

## 2. FAST AND ULTRA-FAST INTERNET ACCESS

### 2.1. Introduction

**Over 99.9% of European homes can have access to broadband of at least a basic quality, when considering all technologies (including fixed, fixed-wireless, mobile and satellite).** Standard fixed broadband covers 95.5% of homes. Rural coverage of standard fixed broadband stands at 83.2% as of end of 2012. **Next Generation Access technologies capable of providing at least 30 Mbps download cover 53.8% of EU homes.** Cable has the highest NGA coverage (39.4%) followed by VDSL (24.9%) and FTTP (12.2%).

**The total number of fixed broadband lines went up by 5.5 million, and the penetration rate (number of lines over population) reached 28.8% in January 2013.** 24% of European homes do not subscribe to internet<sup>1</sup>. Fixed broadband penetration is the highest in the Netherlands, Denmark and France, and the lowest in Romania, Poland, Bulgaria and Slovakia in the EU. Penetration increased the most in Lithuania, Latvia and Bulgaria.

**Next Generation Access lines account for 20.3% of all fixed broadband lines as opposed to 12.2% a year ago. 57.4% of NGA lines are cable DOCSIS3.0, the majority of cable lines are already NGA.** Cable is followed by FTTH/B (25.8%) and VDSL (14.9%). Contrary to cable, in xDSL, only 3.9% of lines have been upgraded to VDSL so far. New entrants provide 77.5% of NGA lines, although their market share in the total fixed broadband market is only 57.7%. The majority of fixed broadband lines are NGA in Romania, Belgium, Lithuania and the Netherlands, while the share of NGA is below 10% in Greece, Cyprus, Italy and France. **Although the number of ultrafast lines more than doubled in 2012, they currently represent only 3.4% of all fixed broadband lines, which translates to about 2% of European homes subscribing to at least 100Mbps.** 14.8% of fixed broadband lines provide at least 30 Mbps, up from 9% a year ago.

**Third generation mobile broadband (HSPA) coverage reached 96.3% of population, while fourth generation (LTE) coverage tripled and stands at 26.2%. Mobile broadband subscriptions increased by 17.3% last year, and penetration (SIM cards over population) grew to 54.5%.** Considering only large screen use, penetration reached 9%. Mobile broadband is the most popular in Finland, Sweden and Denmark.

### 2.2. The fixed broadband market

#### 2.2.1. Broadband coverage

The [Digital Agenda for Europe](#) has set three targets related to broadband access, two of which refer to broadband coverage

- All homes should have access to broadband of at least a basic quality by 2013,
- All homes should have access to high-speed broadband of at least 30 Mbps by 2020.

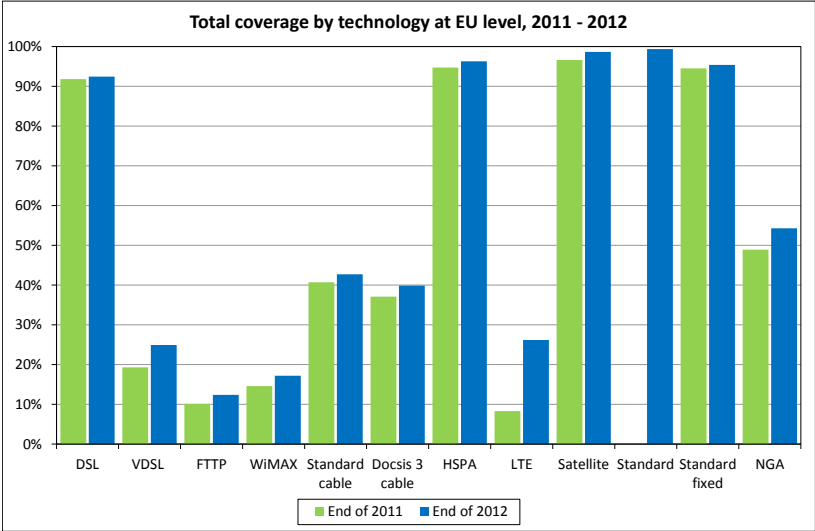
---

<sup>1</sup> According to Eurostat 76% of households with at least one member aged 16-74 years in the EU27 had access to the internet in 2012.

At the end of 2012, over 99.9% of European homes could have access to at least a basic broadband network considering all technologies (fixed, fixed-wireless, mobile and satellite). Satellite broadband has the largest physical coverage: it is available to 100% of population in 24 out of the 27 Member States. Despite the high coverage, satellite take-up is still marginal, as it represents less than 1% of all EU broadband lines. Without satellite, 99.4% of homes are covered by broadband (Standard broadband coverage). Considering only fixed and fixed wireless technologies (Standard fixed broadband coverage) coverage goes down to 95.5% leaving a gap of more than 9 million homes.

Next Generation Access technologies capable of at least 30 Mbps are available to 53.8% of homes as of end of 2012. Docsis 3.0 cable has by far the highest NGA footprint (39.4%) followed by VDSL (24.9%) and FTTP (12.2%)<sup>2</sup>.

**Figure 16: Total coverage by technology at EU level, 2011-2012**

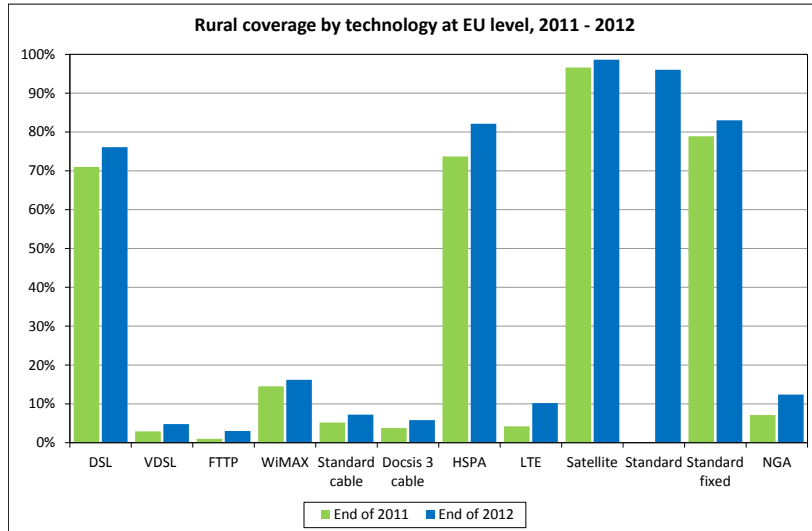


Source: Point Topic

Broadband coverage is significantly lower in rural areas. Standard broadband covers 96.1% while standard fixed broadband only 83.2% of rural homes. Wireless technologies (satellite and mobile HSPA) exceed the rural coverage of fixed technologies in general. NGA remains very low in rural areas with 12.4% availability.

<sup>2</sup> In some countries proxies for coverage have been used in the absence of precise data on household coverage or if the data supplied deviated from the survey definitions. We have been informed of potential differences from the survey definitions for Poland (affecting the published results for DSL, FTTP and WiMAX – other technology data has been estimated based on research by Point Topic), the Netherlands (they have specified differences in the definition of rural households), Slovakia (affecting the data published for DSL and VDSL). Data in Denmark reflects the broadband market at June 2012 rather than December 2012. In Belgium, the published result for VDSL coverage represents all VDSL coverage – however, the NGA combination score in Belgium only considers only VDSL capable of delivering speeds greater than 25Mbps. In the UK VDSL represents all VDSL coverage. In Austria, Poland, Czech Republic, Italy and Hungary we have not had confirmation that the survey definition for VDSL has been met. Note that coverage does not include CDMA technology, which extends standard broadband coverage in several markets. No breakdown is available for FTTH and FTTB. Rural areas are defined as square kilometres with a population of less than 100 inhabitants.

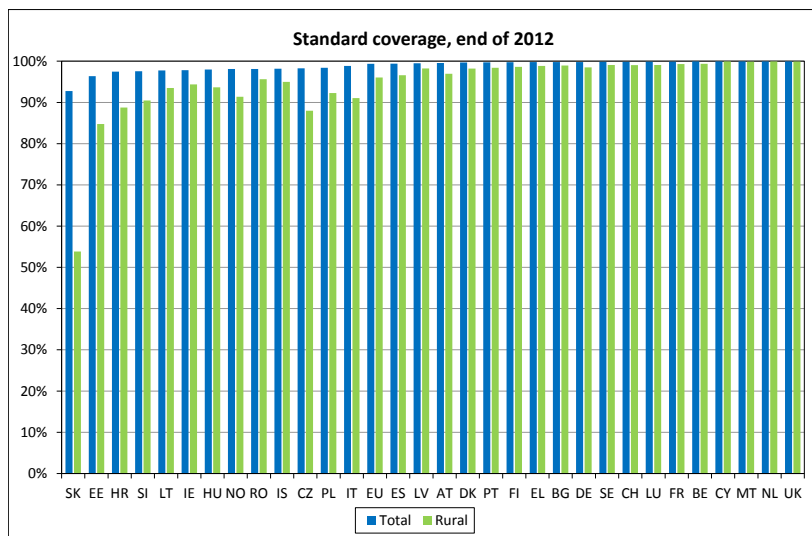
**Figure 17: Rural coverage by technology at EU level, 2011-2012**



Source: Point Topic

Standard broadband coverage exceeds 99% in 18 Member States. Countries with the lowest coverage are Slovakia, Estonia and Slovenia; of which Slovakia and Slovenia are fully covered by satellite broadband.<sup>3</sup>

**Figure 18: Standard coverage, end of 2012**

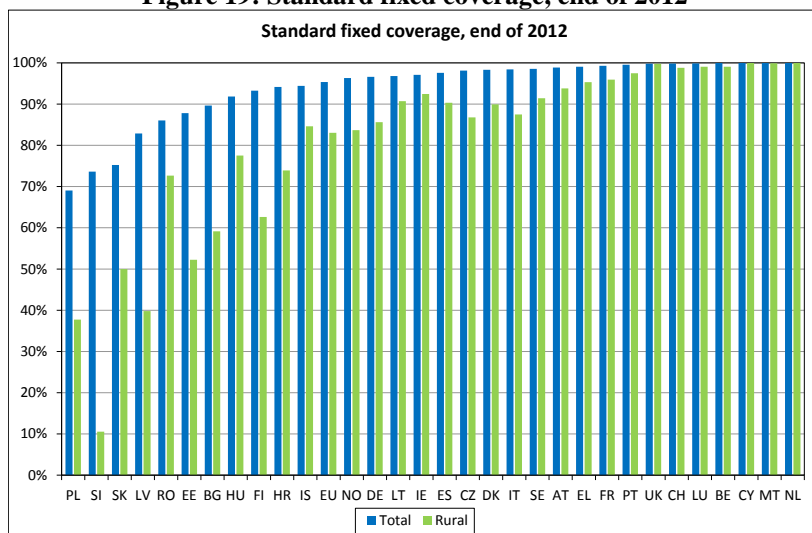


Source: Point Topic

In standard fixed broadband, only 10 Member States are really close (>99%) to full coverage. Standard fixed broadband coverage is lower in Eastern Europe, especially in Poland, Slovenia Slovakia and Latvia.

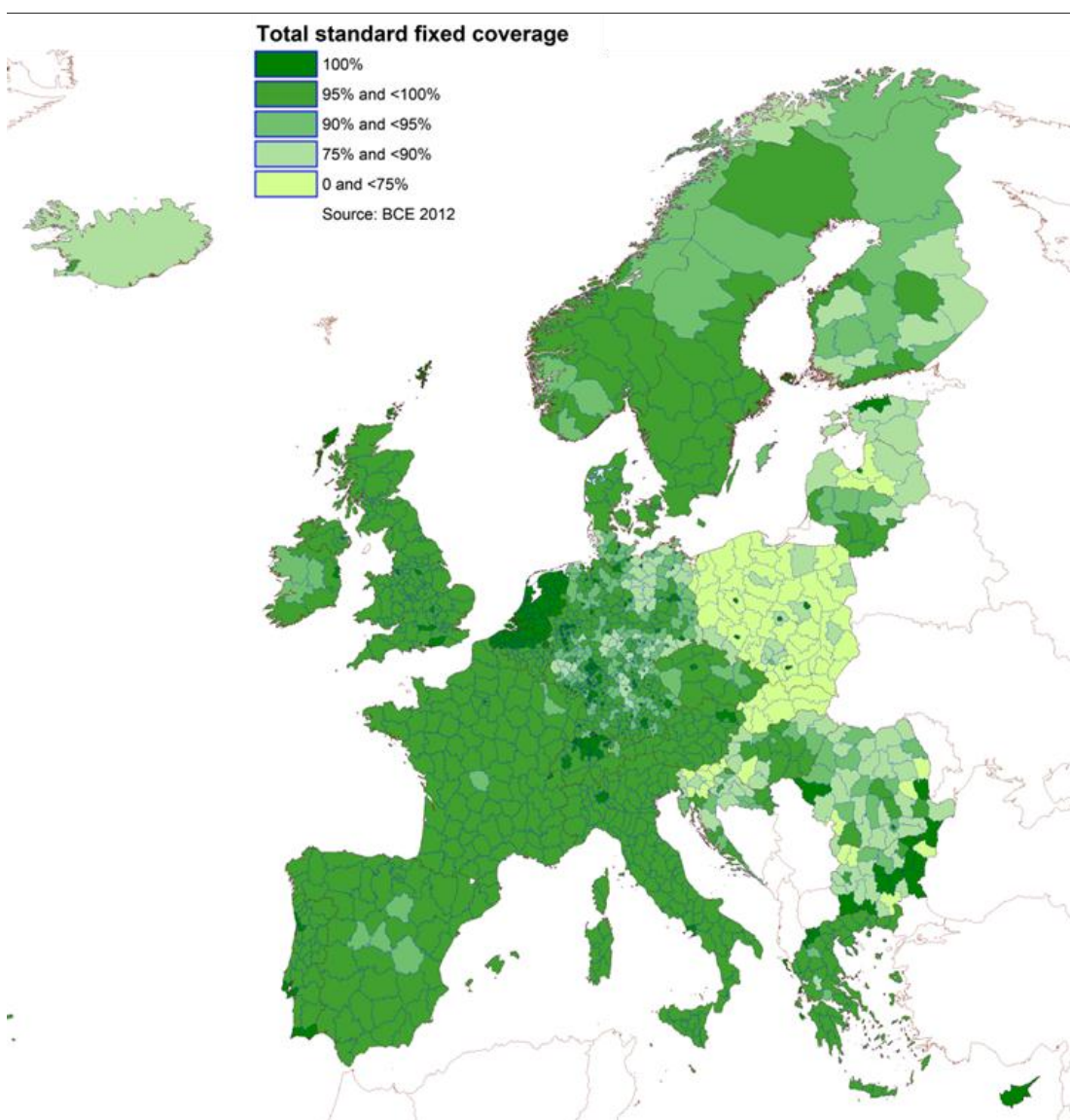
<sup>3</sup> The reason for presenting broadband coverage also with and without satellite technology is that currently the take-up of satellite broadband is marginal, which may partly be caused by the novelty of high-speed KA-band satellite technology.

**Figure 19: Standard fixed coverage, end of 2012**



Source: Point Topic

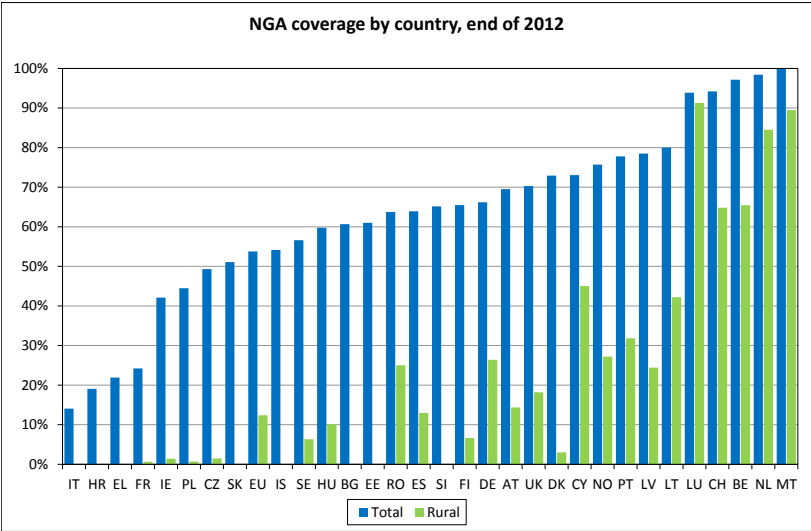
**Figure 20: Standard fixed coverage by region, end of 2012**



Source: Point Topic

In NGA, the best performing Member States are Malta, the Netherlands, Belgium and Luxembourg having more than 90% of homes covered. On the other hand, Italy, Croatia and Greece are lagging behind in fast broadband deployment.

**Figure 21: NGA coverage by country, end of 2012**

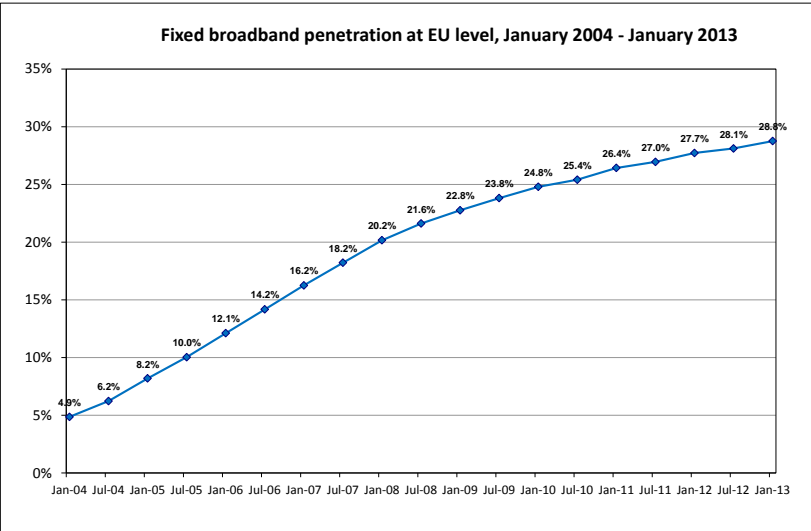


Source: Point Topic

2.2.2. Fixed broadband take-up

As of January 2013, there were 144.8 million fixed broadband lines in the EU, which corresponds to 28.8 lines per 100 inhabitants. Although the annual growth has been continuously slowing down since 2007, the fixed broadband market grew by 5.5 million lines in 2012. There is still potential for further growth in the market, as 24% of EU homes do not have an internet subscription.

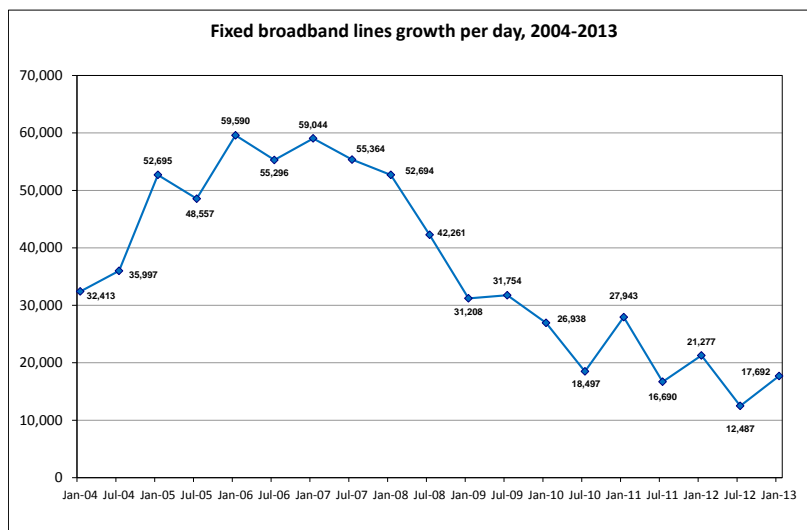
**Figure 22: Fixed broadband penetration at EU level, 2004-2013**



Source: Communications Committee

Over 17 000 new lines were connected per day in the second half of 2012, which is less than one third of the highest observed growth. Growth in new lines has declined sharply especially in 2008 and 2009, and seems to have largely stabilized in 2011 and 2012. The second halves of the year are generally stronger due to the promotional offers at end of the year.

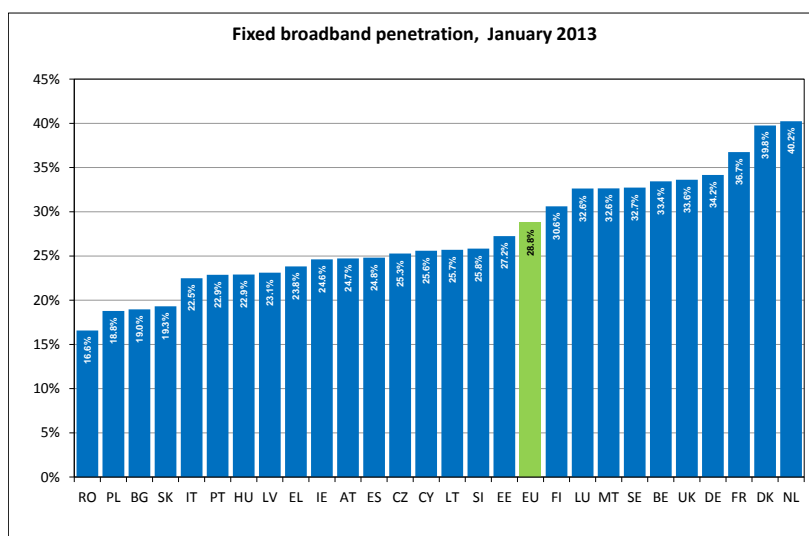
**Figure 23: Fixed broadband lines growth per day, 2004-2013**



Source: Communications Committee

Very large differences can be observed when comparing Member States. The Netherlands and Denmark compete for the first position with around 40 lines per 100 inhabitants followed by France, Germany and the UK. At the bottom of the list, four Eastern European Member States (Romania, Poland, Bulgaria and Slovakia) have lower than 20% penetration.

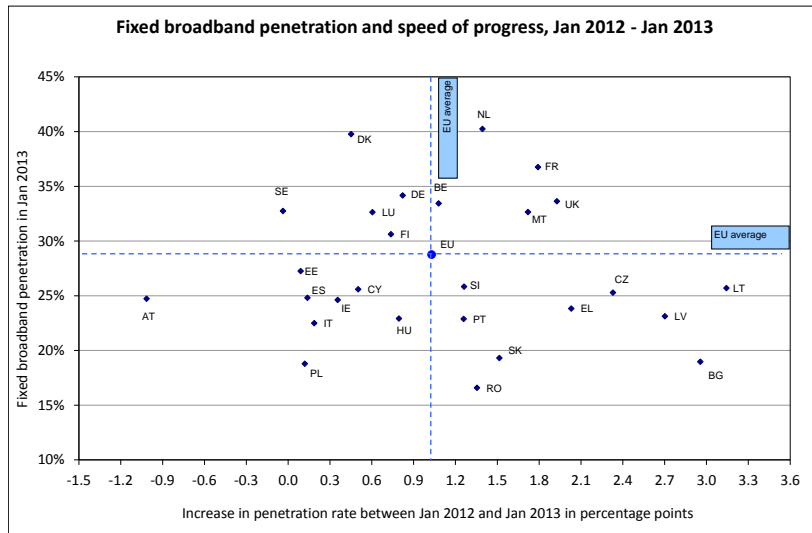
**Figure 24: Fixed broadband penetration, January 2013**



Source: Communications Committee

Penetration increased by 1 p.p. in the EU in the last twelve months, with marked differences among the Member States. No strong correlation can be observed, when looking at broadband penetration and the penetration rate growth during 2012, i.e. it cannot be concluded that those Member States with lower penetration progress more quickly than those with relatively mature fixed broadband markets. Nevertheless, the highest growth rates were recorded in Lithuania, Bulgaria, Latvia and the Czech Republic; these Member States managed to reduce their broadband penetration gaps by 1-2p.p. On the other hand, in eight Member States (Austria, Spain, Estonia, Italy, Poland, Ireland, Cyprus and Hungary) with lower than average penetration rates, the gap widened in 2012. At the same time, in the UK, France, Malta and the Netherlands, the growth was above the EU average despite their already high penetration rates.

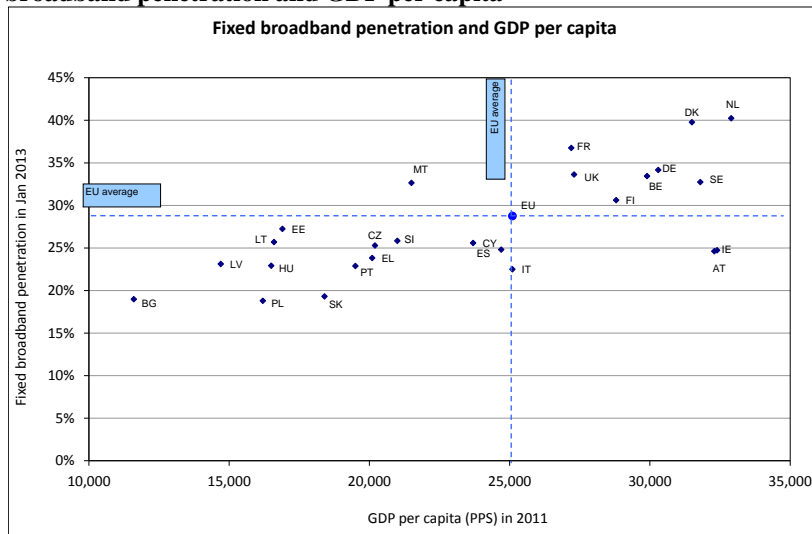
**Figure 25: Fixed broadband penetration and speed of progress, 2012-2013**



Source: Communications Committee

Fixed broadband penetration correlates with GDP per capita ( $R^2=0.5419$ ), as more wealthy Member States have generally higher penetration. Two remarkable exceptions are Austria and Ireland, where GDP per capita is relatively high, but fixed broadband take-up is below the average. This may be partly caused by the fact that mobile broadband use on large screens is above the average in these countries and substitute for fixed access. In Malta, despite lower GDP per capita, fixed broadband penetration is above the EU average.

**Figure 26: Fixed broadband penetration and GDP per capita**

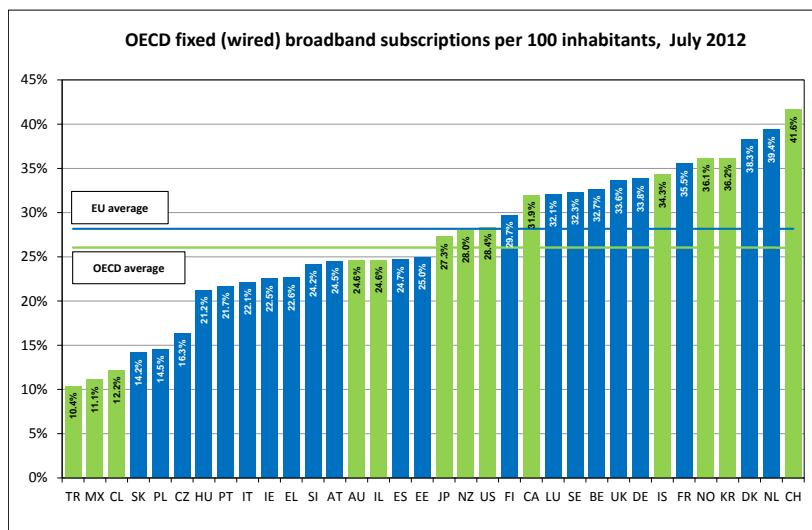


Source: EC services based on Communications Committee

### 2.2.3. An international comparison of broadband penetration

Fixed broadband penetration in the EU was slightly higher than in Japan and just below that of the US as of July 2012. The EU fixed broadband market has grown faster than those of Japan and the US over the past few years. Four European countries (Switzerland, the Netherlands, Denmark and Norway) are among the five best performing countries in the world in fixed broadband penetration.

Figure 27: OECD fixed (wired) broadband subscriptions per 100 inhabitants, July 2012



Source: Commission services based on the Communications Committee and OECD figures<sup>4</sup>

#### 2.2.4. Fixed broadband technologies

xDSL continues to be the predominant technology in the EU broadband market despite the decrease of its share from 80.9% of all fixed broadband lines in January 2006 to 73.8% in January 2013. Nevertheless, the number of xDSL lines increased by 1.7 million in 2012. All this increase can be attributed to VDSL lines, which currently represent a mere 3.9% of xDSL lines.

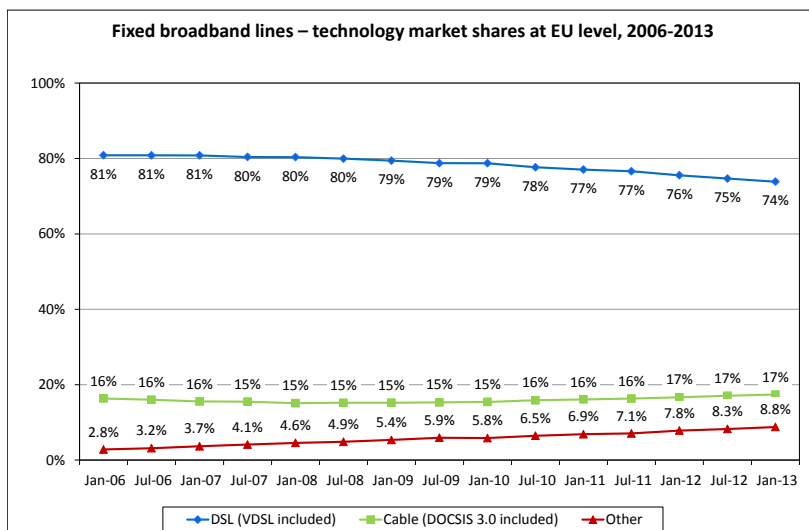
Cable, being the second most widespread fixed technology, has slightly increased its market share from 15.4% to 17.4% since 2010. The number of cable lines increased by 2 million, slightly surpassing xDSL in growth in 2012. NGA cable based on DOCSIS 3.0 doubled in 2012, as it expanded by 8.4 million lines making cable the most widely used NGA technology in the EU. By now, the vast majority of European cable networks have been upgraded to DOCSIS 3.0, and two thirds of cable subscriptions have already been migrated to this standard.

As for the other technologies, fibre lines (FTTH and FTTB) went up by 31% in the last 12 months, but still represent only 5.1% of all fixed broadband lines.

<sup>4</sup> The OECD applies a slightly different definition of fixed broadband by excluding fixed-wireless and satellite access.



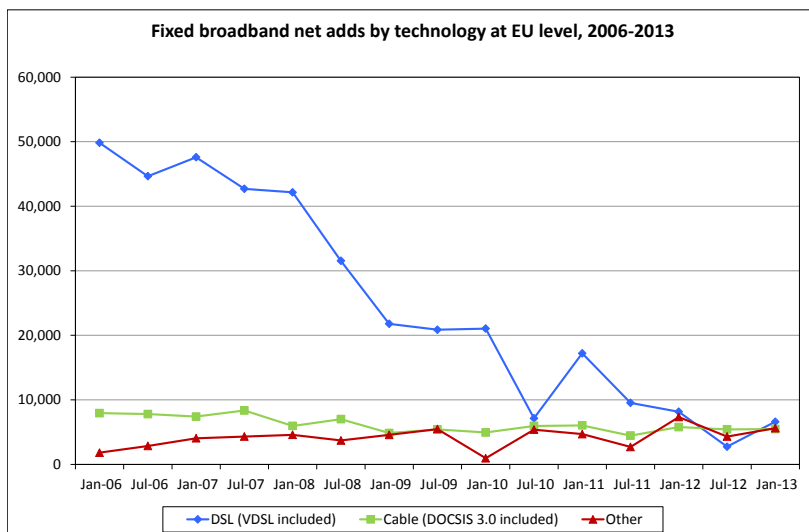
**Figure 28: Fixed broadband lines – technology market shares at EU level, 2006-2013**



Source: Communications Committee

Growth in xDSL has significantly declined since 2006, and the growth stands currently at comparable levels with cable. The growth rates in cable have been more stable over the last years. Nevertheless, the penetration over coverage ratio is still much higher for xDSL than for cable suggesting that there is still a high potential for cable operators to expand their customer base.

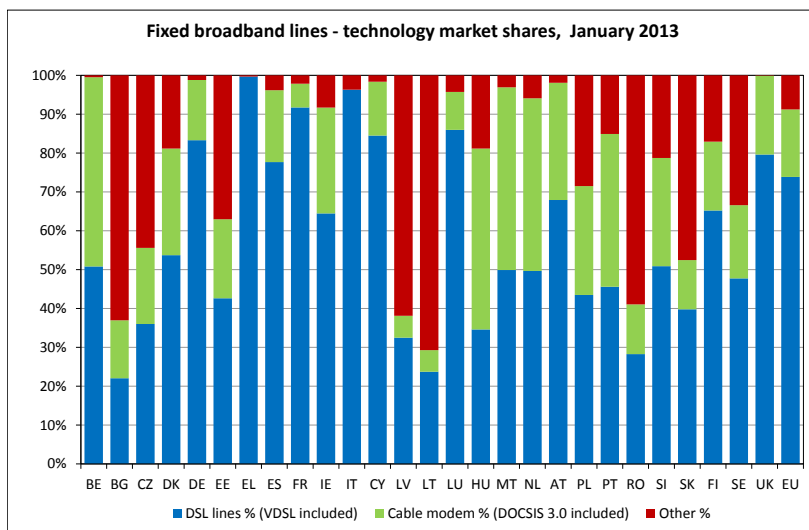
**Figure 29: Fixed broadband net adds by technology at EU level, 2006-2013**



Source: Communications Committee

xDSL is the dominant technology in most of the Member States, with really high market shares in Greece (100%), Italy (96%) and France (92%). In these Member States, the access to the incumbents` DSL infrastructure is of particular importance, as far as competition is concerned. xDSL has a substantially lower share in Eastern European Member States, where the legacy PSTN networks have not been deployed so widely than in Western Europe. xDSL has a relatively low share also in Belgium, the Netherlands and Malta, where cable provides strong platform competition. Cable is present in all but two countries (Italy and Greece), and plays a major role also in Portugal and Hungary.

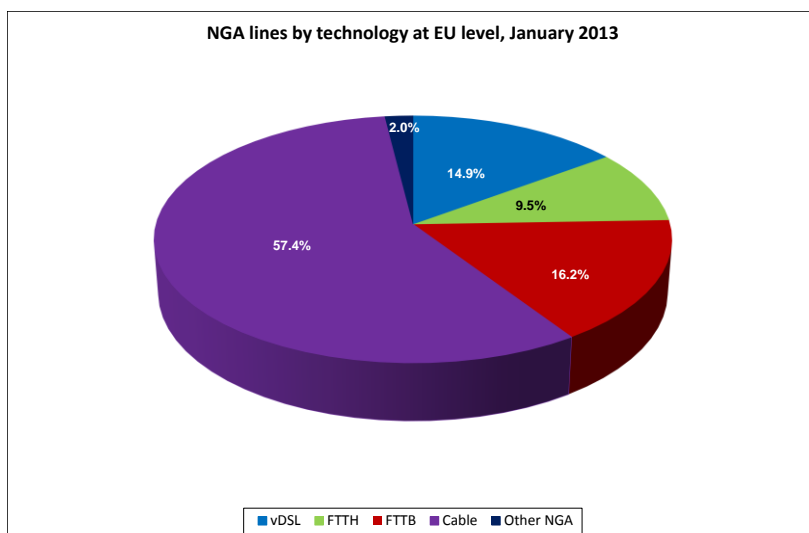
**Figure 30: Fixed broadband lines – technology market shares, January 2013**



Source: Communications Committee

In terms of NGA technologies, cable is by far the market leader having 57.4% of high-speed lines. Over 90% of European cable networks have been upgraded to Docsis 3.0 capable of download speeds well above 30 Mbps. Furthermore, cable operators have also migrated the majority of their customer base to NGA. VDSL has been progressing much more slowly, as only a fraction of xDSL lines have been upgraded to VDSL. FTTH and FTTB have a combined share of 25.8% within NGA lines, and only 5.1% of all fixed broadband lines as opposed to 42% in Japan, 58% in South Korea and 9% in the US<sup>5</sup>. NGA lines in total account for 20.3% of EU fixed broadband lines as opposed to 12.2% a year ago.

**Figure 31: NGA lines by technology at EU level, January 2013**



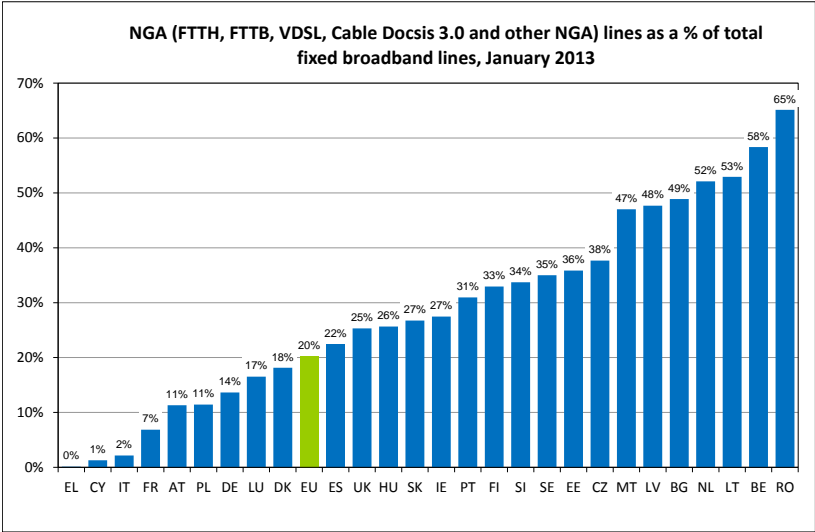
Source: Communications Committee

NGA technologies are most widespread in Romania, Belgium, Lithuania and the Netherlands, where over 50% of lines are high-speed. NGA lines are mainly based on cable in the Netherlands and fibre (FTTH and/or FTTB) in Romania and Lithuania. In Belgium, both

<sup>5</sup> Source: FTTH Council

VDSL and cable are important. Greece, Cyprus and Italy are similar in terms of weak platform competition and for lacking a significant presence of VDSL.

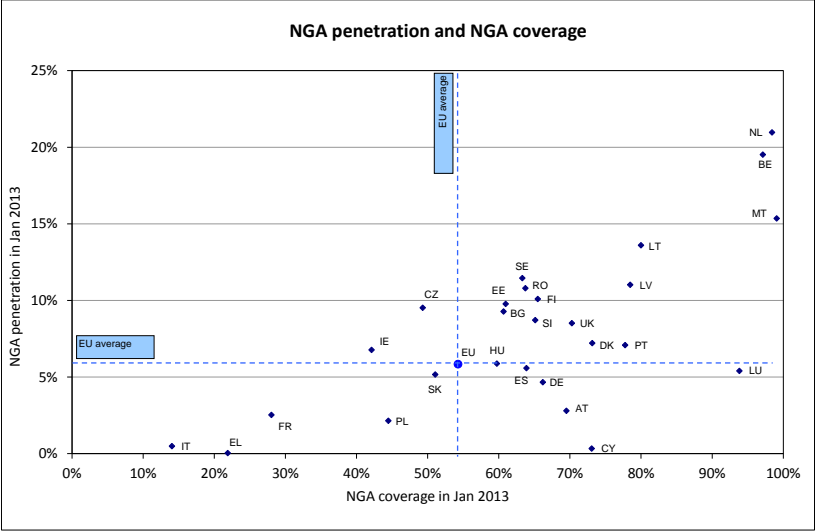
**Figure 32: NGA lines as a % of total fixed broadband lines, January 2013**



Source: Communications Committee

The correlation between NGA penetration and coverage is positive ( $R^2= 0.5193$ ). There is, however a large difference between coverage and penetration: NGA is available to 54% of EU homes, but take-up is only ~12% of homes.

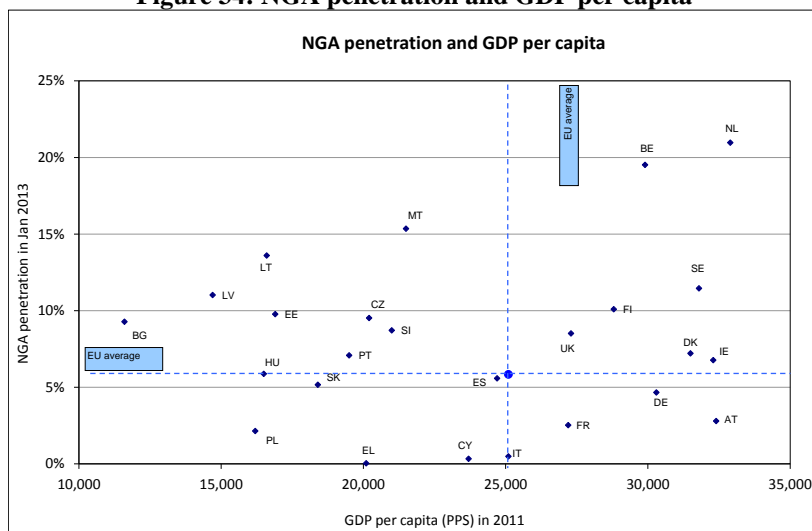
**Figure 33: NGA penetration and NGA coverage**



Source: EC services based on Communications Committee

On the other hand, there is no correlation between NGA penetration and GDP per capita ( $R^2=0.0012$ ). This is because NGA deployments are more dependent on the state and coverage of legacy DSL infrastructure and the existence of infrastructure competition. This is the reason why Eastern European countries have higher than average NGA penetration despite the lower GDP figures. In Belgium and the Netherlands, strong infrastructure competition between xDSL and cable brings high NGA availability and penetration.

**Figure 34: NGA penetration and GDP per capita**



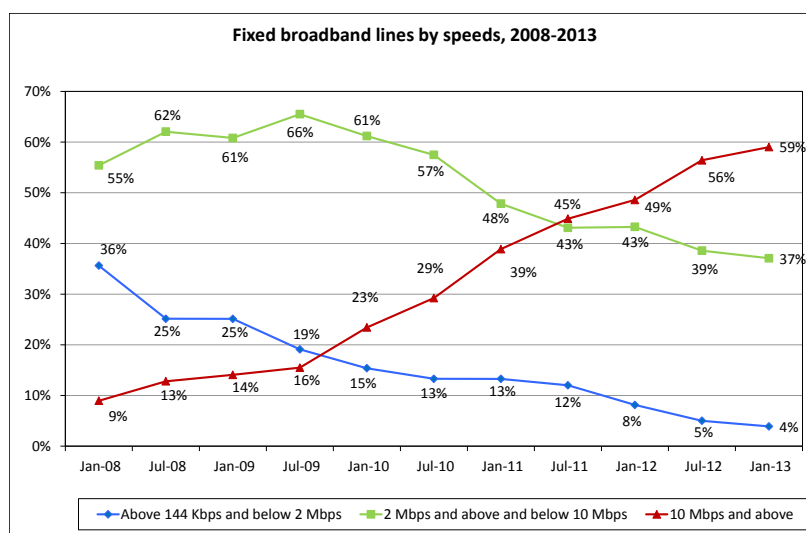
Source: EC services based on Communications Committee

### 2.2.5. Fixed broadband speeds

The Digital Agenda calls for fast and ultrafast broadband. Although a lot of progress has been made in improving broadband speeds, fast (at least 30 Mbps) and especially ultrafast (at least 100 Mbps) broadband are still rare in Europe.

The progress is more significant when considering lower speed brackets. Five years ago only 9% of fixed broadband lines provided at least 10 Mbps, in January 2013 it was 59%. Furthermore, currently only 3.9% of lines are below 2 Mbps as opposed to 35.6% in January 2008.

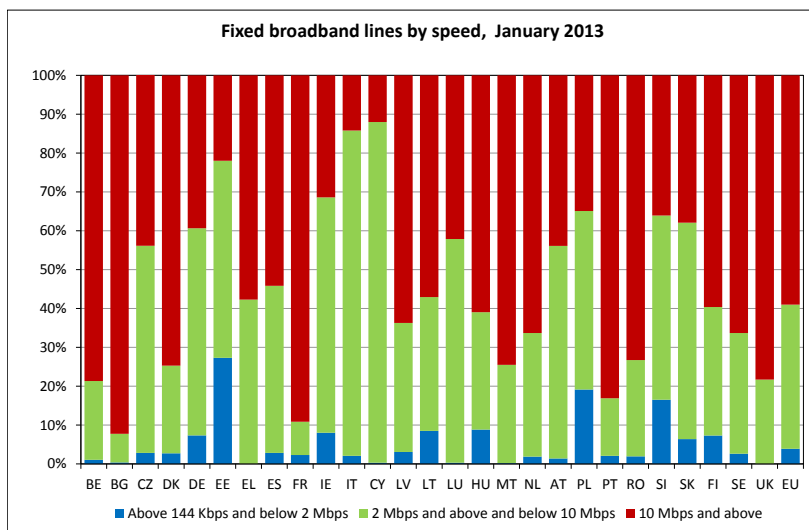
**Figure 35: Fixed broadband lines by speeds, 2008-2013**



Source: Communications Committee

There are only three Member States (Estonia, Poland and Slovenia), where more than 10% of lines are below 2Mbps. In Bulgaria and France, already roughly 90% of lines are at least 10 Mbps.

**Figure 36: Fixed broadband lines by speed, January 2013**

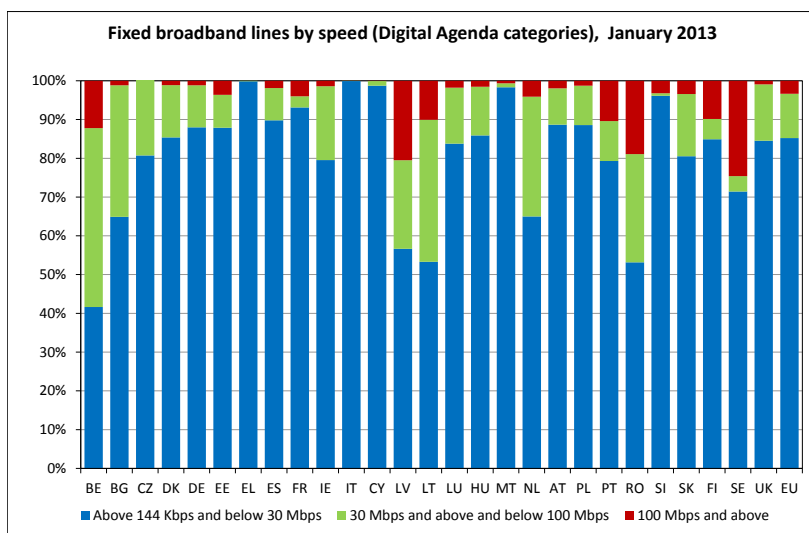


Source: Communications Committee

14.8% of European fixed broadband lines provide a headline download speed of at least 30 Mbps up from 9% a year ago, mainly thanks to the expansion of cable DOCSIS 3.0 lines. Belgium is the most advanced in NGA, as close to 60% of fixed broadband lines are at least 30 Mbps download as a result of fierce platform competition between cable and VDSL. Belgium is followed by Romania, Lithuania, Latvia, Bulgaria and the Netherlands with rates between 35-50%. At the same time, less than 5% of fixed broadband lines are at least 30 Mbps in Greece, Italy, Cyprus, Malta and Slovenia.

The share of lines with at least 30 Mbps (14.8%) falls below the share of lines of NGA technologies (20.3%), which are actually capable of delivering 30 Mbps. This is due to the fact that especially in VDSL but also in cable DOCSIS 3.0 offers start from lower speeds in several Member States, and many customers buy the cheaper entry products instead of the high-speed products.

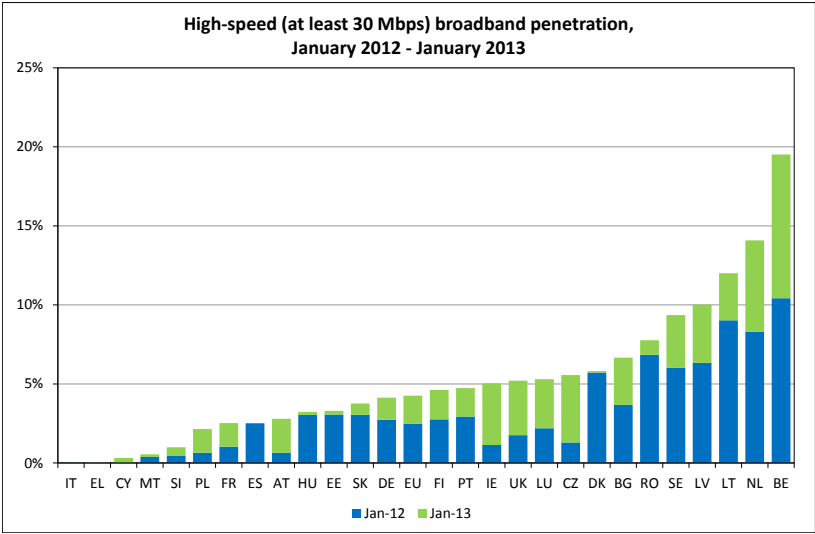
**Figure 37: Fixed broadband lines by speed (Digital Agenda categories), January 2013**



Source: Communications Committee

The number of high-speed lines (at least 30 Mbps) as a percentage of population is shown in Figure 38. Belgium is on the lead strengthened by a remarkable increase in the last twelve months.

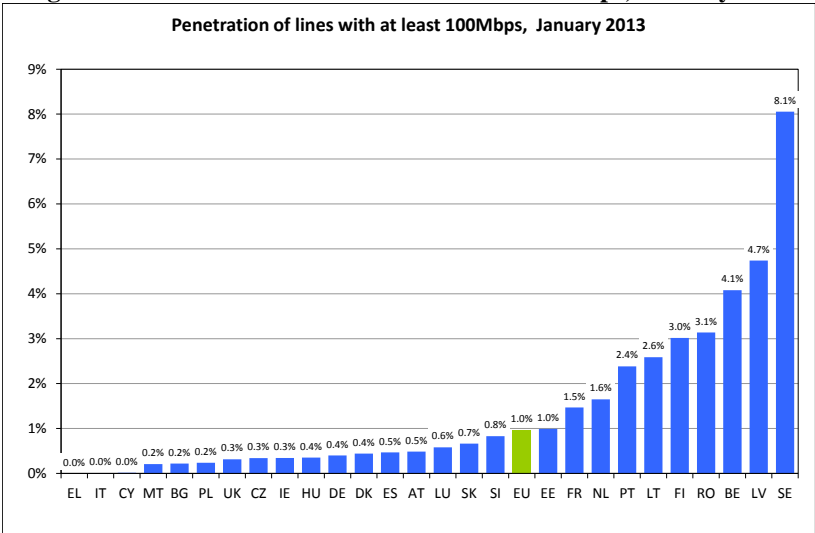
**Figure 38: High-speed broadband penetration, 2012-2013**



Source: Communications Committee

The Digital Agenda for Europe sets the ambitious target that at least 50% of European homes should subscribe to 100Mbps and above by 2020. Currently, 100Mbps lines are really scarce in Europe; there is one line per 100 inhabitants, which translates to around 2% of homes. Sweden scores best in this indicator in Europe followed by Latvia, Belgium, Romania and Finland. The performance of Romania is even more striking given that it has the lowest overall fixed broadband penetration rate.

**Figure 39: Penetration of lines with at least 100Mbps, January 2013**



Source: Communications Committee

### 2.2.6. Actual versus nominal fixed broadband speeds

Several studies<sup>6</sup> have shown that the effective speed of fixed broadband connections is typically less than the headline or advertised speed. In 2012 the Commission launched a study<sup>7</sup> to obtain reliable and accurate statistics of broadband performance across the different EU Member States. Measurements were taken from 9,104 measurement devices in March 2012 spread across all EU countries.

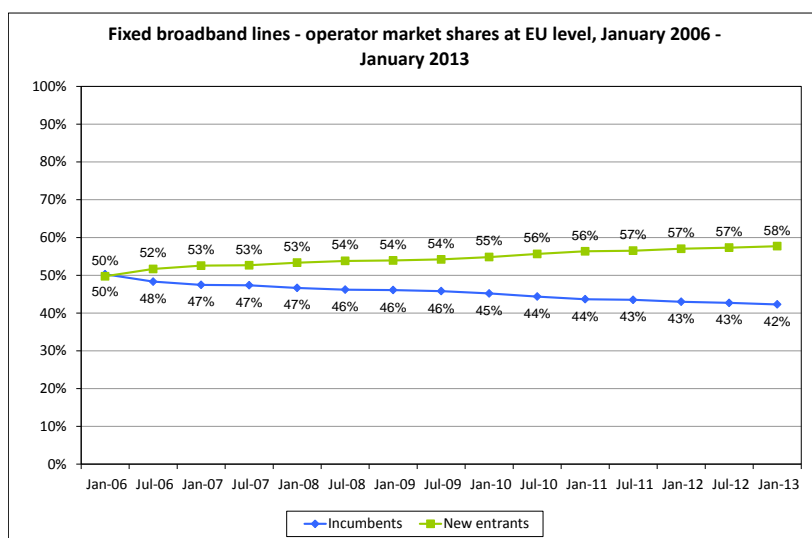
The average download speed across all countries was 19.47 Mbps during peak hours, and this increased slightly to 20.12 Mbps when all hours were considered. This figure represents 74% of the advertised headline speed. These are the overall results of the sample, and do not refer to the actual composition of the broadband market across each country.

The study showed that there is significant variation in the performance of different technologies. xDSL based services achieved 63.3% of the headline download speed, whilst cable and FTTx services, including VDSL, achieved 91.4% and 84.4% respectively.

### 2.2.7. Competition dynamics

The market share of the incumbent operators has followed a slight downward trend, going down from 50.3% in January 2006 to 42.3% in January 2013. New entrant operators increased their market share by 0.8p.p. last year.

**Figure 40: Fixed broadband lines – operator market shares at EU level, 2006-2013**



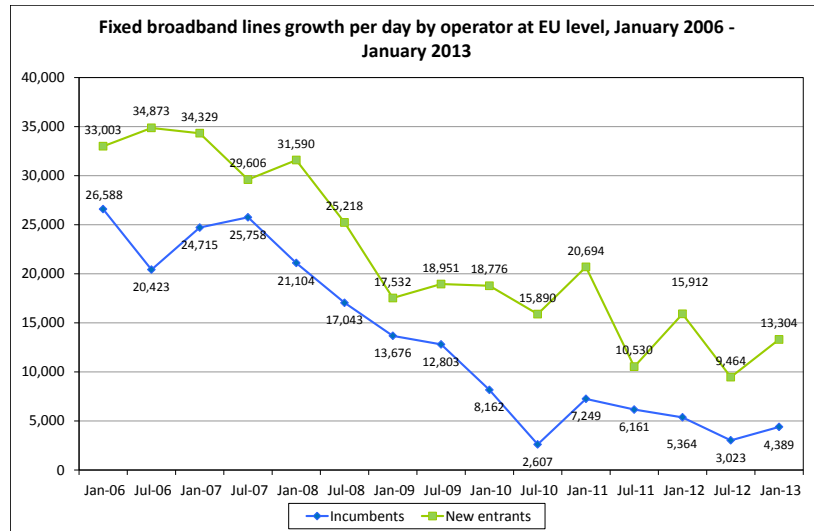
Source: Communications Committee

The net gains of new entrants were much above those of incumbents in the last 7 years. In the second half of 2012, new entrants added 13k new lines per day, which is more than three times the daily increase in incumbent lines. New entrants were more active also in selling NGA lines.

<sup>6</sup> Ofcom, Bundesnetzagentur.

<sup>7</sup> Available at <http://ec.europa.eu/digital-agenda/en/scoreboard>

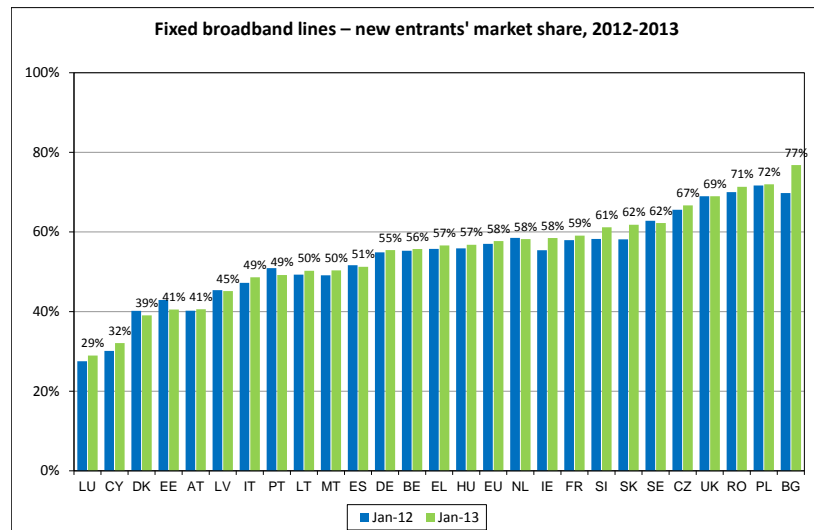
**Figure 41: Fixed broadband lines growth per day by operator, 2006-2013<sup>8</sup>**



Source: Communications Committee

The market power of incumbents varies greatly across Member State. In Bulgaria, Romania, Poland and the Czech Republic there is strong platform competition, while in the UK new entrants have gained a substantial share on the incumbents xDSL network. On the other hand, incumbents remained very strong in Luxembourg, Cyprus and Denmark. In Luxembourg and Cyprus, the share of xDSL lines is above the average, while in Denmark, the incumbent also plays a key role in the cable market. Despite the general decline of incumbent market shares in the EU, in seven Member States (Denmark, Estonia, Latvia, Portugal, Spain, the Netherlands and Sweden) the incumbents managed to regain market share in 2012.

**Figure 42: Fixed broadband lines – new entrants' market share, 2012-2013**



Source: Communications Committee

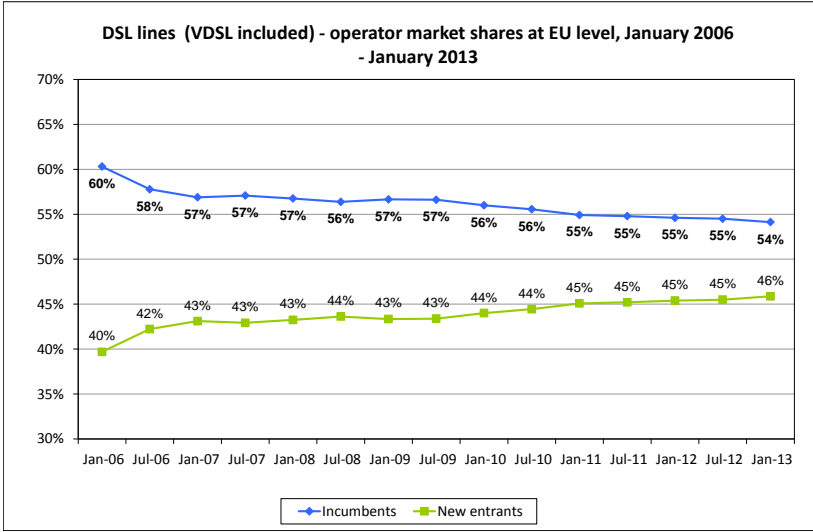
As far as the xDSL market is concerned, the market share of incumbents shows a similar pattern exhibiting a continuous but slight decline, although in this segment incumbents still

<sup>8</sup> The July 2010 figures are influenced by some adjustments in certain Member States



control over half of the lines. The incumbents share in the xDSL market went down by 0.5 p.p. last year.

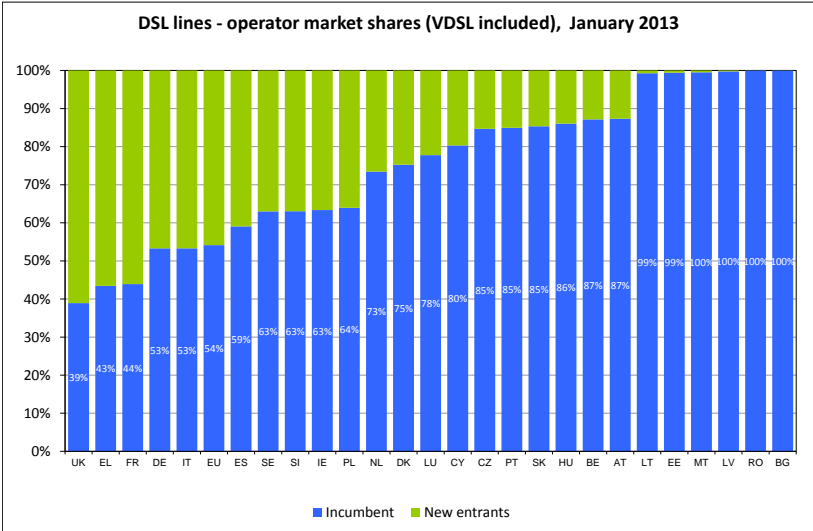
**Figure 43: DSL lines – operator market shares at EU level, 2006-2013**



Source: Communications Committee

In six Member States (Bulgaria, Romania, Latvia, Malta, Estonia and Lithuania), the incumbents control almost the whole xDSL market, but all these countries have strong alternative platforms (cable or FTTH/B). New entrants are the strongest in the xDSL market in the UK, Greece, France, Germany and Italy. In all these Member States, xDSL lines represent more than 80% of all fixed broadband lines. On the other hand, in Cyprus and Luxembourg, both the share of xDSL lines and the market share of the incumbents in the xDSL market are above the average.

**Figure 44: DSL lines – operator market shares, January 2013**

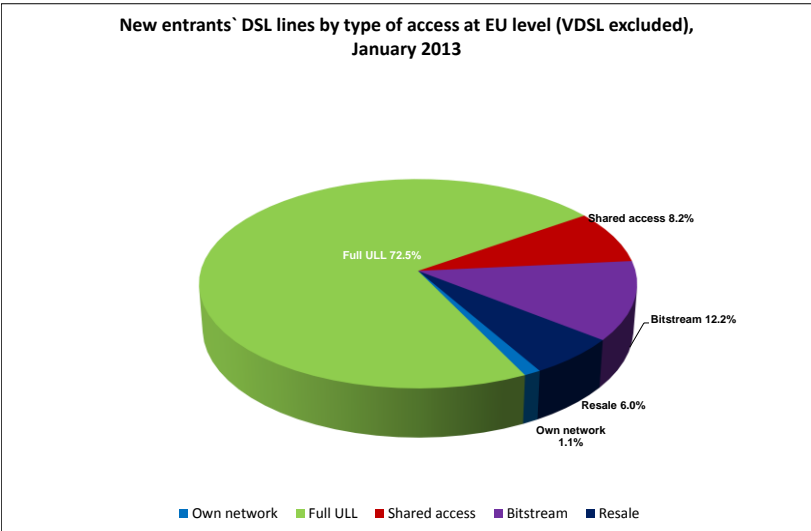


Source: Communications Committee

New entrants use local loop unbundling (fully unbundled lines and shared access) as the main option to access the incumbent network. There is a continuous migration towards full LLU, all other types of access to the incumbent network is going down. Fully unbundled lines are the most popular in Greece, Cyprus, Austria, Portugal, Sweden, Germany, France, Spain, Italy, Romania, the Netherlands, Luxembourg, Denmark and the UK. However, in Belgium

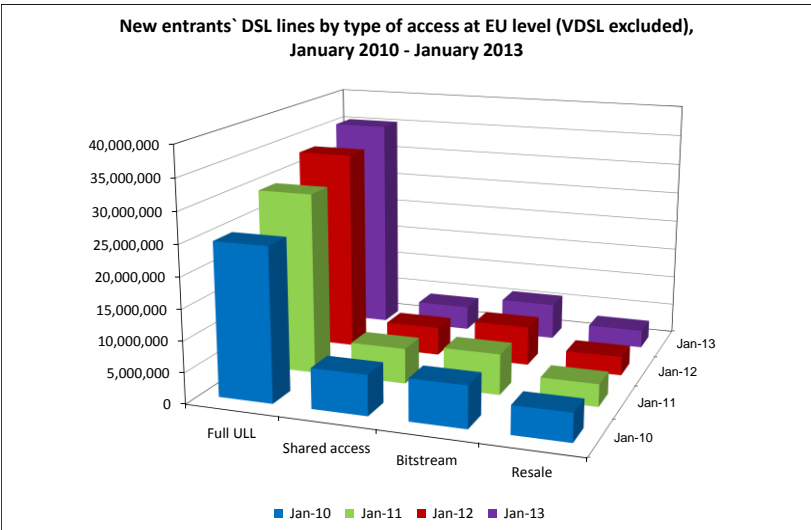
resale is the most popular access type, while in the Czech Republic, Hungary, Slovenia and Ireland bitstream is the most widely used.

**Figure 45: New entrants' DSL lines by type of access at EU level, January 2013**



Source: Communications Committee

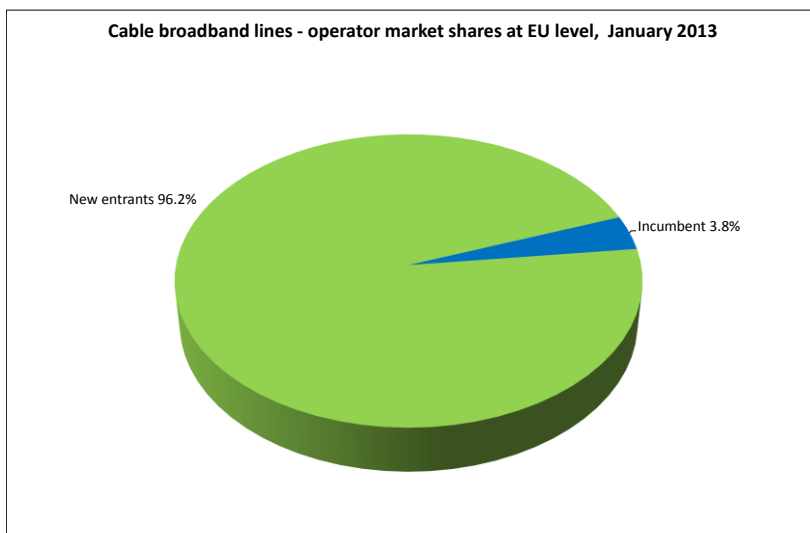
**Figure 46: New entrants' DSL lines by type of access at EU level, 2010 - 2013**



Source: Communications Committee

Incumbents have no major presence in the cable market with the exception of Denmark and Hungary.

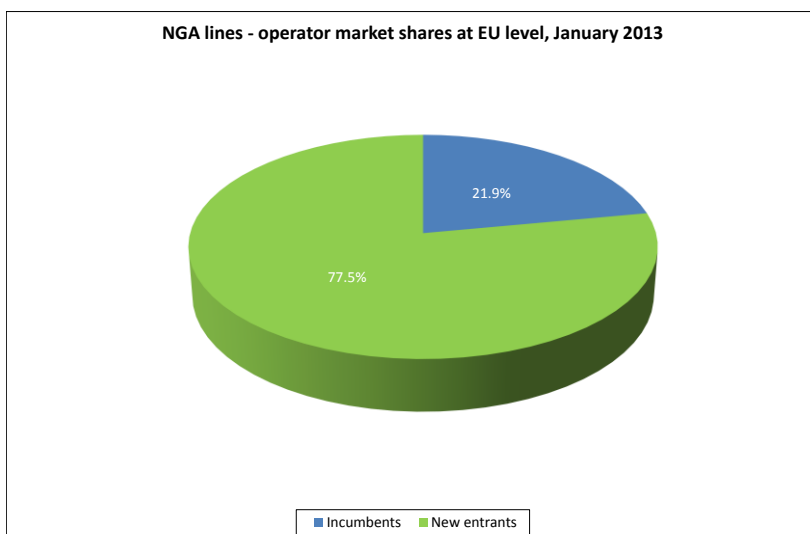
**Figure 47: Cable broadband lines – operator market shares at EU level, January 2013**



Source: Communications Committee

The NGA market is currently dominated by new entrants, mainly cable operators. This is mainly due to the much faster spreading of cable NGA lines than VDSL. FTTH and FTTB are also mainly provided on new entrants' networks.

**Figure 48: NGA lines – operator market shares at EU level, January 2013**



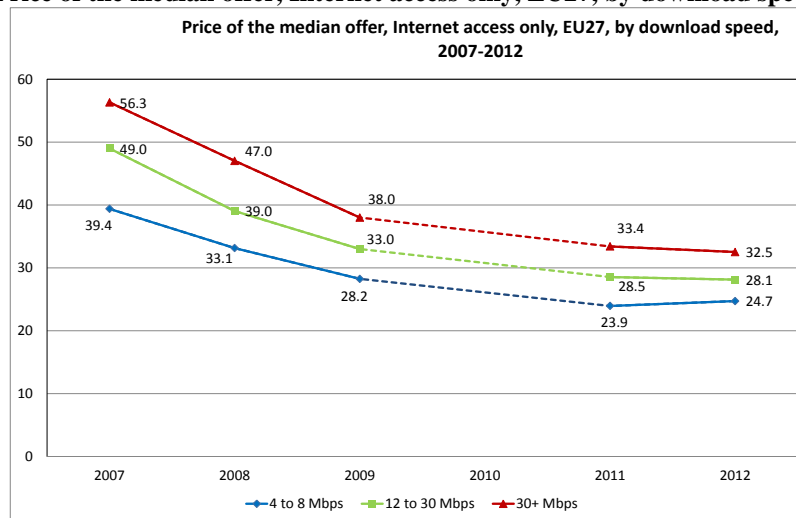
Source: Communications Committee

#### 2.2.8. Prices of fixed broadband access

The analysis of retail broadband prices for fixed access networks is based on available offers because information about the most popular packages in the market is not available. To analyse trends in broadband retail prices, we differentiate available offers according to speed brackets and bundling solutions (standalone internet, internet + telephone, internet + telephone + television). Median prices are used to compare the price levels in 2009 to 2012.

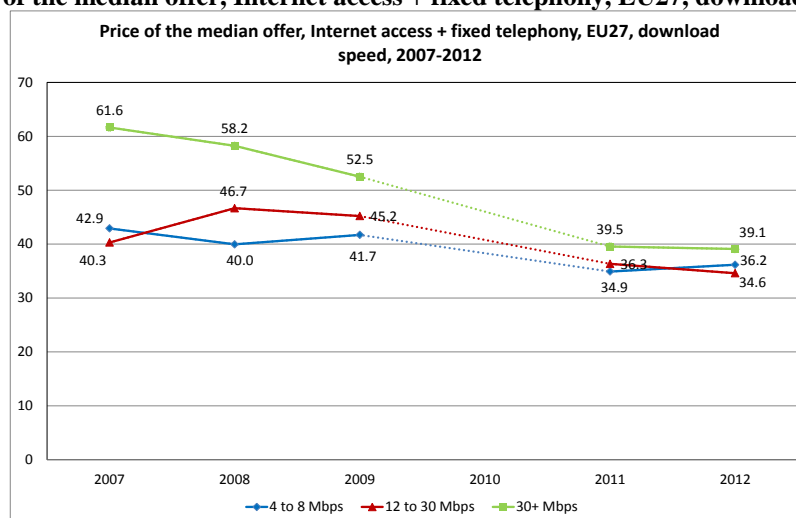
The sample includes around 3,700 commercial offers<sup>9</sup> and reveals a pattern of price reduction over the last six years.

**Figure 49: Price of the median offer, Internet access only, EU27, by download speed, 2007-2012**



Source: Broadband Internet Access Cost (BIAC) Reports by Van Dijk

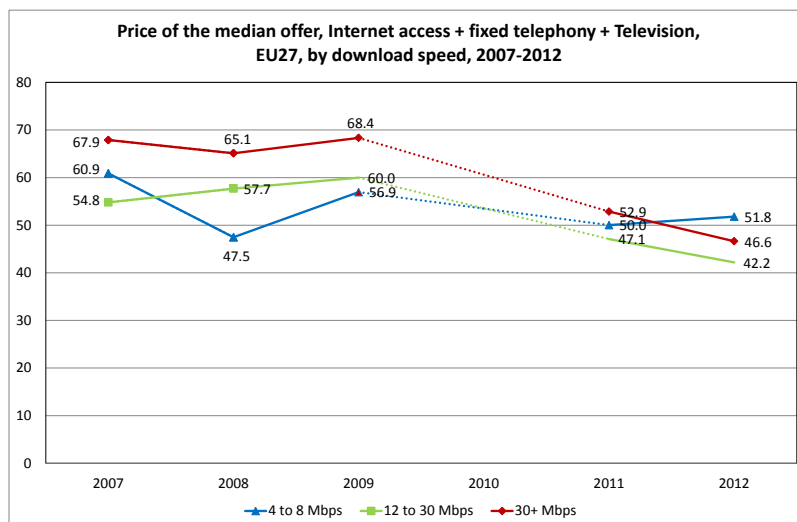
**Figure 50: Price of the median offer, Internet access + fixed telephony, EU27, download speed, 2007-2012**



Source: Broadband Internet Access Cost (BIAC) Reports by Van Dijk

<sup>9</sup> Broadband Internet Access Cost (BIAC). Report August, 2011. Van Dijk-Management Consultants

**Figure 51: Price of the median offer, Internet access + fixed telephony + Television, EU27, by download speed, 2007-2012**

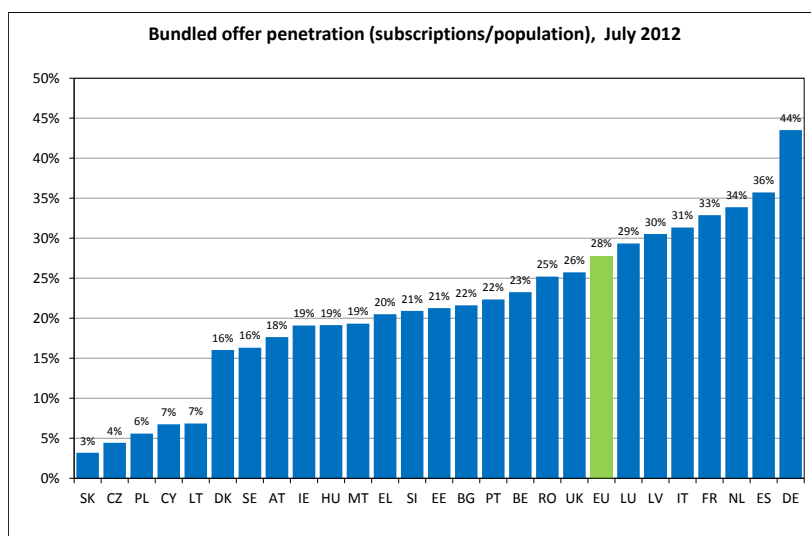


Source: Broadband Internet Access Cost (BIAC) Reports by Van Dijk

Broadband services are more and more provided through bundled packages which may include services such as fixed/mobile telephony and pay TV. In July 2012 there were 27 bundled subscriptions per 100 inhabitants on average in the EU, up from 23 a year ago. 71% of bundled subscriptions include two services (double pay), telephony and internet services.

Bundled service packages are the most common way for consumers to get electronic communications services in Germany, Spain, the Netherlands, France and Italy. On the other hand, in Slovakia, the Czech Republic, Poland, Cyprus and Lithuania, telecom services are sold mainly as standalone products.

**Figure 52: Bundled offer penetration (subscriptions/population), July 2012**



Source: Communications Committee

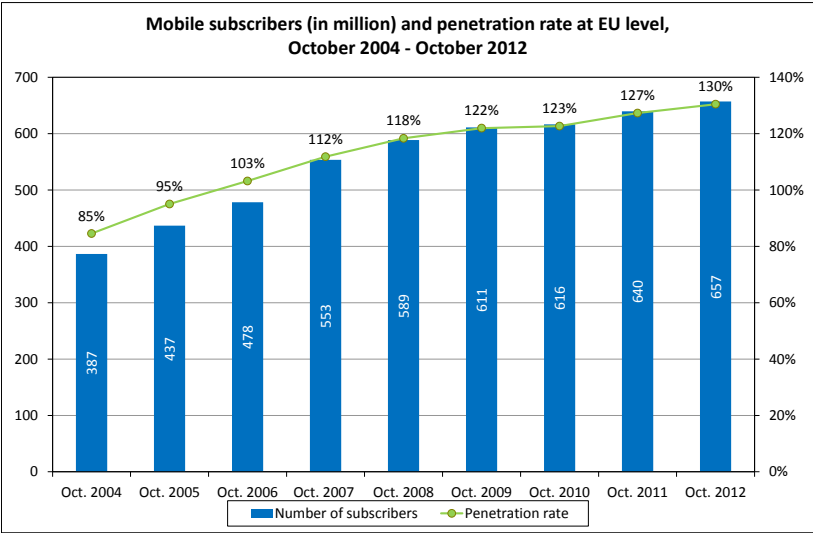
### 2.3. The mobile market

#### 2.3.1. Mobile subscriptions

Mobile SIM card penetration reached 130.4% in the EU in 2012. The number of mobile SIM cards grew by 17.4 million in 2012. Monthly paid subscriptions became more popular with an

increase of 17.9 million in a year, while prepaid went down by 0.5 million. More than 30% of the growth came from Machine-to-Machine SIM cards. Mobile Virtual Network Operators (MVNO) also grew by 3.2 million last year.

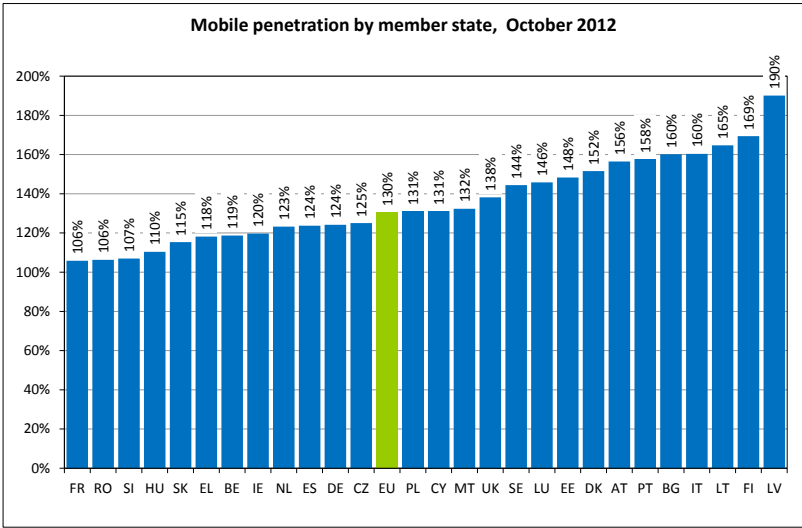
**Figure 53: Mobile subscribers and penetration rate at EU level, 2004-2012**



Source: Communications Committee

By now, all the Member States have exceeded the 100% of population penetration threshold. The largest increase took place in Latvia, where penetration grew by 20 p.p. mainly due to a large growth in the postpaid segment. Latvia has currently the highest mobile subscription penetration followed by Finland, Lithuania, Italy and Bulgaria. Despite growth of 5.8 p.p., France has still the lowest mobile penetration in the EU. Nonetheless, the differences among Member States do not necessarily mean that in countries with lower SIM card penetration, mobile use is also lower. Differences rather reflect the different levels of multiple subscription use.

**Figure 54: Mobile penetration by member state, October 2012**

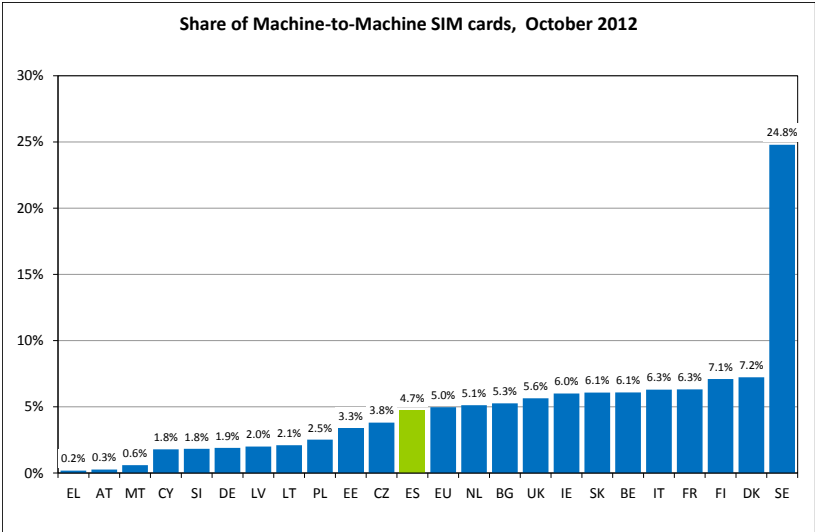


Source: Communications Committee

Machine-to-Machine SIMs account for an increasing proportion of mobile SIM cards. These cards are used in several industries through a large variety of devices to communicate between objects. M2M can be used in homes (e.g. alarm systems), smart grids, fleet

management, health care and smart metering for example. Data on M2M are available for 23 Member States. M2M represented 5% of mobile SIMs in average in these 23 Member States, which is a growth of 23% compared to a year ago. There were 30 million M2M SIMs in those 23 countries. Sweden has by far the highest figure at 24.8%.

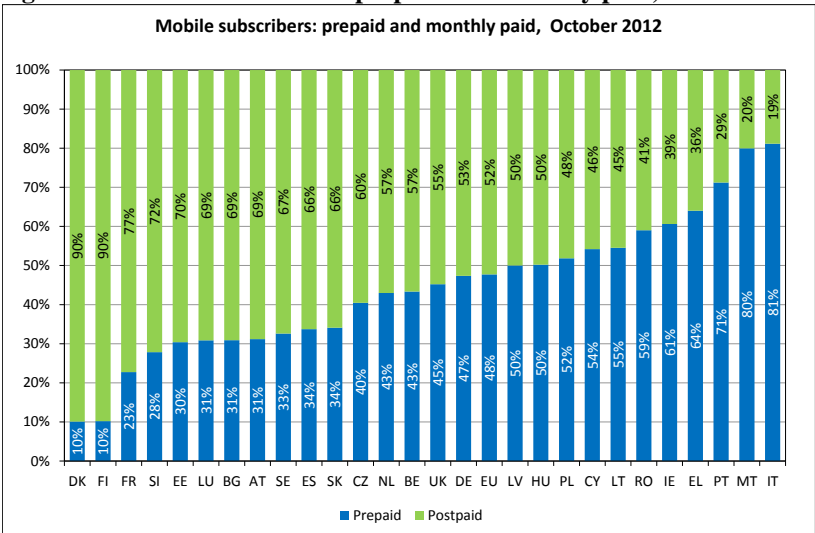
**Figure 55: Share of Machine-to-Machine SIM cards, October 2012**



Source: Communications Committee

52.3% EU mobile subscriptions were postpaid in October 2012, which is 2.1p.p. higher than last year. Postpaid is especially dominant in Denmark and Finland with a share of 90% of all subscriptions. At the same time in Italy and Malta, prepaid has a share of 81% and 80% respectively.

**Figure 56: Mobile subscribers: prepaid and monthly paid, October 2012**

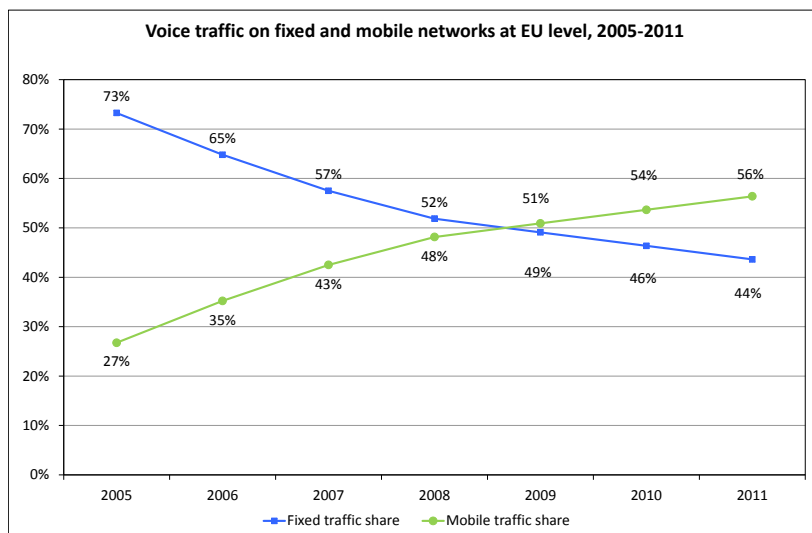


Source: Communications Committee

2.3.2. Mobile voice traffic development

Mobile voice traffic was 29.3% higher than fixed PSTN voice traffic in 2011. Total voice traffic (excluding VoiP) decreased by 1.1% in Europe, mobile traffic grew by 3.9%, and fixed declined by 7% in 2011. The largest growth in mobile traffic was recorded in Malta (+29%) and Latvia (+13.2%). Over 56.4% of the traffic was mobile, 2.7 p.p. higher than in 2010.

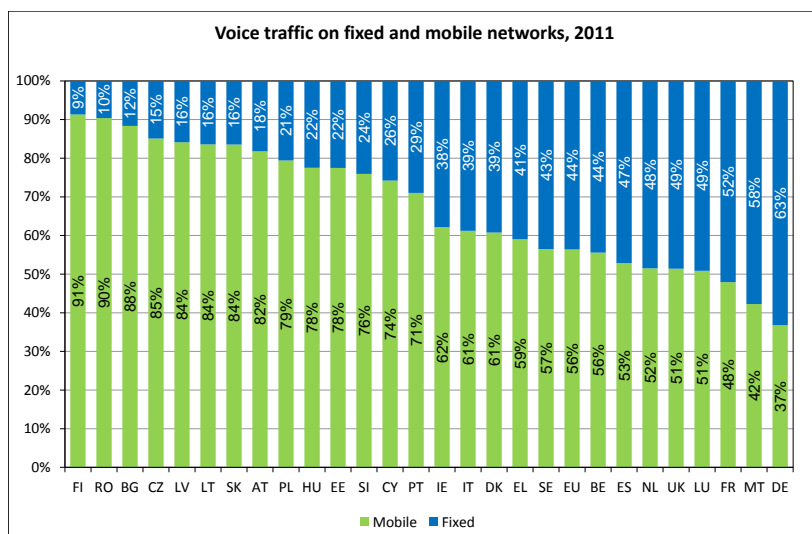
**Figure 57: Voice traffic on fixed and mobile networks at EU level, 2005-2011**



Source: Communications Committee

In all but three Member States the majority of voice traffic was carried by mobile networks. Eastern European countries have higher than average mobile traffic shares due to their lower fixed telephony penetration. However, it is in Finland where mobile is the most dominant in Europe (91%). At the same time, especially in Germany, but also in Malta and France, fixed voice usage remained higher than mobile.

**Figure 58: Voice traffic on fixed and mobile networks, 2011**



Source: Communications Committee

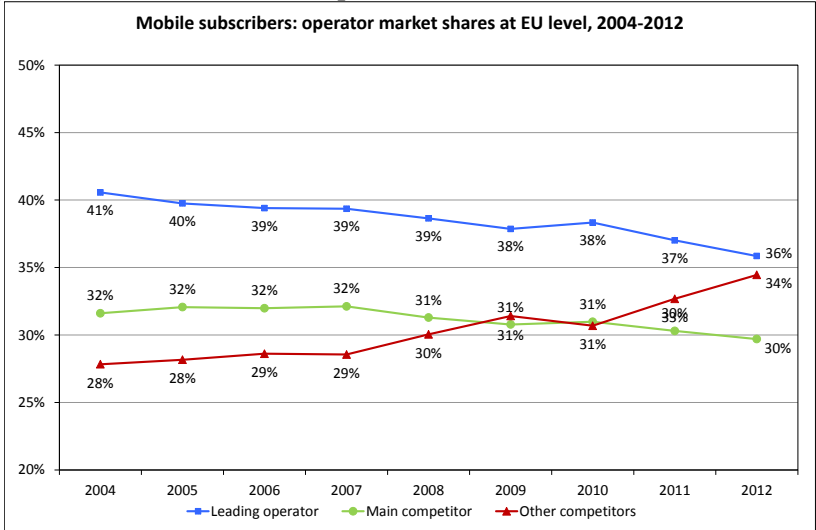
### 2.3.3. Competition in the mobile sector

The market share of leading operators continued to decline and stood at 35.9% in October 2012, which is 1.1p.p. lower than in October 2011. Main competitors (the second largest operators in the Member States) also lost market share (by 0.6%) meaning that alternative providers managed to strengthen their positions slightly last year. The EU regulations on number portability and the lowering of mobile termination rates also contributed to this trend. Number portability significantly reduced the barriers to migrate from one operator to the other, while the lowering of termination rates helped especially small operators to apply more



competitive off-net prices. At the same time, the mobile market remained highly concentrated with still around two thirds of subscribers belonging to the top two operators.

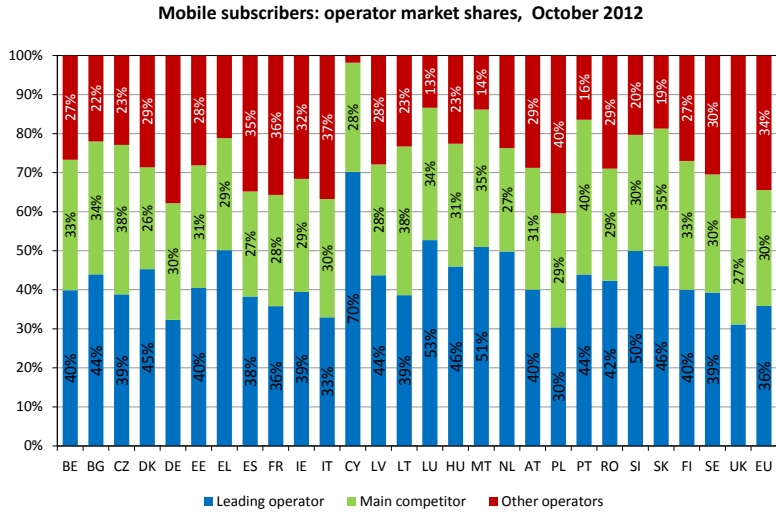
**Figure 59: Mobile subscribers: operator market shares at EU level, 2004-2012**



Source: Communications Committee

The highest levels of concentration are in relatively small Member States, the market leader has a market share of 70% in Cyprus, 53% in Luxembourg and 51% in Malta. Market leaders are the weakest in Poland (30%), the UK (31%), Germany (32%) and Italy (33%). Market leaders became somewhat weaker in 20 Member States, the most remarkable decreases were in Cyprus (-3.6p.p.) and Spain (-3.3p.p.).

**Figure 60: Mobile subscribers: operator market shares, October 2012**

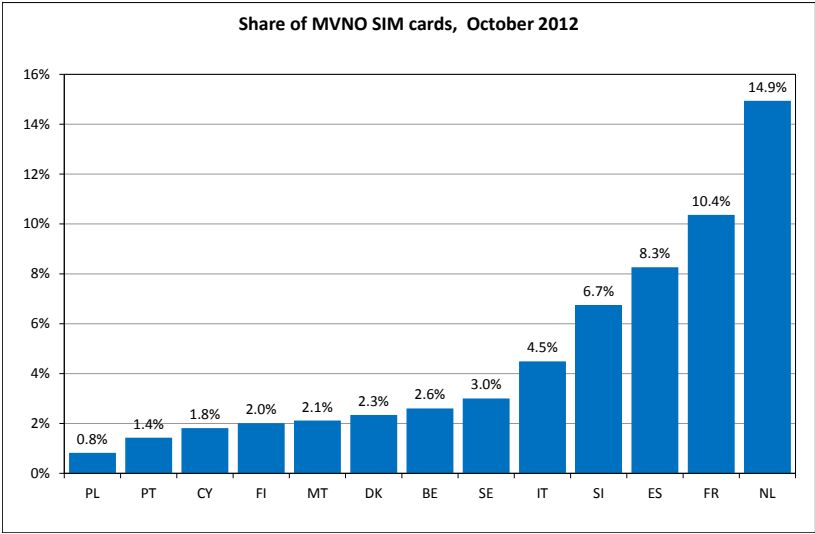


Source: Communications Committee except for DE, EL, NL and UK (Screen Digest)

On the performance of Mobile Virtual Network Operators (MVNO), data are available for 13 Member States. In general, MVNOs have not yet managed to have a significant share in European mobile markets. MVNOs are defined as operators with their own SIM cards and own mobile network code but without any mobile telecommunications network infrastructure. Operators that fulfil the above two conditions, but are majority owned (more than 50%) by any of the Mobile Network Operators operating in the same national market are not included (e.g. operators being only a sub-brand of a Mobile Network Operator). The aggregate market

share of all MVNOs passed the 10% threshold only in two Member States (The Netherlands at 14.9% and France at 10.4%). In most of the Member States, MVNOs either do not exist or remain marginal.

**Figure 61: Share of MVNO SIM card, October 2012**



Source: Communications Committee

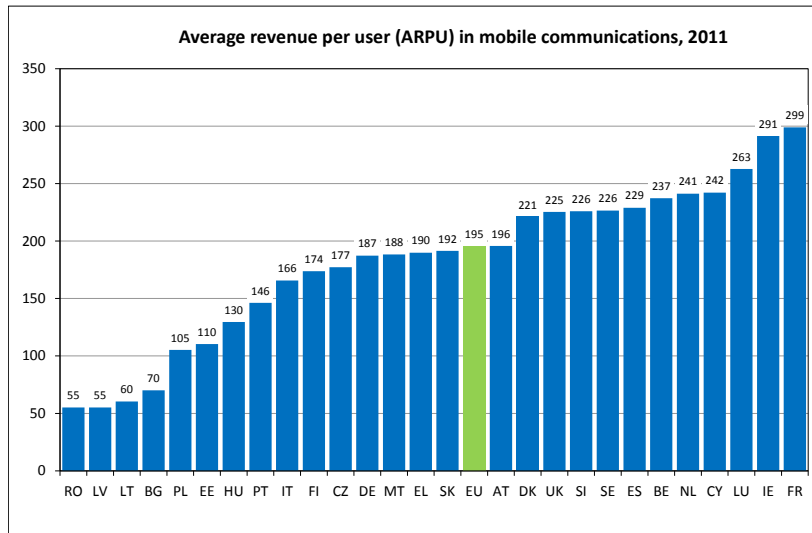
**2.3.4. Average Revenue per Minute (ARPM) and Average Revenue Per User (ARPU)**

Average Revenue per User (ARPU) decreased to 195 EUR per year in 2011 from 211 EUR a year ago.

France had by far the highest ARPU (EUR 299), which is partly caused by the low penetration rate (it is not common in France to have more than one subscription per person).<sup>10</sup> There were four countries with an ARPU of less than EUR 100 per year: Bulgaria, Latvia, Lithuania and Romania (Figure 62). Low ARPU in these countries is mainly driven by the very low voice prices. At the top of the list, France, Ireland and Luxembourg have the highest ARPUs partly because of the relatively high voice fees.

<sup>10</sup> As the data is as of 2011, the effects of Free's market entry cannot be tracked.

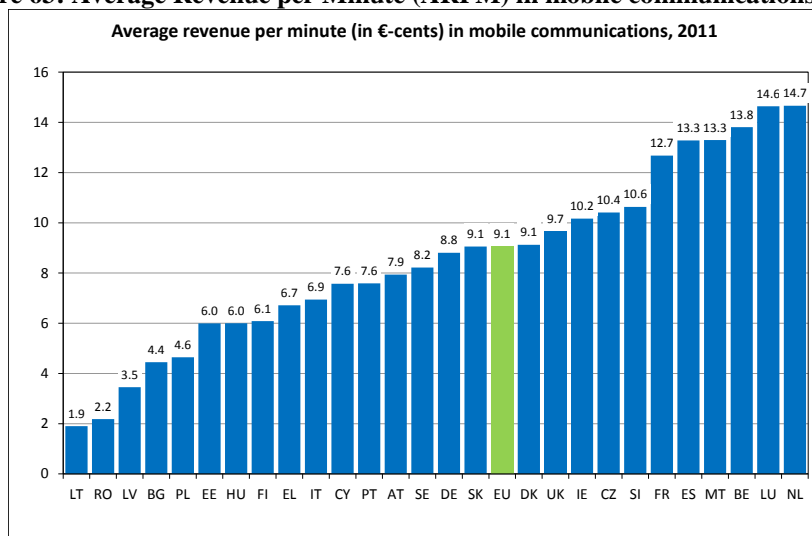
**Figure 62: Average Revenue per User (ARPU) in mobile communications, 2011**



Source: Communications Committee

European mobile users paid 9.1 cents per voice minute on average in 2011, which is 12.1% less than in 2010. There are really large differences between Member States on this indicator. Average Revenue per Minute was around 7 times higher in the Netherlands, Luxembourg and Belgium, than in Lithuania and Romania.

**Figure 63: Average Revenue per Minute (ARPM) in mobile communications, 2011**

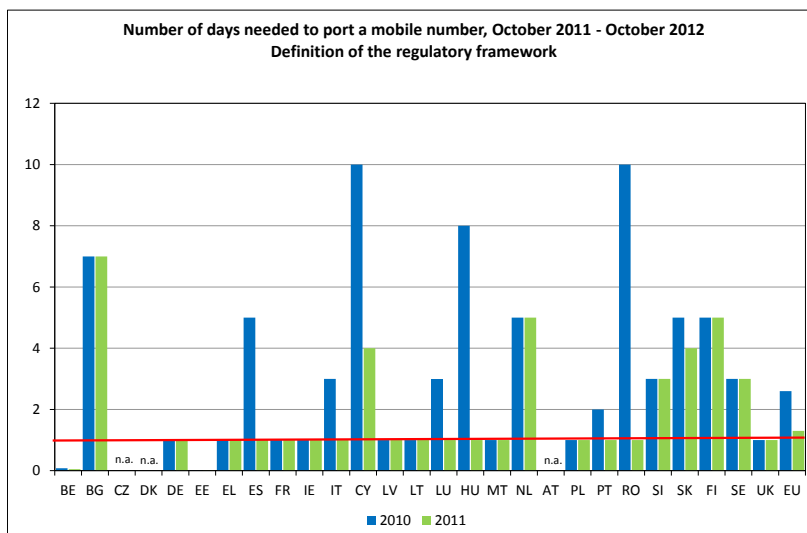


Source: Communications Committee

### 2.3.5. Mobile number portability

Number portability makes it easier for mobile subscribers to migrate from one operator to another. In October 2012, it took 1.3 days on average to port a mobile number, down from 2.6 days in October 2011, which is still higher than the maximum (1 day) permitted in the regulatory framework. In 17 Member States, a mobile number can be ported in maximum one day.

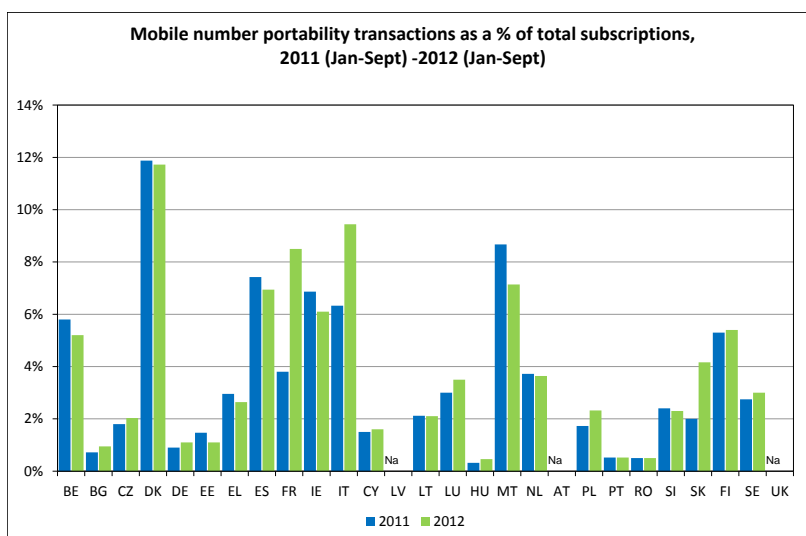
**Figure 64: Number of days needed to port a mobile number, 2011 - 2012**



Source: Communications Committee

The popularity of number portability varies among Member States. Mobile number portability is the most popular in Denmark, Italy and France, where 8-12% of numbers were ported in the first three quarters of 2012. On the other hand, the ratio was below 1% in Bulgaria, Hungary, Portugal and Romania.

**Figure 65: Mobile number portability transactions as a % of total subscriptions, 2011-2012**

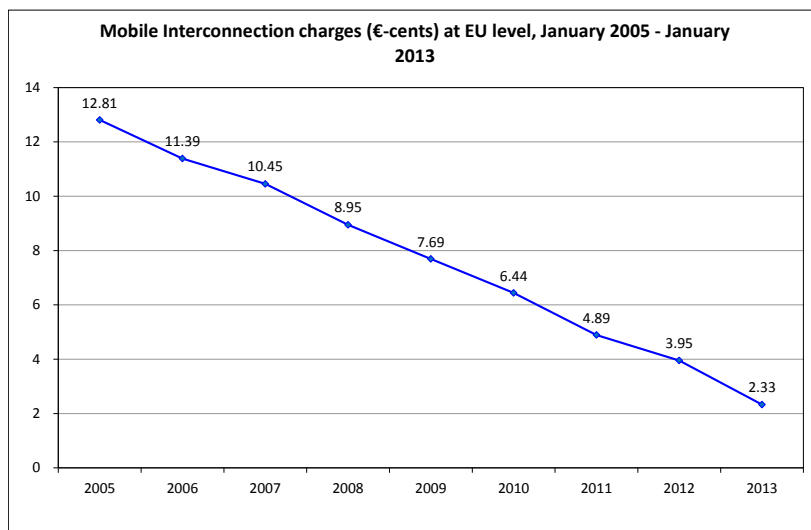


Source: Communications Committee

### 2.3.6. Mobile interconnection charges

Mobile interconnection charges can have a large impact on the tariff structures and the retail price levels, as they represent a major direct cost element on off-net calls. Mobile interconnection charges (wholesale charges for terminating calls on mobile networks) have continued to decline. There was a remarkable reduction of over 40% last year. Mobile interconnection charges are more than five times lower than in January 2005.

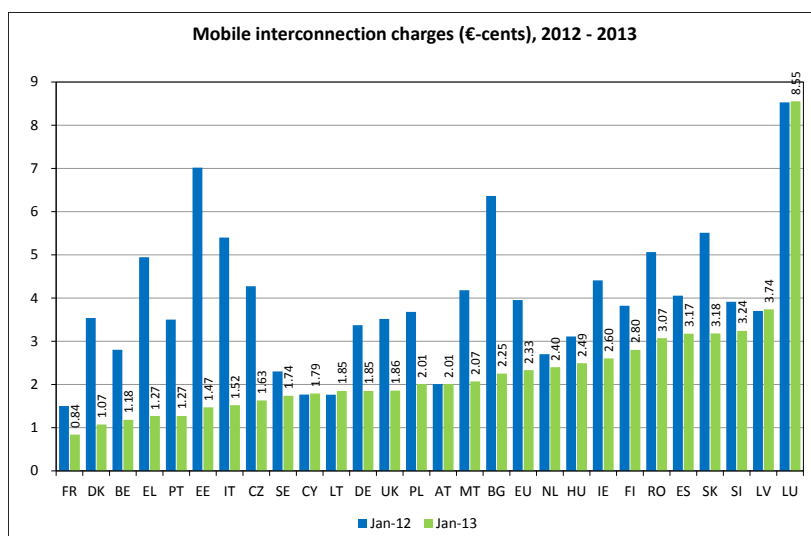
**Figure 66: Mobile interconnection charges at EU level, 2005-2013**



Source: BEREC

The largest declines were recorded in Estonia, Bulgaria, Italy and Greece. In Luxembourg mobile interconnection remained really high, more than twice as high as the second largest rate in the EU. Luxembourg is also one of the most expensive in retail mobile voice charges in the EU.

**Figure 67: Mobile interconnection charges, 2012-2013**



Source: BEREC

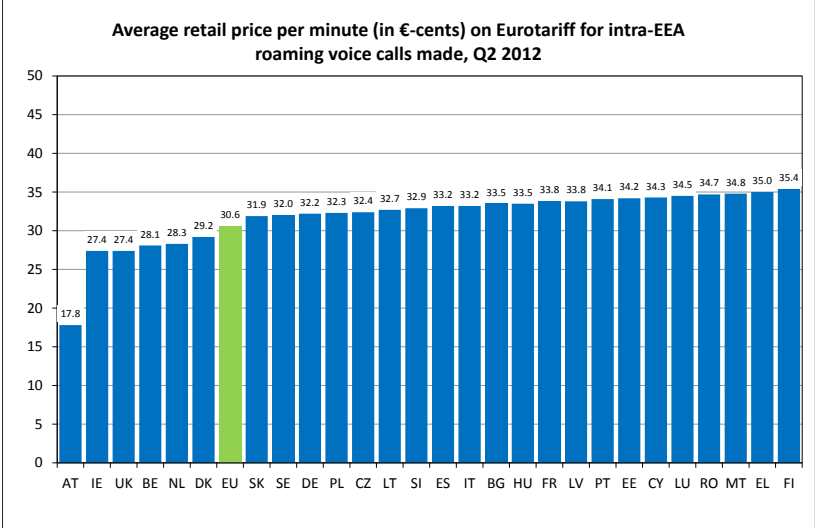
### 2.3.7. Mobile roaming prices<sup>11</sup>

The Digital Agenda aims at minimising so that the difference between roaming and national tariffs should approach zero by 2015. Roaming prices have been regulated in the European Union since 2007. Currently, both wholesale and retail voice and SMS prices as well as wholesale data roaming prices are regulated.

<sup>11</sup> Source: BEREC: International Roaming BEREC Benchmarking Data Report January 2012 – June 2012

As for outgoing retail intra-EEA voice roaming prices, the current regulation sets a maximum minute fee of 35 eurocents. The EU average price on Eurotariff stood at 30.6 eurocents, which is by 13% below the regulated maximum. Most of the Member States remained very close to the regulated maximum. However, voice roaming is much below the cap in Austria in particular, but also in Ireland, the UK, Belgium and the Netherlands.

**Figure 68: Average retail price per minute for intra-EEA<sup>12</sup> roaming voice calls made, Q2 2011**



Source: BEREC

Average retail roaming voice prices (intra-EEA) have declined by 54% since Q2 2007 (before the first roaming regulation). Nevertheless, voice roaming is still more than three times more expensive than national mobile voice.

As for SMS, thanks to the regulation the average price (Euro-SMS after the regulation) declined from 27 eurocents in Q1 2009 to 10 eurocents in Q2 2012. Looking at data roaming prices, the EU average retail price stood at 1.2EUR/MB for postpaid and 1.3EUR/MB for prepaid subscriptions as opposed to the regulated wholesale cap of 0.5 EUR/MB in Q2 2012.

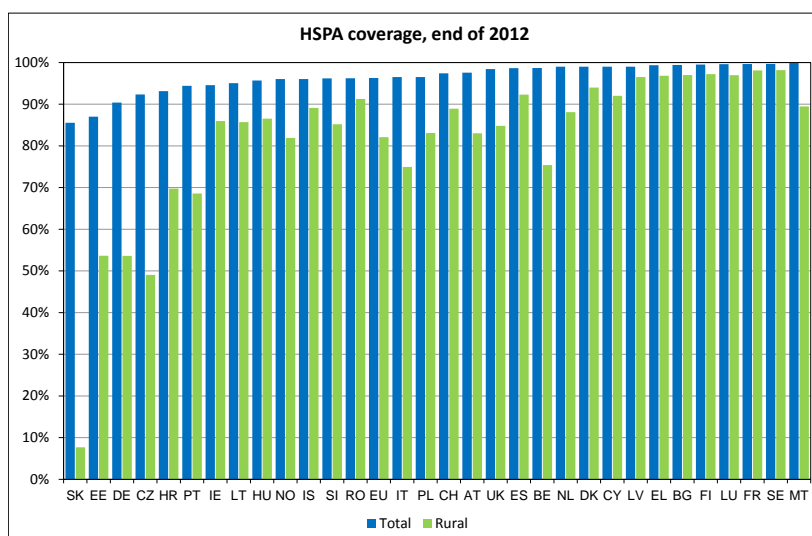
**2.4. Mobile Broadband**

*2.4.1. Mobile Broadband coverage*

On average, there was 96.3% population coverage of third generation HSPA networks in the EU in December 2012. HSPA is available to over 90% of population in all Member States except for Slovakia and Estonia. Rural coverage varies greatly among countries, but on average it is higher than any fixed technology.

<sup>12</sup> European Economic Area

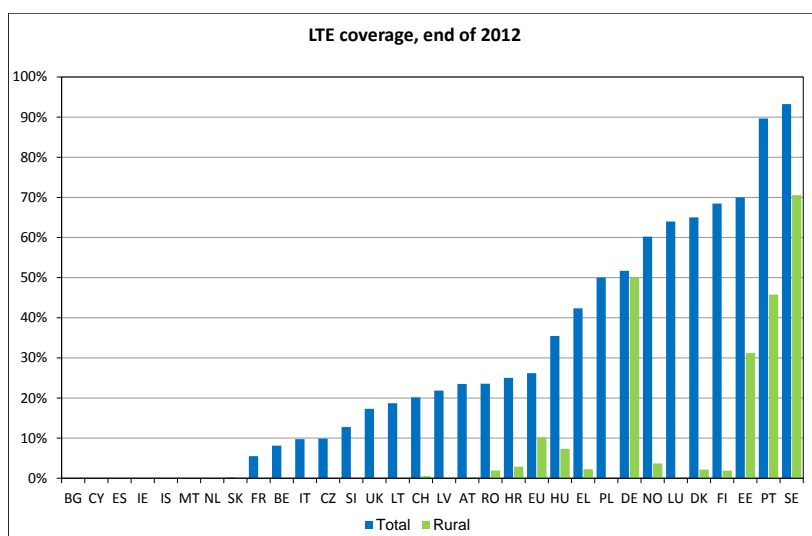
**Figure 69: HSPA coverage, end of 2012**



Source: Point Topic

The European coverage of 4<sup>th</sup> generation LTE networks tripled in 2012, currently LTE is available to 26.2% of population. LTE is most significant in Sweden and Portugal with 90% or higher coverage. LTE mainly covers urban areas except for Germany, Portugal, Sweden and Finland. LTE is yet to be launched in Bulgaria, Cyprus, Spain, Ireland, Iceland, Malta and the Netherlands (based on end of 2012 data).

**Figure 70: LTE coverage, end of 2012**

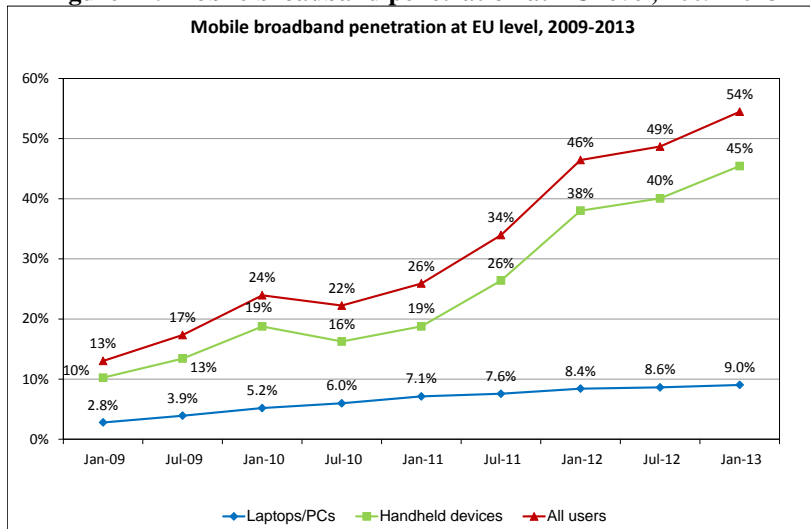


Source: Point Topic

#### 2.4.2. Mobile broadband subscriptions/users

Mobile broadband penetration reached 54.5% (use of handheld devices and computers), although the growth slowed down last year. 83.4% of mobile broadband subscriptions were used in handheld devices.

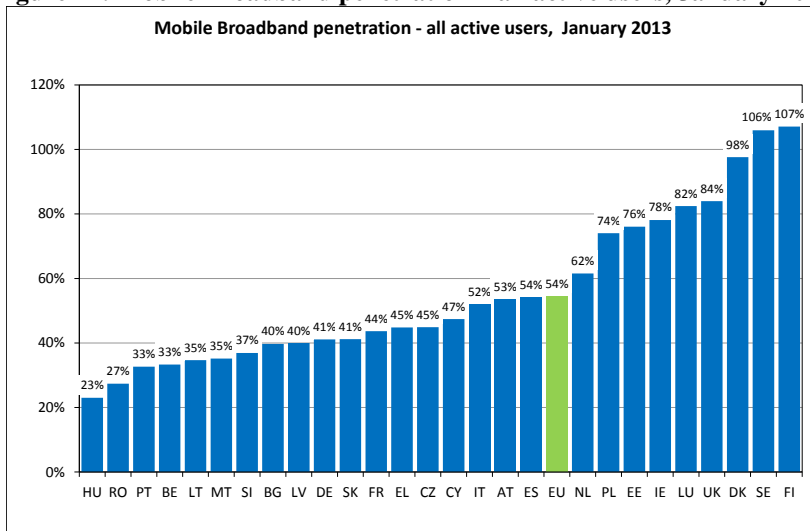
**Figure 71: Mobile broadband penetration at EU level, 2009-2013**



Source: Communications Committee

Considering both handheld and computer user, mobile broadband is most popular in the Nordic countries where penetration is already around 100%.

**Figure 72: Mobile Broadband penetration – all active users, January 2013**

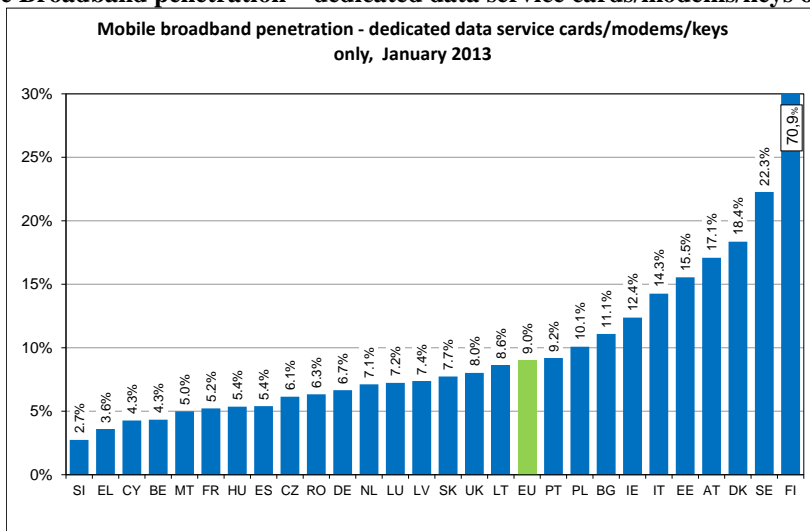


Source: Communications Committee

The penetration of mobile broadband as measured by dedicated data service cards/modems/keys increased from 8.4% to 9% last year, which is much below the growth rates for the previous years. Nordic countries and Austria remained on the top of the list.



**Figure 73: Mobile Broadband penetration – dedicated data service cards/modems/keys only, January 2013**



Source: Communications Committee