 Mbps to 10 Mbps, 1 Mbps to 2 Mbps and offers below 1 Mbps, groupings of homogeneous offers are formed and set out in the tables. There was no special reason for choosing these categories of capacity. These were chosen as a simple way to categorise and compare offers at similar levels of advertised performance.

Broadband Internet Access Costs, European Commission

On the treatment of the speed, the tender specifications document proposes to compare the lowest prices at a range of download speeds:)

- 144 kbps-512 kbps (excl.)
- 512 kbps-1024 kbps (excl.)
- 1024 kbps-2048 kbps (excl.)
- 2048 kbps-4096 kbps (excl.)
- 4096 kbps-8192 kbps (excl.)
- 8192 kbps-20 Mbps (excl.)
- 20+Mbps

2.19 An alternative approach is the use of speed bands, which allows direct comparisons within the bands and ensures, on one hand, that not all speed combinations are offered in all countries and, on the other hand, to avoid the overestimation of the high-speed offers.

2.20 The difficulty of this solution lies on the definition of the bands: the definition of the speed bands will affect the comparison. As a consequence of the abovementioned non-linearity of the price-speed ratio, the wider the interval the worse the result for the better performing countries i.e. those offering high speeds at low prices, because their prices are directly compared against prices of countries offering, for example, the same price but in exchange for a much lower speed.

2.21 Therefore, the definition of the range of different intervals should follow some criteria, either based on the speed that different technologies may support i.e. ADSL2 generally allows downstream speeds of up to 12 Mbit whilst ADSL2+ of up to 24 Mbit. As an alternative the definition may follow the consumer perception of the speeds or speed bands that represent a qualitative leap in the obtained performance.

2.22 Given the difficulties linked to this, another possibility could be the use of other comparable data (following previously agreed criteria) such as, for example, that used by the Communications Committee (COCOM) which established the following speed bands: 144 Kbps to 1, 99 Mbps; 2 Mbps to 9, 99 Mbps and from 10 Mbps on.

C. Bundling

-Figure 5: Broadband Internet Access Costs, European Commission-

Bundling
This comparison makes no specific treatment of bundled offers.

2.23 As outlined above, in Europe, more and more European consumers take broadband product as part of a bundle. The Special Eurobarometer "E-Communications Household Survey" released in June 2008 with data as of December 2007, shows that the number of households that buy Internet access combined with other services rose to 24%, showing a remarkable growth from the 15% registered in last year's Eurobarometer survey. In fact, the most popular package within EU27 is the combination of Internet access plus fixed telephony, with 13% of households buying this bundle. Moreover, the 2007 Annual Report of Comisión del Mercado de las Telecomunicaciones ('CMT') reflects the fact that 92% of the broadband lines in Spain are bundled with other services as of December 2007.

2.24 Despite this, none of the existing comparisons includes the treatment of bundled offers in their analysis. Consideration should be given to a characteristic of the product which has a direct impact on broadband price especially when purchasing a bundle the unit price of the different products within the bundle is lower compared to the same products purchased separately. Quoting the Special Eurobarometer E-communications household survey published by the European Commission in April 2007, "*as regards EU27 citizens' attitudes towards combination packages of e-communication services, a clear majority of representatives of households that buy service packages finds it cheaper than paying separately for each service*".

2.25 Therefore, in order to accurately reflect the situation of the European broadband markets, it would be necessary to introduce the consideration of broadband bundled offers in the comparison. In practice, the handling of bundled offers in the comparison requires a decision on:

- the type of bundled products to include in the study, i.e. what additional services will be considered (voice, TV) and what type of combinations will be analysed (double play, triple play, quadruple play); and

- whether to run a separate analysis for each type of identified bundles and for the standalone offers.

2.26 On the first point, the level of price differentiation should be considered; as this characteristic will determine the complexity of the selection process (a high level of diversity in prices may not be useful whatever the effort to make homogeneous comparisons). In this regard the inclusion of voice and television services presents the difficulty of adding a certain degree of differentiation (For voice the price depends on the specific services included i.e. national, international, on-net, off-net and for TV the price varies with the number and type of channels provided in the offer).

2.27 When answering the second point, the existence of one of the following two scenarios would need to be considered at an EU level:

i. In some countries, operators may have the strategy of pricing standalone broadband offers the same as "broadband + voice" offers. In these cases, standalone broadband and "broadband + voice" bundles could be analysed as if they were the same category.

ii. However, in other countries, there is a difference in price between standalone and "broadband + voice" offers, that would support the running of separate analysis for each category.

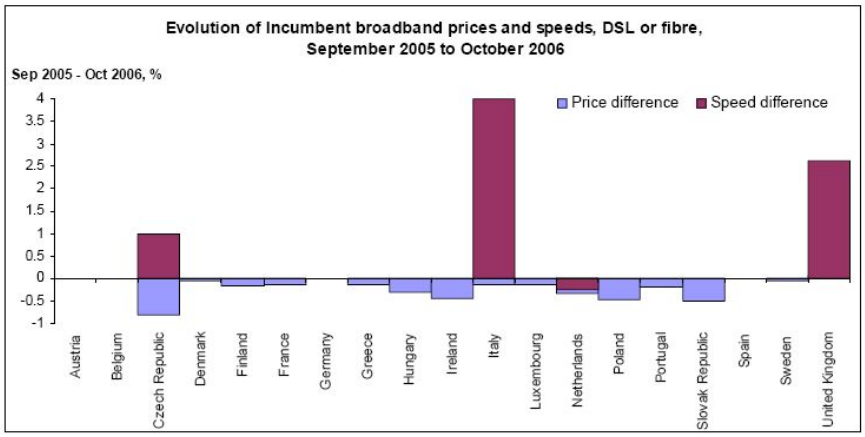
D. Access technology

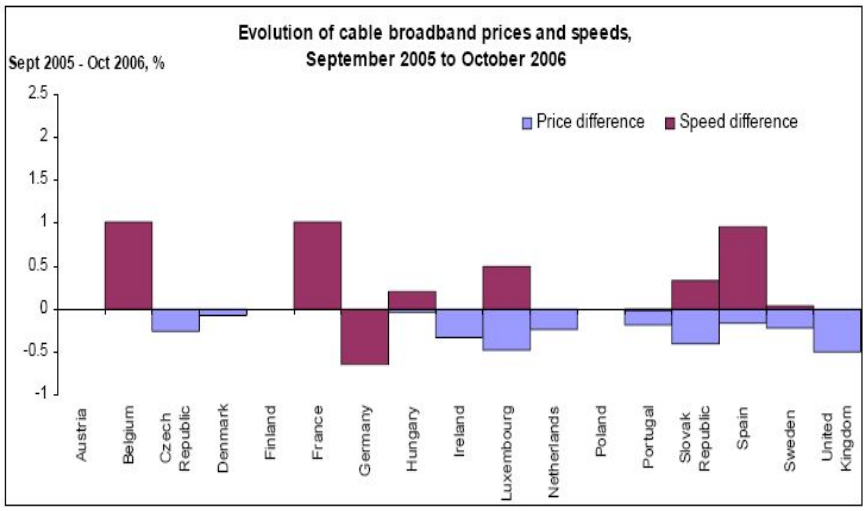
2.28 The access technology defines the cost structure (line rental already included in the price or not) and also determines the range of speed the operator is likely to offer due to technical reasons. Therefore, it could be adequate to run separate analysis for different access technologies (xDSL, cable, FTTx, FWA, Satellite, Wi-fi, Wi-max, etc).

2.29 For **non-xDSL access technologies**, given that they are probably not deployed in every European country, a specific comparison for every technology would imply partial results. Therefore, despite the fact that the high presence of cable or FTTx in some countries would deserve a separate analysis, if all the countries have to be considered, no distinction should be made amongst the non x-DSL technologies.

2.30 On the other hand, the specific features of the **mobile broadband** in respect to the fixed broadband advise against including both access types into the same comparison. Current data on broadband connections seem to prove that both types of access are not substitutable technologies or that they are only for lower download speeds. For this reason, the analysis of mobile broadband offers, if addressed, should be subject of a separate comparison.

-Figure 6: Communications Outlook 2007, OECD-





The Communications Outlook 2007 shows the evolution of prices vs. speed between September 2005 to October 2006 for:

i. the incumbents, either xDSL or fibre

ii. cable operators

-Figure 7: International Comparison of broadband prices[7],

ANACOM, November 2007-

In its report, ANACOM includes two different comparative analysis for fixed and mobile broadband prices.

Table 6 – **Minimum monthly fees of mobile broadband offers in E.U.15 countries with offers with transmission throughputs similar to those provided in Portugal – July 2007**

	Traffic Limits			
	1 GB		5-6 GB	
	Price	Ranking	Price	Ranking
Germany			21.55	2
Austria	16.67	1	45.83	6
Denmark	43.01	6		
Spain	25.86	4	50.00	7
France	58.53	8		
Greece			59.66	8
Netherlands	38.00	5		
Ireland			33.05	4
Italy	16.67	1	15.83	1
Luxembourg			43.48	5
Portugal	**18.60**	3	**24.71**	3
United Kingdom	56.99	7		
Average excluding Portugal	36.53		38.49	
Deviation regarding the average	**-49.1%**		**-35.8%**	

Unit: Euros excluding VAT.

For the mobile benchmark, ANACOM collected data on 138 mobile broadband residential tariff schemes by the EU15 in July 2007. The monthly fees of the several available offers were compared. Results were shown by traffic limits, since this was considered to be the most important variable in order to segment the several offers in terms of price. Comparisons were presented for the traffic limits experienced in Portugal. The values presented exclude Value Added Tax ('VAT') and were calculated without Purchasing Power Parity ('PPP').

E. Type of operators

2.31 In the provision of broadband, important differences arise if the service is provided by the incumbent operator (ILEC[8]) or by the alternative operators (CLEC[9]). These differences have an influence in the results of a methodology and, therefore, it may be worthwhile to compare different price groups.

2.32 In the existing methodologies, it is a current practice to use the price of the incumbent operators[10] as the approximate price for a country. Although *"…the*

[7] http://www.anacom.pt/template12.jsp?categoryId=260102 .
[8] Incumbent Local Exchange Carrier.
[9] Competitive Local Exchange Carriers.
[10] If representative offers were available, the price of the incumbent would be less relevant as ILEC offers with high percentage of users could be taken into account.

incumbents rarely have the least expensive offer for broadband access"[11], there is merit in using their prices as a proxy, given that:

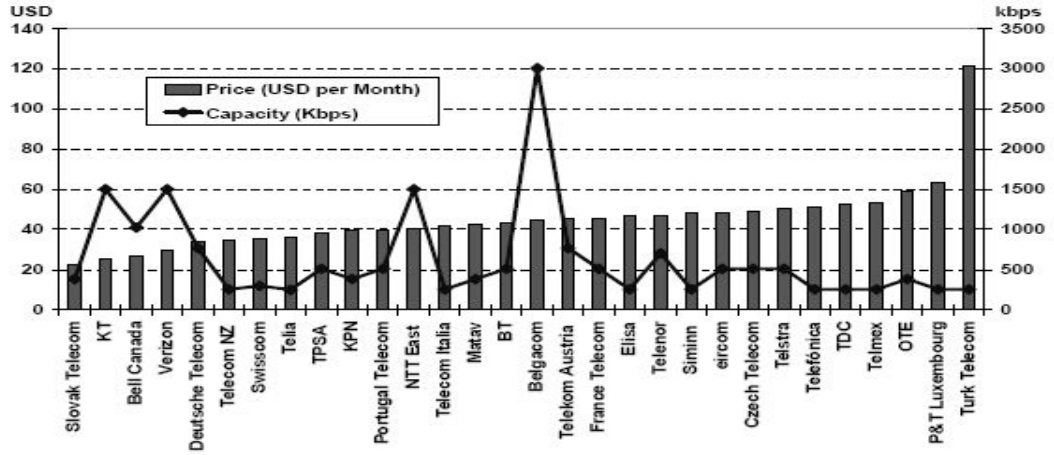
- *"their pricing is an important indicator of the overall competitiveness of any market; and*

- *generally have the widest geographical coverage and the largest market share, whereas the offers of some other service providers may be limited to specific locations*."[12]

2.33 However, given that these large groups of operators exist in every country (ILEC; CLEC) and that it is unlikely that the best offer is provided by the incumbent operator, it could be necessary to include information about CLEC prices in the comparison. In addition, given that the availability of broadband services at different prices depends on the geographic location of the consumer, it may be convenient to include a separate analysis for incumbent operators, apart from a joint analysis comprising the whole set of companies operating in a country.

-Figure 8: Benchmarking broadband prices in the OECD, OECD, 2004-

This OECD report only included prices of the incumbent operators. The following comparisons were produced:



- Incumbent broadband offers ranked by capacity (table)
- Incumbent broadband offers with unmetered data transfer ranked by price (table)
- Incumbent broadband offers with metered data transfer ranked by price (table)
- Baseline DSL access prices from incumbents: baseline offers are defined as offers above 250 Kbps with data transfer of at least 1 Gigabyte (graph).

Baseline offers are defined as offers above 250 Kbps with data transfer of at least 1 Gigabyte. Not all offers of the different incumbents meet the 1 Gigabyte requirement. So, the limitation in this case is the fact that not all offers fulfilled the same criteria.

11 See OECD report Benchmarking Broadband prices in the OECD, 2004.
12 Id.

F. Usage

2.34 Depending on whether broadband is considered an always-on service, usage considerations may be included in the comparison methodology.

Limited vs. unlimited offers

2.35 Broadband offers can be limited both in terms of download capacity (the price is a function of the download volume beyond a given threshold) and time (the broadband usage is limited to a given number of daily or monthly hours).

2.36 Regarding the limitation in capacity, although in the majority of European countries the provision of unlimited offers is the rule, the inclusion of the capped offers can be deemed to be necessary.

2.37 Regarding the limitation of the offer in time, it should be noted that only in exceptional cases the offers in the EU correspond to these characteristics. In addition, taking into account that this kind of offers does not respond to what the average consumer can expect from a broadband service, its inclusion in the methodology can be questioned as being non meaningful in terms of comparison.

2.38 Should the limited offers be included in the comparison, a harmonisation mechanism based on the definition of baskets of Internet usage is necessary in order to make it feasible to use both limited and unlimited offers within the same group of products (see Section 3.I.C for further description of this matter).

Residential vs. business offers

2.29 Regarding the treatment of the residential and business offers, it should be noted that some methodologies make no distinction between these two market segments.

2.30 However, taking into account that these types of offers have different prices and characteristics (for instance, the number of tariff structures is considerably more complex in the business segment), it is reasonable, in the interest of accuracy, that the design of the methodology separately analyses residential and business prices.

Section 3

Criteria for price comparison

I. Elements to include in the price to gain access to the broadband service

3.1 All the necessary costs to gain access to the broadband service can be classified in recurring, non-recurring and usage costs, the total cost being the sum of these three categories:

Total price = Recurring costs + Non recurring costs + [Usage costs] *****

****** Only for capped offers*

I.A. Recurring costs (monthly line rental, monthly tariff)

3.2 The recurring costs are linked to the fixed price paid monthly. They are basically composed by the monthly tariff and the monthly line rental.

3.3 The **monthly tariff** refers to the fixed payment engaged by the consumer for using its broadband connection. It is applicable both in the case of flat-rate and capped offers. In the latter case, the monthly tariff refers to the fixed price to be paid when the service usage is below the cap, whereas the charges applicable to usage in excess of the limits (in time or download capacity) are added to the formula through the "usage" component (see paragraph I.C below).

3.4 The **monthly line rental** is the fixed payment engaged by the consumer for having *access* to its broadband connection. The specific value to be considered in the final price and the question of whether the line rental has to be included in the final price depend on the access technology and/or on the wholesale product on which the offer is based.

- Inclusion of the line rental charges in the formula

  The inclusion of line rental charges would allow a comparison of offers including the full payment by the consumer. This includes, apart from the monthly tariff, the additional cost incurred when subscribing to the broadband connection[13].

  In the case of xDSL, broadband prices do not usually include PSTN line rental charges –when published in the operators' site–, even though subscribers may be required to have a PSTN line to subscribe to DSL. On the contrary, cable operators usually include the line rental charges in the tariff.

[13] Therefore, the affordability of the broadband service does not depend solely on the price but also on the additional cost associated to the connection (line rental). According to ECTA information as of December 2006, this wholesale service only exists in 6 countries and, 4 out of 6 NRAs state that this is a service with still low relevance.

It can be argued that most ADSL users, when subscribing to a broadband offer, either previously own a PSTN line or subscribe to it not only for broadband but also for voice services (and in this case it is difficult to assess which part of the PSTN price derives exclusively from the broadband connection). In this case, the inclusion of the monthly line rental would distort the results.

However, this assumption cannot be taken for granted and, in any case, the fact that users already own a PSTN line does not mean that it is for free. In addition, the inclusion of PSTN line price allows comparison of broadband prices in a technologically neutral manner, in particular with regard to cable services.

- Specific value of the line rental charges

With regard to wholesale products, the same DSL operator may offer the same retail broadband product by means of different wholesale products depending on the region or city in question. Thus, a different line rental would apply for the same retail broadband product.

In the case of FTTx, the line rental may be included, depending on the business model of the utility company. In some cases (closed networks model), the monthly subscription fee for the broadband connection usually includes line rental for the fibre since the utility company offers both the fibre and the internet connection. On the contrary, in other cases (open networks model), the customer usually pays a monthly subscription fee for the internet connection to the service provider and a monthly fee (equivalent to the line rental for xDSL solutions) to the utility company for the fibre.

Recurring price (xDSL, FTTx open networks model) = line rental + monthly tariff	
xDSL line rental (ILEC) =	*ILEC monthly charges for the fixed telephone line rental*
xDSL line rental (CLEC, bitstream) =	*Line rental (ILEC)*
xDSL line rental (CLEC, ULL) =	*CLEC monthly charges for the Internet access ≅ Line rental (ILEC)*
Recurring price (cable, FTTx closed networks model) = monthly tariff	

I.B. Non-recurring costs (modem, installation, sign-up, promotions...)

3.5 Non-recurring cost are referred to upfront costs paid by the subscriber at the beginning of the contract with the broadband operator, such as the hardware (modem, router), installation fees, sign-up costs, etc. This variable would also include the possible discounts and promotions, such as:

- Discounts based on promotions which are valid for a specific period (e.g. subscriptions made in summer), geographical area e.g. big cities, user group e.g. students;

- Discounts on exchange of a minimum duration for the contract (permanence clause), which can apply at the time of subscription to the monthly tariff, installation fees, hardware elements, etc; and

- Discounts that can be obtained using a specific means of payment e.g the use of direct debit.

3.6 The inclusion of discounts and promotions can be helpful as this reflects the real payment to be done for the broadband product. However, taking into account that the discounts and promotions applied by operators can be very different across Member States, it may be difficult to include them into the comparison.

3.7 In any case, obtaining complete information on the elements described, in particular regarding the level and validity period for the promotions, may be a difficult issue. In any case, even if the information was available the time to amortise these fixed initial payments would need to be decided.

3.8 It could be argued that discounts and promotions with a time-frame of one year or longer should be included in the benchmark, but in this case NRAs should consider the necessity of a more detailed data gathering process.

3.9 In light of this, most methodologies usually only refer to the monthly fee (recurring costs) and do not take into account the abovementioned components (non-recurring costs).

I.C. Usage costs (uncapped vs. capped tariffs)

3.10 There are countries were capped tariffs are frequently provided by operators (e.g. Austria, Belgium, Portugal, etc.), whilst in others, unlimited flat rates are the rule, with few exceptions.

3.11 As a means of comparability or harmonisation between unlimited/limited offers amongst countries, the usage charges are added to the total price when broadband products with time and/or download capacity restraints are introduced in the comparison.

3.12 For the sake of comparability, a specific level of usage duration and volume (a cap) is set and the costs of a monthly broadband activity exceeding this cap are calculated for every offer and country. Therefore:

- the monthly costs below the cap are included in the “recurring costs” component of the formula, as equivalent to a flat-rate tariff; and

- the monthly costs exceeding the cap are introduced as the value of the “usage” component.

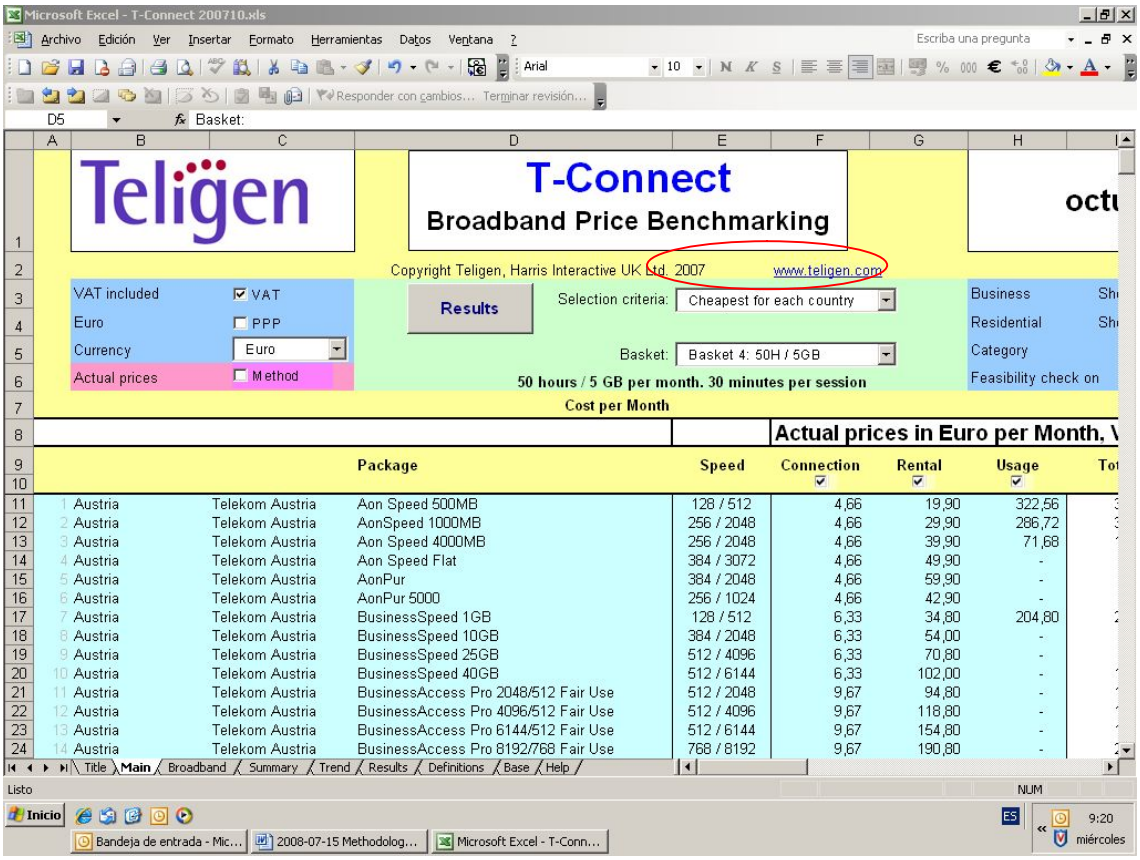
3.13 The definition of the cap, to be fixed in the methodology, implies the definition of usage profiles, which are based on the estimation of the average usage duration (hours per month and minutes per session) and the usage volume (Gbit per month) of a monthly subscription for an EU consumer.

3.14 Originally the baskets of Internet usage were first used by OECD to compare fixed voice offers, and then its use was extended for the comparison of mobile voice offers and finally also for broadband offers. After some years elaborating

its own studies, OECD commissioned its report to Teligen consultants, which elaborates the study for the OECD.

3.15 In practice, the definition of the user profile is sensitive, as some patterns may apply better for some countries, and therefore allowance for the differences must be accounted for. In any case, comparing all countries under the same pattern of use may not be adequate and the definition of different usage profiles (from low use to high use) is necessary in order not to favour certain offers or countries above others.

-Figure 9: Teligen baskets-



In the T-Connect Broadband Price Benchmarking, Teligen produces 6 baskets, from low to high usage patterns:

Basket 1: 10 hours/1 GB
Basket 2: 15 hours/2 GB
Basket 3: 30 hours/5 GB
Basket 4: 50 hours/5 GB
Basket 5: 75 hours/10 GB
Basket 6: 100 hours/20 GB

Besides, the selection criteria are based on the cheapest price per country and the cheapest price per provider, and the template allows reflection of prices either as actual prices in euros per month, VAT included, or as prices normalised to 1024 kbps in euros per month, VAT included. Prices may be adjusted by the Purchasing Power Parity (PPP).

I.D. Price unit

3.16 In the definition of the price unit to be used in the comparisons amongst European countries, the **selection of the currency** and the **inclusion of VAT** must be decided upon.

3.17 Regarding the currency, in the case of European countries the use of separate comparisons for the Euro and the Euro adjusted by Purchasing Power Parity[14] (PPP), according to the differences in the level of purchasing power across Member States, is the rule. The use of PPP is justified by the fact that the differences in values of GDP among countries are related, to a considerable extent, to the level of prices. This correction therefore ensures avoidance of any impact from factors beyond the service providers for comparable purposes.

3.18 On one hand, VAT can be excluded from a benchmark because of the disparity in the standard VAT rates in the EU –they range from 15% (Cyprus, Luxembourg) to 25% (Denmark, Sweden)–.

3.19 On the other hand, the inclusion of VAT in the price reflects the real final price consumers have to pay, as retail prices always include VAT.

II. Price comparison criteria

3.20 In this epigraph, a list of the criteria that can be used to build a comparison methodology is presented and their validity is assessed. Some reflections on this were discussed in Section 1 (epigraph *B. The comparison criteria: how to compare?)*.

3.21 Taking into account the limited validity of the different comparison criteria (as they are just approximations), an array of several indicators may be used as a way of providing more reliable conclusions.

A. Most common offer (representative price)

3.22 The most common offer is the most subscribed offer in the market. As explained in Section 1, the main problem here is the inherent difficulty in getting information about the number of users that subscribe to every single offer of a database. The burden of work for the operators would be excessive.

3.23 The most common offer is a criterion on its own, but the information on the number of users associated to the offer may be used as the weighting variable to calculate an average price, as analysed below.

Advantages

3.24 This criterion filters all those offers that are not relevant in terms of the number of subscribers, drawing the attention only to the products that are a reflection of the European broadband markets (see Figure 2).

Disadvantages

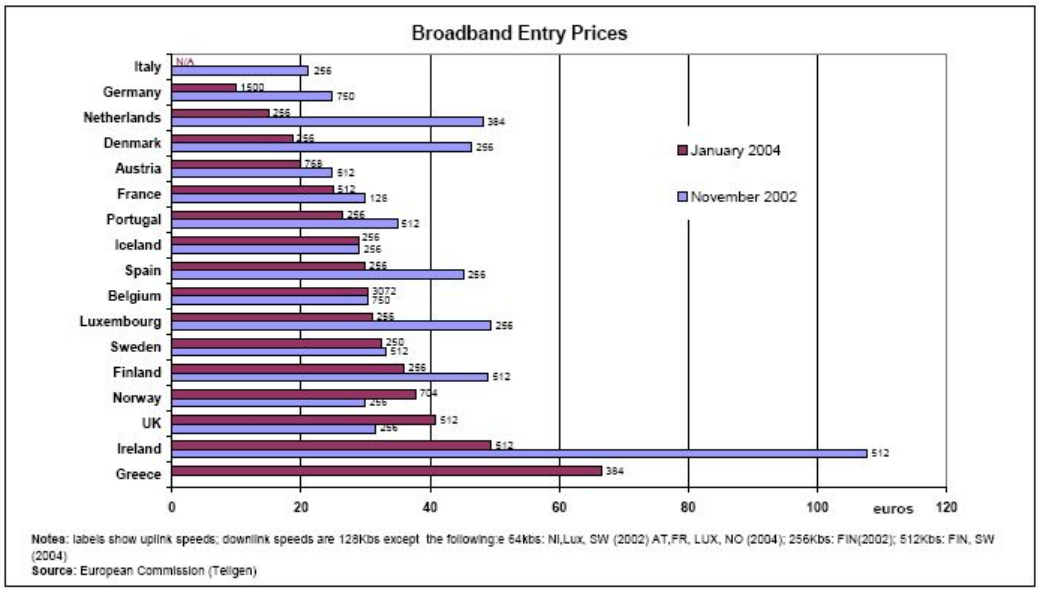
[14] The specific adjusting factors are periodically published by Eurostat and by the European Central Bank.

3.25 The information needs are the main difficulty: the information on the number of subscribers for each offer is not currently available.

B. Best entry offer

-Figure 10: Information Society Benchmarking Report 2005-

European Commission, 2005



3.26 The best entry offer is the lowest price at which a broadband connection at any speed is available in each country. As previously shown, ComReg, Anacom, the OECD (the lowest value of the range of broadband prices is the best entry offer), the European Commission in its 2005 Information Society Benchmarking Report all use this criterion.

Advantages

3.27 As pointed out above in this document, a good approximation to the representative price in a country is the best entry offer, as it can be considered that there is a correlation between the cheapest offer and the number of subscriptions (see downsides).

3.28 It is not always true that the most popular method (in this case, this widely-used criterion) is therefore the best, but what is indeed certain is that there is consensus among the International Institutions and European Regulators on the use of the best entry offer and that the mere existence of this consensus justifies its selection over other criteria.

Disadvantages

3.29 Although there is a high correlation between the representative or most common offer and the best entry offer, in some cases, the time lag to contract the newly launched entry offers (most broadband service contracts include permanence clauses that may deter users from changing suppliers automatically) implies that

such a relation is broken. Due to the permanence commitments, only a few broadband users may be subscribed to the cheapest offer just after its launch. Consequently, it is likely that this offer is not the most common in the market during a short-medium period. This process can be described as follows: if we assume a market equilibrium, where all customers have chosen the subscription that best suits their needs, and then introduces a disturbance of the market in the form of a price cut by one of the suppliers, some customers will give up their old subscription and move to the price cutting supplier. This shift will take some time, as the customers have to be aware of the new price cut, decide to take action and finally make a decision to move. After some time, a new equilibrium will be established.

3.30 An additional drawback of the best entry offer arises by including "the time variable", that is when the comparison is carried out over time (e.g. quarterly or annually). Some mechanisms to cushion the possible sensitive price changes due to the change in the offers selected (infra-marginal offers which are not available anymore and newly launched marginal offers) and not to the evolution of prices itself should be designed. For instance, instead of selecting only the cheapest offer, an average among the three best entry offers should be considered to make up the dynamics of the broadband market.

C. Average price / average price weighted by market share

-Figure 11:

International comparison of broadband prices, Anacom, November 2007

Country	2 Mbps		4 Mbps		8 Mbps		20 Mbps	
Germany	25.83	7	25.78	4	-		-	
Austria	31.17	9	40.83	9	57.50	9	-	
Belgium	-		27.21	5	42.98	7	-	
Denmark	29.22	8	51.82	10	77.58	10	-	
Spain	-		37.00	8	39.07	6	-	
France	-		-		27.51	4	25.00	1
Holland	18.21	2	22.23	3	45.78	8	-	
Ireland	22.72	4	-		14.87	1	-	
Italy	15.35	1	20.17	2	-		-	
Luxemburg	38.98	10	-		-		-	
Portugal	**19.96**	3	**27.83**	6	**32.62**	5	**41.15**	3
United Kingdom	24.66	6	31.46	7	22.60	2	-	
Sweden	23.57	5	19.24	1	26.53	3	30.50	2
Average excl. Portugal	**25.52**		**30.64**		**39.38**		**27.75**	
% difference of Portugal compared to the average	-21.8%		-9.2%		-17.2%		48.3%	

3.31 After proceeding to the selection of offers using the criteria described in Section 2, an average price may be calculated from the different groupings of selected offers.

Advantages

3.32 The use of an average allows for softening of the eventual distortions in the results produced by the presence of offers situated in both extremes of the sample, i.e. the most and least expensive offers.

3.33 As shown in the previous epigraph, one inconvenience of the “best entry offer” criterion is its inadequacy for a comparison over time, due to the high dynamism of the broadband market. In this case, an average price of a small set of the cheapest offers can be used in order to avoid the removal/launch in the market of an offer which impedes the comparison in two different periods.

3.34 On the other hand, an average price weighted by market share can be used to introduce information on the representative price for comparable purposes.

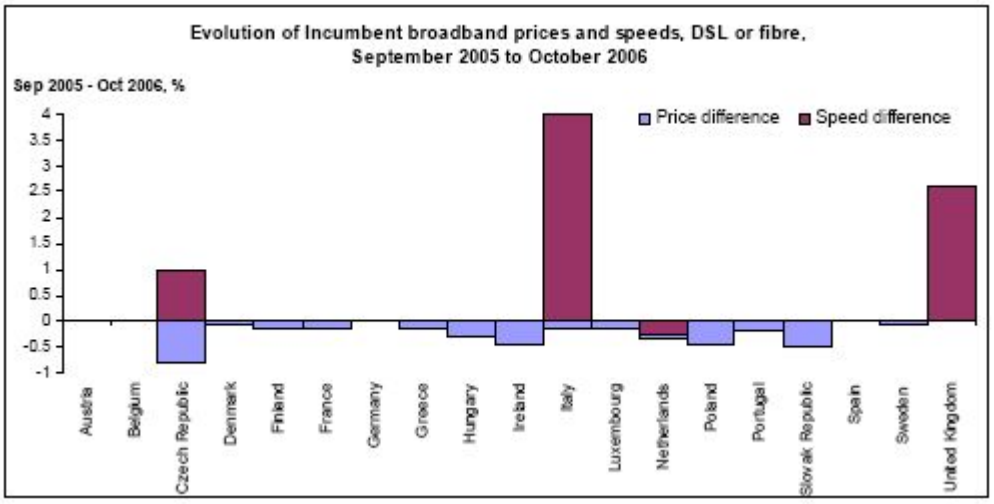
Disadvantages

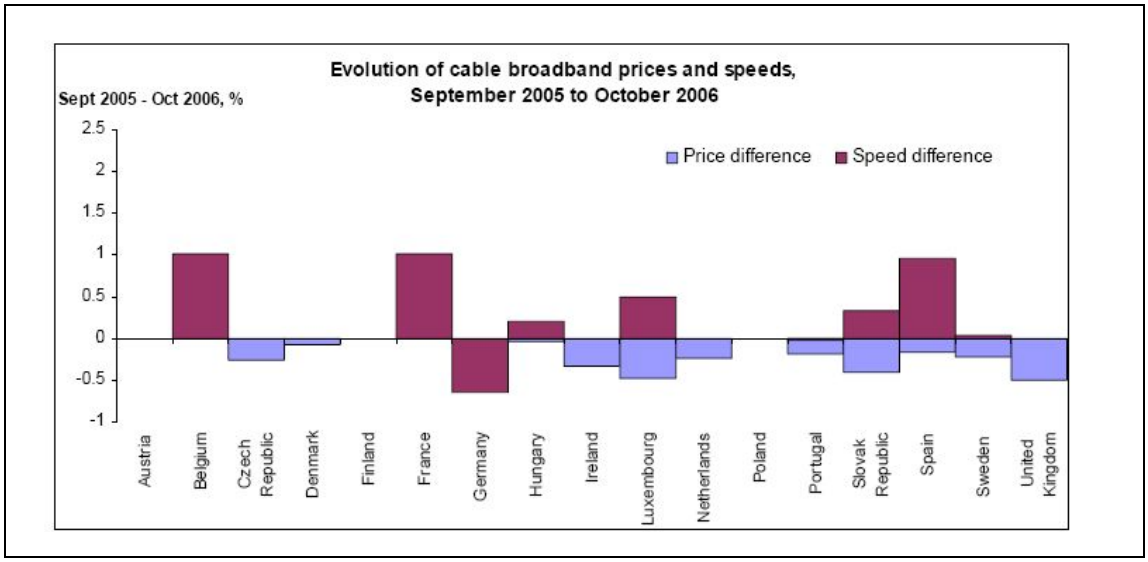
3.35 The strong feature of using an average criteria is also its main shortcoming, as there is a risk that this may not truly reflect the offer which, although in the extreme, is representative of the country.

3.36 In the case of the average weighted price by the number of subscribers, the downside is not of the criteria itself but the lack of availability of information in this regard.

Evolution of broadband prices vs. speeds

-Figure 12: Communications Outlook 2007, OECD, 2007





3.37 This analysis is used by OECD in its 2007 Communications Outlook and is also used by the European Commission in its 13th Implementation Report. In this analysis, the price is measured in relation to the speed of the incumbent as well as for cable operators. It measures the evolution in two periods of the price in relation to speed.

Advantages

3.38 This approach highlights the value for money, since an improvement in speed even with no price variation is considered to be equivalent to a decrease in broadband prices.

Disadvantages

3.39 One limitation of the analysis is that for some countries it was possible to track the same product in different years but not for other countries, so the criterion is not the same for all countries. Besides, the characteristics of each selected product are unknown so it is very likely that they are different among countries.

3.40 Actual prices paid by customers are not shown. The price difference in percentage is produced instead. When working with percentages, it should be taken into account that the lower the price, the bigger the percentage of price difference. For instance, from 30 euros to 28 euros the percentage of price difference is 7.1%; while from 40 euros to 38 euros the percentage of price difference is 5.2%. And the other way around: the same price variation percentage implies different variations in absolute terms.

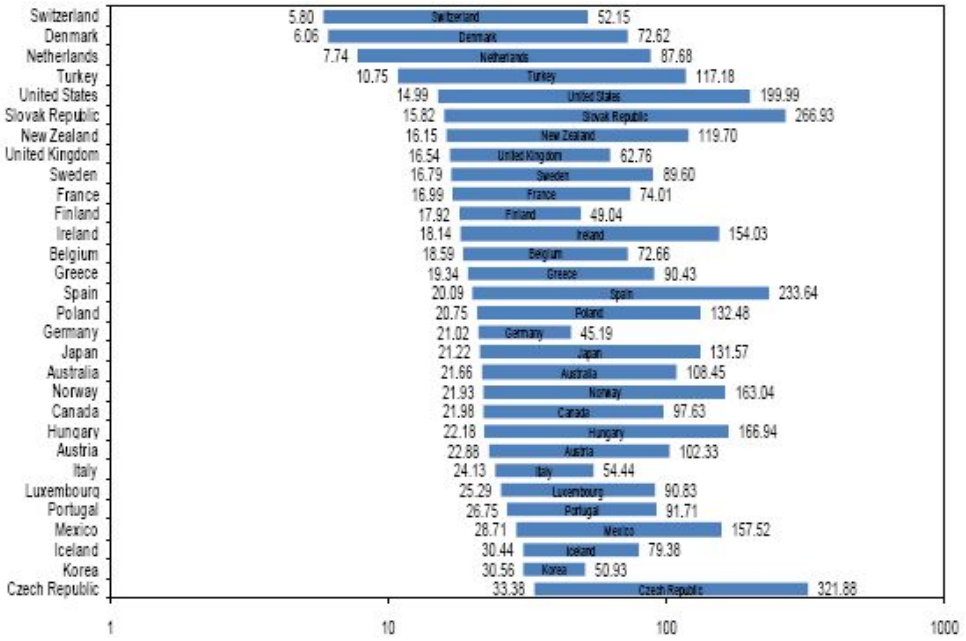
3.41 Furthermore, this comparison exercise does not compare broadband prices among countries and over time, but does compare how dynamic the take-up of the product is (price and speed variations registered in one year's time), not even showing how dynamic the broadband market is by means of including a larger sample of broadband products.

D. Range of broadband prices

-Figure 13: Broadband Growth and Policies in OECD Countries, OECD, May 2008.

Broadband monthly subscription prices, October 2007-

All platforms, USD PPP, logarithmic scale



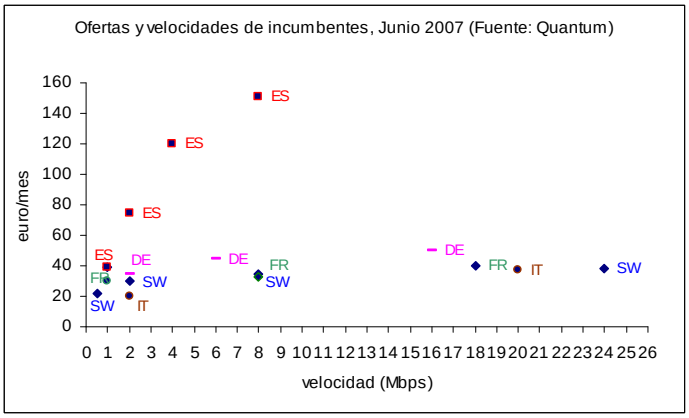
3.42 The range of broadband prices is based on the selection of the most and the least competitive offers. This analysis is produced by the OECD in several reports: In the Communications Outlook for different years as well as in the recently released Broadband Growth and Policies in the OECD Countries. This criterion is also used with broadband prices normalised by 1 Mbit.

Advantages

3.43 The range shows the difference between the highest and lowest value which represents a measure of dispersion. It also gives information about the spread of prices in a country.

3.44 Ideally, the measure of dispersion should be complemented with information about the tariff structure in the country. A scattered graph of price against speed will show information on what speeds are most frequently offered by operators and at what prices, obtaining a range of points.

Figure 14: Incumbent offers and speeds (Source: CMT from Quantum)



Disadvantages

3.45 With regard to the most expensive offers, as it can be seen from the OECD, that a high variability is found in the most expensive options and the highest value of the interval. Thus, caution should be taken in relation to the validity of the lowest and highest values of the interval.

3.46 In relation to speed, no information is available about the speed of the selected offers.

Section 4

ERG's methodology - principles

A. General principles

4.1 From the discussions and views outlined in the previous sections, which analyse the strengths and weaknesses of the different components comprising a methodology for the comparison of broadband prices, some conclusions can be drawn on the principles that should form the basis of an ERG's methodology for comparison of retail broadband prices.

- The methodology should recognise the limitations and relative validity of its results.

  A general principle to bear in mind is that whatever the methodology chosen, the results of the comparison will be affected by the specific components included. Therefore, instead of taking for granted any element of the methodology, an analysis should be made on the way it may affect the results and this should be highlighted.

- The methodology should clearly state the assumptions made.

- The comparison should be based on a regular time frame so as to allow for comparability over time. To this aim, the time frequency for publishing the results should be agreed, so should the mechanisms to mitigate the effects of the changes in the offers be.

  The original design of the methodology should accommodate in advance any possible change if needed. The grounds for any changes that will be accepted should be agreed and stated from the outset.

- Information on how representative the offers (i.e. about the actual subscription to them by consumers) are, if available, should be used in the comparison.

- If available, data on regional zones should be used in the comparison in order to get a full picture of the different tariffs in rural/urban areas or unbundled/bundled areas in the European context.

B. Structure of the methodology

4.2 In line with what has been discussed throughout this document, the structure of the ERG's methodology implementation would basically include:

1) Establishing the aim of the comparison:

   In the definition of the methodology, an initial step should refer to the purpose of the benchmark - what is the purpose of making the comparison?. This step is relevant as it will guide the selection of the different comparable components.

2) Design of the methodology:

   - Selection of comparable broadband offers (establishing homogeneous groups of products)
   - Selection of the comparison criteria
   - Definition of the broadband price

3) Data gathering (information needs):

   The design of the methodology must take due account of the different information needs imposed by the selected criteria, as they could limit and hinder obtaining the desired indicators.

4) Application of the methodology (results)

ERG's methodology – a proposal

Aim of the comparison

5.1 In terms of the requirements for ERG, the need is to develop a common methodology which provides the most suitable comparison within EU-countries. This means, firstly, that it is necessary to properly reflect the specific nature of the broadband services in the EU, which means, for example, reflecting the common trend in the increasing percentage of consumers subscribing to bundled offers or the similar development across the EU on the speed offers. Secondly, it is necessary to embrace the diversity encountered in the different Member States in terms of market situation, which refers, for instance, to the differences in the access technologies present in every country.

5.2 The aim of an ERG comparison is to indicate the performance of the broadband markets in the EU, in order to measure the impact of the regulatory practices (of the Common Positions, in the ERG case) in the broadband markets. In this regard, the analysis of the broadband retail prices is essential in terms of measuring the level of competition and also in terms of assessing its effects on the consumers' welfare.

Scope of the comparison

5.3 The scope of the comparison presents the following principles:

1. Broadband internet access is defined as an access assuring an always-on service with speeds in excess of 144kbps. This definition is consistent with the definitions made by the European Commission.

2. The benchmark covers ERG countries, comprising the 27 Member States of the European Union, the EFTA countries (Norway, Iceland, Liechtenstein, Switzerland), and the candidate countries Turkey, Croatia and Macedonia (FYRoM).

3. The analysis is aimed at comparing retail broadband price offers while wholesale prices are not under consideration as part of this review.

4. The broadband retail offers included in the comparison are only those addressed to **residential consumers**. Given their complexity and specificity, business offers are out of the scope.

5. The comparison is focused on fixed broadband technologies but a benchmark on **mobile broadband** will also be undertaken at the same time.

Limitations of the comparison

5.4 One should be mindful that the comparison is based on a series of assumptions and on the definition of specific parameters that impose a number of limitations into the analysis. Therefore, attention should be given to this in the interpretation of any results.

5.5 The main limitations in relation to the comparable data are as follows:

1. The comparison does not include information on the actual consumer subscriptions to the different offers, that is, on how representative the offers available are in the market

5.6 It should be noted that there is lack of data at an EU level on the number of subscriptions associated with every offer. As a consequence, the methodology makes assumptions on how representative the offers are and also that the different offers will be assumed to have the same weight in the market. However, if subscription data is available[15], this data may be included.

2. The comparison is based on national offers

5.7 For this comparison exercise the national area as a whole is taken, as many countries do not collect data by geographical areas.

5.8 Although geographical distinction among rural/urban areas or unbundled/bundled areas would be desirable, the fact that many European countries do not collect this information means that the information available at a national level must be used. At a later stage this distinction may be made.

3. The comparison will examine the inclusion of discounts and promotions

5.9 Taking into account that the discounts and promotions applied by operators can be of very different nature across Member States, the feasibility of their inclusion into the comparison will be subject to further analysis.

5.10 In particular, this assumption refers to:

- Discounts based on promotions which are valid for a specific period (e.g. subscriptions made in summer), geographical area (e.g. big cities) or users group (e.g. students)

- Discounts on exchange of a minimum duration for the contract (permanence clause), which can apply at the time of subscription to the monthly tariff, installation fees (recurring costs), hardware elements (non-recurring costs), etc.

- Discounts that can be obtained using a specific means of payment (e.g the use of direct debit)

4. The term speed refers to the headline speed advertised by operators, not to the actual speed enjoyed by the user

5.11 Although there are attempts to evaluate the actual performance of the broadband connections in some Member States, it is currently not viable to obtain information at an EU level[16] which can be relevant for the comparison. Therefore, only the advertised performance is taken as a reference for this review.

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[15] As explained later, the use of the Cocom speed bands provides information (although at a limited degree) on representative offers, given that its questionnaires gather data on the number of lines associated to each band.

[16] ANACOM has conducted two studies to determine the actual performance of broadband offers, the most recent being available at: http://www.anacom.pt/render.jsp?contentId=557178. In addition, a research programme to identify actual performance of broadband for consumers is currently being carried out by Ofcom's initiative of the Voluntary Code of Practice.

Selection criteria of broadband offers

1. Inclusion of bundled offers

5.12 The starting point for the comparison of retail broadband prices is the analysis of standalone offers, i.e, including only Internet access services. However, considering the current trend in the European markets, where the bundling of different services (mobile voice, fixed voice, TV) within a unique subscription represents a significant percentage of the market, the ERG's methodology should also include the bundled offers in the comparison.

5.13 Further analysis will be needed in order to agree the most suitable way to deal with these offers.

5.14 In any case, a separate analysis should be carried out for standalone and bundled broadband offers. Furthermore, a comparison will be necessary between bundled broadband offers with double play offers versus triple play offers.

2. Use of speed bands

5.15 Due to the limitations of comparing download speeds[17] and of normalised price per 1Mbps[18], the identification of speed bands seems more appropriate at this stage of market evolution.

5.16 For the sake of simplicity, the specific bands to be used could be built on speed bands already agreed at an EU level, which has been used by Cocom[19] in the elaboration of the half-yearly Cocom broadband report.

5.17 Apart from reducing the burden on NRAs for gathering data (as this data has already been collected for Cocom), this approach would allow use of data on the how representative the offers are, given that the Cocom questionnaires provides information regarding the number of lines associated with each speed band.

5.18 The speed bands included in the comparison would be as follows:

- 144 Kbps to 2 Mbps (not incl.);

- 2 Mbps to 10 Mbps (not incl.);

- From 10 Mbps on.

5.19 As broadband connections gradually provide higher speeds with the development of the Fibre to the Home ('FTTH'), new speed bands, especially faster speeds, could be defined and agreed in the future for a more accurate benchmark.

3. Access technologies

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17 In particular, the main limitation is that not all the download speeds are available in all countries and in principle an ERG methodology should take into account all Member States.

18 In particular, the main limitation refers to the fact that high speed offers are favoured, this effect being linked to the non-linear ratio between price and speed.

19 COCOM07-35 Working Document: Broadband data and indicators-proposed modifications (June 2007).

5.20 All access technologies (xDSL, cable, fibre) are taken into account into the methodology.

5.21 However, a particular distinction in the comparison of every access technology could be problematic in the case of some technologies, such as cable, which may not be available in all countries. Therefore, for the sake of comparability across countries, the broadband offers should not differentiate on access technology.

5.22 Regarding the **mobile broadband market**, a separate benchmark exercise will be included. The details about the specific type of data for the mobile comparison would need to be further analysed at a later stage of the methodology.

4. Type of operator (ILEC, CLEC)

5.23 Offers of all type of operators are included in the benchmark.

5.24 However, taking into account the relevance of the incumbent operators' products (in terms of coverage and market share), these particular offers are analysed separately in the comparison from the offers provided by the alternative operators. In practice, two comparisons are included, one devoted to compare incumbent's products across countries and the other to compare the whole sample of offers (those provided by/subscribed with incumbent and alternative operators).

5. Limited / unlimited offers

5.25 Offers limited by download volume are considered in the methodology.

5.26 However, taking into account that the largest amount of offers in the Member States are of unlimited nature, the effect on the comparison of the capacity-limited products is expected to be low. Furthermore, it appears that the volume caps in the market are in most cases not so restrictive if we consider that, according to the behaviour of the average Internet user[20] the download caps considered to be restrictive are those below 1 GB.

5.27 In any event, further analysis on this issue would be necessary in order to conclude on the necessity to introduce normalisation parameters (i.e. definition of usage patterns) within every speed band in order to deal with limited and unlimited offers in the comparison.

5.28 Offers limited by time are excluded from the methodology.

5.29 Taking into account the small representation of this kind of product at an EU level as well as the fact that they do not take account of what an average consumer can expect from a broadband service, its inclusion in the methodology does not seem meaningful and has therefore been excluded.

Comparison criteria

[20] Office of Communications (Ofcom), The Communications Market: Broadband, April 2007.

5.30 In the absence of information about the number of consumers associated with every offer, the "best entry offer" is used as an approximation for the price comparison.

5.31 The best entry offer is the minimum price at which a broadband connection is available within each of the speed bands analysed. It is the cheapest price but not intended to be the most representative. It refers to "marginal offers", not representing the price paid by the majority of users with "infra-marginal" offers.

5.32 In order to avoid the deficiencies raised by the use of this indicator in a comparison over time, namely the effect in the results of the possible price changes due to the change in the offers selected, an average is used to mitigate any distortion in the results when repeating the comparison over time.

5.33 Therefore, instead of selecting only the cheapest offer of the sample within every speed band, the three best offers will be chosen and their mean average calculated.

5.34 In addition to the best entry offer indicator an array of other indicators (average monthly tariff, range of prices, etc.) can be agreed as a way to provide more reliable conclusions.

Definition of the broadband prices

5.35 The price of a broadband retail offer is considered to be composed as indicated by the following formula:

Total price = Recurring costs + Non recurring costs + [Usage costs] *****

***** *Only for capped offers*

1. Recurring costs

5.36 The recurring costs are linked to the fixed price paid monthly, and basically composed by the monthly tariff and the monthly line rental.

5.37 The monthly tariff refers to the fixed payment engaged by the consumer for the use of its broadband connection. It is applicable both in the case of uncapped and capped offers. In the latter case, the monthly tariff refers to the fixed price to be paid when the service usage is below the cap, whereas the charges applicable to usage in excess of the limits (in time or download capacity) are added to the formula through the "usage" component (see above).

5.38 The monthly line rental is the fixed payment engaged by the consumer for having access to its broadband connection. The inclusion of the line rental charges in the formula would allow a comparison of offers including the full payment to be done by the consumer. This includes, apart from the monthly tariff, the additional cost incurred when subscribing the broadband connection[21]. In the case of xDSL, broadband prices do not usually include PSTN line rental charges –when published in the operators' site–, even though subscribers may

[21] Therefore, the affordability of the broadband service does not depend solely on the price but also on the additional cost associated to the connection (line rental). According to ECTA information as of December 2006, this wholesale service only exists in 6 countries and, 4 out of 6 NRAs state that this is a service with still low relevance.

be required to have a PSTN line to subscribe to DSL. On the contrary, cable operators usually include the line rental charges in the tariff. In the case of Fibre to the Exchange ('FTTx'), the monthly fee paid to the utility company for the fibre, the equivalent to the line rental for xDSL solutions, may be included in the monthly subscription fee depending on the business model of the utility companies (closed or open networks). Therefore, this criteria allows for the comparison of broadband prices in a technologically neutral manner, in particular with regard to cable services.

5.39 On the contrary, the exclusion of the line rental is supported by the fact that most ADSL users, when subscribing a broadband offer, either previously own a PSTN line or they subscribe to it not only for broadband but also for voice services (and in this case it is difficult to assess which part of the PSTN price derives exclusively from the broadband connection). In this case, the inclusion of the monthly line rental would distort the results.

5.40 In conclusion, **further analysis at an EU level would be needed** in order to assess the viability of this approach and the specific value of the line rental charges to be included in the formula.

2. Non recurring costs

5.41 Given the difficulty in obtaining information about the non-recurring costs, these charges would not be included in the comparison of prices.

5.42 Nonetheless, the inclusion of discounts/promotions, if feasible after due consideration, may lead to consider non recurring costs as an element of the price.

3. Usage costs

5.43 In theory, usage is necessary if limited and unlimited offers are included in the methodology. However, the tariffs capped in terms of time are excluded for the comparison (they are not so commonly offered by operators) and tariffs capped in terms of download capacity allow for unrestrictive capacity caps, then usage is not necessary as a way of harmonisation with uncapped tariffs.

5.44 As commented above, if the restrictions of the volume-limited offers are considered to be non negligible, the definition of usage patterns would require further analysis.

Price unit

1. Currency

5.45 For the benchmark exercise, the Euro is used.

5.46 In addition, the Euro adjusted by PPP is used in order to avoid the influence of the differences in purchasing power in the comparison.

5.47 Therefore, two different results will be provided, in Euro and in Euro adjusted using PPP.

2. VAT

5.48 Two comparisons are defined, with and without VAT:

(i) VAT is included, in order to evaluate the real price an end-user is paying to use a broadband connection.

(ii) VAT is excluded in order to eliminate the distortions due to the disparity in the standard VAT rates within each of the EU countries.

Data gathering

5.49 The data will be collected by the ERG.

Period

5.50 Given the high dynamism of the broadband market, and the implications of the data gathering process, it is proposed that the retail broadband prices will need to be systematically tracked for, at least, a period of 6 months.

Annex I

Overview of existing methodologies

		OECD		
		OECD Baskets	**Benchmarking broadband prices in the OECD (2004)**	**OECD Communication Outlook (2007)**
Sample Selection	**Bundling/ Standalone**	Standalone broadband	Standalone broadband	Standalone broadband
	Limited/ Unlimited	Both	Both	Both
	Operators	Incumbents	Incumbents Alternative	Incumbents Alternative
	Access Technology	DSL	DSL, Cable	DSL, Cable, Fibre
	Speed	Actual and normalized price per 1 Mbit	Speed bands 10 to 100 Mbps 2 to 10 Mbps 1 to 2 Mbps Offers below 1 Mbps	Actual and normalized price per 1 Mbit
Broadband price	**Recurrent costs**	Yes	Yes	Yes
	Non-recurrent costs (instal. + hardware)	Yes	No, but info on installation costs is given	No
	Discounts?	Yes	Yes	No
	Usage	20, 30 and 40 hours baskets	No, but info on additional price per Mbps is given	No
	Price Unit	USD, VAT incl.	USD + USD PPP, VAT incl.	USD PPP
Comparison criteria		Best entry offer	Best entry offer	Lowest and most expensive offer

		EUROPEAN COMMISSION			
		Internet Access Cost (2004)	**Information Society Benchmarking (2005)**	**XIII Implementation Report**	**Broadband Internet Access Cost (to be published)**
Sample Selection	**Bundling/ Standalone**	Standalone broadband	Standalone broadband	Standalone broadband	Standalone broadband
	Limited/ Unlimited	Both	Both	Both	Both
	Operators	Incumbents Alternative	Incumbents Alternative	Incumbents Alternative	Incumbents Alternative
	Access Technology	DSL, Cable	DSL, Cable	DSL, Cable, Fibre	DSL, Cable, Fibre
	Speed	Normalized price per 1 Mbit	Normalized price per 1 Mbit	Actual and normalized price per 1 Mbit prices	Range of download speeds (256 Kbps, 512 Kbps, 1024 Kbps, 4 and 8 Mbps, 8 to 20 Mbps, higher than 20 Mbps)
Broadband price	**Recurrent costs**	Yes	Yes	Yes	Yes
	Non-recurrent costs (instal. + hardware)	Yes	Yes	No	Yes
	Discounts?	No	No	No	No
	Usage	40 hours or 10 Gigabits per month	40 hours or 10 Gigabits per month	No	Yes
	Price Unit	Euro, VAT incl.	Euro and € PPP, VAT incl.	USD PPP (% of price variation shown)	Euro, VAT incl.
Comparison criteria		Best entry offer	Best entry offer	Lowest and most expensive offer	Best entry offer

ITU

		Birth of Broadband (2003)	Measuring the information society (2007)
Sample Selection	Bundling/ Standalone	Standalone broadband	Standalone broadband
	Limited/ Unlimited	Limited (1 Gigabyte and 100 hours/month)	Both
	Operators	Incumbents Alternative	Incumbents Alternative
	Access Technology	DSL, Cable	DSL, Cable
	Speed	Normalized price per 100 Kbit	No
Broadband price	Recurrent costs	Yes	Yes
	Non-recurrent costs (instal. + hardware)	No	No
	Discounts?	No	No
	Usage	1 Gigabyte and 100 hours/month	20 hours per month
	Price Unit	USD and USD PPP, vat incl.	USD and USD PPP, vat incl.
Comparison criteria		Cheapest monthly price per 100 Kbit as a percentage of monthly income	Cheapest prices for 20 hours per month of internet access and Cheapest prices for 20 hours per month of internet access as percentage of Gross National Income per capita

I. OECD

I.A. OECD baskets and Teligen's T-connect Product

6.1 The OECD Internet basket (developed by Teligen) includes one monthly line rental for a residential user. Usage charges are defined in blocks of one hour for the 20, 30 and 40 hour baskets. For 20 hours of usage, the price is the equivalent of 20 calls of one-hour duration at peak or off-peak rates. For the "always-on" basket, usage is defined in 30 calls of five-hour duration.

6.2 Discount schemes (or special access number pricing) and tax rates are applied to these charges. The access pricing selected represents the best available offer for the applicable online time (this can be a different discount scheme for peak or off-peak service). The Internet Service Provider ('ISP') charge is the best

available rate, from the largest telecommunication operator, for that amount of service.

-TELIGEN-

Teligen is a consulting firm that provides information on the prices of electronic communications services to the OECD and to the European Commission.

In October 2007, Teligen launched the T-Connect service, which makes it possible to perform international comparisons of prices of ADSL broadband Internet access offers. The collected data is limited to the offers of the historic operators of the EU, Switzerland, Norway and Iceland.

T-Connect makes it possible to perform price comparisons using usage Baskets (defined in terms of traffic volume, usage profile during the day period, number of usage hours per month).

The T-Connect product includes business and residential tariffs, as well as broadband tariffs that are bundled with additional telephony services such as line rental and/or telephone calls. Bundled tariffs include only internet and telephony services and only rental and charges related to the internet element are considered – in other words if calls are included in a bundle which contains broadband access, the call element is not added to the analysis, and standard PSTN and cable connection/rental charges are also not included. Bundles that include television services are also not analysed.

This is to ensure that the analysis is confined to the cost of broadband internet services, while also recognising that an increasing number of broadband users receive their broadband by means of a bundled service.

Where multiple bundles are offered in a specific country or by a specific operator, the cheapest bundle is used. In general promotional offers such as “free connection” are not included unless such promotions are unlimited (e.g. permanent free connection promotions where the user never pays a connection fee).

I.B. Benchmarking broadband prices in the OECD (2004)

6.3 Prices were compared across different levels of service (speed bands) for incumbents and new entrants and then for incumbents against each other. There was no special reason for choosing the categories of capacity: 10 Mbps to 100 Mbps, 2 Mbps to 10 Mbps, 1 Mbps to 2 Mbps and below 1 Mbps. They were chosen as a simple way to categorise and compare offers at similar levels of advertised performance.

6.4 In most cases operators advertise the maximum connection speed and the actual data transfer rates can be influenced by a number of other factors that are not always made transparent to the user (e.g. the contention ratio, distance from exchange) or other factors that are beyond the control of the operator. Advertised broadband access speeds range enormously across the OECD. In some countries fibre to the home connections are available at speeds up to 100 Mbps. By way of contrast baseline offers, using platforms capable of providing broadband access start as low as 128 kbps. While there is, in fact, no standard definition of the speed necessary for a connection to be considered ‘broadband’, there is widespread agreement that this should be faster than basic rate ISDN which operates at 128 kbps. In this document most attention is paid to offers

higher than 250 kbps but in some markets lower speed offers using broadband platforms are available.

6.5 When collecting the data it is assumed that a user is a customer of the service provider. In other words the prices shown for services such as DSL and cable modem assume that a user also takes telephony or cable television from that provider. This generally enables the least expensive price to be selected. In addition many providers offer less expensive prices if a customer is willing to sign a contract to take service for a specified duration. The prices selected are for contracts up to a maximum of two years.

6.6 The operators selected, in all OECD countries, have a combined market share of more than 60% of the total number of broadband subscribers.

6.7 All offers need to have always-on capabilities. This does not mean that a user will necessarily always have their connection open but the pricing structure needed to accommodate this capability (i.e. unmetered offers or offers metered by data transfer rather than online time).

6.8 All prices cited in the text are expressed in United States dollars using exchange rates, but purchasing power parity equivalents are also available in the tables. Applicable taxes such as value added tax (VAT) are included in the prices. The data collected directly from operators are for offers aimed at residential and small business users as of October 2003. If there have been major shifts in pricing announced, prior to the end of February 2004, these are mentioned in the text associated with the country concerned, where possible, but not included in the tables.

I.C. Communications Outlook (2007)

The *OECD Communications Outlook* provides an extensive range of indicators on the development of different communications networks and compares performance indicators such as revenue, investment, employment and prices for services throughout the OECD area. This book is based on the data from the OECD Telecommunications Database 2007, which provides time series of telecommunications and economic indicators -such as network dimension, revenues, investment and employment- for OECD countries from 1980 to 2005.

6.9 The OECD research gathered pricing data in each country on all broadband offerings from the incumbent telecommunication operator, a key cable company and a third competitive provider (cable, fibre or ADSL).

6.10 The comparison looked at the same package, if available, or one that made the consumer better off one year later.

6.11 Range of monthly subscription charges in USD PPP across all three providers in each country: the lowest entry point and the most expensive offer put forward by the three surveyed firms in each of the 30 OECD broadband markets.

6.12 Evaluating monthly subscription ranges alone neglects the differences in prices for bandwidth. Countries can also be compared by the price per Mbit/s that

users pay for connectivity (entry level charges per Mbit/s; range from lowest and highest observed price per Mbit/s).

II. European Commission

II.A. Internet Access Cost (2004)

6.13 In this study, prepared by Teligen for the Commission, dial-up access is compared against DSL and cable-modem access. The development of bundles when the report was released was short. Notwithstanding this fact, its analysis gives forecasts of what was expected for that year in the Broadband Internet Access Cost study.

6.14 Leaving aside dial-up, different tables for DSL and Cable-modem are produced. Due to the existence of offers limited either by data volume or by time, Teligen assumed a usage level of 40 hours or 10 Gigabits per month (with each session lasting 60 minutes).

6.15 Both for the best normalised price and for the cheapest price, the usage level mentioned before is taken into account. This means that besides non-recurring and recurring costs, usage costs are also factored. This can be easily illustrated as set out in the table below.

Cheapest for each provider *All prices in Euro, including VAT*			Normalised prices per month @ 1024 kb/s 40 hours / 10 GB per month, 60 minutes per session				
Country	ISP	Package	Speed Up/Down	Non-recurring	Recurring	Usage	Total
Sweden	Telia Sonera	Telia Bredband 8000	800 / 8000	0.48	5.68	-	6.16
Belgium	Belgacom Skynet	ADSL Go	128 / 3072	2.15	9.72	-	11.87
Belgium	Tiscali	Tiscali ADSL	128 / 3000	0.66	11.46	-	12.12
Netherlands	Planet Internet	ADSL Advanced	640 / 4096	0.86	17.29	-	18.14
Germany	FreeNet	freenet DSL by Call traffic	196 / 1536	2.11	11.82	6.05	19.98
Netherlands	Zon Zonnet	Extra	640 / 4096	1.60	19.03	-	20.63

6.16 The bandwidths offered in the different countries vary a lot. Teligen's research shows that there is no single bitrate combination speed that is offered in all countries. Nowadays, this statement is also true.

6.17 This characteristic, hinders the establishment of an inter-country price comparison that can be overcome by using speed bands, as suggested in the Broadband Internet Access Cost, or by using normalised price per 1 Mbit. With products classified by speed bands as well as with normalised prices direct comparisons can be made. However, in the cheapest price comparison, a direct price to price comparison is not immediate, since it is necessary to seek products with the same speed.

6.18 A normalised price per 1 Mbit allows for direct price comparisons. This normalised price per 1 Mbit is calculated in the following way:

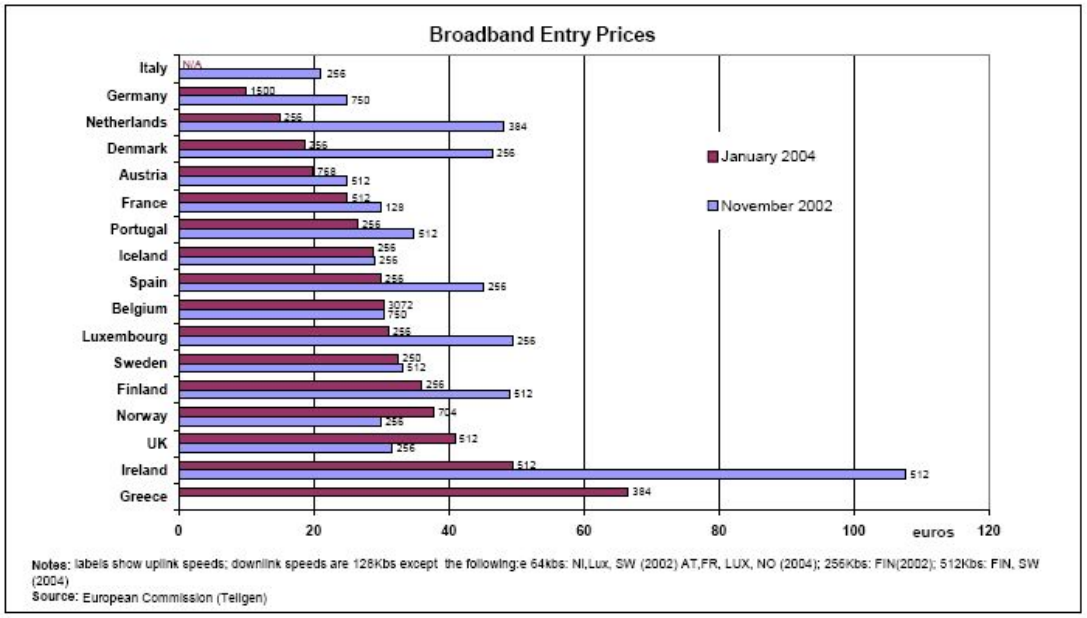
- Upload and download bitrates are added to get a total bitrate.
- The monthly rental is divided by the calculated total bitrate and multiplied with 1024 Kbps (1 Mbit/s) to give the price per 1 Mbit/s.
- The non-recurring charges (e.g. hardware and installation) are then added to this price, discounted over three years.
- Finally, any applicable usage charges are added to the total (e.g. charges applicable to usage in excess of the limits set in the comparison, those being 40 hours or 10 Gigabits per month).

II.B. Information Society Benchmarking Report (2005)

6.19 In June 2005, the European Commission set out a new strategic framework for the Information Society, i2010 –a European Information Society for growth and employment. The Information Society Benchmarking Report 2005 provides the first overview of the state of the Information Society since i2010 was adopted and a check on progress since the launch of eEurope 2005 in 2003. It also provides the first analysis of the Information Society in the Member States that joined the EU in 2004. This report is largely based on the 2004 surveys of Households and Enterprises that were developed by Eurostat and the National Statistical Institutes of the EU Member States. These surveys are supplemented by actualized data, for example, the e-Business Watch survey of 2005 and broadband subscriber data from July 2005 and independent studies to make up a comprehensive review of Information Society themes. The report covers the whole EU25 plus the candidate and EEA countries.

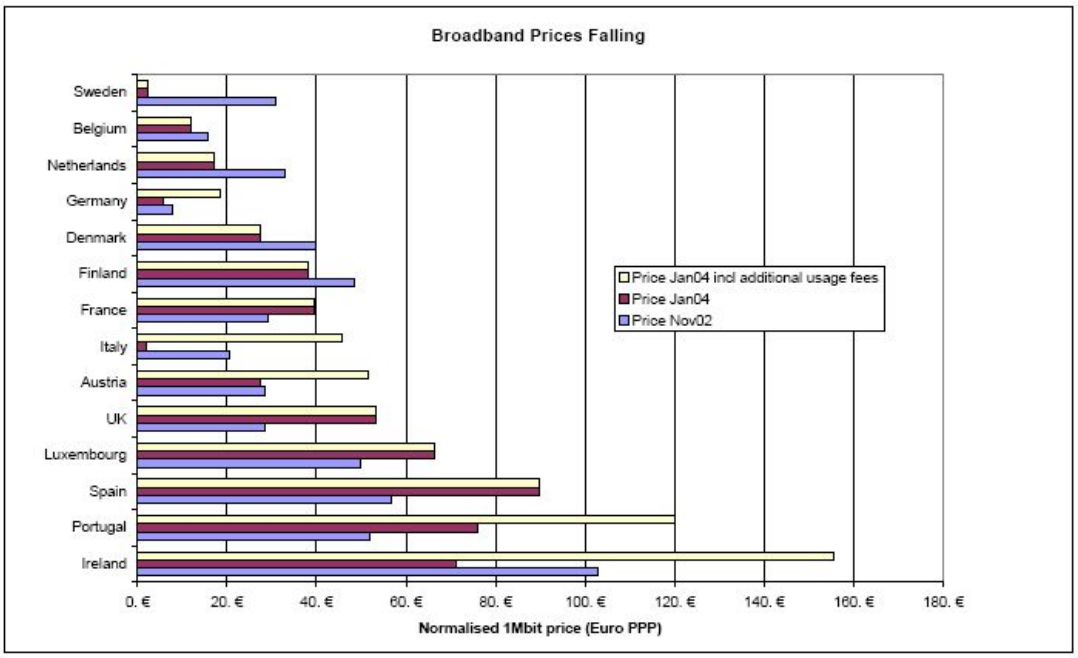
6.20 This report was carried out by Teligen for the EC. Again two categories of prices were used: Entry price and Normalised 1 Mbp/s price (the same categories as in the Internet Access Cost study (2004)).

6.21 Entry price is the lowest offered price for a broadband connection at any speed. A dynamic analysis comparing two different periods of time is shown. The graph 1 below also shows the relation price to speed. No mention of usage levels is made.



Graph 1: Broadband Entry Prices. Source: European Commission

6.22 Normalization of price is calculated in the same way as in the 2004 study. In this case, it also assumes the 40 hours usage and 10 Gbit/s download per month pattern (Graph 2: additional usage fees in yellow)



Graphic 2: Normalised 1Mbit Price. Source: European Commission

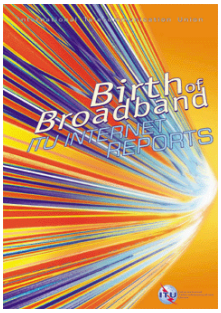
II.C. XIII Implementation report (2008)

6.23 In the XIII Implementation Report, volume 1, released on March 2008, the European Commission refers to the study prepared by OECD "Communications Outlook 2007". In fact, it shows exactly the same two graphs as those appearing on the mentioned OECD publication.

6.24 In the first graph, broadband prices and speeds for incumbents, either by DSL or fibre, are compared between September 2005 and October 2006. In the second graph, broadband prices and speeds for cable operators are compared between September 2005 and October 2006.

6.25 The idea is measuring price in relation to speed, showing the value for money, since an improvement in speed even with no price variation is considered to be equivalent to a decrease in broadband prices. In other cases, prices fall while transmission speeds increase between the two periods of time, 2005 and 2006.

III. ITU



III.A. Birth of broadband (2003)

"*Birth of Broadband*" is the fifth in the series of the "*ITU Internet Reports*", originally launched in 1997 under the title "*Challenges to the Network*". This edition was specially prepared for the ITU TELECOM World 2003 Exhibition and Forum, which was hold in Geneva from 12 to 18 October 2003. This report examines the emergence of high-speed, dedicated Internet connections as a way to expand the world's access to information.

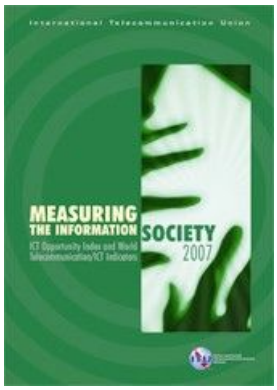
6.26 In the different chapters, the report "Birth of Broadband" explains what broadband can do for users, the different types of broadband technologies, the

emerging applications, the new regulatory challenges and provides information about some case studies. The Statistical annex contains data and charts covering 206 economies worldwide, with original data on broadband and comparative information measured against a selection of variables. This study measures broadband prices per 100 Kbit/s, as percentage of monthly income. The broadband offers compared are residential offers unless only business connections are available from the ISP. Most services are DSL-based, but cable and WLL were also used.

6.27 The prices shown do not include installation charges or telephone line rentals, which are often required in a DSL service. Broadband prices per 100 Kbit/s represent broadband prices per month divided by the speed down and then multiplied by 100. For this reason, they do not necessarily represent the least expensive of fastest connections available and can only be used as a rough example of current offers available to users within an economy.

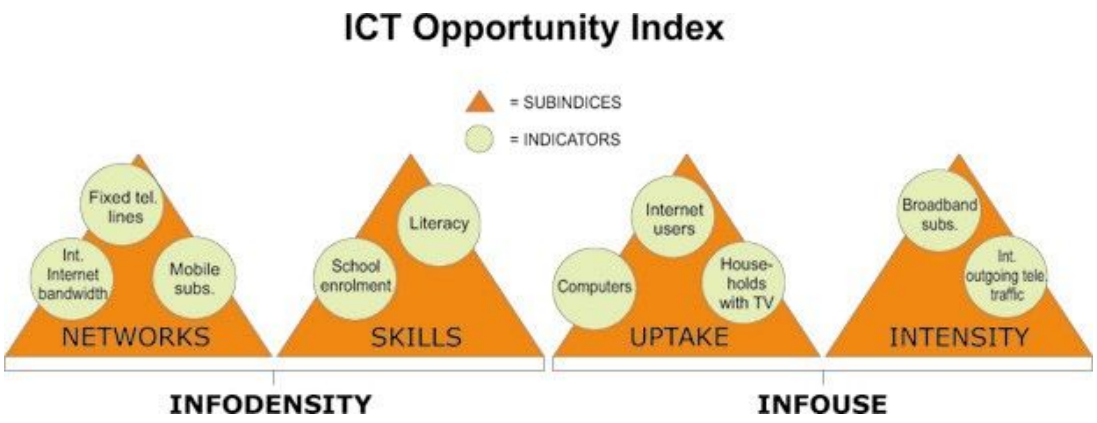
6.28 Some ISPs place download limits on broadband connections. Where applicable, the service offering closes to 1 Gigabyte of data per month was used. Other economies put time restrictions on broadband usage. The service offering closes to 100 hours per month was selected.

6.29 The prices were gathered looking for the most "common" of cost-efficient broadband offer. As an example, if an economy offered 256 and 512 bit/s ADSL, the faster speed was only used if it offered better value per 100 kbit/s. In other words, the monthly price per 100 kbit/s had to be equal or less than the lower speed in order to be used.



III.B. Measuring the information society (2007)

The ITU's 2007 ICT Opportunity Index, which has benefited from the expertise of several international and research organizations, is based on a selected list of indicators and methodology. The different sub-indices allow countries to further identify their specific weaknesses and strengths (see figure below).



6.30 The 2007 ICT-OI, which is an inclusive index and provides measurement across 183 economies, relies on ten indicators that help measure ICT networks,

education and skills, uptake and intensity of the use of ICT. For analytical purposes, economies are grouped into four categories, ranging from high to low ICT Opportunities. Apart from cross-country comparisons, the index's methodology highlights relative movements between 2001 and 2005. A comparison of annual average growth rates shows which countries are making progress and how fast.

6.31 With regard to the network index, it measures fixed telephone lines per 100 inhabitants, cellular subscribers per 100 inhabitants and international internet bandwidth (Kbits/s per inhabitant).

6.32 Data is generally those of the largest Internet Service Provider (ISP) and incumbent telephone company. Where broadband is available, the cost of a monthly broadband subscription is compared to the cost of dial-up.

6.33 The cost of dial-up also includes telephone usage charges, based on 20 hours of local calls of one-hour duration. It is assumed 50% of peak usage and 50% of off-peak usage. Where broadband is used, telephone usage charges are not included. The monthly rental for the telephone line is not included.