



Final Report for Maatschappelijke
Integratie – Intégration Sociale

Lot 1 – A Comparative
Study of Retail Prices for
Broadband Internet
Connections and Triple-
Play Offers in Belgium
and Six Other European
Countries

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0 Executive summary

0.1 Introduction

Analysys Consulting Limited (Analysys) has been asked to conduct an analysis of the structural determinants of the price of broadband Internet access in Belgium. This report is the first part of the framework that has been defined with the SPF MIIS of Belgium, which divides this study into two 'lots' of work. In this report, we will compare objectively the price of broadband Internet connections and triple-play (fixed-line voice, broadband and digital TV from one provider) services in Belgium and a set of six benchmarked countries.

The benchmarked countries chosen by SPF MIIS are Austria, Belgium, France, Germany, the Netherlands, Sweden and the UK. They were chosen for their proximity to Belgium, their similarity in terms of GDP per capita, the similarity of their market structure (including at least one major cable TV operator) and a comparable broadband penetration per household. They also include markets of a similar size to Belgium.

For the broadband Internet comparison, we have benchmarked 35 operators, comprising each country's incumbent fixed-line operator as well as major cable operators, alternative network operators and Internet service providers (ISPs). We have gathered data for these operators over a six-year period, from 2001 to 2006. For the triple-play comparison, we have benchmarked the prices of 22 service providers in November 2006.

0.2 Methodology

The comparison of broadband and triple-play products' prices is not straightforward and there are various factors to consider.

The price of broadband is related to the quoted maximum Internet speed (measured in kbit/s or Mbit/s), but is in many cases also related to the volume of data (or time permitted to be connected) included in the monthly charge, as defined by the usage cap or in the fair use policy. We also have to decide how to place weight upon the upstream speed and the downstream speed, when we compare the quoted maximum speeds to prices associated with each offer.

Based on our experience of other similar projects, we have defined a product comparison framework, including three comparison methods:

- cheapest product offering at least a specified downstream speed, for a range of speeds ('downstream speed range')
- geometric mean of speed unit price
- downstream speed unit price.

We have then applied the three comparison methods to all services offered to consumers by the operators under study in each of the seven countries over the period 2001–2006.

Additionally we have directly compared the incumbent operators' offerings in each country using the 'downstream speed range' comparison method.

We have also compared the prices of two operators which offer broadband services in Belgium and several other countries in the study (UPC/Chello in Austria, Belgium, France, the Netherlands and Sweden, and Tele2/Versatel in Austria, Belgium, France, Germany, the Netherlands and Sweden) using two of the comparison methods.

We have then compared triple-play packages in each country using the same comparison methods.

Finally we have compared installation, connection and equipment purchase charges and compared usage caps for a specific downstream speed for each operator in each country.

0.3 Comparison of broadband offers

Belgium was the first country in the study to have a service of 4000kbit/s or more when Telenet launched a cable-modem service providing 10Mbit/s downstream in 1997. Sweden followed in 2003 when B2 Sweden launched its 10Mbit/s downstream and upstream offer. In the remainder of the benchmarked countries, services with 4000kbit/s or more downstream speed were progressively offered from 2003 to 2005. Exhibit 0.1 below shows the price of the cheapest service of 8000kbit/s or above in each country since 2001.

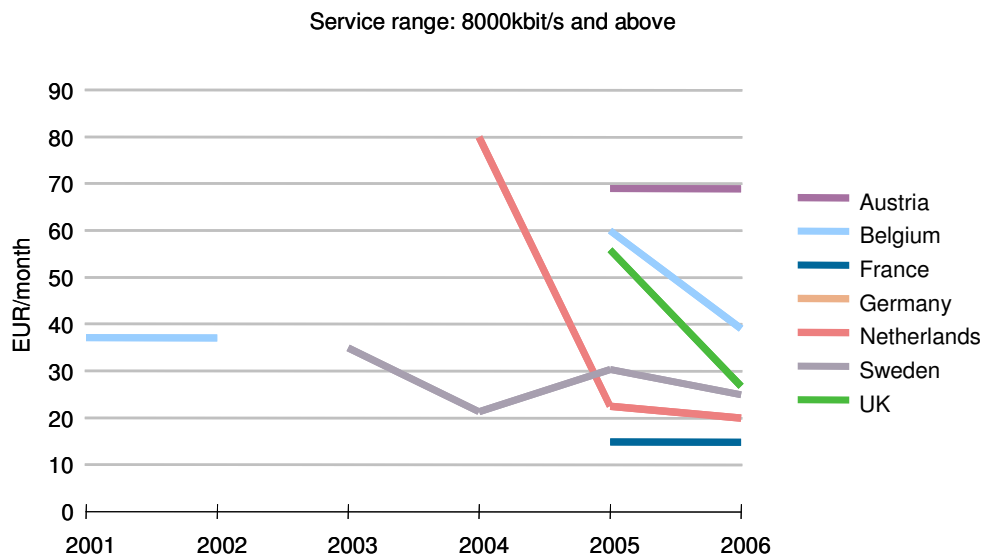


Exhibit 0.1: Minimum monthly price for 8000kbit/s (and above) Internet services in the benchmarked countries [Source: Analysys]

There are two main observations: firstly, Belgium was much more advanced than the benchmarked countries in 2001 and 2002 for high downstream speeds and a competitive price for that service. Secondly, the headline capacity offered by Telenet decreased to 4000kbit/s in 2003 and was only reinstated to a higher speed in 2004; hence there was no offer to new customers in Belgium for 8000kbit/s and above services from 2003 to 2004. It

should also be noted that the Telenet offer was only available to those customers in the Telenet cable franchise area, predominantly in Flanders, in line with the rollout of the cable network upgrading programme.

Exhibit 0.2 below shows how the prices of Belgium’s cheapest offers in each speed range compared with the average price of the benchmarked countries’ cheapest offers over time.

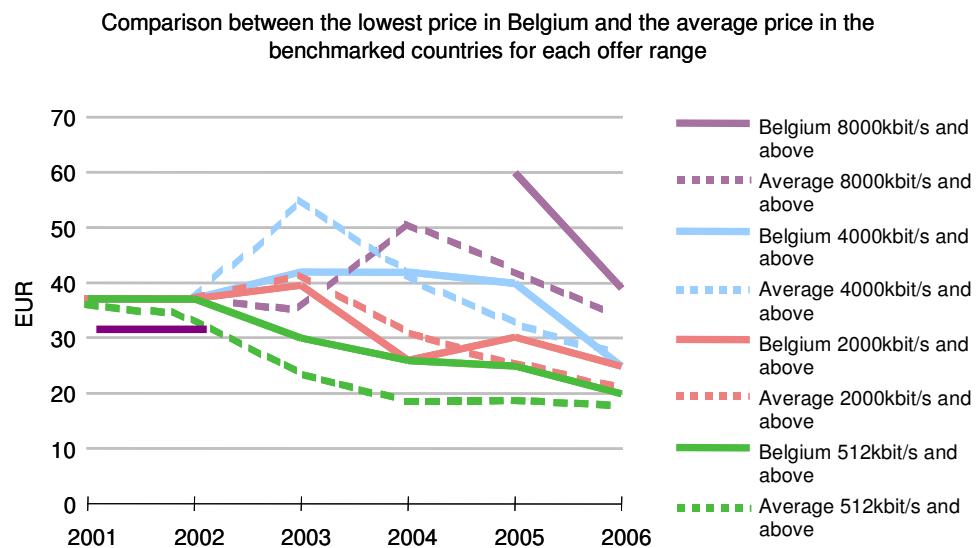


Exhibit 0.2: *Historic comparison between Belgium’s lowest prices and the average lowest prices in the benchmark*

Belgium’s cheapest service offer in the 4000kbit/s and above range remained highly competitive against the average of all countries until 2004, when the average started to fall below the Belgian benchmark.

Belgium’s cheapest service offer in the 2000kbit/s and above range followed the average fairly closely over the period, though the Belgian offer is currently more expensive than the average.

In the entry level range of 500kbit/s and above, Belgium’s cheapest offer was always above the average of the benchmarked countries cheapest offers.

Exhibit 0.3 below shows the lowest price offer in each country for each of the four downstream speed ranges as at the end of November 2006.



Exhibit 0.3: *Lowest price offer per country for different offer ranges in the benchmark countries*

In three out of four speed categories, Belgium’s lowest price is above the average price. In the 8000kbit/s and above range it is EUR5.51 above the average; in the 2000kbit/s and above range it is EUR3.39 above the average; and in the 500kbit/s and above range it is EUR2.17 above the average. In the fourth category, 4000kbit/s and above, Belgium’s lowest price is the third cheapest price at EUR2.16 below the average.

Conclusion

This is a mixed picture and has changed over time; from being in the vanguard for high speeds, Belgium now finds itself with prices which are above those offered in the Netherlands and France and indeed above the average of the benchmarked countries for three out of the four speed categories we have considered.

0.4 Comparison of triple-play offers

Comparing triple-play packages with a broadband service in the range of 8000kbit/s or more, France is the most advanced country with Free's triple-play package for EUR29.99. There is no available package in Austria that offers such high speeds. The monthly average for the benchmark is EUR50.73, which is 1% higher than Belgium's best offering for 8000kbit/s or above triple play.

Comparing triple-play packages with a broadband service in the range of 2000kbit/s or more, France still has the lowest price at EUR29.99 per month. Belgium's cheapest price in this range is EUR50.00, which is 10% higher than the average price for the benchmarked countries (EUR45.03), and 40% higher than in France.

Conclusion

If the triple-play packages are sorted into downstream speed ranges of the broadband part of the package, and the cheapest package in each country picked, Belgium has the third cheapest package in the 8000kbit/s and above range and the middle ranking (4th out of 7) package in the 2000kbit/s and above range. In both ranges, France has the cheapest package, at half the price of the most expensive one. This conclusion remains when the prices are compared using the geometric mean method.

In general, triple-play packages in Belgium are more expensive than their peers at the entry level (lowest broadband speed) although this difference does not persist at higher broadband speeds where the Belgian offer is broadly comparable to that in the other countries of the benchmark, except for France which is considerably cheaper.

1 Introduction

1.1 Objectives

Analysys Consulting Limited (Analysys) has been asked to conduct an analysis of the structural determinants of the price of broadband Internet access in Belgium. This report is the first part of the framework that has been defined with the SPF MIIS of Belgium, which divides this study into two ‘lots’ of work:

- Lot 1: a comparative study of retail prices for broadband Internet connections and triple-play offers in the residential market.
- Lot 2: an analytic study of the results of Lot 1 aiming to show the factors which explain retail price differences between countries.

In this report, we will compare objectively the cost of access to broadband Internet connections and triple-play services in the identified benchmarked countries in order to compare with the pricing of broadband Internet access in Belgium.

1.2 Scope

Costs of broadband Internet access as well as triple-play (fixed-line voice, broadband and digital TV) services in seven different countries will be compared.

The benchmarked countries chosen by SPF MIIS are Austria, Belgium, France, Germany, the Netherlands, Sweden and the UK. They were chosen for their proximity to Belgium,

their similarity in terms of GDP per capita, the similarity of their market structure (including at least one major cable TV operator) and a comparable broadband penetration per household. They also include countries of a similar size. We agree that these countries are sufficiently representative to enable a fair and objective comparison of prices.

We have benchmarked 35 operators, comprising each country's incumbent fixed-line operator as well as major cable operators and Internet service providers (ISPs).

All the operators whose offers have been considered during the broadband study are listed in Exhibit 1.1 below. We have gathered data for these operators over a six-year period, from 2001 to 2006. For the triple-play comparison, we have benchmarked the prices of 22 service providers in December 2006.

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
Austria	Telekom Austria AG	Fixed-line incumbent
Austria	Tele2UTA Telecommunication GmbH (formerly TA Telekom AG)	Alternative fixed network operator and telecoms services provider
Austria	Liwest Kabelmedien GmbH	Cable operator in Upper Austria
Austria	UPC Telekabel (formerly Telekabel Group)	Largest cable TV provider and broadband ISP and fixed residential telecoms service provider in Austria
Belgium	Belgacom	Fixed-line incumbent
Belgium	UPC	Cable operator operating under the brand Chello. UPC Belgium (formerly TVD NV-Radio Public) provides TV, telephony and Internet access services in parts of the Belgian cities of Brussels and Leuven. Acquired by Telenet in January 2007.
Belgium	Tele2	Tele2 Belgium NV is a licensed fixed telecoms network operator and public telephony services provider, operating in Belgium. Tele2 bid to acquire Versatel in August 2005 and announced in August 2006 that Versatel and Tele2 would merge their Dutch and Belgian operations. Versatel Belgium NV is an alternative telecoms operator targeting the Belgian SME,

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
Belgium	Telenet Holding NV	<p>corporate and residential markets. The company provides a mix of direct and indirect access retail voice and data services, and offers wholesale carrier services to Belgian telecoms operators and internet service providers. It became active in 1998 and claims to be the largest alternative operator in the country.</p> <p>Telenet Holding NV is a cable-based telecoms operator and internet service provider in Flanders, the Flemish-speaking area of Belgium. The company offers its services over the local access cable TV networks of regional 'intermunicipality' cable companies. It operates a fibre-optic backbone network and has upgraded the existing cable networks of its partners in Flanders to bi-directional capability to create an broadband network. Telenet offers telephony, cable-modem Internet access and video-on-demand services to residential and enterprise customers, plus direct fibre access to larger customers. It also offers xDSL-based broadband services to businesses.</p> <p>Telenet launched broadband cable-modem Internet access services in August 1997 and telephony services in January 1998. The company launched broadband voice services in July 2004 and an IPTV service offering video-on-demand and music downloads to broadband customers in February 2005. Telenet launched interactive digital TV in September 2005.</p>
Belgium	Scarlet Telecom BV	<p>Provides fixed and mobile telephony, and Internet services. Has its own fibre-optic backbone. Scarlet was created in 1992 in the Netherlands and started operating in Belgium in 1997, where it strengthened its position with the purchase of Tiscali's activities in</p>

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
		Belgium at the end of 2004. Scarlet is the third operator in the Benelux with more than half a million subscribers.
Belgium	VOO	Result of the alliance between two cable operators, ALE-Télédis and Brutélé, offering cable-modem Internet access services and telephony in addition to cable-TV services
France	France Telecom	Fixed-line incumbent
France	France Telecom Cable	Cable-TV and Internet access services provider for residential customers, merged into Numericable in 2004
France	Free Telecom	ISP part of Iliad SA which includes One.Tel France, Kertel and Iliad telecom (fixed telephony providers)
France	Neuf Cegetel	Largest alternative operator in France, with a strong presence in all segments of fixed telecoms
France	Noos-Numericable	Provides cable-TV, Internet and telephony services to residential and enterprise customers in France
France	Orange SA (includes Wanadoo SA)	Unified brand for all of France Telecom's mobile, broadband and other converged telecoms services as it simplifies its service portfolio since 2006. Includes the former activities of Wanadoo SA, the operating subsidiary of France Telecom responsible for its mass-market Internet, merged into France Telecom in 2004
France	Tele2	Tele2 France SA is one of the leading alternative providers of fixed telephony and Internet access in France. It offers carrier pre-selection on local, national and international calls and dial-up and broadband Internet access. The company claims to be the leading alternative telephony operator in France with a market share of around 12%. Tele2 France is in the process of being sold to SFR, the second largest mobile operator.
Germany	T-Com	T-Com is the fixed-line division of

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
Germany	QSC AG	the incumbent Deutsche Telekom Provides DSL Internet access on a wholesale and retail basis in Germany. It originated as an infrastructure vendor and then evolved into a services provider. Formed a joint venture with Tele 2 called Plusnet in July 2006.
Germany	Prima Com AG	Cable-TV network operator that offers broadband services as well
Germany	Unity Media GmbH (formerly ish GmbH & Co. KG (formerly Kabel Nordrhein-Westfalen GmbH & Co. KG))	Merger of two cable operators in 2005. It operates a cable network in the Nordrhein-Westfalen state of Germany. It began offering triple-play services to customers in Köln, Bonn, Dortmund and Bochum
Germany	Tele2	Versatel Germany was sold to Swedish rival Tele2 in July 2005. One year later, QSC and Tele2 formed a broadband joint venture known as PlusNet It has been upgrading QSC's proprietary DSL network to ADSL2+. Tiscali Germany is Plusnet's first client.
Netherlands	KPN Telecom NV	Fixed-line incumbent
Netherlands	Tele2	Tele2 Nederland BV offers telephony services and Internet access in the Netherlands, targeting residential customers and SMEs. It also acts as an MVNO, using the mobile network of Telfort (part of KPN).
Netherlands	Orange Netherlands (formerly Wanadoo Nederland BV formerly EuroNet Internet BV)	Internet service provider for residential and business customers. Wanadoo's services were transferred to the Orange brand as part of France Telecom's rebranding in 2006
Netherlands	Versatel Nederland BV	Dutch-operating subsidiary of Versatel Telecom International NV providing telephony, voice, data and Internet services via its own DSL and fibre-optic network
Netherlands	UPC Nederland (formerly United TeleKabel Holding NV (UTH))	Largest cable operator in the Netherlands, offering digital cable TV, cable telephony, cable-modem Internet access services and interactive services

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
Sweden	TeliaSonera Sverige AB (TeliaSonera Sweden)	Fixed-line incumbent, Swedish subsidiary of the Nordic operator TeliaSonera AB
Sweden	com hem AB (formerly Telia Com Hem)	Swedish cable operator. Formerly owned by incumbent operator Telia, and divested in 2003. Com Hem owns and operates infrastructure passing around one third of Swedish households
Sweden	B2 Bredband AB (Bredbandsbolaget)	Second largest broadband local access service provider including high-speed Internet access, video services (including broadcast TV) and voice telecoms
Sweden	Tele2 Sverige AB (formerly Tele2 AB)	Alternative telecoms operator offering public fixed telephony and datacomms, business network services, Internet services, mobile telecoms and cable TV
UK	BT	Fixed-line incumbent
UK	British Sky Broadcasting Group plc (BSkyB)	Major provider of digital pay-TV services (branded 'Sky') via a proprietary direct-to-home (DTH) satellite broadcasting platform. In late 2005, it launched mobile-TV and broadband video download services, and plans to introduce a full DSL-based IPTV service via leading UK ISP Easynet, which it acquired in January 2006
UK	NTL	Largest cable operator in the UK. It merged with Telewest in October 2005 and bought the MNVO Virgin Mobile in April 2006. It offers quad-play services since it has launched cable-TV, Internet and telephony services, and is rolling out digital TV and broadband over cable modems
UK	Carphone Warehouse	Alternative provider of fixed telecoms for the residential market, acquired One-Tel in late 2005 and AOL UK (the major UK virtual ISP) in October 2006

Exhibit 1.1: List of benchmarked operators [Source: Analysys]

2 Methodology

2.1 Data sources

For our analysis, we have referenced a wide range of information, including:

- ARL Research materials (including the Analysys Broadband Pricing Study)
ARL Research provides telecommunication market research and analysis, publications and benchmarking.
- Operators' Web sites to cross-reference the figures from ARL Research
We used the operators' Web sites to get the most up-to-date information, as well as to examine the terms and conditions of the different offers.
- Tarifica
Tarifica is a London-based communications, media and pricing consultancy providing tariff information.
- Oanda
Oanda provides current currency rates, simple conversions, forecasts as well as historical currency rates.
- Screen Digest and Cable Europe – European Broadband Cable 2006 report
Screen Digest provides research and analysis on global audiovisual media. Cable Europe is the trade association for European cable operators and their national trade associations.

- OECD's Web site
OECD stands for Organization for Economic Cooperation and Development. The OECD is an international agency which supports programs designed to facilitate trade and development. Some of its reports were used to double-check historical data such as available speed provided by cable operators.
- Ortel's Web site
Ortel stands for Observatoire Régional des Télécommunications and provides coverage data for French operators.

2.2 Product comparison framework

2.2.1 Introduction

The comparison of broadband and triple-play prices is not straightforward and there are various factors to consider.

As far as all offers are concerned, the price is correlated to the Internet throughput (kbit/s–Mbit/s), but is, in many cases also related to the volume of data (or time) included in the monthly price. Similarly, we have to decide how to consider the upstream speed and the downstream speed, when we compare throughput to prices associated with each offer.

Although 'broadband' services in the benchmarked countries currently exist from 256kbit/s up to 100Mbit/s, in this study we have limited the scope to services that offer at least 500kbit/s as the maximum downstream speed. In 1999–2000, the Federal Communications Commission (FCC) of the United States defined broadband services as being at least 200kbit/s in each direction. Since then, typical broadband speeds have risen considerably such that 2000kbit/s and 8000kbit/s are common services, while 512kbit/s services are entry level, or for rural areas where it is technically difficult to provide higher speed services.

Operators do not publish data with regard to the take-up of services of different speeds; this information is considered to be commercially sensitive. However, we know that more users

are migrating to higher speed services, especially over 2000kbit/s, in order to download video and music. In order to gain a perspective of the usefulness of different speed services, Exhibit 2.1 below shows typical applications and their minimum speed requirements.

<i>Application</i>	<i>Required internet connection speed</i>
E-mail, web surfing	512kbit/s is acceptable, but response times (e.g. page refreshes, receiving attached files) is now perceived to be slow
Download MP3 music track	512kbit/s (could take 2–3 minutes or more)
Video clips (downloaded and streamed)	128kbit/s – 512kbit/s depending on picture size and resolution (quality)
Time shift TV – 1 hour programme (downloaded in background; watched later)	Minimum of 512kbit/s (could take 8 hours to download)
Streamed (i.e. real time) broadcast TV	2000kbit/s–4000kbit/s per channel watched
Streamed (i.e. real time) High Definition TV (HDTV)	8000kbit/s–10 000kbit/s per channel watched

Exhibit 2.1: *Content type and its implications for required connection speed [Source: Analysys]*

From the exhibit above it can be seen that the most demanding applications in terms of speed are real-time TV services. Note that it is debatable that for a household it may be necessary to provide two channels simultaneously – either two people in a household watching different programmes, or one programme being watched while another is recorded.

2.2.2 Comparison methods

Based on our experience of other similar projects, we have defined a product comparison framework, including three comparison methods:

- downstream speed range
- geometric mean of speed unit price
- downstream speed unit price.

The methods are explained in detail in Sections 2.2.3 to 2.2.5.

We have then applied the three comparison methods to all services offered to consumers by the operators under study in each of the seven countries over the period 2001–2006.

Additionally we have directly compared the incumbent operators' offerings in each country using the 'downstream speed range' comparison method.

We have also compared the prices of operators which offer broadband services in Belgium as well as other countries in the study (UPC/Chello in Austria, Belgium, France, Netherlands and Sweden and Tele2 in Austria, Belgium, France, Germany, the Netherlands and Sweden) using the 'downstream speed range' and 'downstream speed unit price' comparison methods.

We have then compared triple-play packages in each country using the same comparison methods.

Finally we have compared installation, connection and equipment purchase charges and compared usage caps for a specific downstream speed for each operator in each country.

2.2.3 Pricing assumptions and factors

Tariffs

All tariffs used for comparisons in this study have been collected from data published by operators since 2001 for standard available services and packages. They do not include special introductory offers, discounts or cashbacks which are transitory in nature and are used to poach customers from other operators and recruit brand new customers – tariffs typically return to standard levels after between one and six months. The tariffs collected are those published and available for new connections and do not necessarily reflect the tariffs that existing customers are being charged.

In some countries (Germany and the Netherlands), some of the packages cover only the network connection and do not include the subscription fee to be paid to ISPs (whether affiliated with the network owner or not). In these cases, we have added the standard ISP fee to the monthly charge.

Some broadband service providers (for example, Free in France) use a mix of their own network (local loop unbundling) and wholesale services bought from the incumbent (bitstream). As a result, they are in a position to offer some of their customers different services (on their own network or ‘on-net’) than others (‘off-net’). Most typically, the TV offering is only offered ‘on-net’ and the speeds offered are higher ‘on-net’, but the price is often the same. This distinction does not apply to incumbent telecoms operators or to the cable operators.

The comparison methods we have used pick the minimum available price for a particular category in each country. This will result in on-net prices being picked. If an operator with a low on-net price has only a small coverage of the country, this may result in an apparent low price for that country, even though such a price is not widely available. In order to mitigate this, we have indicated in Annex A the coverage of each operator where such information is available.

Quoted downstream and upstream speeds

The downstream speed we have used when describing services in this study is not a guaranteed downstream speed, but a maximum downstream speed. It corresponds to the headline downstream speed quoted by the operator, but most of the time it is not what the subscriber will experience. There are several reasons for this:

- With DSL technologies, the further away the customer is located from the exchange, the lower the achievable peak speed.
- Shared resources, which reduce the average capacity available (though they do not modify the peak speed):
 - with cable networks several customers share the last drop (usually a single coaxial cable). The greater number of customers connected to the cable, the lower the average capacity per user.

- for DSL there will be over-booking (or “contention ratio”) at the exchange in the range of approximately 10:1 to 50:1, depending upon the operator and the quality of service offered. This implies that with a contention ratio of, say, 20:1, the operator provisions about 5% of the theoretical capacity required (number of users*peak speed). Much of the time, this contention is invisible to the user. However, at busy periods, more customers will be using the service and sharing the capacity – hence the average speed achieved will fall.
- High traffic levels on the Internet itself will reduce achieved speeds.
- Prioritisation strategies employed by operators, e.g. prioritising voice and real-time video over data, will reduce achieved speeds for the non-prioritised services.

Many of the offers we have considered in this study are ‘best effort’ services (e.g. ‘up to 8Mbit/s’). That means that the operator will try to provide the best speed that the line can support, but the subscriber has no absolute guarantee on the actual speed that will be achieved.

Exchange rates

Two sources of exchange rates have been used in this study. The former European national currencies prior to 2002 (ATS in Austria, BEF in Belgium, FFF in France, DEM in Germany and NLG in the Netherlands) have been converted using the exchange rates at which they entered the Euro zone. As far as GBP in the UK and SEK in Sweden are concerned, we have used the average Interbank rate over the quarter considered.

VAT rates

Exhibit 2.2 below shows the VAT rates in each of the benchmarked countries at the end of 2006.

<i>Country</i>	<i>VAT rate</i>
Austria	20%
Belgium	21%
France	19.6%
Germany	16%
Netherlands	17.5%
Sweden	25%
UK	17.5%

Exhibit 2.2: VAT rates in the benchmarked countries [Source: Analysys]

All of the tariff data in the charts below and in the annexes is inclusive of VAT. This enables comparison of tariffs as presented to consumers. It is apparent from the offers to consumers that price points with VAT included (e.g. EUR19.99, EUR29.99, EUR39.99) are an important marketing mechanism that influences prices.

Connection charges and equipment purchase

The comparison of connection charges is not straightforward since the connection price is sometimes included in the monthly charge. However, we have been able to isolate some connection charges in order to compare them from one country of our benchmark to another. In Annex A.3, these charges have been compared for each operator in each country. It should be noted that connection (or installation) charges are particularly prone to changing over a short period of time, as they are frequently the subject of special offers and promotions, factors that have not been included in this study.

Similarly, the comparison of equipment purchase, lease or rental prices is not straightforward as several options are available. The operator may offer one, two, or all of the following offers at the same time:

- offering free rental of the equipment, providing that the customer agrees to subscribe for a pre-defined period (such as 2 years)
- renting the equipment for a monthly fee, generally between EUR2 and EUR6 a month
- purchasing the equipment one-off, at an average cost of EUR78 across the benchmark.

In Annex A.3, the equipment purchase prices have been compared for each operator in each country.

Usage caps

Some operators impose a maximum monthly volume of data that can be downloaded by the subscriber. This is known as the usage cap, typically measured in Gigabytes (Gb). If a subscriber exceeds the usage cap, either the operator will charge for the additional volume (additional charge per Gb) or dramatically reduce the speed of the subscriber's connection.

A download volume of 1Gb – which equals 1000Megabytes (Mb) – approximately represents one film (full length, broadcast quality), or 250 music tracks (MP3 songs), or 250 photos, or 25 000 emails (without file attachments).

From data gathered by Analysys for the UK, we estimate that the average monthly download volume of a UK Internet user in 2006 was 2Gb. This varied by age group as shown in Exhibit 2.3 below.

<i>Age group</i>	<i>Monthly download in Gigabytes</i>
24 and under	5
25-44	1.6
45-64	0.6
65 and over	0.1
Average of population	2

Exhibit 2.3: *Average monthly Internet usage in the UK in 2006 [Source: Analysys, 2006]*

For the purpose of the three comparison methods, the usage caps (if imposed) have been ignored as their use varies considerably by country and operator. However, in Annex A.1 the usage caps for a specific downstream speed range have been compared for each operator in each country.

In some countries, formal usage caps are often not imposed. However, in most of the countries where no formal usage cap is defined (such as the UK), a 'fair usage' policy is applied by the operator. This condition is aimed at ensuring reliability and a minimum

quality of service to all customers by restricting excessive usage by a minority of users. Usually the operator would contact a subscriber with excessively heavy usage over a significant period of time to request him to reduce his downloaded volumes. If such a request is ignored, the operator will usually reserve the right to terminate the service.

Limited geography availability

As shown in Annex A, incumbents have a relatively high population coverage for broadband services (between 86% in Austria and 100% in the UK). Belgian and Dutch incumbents have the second highest coverage in terms of population with 99%. Cable operators usually have a much lower population coverage. In the benchmark, cable operators have broadband coverage varying from 21% in Germany to 97% in the Netherlands (adding the coverage of every cable operator in each country). Belgium has the second highest broadband coverage for cable operators in the benchmark with 81%.

Extensive coverage does not imply that the operator will be able to provide the same quality of service to all its customers. Consequently, some high speed offers will be restricted to a number of lines, typically geographical areas that are close to the serving exchanges.

This study takes into consideration all of the offers commercially available, independent of coverage restraints.

Time-based usage

In Belgium, there is a time-based tariff available from Belgacom which is not easily comparable with a flat-rate tariff (with or without usage cap). Although this tariff has not been included in the comparison charts, a number of usage scenarios have been listed in Exhibit 3.7 to enable a subjective comparison with the other tariffs.

2.2.4 Comparison method – Downstream speed range

Method description

In the first stage, we divided the offers into four ranges according to the downstream speed. The first range gathers all the products that have a downstream speed of 8000kbit/s and above, the second one 4000kbit/s and above, the third one 2000kbit/s and above, and the fourth one 500kbit/s and above.

In the next stage, we selected from each of these ranges the cheapest offering available in each country for each year of the study.

Advantages and disadvantages

The advantage of this method is that it fits quite well with customer behaviour when opting for a product. This also reflects the way most operators have decided to segment the market: a consumer often has to choose between three or four offers from each operator which have different maximum speed. Consumers identify themselves as high, moderate or low speed users, and then choose a service package according to its price, from all the packages that correspond to or are better than the service set they need.

However, comparisons between packages are sometimes difficult, because downstream and upstream speeds vary considerably between countries. Furthermore, this method relies on a range of downstream speeds and takes no account of upstream speeds.

2.2.5 Comparison method – Geometric mean of speed unit price

Method description

Firstly, we calculated the geometric mean of downstream speed and upstream speed for each product. The geometric mean is defined as the square root of the product of the downstream and upstream speeds.

Next, we divided each product's price by its corresponding geometric mean to obtain unit prices (Euro cents per month per kbit/s).

Finally, we selected the lowest unit price in each country for each year of the study.

Advantages and disadvantages

This method considers both downstream speed and upstream speed. However, upstream speeds are not important for some users and this method is also arguably biased towards high speed products.

2.2.6 Comparison method - Downstream speed unit price

Method description

Firstly, we divided the price for each product by the maximum downstream speed to obtain the unit price (Euro cents per month per kbit/s), and then selected the lowest unit price in each country for each year of the study.

Advantages and disadvantages

This comparison method is based on the downstream part of the offer, which reflects how the products are marketed (headline downstream speed), but ignores the upstream offer, which may be a significant factor in some consumers' choice of package (for example consumers who are heavy users of Web-based storage solutions such as flickr). Similarly to the geometric mean speed unit price, it may be biased towards high speed offers.

3 Comparison of broadband offers

3.1 Comparison method – Downstream speed range

3.1.1 Service range: 8000kbit/s and above

Exhibit 3.1 below presents the results obtained when comparing the prices of the cheapest Internet service providing a downstream speed of 8000kbit/s or above in each country over time.

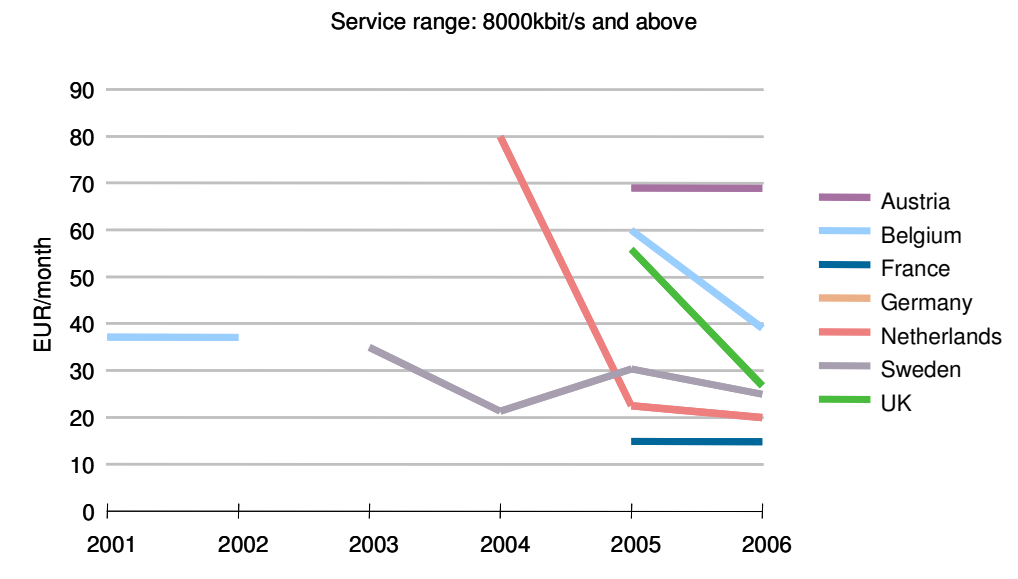


Exhibit 3.1: Minimum monthly price for 8000kbit/s (and above) Internet services in the benchmarked countries [Source: Analysys]

Please note that at the end of 2006 an 8Mbit/s service was introduced in Germany at EUR39.94 per month.

Belgium was the first country to have a service in this range when Telenet launched a cable-modem service providing 10Mbit/s downstream in 1997. Sweden followed in 2003 when B2 Sweden launched its 10Mbit/s downstream and upstream offer. In the remainder of the benchmarked countries, this type of downstream speed was offered from 2004 or 2005.

Exhibit 3.1 highlights two main patterns.

Firstly, we can see that Belgium was much more advanced than the benchmarked countries in 2001 as far as high downstream speeds were concerned.

Secondly, the headline capacity offered by Telenet decreased to 4000kbit/s in 2003 and was only reinstated to a higher speed in 2005; hence there was no offer *to new customers* in Belgium for 8000kbit/s and above services from 2003 to 2004.

In 2005 and 2006, prices in Belgium for very high speed offers are high (EUR39 per month) compared to those of the benchmarked countries. The average minimum price for the benchmarked countries is EUR33.49 per month in 2006, which is 16% less than the average monthly price in Belgium, and the cheapest minimum price among benchmarked countries is EUR14.90 (from Neuf Cegetel in France), which is 61% lower than in Belgium. Only Austria and Germany have a minimum price higher than that of Belgium.

Conclusion: Belgium's very high speed packages represent the third highest minimum price in our benchmark, despite a much earlier commercial launch. The trend is a decrease in this price.

3.1.2 Service range: 4000kbit/s and above

Exhibit 3.2 below shows the results obtained when comparing the prices of the cheapest Internet service providing a downstream speed of 4000kbit/s or above in each country over time.

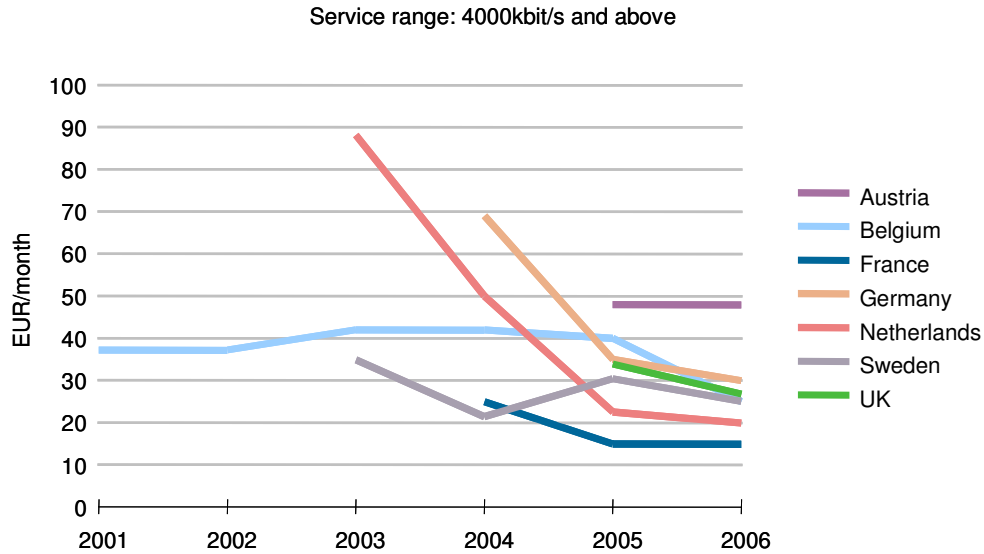


Exhibit 3.2: Minimum monthly price for 4000kbit/s (and above) Internet services in the benchmarked countries [Source: Analysys]

In most of the benchmarked countries, this downstream speed was offered from 2003 onwards. Austria and the UK were the last two countries to have benefited from a commercial package with download speeds higher than 4000kbit/s. Similarly to Exhibit 3.1, the 10Mbit/s offer from Telenet, launched in 1997, makes Belgium the most experienced in high speed broadband amongst the benchmarked countries. However, even if Belgium was the first country of our benchmark to launch high downstream speed services, Sweden was the country with the cheapest offer in 2003 (EUR34.93) and was the price leader in 2004.

In 2006, the minimum price for this speed range in Belgium, at EUR24.90, has fallen behind France and the Netherlands.

Conclusion: Regarding high downstream speed packages (4000kbit/s and above), Belgium started much earlier than the other benchmarked countries, but its minimum price is now towards the middle of the price spectrum.

3.1.3 Service range: 2000kbit/s and above

Exhibit 3.3 below presents the results obtained when comparing the prices of the cheapest Internet service providing a downstream speed of 2000kbit/s or above in each country over time.

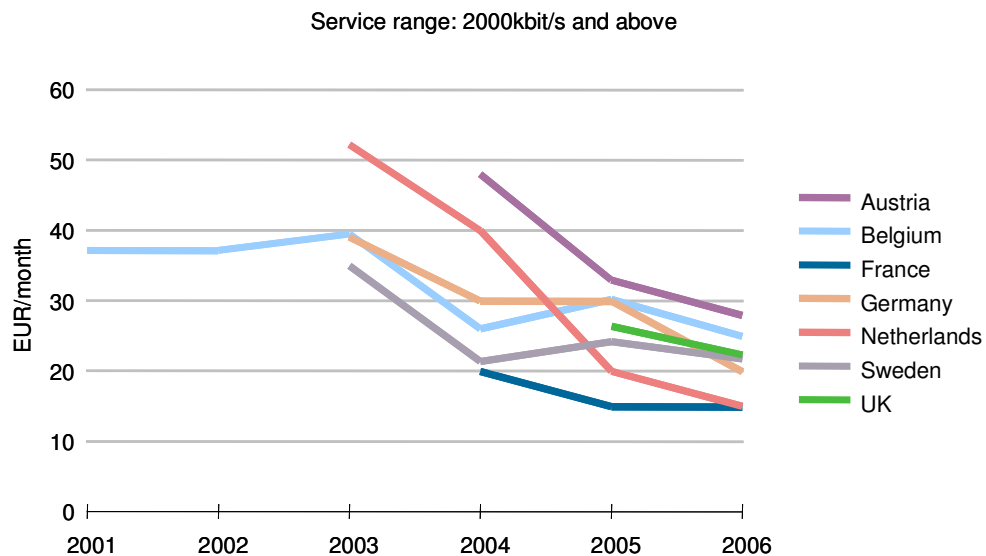


Exhibit 3.3: Minimum monthly price for 2000kbit/s (and above) Internet services in the benchmarked countries [Source: Analysys]

Belgium has moved from the position of the cheapest in 2001, with Telenet’s 10Mbit/s offer, to the second most expensive in 2006.

Once again, this highlights the fact that Belgium was one of the most advanced countries in 2001 as far as broadband Internet services were concerned, but the reduction in prices has been slower than that experienced in most of the other benchmarked countries.

The average minimum price for our benchmark is EUR27.0420.92, which is 16% lower than the Belgian minimum price (EUR24.90).

Conclusion: For moderate downstream speeds, Belgium has the second highest minimum price. However, this price is only EUR2.62 higher than our benchmark average. Belgium was the only country of our benchmark to have a service of 2000kbit/s or over in 2001.

3.1.4 Incumbent’s offer for 2000kbits/s and above

Exhibit 3.4 below compares the incumbent operator’s downstream prices in each country over time.

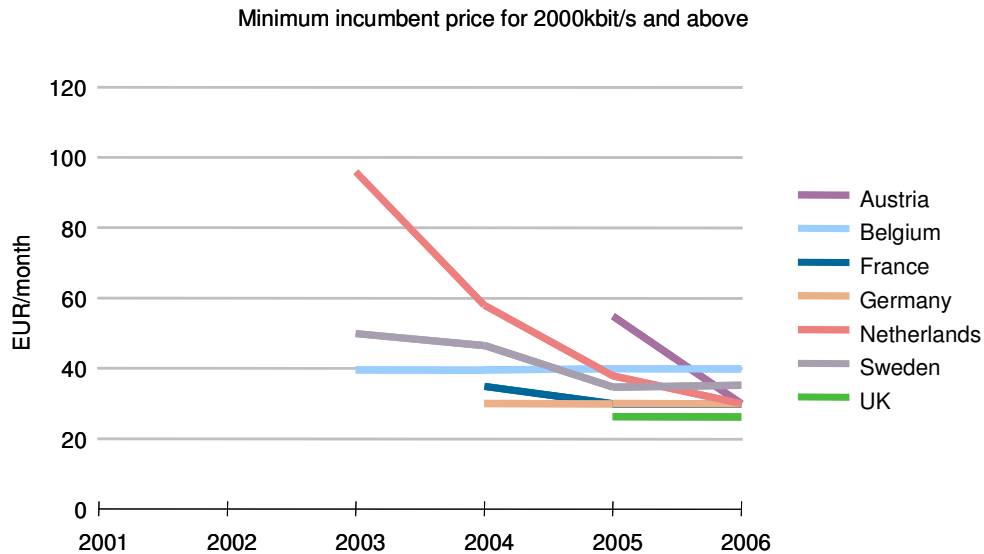


Exhibit 3.4: Minimum monthly price for 2000kbit/s (or above) Internet services for the benchmarked incumbents [Source: Analysys]

If we limit our benchmark to the incumbent’s offers, the trend we get is similar. Belgacom’s offer is the most expensive of our benchmark. Current prices range widely from EUR26.2372 (the UK) to EUR39.95 (Belgium).

3.1.5 Service range: 500kbit/s and above

Exhibit 3.5 below presents the results obtained when comparing the prices of the cheapest Internet service providing a downstream speed of 500kbit/s or above in each country over time.

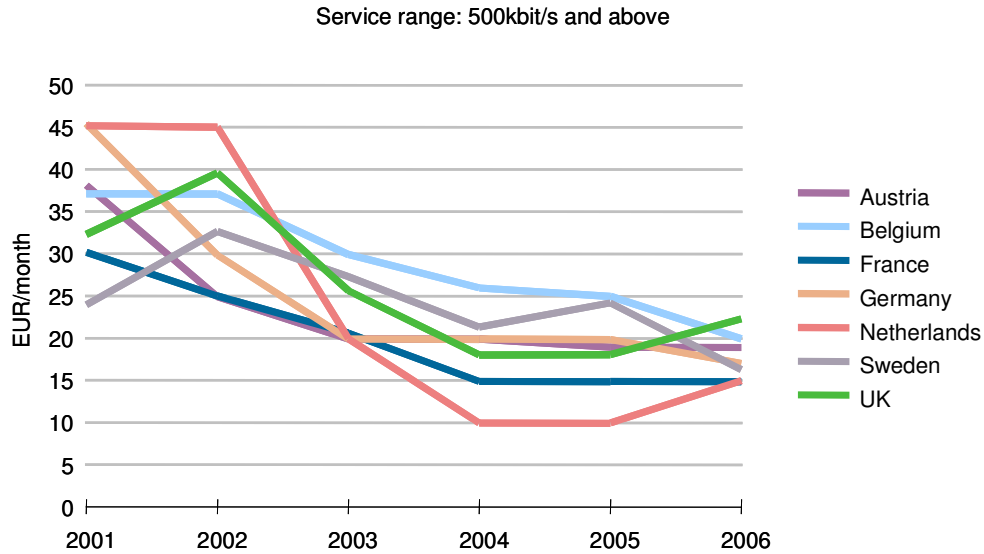


Exhibit 3.5: Minimum monthly price for 500kbit/s (and above) Internet services in the benchmarked countries [Source: Analysys]

Rank (most expensive first)	Country	Minimum price (EUR)
1	UK	22.27
2	Belgium	19.90
3	Austria	18.90
4	Germany	16.99
5	Sweden	16.23
6	Netherlands	14.95
7	France	14.90

Exhibit 3.6: Country ranking in November 2006 regarding the minimum price for 512/128kbit/s Internet services (or above) [Source: Analysys]

All of the countries of our benchmark had already launched this type of service before 2001. As a consequence, this market is very mature; indeed some low-price operators no longer offer such a service and the price has increased (although the service provided may also have increased in speed). We can observe that the prices in the seven countries of our benchmark range from EUR14.90 to EUR22.27, and that Belgium has the second highest price in the benchmark (EUR19.90) after the UK.

It may seem surprising that in some countries (the Netherlands and the UK) the minimum price of all the products in this service range is rising. This is mainly because lower speed packages available to customers (downstream speed between 500 and 2000kbit/s) have been withdrawn or replaced by higher speed packages at slightly increased prices. Hence the cheapest package available in 2006 in these countries has a higher downstream speed.

The average minimum price is EUR17.73, which is EUR2.17 lower than the minimum price in Belgium.

Note: to carry out this comparison, we have not used Belgacom's offer called 'ADSL Time' 512/128kbit/s. The reason is that this offer is time-based, compared to most of the offers in the other countries that offer unlimited time access to Internet, or volume-based package offers, such as in Austria and Belgium. Moreover, this offer only includes two hours of connection time, and every additional hour used is charged at EUR2.58.

	<i>2 hours</i>	<i>4 hours</i>	<i>6 hours</i>	<i>8 hours</i>	<i>10 hours</i>	<i>12 hours</i>
Price (EUR)	4.95	10.11	15.27	20.43	25.59	30.75

Exhibit 3.7: *Usage scenario for 'ADSL Time' 512/128kbit/s [Source: Analysys]*

Exhibit 3.7 shows a comparison between this time-based offer and volume-based offers. The monthly charge for Belgacom's unlimited time (limited volume) offer (called 'ADSL Light' 512/128kbit/s) is EUR29.95. Consequently, an 'ADSL Time' subscriber needing to be connected to the Internet for more than 12 hours a month should subscribe to the volume offer, which is 'ADSL Light'.

Data sourced from Nielsen/NetRatings shown in Exhibit 3.8 below indicates that the average time spent per user on the Internet is over 30 hours per month. This is broken

down further for four countries in the benchmark and the US, showing a range of over 25 to almost 38 hours per month. Thus the ‘ADSL Time’ product is aimed at users with significantly below average Internet usage patterns.

<i>Internet usage per month</i>	<i>Global average</i>	<i>France</i>	<i>Germany</i>	<i>Sweden</i>	<i>UK</i>	<i>US</i>
Number of sessions per person	34	43	36	32	31	35
On-line time per person in hrs:mins	30:25	37:56	33:30	27:37	25:47	32:54

Exhibit 3.8: *Time spent on the Internet per user per month [Source: Nielsen/NetRatings, November 2006]*

3.1.6 Summary of downstream speed range method of comparison – November 2006

Exhibit 3.9 below shows the current (as at November 2006) lowest price offer per country for different speed ranges in the benchmark countries, along with the average of the lowest price offers in each country. Exhibit 3.10 shows the same information graphically.

	<i>8000kbit/s and above</i>	<i>4000kbit/s and above</i>	<i>2000kbit/s and above</i>	<i>500kbit/s and above</i>
France	14.90	14.90	14.85	14.85
Netherlands	19.95	19.95	14.95	14.95
Sweden	24.95	24.95	21.68	16.23
UK	26.72	26.72	22.28	22.27
Average	33.49	27.06	21.51	17.73
Belgium	39.00	24.90	24.90	19.90
Germany	39.94	29.99	23.99	16.99
Austria	69.00	48.00	27.90	18.90

Exhibit 3.9: *Lowest price offer per country for different offer ranges in the benchmark countries [Source: Analysys]*



Exhibit 3.10: *Lowest price offer per country for different offer ranges in the benchmark countries [Source: Analysys]*

This exhibit shows a number of interesting features:

- the price of the entry level service is between EUR15 and EUR20 in all countries other than the UK
- prices for 2000kbit/s are similar except in France and the Netherlands
- Prices for higher speeds are much more variable from country to country.

3.2 Comparison method – Geometric mean of speed unit price

Exhibit 3.11 below shows the results we have obtained using the geometric mean unit price method. As described previously, both downstream and upstream speeds have been taken into consideration, and the monthly unit price per (geometric mean) kbit/s of the corresponding offers is shown.

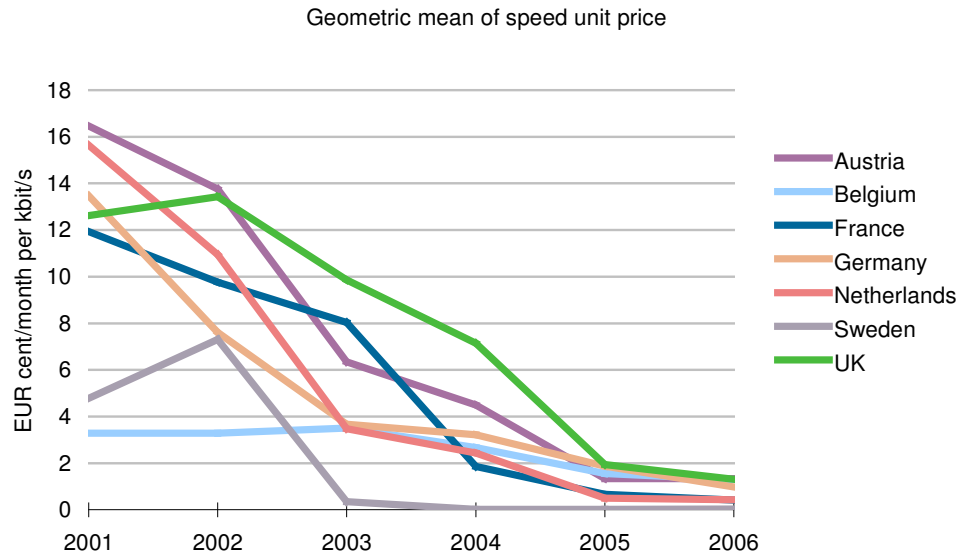


Exhibit 3.11: Geometric mean of speed unit price [Source: Analysys]

The chart is also plotted below (Exhibit 3.12) with a logarithmic scale to assist legibility. This means that instead of plotting the monthly unit price per kbit/s as a function of time, we have plotted the logarithm of the monthly unit price per kbit/s as a function of time. The advantage of the logarithmic scale is that small variations are emphasized for legibility. Thus, the first graph is legible enough for us to see the ranking of the countries at the beginning of the period, and the second one with the logarithmic scale enables us to do the same for the end of the period.

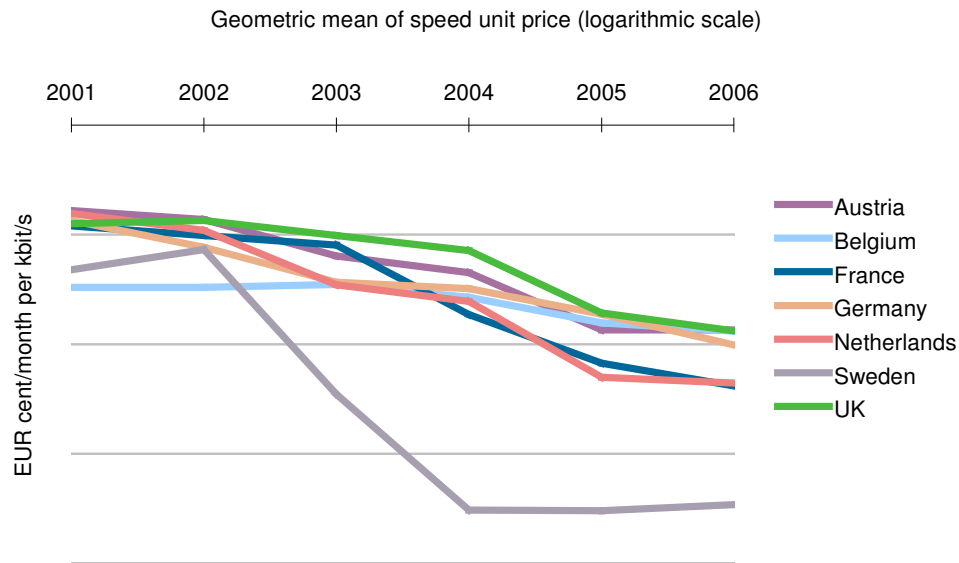


Exhibit 3.12: Geometric mean of speed unit price (logarithmic scale) [Source: Analysys]

Exhibit 3.12 repeats the trends previously described. In 2001, Belgium was the most advanced country by far and the price per geometric mean kbit/s per month was EUR cent 3.28, which is very low compared to the average price of EUR cent 11.17 per kbit/s per month for the benchmark.

However, whilst this price fell considerably in all the other countries between 2001 and 2006, the price in Belgium decreased only slowly. In November 2006, Belgium was the third most expensive country out of the seven countries of our benchmark with EUR cent 1.31 per kbit/s per month. The average price for the benchmark in November 2006 was EUR cent 0.84 per kbit/s per month.

Rank (highest price first)	Country	Price per kbit/s per month (EUR cent)
1	Austria	1.35
2	UK	1.32
3	Belgium	1.31
4	Germany	0.99
5	Netherlands	0.44
6	France	0.42
7	Sweden	0.03

Exhibit 3.13: Country ranking in November 2006 for the price per kbit/s per month [Source: Analysys]

3.3 Comparison method – Downstream speed unit price

Exhibit 3.14 compares the minimum price per downstream kbit/s in each country over time.

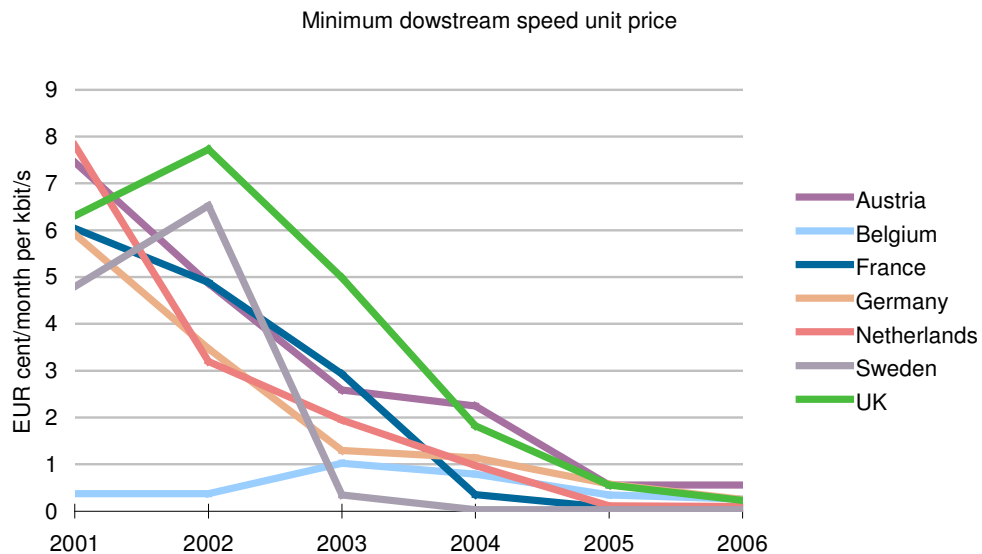


Exhibit 3.14: Minimum downstream speed unit price [Source: Analysys]

The chart is also plotted below with a logarithmic scale to assist legibility.

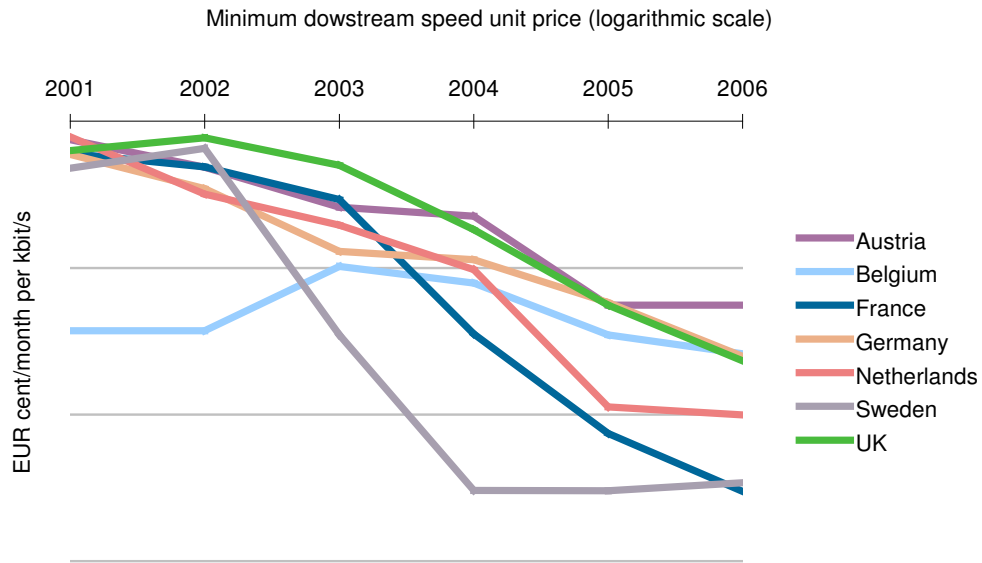


Exhibit 3.15: Minimum downstream speed unit price (logarithmic scale) [Source: Analysys]

The results of this comparison are quite similar to those of the geometric mean method.

As previously, in 2001 Belgium had the cheapest downstream unit price by far, with Telenet’s 10Mbit/s offer. This corresponded to EUR cent 0.37 per kbit/s per month, compared to an average price of EUR cent 5.53 per kbit/s per month amongst the benchmark. However by November 2006, Belgium had the second highest price.

Rank (highest price first)	Country	Price per kbit/s(EUR cent)
1	Austria	0.56
2	Belgium	0.26
3	Germany	0.25
4	UK	0.23
5	Netherlands	0.10
6	Sweden	0.03
7	France	0.03

Exhibit 3.16: Country ranking in November 2006 for the price per kbit/s [Source: Analysys]

Telenet’s 10Mbit/s offer dominates the comparison in Belgium but it is only available in Flanders, and therefore does not represent the whole of Belgium. Therefore we have considered another scenario excluding Telenet’s offer, which shows that Belgium’s downstream unit price in 2001 and 2002 is more in line with the other countries of the benchmark, as shown in Exhibit 3.17 below.

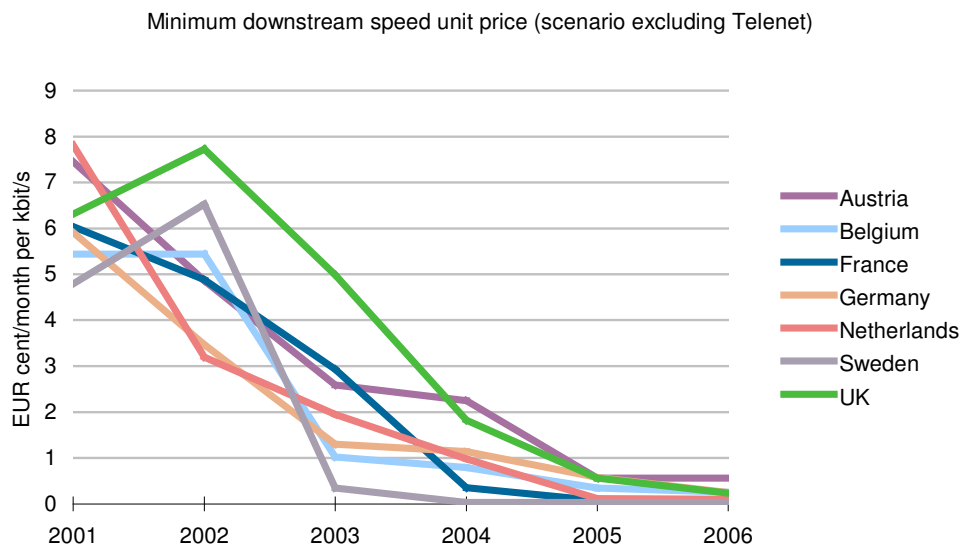


Exhibit 3.17: Minimum downstream speed unit price, scenario excluding Telenet’s 10Mbit/s offer [Source: Analysys]

3.4 Two cross-national examples: UPC and Tele2

3.4.1 UPC

UPC operates in most countries of our benchmark, and we will compare its offers in five countries: Austria, Belgium, France, the Netherlands and Sweden. UPC operates under the Chello brand in Austria, Belgium and the Netherlands, under ‘Noos-Numericable’ in France (note that UPC has recently sold Noos-Numericable) and under the ‘Com Hem’ brand in Sweden.

Chello broadband NV offers broadband Internet access via cable modem in association with UPC and other cable operators in Europe. Although the company still exists as a legal entity, its content operations were taken over by the UPC Media division in February 2001 and its broadband access and network operations were integrated into the UPC Distribution division in December 2001.

UPC's offers in these five countries in November 2006

Chello offers five different broadband services for the residential market. However, according to the country, the price and the throughput included are different. Moreover, some offers, Chello Classic for example, are volume-capped in Belgium whereas users have unlimited access to broadband subject to fair use limits with the same offers in Austria and the Netherlands.

For the operators that became or were UPC subsidiaries in France and in Sweden, the name of the packages are different. We have allocated the offers from Noos and Com Hem to the different segments according to the maximum downstream speed included in the packages.

Exhibit 3.18 below lists these packages and their respective prices (in EUR) in November 2006.

<i>Package</i>	<i>Austria</i>	<i>Belgium</i>	<i>France</i>	<i>Netherlands</i>	<i>Sweden</i>
Chello Light	19.98			32.95	21.68
Chello Classic	49.00	45.86		49.95	32.58
Chello Plus	69.00		19.90		40.20
Chello Extreme	89.00	59.95	29.90	59.95	

Exhibit 3.18: *Prices for Chello's broadband offers in Austria, Belgium and the Netherlands in November 2006 [Source: Analysys]*

Exhibit 3.19 below lists these packages and their respective maximum downstream speeds (in kbit/s) in November 2006.

<i>Package</i>	<i>Austria</i>	<i>Belgium</i>	<i>France</i>	<i>Netherlands</i>	<i>Sweden</i>
Chello Light	400			3072	2048
Chello Classic	4096	10 240		8000	8192
Chello Plus	8192		30 000		24 576
Chello Extreme	16 000	20 000	100 000	20 000	

Exhibit 3.19: *Maximum downstream speeds for Chello's broadband offers in Austria, Belgium and the Netherlands in November 2006 [Source: Analysys]*

Trend since 2001

Exhibit 3.20 below shows the pricing trend over time using the comparison method – downstream speed range of 8000kbit/s and above.

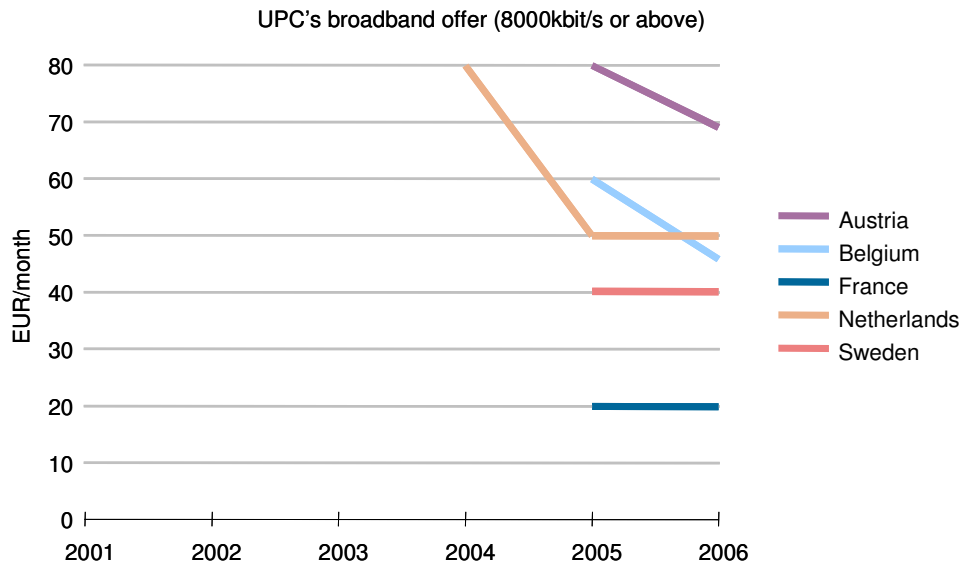


Exhibit 3.20: Monthly fee for UPC packages including 8000kbit/s broadband (or above)
[Source: Analysys]

The results for very high speed downstream broadband show that UPC's prices are in line with the general study seen above. Austria is the most expensive country (EUR69 for 'Chello Plus' 8000kbit/s), followed by the Netherlands (EUR49.95 for 'Chello Classic' 8000kbit/s) and Belgium (EUR45.86 for 'Chello Plus' 10 000kbit/s). France is the cheapest country (EUR19.90 for 'NET 30 MEGA' 30 000kbit/s). However, UPC's offers in France are available only in eight cities, and are subject to a download limit of 50Gbytes per month. Usage caps for Chello's service in Belgium range from 1Gbyte per month to unlimited, subject to an 'acceptable use' policy.

The trend we have observed in UPC's prices among the benchmarked countries is consistent with the comparisons we have made so far.

Tele2 operates in six out of seven countries of our benchmark. (Tele2/Versatel is no longer active in the UK. Tele2 UK changed its name to Liberty broadband and became insolvent in 2003. It was then taken over by FirstNet Services, which is now owned by Pipex.)

Using the downstream speed range comparison, we have compared Tele2/Versatel’s offers across the countries of our benchmark.

Service range: 2000kbit/s and above

Exhibit 3.21 below compares monthly fees for broadband products in the 2000kbit/s and above service range offered by Tele2/Versatel in the different countries of the benchmark.

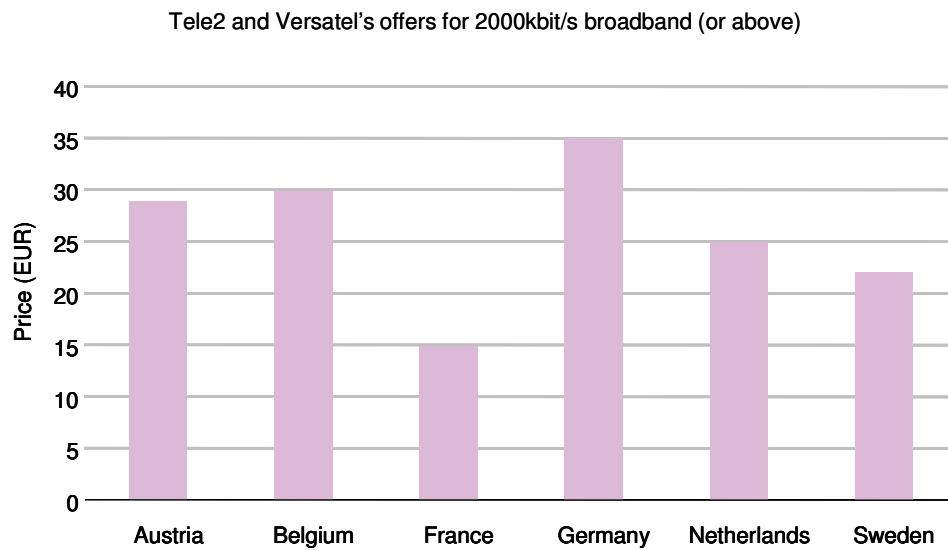


Exhibit 3.21: *Monthly fee for Tele2 and Versatel's broadband offers for 2000kbit/s and above*
 [Source: Analysys]

The country where the Tele2/Versatel broadband offer in this range is the lowest is France (EUR14.85), and the highest is Germany (EUR34.99).

Belgium is the second most expensive country (EUR29.90). The comparison is complicated by the number of offers in each country, as shown in Exhibit 3.22 below.

	<i>Austria</i>	<i>Belgium</i>	<i>France</i>	<i>Germany</i>	<i>Netherlands</i>	<i>Sweden</i>
Total number of packages available (500kbit/s and above)	5	2	1	4	2	5
Number of packages available for 2000kbits and above	3	1	1	3	2	3
Number of packages available for 4000kbits and above	0	1	0	2	1	2
Number of packages available for 8000kbits and above	0	0	0	1	1	2

Exhibit 3.22: *Number of Tele2/Versatel packages available according to the service range*
[Source: Analysys]

France and Belgium only have one package available for a broadband service of 2000kbit/s and above. However, Belgium has also a package in the 4000kbit/s and above service range, which is consistent with the fact that it is more expensive. Belgium's ranking in this service range is possibly due to the fact that the offer range is not as wide as in the other countries of the benchmark.

Service range: 4000kbit/s and above

Exhibit 3.23 below compares monthly fees for broadband products in the 4000kbit/s and above service range offered by Tele2/Versatel in the different countries of the benchmark.

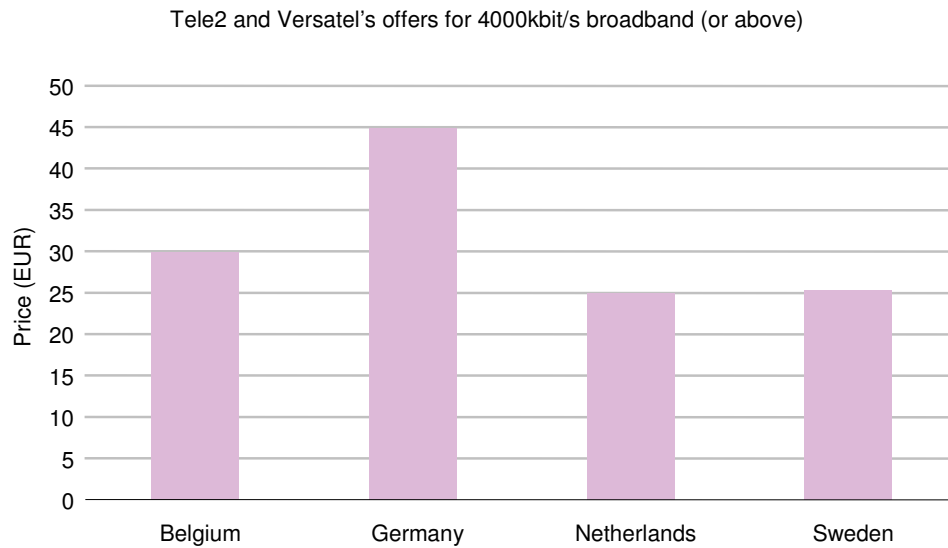


Exhibit 3.23: *Monthly fee for Tele2 and Versatel's broadband offers for 4000kbit/s and above*
 [Source: Analysys]

In this service range, the most expensive country is still Germany (EUR44.98) and the lowest is the Netherlands (EUR24.95). Belgium is ranked three out of four (EUR29.90). Austria and France have no offer in this service range.

Service range: 8000kbit/s and above

Exhibit 3.24 below compares monthly fees for broadband products in the 8000kbit/s and above service range offered by Tele2/Versatel in the different countries of the benchmark.

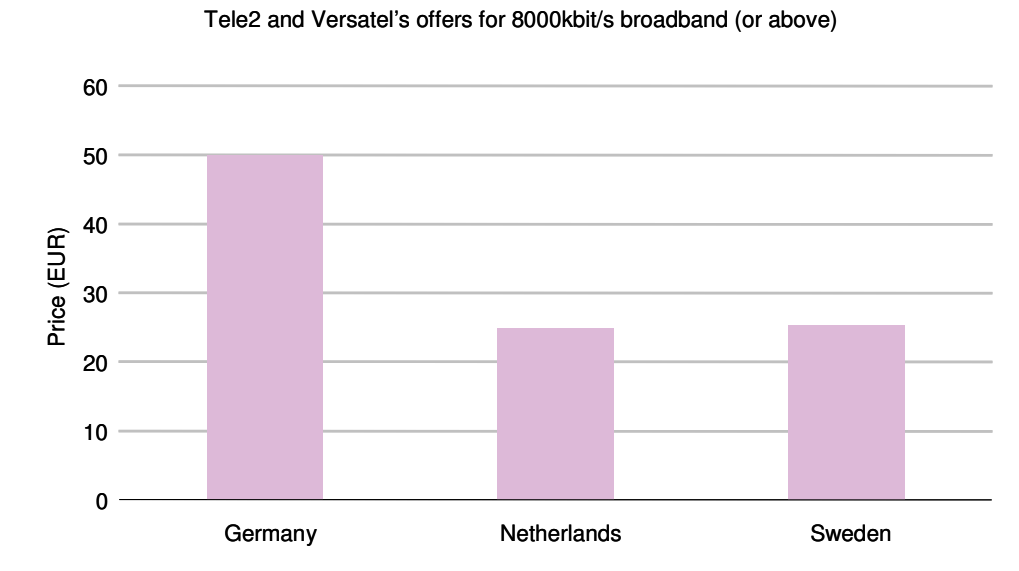


Exhibit 3.24: *Monthly fee for Tele2 and Versatel's broadband offers for 8000kbit/s and above*
 [Source: Analysys

In this service range, the most expensive country is still Germany (EUR49.98) and the lowest is still the Netherlands (EUR24.95). Austria, Belgium and France do not have packages in this service range.

A pattern which emerges from this data is that Germany has the highest prices and Belgium the second highest. The monthly fees in each speed category vary considerably, by a factor of more than two, suggesting that Tele2's prices are not set for consistency across Europe, but are adjusted to suit each local country market.

4 Triple-play offers

4.1 Introduction

A triple-play package comprises high-speed Internet access, telephone and multi-channel TV as a single package of services.

Triple-play packages were launched in most of the benchmarked countries between 2004 and 2006. However the very first country to do so was the UK, before 2001. In November 2006, triple-play services were available in all seven countries of the benchmark.

We have compared triple-play packages in the countries of the study using the downstream speed methods seen in the previous section. The comparisons are as follows:

- comparison of the cheapest packages available in each country
- comparison of the lowest priced package for 8000kbit/s and above
- comparison of the lowest priced package for 2000kbit/s and above.

All the operators whose triple-play offers have been considered during the study are listed in Exhibit 4.1 below. We have gathered data for the available triple-play packages of these operators in December 2006.

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
Austria	Telekom Austria AG	Fixed-line incumbent
Austria	UPC Telekabel (formerly Telekabel Group)	Largest cable TV provider and broadband ISP and fixed residential telecoms service provider in Austria
Belgium	Belgacom	Fixed-line incumbent
Belgium	Telenet Holding NV	Cable operator and ISP
Belgium	VOO	Result of the alliance between two cable operators, ALE-Télédis and Brutélé, offering cable-modem Internet access services and telephony in addition to cable-TV services
France	France Telecom	Fixed-line incumbent
France	Free Telecom	ISP part of Iliad SA which includes One.Tel France, Kertel and Iliad telecom (fixed telephony providers)
France	Neuf Cegetel	Largest alternative operator in France, with a strong presence in all segments of fixed telecoms
France	Noos-Numericable	Provides cable-TV, Internet and telephony services to residential and enterprise customers in France
France	Tele2	Tele2 France SA is one of the leading alternative providers of fixed telephony and Internet access in France. It offers carrier pre-selection on local, national and international calls and dial-up and broadband Internet access. The company claims to be the leading alternative telephony operator in France with a market share of around 12%.
Germany	T-Com	T-Com is the fixed-line division of the incumbent Deutsche Telekom

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
Germany	Kabel Deutschland	Kabel Deutschland GmbH (KDG) is Germany's largest cable operator. It comprises six out of the nine regional cable networks in 13 federal states throughout the country formerly owned by incumbent TO Deutsche Telekom.
Germany	Unity Media GmbH (formerly ish GmbH & Co. KG (formerly Kabel Nordrhein-Westfalen GmbH & Co. KG))	Merger of two cable operators in 2005. It operates a cable network in the Nordrhein-Westfalen state of Germany. It began offering triple-play services to customers in Köln, Bonn, Dortmund and Bochum
Netherlands	KPN Telecom NV	Fixed-line incumbent
Netherlands	Versatel Nederland BV	Dutch-operating subsidiary of Versatel Telecom International NV providing telephony, voice, data and Internet services via its own DSL and fibre-optic network
Netherlands	UPC Nederland (formerly United TeleKabel Holding NV (UTH))	Largest cable operator in the Netherlands, offering digital cable TV, cable telephony, cable-modem Internet access services and interactive services
Sweden	TeliaSonera Sverige AB (TeliaSonera Sweden)	Fixed-line incumbent, Swedish subsidiary of the Nordic operator TeliaSonera AB
Sweden	com hem AB (formerly Telia Com Hem)	Swedish cable operator. Formerly owned by incumbent operator Telia, and divested in 2003. Com Hem owns and operates infrastructure passing around one third of Swedish households
Sweden	B2 Bredband AB (Bredbandsbolaget)	Second largest broadband local access service provider including high-speed Internet access, video services (including broadcast TV) and voice telecoms

<i>Country</i>	<i>Name of operator</i>	<i>Type of operator</i>
UK	BT	Fixed-line incumbent
UK	British Sky Broadcasting Group plc (BSkyB)	Major provider of digital pay-TV services (branded 'Sky') via a proprietary direct-to-home (DTH) satellite broadcasting platform. In late 2005, it launched mobile-TV and broadband video download services, and plans to introduce a full DSL-based IPTV service via leading UK ISP Easynet, which it acquired in January 2006
UK	NTL	Largest cable operator in the UK. It merged with Telewest in October 2005 and bought the MNVO Virgin Mobile in April 2006. It offers quad-play services since it has launched cable-TV, Internet and telephony services, and is rolling out digital TV and broadband over cable modems

Exhibit 4.1: List of benchmarked operators [Source: Analysys]

4.2 Pricing assumptions and factors for triple-play offers

4.2.1 Tariffs

We have selected only the basic triple-play packages in each country (minimum number of channels, smallest telephone bundle) at different broadband speeds. We have only compared publicly available tariffs and excluded discounts, special offers and cashbacks.

We have excluded quad-play services (those which include mobile telephony).

The definition of the triple-play package commonly used (see Section 4.1) includes a line rental. However, some of the operators offering triple-play packages do not offer line rental

but require the customer to rent a telephone line from, typically, the incumbent telephone operator. As a consequence, a monthly line rental charge often has to be paid directly to the incumbent operator, on top of the triple-play package monthly fee. For example, in the UK, Sky requires customers to use BT phone lines and Sky subscribers who want to take advantage of Sky's triple-play offers have to pay a monthly subscription to BT on top of the Sky monthly fee. By comparison, the UK cable operator NTL is able to provide a telephony service over its cable and the customer does not rent a telephone line from BT. Consequently, the line rental is included in the NTL monthly charge.

In cases where telephone line rental is not included, we have added the cost of line rental from the incumbent to the benchmarked data to enable fair comparison of the packages, except where specifically stated.

In some countries (for example Germany and the Netherlands), some of the packages cover only the network connection and do not include the subscription fee to be paid to ISPs (whether affiliated with the network owner or not). In these cases, we have added the standard ISP fee to the monthly charge.

4.2.2 Connection charges and equipment purchase

We have ignored the effect of activation and connection charges and equipment purchase in the triple-play comparison, due to the wide variety of models adopted by operators for making available set-top boxes/decoders/modems.

4.2.3 Usage caps

We have ignored the effect of broadband usage caps in the triple-play comparison. Only in Austria and Belgium are usage caps imposed, though "fair use" or "acceptable use" policies are commonplace.

4.2.4 Phone bundles

We have ignored the effect of phone bundles in the triple-play comparison; although we have selected entry-level bundles available to enable comparison, there may be more value to some users in some of these packages (e.g. bundled minutes or free calls of certain types) which we are not taking into account.

4.3 Comparison of the cheapest packages available

As of November 2006, Sweden has the cheapest triple-play offer and Belgium the most expensive one amongst the benchmarked countries, as shown in Exhibit 4.2 below.

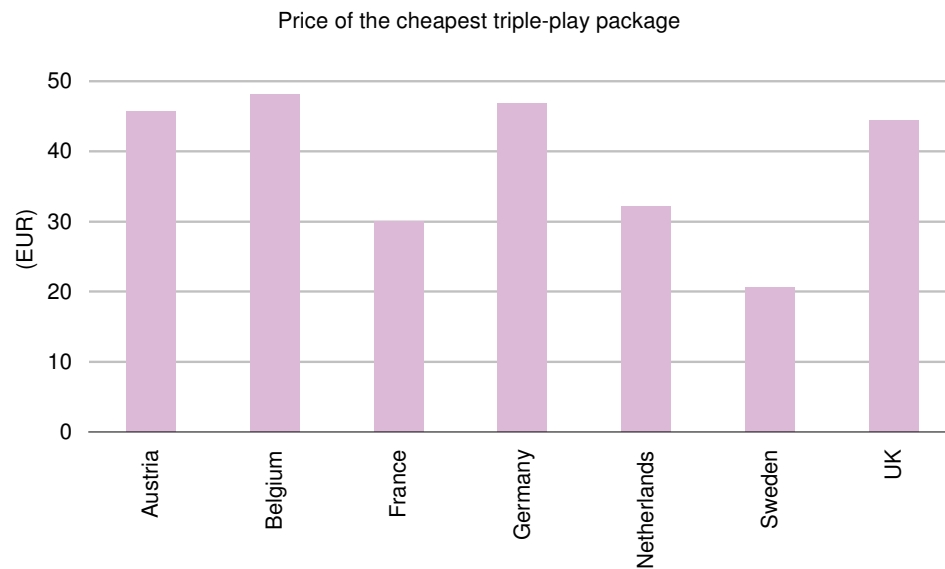


Exhibit 4.2: Monthly prices for the cheapest triple-play offer in each country of the benchmark
[Source: Analysys]

However, the entry-level triple-play package is very different from one country to another. Typically, Sweden's cheapest package (EUR20.64) includes 256kbit/s broadband, whereas the UK's cheapest package (EUR44.39) includes 2000kbit/s broadband.

In most of the countries, broadband, fixed telephony and TV are offered as a single package. This is for example the case in France where Free offers up to 28 000kbit/s broadband, where available, as well as unlimited calls to the fixed telephony network (national calls and calls to many international destinations are included) and more than 100 TV channels. However, in some countries this is not the case. We have therefore constructed a ‘triple-play’ package by adding a broadband offer with a telephony offer and a digital TV offer.

4.4 Comparison of the broadband component of the triple-play package

4.4.1 Comparison of the lowest priced package for a particular downstream speed range in each country

Triple-play offers including 8000kbit/s (or above) broadband

Exhibit 4.3 below compares the lowest prices per country for triple-play packages with broadband at a downstream speed of 8000kbit/s or above in November 2006.

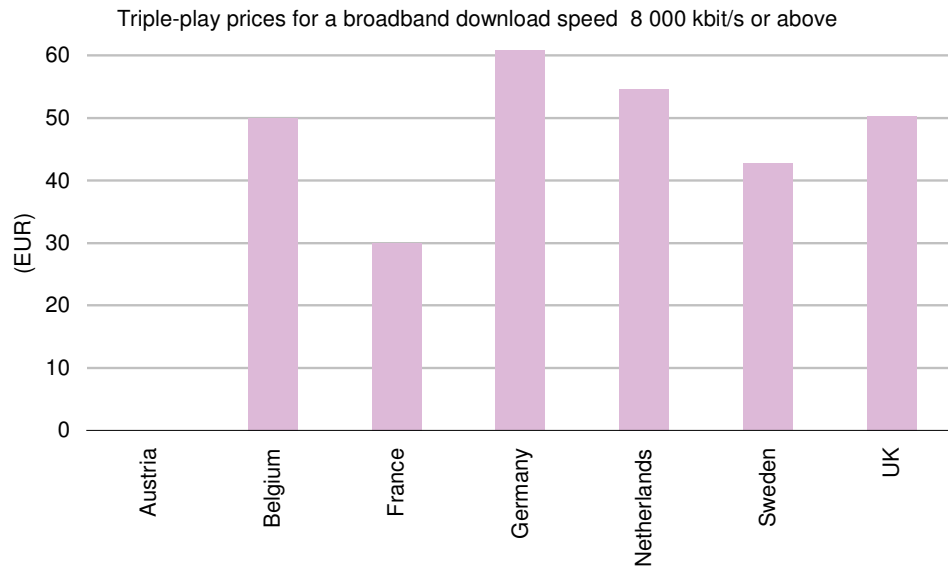


Exhibit 4.3: Monthly prices for triple-play offers including 8000kbit/s (or above) broadband (November 2006) [Source: Analysys]

France is the most advanced country in terms of very high speed triple-play offers with Free’s triple-play package (up to 28 000kbit/s for EUR29.99). There is no available package in Austria that offers such high throughputs. The monthly average for the benchmark is EUR50.73, which is 1% higher than the Belgian best offering for 8000kbit/s (or above) triple play.

Triple-play offers including 2000kbit/s (or above) broadband

Exhibit 4.4 below compares the lowest prices per country for triple-play packages with broadband at a downstream speed of 2000kbit/s or above in November 2006.

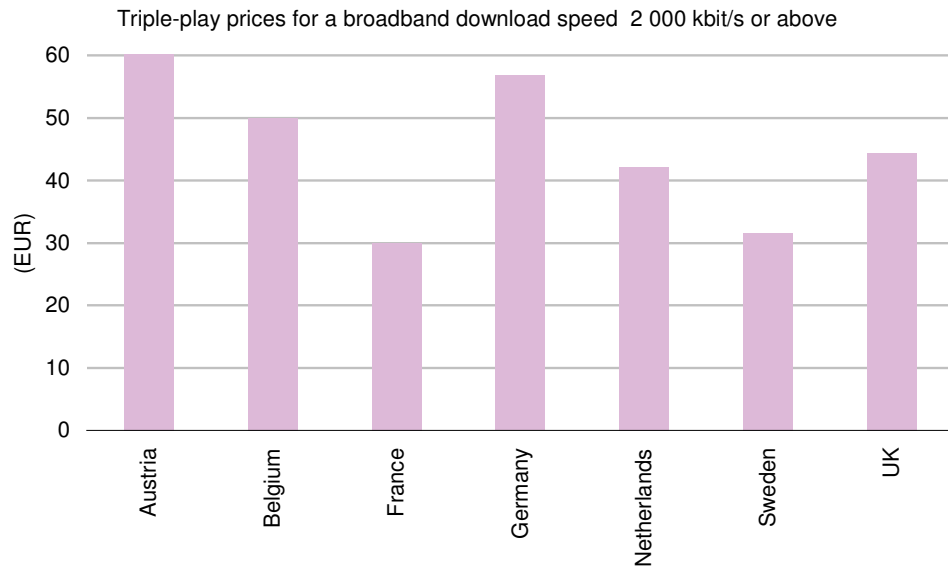


Exhibit 4.4: Monthly prices for triple-play offers including 2000kbit/s (or above) broadband (November 2006) [Source: Analysys]

France still has the lowest price for triple-play packages with broadband in this speed range (EUR29.99 per month).

Belgium’s cheapest price for high speed broadband packages is EUR50.00, which is 10% higher than the average price for the benchmarked countries (EUR45.03), and 40% higher than France.

4.5 Number of TV channels

Exhibit 4.5 below shows the maximum number of TV channels offered as part of a triple-play package in each of the benchmarked countries.

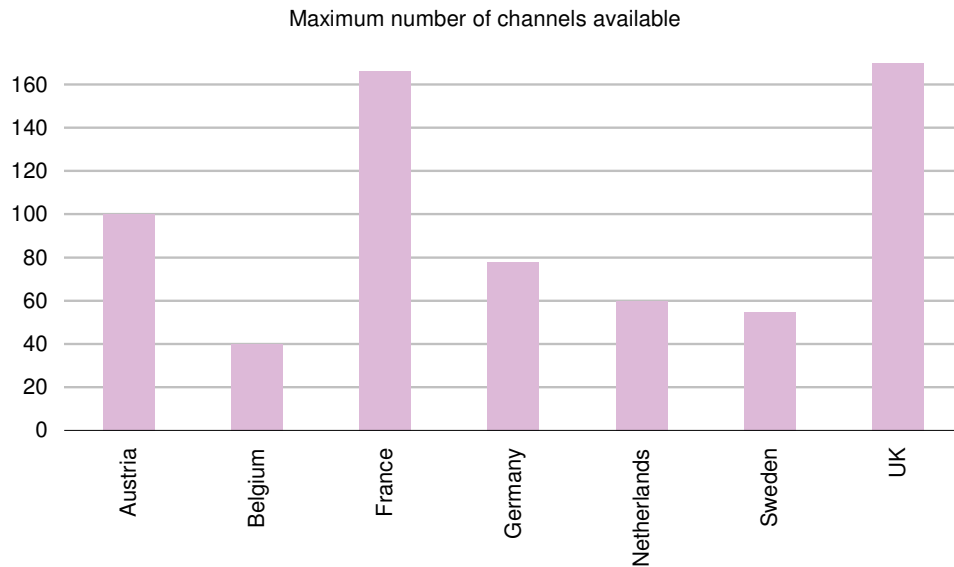


Exhibit 4.5: *Maximum number of TV channels available in the basic package offer in the benchmarked countries [Source: Analysys]*

In the UK, NTL offers a triple-play package including 170 channels. This is much higher than in all the other countries of our benchmark, except for France (166 channels with the Noos package). The average maximum number of channels available in the basic offers amongst our benchmark is 96 channels. This is much higher than the number of channels available in Belgium (40 channels) and in Sweden (55 channels).

4.6 Triple-play conclusion

If the cheapest available triple-play package in each country is picked, Belgium has the highest price and Sweden the lowest, at approximately half the price (though at 256kbit/s only, it is arguably not ‘broadband’).

If the triple-play packages are sorted into downstream speed ranges of the broadband part of the package, and the cheapest package in each country picked, Belgium has the third cheapest package in the 8000kbit/s and above range and the middle ranking (4th out of 7)

package in the 2000kbit/s and above range. In both ranges, France has the cheapest package, at half the price of the most expensive one.

In general, triple-play packages in Belgium are more expensive than their peers at the entry level (lowest broadband speed) although this difference does not persist at higher broadband speeds where the Belgian offer is broadly comparable to that in the other countries of the benchmark, except for France which has an exceptionally low priced minimum offer.

5 Conclusion

In this section we aim to answer the following question:

“Are prices for broadband Internet access and triple-play offers higher in Belgium than in other countries compared?”

We have compared the published residential broadband prices of 36 operators in seven countries (Austria, Belgium, France, Germany, the Netherlands, Sweden and the UK) using a comparison framework incorporating several methods. We have also directly compared the prices of incumbent operators in each country and of two operators that are present in most of the countries. Finally, we have compared basic triple-play package prices in each country at three different downstream speed ranges.

5.1 Broadband comparison

5.1.1 All services and operators

Belgium was the first country in the study in which a high speed broadband service (downstream speed range of 8000kbit/s and above) was launched when Telenet introduced a 10Mbit/s Internet service over cable in 1997. Priced at around EUR40 per month, this was a competitive offer compared with the other countries until 2004, but by 2006 Belgium had the third highest price in this speed range in the study, as shown in Exhibit 5.1 below.



Exhibit 5.1: *Lowest price offer per country for different offer ranges in the benchmark countries [Source: Analysys]*

At the next lowest downstream speed range of 4000kbit/s and above, Belgium had the cheapest offer until 2003 and currently (November 2006) has a middle ranking lowest price (3rd out of 7), with France, the Netherlands and Germany having cheaper priced services.

At the downstream speed range of 2000kbit/s and above, Belgium again had the cheapest offer until 2003, when cheaper offers were introduced in France, Germany, the Netherlands and Sweden. By November 2006, the lowest price in Belgium was the second highest in the study, with only Austria being more expensive.

At the downstream speed range of 500kbit/s and above, the lowest price in Belgium was middle ranking in 2001 (4th out of 7), most expensive in 2003 and second most expensive in 2006 among the countries in the study.

Using two more comparison metrics (geometric mean of speed unit price and downstream speed unit price) reveals similar results: in 2001 Belgium was by far the cheapest, but prices have remained generally flat through to 2006. In other countries, prices have started higher and fallen significantly over time such that in November 2006 France, the

Netherlands, Sweden and the UK are cheaper than Belgium, Germany is roughly equivalent, and Austria is more expensive.

France's lowest cost position is due to the 20Mbit/s offer from Cegetel of EUR14.90 (available at that price since the fourth quarter in 2005), while the next lowest high speed broadband offer is in the Netherlands with Orange's offer of 20Mbit/s for EUR19.95.

5.1.2 Incumbent operators only

If just the incumbent operators' prices for the downstream speed range of 2000kbit/s and above are examined, a similar picture emerges. Belgium had the lowest prices in 2003 (when these products were first available) but by November 2006 had the second highest prices, with only Austria having higher prices.

5.1.3 Operators operating across several markets

UPC operates in five of the benchmarked countries under the brands Chello, Noos-Numericable and Com Hem. Comparing downstream speed ranges of 8000kbit/s and above and 2000kbit/s and above, a similar pattern emerges: France and Sweden have the cheapest prices and Austria the most expensive ones; the prices for Belgium and the Netherlands are between these two extremes. The prices for the 8Mbit/s and above range vary from EUR19.90 to EUR89 across the five countries, which suggests that there is little pricing convergence across country operations of this company: Accordingly, it suggests that Chello is not a price leader and is following the 'market price' in each of the countries in which it operates.

Tele2/Versatel operates in six out of seven countries of our benchmark. Comparing the prices for services with downstream speed ranges of 4000kbit/s and above and 2000kbit/s and above, a similar pattern emerges: Germany has the highest prices and Belgium the second highest. The monthly fees in each speed category vary considerably, by a factor of more than two, suggesting that Tele2's prices are not set for consistency across Europe, but are adjusted to suit each local country market.

5.2 Triple-play package comparison

If the cheapest available triple-play package in each country is picked, Belgium has the highest price and Sweden the lowest, at approximately half the price.

If the triple-play packages are sorted into downstream speed ranges of the broadband part of the package, and the cheapest package in each country picked, Belgium has the third cheapest package in the 8000kbit/s and above range and the middle ranking (4th out of 7) package in the 2000kbit/s and above range. In both ranges, France has the cheapest package, at half the price of the most expensive one. This conclusion remains when the prices are compared using the geometric mean method.

In general, triple-play packages in Belgium are more expensive than their peers at the entry level (lowest broadband speed) although this difference does not persist at higher broadband speeds where the Belgian offer is broadly comparable to that in the other countries of the benchmark, except for France.

Annex A: Usage caps and on-net coverage per operator

A.1 Usage caps per operator

<i>List of operators</i>	<i>Usage caps (8 000kbit/s or above) in Gigabytes</i>
Austria	
Tele2UTA	No offer available in this range
Telekom Austria AG	No offer available in this range
Chello Broadband GmbH	No usage cap
Livest Kabelmedien GmbH	20
Belgium	
Belgacom SA	No usage cap
Chello Broadband NV (UPC Belgium)	40 (Chello classic 10Mbit/s), no usage cap (Chello extreme 20Mbit/s)
Voo	10
Scarlet Telecom	No offer available in this range
Telenet Holding NV	12
France	
Cegetel	No usage cap
Noos-Numericable	No usage cap
Orange SA (France Telecom)	No usage cap
Free	No usage cap
Germany	
PrimaCom AG	No usage cap
Deutsche Telekom	No usage cap
QSC AG	No usage cap
Kabel Deutschland	No usage cap
Netherlands	

<i>List of operators</i>	<i>Usage caps (8 000kbit/s or above) in Gigabytes</i>
Chello Broadband NV	No usage cap
Orange Netherlands	No usage cap
KPN Telecom NV	No usage cap
Sweden	
Tele2 Sverige AB	No usage cap
Com Hem AB	No usage cap
TeliaSonera AB	No usage cap
B2 Sweden	No usage cap
UK	
AOL	No usage cap
Sky	No usage cap
BT	No usage cap – guideline allowance 2, 6 or 40GB
NTL Group Ltd	No usage cap

Exhibit A.1: *Usage caps per operator [Source: Analysys]*

A.2 On-net coverage per operator

<i>Austria</i>	<i>Operator</i>	<i>On-net broadband coverage 2005 (% of the population)</i>
Incumbent	Telekom Austria AG	86%
All cable	UPC chello broadband GmbH + others	44%
Other	Tele2UTA	n/a
<i>Belgium</i>	<i>Operator</i>	<i>On-net broadband coverage 2005 (% of the population)</i>
Incumbent	Belgacom SA	99%
All cable	Telenet + Voo + Chello	81%
Other	Scarlet Telecom	n/a
<i>France</i>	<i>Operator</i>	<i>On-net broadband coverage 2005 (% of the population)</i>
Incumbent	Orange SA (France Telecom)	93.45 % (note : Source; Ortel,30/09/05)
All cable	Noos-Numericable + others	27% (note : Source; Ortel,30/09/05)
DSL unbundled	Cegetel + others	52 % (note : Source; Ortel,30/09/05)
<i>Germany</i>	<i>Operator</i>	<i>On-net broadband coverage 2005 (% of the population)</i>
Incumbent	Deutsche Telekom AG	92%
All cable	Kabel Deutschland + ish + PrimaCom + others	21%
Other	QSC AG	n/a
<i>Netherlands</i>	<i>Operator</i>	<i>On-net broadband coverage 2005 (% of the population)</i>
Incumbent	KPN Telecom NV	99%
All cable	Chello Broadband NV + others	97%
Other	Orange Netherlands	n/a
<i>Sweden</i>	<i>Operator</i>	<i>On-net broadband coverage 2005 (% of the population)</i>
Incumbent	TeliaSonera AB	90%
All cable	Tele2 Sverige AB + com hem AB + others	45%
Other	B2 Sweden	52%
<i>UK</i>	<i>Operator</i>	<i>On-net broadband coverage 2005 (% of the population)</i>
Incumbent	BT	100%
All cable	NTL Group Ltd (ntl)	48%

Other	AOL	70%
Other	Sky	70%

Exhibit A.2: *Coverage per operator [Source: Analysys, European Broadband Cable 2006 (Screen Digest), Ortel.fr]*

Similarly to a wireline system, a cable connection can be either one way or two way. In the case of a one-way connection, information is always transferred according to one pre-assigned direction. Examples of one-way systems include broadcast stations. Consequently a one-way communication system is enough to provide cable TV.

Other systems, such as telephony, require two directions of communication. This type of system is called a duplex system and comprises two parts which can communicate with one another in both directions. A duplex system can be either half-duplex (communication in both directions is possible, but only in one direction at a time) or full-duplex (in both directions simultaneously).

Broadband network traffic is bi-directional: there are download and upload directions. A two-way connection is consequently required for cable broadband. This explains why cable broadband coverage figures are lower than cable TV figures: a one-way communication system is enough for cable TV, whereas it would have to be enhanced in order to provide broadband services.

For example, 90% of Belgium's cable connections are two-way, resulting in only 81% broadband cable coverage in Belgium which is lower than the cable TV coverage. This is also the reason why Germany's cable broadband coverage is around 21%, since only 30% of Germany's cable connections are two-way.

A.3 Activation, installation and equipment fees per operator

<i>List of operators</i>	<i>Activation and installation fee (self install)</i>	<i>Activation and installation fee (technician install)</i>	<i>Equipment purchase</i>
Austria			
Tele2UTA	43.52	131.00	n/a
Telekom Austria AG	29.90	131.00	n/a
Chello Broadband GmbH	25.00	75.00	70.00
Livest Kabelmedien GmbH	35.00	71.95	72.67
Belgium			
Belgacom SA	25.00	111.55	39.00
Chello Broadband NV)	39.99	164.99	n/a
Voo	90.00	130.00	75.00
Scarlet Telecom	n/a	111.55	5.00
Telenet Holding NV	50.00	125.00	99.00
France			
Cegetel	0.00	199.00	n/a
Noos-Numericable	60.00	100.00	n/a
Orange SA (France Telecom)	n/a	n/a	79.00
Free	96.00	n/a	190.00
Germany			
PrimaCom AG	n/a	n/a	49.90
Deutsche Telekom	99.95	n/a	n/a
QSC AG	99.00	299.00	n/a
Kabel Deutschland	49.00	n/a	90.00
Netherlands			
Chello Broadband NV	29.00	n/a	25.00
Orange Netherlands	n/a	89.00	74.95
KPN Telecom NV	n/a	74.95	79.00
Sweden			
Tele2 Sverige AB	n/a	64.83	54.37
Com Hem AB	53.93	n/a	104.05
TeliaSonera AB	162.88	201.01	75.72
B2 Sweden	53.93	n/a	n/a
UK			
AOL	0.00	n/a	81.70
Sky	59.42	133.69	0.00
BT	0.00	37.14	74.27
NTL Group Ltd	0.00	n/a	0.00

Annex B: Broadband data collection

See separate electronic spreadsheet.¹

¹ We note from a report issued in February 2007 by Anacom, the National Regulatory Authority (NRA) for telecommunications for Portugal, ranking various European countries by price of broadband services, that some of the rankings differ from those of this study.

We should like to clarify that the methods used for comparison differ between the two reports:

- Anacom has set a minimum threshold of 70-80% coverage for selecting operators, and they acknowledge that the data for this is hard to find and not necessarily accurate. This suggests that the Anacom study uses a different list of operators to the Analysys study, which deliberately includes cable TV operators with regional franchises and LLU-based new entrants with coverage in urban centres only. It is possible that Neuf/Cegetel has not been included in the Anacom study.
- From the Anacom report it is not clear whether double/triple play offers have been included, which could be a significant factor in the difference in prices in the UK, where there are some low-priced broadband offers dependent upon purchasing a monthly mobile or fixed phone tariff.
- Anacom's price comparison includes 256kbit/s services; the Analysys study has considered only offers above 500kbit/s.
- The Anacom report excludes VAT; the Analysys report includes VAT.

Annex C: Triple-play data collection

See separate electronic spreadsheet.