



Connectivity

Broadband market developments in the EU

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU Member States in digital competitiveness.

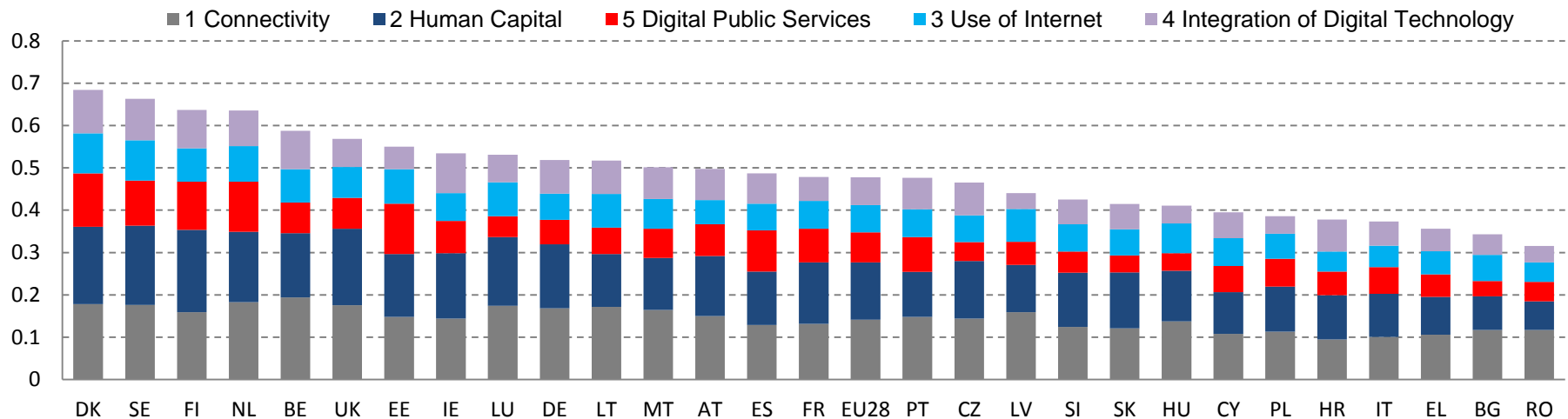
Denmark, Sweden, Finland and the Netherlands have the most advanced digital economies in the EU followed by Belgium, the UK and Estonia.

Romania, Bulgaria, Greece and Italy are at the bottom of the list.

The five dimensions of the DESI

1 Connectivity	Fixed Broadband, Mobile Broadband, Broadband speed, and Affordability
2 Human Capital	Basic Skills and Usage, Advanced skills and Development
3 Use of Internet	Content, Communication and Transactions on line
4 Integration of Digital Technology	Business digitization and eCommerce (40%)
5 Digital Public Services	eGovernment and eHealth (33%)

Digital Economy and Society Index (DESI), June 2015



Source: European Commission, Digital Agenda Scoreboard

As for **Connectivity**, the **highest score** was registered by **Belgium** followed by **Luxembourg** and the **Netherlands**. **Poland, Romania and Croatia** had the **weakest performance** in this indicator.

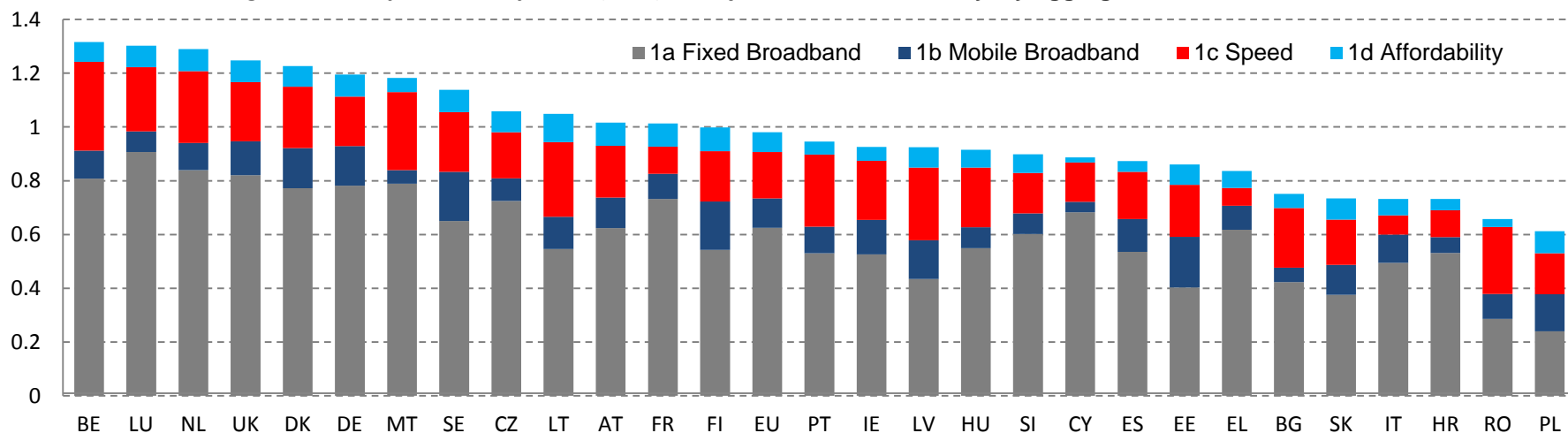
The Connectivity dimension looks at both the demand and the supply side of fixed and mobile broadband. Under fixed broadband it assesses the availability as well as the take-up of basic and high-speed NGA broadband and also considers the affordability of retail offers. On mobile broadband, the availability of radio spectrum and the take-up of mobile broadband are included.

On the fixed side, Belgium, Luxembourg and the Netherlands are the strongest, and Poland, Romania, Croatia and Italy the weakest. NGA is particularly advanced in Luxembourg, the Netherlands, the UK and Belgium.

As for mobile broadband, The Nordic countries (Sweden, Denmark and Finland) lead along with Estonia, while lowest figures were registered by Cyprus, Bulgaria and Malta.

DESI - Connectivity	
Fixed broadband coverage (% of homes)	97%
Fixed broadband take-up (% of homes)	70%
Mobile broadband take-up (subs per 100 people)	72
Spectrum (% of spectrum harmonised)	70%
NGA coverage (% of homes)	68%
Subscriptions to fast broadband (% of subscriptions)	26%
Fixed broadband price (as a % of income)	1.3%

Digital Economy and Society Index (DESI), Component 1 - Connectivity, by aggregate scores, June 2015

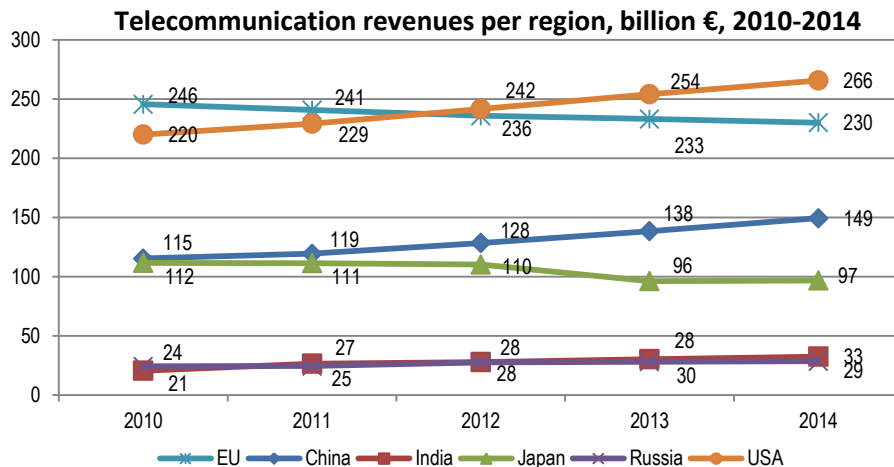


Source: European Commission, Digital Agenda Scoreboard

Telecom operator revenues have been declining since 2010 in the EU, while still increasing in the US. EU telecom CAPEX remained stable in the same period.

Telecom operators in Europe generate less and less revenues. Revenues went down from € 246 bn in 2010 to € 230 in 2014. At the same time the US progressed from € 220 bn to € 266 bn surpassing Europe despite its lower population. There has been large increases in emerging markets, such as China and India, where there is still relatively low take-up of telecom services.

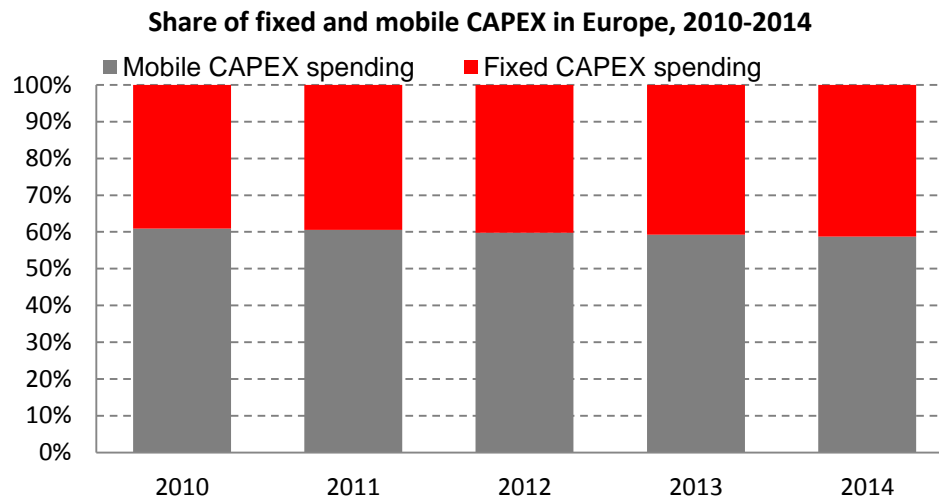
Note: this analysis is based on detailed figures from 24 Member States, which covered about 95% of the EU total market.



Source: 2014 EITO in collaboration with IDC

Telecom network CAPEX in Europe was € 43 bn in 2013 (Source: Communications Committee). CAPEX figures remained relatively stable over the last 4 years despite the fact that in the same period NGA coverage increased from 29% to 68%.

Mobile CAPEX spending represented 59% of total spending (source: EITO in collaboration with IDC).



Source: 2014 EITO in collaboration with IDC

Mobile and fixed voice revenues have decreased by over 20% since 2010. Mobile data grew by 36%, and represents already 25% of total telecom revenues at EU level.

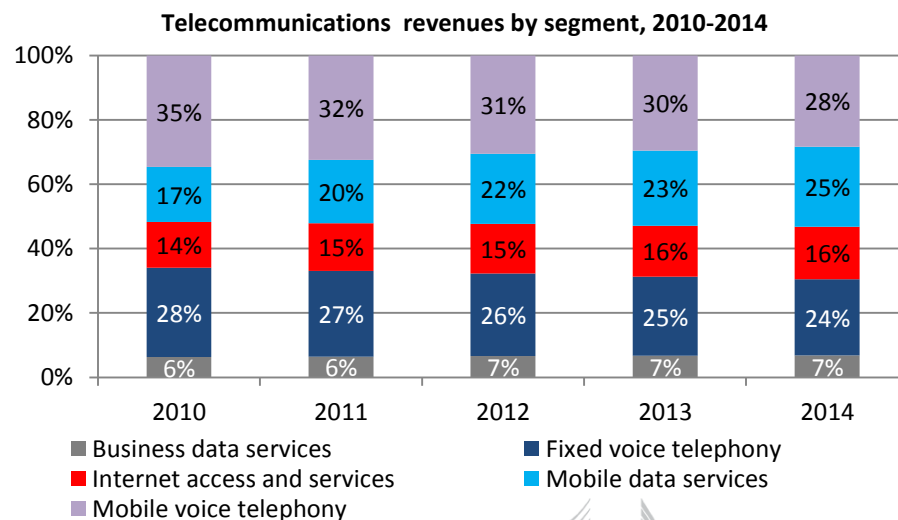
The revenues of the telecommunications sector went down by 6.6% between 2010 and 2014.

Telecommunications revenues by segment showed how voice services (both fixed and mobile) lost importance. Fixed voice decreased by 20.5%, while mobile by 23.7%. Fixed and mobile voice services made up 63% of total telecom revenues in 2010, but only 52% in 2014.

Growth rates 2010-2014	
Telecommunications Serv.	-6.6%
Business data services	1.3%
Fixed voice telephony	-20.5%
Internet access and services	7.5%
Mobile data services	36.0%
Mobile voice telephony	-23.7%

On the contrary, the growth in mobile data services (36% between 2010 and 2014), which represented in 2014 one quarter of total market revenues, was remarkable. The growth in mobile data services could not, however, compensate for the large declines in voice

Revenues from fixed internet access went up by 7.5% since 2010, while fixed broadband subscriptions increased by 18.5%. This means that the Average Revenue per User on internet access declined by 9%.



In recent years the telecom sector has been experiencing **significant M&A activity in Europe.**

On the basis of the deals notified to the European Commission for merger clearance since the beginning of 2012, telecom operators are reported to have spent over EUR 60 bn acquiring other operators in Europe. By way of comparison, network investments by telecom companies in Europe in the same period are estimated to be twice as high. Total revenues amounted to around 700bn.

In addition, there were significant telecom mergers reviewed at the national level (e.g. Numericable's acquisition of SFR in France or Telia Sonera's acquisition of the Norwegian operations of Tele2).

** See slides 4-5, source: EITO and the Communications Committee*

This Merger and Acquisition (M&A) activity is significant and does not seem to recede: important deals have been recently announced (e.g. BT/EE and Three/O2 in the UK or Liberty Global's announced acquisition of Belgian mobile operator Base, with a combined reported value of around EUR 30bn).

Besides acquiring other telecom companies, telecom operators also set up Joint Ventures (JV) and/or acquired companies active in services other than core telecoms (e.g. content or financial services).

Cross-border telecom mergers are rather the exception than the rule. There were varying degrees of complementarity between the merging parties` activities.

Most mergers took place in the same national market, although there are few examples of cross-border consolidation (Liberty Global`s acquisition of Virgin Media or Telenor`s acquisition of Bulgarian mobile operator Globul). Telecom operators mostly made acquisitions in Western Europe with some exceptions (E.g. Deutsche Telecom`s acquisition of GTS, active in Central Europe, or Telenor`s acquisition of Globul).

Three multinational companies (Liberty Global, Hutchison and Vodafone) have been particularly active in M&A in recent years.

Mobile mergers in Austria, Ireland and Germany led to Mobile Network Operators (MNOs)s consolidating their market positions in the same country and reducing the number of MNOs from 4 to 3. However, looking at all the acquisitions and JVs by telecom operators since early 2012, there are often product or geographic complementarities between the parties` activities indicating a more complex set of drivers behind mergers and acquisitions.

There were mergers leading to

- the increase in the geographic coverage of the acquirer`s networks within the same country, but also cross-border (e.g. Liberty Global`s acquisition of Dutch Cable company Ziggo or UK cable company Virgin Media);
- the significant strengthening of certain telecom services in the portfolio of services offered by the acquirer (e.g. Vodafone`s acquisition of Kabel Deutschland in Germany or of ONO in Spain);
- diversification into activities which are not core telecom services but which can be supplied using telecom networks and which offer an additional revenue stream (e.g. content or financial services).

The European Commission reviewed most of the significant telecom mergers in the EEA in the past three years. **All mergers were cleared by the Commission, albeit some with remedies.**

Mergers without significant complementarities in the activities of the parties (most notably the 4 to 3 MNO mobile mergers) required an in-depth merger review and were cleared subject to remedies. The remedies aimed to

- facilitate and incentivise the entry or expansion by MVNOs by ensuring access to the merged entity's networks (and in Germany and Ireland also to up to 30% of the merged entity's capacity);
- help a new MNO enter or emerge through the divestment of spectrum; and
- safeguard existing agreements if necessary for maintaining the competitive pressure from existing competitors (Germany).

The European Commission unconditionally cleared most mergers presenting more apparent complementarities (product or geographical) between the parties' activities with a very few exceptions where clearance was subject to remedies (e.g. Liberty Global's acquisition of controlling stake in De Vijver Media).

Broadband coverage: Basic broadband is available to everyone in the EU, while **fixed technologies** cover 97%. **Next Generation Access (NGA)** covers 68%, up from 62% a year ago. Deployment of **4G** mobile continued to increase sharply. Rural coverage remains significantly lower, especially in NGA.

Basic broadband is available to all in the EU, when considering all major technologies (xDSL, Cable, Fibre to the Premises, WiMax, HSPA, LTE and Satellite). Fixed and fixed-wireless technologies cover 97% of EU homes.

Next Generation Access technologies (VDSL, Cable Docsis 3.0 and FTTP) capable of delivering at least 30Mbps download are available to 68%.

4G mobile (LTE) coverage increased by 20 percentage points and reached 79%.

Coverage in rural areas is substantially lower for fixed technologies (90%), and especially for NGA (25%).

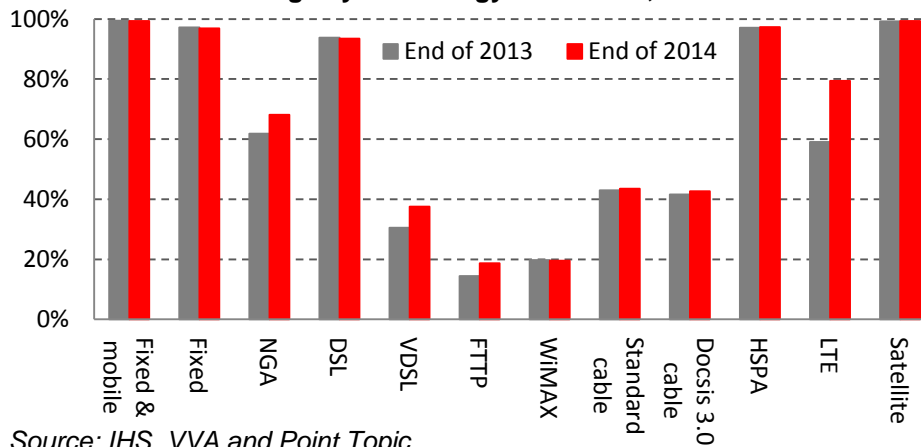
Our Target

Basic broadband for all by 2013: **100% in 2014**

Fast broadband (>30Mbps) for all by 2020: **68% in 2014**

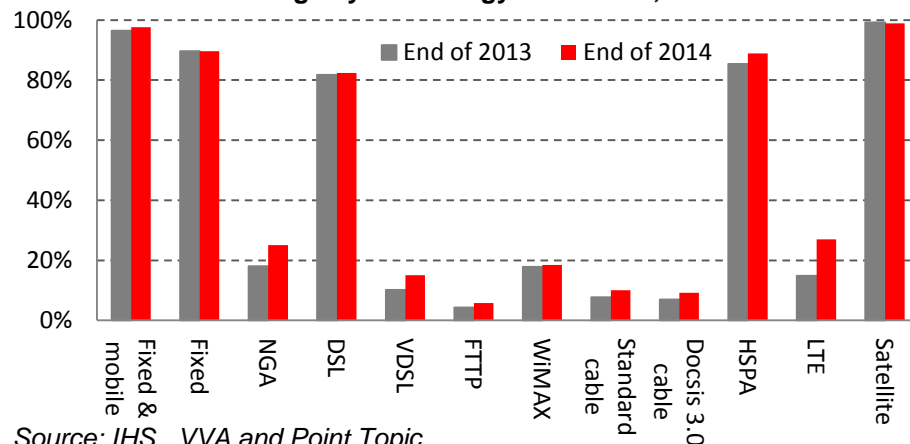


Total coverage by technology at EU level, 2013 - 2014



Source: IHS, VVA and Point Topic

Rural coverage by technology at EU level, 2013 - 2014



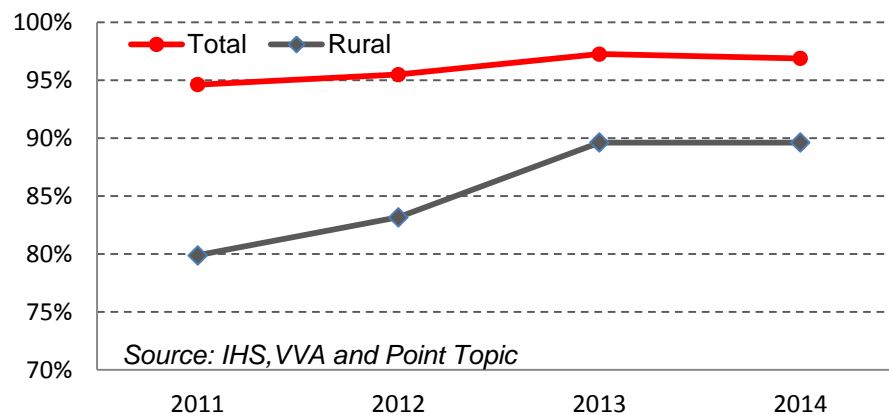
Source: IHS, VVA and Point Topic

Coverage of fixed broadband remained at 97%. In about half of the Member States more than 99% of homes are covered. At the same time, Poland, Slovakia, Estonia and Romania are lagging behind with less than 90%.

Primary internet access at home is provided mainly by fixed technologies. Among these technologies, xDSL has the largest footprint (93%) followed by Cable (43%) and WiMAX (20%). Fixed coverage is the highest in the Member States with well-developed DSL infrastructures, and is over 90% in all but four Member States.

Overall coverage of fixed broadband has only marginally increased since 2011, but rural coverage improved by 10 percentage points. Developments have slowed down, as Member States rather focus on NGA and wireless technologies.

Fixed broadband coverage in the EU, 2011-2014



Fixed broadband coverage, 2014

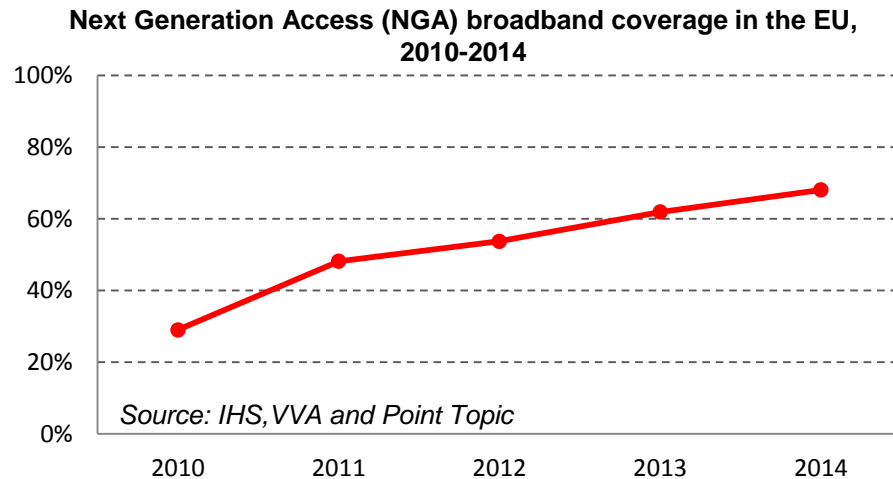


Source: IHS and VVA

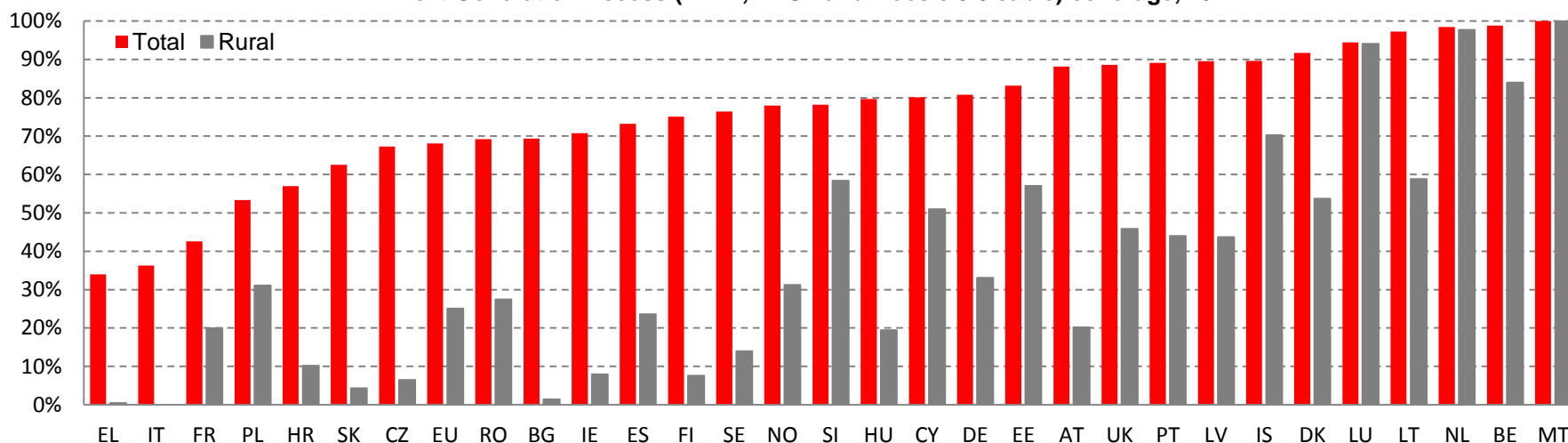
Coverage of Next Generation Access technologies continued to increase and reached 68%. NGA deployments still focus mainly in urban areas, while only 25% of rural homes are covered.

For the purpose of this report, Next Generation Access includes VDSL, Cable Docsis 3.0 and FTTP. At the end of 2013, Cable Docsis 3.0 had the largest NGA coverage at 43%, followed by VDSL (38%) and FTTP (19%). Most of the upgrades in European cable networks already took place by 2011, while VDSL coverage doubled in the last three years. There was remarkable progress also in FTTP growing from 10% in 2011 to 19% in 2014, but FTTP coverage is still low.

NGA networks are still very much limited to urban areas: only 25% of rural homes are covered, mainly by VDSL.



Next Generation Access (FTTP, VDSL and Docsis 3.0 cable) coverage, 2014



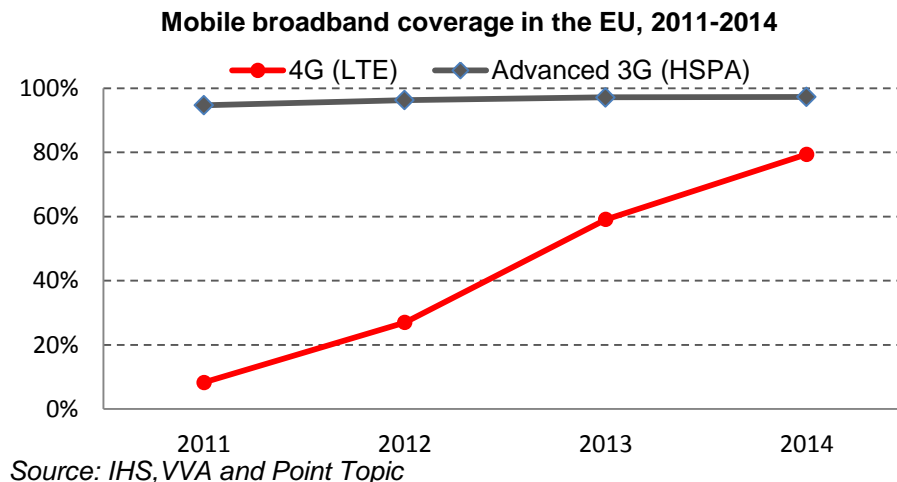
Source: IHS and VVA

4G mobile broadband availability reached 79%, up from 27% two years ago. 4G has been commercially launched in all but one Member State.

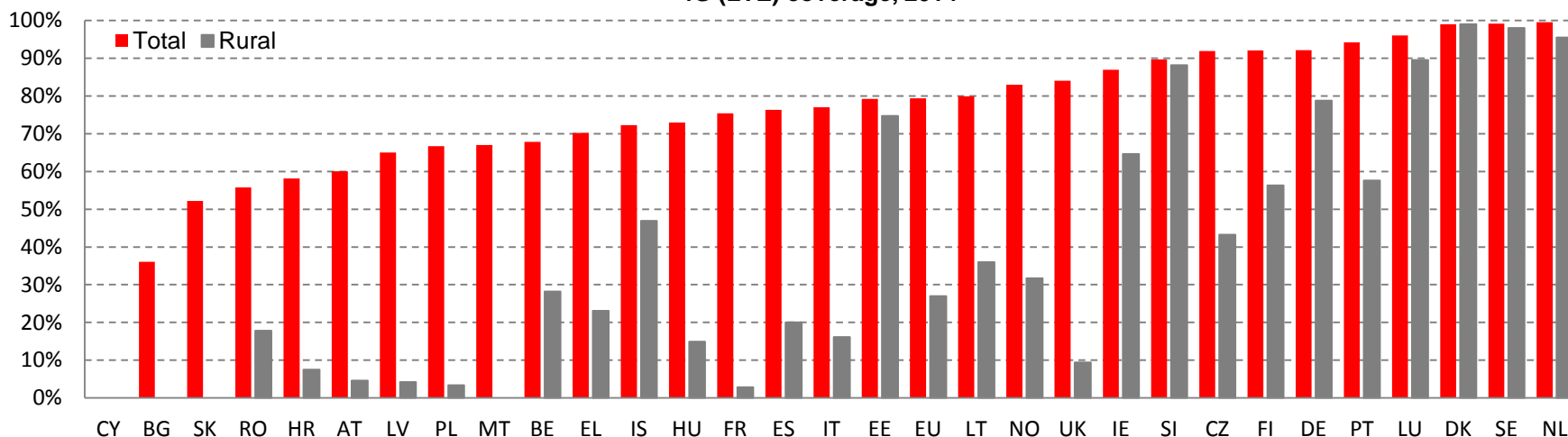
In 2014, deployments of 4G (LTE) continued: coverage went up from 59% of homes to 79%. Nevertheless, 4G coverage is still substantially below that of 3G (HSPA). As of October 2014, three quarter of Mobile Network Operators in the EU offered 4G services on LTE networks.

LTE is most widely developed in the Netherlands, Sweden and Denmark, while commercial 4G services have not yet been launched in Cyprus.

LTE deployments have focused so far mainly in urban areas, as only 27% of rural homes are covered. However, in ten Member States, LTE is already available also in the majority of rural homes, with very high rates in Denmark, Sweden and the Netherlands.



4G (LTE) coverage, 2014



Broadband coverage by speed: 96% of European homes have access to at least 2 Mbps broadband, 64% to 30Mbps.

As stated before, everyone in the EU can have access to broadband services, when considering fixed, mobile and also satellite technologies. These technologies normally provide more than 2 Mbps, but speed goes below this threshold for an estimated 4% of homes in Europe.

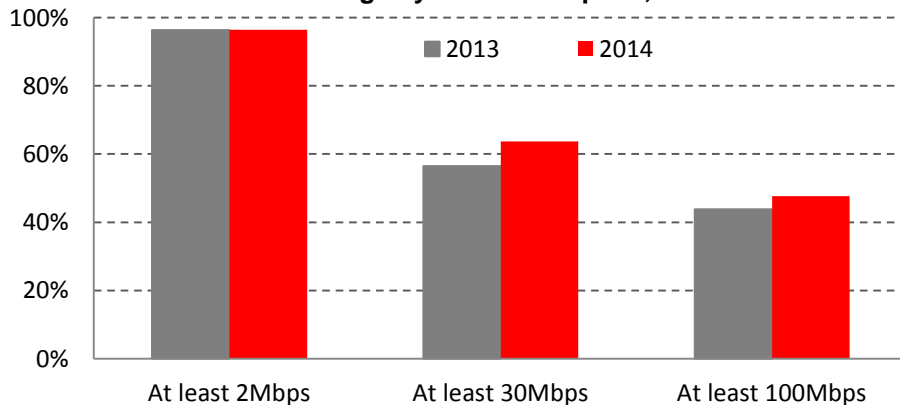
30 Mbps is available to 64%, just below the NGA coverage of 68%. At least 30Mbps broadband can be delivered through VDSL (but not for all connections), Cable Docsis 3.0, FTTP and to lesser extent through LTE. It is assumed that Cable Docsis 3.0 and FTTP can deliver at least 30Mbps on their entire footprint.

The majority of VDSL connected homes connected homes can also access 30 Mbps, while actual speeds on LTE networks are typically below this level.

100 Mbps or more is available to around one in two EU homes, delivered either on FTTP or Cable Docsis 3.0 networks.

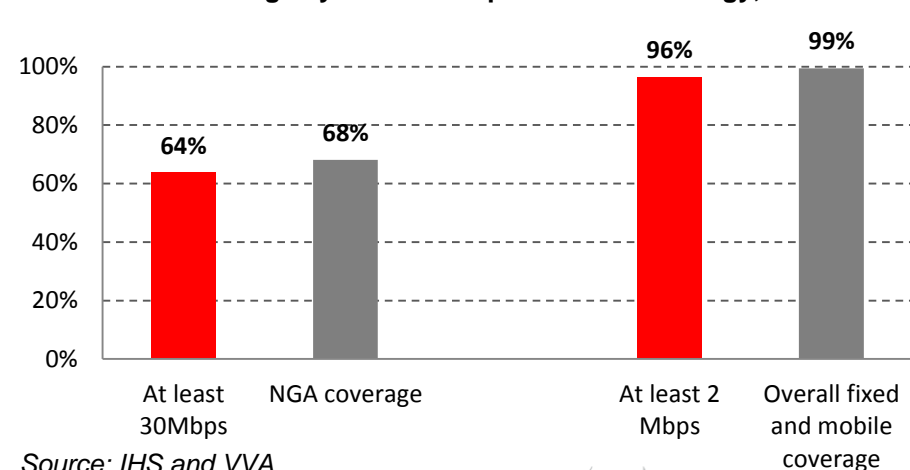
Speed definition: *actual download speeds are assessed, which users can typically reach most of the time in peak hours.*

Broadband coverage by download speed, 2013 - 2014



Source: IHS and VVA

Broadband coverage by download speed and technology, 2013 - 2014



Source: IHS and VVA

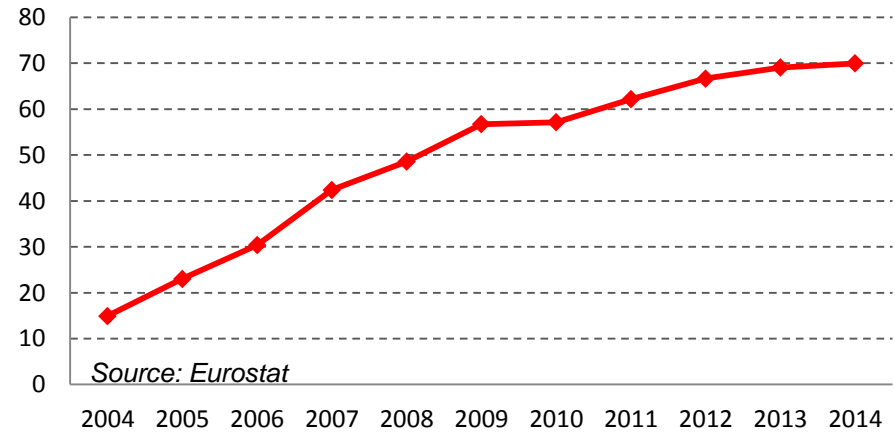
70% of EU homes had a fixed broadband subscription in 2014. Luxembourg, Germany and the UK registered the highest figures at EU level, while Italy, Portugal and Bulgaria have the lowest take-up rates.

Although fixed broadband is available to 97% of EU homes, 30% does not have a subscription. Growth in take-up was very strong until 2009, but then slowed down in the last few years. This is to some extent due to fixed-mobile substitution (see slide 29)

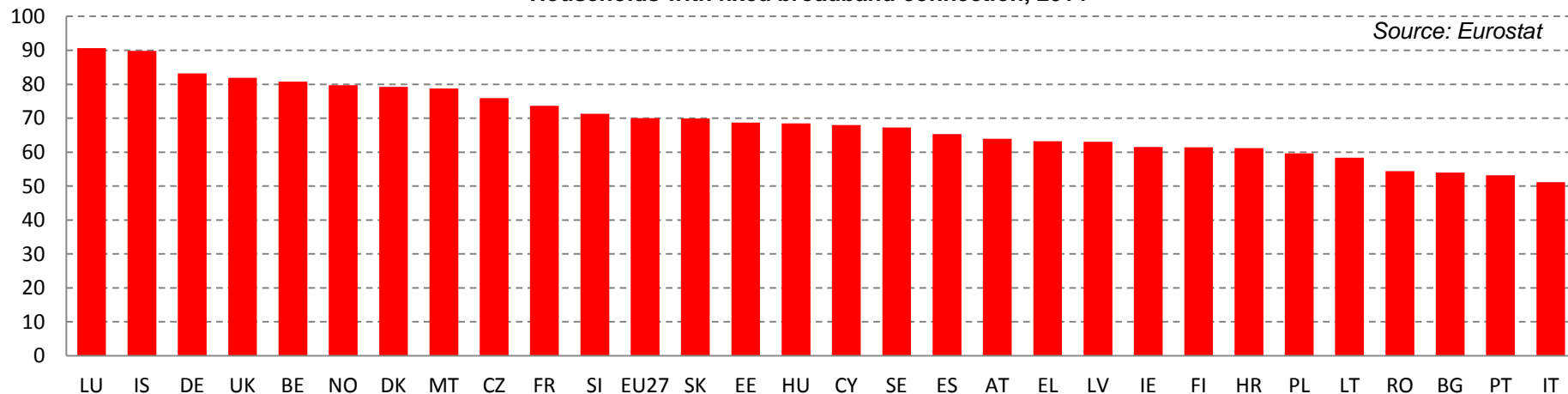
Looking at the Member States, take-up rates range from only 51% in Italy to 91% in Luxembourg.

Note: Penetration figures include also mobile subscriptions until 2009.

Households having a (fixed) broadband subscription, 2004 - 2014



Households with fixed broadband connection, 2014

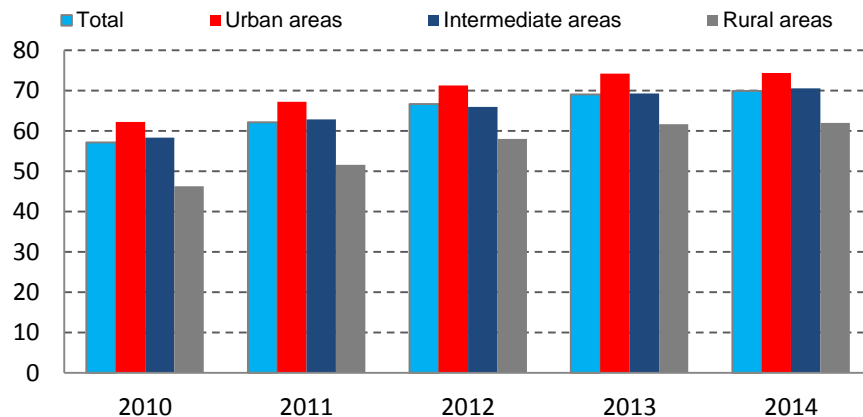


62% of rural homes had a fixed broadband subscription across the EU in 2014. Luxembourg, the UK and Germany registered the highest figures, while in six Member States, less than half of the homes subscribed.

There is a substantial gap between rural and national penetration rates, although the differences became smaller over the last five years (from 12 percentage points in 2010 to 8 percentage points in 2014).

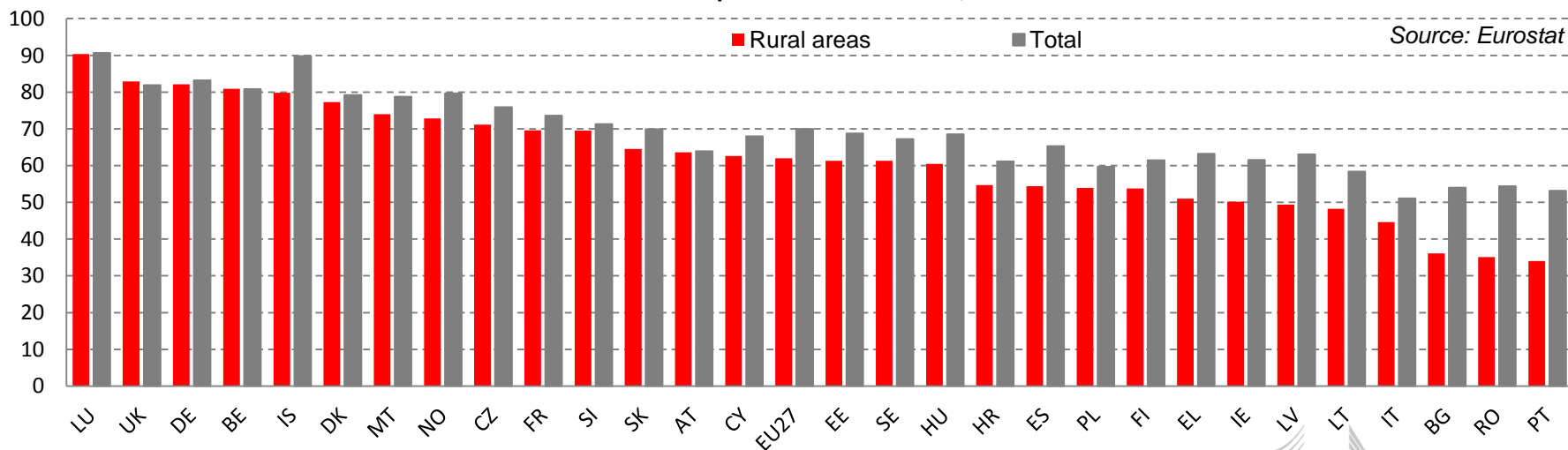
In Luxembourg, Germany, the UK, Belgium, Austria and Slovenia, rural and national penetration rates are almost identical. On the other hand, in Portugal, Romania and Bulgaria, where rural take-up is the lowest in Europe, there are significant gaps of 18-19 percentage points compared to the national take-up.

Households having a fixed broadband connection per area, 2010 - 2014



Source: Eurostat

Household penetration rural/total, 2014

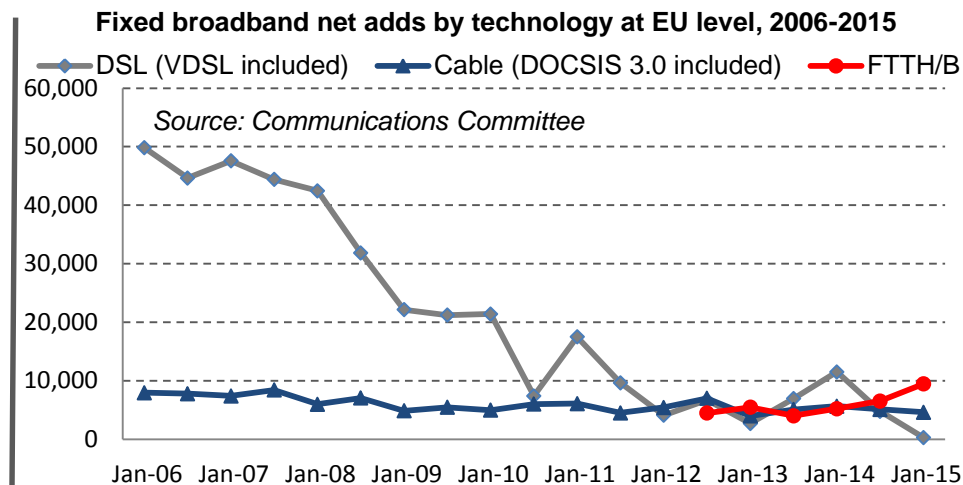


Source: Eurostat

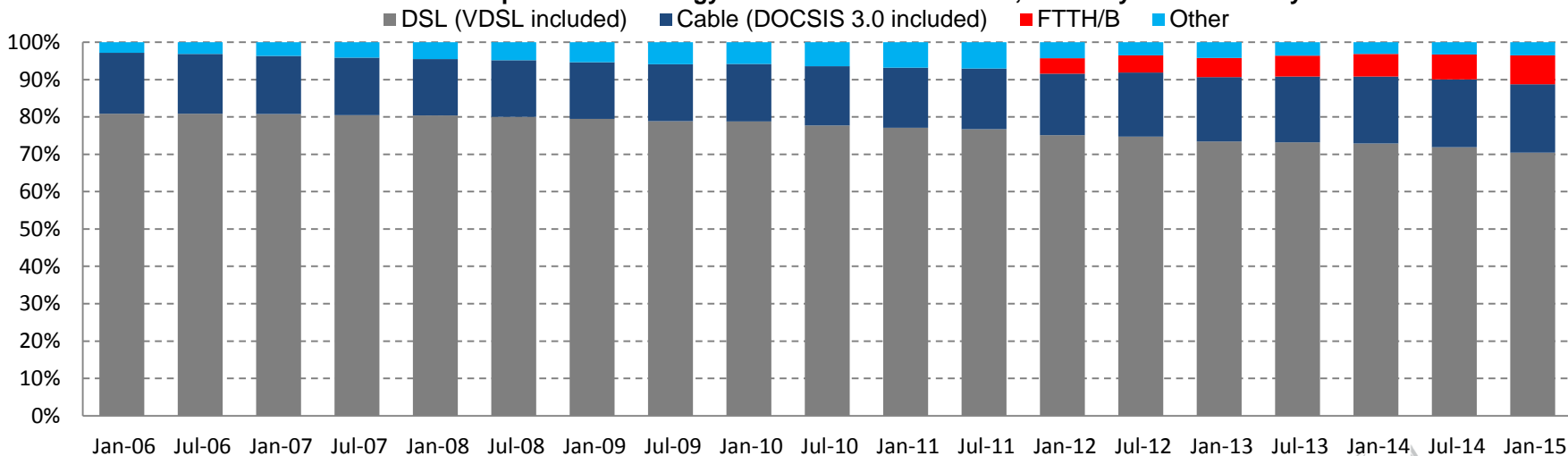
70% of subscriptions are **xDSL**, although xDSL is slightly losing market share. **Cable** is second with 18% of the market. **Fibre to the Home/Building** is emerging.

Although DSL is still the most widely used fixed broadband technology, its market share declined from 80% in 2009 to 70% in 2014. The main challenger – cable – somewhat increased its share during the same time period, but most of the gains were posted by alternative technologies, especially FTTH/B.

Nevertheless, DSL continues to be predominant, and its share can be strengthened thanks to the increased VDSL coverage.



Fixed broadband subscriptions - technology market shares at EU level, January 2006 - January 2015



Source: Communications Committee

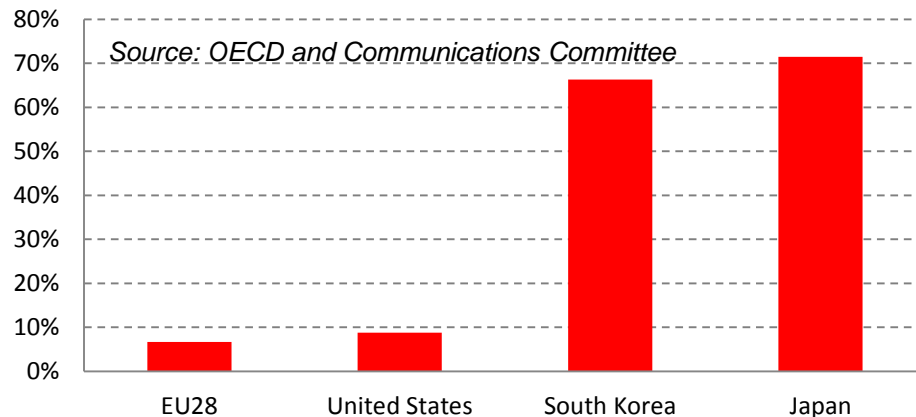


xDSL is particularly important in Greece and Italy, and has the lowest share in Bulgaria, Lithuania and Romania. **Cable** has very high market share in Belgium, Hungary, Malta and the Netherlands. **FTTH/B** is the most widely used technology in Lithuania, Latvia and Romania.

The share of xDSL ranges from 15% in Bulgaria to 100% in Greece. DSL is generally less dominant in Eastern Europe. Looking at alternative technologies, cable is present in all but two Member States and it is the most important technological competitor of DSL in the majority of the Member States.

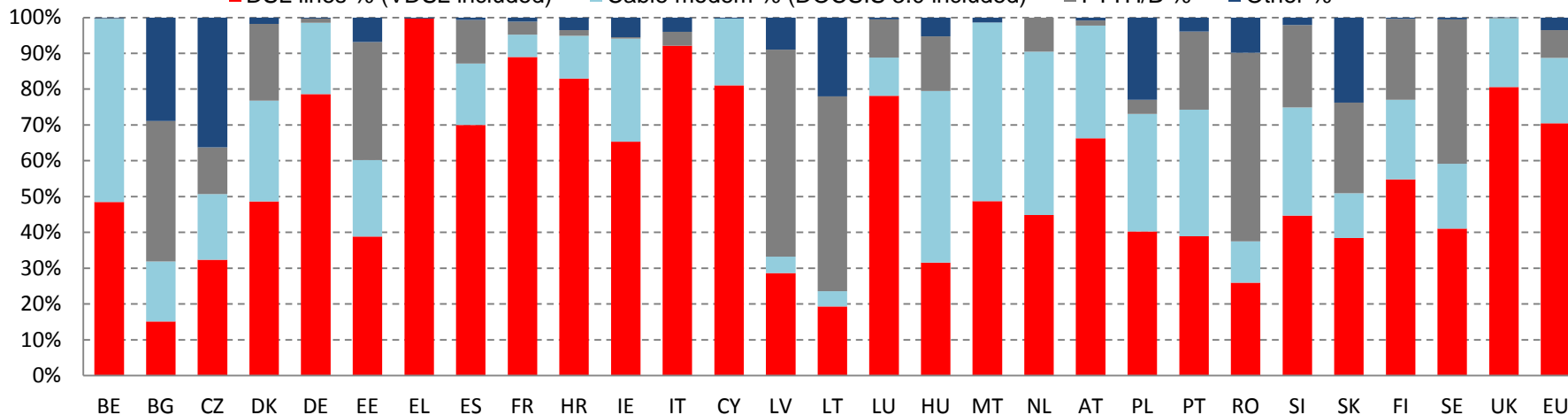
FTTH and FTTB together represent 8% of EU broadband subscriptions up from 6% a year ago. In these technologies, Europe is still very much lagging behind South Korea and Japan.

Share of fibre connections in total fixed broadband, June 2014



Fixed broadband subscriptions - technology market shares, January 2015

■ DSL lines % (VDSL included) ■ Cable modem % (DOCSIS 3.0 included) ■ FTTH/B % ■ Other %



Source: Communications Committee

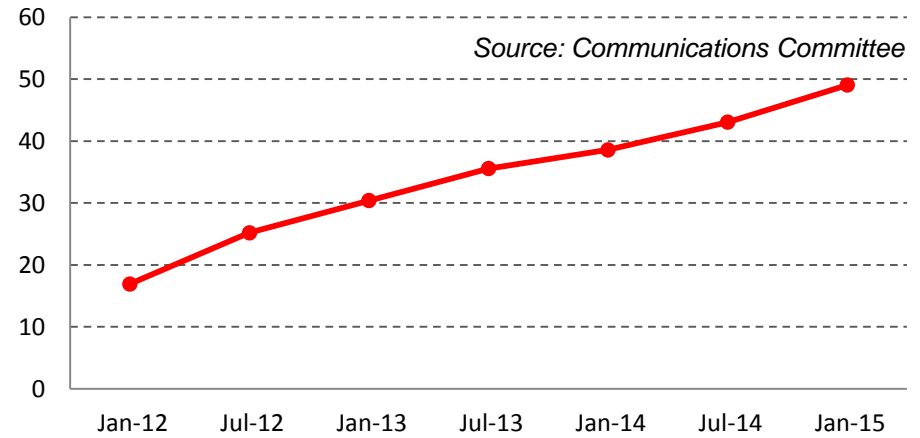
NGA subscriptions went up sharply by 20 million in the last two years, but only less than one third of all subscriptions are NGA. In Belgium and Romania, over 70% of fixed broadband subscriptions are NGA, while the same ratio is less than 10% in Greece, Cyprus and Italy.

Next Generation Access accounts for 31% of all EU fixed broadband subscriptions. Earlier, the increase in NGA was mainly attributed to cable, by now, more than 80% of cable subscriptions have been upgraded to DOCSIS 3.0.

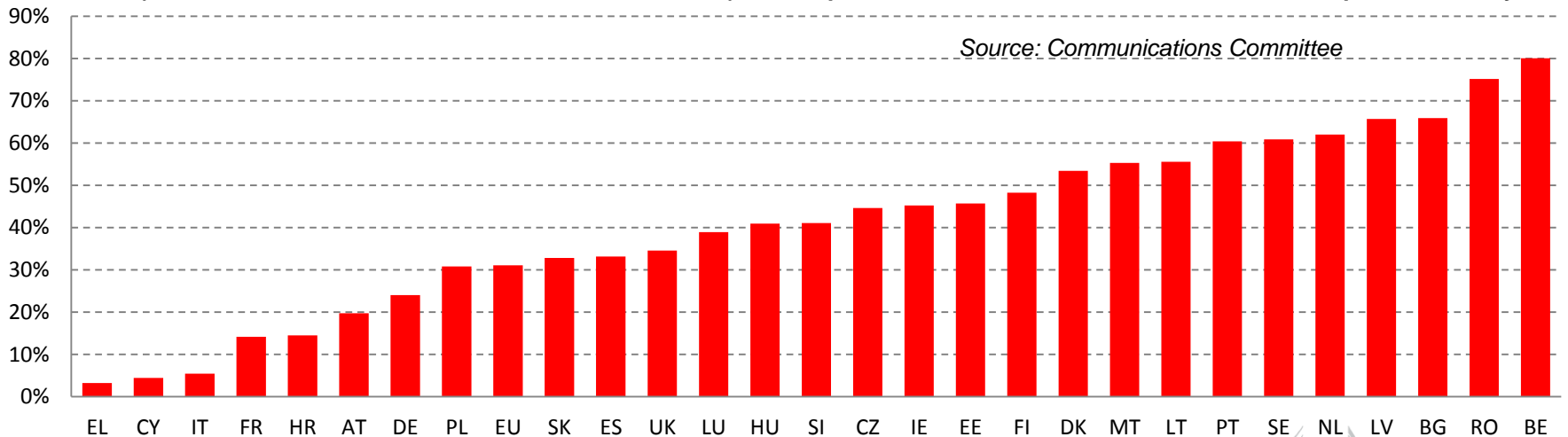
In the last 12 months, VDSL grew by 4.7 million, FTTH/B by 2.9 million and Cable Docsis 3.0 by 2.8 million.

The majority of broadband subscriptions are NGA in Belgium, Romania, Bulgaria, Latvia, the Netherlands, Sweden, Portugal, Lithuania, Malta and Denmark. At the same time, Cyprus Greece and Italy are very much behind all other Member States.

Evolution of NGA subscriptions (in millions) in the EU, 2012-2015



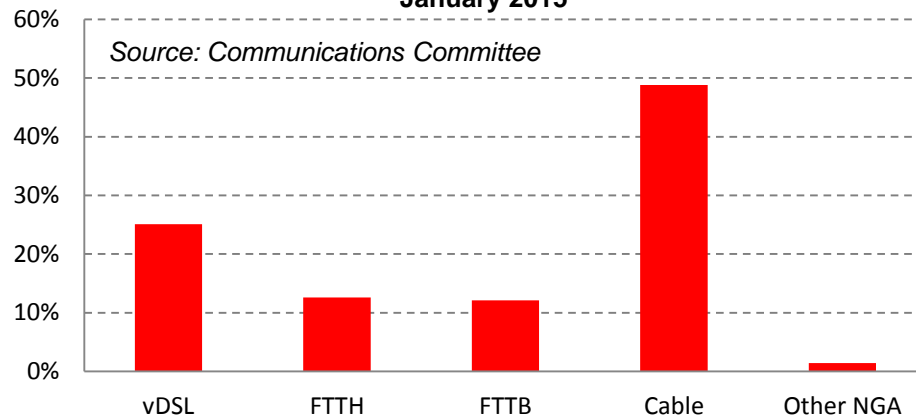
NGA (FTTH, FTTB, VDSL, Cable Docsis 3.0 and other NGA) subscriptions as a % of total fixed broadband subscriptions, January



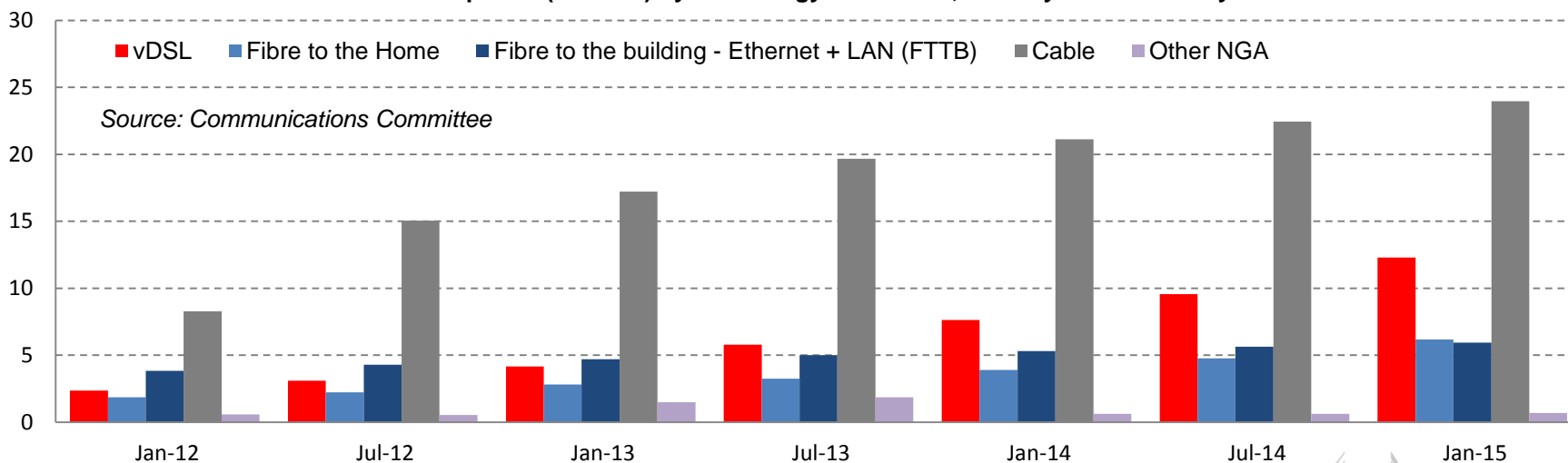
Cable Docsis 3.0 is currently the most widespread NGA technology in the EU both in terms of coverage and take-up. **VDSL** subscriptions went up by 28% in the last six months.

Close to 50% of NGA subscriptions are Docsis 3.0, which is remarkable given that cable broadband in total represents only 18% of all EU fixed broadband subscriptions. While almost all the cable networks have been upgraded to NGA, in xDSL, only 40% of the network is VDSL. Nevertheless, VDSL coverage went up by 23% and the number of subscriptions by 61% in the last twelve months. FTTH and FTTB have 13% and 12% share in total NGA, respectively.

Share of different NGA technologies in total NGA subscriptions, January 2015



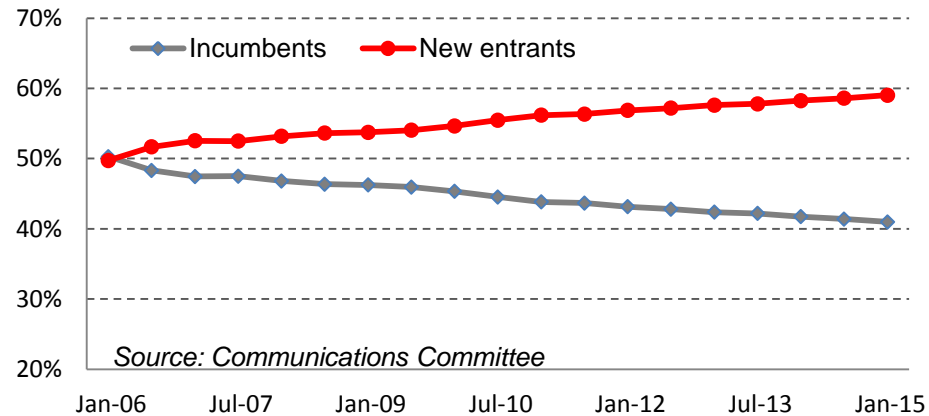
NGA subscriptions (millions) by technology at EU level, January 2012 - January 2015



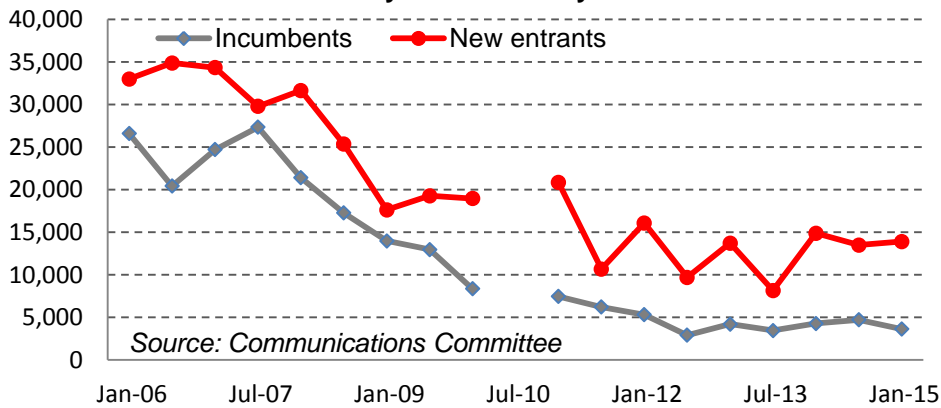
Competition in the fixed broadband market: new entrant operators are continuously gaining market share, but incumbents still control 41% of the subscriptions.

Incumbent operators are market leaders in almost all Member States, although their market share is decreasing. During the last nine years, new entrant operators always posted higher net gains than the incumbents. In the last six months, new entrants yielded 79% of the total net gain in the market. This, however, could not result in a large change in the overall market share of new entrants because of the low growth rate of the total market.

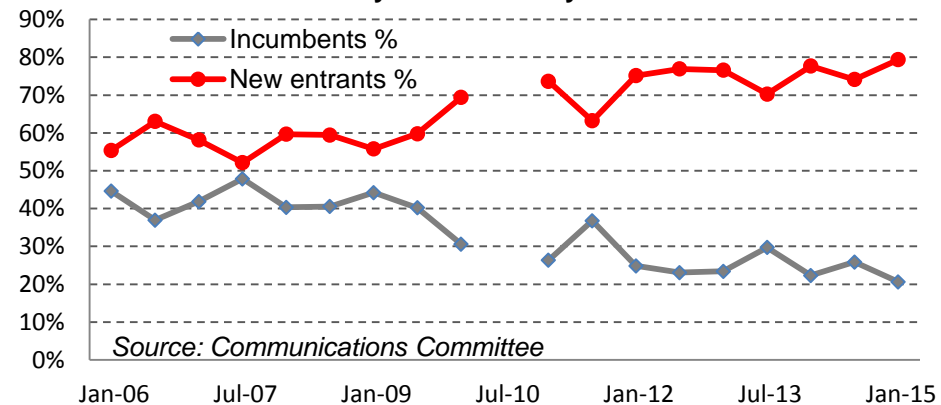
Fixed broadband subscriptions - operator market shares at EU level, January 2006 - January 2015



Fixed broadband subscriptions growth per day by operator at EU level, January 2006 - January 2015



Fixed broadband subscriptions growth per day by operator at EU level, January 2006 - January 2015

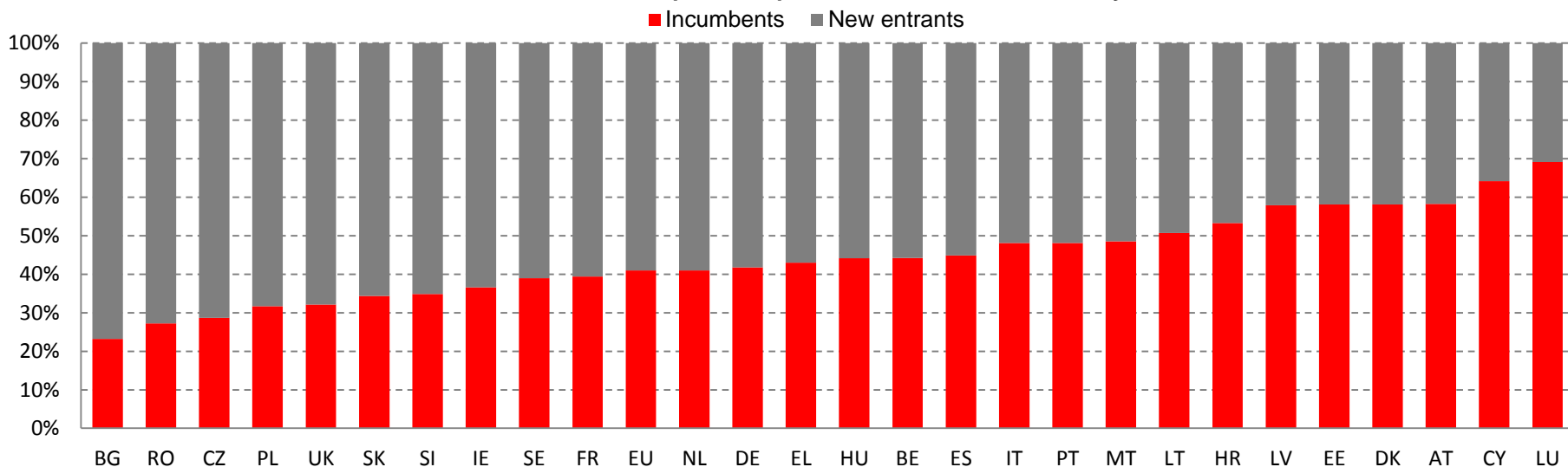


The **market share of incumbents** show very large differences across Europe. In 8 out of the 28 Member States, more than half of the subscriptions are provided by the incumbent operator.

Market shares are calculated at the national level for the incumbents and new entrants. However, broadband markets are geographically fragmented suggesting that a large number of homes are served by only one provider (most likely by the incumbent operator in this case).

Incumbents have the highest subscription market share in Luxembourg and Cyprus, where the small market size may favour concentration. Incumbents are the weakest in Europe in four Eastern European Member States: in Bulgaria, Romania, the Czech Republic and Poland. In all these four Member States, most of the subscribers use technologies other than xDSL.

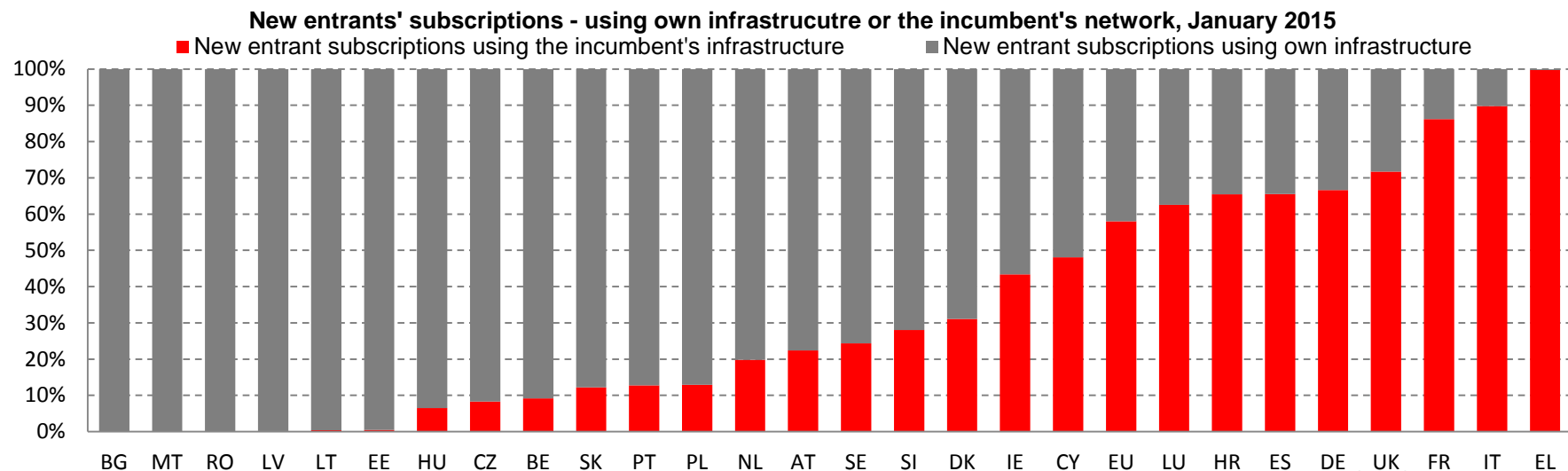
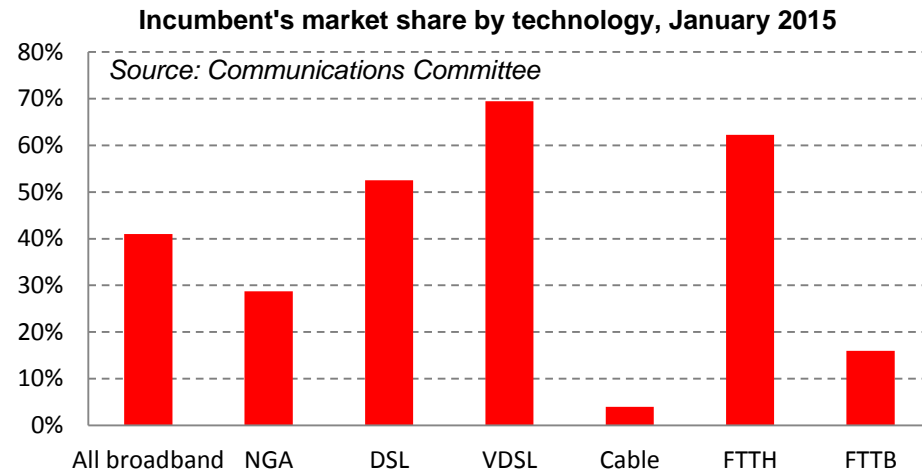
Fixed broadband subscriptions - operator market shares, January 2015



Source: Communications Committee

In the **DSL** market, unbundling reduced the dominance of incumbents, but in **VDSL** incumbents have 69% of subscriptions. Nevertheless, **NGA** is provided mainly by new entrants because of the high share of **cable**. More than 50% of new entrant subscriptions use the incumbents' network infrastructure.

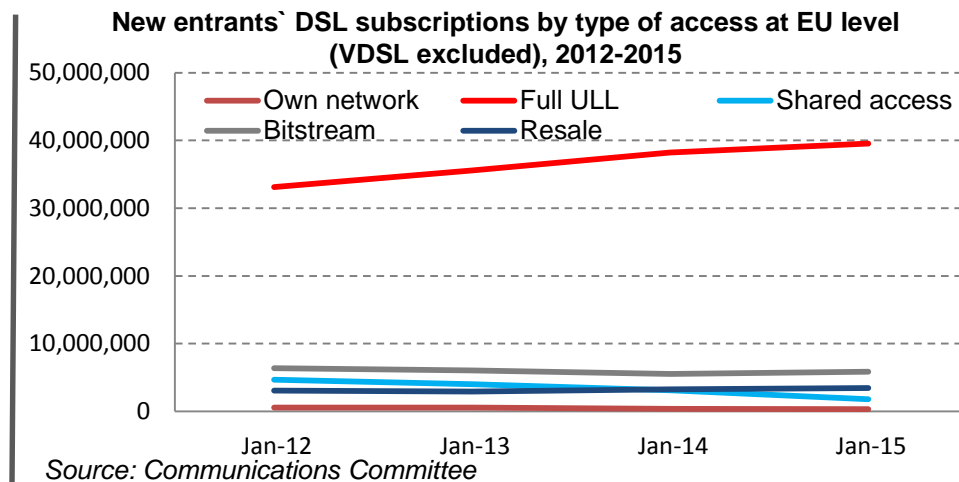
New entrant operators can compete with the incumbents by using either the incumbent's network or their own network to offer internet access. In Greece, competition is entirely based on regulated access to the incumbent's access network, and over 80% in Italy and France. In the Eastern European Member States, competition is rather based on competing infrastructures. This applies also to Belgium, Malta, Portugal and the Netherlands.



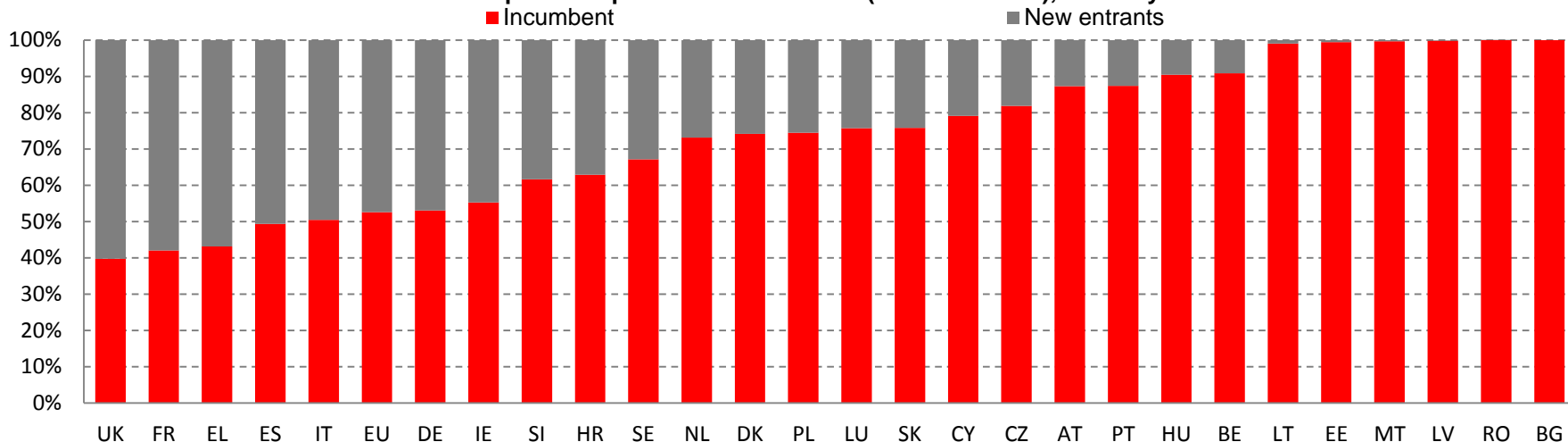
Source: Communications Committee

53% of **DSL** subscriptions belong to the incumbents. New entrants mainly use **Local Loop Unbundling** to sell DSL. In six Member States, the new entrants' presence in the DSL market is marginal. In all these Member States, alternative technologies are significant.

In Bulgaria, Romania, Latvia, Malta, Estonia and Lithuania, there is virtually no competition in the DSL market. These Member States, however, have strong platform competition. At the same time, in the UK, Greece, France and Spain, new entrants have the majority of xDSL subscriptions, followed by Spain and Italy. In all these Member States, the vast majority of new entrants' DSL subscriptions are provided through Local Loop Unbundling, but in Italy bitstream is also important.



DSL subscriptions - operator market shares (VDSL included), January 2015

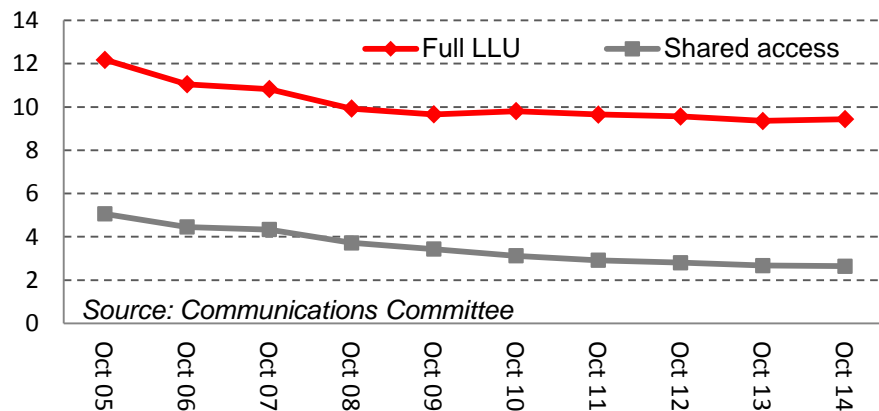


Source: Communications Committee

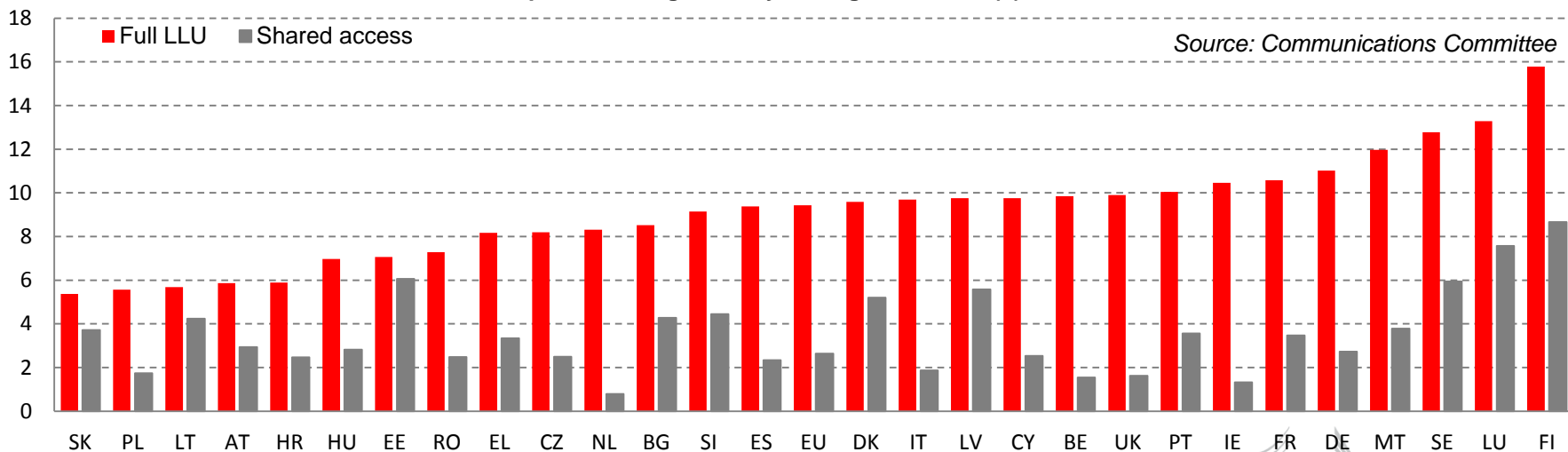
The wholesale charges of **Local Loop Unbundling** went down by 23% for **full access** since 2005, but has been broadly stable since 2008.

The regulated wholesale charges giving access for new entrants to the local loop are important to effective competition in the xDSL market. The monthly average total cost (calculated as the monthly rental + the one time connection charge distributed over a three years period) stood at €9.43 for full access (provision of both voice and broadband) and at €2.64 for shared access (provision of broadband only) in October 2014.

Local Loop Unbundling monthly average total cost (€) at EU level, 2005-2014

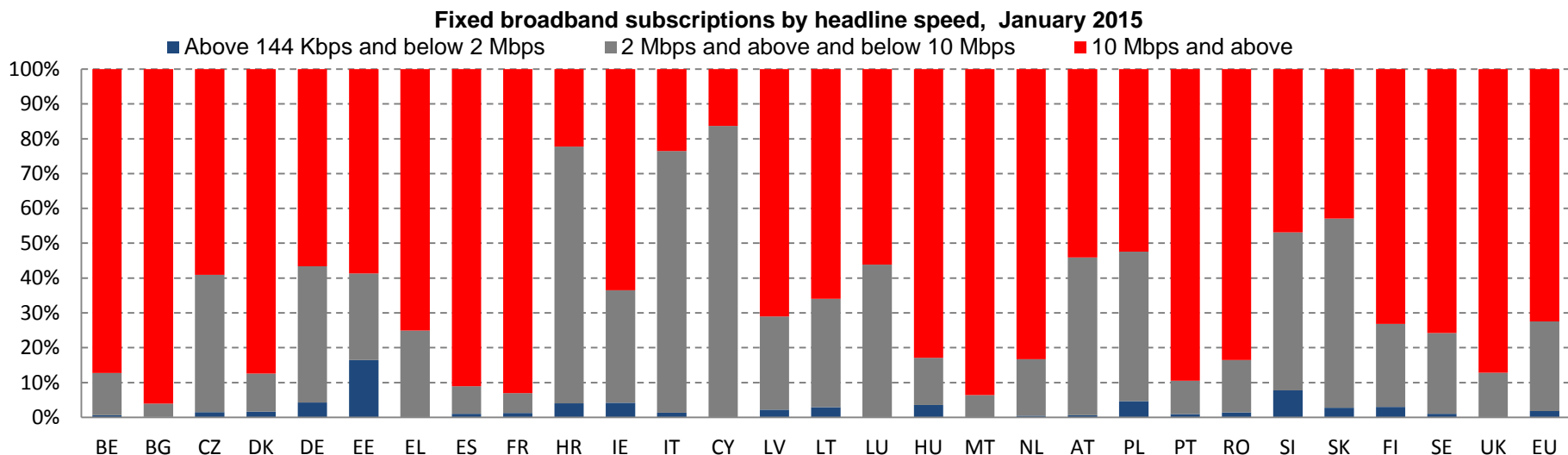
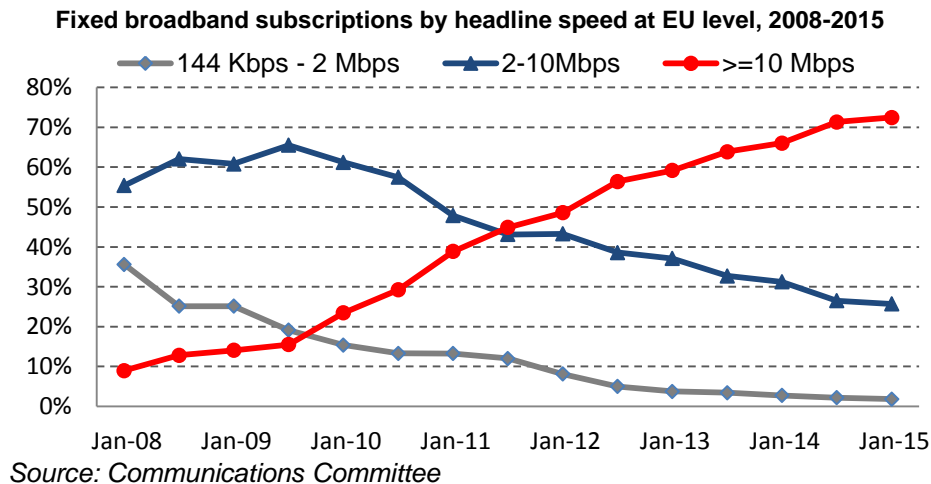


Local Loop Unbundling monthly average total cost (€), October 2014



Fixed broadband speeds: over 70% of subscriptions are at least 10Mbps. <2Mbps is marginal (2% except for Estonia and Slovenia).

Low speed fixed broadband subscriptions are getting marginal: only 2% of all subscriptions have less than 2 Mbps advertised download speed as opposed to 36% seven years ago. At least 10Mbps applies to more than 70% of subscriptions, up from 9% in 2008. However, broadband connections are still slow in Italy, Croatia and Cyprus, where less than a quarter of subscriptions are at least 10Mbps. In Estonia and Slovenia, still a relatively large proportion of subscriptions are below 2Mbps.



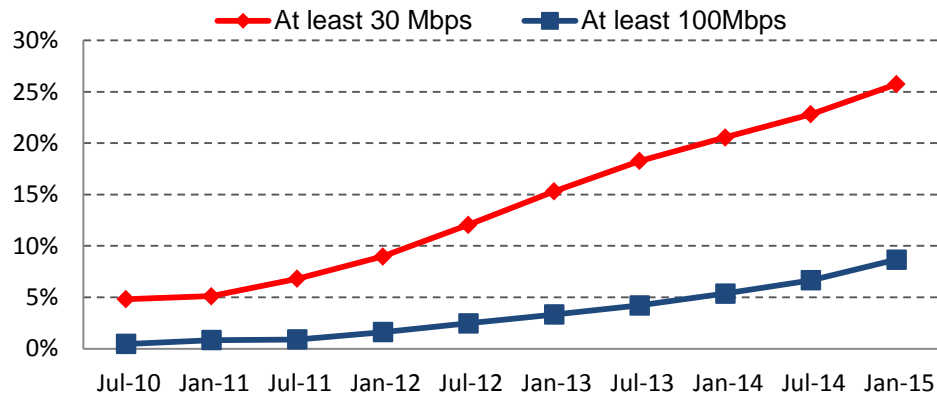
Source: Communications Committee

Fast and ultrafast broadband subscriptions grew by 32% in twelve months. In Belgium, Latvia and Romania, the majority of subscriptions are at least 30Mbps. Ultrafast (at least 100Mbps) is most widespread in Belgium and Romania.

Despite the growth in fast and ultrafast subscriptions, they are still rare in the EU. In January 2015, only slightly more than one in four subscriptions were at least 30 Mbps and only 9% at least 100Mbps.

In Belgium, Romania, Malta, Latvia, Portugal and Lithuania, already more than 50% are at least 30Mbps, while the same ratio is less than 10% in Italy, Greece, Cyprus, Slovenia and Croatia. In ultrafast (at least 100 Mbps), Sweden, Latvia and Romania are the most advanced with more than 30% of subscriptions.

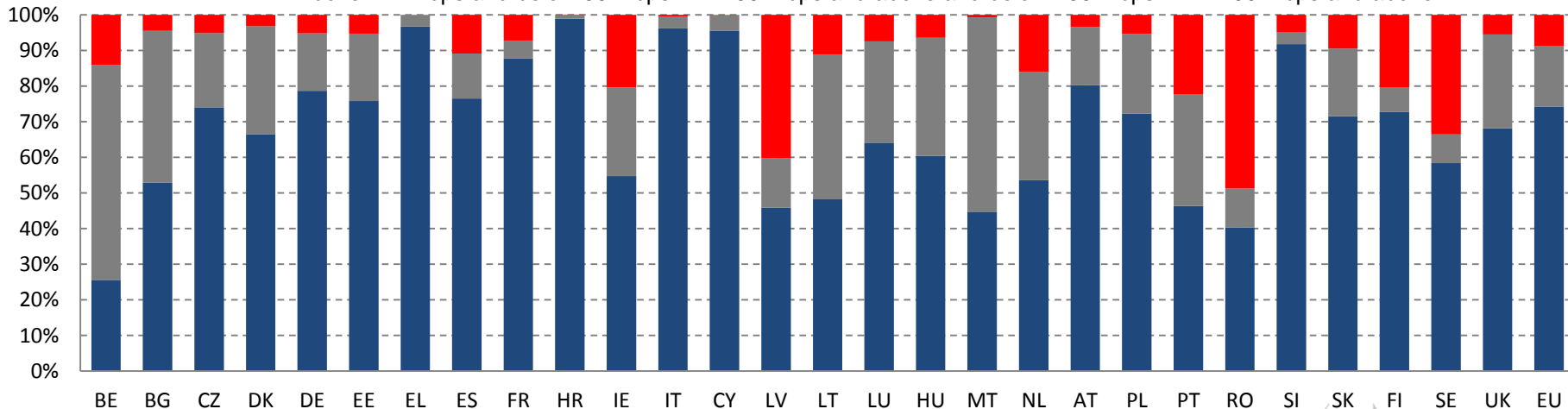
Fixed broadband subscriptions by headline speed at EU level, 2008-2015



Source: Communications Committee

Fixed broadband subscriptions by headline speed (Digital Agenda categories), January 2015

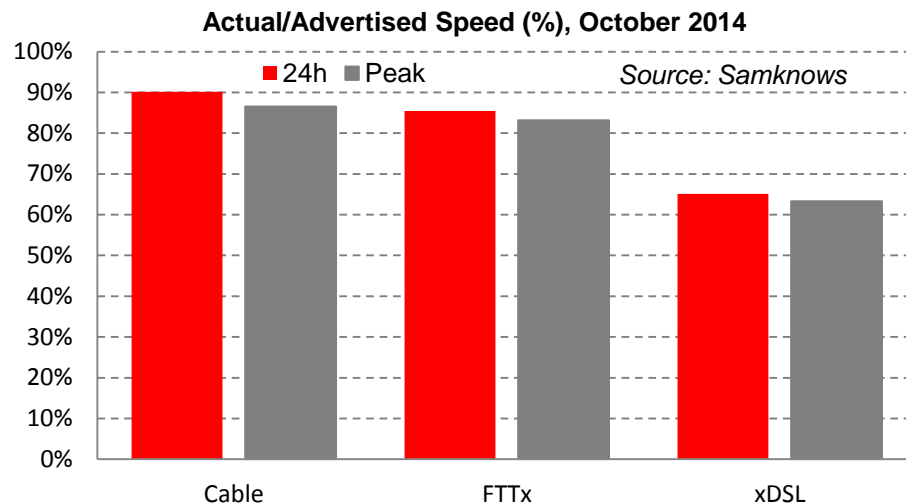
■ Above 144 Kbps and below 30 Mbps ■ 30 Mbps and above and below 100 Mbps ■ 100 Mbps and above



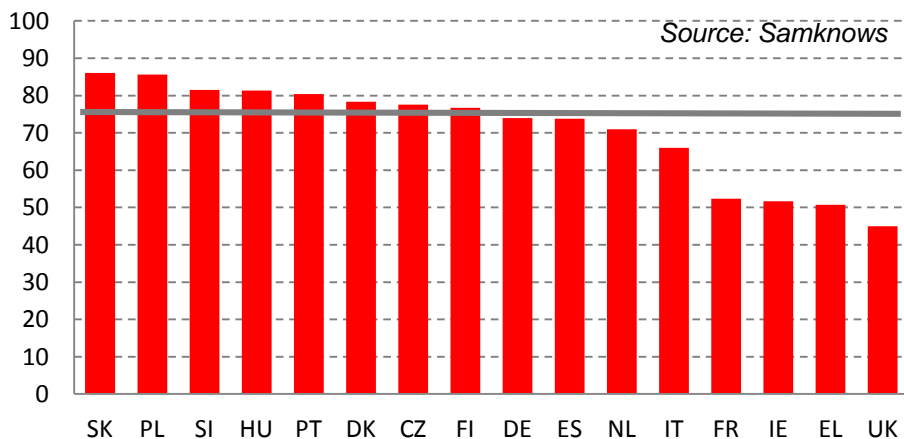
Source: Communications Committee

Actual speeds of broadband connections are only **76%** of the advertised speeds in peak hours. The same ratio is only **63%** for DSL.

Speeds of broadband products are advertised as "up to a certain Mbit/s", but there are significant differences between the advertised speed and the actual speed that consumers receive. In the EU, the actual download speed remains at 76% of the advertised speed. DSL delivers only 63.3% of the advertised headline download speed, which means a slight decrease since last year. Cable delivers 86.5% (3 points less than in 2013) and FTTx 83.1% (somewhat better than last year).



Actual Download Speed of xDSL technology as a Percentage of Advertised Speed, peak hours, October 2014



As of 2014, in the US 91% of the advertised xDSL download speed is delivered. However, the actual download throughput in Europe is typically better than in the US across all access technologies, especially in cable.

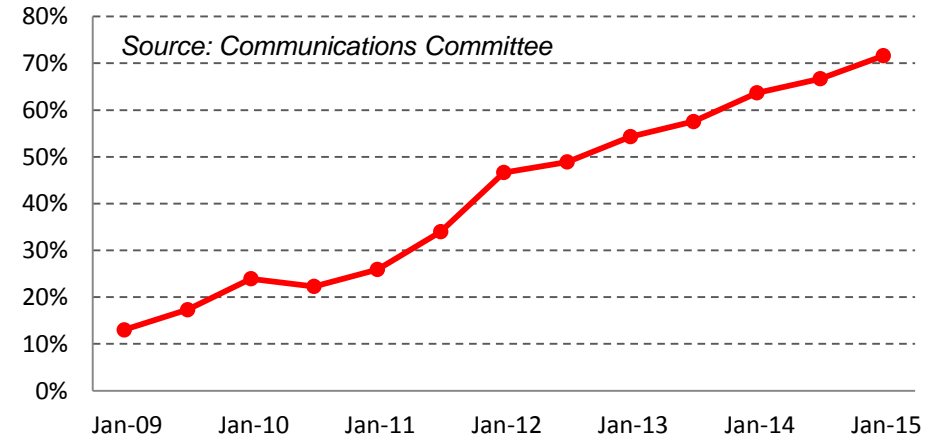
As for xDSL, being the most widely used technology in Europe, there are large differences across Member States: 86% of the advertised download speed is attained in Slovakia, but only 45% in the UK, 51% in Greece and 52% in Ireland (*non-weighted results*).

There are 72 active **mobile broadband** SIM cards per 100 people in the EU, up from 26 four years ago. The growth was linear over the last three years with over 40 million new subscriptions added every year.

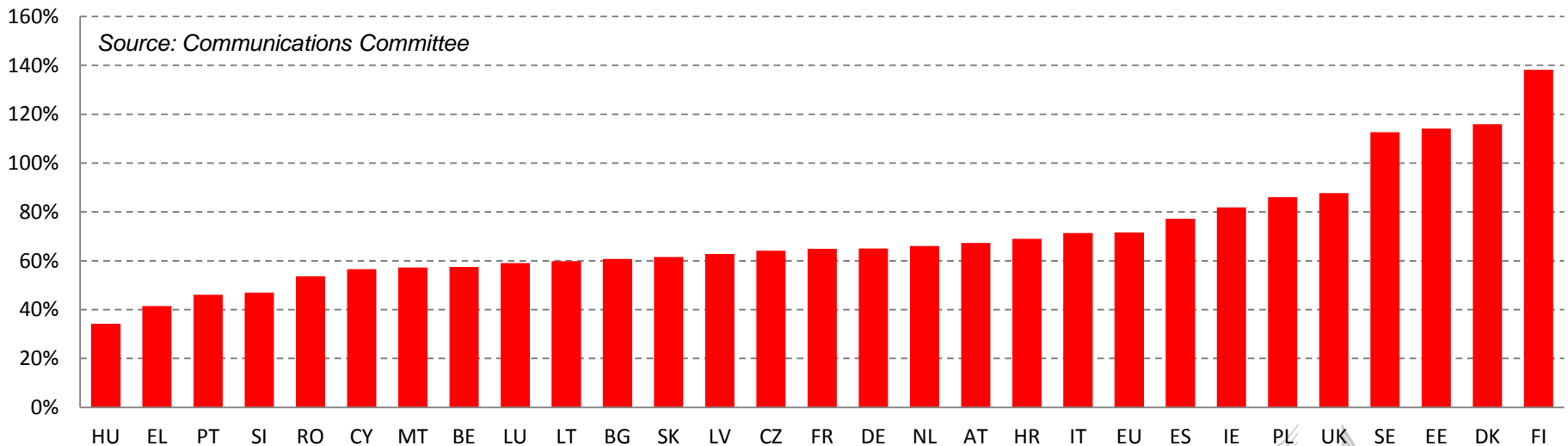
Mobile broadband represents a fast growing segment of the broadband market. About 60% of all active mobile SIM cards use mobile broadband.

In the Nordic countries and Estonia, there are already more than 100 subscriptions per 100 people, while in Hungary, Greece, Portugal and Slovenia the take-up rate is still below 50%. Most of the mobile broadband subscriptions are used on smartphones rather than in tablets or notebooks.

Mobile broadband penetration at EU level, January 2009 - January 2015



Mobile broadband penetration - all active users as a % of population, January 2015



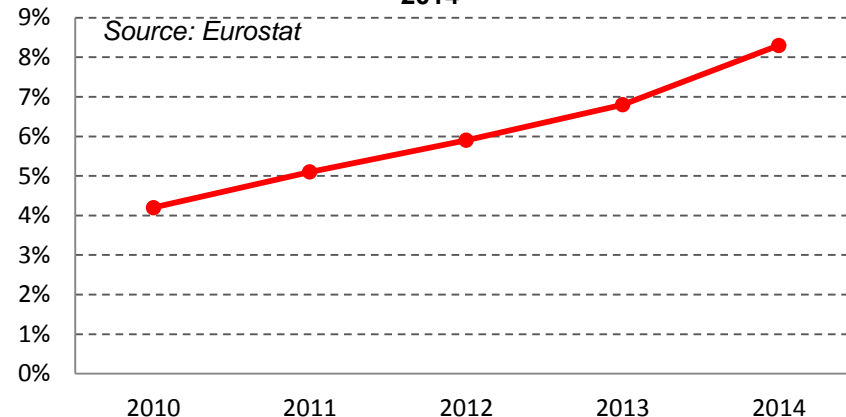
Mobile broadband is still mainly complementary to fixed broadband. In 2014, 8.3% of EU homes accessed the internet only through mobile technologies. Finland and Italy were leaders in mobile access to internet with 27.5% and 20% of homes in 2014.

Europeans access the internet primarily with fixed technologies at home. However, there is a growing number of homes with only mobile internet use. The percentage of homes with purely mobile broadband access went up from 4.2% in 2010 to 8.3% in 2014. This indicates that mobile broadband is still mainly complementary to fixed broadband, but not a substitution product.

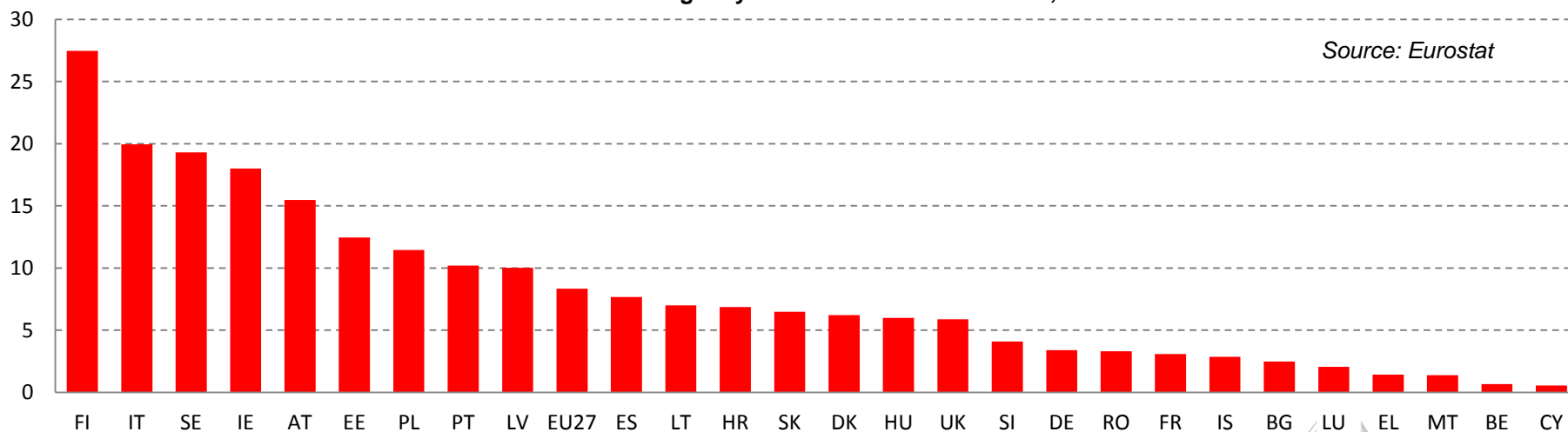
Cyprus was the Member State with the lowest figure at less than 1%.

On the contrary, Finland and Italy were leaders in mobile access to internet with 27.5% and 20% of homes in 2014.

Households using only mobile broadband at home, EU level, 2010 - 2014

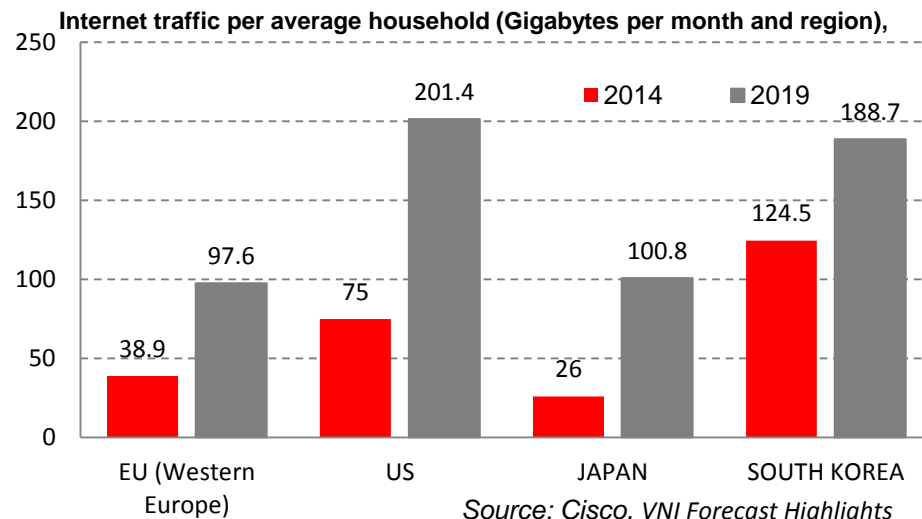


Households using only mobile broadband at home, 2014

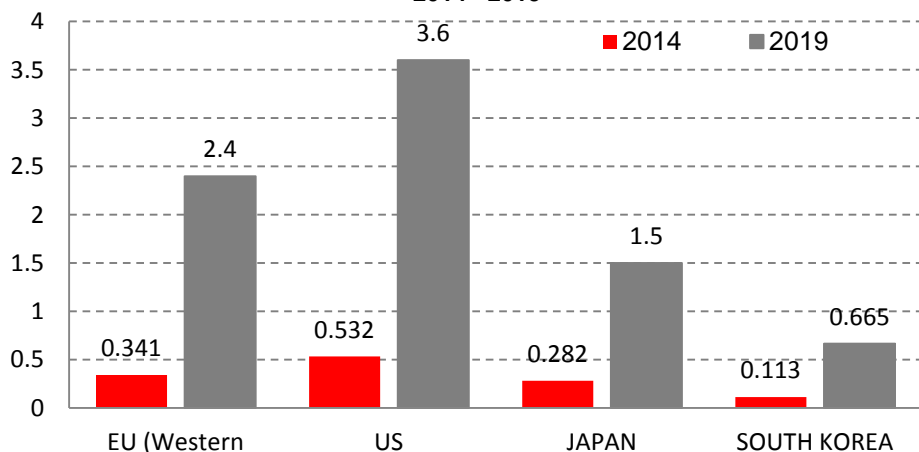


Broadband traffic: Internet traffic is much higher in the US than in Western Europe on both fixed and mobile networks.

In Western Europe, the average Internet use by households is expected to be 97.6 GB monthly in 2019, up by 151% from 38.9 GB in 2014. The average usage in the US is about twice as high as in Western Europe. As for Japan and South Korea, Internet household traffics will increase by 287% and 52%, respectively. This implies that with this growth rates, Western Europe will be lagging behind those economies.



Total traffic on mobile networks (Exabytes per month) by region, 2014 - 2019



Source: Cisco, VNI Forecast Highlights

As for total mobile traffic, Western Europe will have a compound annual growth rate of 48% until 2019, reaching an estimated 2.4 Exabytes per month. In the US, the compound annual growth will be similar, with 47% growth rate, reaching a total mobile traffic of 3.6 Exabytes per month by 2019. Per capita traffic on mobile networks is more than twice as high in the US than in Western Europe.

Mobile broadband traffic: Tablet devices are expected to be the touchstone for mobile data traffic in 2019, exceeding smartphones and laptops in average usage. Mobile data traffic in 2019 is expected to be 219% higher than in 2014. Western Europe will be lagging behind US, Japan and South-Korea in average usage in any mobile device.

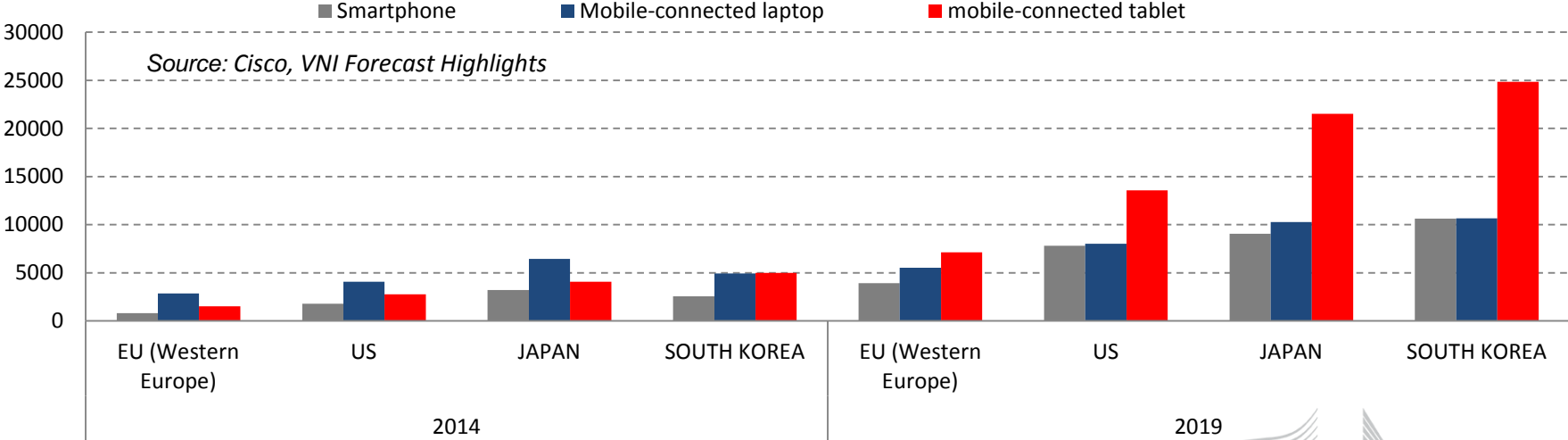
Mobile data traffic in Western Europe is expected to grow by 219% until 2019, which represents a smaller growth compared to the US (+240%) and South-Korea (269%), but higher than in Japan (197%).

The average smartphone user in Western Europe will generate 4 Gb of mobile data traffic per month in 2019, up by 377% from 2014. Laptop users will generate 5.5 Gb and tablets user more than 7GB.

Tablet devices will overpass mobile-connected laptops and smartphones. Currently, in Western Europe, tablets represent 29% of total mobile traffic. As for 2019, this percentage will be 43%, while in South-Korea and Japan tablets will weigh more than 50% of total mobile traffic.

As for US, tablets will represent 46% of total mobile traffic by 2019, with an absolute figure of 13 Gb per month, as opposed to 7 Gb from EU.

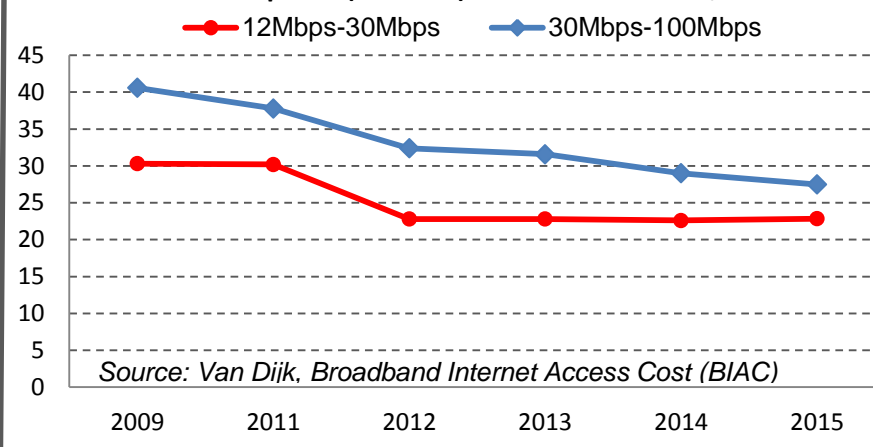
Mobile data traffic per type of device and region, Megabytes per month, 2014 - 2019



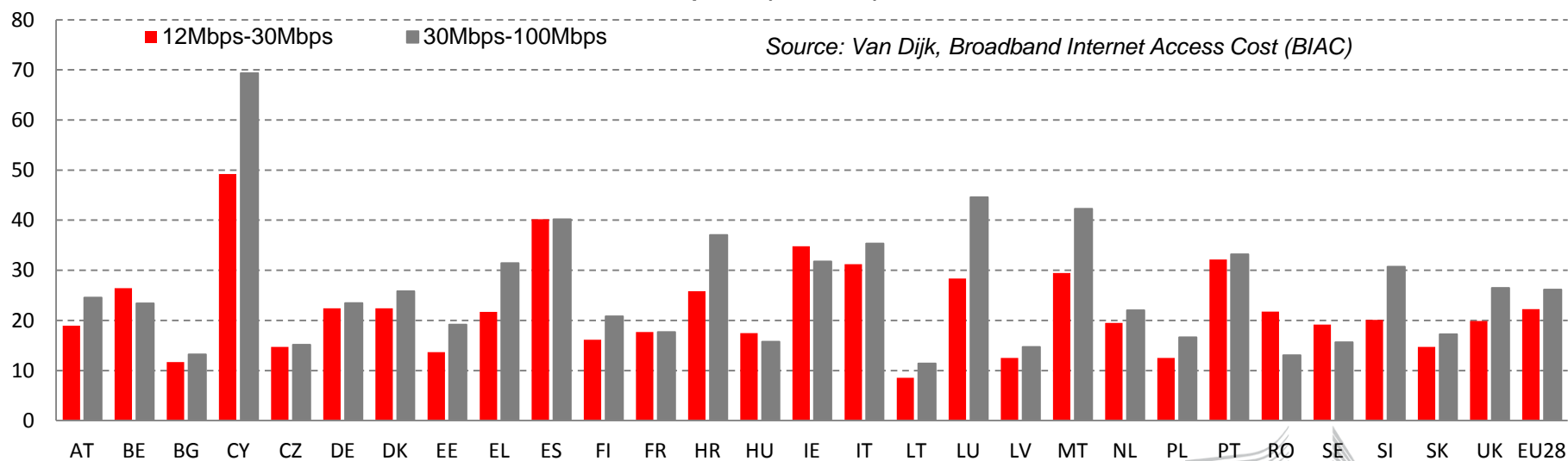
Prices of high speed broadband access across the EU Member States tend to decrease over time but remain dispersed across Member States.

Broadband access prices remained dispersed across Europe: the minimum prices (calculated on Purchasing Power Parity) vary between €11 and €69 for a standalone offer with a download speed between 30 and 100 Mbps. The minimum prices were the lowest in Lithuania (€11), Bulgaria (€13) and Romania (€13) and the highest in Cyprus (€69), Luxembourg (45€) and Malta (€42). In Italy, Greece, Cyprus, Slovenia and Croatia, fast broadband (at least 30Mbps) is still rare, representing less than 10% of all subscriptions. The minimum price of standalone offers of 30 to 100Mbps decreased from €41 in 2009 to €28 in 2015.

Broadband retail prices (EUR PPP) – Standalone offers, 2009-2015



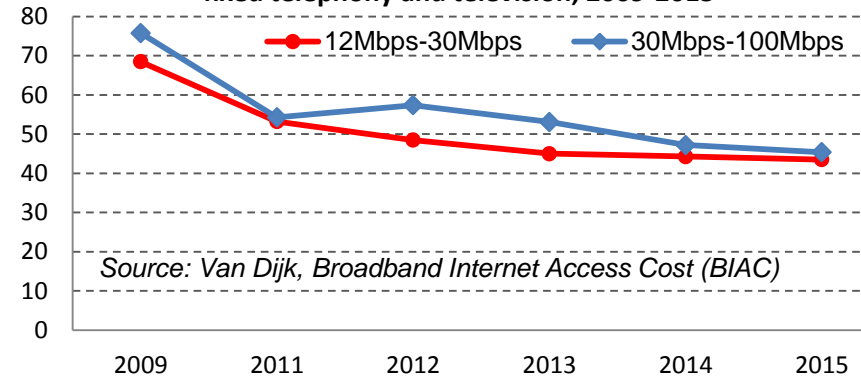
Fixed broadband retail prices (EUR PPP) - Standalone offers, 2015



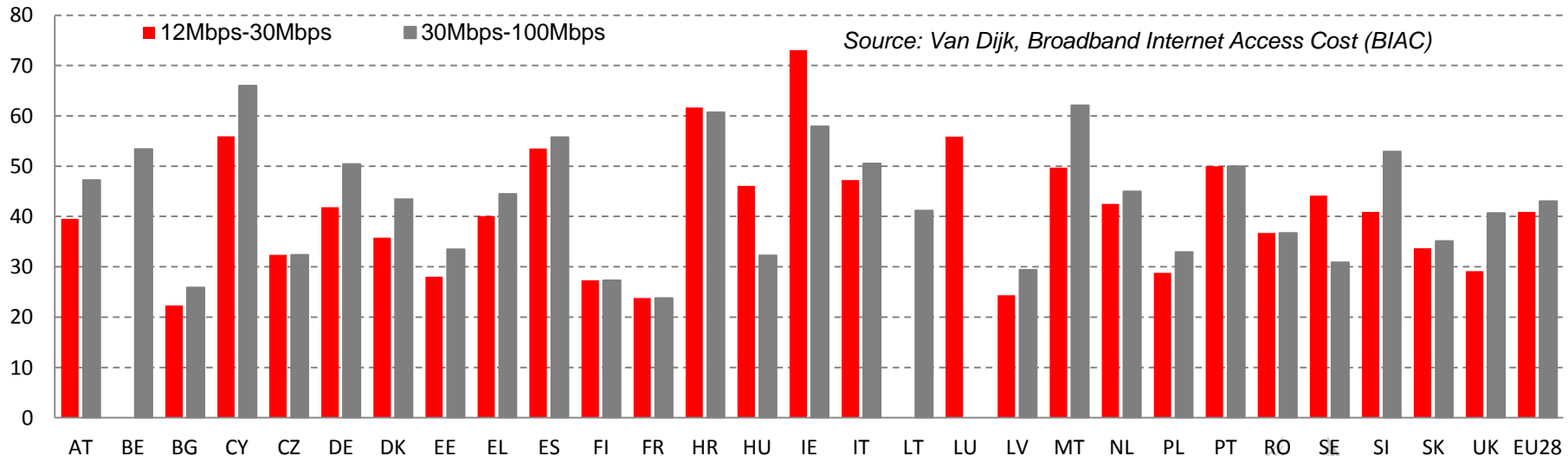
Prices of triple play bundles including broadband access, fixed telephony and television went down considerably since 2009.

The minimum prices of triple play bundles including broadband access (with a download speed between 30 and 100 Mbps), fixed telephony and television vary between €24 and €66 in the EU. The minimum price was the lowest in France (€24), Bulgaria (€26) and Finland (€27) and the highest in Cyprus (€66), Malta (€62) and Croatia (€61). Prices decrease over time, with the minimum going down from €76 in 2009 to €45 in 2014. High-speed triple play offers have very low price premium over 12-30Mbps services.

Broadband retail prices (EUR PPP) – Bundles including broadband, fixed telephony and television, 2009-2015



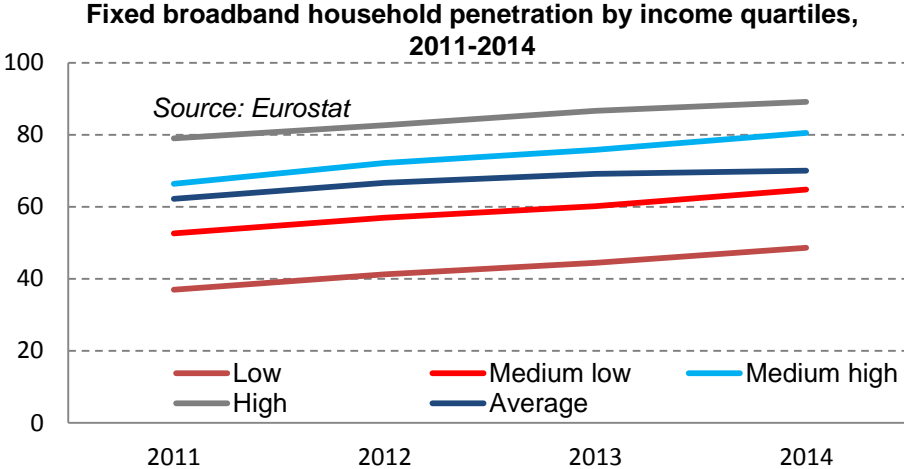
Fixed broadband retail prices (EUR PPP) - Bundles including broadband, fixed telephony and television, 2015



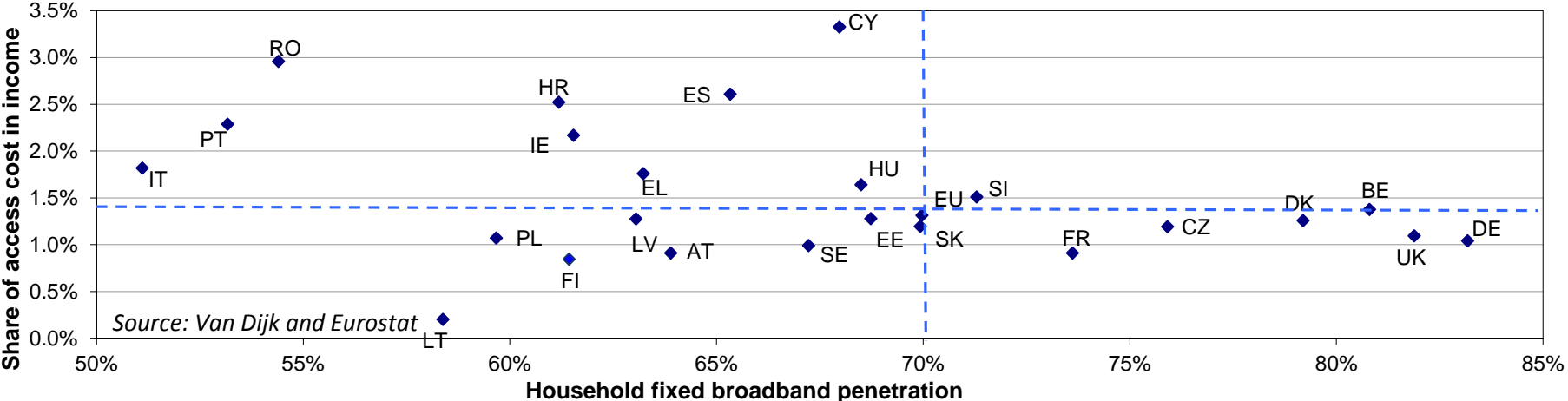
Broadband take-up tends to be lower in countries where the cost of broadband access accounts for a higher share of income, but the correlation is not strong.

The correlation between fixed broadband take-up and the relative price of broadband access is negative (-51%), so broadband take-up tends to be lower in countries where the cost of broadband access represents a higher share of the income.

Only 49% of homes in the lowest income quartile have a fixed broadband subscription as opposed to 89% in the highest income quartile, and the overall average of 70%.



Household fixed broadband penetration and share of broadband access cost (standalone offers, 12-30Mbps download) in disposable income



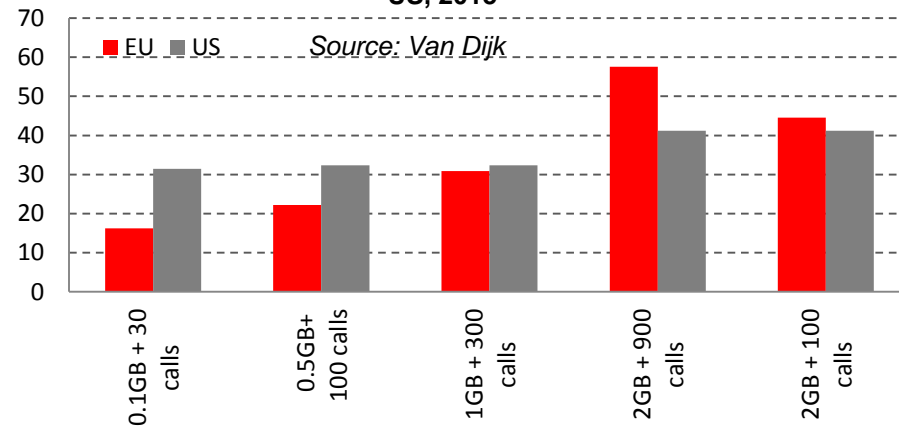
Prices of mobile voice+data plans vary greatly across Europe. In comparison with the US, the EU is cheaper for lower usage baskets, and more expensive for high-end packages.

Looking at the usage basket of 300 voice calls and 1GB data usage on handset, minimum prices range between €13 and €73 with an EU average of €31.

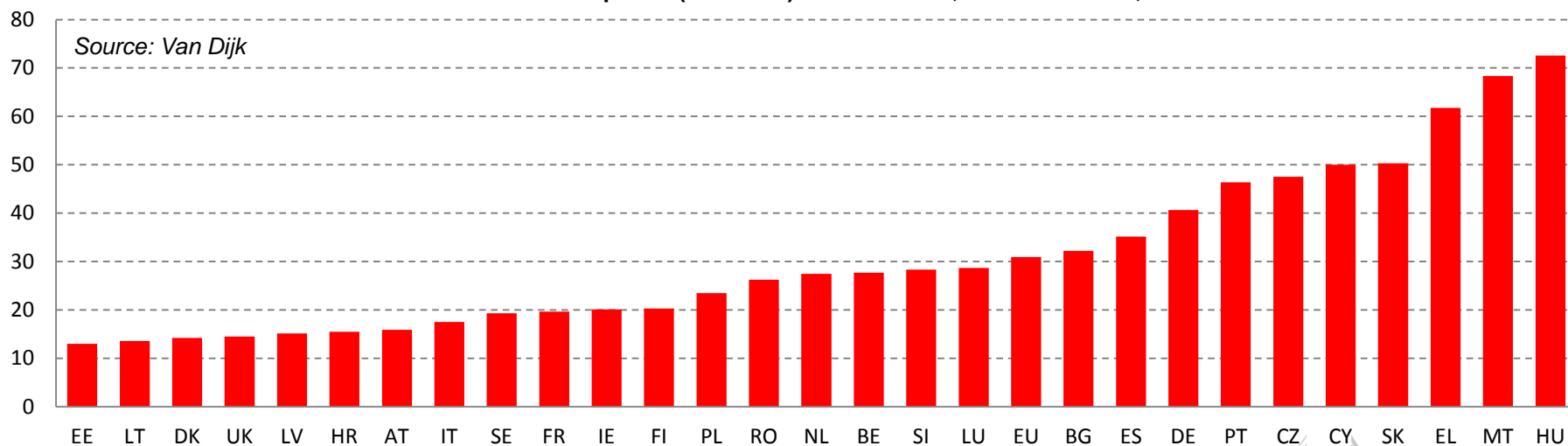
The cheapest countries are Estonia, Lithuania, Denmark and the UK with minimum prices below €15. At the same time, prices are very high (>€60) in Hungary, Malta and Greece.

The EU on average has much lower prices than the US for the 0.1GB+30 calls and the 0.5GB+100 calls baskets, however, on the 2GB+900 calls basket, the US is by close to 30% cheaper than the EU.

Mobile broadband prices (EUR PPP) - handset use in the EU and the US, 2015



Mobile broadband prices (EUR PPP) - handset use, 1GB + 300 calls, 2015



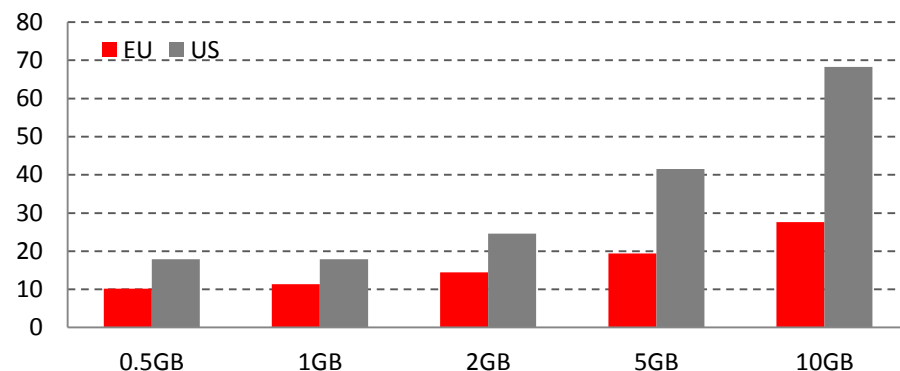
Prices of mobile broadband plans for laptops also show large differences across Europe. In comparison with the US, the EU is cheaper for all usage baskets.

Looking at 5GB data-only plans for laptops, minimum prices range between €10 and €46. The EU average (€19) is below the price of fixed standalone offers of 12-30Mbps.

The cheapest countries are Austria, Italy, Finland, Denmark and Poland with prices below €12. At the same time, prices are very high (>€30) in Cyprus, Spain, Czech Republic and Croatia.

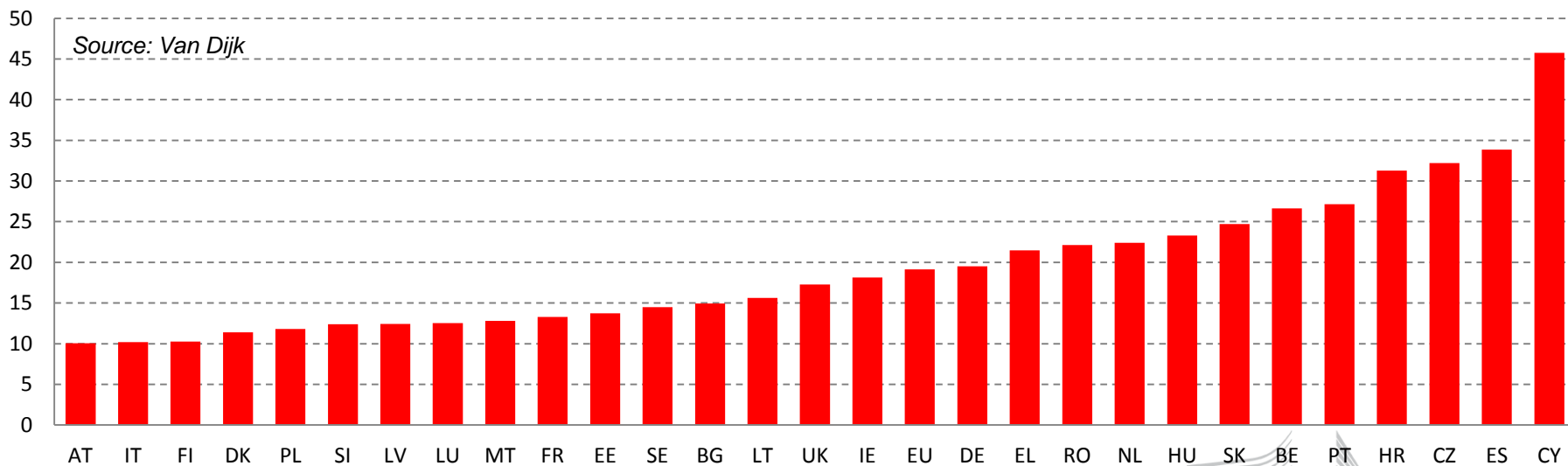
The EU on average has much lower prices than the US for all the laptop baskets.

Mobile broadband prices (EUR PPP) - laptop use in the EU and the US,



Source: Van Dijk

Mobile broadband prices (EUR PPP) - laptop use, 5GB, 2015



Source: Van Dijk

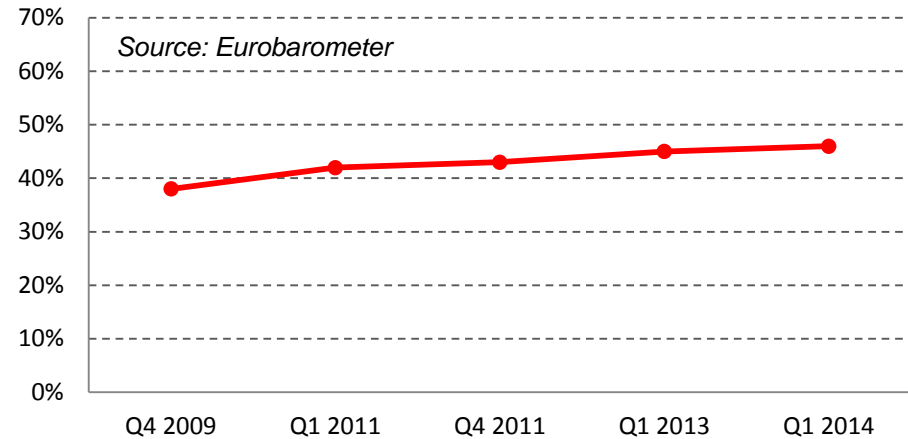
Almost half of all EU households subscribed to bundled communications services (46%) in 2014. 91% of internet access is purchased as part of a bundle. Fixed telephony+internet is the most popular service bundle.

Almost half of all EU households purchase bundled communications services (46%), up from 38% five years ago.

Internet access is the most popular product in service bundles. In 2014, 91% in internet access products were sold as part of a bundled package.

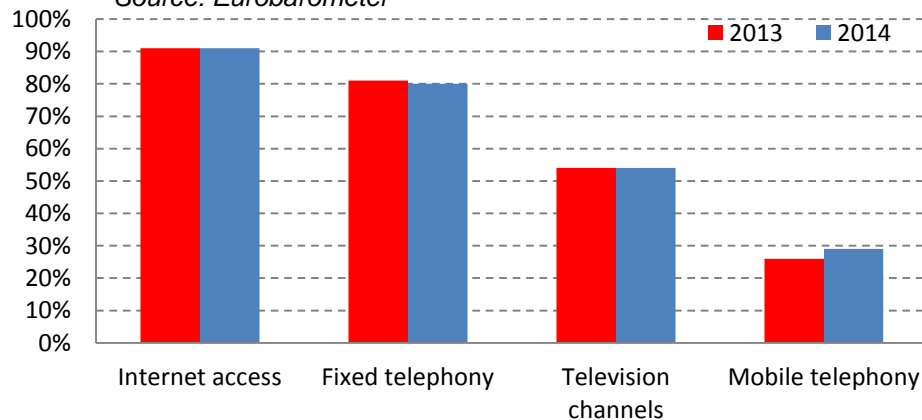
The most popular bundle is Fixed telephony + Internet followed by the triple play Fixed telephony + Internet + TV.

Households subscribing to bundled services, 2009 - 2014



Percentage of services purchased as part of a bundle at EU level, 2013-2014

Source: Eurobarometer



Popularity of different bundles (% homes with subscriptions), 2014

