Connectivity
Broadband market developments in the EU

Digital Economy and Society Index Report 2018
Connectivity

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the progress of EU Member States in digital competitiveness.
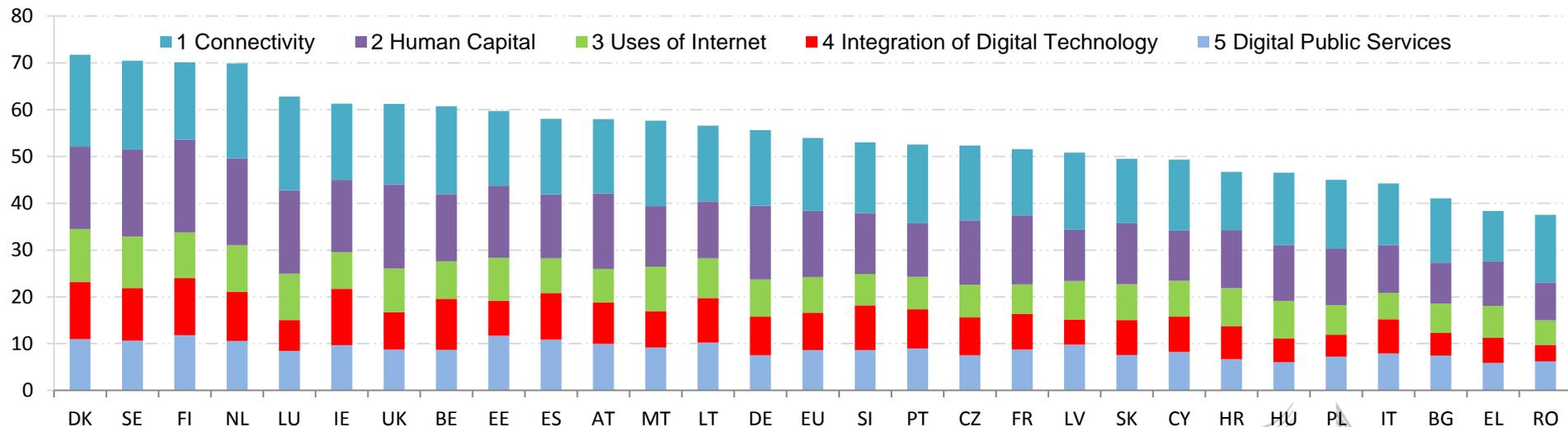
Denmark, Sweden, Finland and the Netherlands have the most advanced digital economies in the EU followed by Luxembourg, Ireland, the UK and Belgium.

Romania, Greece, Bulgaria and Italy have the lowest scores on the index.

The five dimensions of the DESI

1 Connectivity	Fixed Broadband, Mobile Broadband, Fast and Ultrafast Broadband and Prices
2 Human Capital	Basic Skills and Internet Use, Advanced skills and Development
3 Use of Internet Services	Citizens' use of Content, Communication and Online Transactions
4 Integration of Digital Technology	Business Digitisation and E-commerce
5 Digital Public Services	eGovernment and eHealth

Digital Economy and Society Index (DESI) 2018

■ 1 Connectivity ■ 2 Human Capital ■ 3 Uses of Internet ■ 4 Integration of Digital Technology ■ 5 Digital Public Services

Source: DESI 2018, European Commission

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European Commission

For Connectivity, the highest score was registered by the Netherlands followed by Luxembourg, Denmark and Sweden. Greece, Croatia and Italy had the weakest performance in this dimension of the DESI.

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, fast (Next Generation Access – NGA providing at least 30 Mbps) and ultrafast (at least 100 Mbps) broadband and also considers the prices of retail offers. On mobile broadband, the availability of 4G and the take-up of mobile broadband are included. Digital Connectivity is considered as a social right in the EU*.

A comparative assessment of fixed broadband (basic, fast and ultrafast) shows the Netherlands, Belgium, Luxembourg, Malta and Denmark, as the strongest performers. In contrast, Greece, Poland, Italy and Croatia are shown to be among the weakest performers.
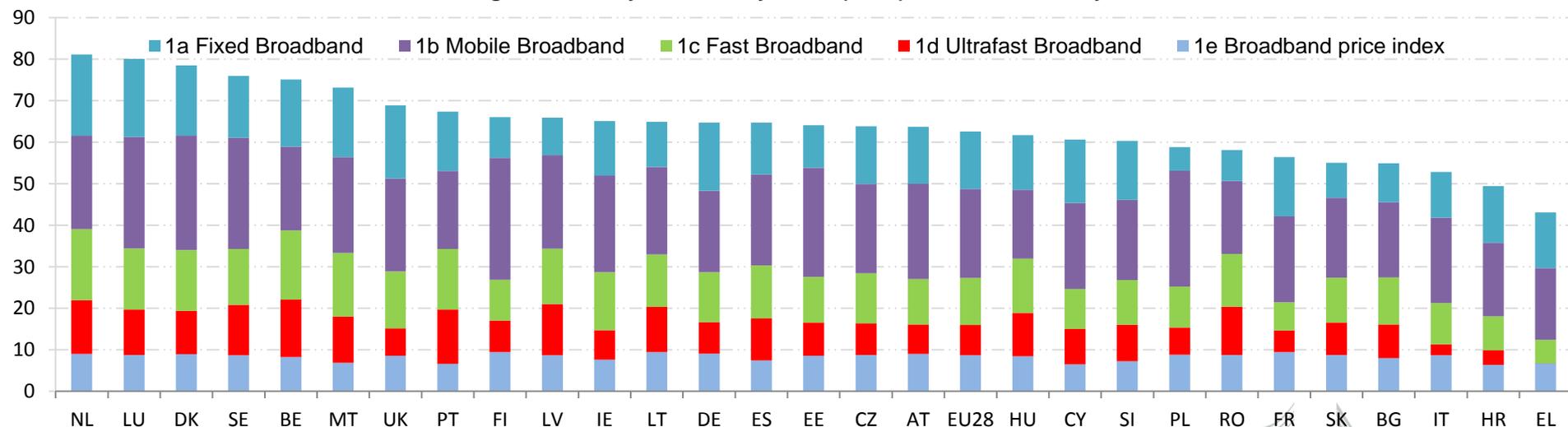
As for mobile broadband, the Nordic countries (Finland, Sweden and Denmark) lead Europe along with Latvia and Poland, while the lowest scores were registered by Hungary, Greece and Romania.

* https://composite-indicators.jrc.ec.europa.eu/social-scoreboard/

Connectivity indicators in DESI 2018	EU
1a1 Fixed Broadband Coverage	**97%**
% households	2017
1a2 Fixed Broadband Take-up	**75%**
% households	2017
1b1 4G Coverage	**91%**
% households (average of operators)	2017
1b2 Mobile Broadband Take-up	**90**
Subscriptions per 100 people	2017
1c1 Fast Broadband (NGA) Coverage	**80%**
% households covered by VDSL, FTTP or Docsis 3.0	2017
1c2 Fast Broadband Take-up	**33%**
% homes subscribing to >= 30Mbps	2017
1d1 Ultrafast Broadband Coverage	**58%**
% households covered by FTTP or Docsis 3.0	2017
1d2 Ultrafast Broadband Take-up	**15.4%**
% homes subscribing to >= 100Mbps	2017
1e1 Broadband Price Index	**87**
Score (0 to 100)	2017

Digital Economy and Society Index (DESI) 2018, Connectivity

Legend: ■ 1a Fixed Broadband ■ 1b Mobile Broadband ■ 1c Fast Broadband ■ 1d Ultrafast Broadband ■ 1e Broadband price index

Source: DESI 2018, European Commission

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Total telecom services revenues have slightly declined (by 3.1 %) in Europe since 2014. **Mobile and fixed voice revenues** have decreased by 16 % since 2014. An increase in **mobile data and internet services** was not enough to offset the major decline in voice services.

Telecom operators in Europe generated less revenue than the US operators. Revenues went slightly down from EUR 220 billion in 2014 to EUR 213 billion in 2017 in Europe. At the same time, the US revenues also slightly increased from EUR 297 billion to EUR 310 billion, despite its smaller population.

China increased its revenues by 23.3 %, from EUR 149 billion in 2014 to EUR 179 billion in 2017.

Note: this analysis is based on detailed figures from 26 Member States, which covered about 98% of the total EU market (total telecom carrier services).

**Total Telecommunication revenues per region, billion €, 2014-2018**
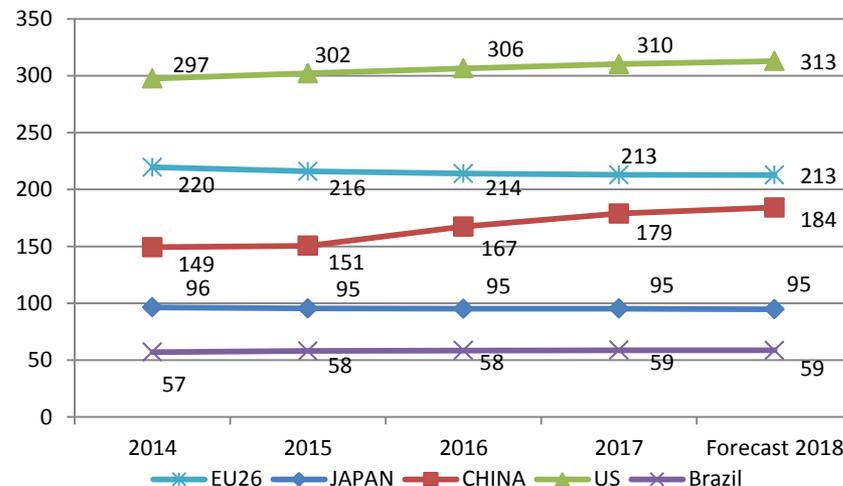
The analysis of telecommunications revenues (carrier services) by segment shows a decline in voice services (both fixed and mobile) revenues. Fixed voice service revenues have fallen by 11.6 % since 2014, compared to 20.4 % for mobile services over the same period (2014 – 2017). Together, fixed and mobile voice services represented 44 % of total telecom revenues in 2017, compared with 51 % in 2014.

Mobile data services represented 27 % of total revenues in 2017, up from 24 % in 2014. The growth in mobile data services could not, however, compensate for the major decline in voice services and overall revenues fall by 3 %.

*Note: This analysis is based on detailed figures from 26 Member States, which covered about 98% of the total EU market (total telecom carrier services).Data is not available for Malta and Cyprus.

Source: 2017 - 2018 European IT Observatory (EITO) in collaboration with IDC.

Telecom services revenues by segment, EU 26*, % of total, 2014 - 2018

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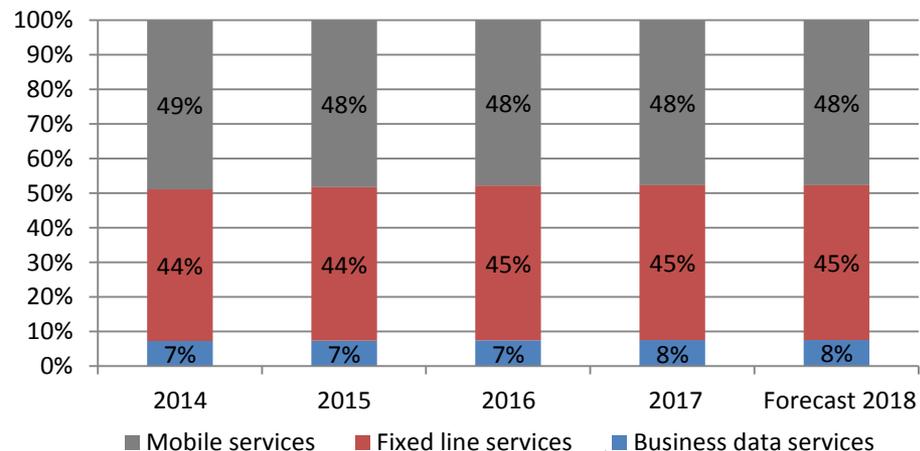
Broadband coverage: Fast Broadband (Next generation access - NGA) covers 80 % of homes, up from 76 % a year ago, while Ultrafast Broadband (Fibre to the Premises and Docsis 3.0 cable) is available in 58 %. 4G mobile is almost universal at 98%. Rural coverage improved substantially in 4G and NGA technologies.

Basic broadband is available to all homes in the EU, when considering all major technologies (xDSL, cable, fibre to the premises - FTTP, WiMax, HSPA, LTE and satellite). Fixed and fixed-wireless technologies cover 97 % of EU homes.

Coverage of NGA technologies (VDSL, Cable Docsis 3.0 and FTTP) capable of delivering at least 30 Mbps download reached 80 %, thanks to an increase of 5 percentage points in VDSL and 3 percentage points in FTTP last year.

Rural areas remain challenging, as 8% of homes are not covered by any fixed network, and 53% are not covered by any NGA technology.
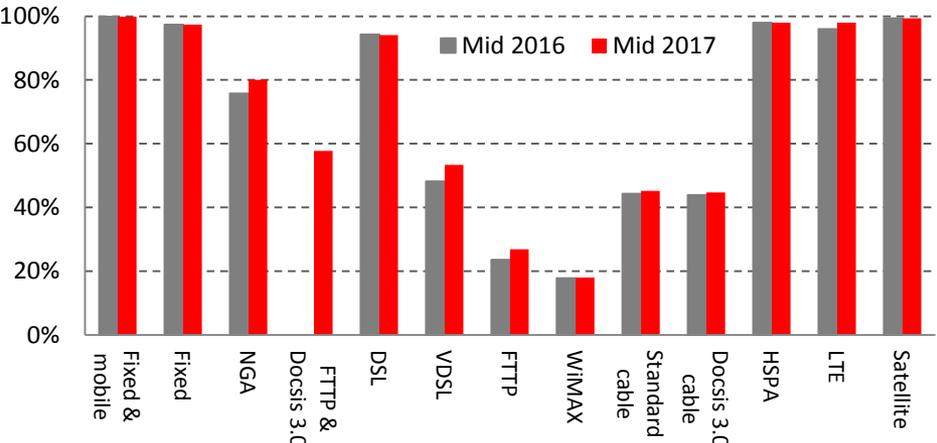
Our Target under the Digital Agenda for Europe

Basic broadband for all by 2013: 100 % in 2017
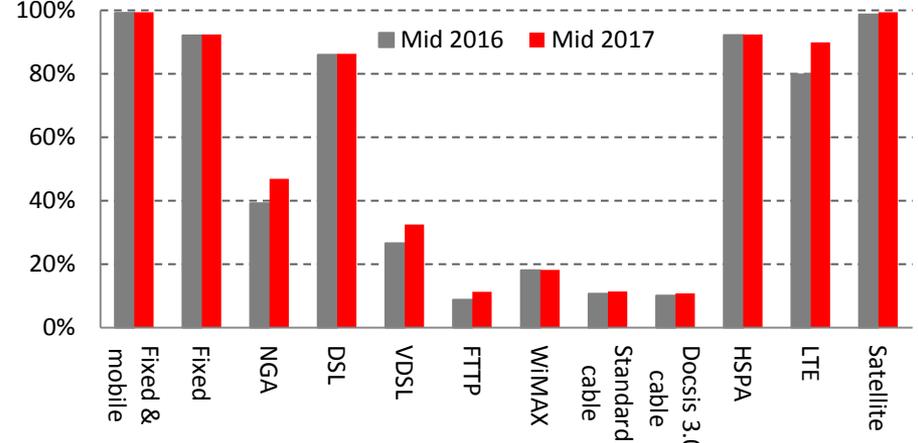**Fast broadband (>30Mbps) for all by 2020: 80 % in 2017**

Total coverage by technology at EU level, 2016-2017

Source: IHS and Point Topic


Rural coverage by technology at EU level, 2016-2017
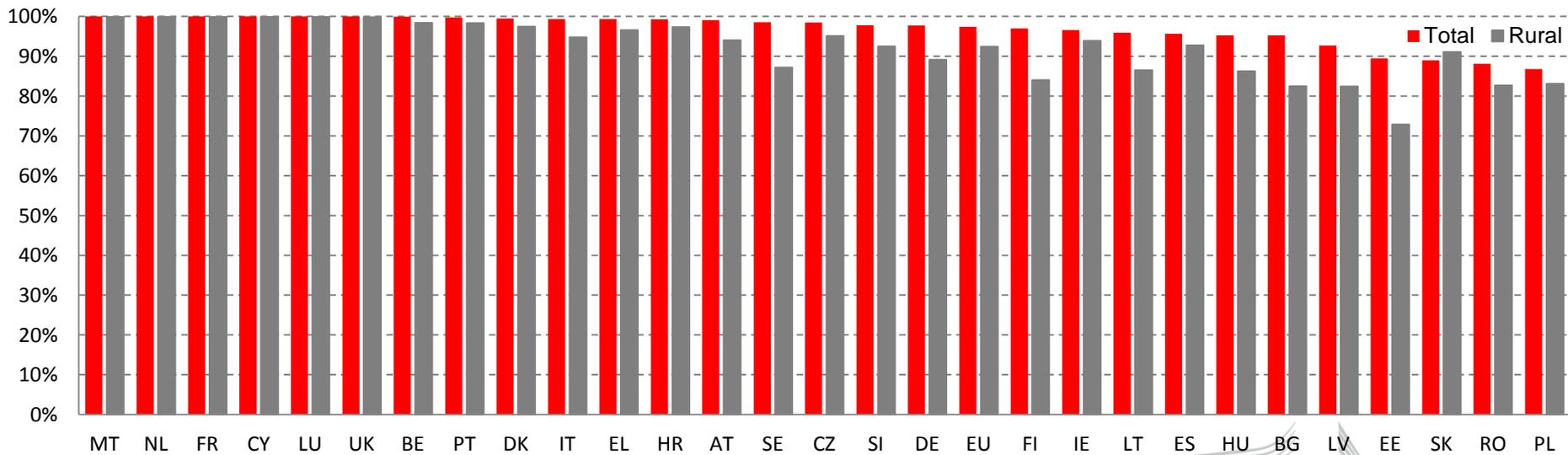
Source: IHS and Point Topic

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

Primary internet access at home is provided mainly by fixed technologies. Among these technologies, xDSL has the largest footprint (94 %) followed by cable (45 %) and WiMAX (18 %). 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 12 percentage points. Developments have slowed down, as Member States have diverted their focus to NGA and wireless technologies.

Fixed broadband coverage in the EU, 2011-2017

Source: IHS, VVA and Point Topic
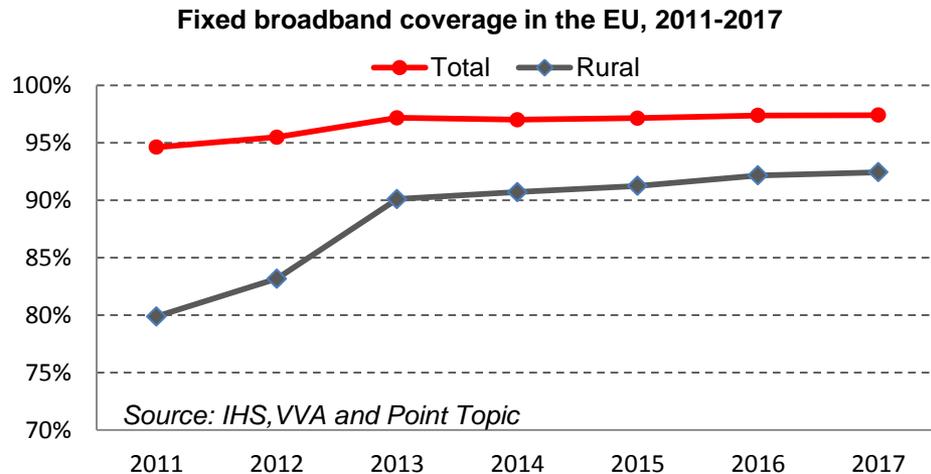
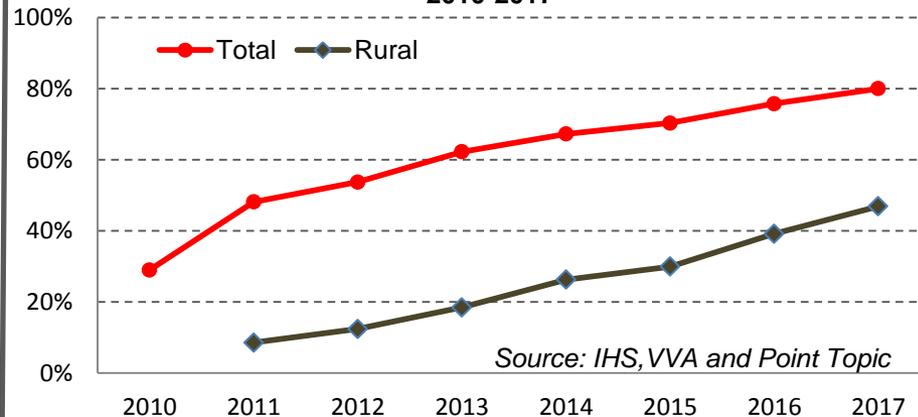**Fixed broadband coverage, June 2017**

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Coverage of Next Generation Access (NGA) technologies continued to increase and reached 80 %. NGA improved significantly in rural areas, from 39 % to 47 % of homes compared to last year.

At mid-2017, VDSL had the largest NGA coverage at 53 %, followed by cable (45 %) and FTTP (27 %). While cable coverage only marginally increased last year, VDSL went up by 5 percentage points. There was progress also in FTTP (from 24 % in 2016 to 27 % in 2016), but FTTP coverage is still low.

Rural NGA is still far behind national coverage.

Next Generation Access (NGA) broadband coverage in the EU, 2010-2017

Source: IHS, VVA and Point Topic

Next Generation Access (FTTP, VDSL and Docsis 3.0 cable) coverage, June 2017

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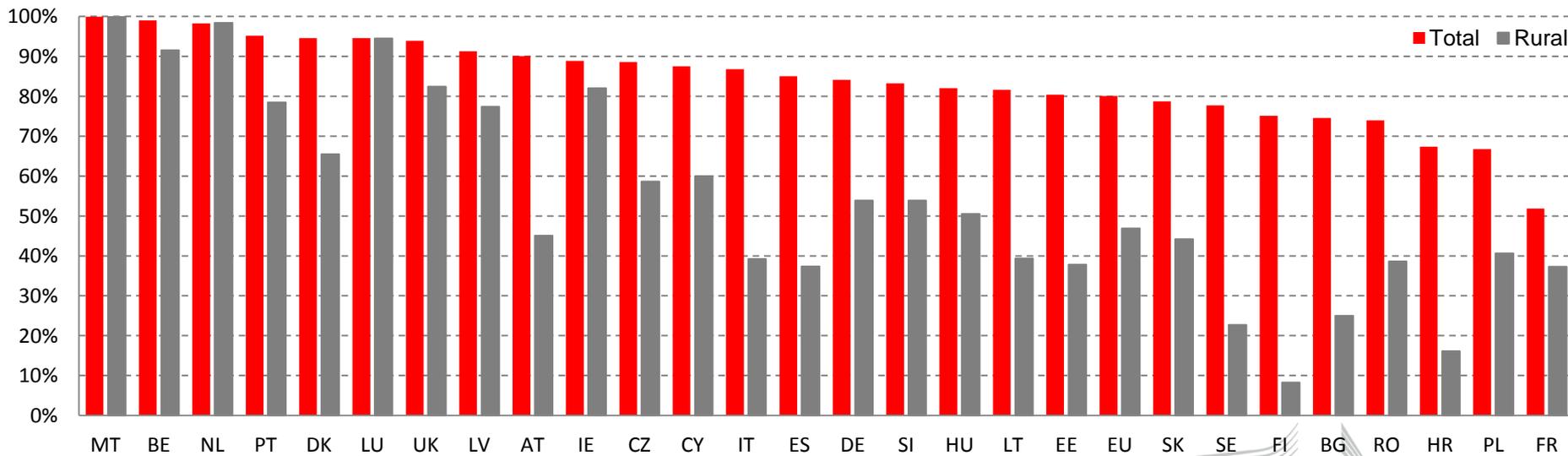
Ultrafast broadband (FTTP & Cable Docsis 3.0) is available in 57% of European homes. In Malta, the Netherlands, Belgium and Portugal more than 90% of homes have access, while in Greece such networks do not yet exist.

The Digital Agenda for Europe set a target that by 2020 at least 50 % of European homes should subscribe to ultrafast broadband of at least 100 Mbps. A precondition to achieving this target is the wide availability of ultrafast broadband networks.

Currently, FTTP and Docsis 3.0 cable networks are capable of delivering ultrafast connectivity. Cable covers 45 %, while FTTP covers 27 % of homes. Cable and FTTP networks overlap, and mainly cover urban areas. 57 % of homes have access to at least one of the ultrafast technologies.

Looking at the Member States, the top three countries (Malta, the Netherlands and Belgium) provide ultrafast connectivity mainly through cable, while in Portugal and Latvia (the next two countries in the ranking) FTTP is the more widespread ultrafast technology. At the bottom of the list, Greece has neither FTTP nor cable, while Italy purely has FTTP available in some cities.

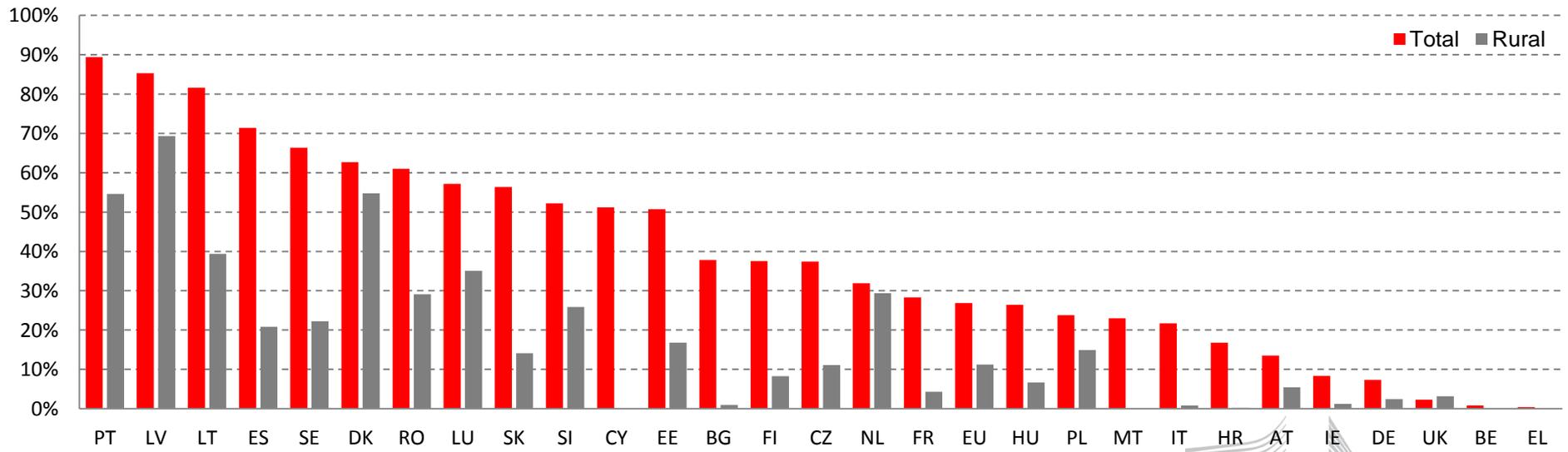**Ultrafast (FTTP and Cable Docsis 3.0) coverage, June 2017**

Source: IHS and Point Topic

European Commission
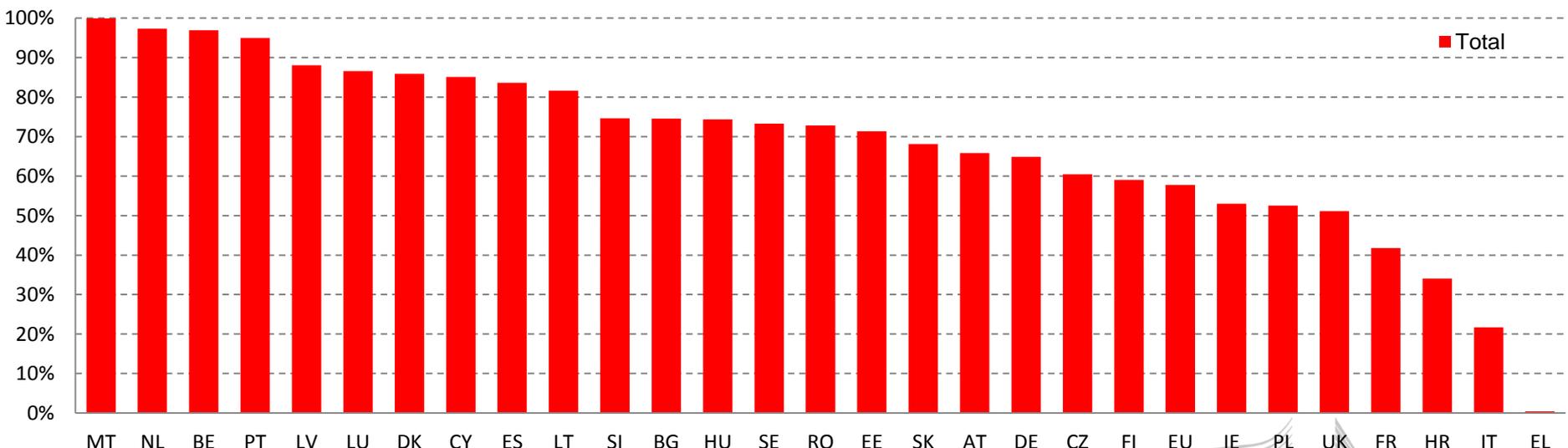
Coverage of Fibre to the Premises (FTTP) grew from 10 % in 2011 to 27 % in 2017, although it remains a primarily urban technology. Portugal, Latvia, Lithuania and Spain are the leaders in FTTP in Europe.

FTTP is catching up in Europe, as coverage of homes has more than doubled since 2011. However, the FTTP footprint is still significantly lower than that of cable Docsis 3.0 and VDSL. In Portugal, Latvia, Lithuania and Spain more than 70 % of homes can already subscribe to FTTP services, while in Greece, Belgium, the UK, Germany and Ireland less than 10 % can do so. FTTP increased the most in Spain (8.6 percentage points) and France (7.5 percentage points). FTTP services are available mainly in urban areas with the exception of Portugal, Latvia and Denmark, where more than 50 % of rural homes also have access to it.

Fibre to the Premises (FTTP) coverage in the EU, 2011-2017
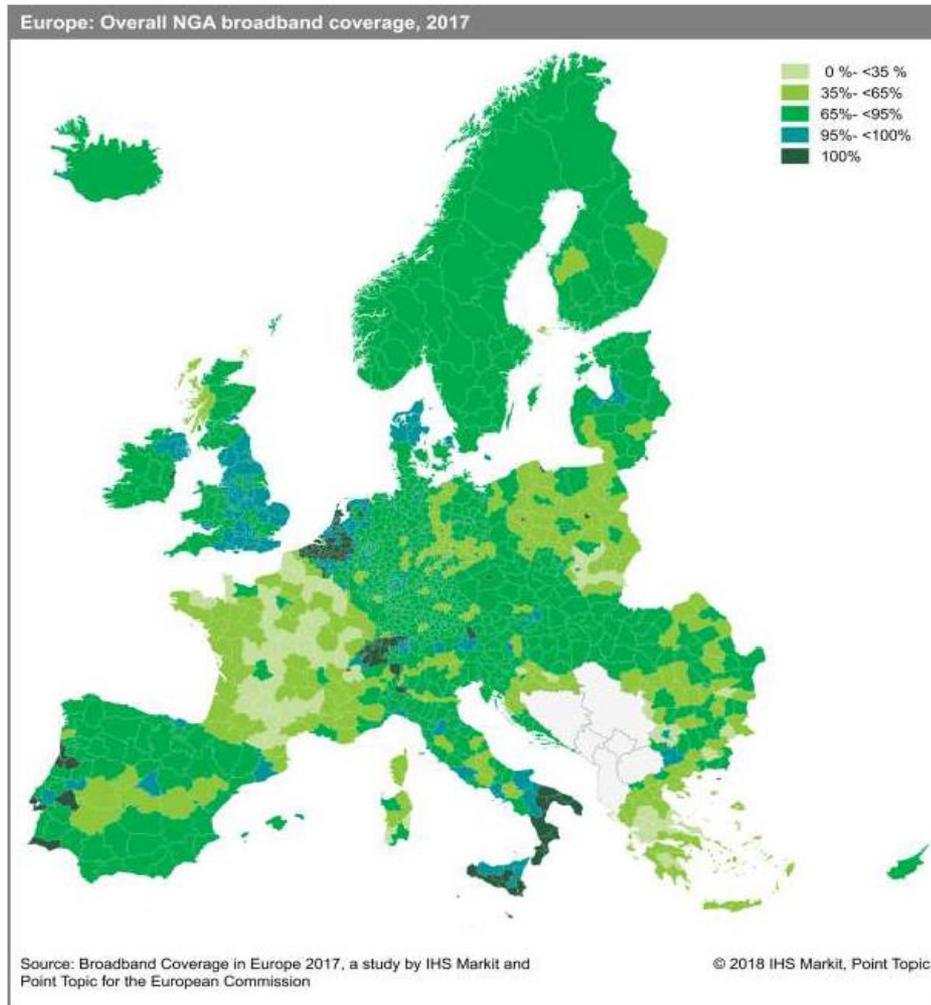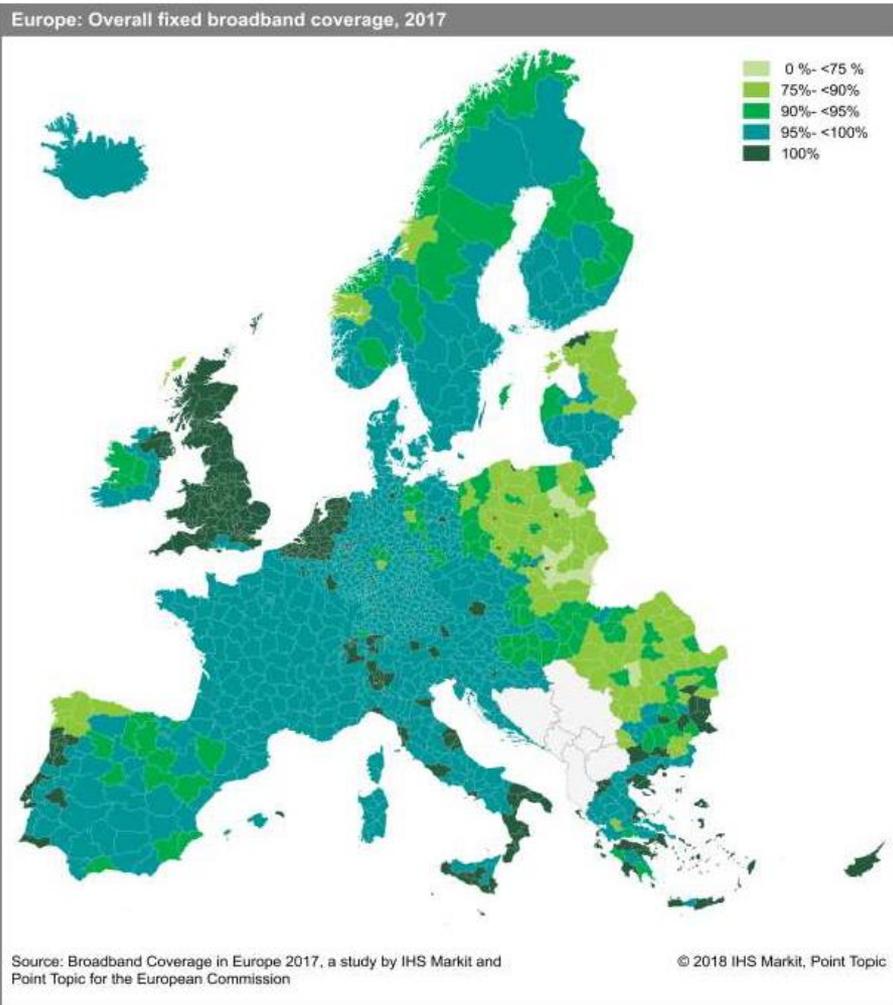

Source: IHS, VVA and Point Topic
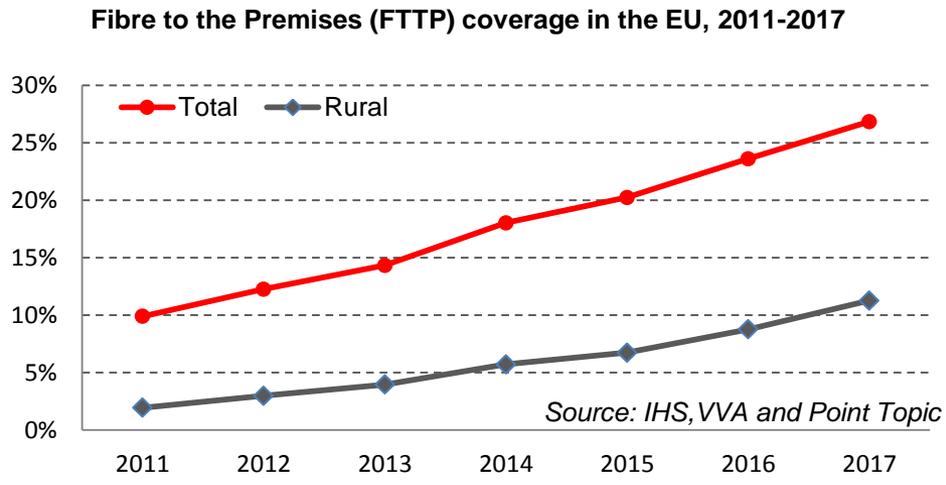
Fibre to the Premises (FTTP) coverage, June 2017


Source: IHS and Point Topic

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Overall fixed broadband and NGA broadband coverage by region.

4G mobile coverage: 98 % of homes are covered by at least one operator in Europe (overall coverage). Rural coverage went up from 38 % in 2015 to 90 % in 2016. Average 4G availability* stands at 91 %, up from 86 % a year ago.

4G (LTE) is now as widely available as advanced 3G (HSPA) and fixed broadband. 4G expanded mainly in Romania (by 18 percentage points) and Bulgaria (by 15 percentage points) last year.

Average 4G availability (calculated as the average of each operator's coverage) is somewhat below the overall coverage and stands at 91 %.

4G mobile coverage in the EU, 2011-2017

Source: IHS,VVA and Point Topic

4G coverage, June 2017

Source: IHS and Point Topic
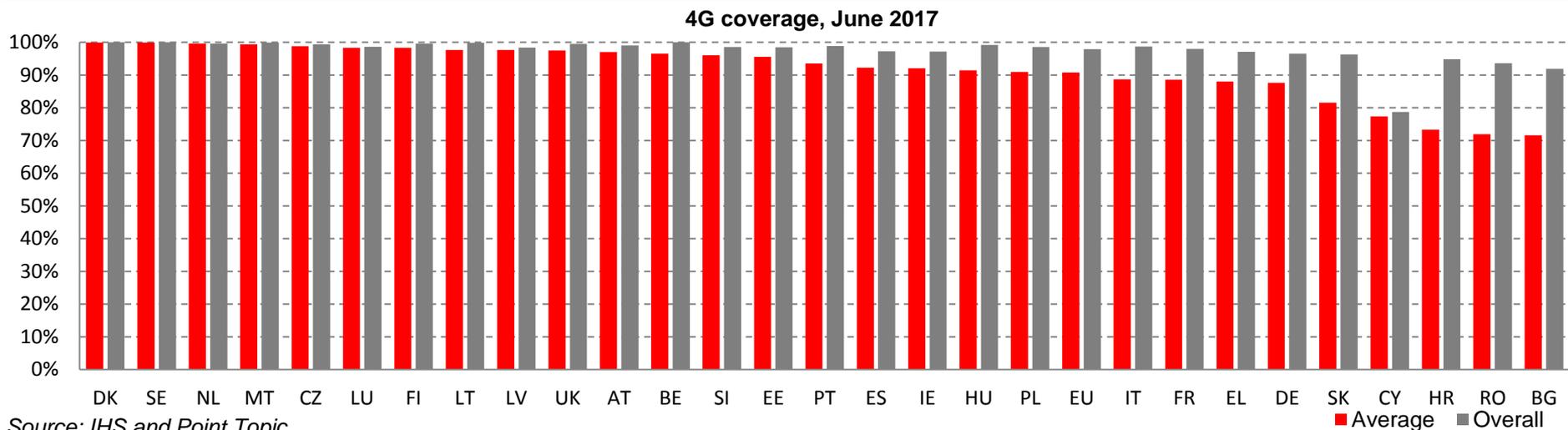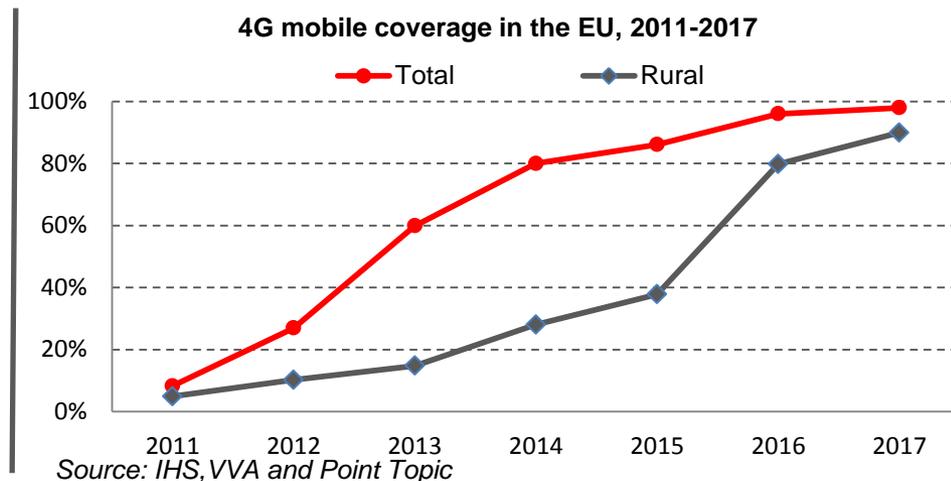
Average   Overall

This indicator measures the average of mobile telecom operators' coverage within each country.
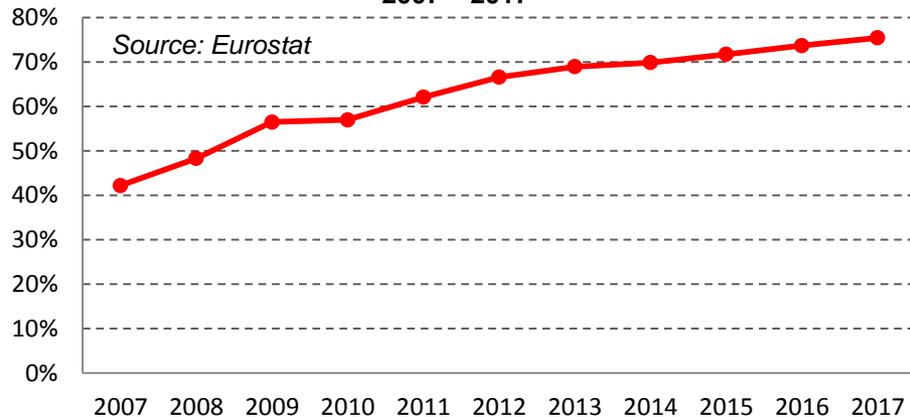
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75 % of EU homes had a **fixed broadband subscription** in 2017. The Netherlands, Luxembourg, Germany and the UK registered the highest figures in the EU, while Italy, Finland and Bulgaria had the lowest take-up rates.

Although fixed broadband is available to 97 % of EU homes, 25 % of homes do not have a subscription. Growth in take-up was very strong until 2009, but has slowed down in the last few years, partially due to fixed-mobile substitution.

At Member State level, take-up rates ranged from only 57 % in Italy and Finland to 98 % in the Netherlands.

* Note: Penetration figures include also mobile subscriptions until 2009.

Households with a fixed broadband subscription (% of households), 2007 – 2017*

Source: Eurostat

Households with a fixed broadband subscription (% of households), 2017

Source: Eurostat

European Commission
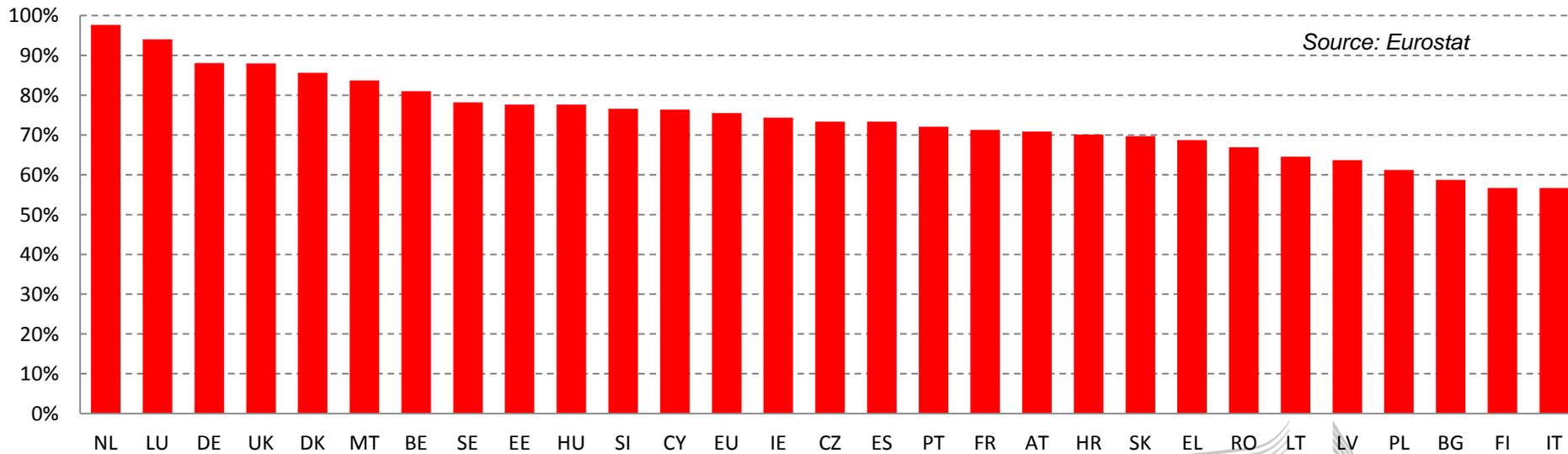
68 % of rural homes in the EU had a fixed broadband subscription in 2017. The Netherlands, Luxembourg, the UK and Germany registered the highest figures, while in Bulgaria and Finland, less than half of rural homes subscribed.

There is a substantial gap between rural and national penetration rates. This gap, however, slightly decreased from 10 percentage points in 2011 to 7 percentage points in 2017.

In the Netherlands, Germany, the UK, Belgium, Austria and Sweden, rural and national penetration rates are identical or almost identical. However, in Finland, Bulgaria, Portugal, Romania and Greece, where fixed rural take-up is among the lowest in Europe, there are significant gaps of 15-18 percentage points compared to the national take-up.

Households having a fixed broadband connection per degree of urbanisation at EU level (% of households), 2011 - 2017
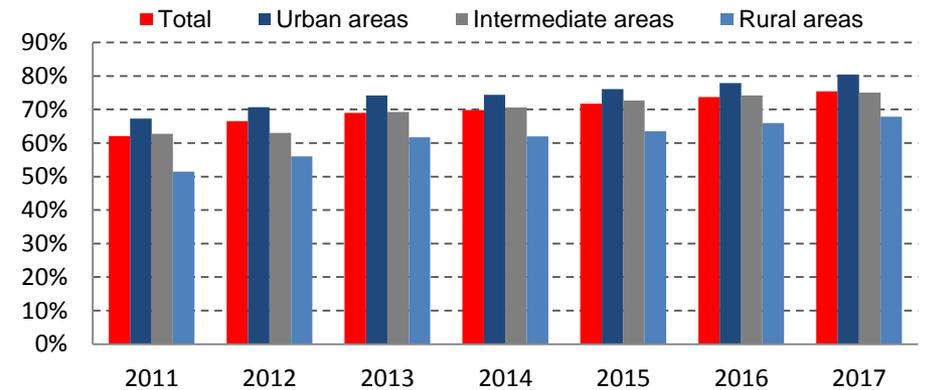
Source: Eurostat

Household penetration rural vs total (% of households), 2017

Source: Eurostat

European Commission
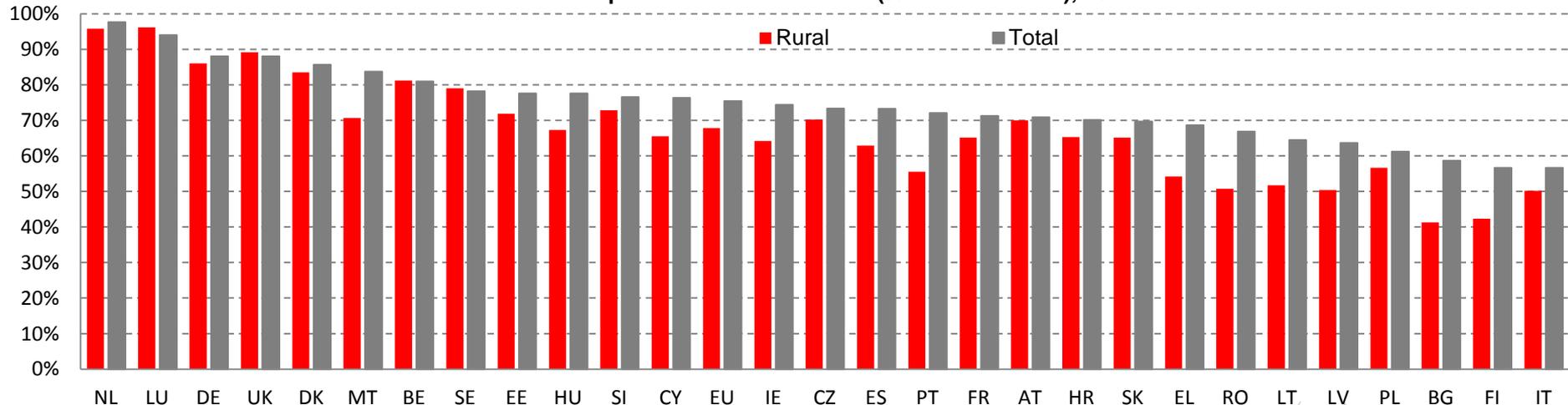
One third of European homes subscribe to fast broadband access of at least 30 Mbps. There has been a significant increase since 2010. The Netherlands and Belgium are the leaders in Europe in fast broadband take-up.

There has been a sharp upward trend in the take-up of fast broadband in the EU since 2010, triggered also by continuous deployment of infrastructure. Most cable subscriptions were migrated to high-speed plans, and high-speed VDSL and fibre services are also catching up. In the Netherlands and Belgium more than two thirds of homes already subscribe to fast broadband, while in Greece, Cyprus and Italy, take-up still remains marginal.

Households with a fast broadband (at least 30Mbps) subscription (% of households), 2010 - 2017

Source: Communications Committee and Eurostat

Fast broadband (at least 30Mbps) household penetration (% of households), July 2017

Source: Communications Committee and Eurostat

European Commission
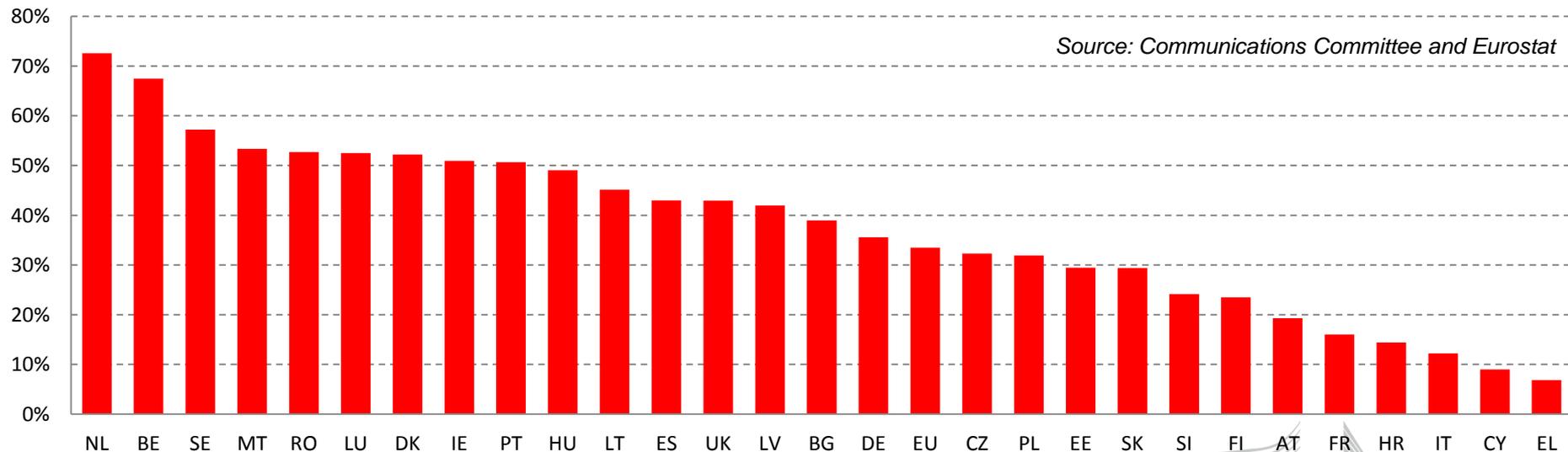
15 % of European homes currently subscribe to ultrafast broadband (at least 100 Mbps), a marked improvement from 0.3 % 7 years ago. Sweden, Romania, Belgium, Portugal and Latvia are the most advanced in ultrafast broadband adoption.

The Digital Agenda for Europe set the objective that at least 50 % of homes should subscribe to ultrafast broadband by 2020. In June 2017, 58 % of homes were covered by networks capable of providing 100 Mbps. As service offers are emerging, take-up is growing sharply. The penetration is the highest in Sweden, Romania and Belgium with over 40% of homes subscribing to at least 100 Mbps. In Greece, Cyprus and Croatia take-up is very low.

Households with an ultrafast broadband (at least 100Mbps) subscription (% of households), 2010 - 2017
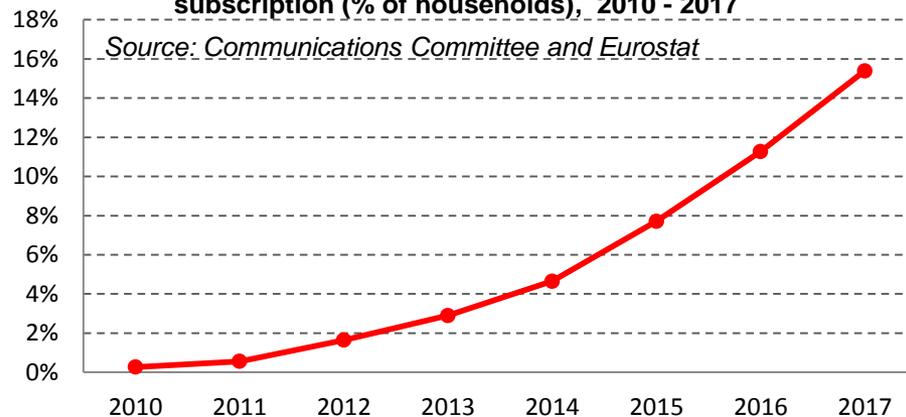
Source: Communications Committee and Eurostat

Ultrafast broadband (at least 100Mbps) household penetration (% of households), July 2017

Source: Communications Committee and Eurostat

European Commission
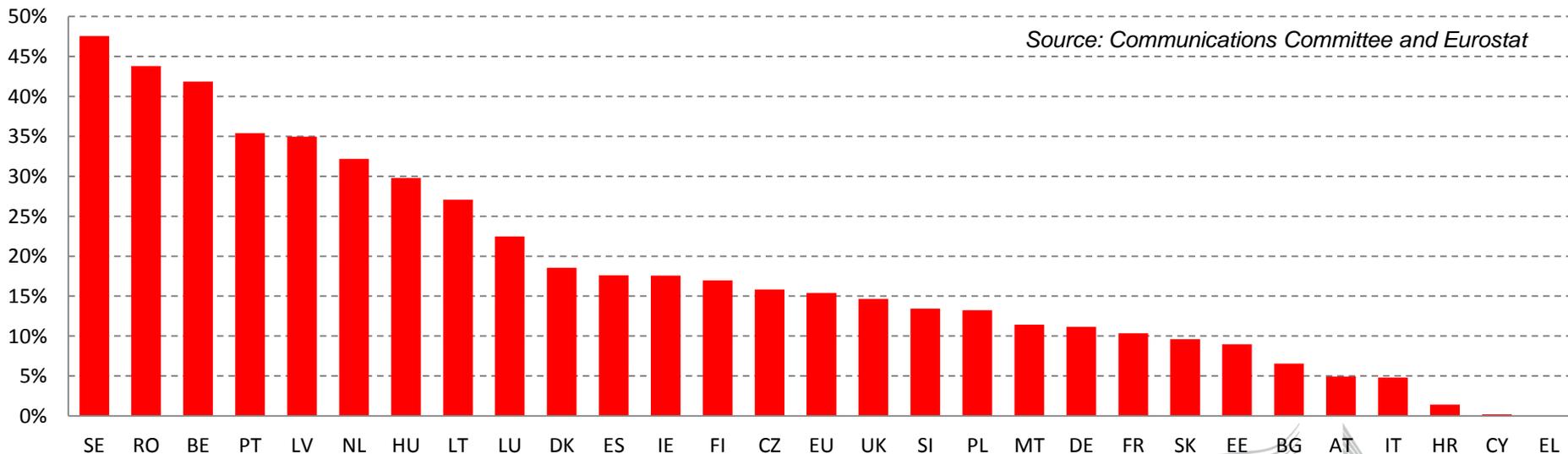
At EU level, 93 % of companies have a fixed broadband subscription. However, only 38 % have fast broadband (at least 30Mbps). While almost all large companies use broadband, 8 % of small enterprises are not yet connected.

While the vast majority of European businesses use broadband, only 38 % of companies and 33 % of private homes subscribed to fast broadband in 2017. The penetration of fast broadband varies greatly between companies of different size. While 69 % of large companies benefit from broadband speeds of at least 30 Mbps, only 35 % of small enterprises do so. The penetration of fast broadband went up from 24 % to 38 % among all enterprises in 4 years.

Enterprises having a fixed broadband connection at EU level, 2014-2017
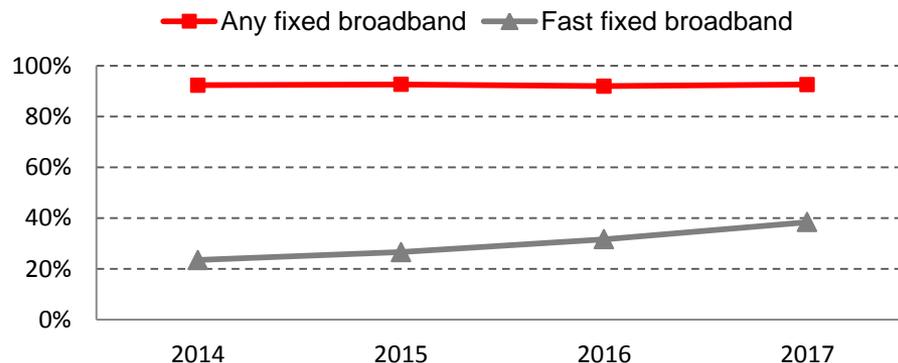
Source: Eurostat

Percentage of enterprises having any fixed broadband connection, by Enterprise size at EU level, 2014 - 2017
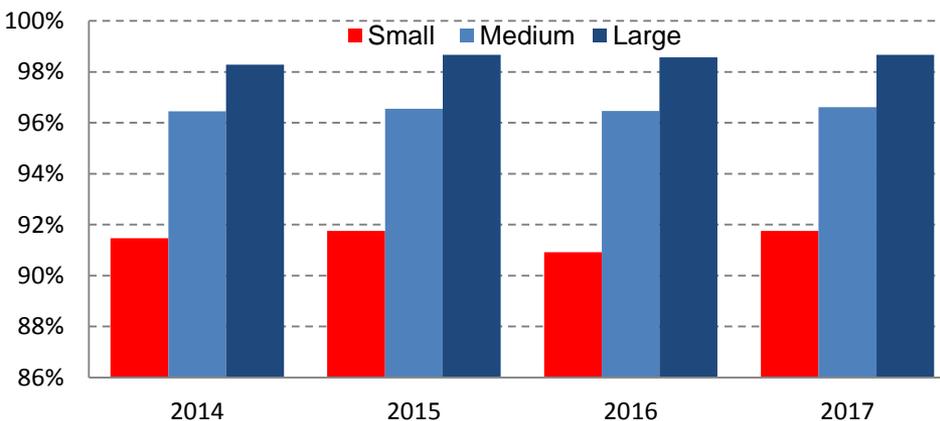
Source: Eurostat

Percentage of enterprises having a fast fixed broadband connection, by Enterprise size at EU level, 2014-2017

Source: Eurostat

European Commission
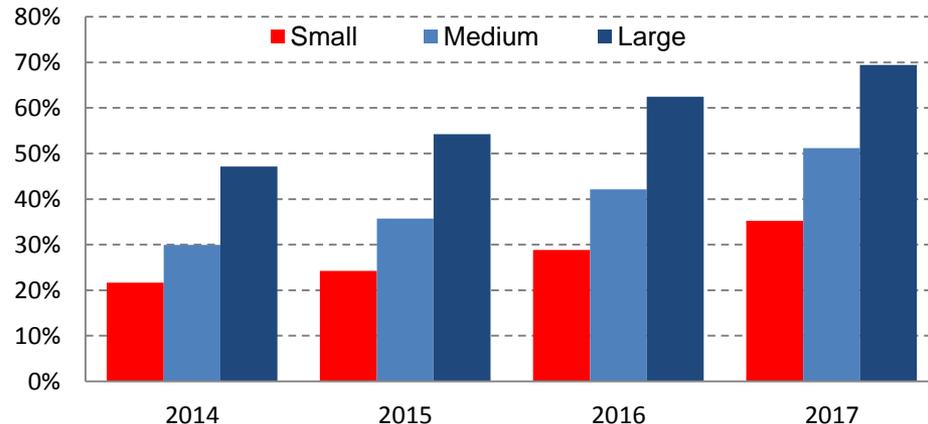
16 % of European enterprises consider that the speed of their fixed connection is not sufficient for the current needs of the company. Germany, France, Croatia and the UK are the countries where this perception is the highest. Bulgarian, Latvian, Bulgarian, Latvian and Estonian companies are the most satisfied with the speed of their broadband connection.

Satisfaction with broadband speeds vary greatly in the Member States. Those with the lowest satisfaction rates all have relatively low coverage of FTTP.

Large companies are generally better served than small ones. While only 11 % of large companies consider that their internet speed is not fast enough, this percentage increases to 16 % in small enterprises.

Enterprises that consider that speed of their fixed internet connection is not sufficient, by Enterprise size at EU level, 2017
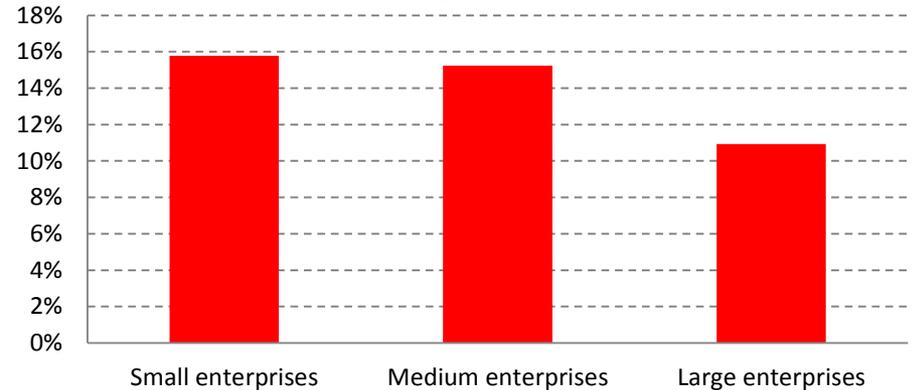
Source: Eurostat

Percentage of enterprises that consider that speed of their fixed internet connection is not sufficient, 2017

Source: Eurostat

European Commission
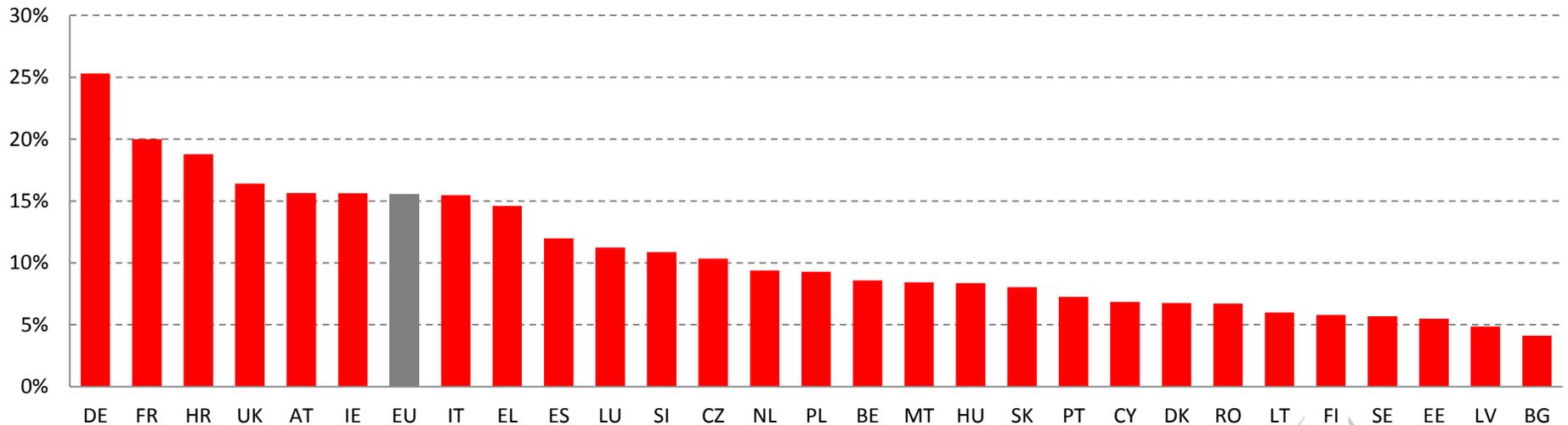
64 % of subscriptions are xDSL, although this technology is slightly losing market share. Cable is second with 19 % of the market. Fibre to the Home/Building (FTTH/B) is the fastest-growing technology.

Although DSL is still the most widely used fixed broadband technology, its market share declined from 80 % in 2009 to 64 % in 2016. In the last 18 months, the number of xDSL subscriptions declined despite the growth of VDSL. The main challenger — cable — increased its share slightly during the same time period, but most of the net adds were posted by FTTH/B during the last 3 years.

Nevertheless, DSL continues to be predominant, and its market share can still grow thanks to the increasing VDSL coverage.

Fixed broadband net adds by technology at EU level, 2006-2017
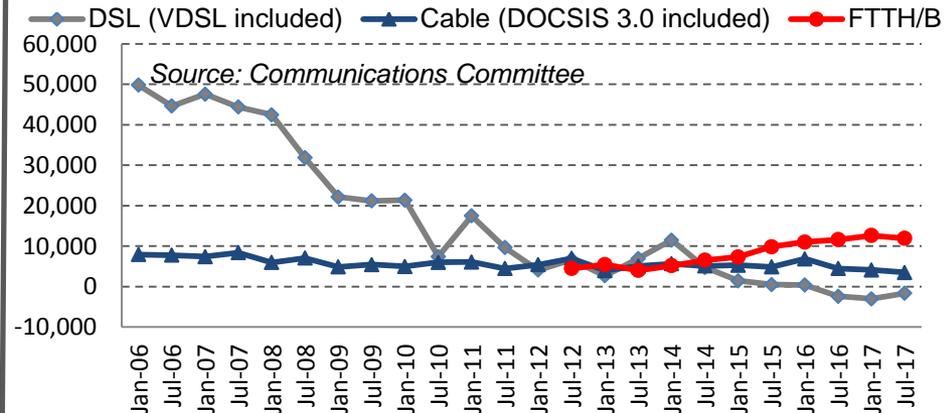
DSL (VDSL included) — Cable (DOCSIS 3.0 included) — FTTH/B

Source: Communications Committee

Fixed broadband subscriptions - technology market shares at EU level, January 2006 - July 2017

DSL (VDSL included) | Cable (DOCSIS 3.0 included) | FTTH/B | Other

Source: Communications Committee

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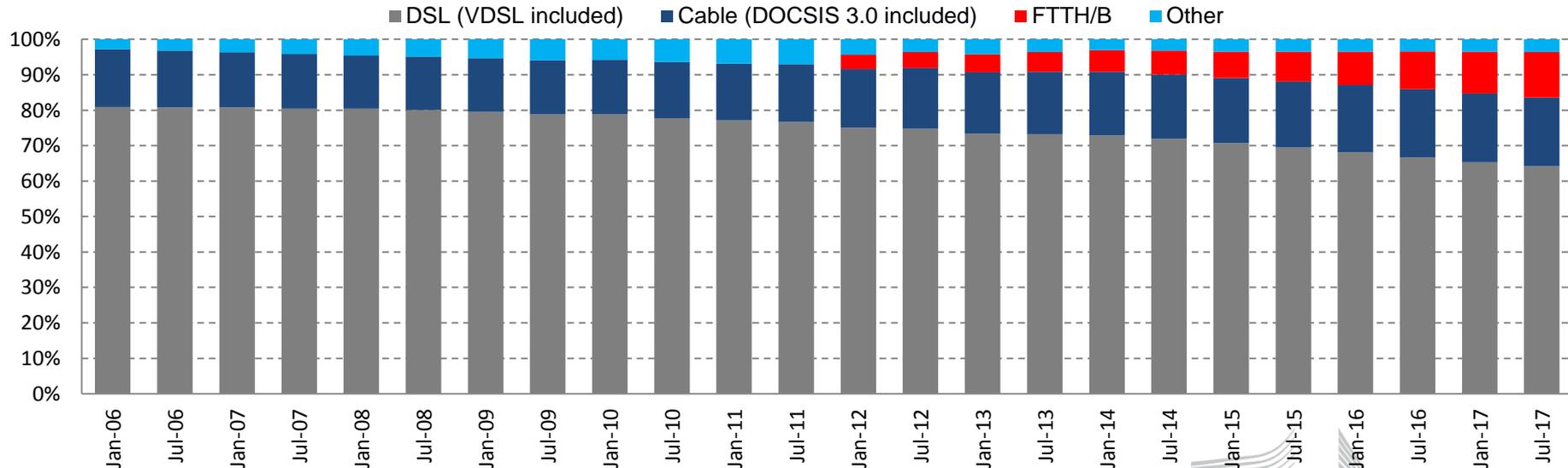
xDSL is particularly important in Greece and Italy, and has the lowest market share in Bulgaria, Lithuania and Romania. Cable has a very high market share in Belgium, Hungary, Malta and the Netherlands. FTTH/B is the most widely used technology in Lithuania, Latvia, Romania, Bulgaria, Portugal, Estonia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

The share of xDSL ranges from 11 % 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 major technological competitor of DSL in the majority of the Member States.

FTTH and FTTB together represent 13 % of EU broadband subscriptions. In these technologies, Europe continues to lag behind global leaders such as South Korea and Japan.

Share of fibre connections in total fixed broadband, July 2017

Source: OECD and Communications Committee
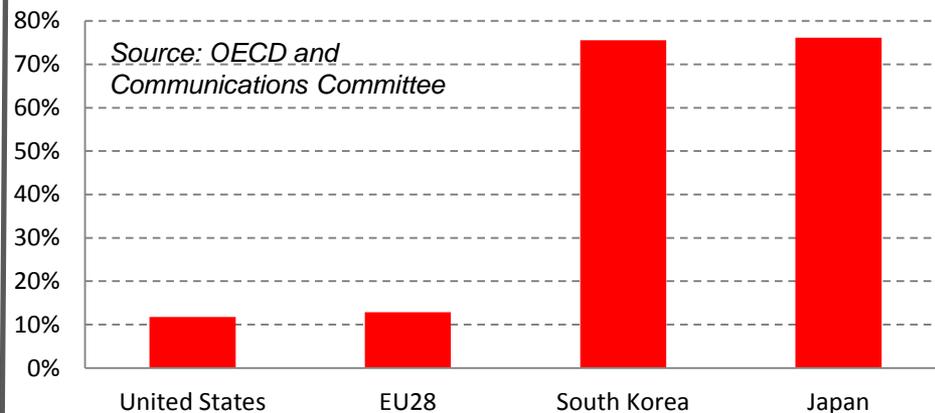
Fixed broadband subscriptions - technology market shares, July 2017

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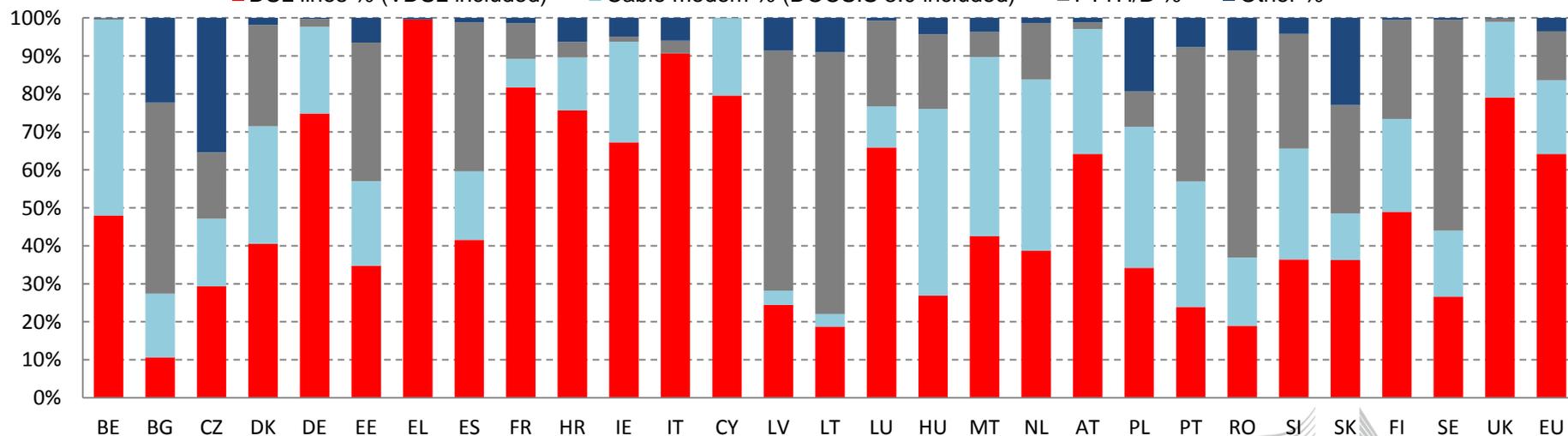
Source: Communications Committee

NGA subscriptions went up sharply by 26 million in the last 2 years, and just below 50 % of all subscriptions are NGA. In seven Member States, NGA's market share is higher than 75%. By contrast, its take-up remains low in Greece, Cyprus, Italy, France and Austria.

NGA subscriptions have been steadily increasing in the EU since 2012 and currently account for 48 % of all EU fixed broadband subscriptions.

European leaders in NGA take-up are Belgium, and the Netherlands. In these two countries, both VDSL and cable Docsis 3.0 are widely available.

The highest growth in the last 12 months was observed in Estonia (14 percentage points) Germany (11 percentage points).

Evolution of NGA subscriptions (in millions) in the EU, 2012-2017

Source: Communications Committee
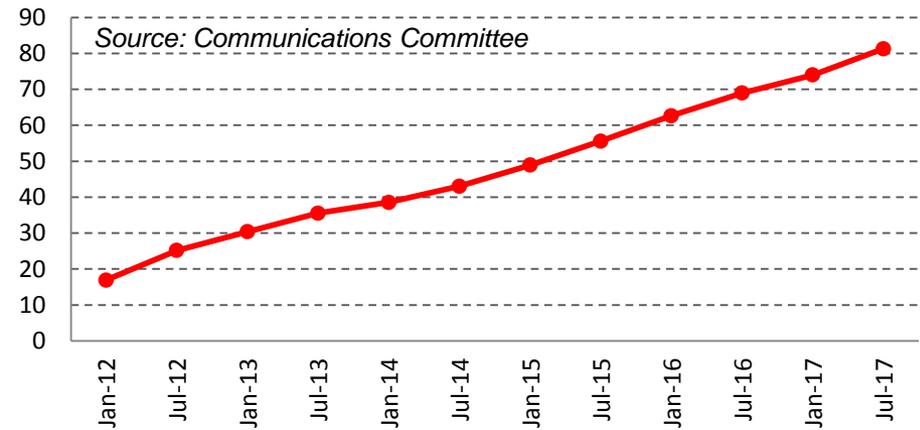
NGA (FTTH, FTTB, VDSL, Cable Docsis 3.0 and other NGA) subscriptions as a % of total fixed broadband subscriptions, July 2017

Source: Communications Committee

European Commission
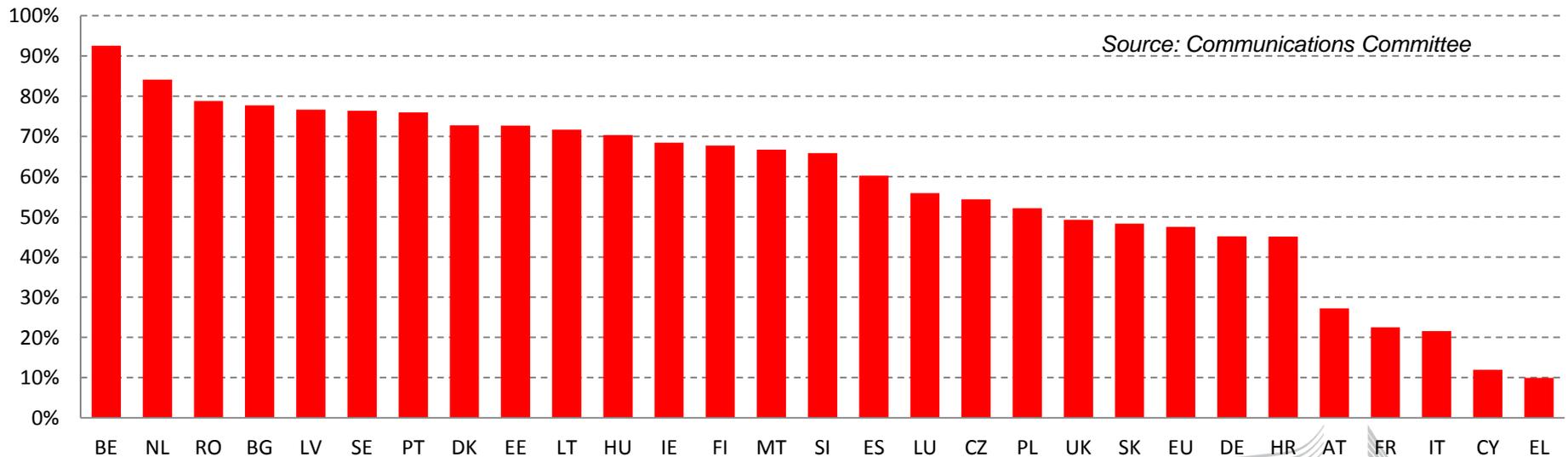
Cable Docsis 3.0 is currently the most widespread NGA technology in the EU in terms of take-up. VDSL is catching up.

37 % of NGA subscriptions are Docsis 3.0, which is a relatively high figure given that cable broadband in total represents only 19 % of all EU fixed broadband subscriptions. While almost all cable networks have been upgraded to NGA, only 55 % of the xDSL network is VDSL-enabled. Nevertheless, in the last twelve months VDSL coverage went up by 11 % and the number of subscriptions by 21 %. FTTH and FTTB have a 19 % and 9 % share in total NGA subscriptions respectively.

Share of different NGA technologies in total NGA subscriptions, July 2017

Source: Communications Committee
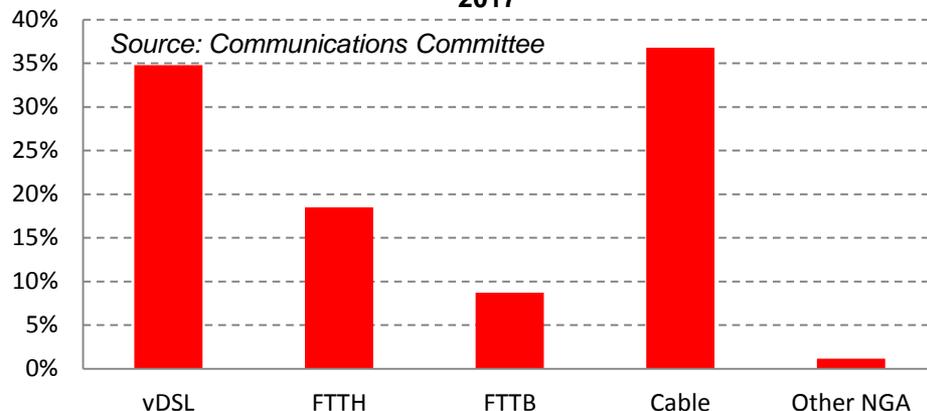
NGA subscriptions (millions) by technology at EU level, January 2012 - July 2017

Source: Communications Committee

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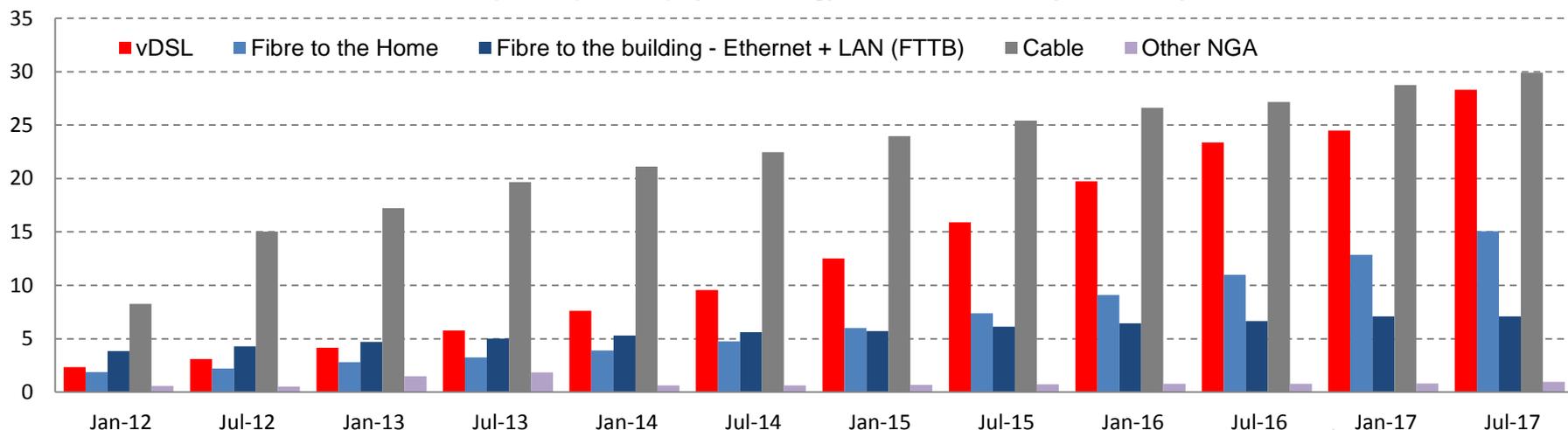
Competition in the fixed broadband market: new entrant operators are continuously gaining market share, but incumbents still control 40 % of subscriptions.

Incumbent operators are market leaders in almost all Member States, although their market share is gradually decreasing. During the last 10 years, new entrant operators have consistently posted higher net gains then the incumbents in each year. Overall, the market share of incumbents in the EU has decreased by 10 percentage points since 2006.*

* Break in series in July 2010 due to modification of historical data.

Fixed broadband subscriptions - operator market shares at EU level, January 2006 - July 2017

Source: Communications Committee
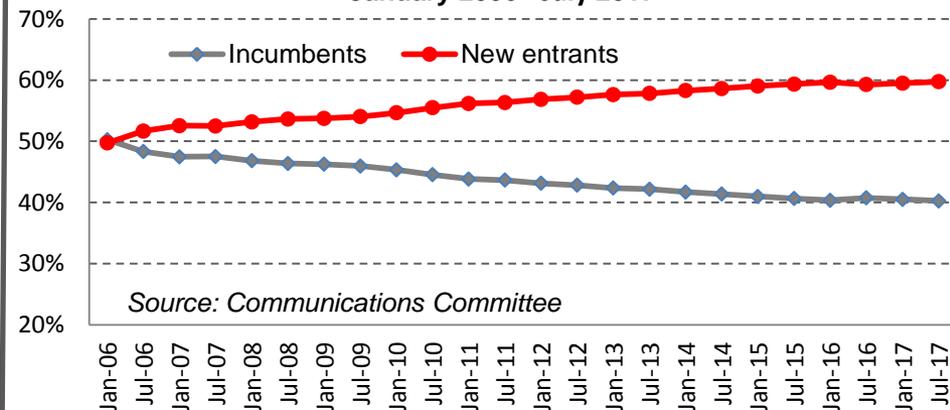
Fixed broadband subscriptions growth per day by operator at EU level, January 2006 - July 2017

Source: Communications Committee
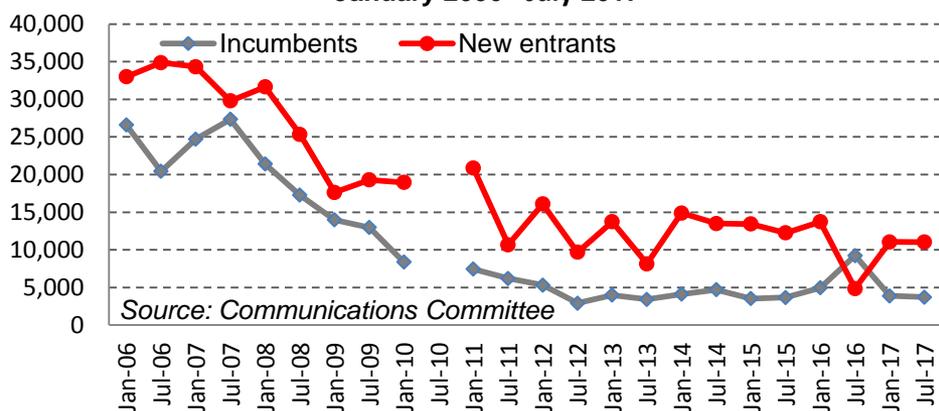
Fixed broadband subscriptions growth - share of operators at EU level, January 2006 - July 2017

Source: Communications Committee

European Commission
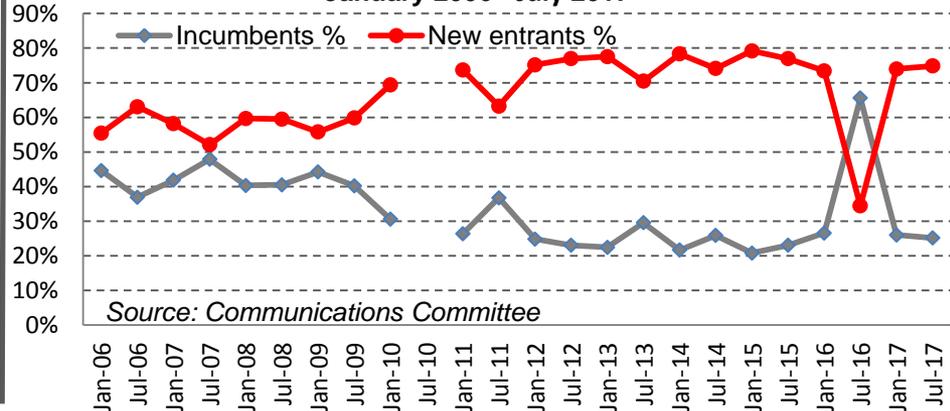
Market shares of incumbents show large differences across Europe. In 7 out of the 28 Member States, at least half of the subscriptions are provided by incumbent operators.

Market shares are calculated at national level for 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 the incumbent operator in this case).

Incumbents have the highest subscription market share in Luxembourg, Austria and Cyprus. In contrast, incumbents are the weakest in Europe in Romania, the Czech Republic, Bulgaria and Poland. In all these four Member States most subscribers use technologies other than xDSL.

Fixed broadband subscriptions - operator market shares, July 2017

■ Incumbents   ■ New entrants

Source: Communications Committee

European Commission
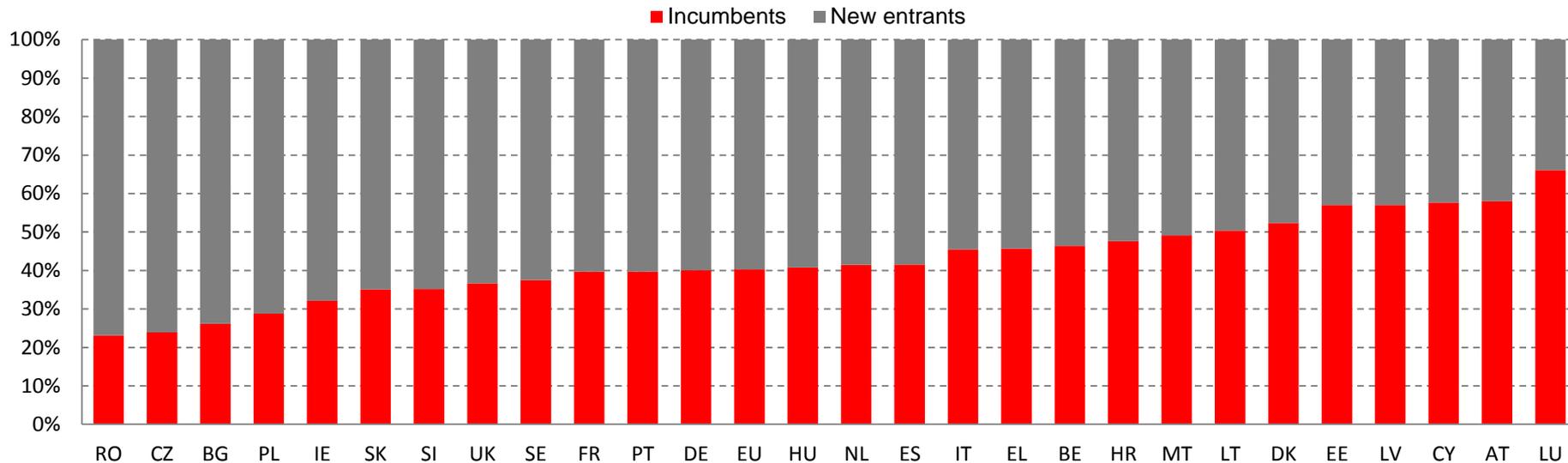
In the DSL market, unbundling reduced the dominance of incumbents, but for VDSL incumbents hold 67 % of subscriptions. Nevertheless, NGA is provided mainly by new entrants because of the high share of cable.

New entrant operators can compete with 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 incumbents access network, while in Italy and France over 80 % of subscriptions are DSL. In eastern European Member States, competition is based rather on competing infrastructures. This applies also to Belgium, Malta, Portugal and the Netherlands.

Incumbent market share by technology, July 2017

Source: Communications Committee
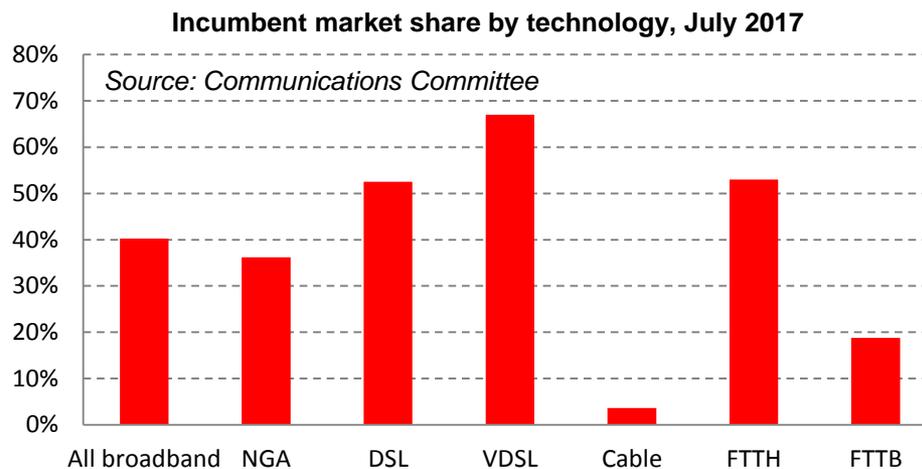
New entrant subscriptions - using own infrastructure or the incumbent network, July 2017

■ New entrant subscriptions using the incumbent's infrastructure ■ New entrant subscriptions using own infrastructure

Source: Communications Committee

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European Commission
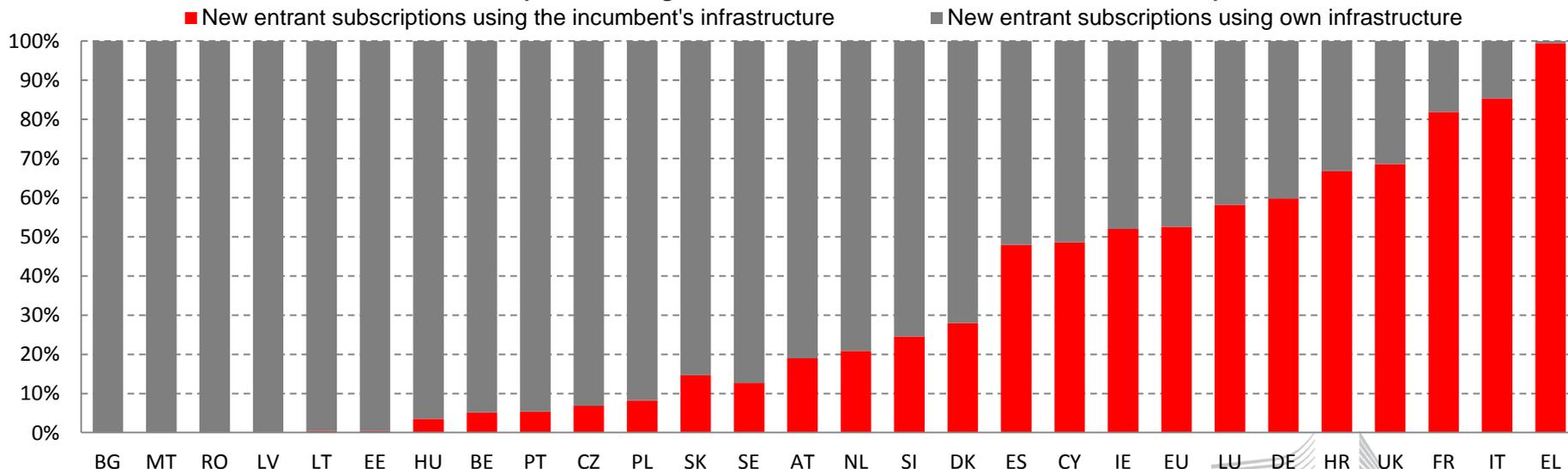
53 % of DSL subscriptions are with incumbents. New entrants mainly use Local Loop Unbundling to sell DSL. In six Member States, the new entrants presence in the DSL market is marginal.

In Bulgaria, Romania, Malta, Latvia, Estonia and Lithuania, there is literally no competition in the DSL market. These Member States, however, have strong platform competition. In France, Greece, the UK, Spain and Ireland new entrants account for the majority of xDSL subscriptions. In all these Member States, competition is strong due to the possibility of entry via DSL subscriptions provided through Local Loop Unbundling.

New entrant DSL subscriptions by type of access at EU level (VDSL excluded), 2014-2017

Legend: Own network, Full ULL, Shared access, Bitstream, Resale

Source: Communications Committee
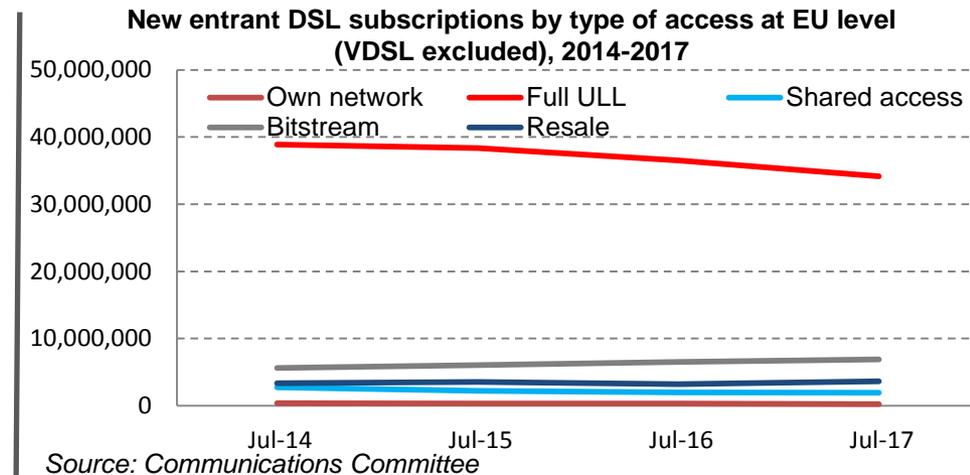
DSL subscriptions - operator market shares (VDSL included), July 2017

Legend: ■ Incumbent ■ New entrants

Source: Communications Committee

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European Commission
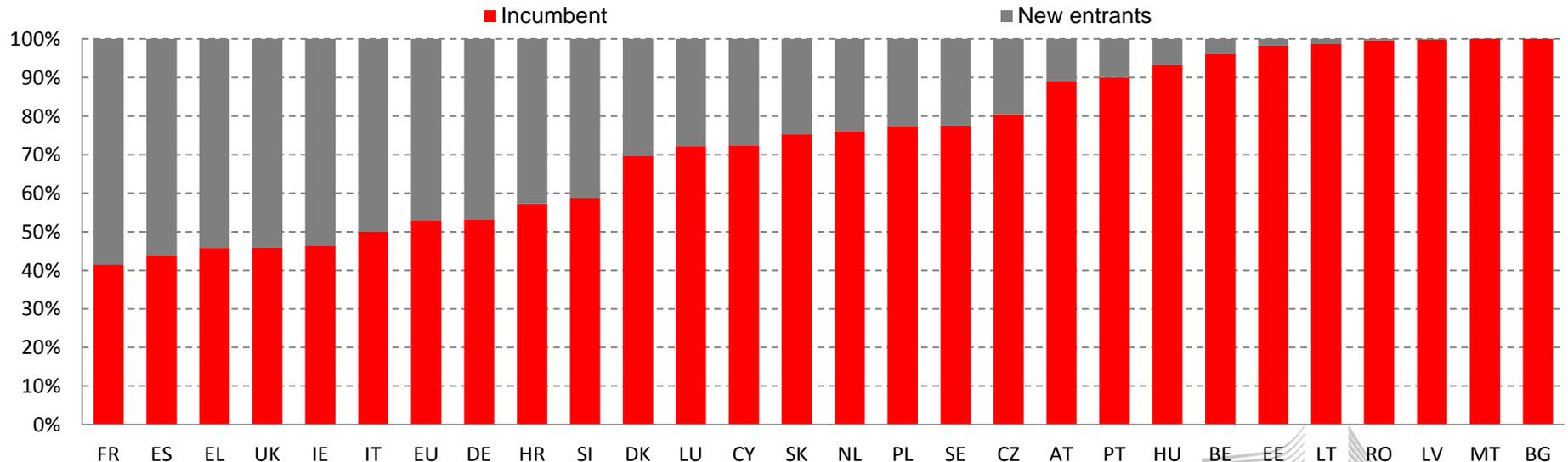
Average connection speeds for fixed broadband range from 7 Mbps to 23 Mbps in Europe. Sweden, Finland, Denmark and the Netherlands are among the top countries in Europe and worldwide.

South Korea is the world leader in average internet connection speed at 28.6 Mbps, followed by Norway and Sweden at 23.5 and 22.5 Mbps respectively.

The EU has an average speed of 14.1 Mbps, well below the preceding leading countries, and also Japan (20.2 Mbps), Canada (16.2 Mbps) and the US (18.7 Mbps).

Last year, five Member States had higher speeds than the US. This year only three did.

Among the selected countries, Brazil has the lowest average speed at only 6.8 Mbps, below Cyprus (6.9 Mbps) and China (7.6 Mbps). At European level, the worst performing countries include Cyprus, Greece, Croatia and Italy with speeds of less than 10 Mbps. With the exception of Cyprus, all these countries have a relatively low coverage of fast broadband technologies (NGA).

The lower speeds in the EU can be explained by relatively low use and/or coverage of FTTH and cable technologies.

Average connection speed (Mbps) by country, 2017

Source: Akamai, Q1 -2017

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European Commission
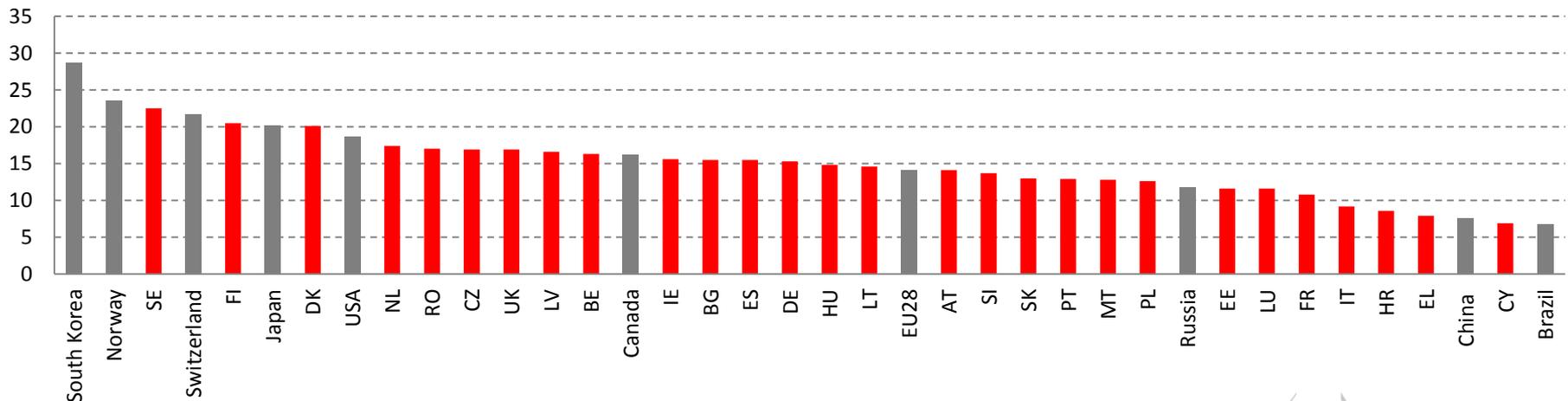
Average 4G (LTE) download speed ranges from 20 Mbps to 42 Mbps in Europe. The Netherlands, Hungary, Bulgaria and Denmark are among the top countries in Europe and worldwide.

The Netherlands is among the world leaders in average LTE download speed at 42.1 Mbps, followed by Norway and South Korea at 41.2 and 40.4 Mbps respectively.

The EU26* has an average download speed of 26.3 Mbps, which is above Japan (25.4 Mbps), Brazil (19.7 Mbps), the US (16.3 Mbps) and Russia (15.8 Mbps).

All Member States had higher LTE average download speeds than the US.

Among the selected countries, Russia is the country that shows the lowest average download speed at only 15.8 Mbps, below all Member States with reported data. When benchmarking only European countries, Poland, Germany, Portugal, the UK, Ireland, France, Estonia and Italy score below the EU average.

* Note: No data available for Cyprus and Malta.

Average LTE download speed (Mbps) by country*, 2018
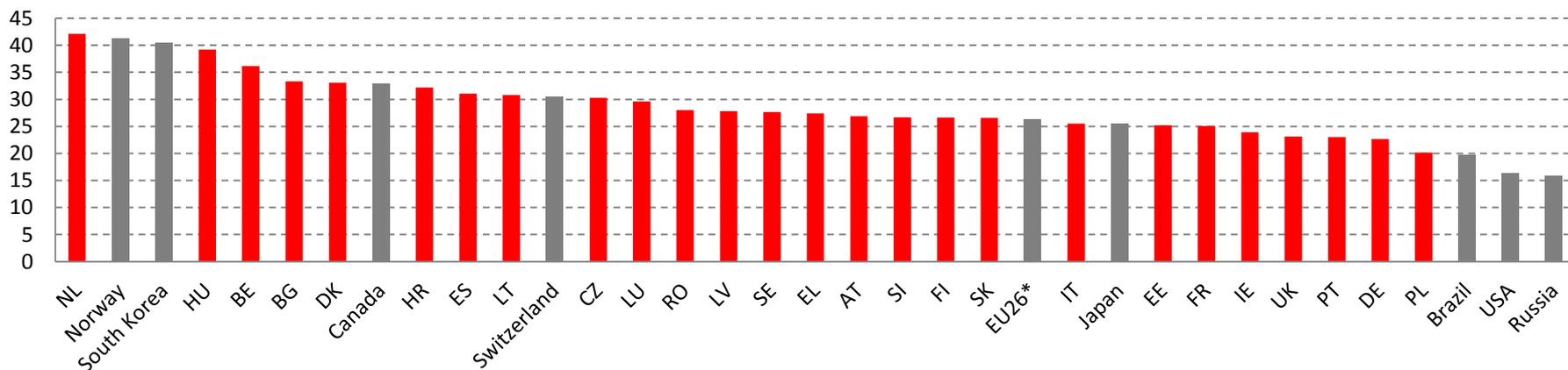
Source: Open Source, February 2018.

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European Commission

There are 90 active mobile broadband SIM cards per 100 people in the EU. The growth was linear over the last 5 years, with over 40 million new subscriptions added every year.

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

In the Nordic countries and Estonia, Luxembourg and Poland, there are already more than 120 subscriptions per 100 people, while in Hungary and Greece the take-up rate is less than half of that. Most mobile broadband subscriptions are used on smartphones rather than on tablets or notebooks.

Mobile broadband penetration at EU level, January 2009 - July 2017

Source: Communications Committee
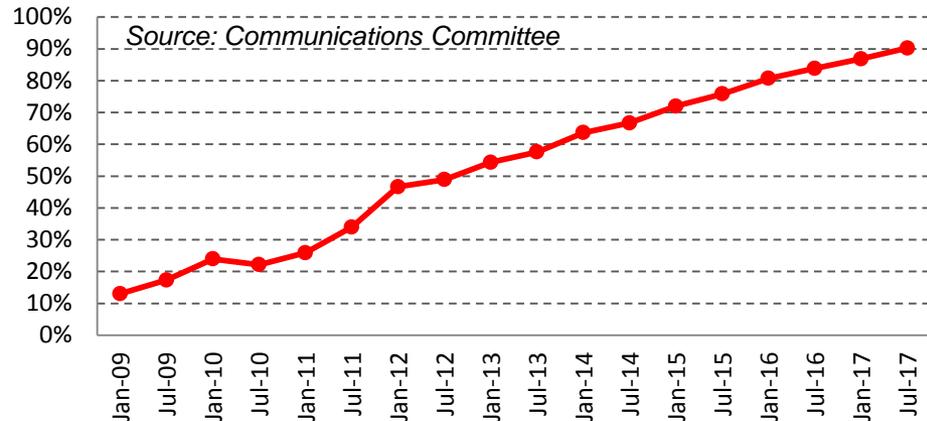
Mobile broadband penetration - all active users as a % of population, July 2017

Source: Communications Committee

FI, PL, DK, LU, EE, SE, IE, CY, AT, MT, ES, LV, EU, UK, NL, FR, BG, IT, SK, RO, HR, CZ, DE, LT, BE, SI, PT, EL, HU

European Commission
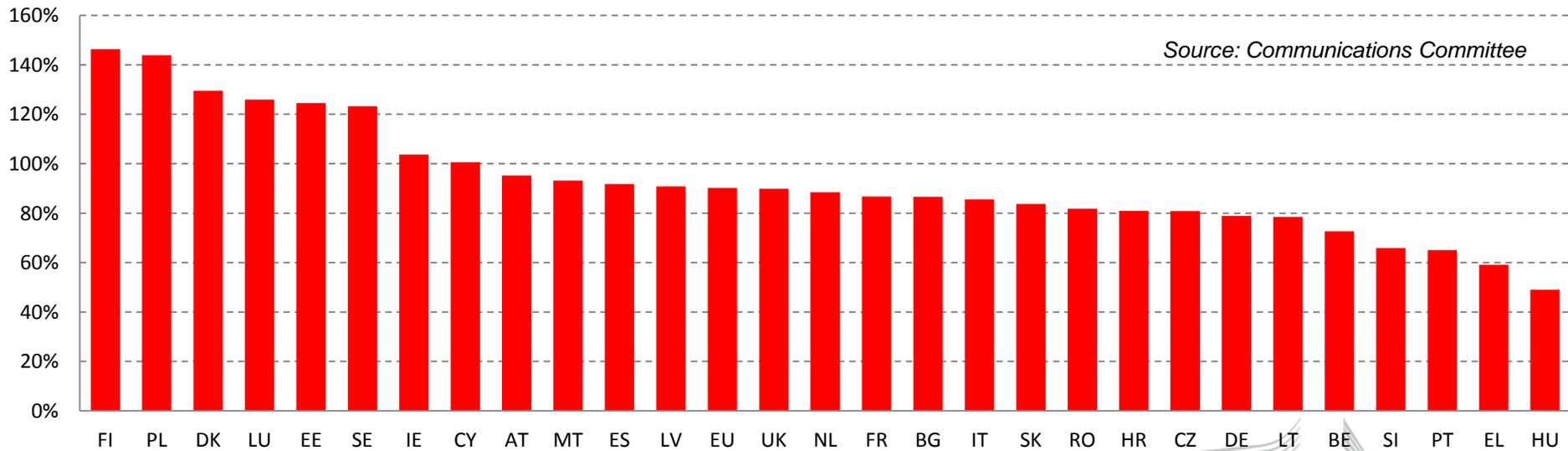
Mobile broadband is still mainly complementary to fixed broadband. In 2017, 9.3 % of EU homes accessed the internet only through mobile technologies. Finland and Italy were leaders in mobile internet access at 37% and 23 % of homes.

Europeans access the internet primarily using fixed technologies at home. However, there are a growing number of homes with only mobile internet use. The percentage of homes with purely mobile broadband access grew from 4.1 % in 2010 to 9.3 % in 2017.

The Netherlands was the Member State with the lowest mobile-only access at less than 0.2 % of homes.

By contrast, in Finland, where fixed broadband take-up has been declining, 37 % of homes rely purely on mobile technologies at home.

Households using only mobile broadband connection at home at EU level (% of households), 2010 - 2017
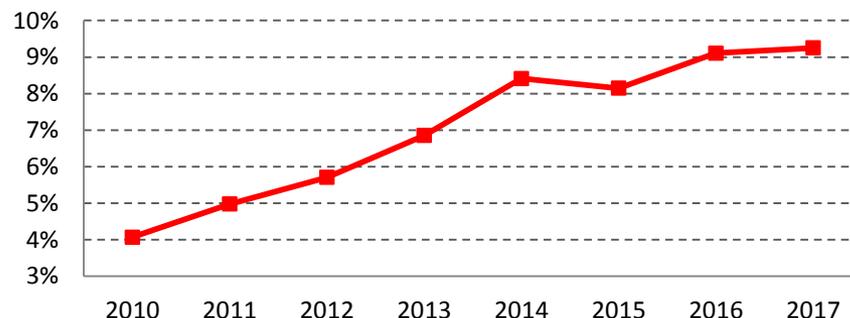
Source: Eurostat

Households using only mobile broadband at home (% of households), 2017

Source: Eurostat

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European Commission
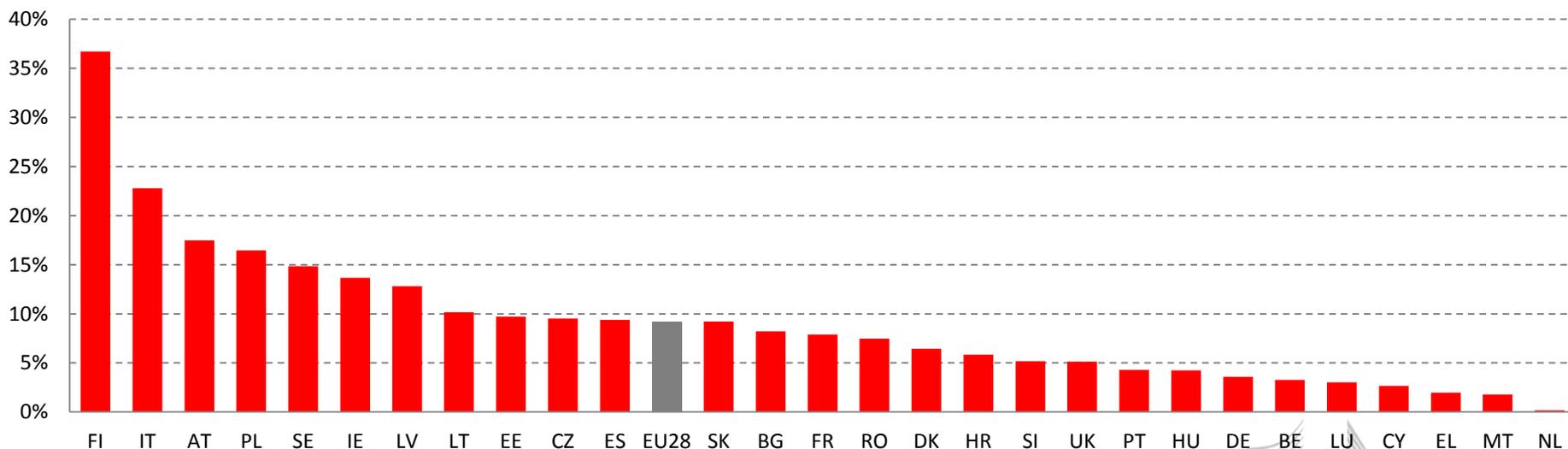
Internet traffic per capita in western Europe* is currently 34 GB per month. By 2021, this figure is estimated to go up to 89 GB, while in the US it will be 237 GB.

IP traffic per capita (Gigabytes per month and region), 2016 - 2021
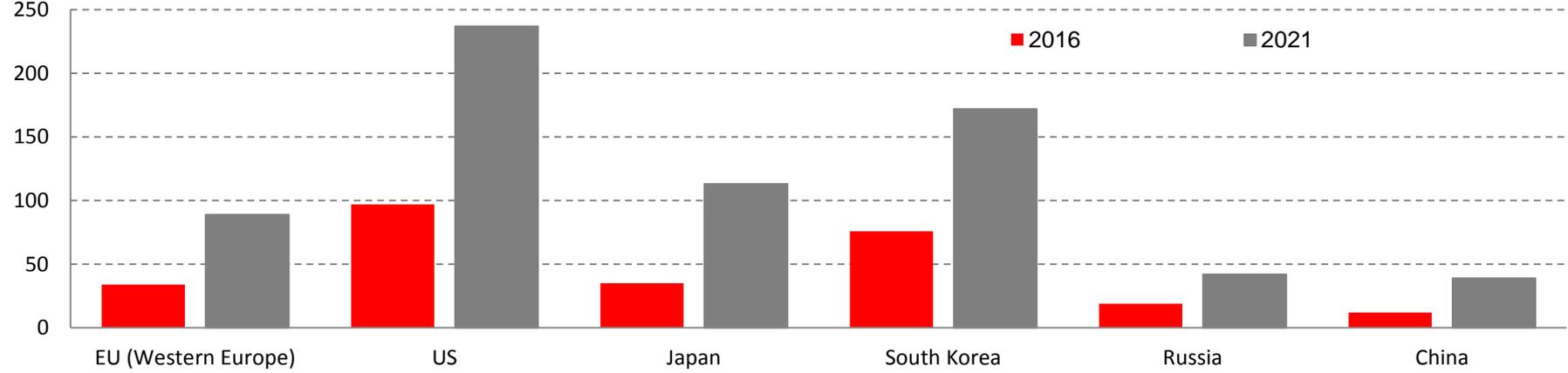
Source: Cisco, VNI Forecast Highlights

Internet traffic per capita in western Europe* is well below the figures for the US and South Korea.

Mobile data traffic is a fraction of total IP traffic, and this will remain so despite the large increase forecast by Cisco. Mobile data currently represents 6% of European internet traffic, and this ratio is estimated to double by 2021. Nevertheless, the share of mobile traffic will be significantly higher in Japan (20 %), China (22 %) and Russia (32 %). The US, on the other hand, will have only 9 % of its internet traffic on mobile networks.

Percentage of mobile data share of total internet traffic, 2016 - 2021
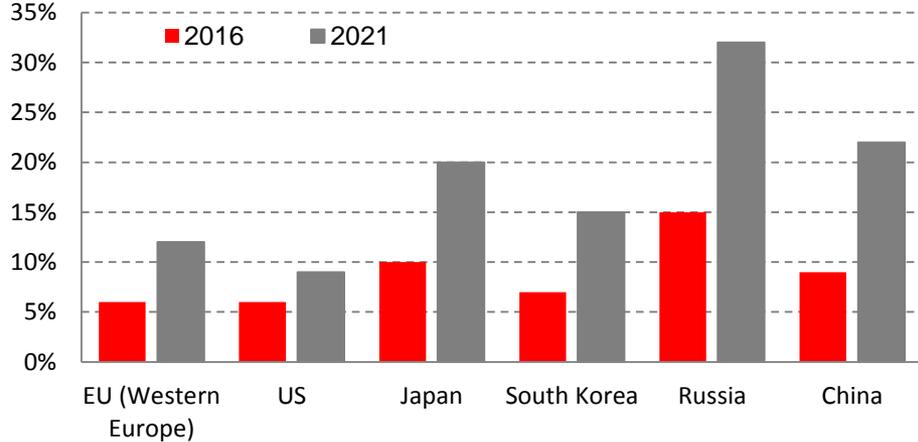
Source: Cisco, VNI Forecast Highlights

* France, Germany, Italy, Spain, Sweden, the United Kingdom, Denmark, Netherlands, Belgium, Ireland, Norway and Iceland.

European Commission

Broadband take-up tends to be lower in Member States where the cost of broadband access accounts for a higher share of income, but this correlation is not strong. Based on the Broadband Price Index, fixed broadband is most affordable in Finland, France and Lithuania.

Income plays an important role in broadband take-up. The lowest income quartile has a take-up rate for fixed broadband of just 67 % as opposed to 96 % in the highest income quartile.

The **Broadband Price Index** is a score* that measures the prices of twelve representative broadband baskets as a percentage of household income. The baskets include three speed categories (12-30 Mbps, 30-100 Mbps and at least 100 Mbps) and four types of products (standalone internet, internet + TV, internet + fixed telephony and internet + TV + fixed telephony).

* 0 to 100, 100 being the best

Broadband household penetration by income quartiles at EU level, 2011 - 2017

Legend: Low income, Medium low income, Medium high income, High income, Average

Source: Eurostat

Broadband Price Index, 2017

Source: Commission services based on Empirica and Eurostat

Categories: FI, FR, LT, DE, AT, NL, DK, PL, LU, SK, CZ, RO, SE, LV, IT, EU, UK, EE, HU, BE, BG, IE, ES, SI, EL, PT, CY, HR

European Commission
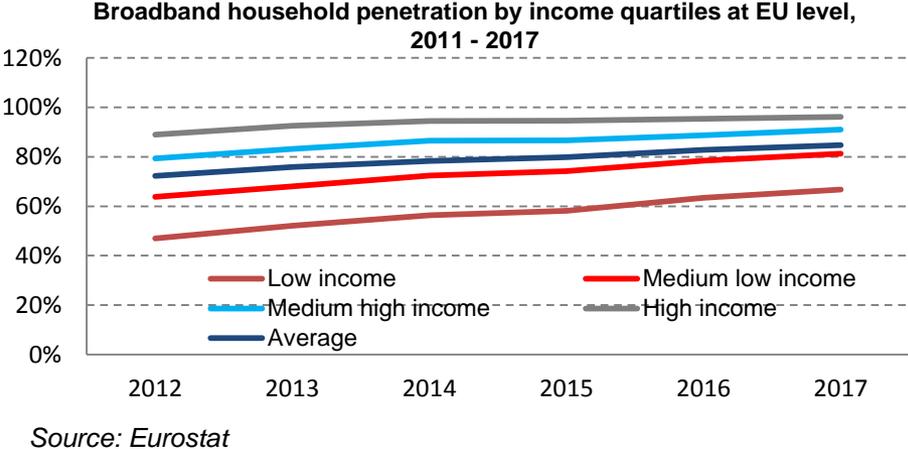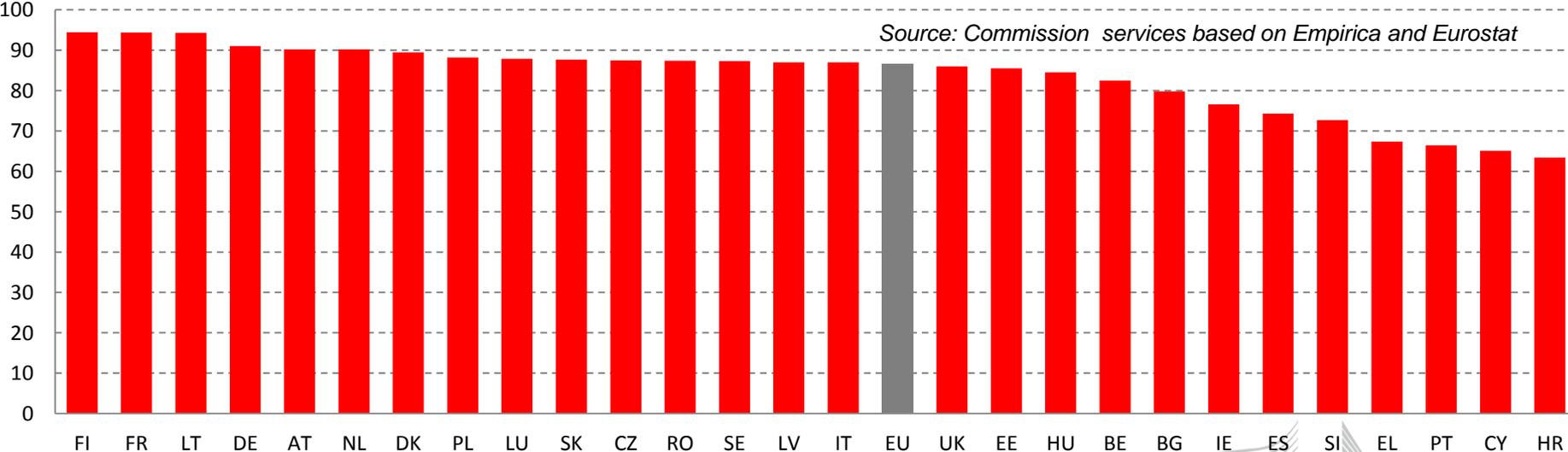
Prices* of fast broadband access tend to decrease over time but vary widely between Member States.

Broadband access prices (minimum prices, calculated on Purchasing Power Parity) vary between EUR 8 and EUR 43 for a standalone offers with a minimum download speed of 12 Mbps. The minimum prices were the lowest in Denmark (EUR 7.7), Lithuania (EUR 13) and Romania (EUR 13), while the highest were in Portugal (EUR 43), Ireland (EUR 36.2), Luxembourg (EUR 35), Spain (EUR 33), Slovenia (EUR 33) and Cyprus (EUR 32).

As for offers of at least 100 Mbps, the European average stands at EUR 35 with a substantial decrease from 2016.

* Based on the least expensive monthly prices available and expressed in euros, adjusted for purchasing power parity, VAT included.

Broadband retail prices (EUR PPP) – Standalone offers, 2013 - 2017

Source: Empirica and Van Dijk, 2013 - 2017
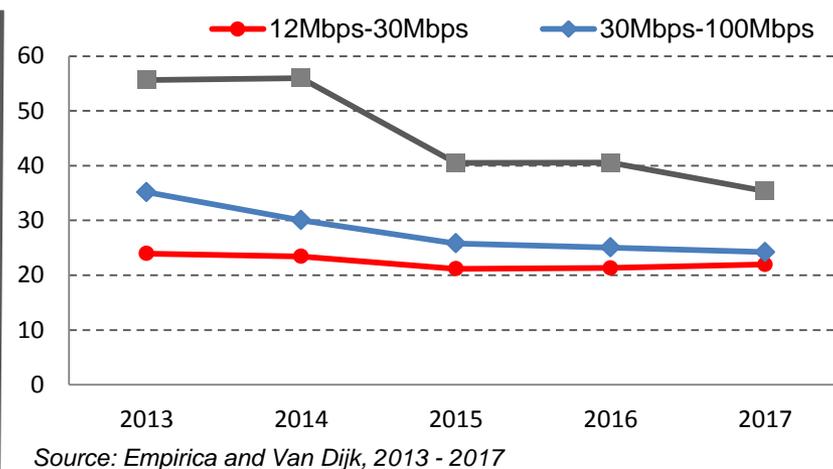
Fixed broadband retail prices (EUR PPP) - Standalone offers, October 2017

Source: Empirica, Fixed Broadband Prices in Europe (2017)

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European Commission
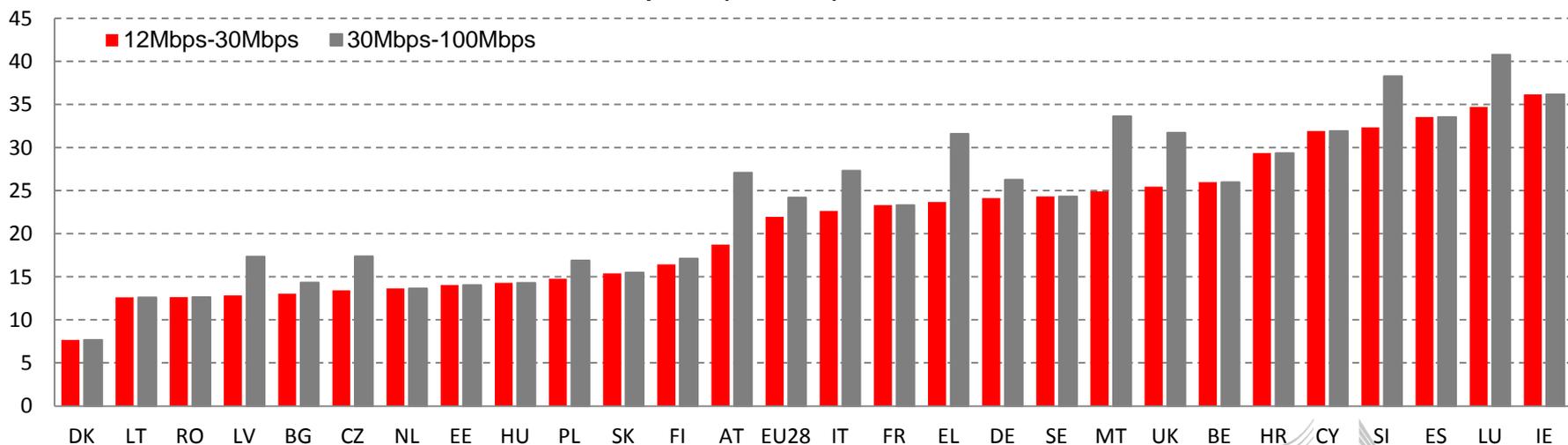
Prices* of triple play bundles** including fast broadband access, fixed telephony and television have gone down by 27 % since 2013.

The minimum prices for triple play bundles including broadband access (with a download speed between 30 and 100 Mbps), fixed telephony and television vary between EUR 13 and EUR 61 in the EU. The lowest prices were recorded in Lithuania (EUR 13), France (EUR 23) and Bulgaria (EUR 28), while the highest were in Belgium (EUR 61), Spain (EUR 56), Ireland (EUR 55), Portugal (EUR 54), Malta (EUR 53) and Denmark (EUR 52).

The EU average prices of at 100 Mbps offers stands at EUR 50 with a decrease of EUR 7 from 2016.

*Based on the least expensive prices available and expressed in euros, adjusted for purchasing power parity, VAT included. **No data available for Finland.

Broadband retail prices (EUR PPP) – Bundles including broadband, fixed telephony and television, 2013-2017
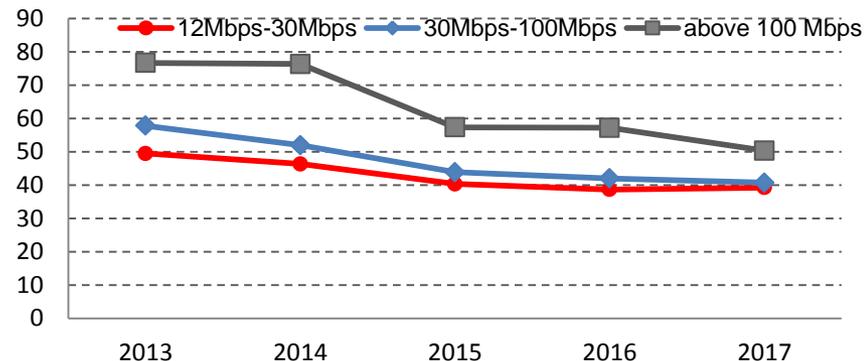
Source: Empirica and Van Dijk, 2013 to 2017

Broadband retail prices (EUR PPP) - Bundles including broadband, fixed telephony and television, October 2017

Source: Empirica, Fixed Broadband Prices in Europe (2017)

European Commission
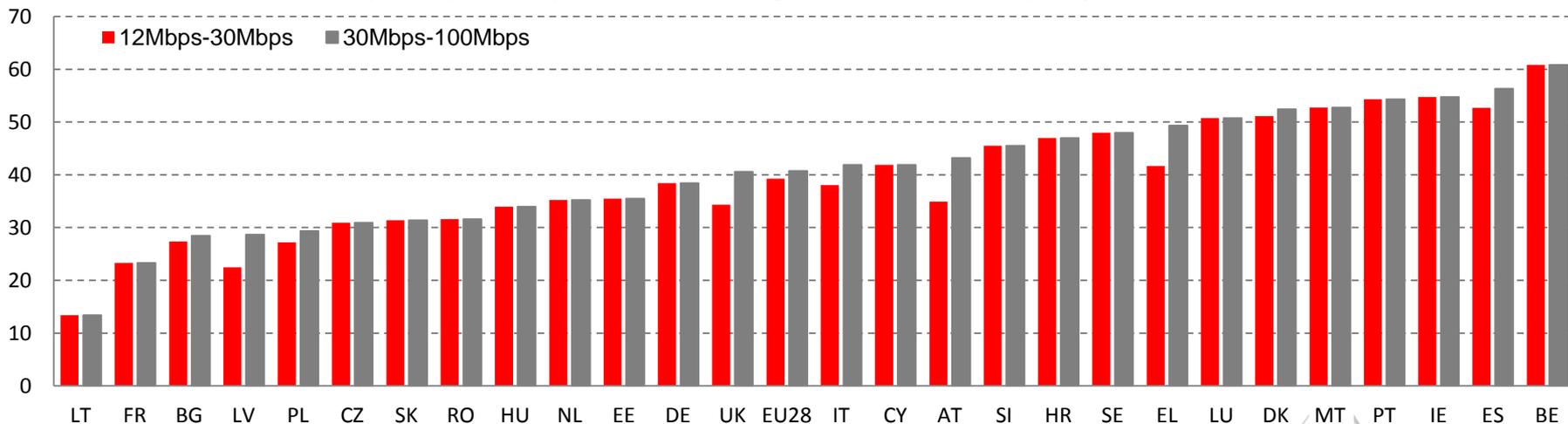
Prices of mobile voice and data plans vary greatly across Europe. Prices went down in all consumption baskets, including 2 GB of mobile broadband and 900 voice calls or 100 voice calls went down by 37 % and 44 % respectively from 2016.

Looking at the usage basket of 300 voice calls and 1GB data, minimum prices range between EUR 9 and EUR 62 with an EU average of EUR 24.

The cheapest countries are Slovenia, France, Poland, Austria, Sweden, Estonia and Italy with minimum prices below EUR 13. By contrast, prices are high in Hungary (EUR 62), Bulgaria (EUR 48) and Greece (EUR 48).

Mobile broadband prices (EUR PPP) - handset use in the EU, 2016 - 2017
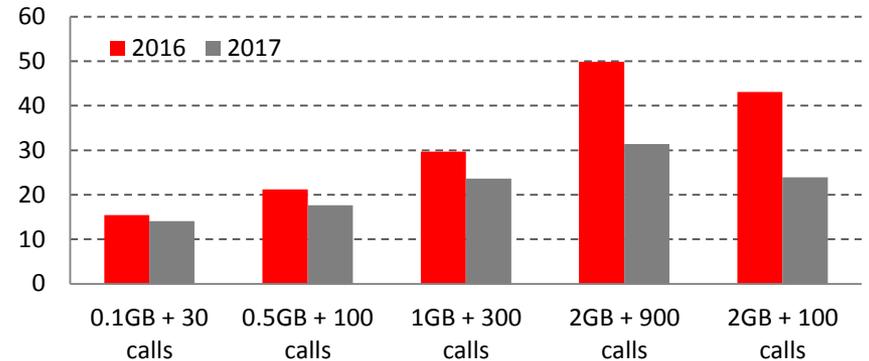
Source: Van Dijk and Empirica, 2016 and 2017

Mobile broadband prices (EUR PPP) - handset use, 1GB + 300 calls + 225 SMS, 2017

Source: Empirica, Mobile Broadband Prices study, February 2017

European Commission
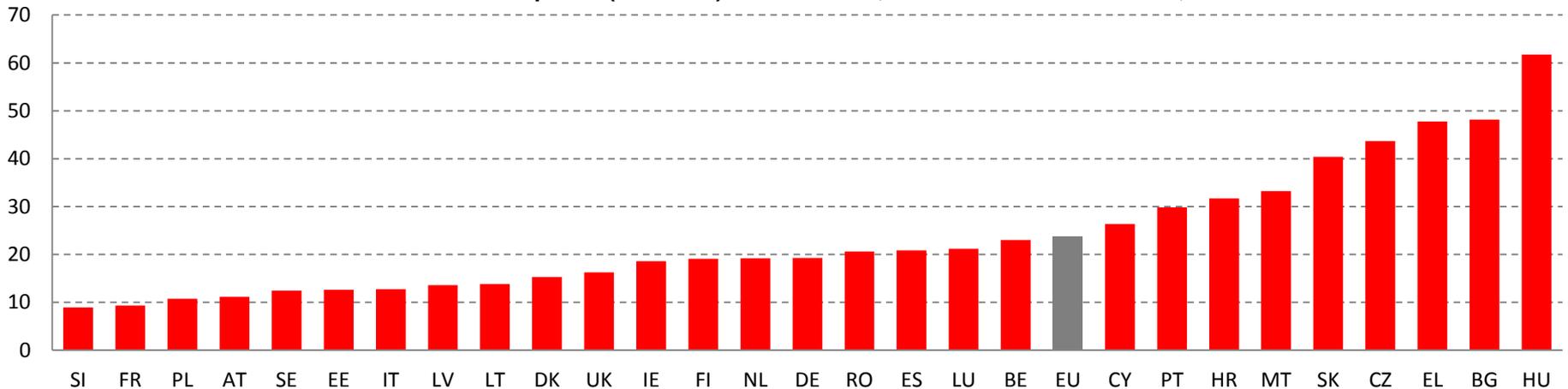
Prices of mobile broadband plans for laptops and tablets also show large differences across Europe. On average, prices have decreased for all types of consumption baskets since 2016, ranging between 8 % and 21 %.

Looking at 5GB data-only plans for laptops, minimum prices range between EUR 3.7 and EUR 42. The EU average (EUR 17) is below the price of fixed standalone offers of 12-30 Mbps.

The cheapest countries are Italy, Poland, Sweden, Latvia and Austria, with prices below EUR 10. At the same time, prices are very high in Cyprus (EUR 43).

Laptop prices have decreased for all types of consumption baskets since 2016. The largest price drop is registered in the highest consumption basket (20 GB), with a 21 % decrease.

Mobile broadband prices (EUR PPP) – laptop use in the EU, 2016 - 2017
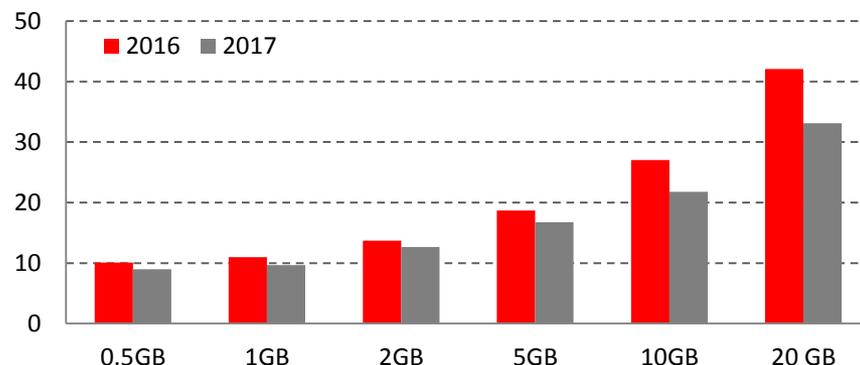
Source: Van Dijk and Empirica, 2016 and 2017

Mobile broadband prices (EUR PPP) – laptop/tablet use, 5GB, 2017

Source: Empirica, Mobile Broadband Prices study, February 2017

European Commission
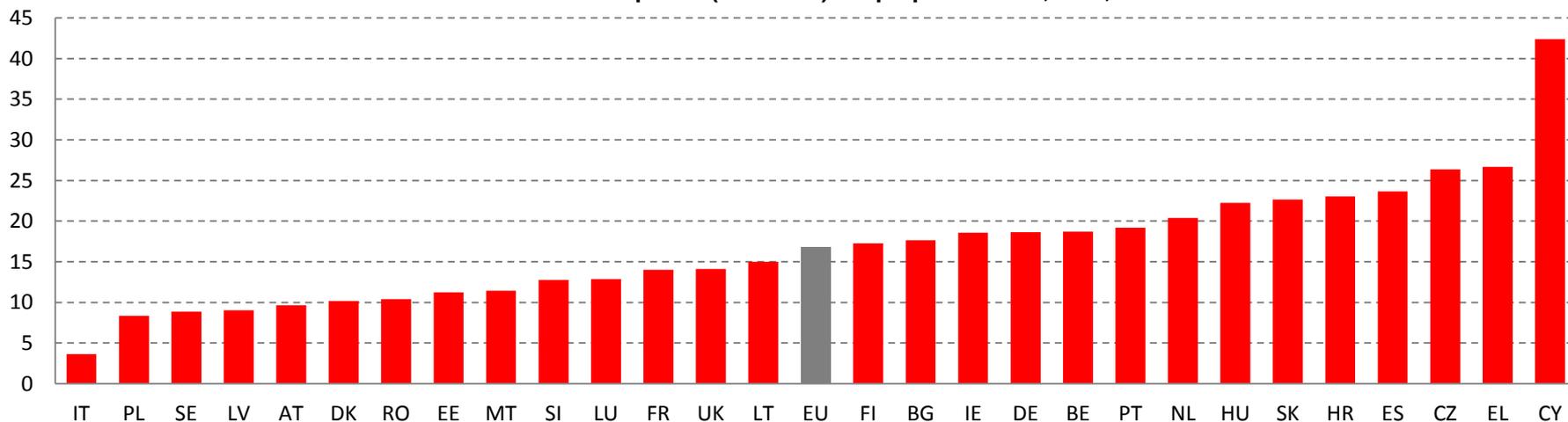
Mobile prices in the world: in comparison with the US, the EU is cheaper for handset usage baskets, and more expensive for high-end data-only (laptop/tablets) packages.

In South Korea and the US, no offers adapted to the lower-usage baskets were found on the market, which is why those two countries might seem overpriced. The least expensive data-only offer in the United States allows up to 23 GB of data, but the maximum download speed is only 2 Mbps.

In the case of Japan, prices seem much higher for baskets with 5 GB, 10 GB and 20 GB than the other economies. On average, the EU performs well for lower baskets, but prices are higher than South Korea and the US for high-end baskets (especially 20 GB).

Mobile broadband prices (EUR PPP) - laptop/tablet use in the EU, the US, Japan and Korea, 2017
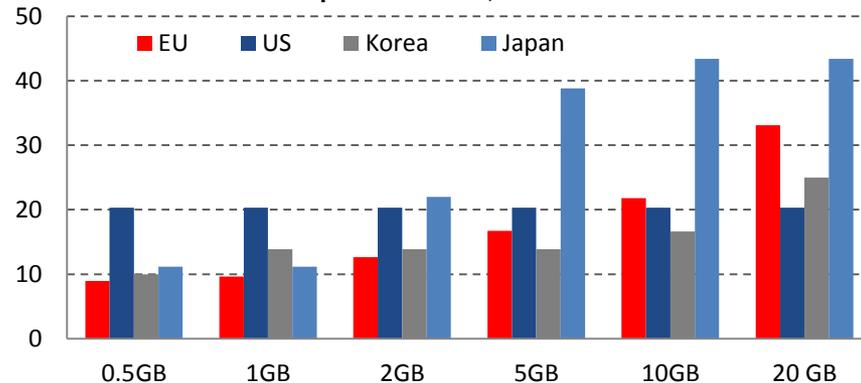
Source: Empirica, Mobile Broadband Prices study, 2017

Mobile broadband prices (EUR PPP) - handset use in the EU and the US, Japan and Korea, 2017
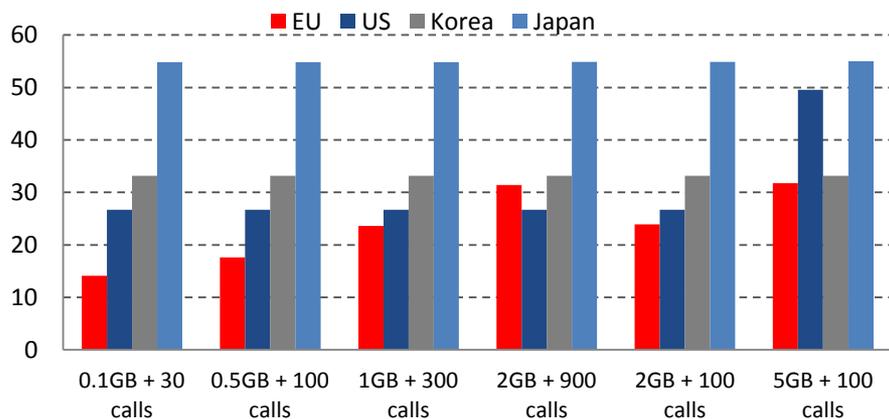
Source: Empirica, Mobile Broadband Prices study, 2017

Regarding handset use baskets, for those below 2 GB data usage, the US offers flat rates for calls and messages for EUR 26.7 in 2017. Additionally, offers in South Korea include 5 GB for all data consumption.

On average, the EU performs well in all data consumption basket, with much lower prices than South Korea and Japan. When comparing EU and US prices, prices are lower for all baskets, with the exception of the basket with 2 GB data and high intensity of voice calls (900 calls) where average EU prices are above US.

European Commission

Telecoms markets: General trends

Under the **connectivity objectives for the European gigabit society**, by 2025 all European households need to have access to at least 100 Mbps connectivity (upgradable to Gbps). In addition, gigabit connectivity should be available for all main socioeconomic drivers and all urban areas, while major terrestrial transport paths should have uninterrupted 5G coverage.

In many Member States the **deployment of fibre networks (FTTH/B)** has increased. This is inter alia due to the supporting regulatory measures (e.g. access to ducts), as well as co-investment agreements, commercial wholesale access agreements and mobile network sharing agreements. Very often, however, FTTB/FTTH is almost exclusively deployed in urban areas and in business parks. As regards take-up of very high speed networks (over 100 Mbps), there has often been a difficult early period in most areas where unfamiliar new access services are deployed, before demand picks up.

Most Member States have **national broadband plans** in place that focus (among other things) on reaching minimum download speeds. Some Member States have adjusted their plans to reflect the gigabit objectives.

Many Member States have either: (i) publicly consulted on **5G**-related challenges (e.g. conditions for 5G roll-out, new use cases, technologies and services, new bands) when setting up a national strategy; (ii) have already published a national plan or strategy; or (iii) at least entered such plan or strategy in their government programmes. A few Member States have earmarked investments to promote the development of 5G. Many operators have started or announced 5G trials.

Effective and impartial governance of telecoms markets is crucial in fast-changing markets. Still, in some Member States concerns have arisen about the national regulatory authority's independence and regulatory capacity. Both should be ensured and must not be undermined.

The trend towards offering **bundled services and fixed-mobile convergence** continues and in many Member States has even increased significantly. Offers consisting of two or three services are the most frequent bundles. Often it is difficult for new customers to obtain services as a single offer. Moreover, access to (premium) content has become a clear competitive advantage in many markets.

European Commission

More EU-harmonised spectrum underpins future spectrum needs within the EU, while assignment varies between national markets (1/2).

Following the adoption of Commission Implementing Decision (EU) 2016/687 harmonising the 700 MHz band, the total amount of spectrum harmonised at EU level for wireless broadband use amounts to 1 090 MHz.

Member States are required to authorise the 700 MHz band by 2020, unless there are justified reasons for delaying it until mid-2022 at the latest. The authorisation process has already been completed in three Member States (Finland, France and Germany).

All Member States but one have met the first milestone set out in the Decision, which is to finalise cross-border coordination with other Member States by 31 December 2017. This is a major success for roadmap-based migration across Europe, which is embedded in EU legislation with a binding end date for assignment.

* A limited list of justified reasons is set out in the Annex to the Decision of the European Parliament and the Council on the use of the 470-790 MHz band in the Union.

The 800 MHz band (the 'digital dividend') is currently assigned (in two cases not entirely) in 26 Member States, 11 of which had been granted a derogation from the original deadline under Article 6(4) of the Radio Spectrum Policy Programme (RSPP). Two Member States have not yet assigned and/or made available the 800 MHz band: while Malta resumed the assignment process after the withdrawal of a proposed merger between two of the three mobile operators, Bulgaria still invokes the exception under Article 1(3) RSPP due to incumbent military use.

Moreover, with a view to reaching the target of 1 200 MHz harmonised for wireless broadband set by the RSPP, the Commission is working on the possible extension of the 1.5 GHz band to provide additional download capacity for 5G services representing an additional 50 MHz**.

** The adoption of a harmonisation decision on the 1.5 GHz extension bands is ongoing at the time of writing. Once such Commission Implementing Decision will enter into force, the total amount of spectrum harmonised for wireless broadband will go up to 1140 MHz.

European Commission

More EU-harmonised spectrum underpins future spectrum needs within the EU, while assignment varies between national markets (2/2).

A slight increase, in absolute terms, in the amount of EU-harmonised spectrum assigned on average across Member States for wireless broadband use can be reported since 2016. As far as the assignment of the 700 MHz band is concerned, most of the Member States are taking the necessary measures to meet the 2020 deadline.

Bands above 1 GHz have the potential for additional capacity. While these remained partly unassigned in many Member States, they will play an even larger role in the deployment of 5G services.

Lack of assignment may be due to different reasons depending on the circumstances in each Member State. These include: delays in making the spectrum available and in the carrying out of assignment procedures, lack of market interest and use for defence purposes.

However, several Member States are currently preparing to assign the 3.6 GHz band. This is particularly important, as the 3.6 GHz band was identified at EU level as one of what are called the 5G pioneer bands.

In this context, and in view of the possible derogations and exceptions applicable to different bands, lack of assignment does not necessarily mean non-compliance with EU law.

Assigned spectrum in harmonised EU bands, end of February 2018
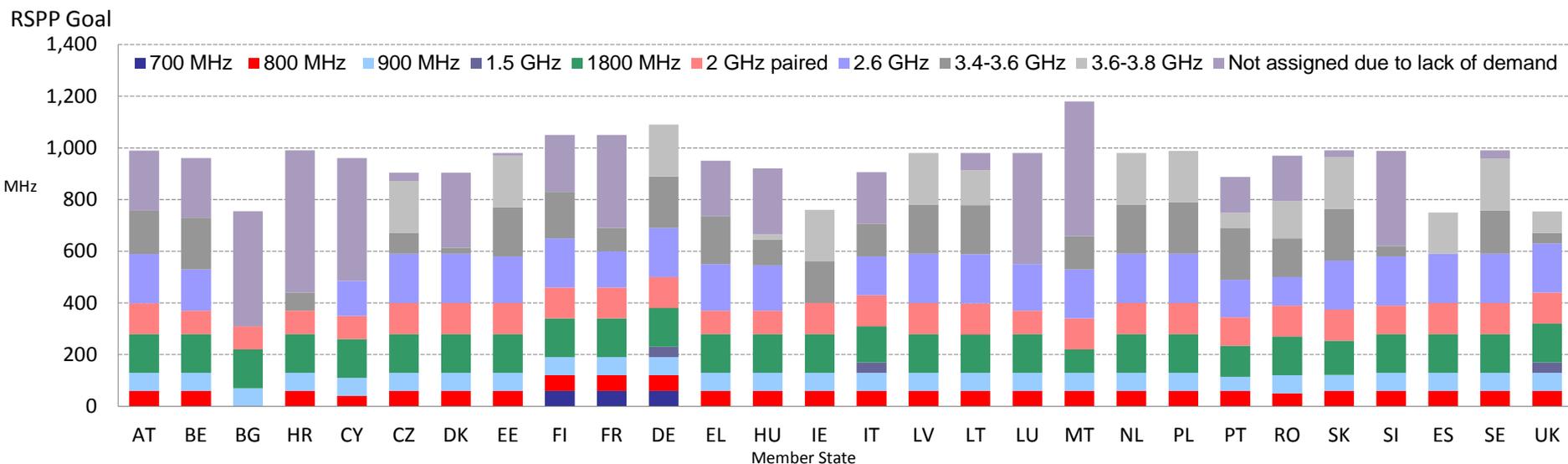
Note: Assigned spectrum include guard bands

European Commission

The Commission has sent warnings to several Member States not carrying out the analysis of the relevant telecom markets on time.

National regulatory authorities must carry out an analysis of telecom markets susceptible to regulation every 3 years (Article 16(6)(a) of the Framework Directive).

As markets evolve and competition develops, regulatory remedies imposed in the past need to be adjusted or even removed to adapt to the developing market conditions.

In the European Electronic Communications Code, the Commission has proposed to extend the market review cycle to 5 years (instead of 3) to achieve a better balance between adequacy and appropriateness of regulation — on the one hand — and the legal certainty and stability of regulation — on the other.

In October 2017, the Commission sent letters of formal notice to seven Member States where the delays were even over 5 years: the countries concerned were Belgium, Spain, Ireland, Hungary, Slovenia, Poland and Romania*.

The markets in question include not only key broadband markets as listed in the 2014 Recommendation on relevant markets for the purpose of ex ante regulation in the electronic communications sector but also 'older' markets removed from the list and which are still regulated in some Member States on the basis of very outdated market analyses.

* Spain and Slovenia have notified the corresponding market reviews in early 2018.

State of play of relevant markets reviews notified under Article 7 cases as of 1 January 2018

Legend:
- Green: Effective competition - no ex ante regulation
- Red: No effective competition - ex ante regulation
- Yellow: Partial competition - partial ex ante regulation
- 1: 1st round-competition/regulation
- 2: 2nd round-competition/regulation
- 3: 3rd round-competition/regulation
- 4: 4th round-competition/regulation

	2014 RECOMMENDATION					2007 REC.		2003 RECOMMENDATION								
	Call term. on fixed network	Voice call term. on mobile networks	Wholesale local access	Wholesale central access	Wholesale high-quality access	Access to PSTN for res & non-res.	Call orig. on fixed network	Local/nat. Call for res.	Internat. call for res.	Local/nat. call for non-res.	Internat. call for non-res.	Retail LL	Transit on fixed network	Trunk segments LL	Access & call orig. on mobile network	Broadcast Transmis.
	Market 1	Market 2	Market 3a	Market 3b	Market 4	ex-Mkt 1	ex-Mkt 2	ex-Mkt 3	ex-Mkt 4	ex-Mkt 5	ex-Mkt 6	ex-Mkt 7	ex-Mkt 10	ex-Mkt 14	ex-Mkt 15	ex-Mkt 18
Austria	3	4	5	5	4	4	4	3	2	4	3	4	1	2	1	3
Belgium	2	3	2	2	1	2	1	3	1	3	1	1	2	1	1	w
Bulgaria	5	3	2	2	3	2	3	2	2	2	2	1	1	1		
Croatia	1	1	1	1	1	1	1	1		1		1		1		
Cyprus	2	3	4	4	2	3	3	3	2	3	2	2	3	2	3	3
Czech Republic	4	4	4	4	3	4	4	2	2	2	1	2	1	1	1	2
Denmark	4	4	4	4	4	3	3	2	2	1	1	2	1	1	1	1
Estonia	3	4	4	4	3	3	3	1	1	1	1	1	1	2	1	3
Finland	2	1	3	3	1	2	3	2	1	2	1	2	2	1	V	3
France	5	5	5	5	3	5	5	1	1	1	1	2	1	2	W	4
Germany	5	5	3	3	2	3	3	2	1	2	1	2	2	1	1	3
Greece	3	4	4	4	2	3	2	3	1	3	1	2	3	2	1	1
Hungary	3	5	4	4	3	6	3	3	3	3	3	3	2	2	2	2
Ireland	3	1	2	2	2	3	2	2	2	2	2	2	2	2	1	2
Italy	3	4	3	3	2	3	2	2	2	2	2	2	3	2	2	2
Latvia	5	4	3	3	3	2	3	4	3	4	3	3	2	1	1	1
Lithuania	4	3	3	3	2	1	3	3	2	3	2	1	2	2	1	6
Luxemburg	3	4	2	2	2	3	3	2	2	2	2	2	1	1	1	
Malta	3	3	2	2	3	3	3	2	2	2	2	3	2	2	2	1
Netherlands	5	5	5	3	3	4	3	2	2	2	2	2	2	2	1	2
Poland	2	3	2	3	1	2	2	2	2	2	2	2	1	1	2	3
Portugal	2	2	3	3	3	2	2	2	2	2	2	1	1	3		2
Romania	3	3	2	1	1	2	2	1	1	1	1		2			2
Slovakia	4	4	3	3	3	4	4	2	2	2	2	2	2	1	1	2
Slovenia	2	5	4	4	2	3	3	2	1	1	1	2	3	1	3	3
Spain	3	4	3	3	3	3	3	2	2	2	2	1	1	4	2	3
Sweden	4	4	3	3	3	3	3	1	1	1	1	2	2	1	1	4
United Kingdom	3	4	2	4	4	5	4	2	2	2	2	4	2	4	1	2

Source: Commission services

European Commission

Development of national broadband plans

Most Member States have gradually adopted national broadband plans (NBPs) since the adoption of the 'Digital Agenda for Europe' (DAE) 2020 targets — i.e. coverage of 30 Mbps download for all Europeans and take-up of 100 Mbps subscriptions by at least 50 % of European households. The plans are devised to integrate all relevant aspects of an effective broadband policy and resources, enabling policy makers and public authorities to properly plan any necessary public action in the telecommunications sector.

A large majority of Member States have started implementing their NBPs, albeit covering various time periods ranging from 2017 to 2022. Some NBPs are integrated within broader strategic approaches, while others are documents specifically dedicated to broadband deployment. In some countries, there are multiple official documents drafted by different national authorities, specifying aspects related to such broadband developments.

In accordance with the connectivity objectives for the gigabit society, by 2025 all European households, whether rural or urban, need to have access to internet connectivity offering a downlink of at least 100 Mbps (upgradable to Gbps). Only very few NPBs have so far been adjusted to reflect those objectives.

Content-wise, nearly all Member States' NBPs focus on reaching minimum download speeds — in most cases in terms of coverage (availability of commercial offer on a given territory) and sometimes also penetration (actual take-up in the form of internet access subscriptions). In contrast, emphasis on upload data rates is rather exceptional (e.g. in Denmark, Luxembourg or Ireland). In addition, operational measures to foster demand for digital applications and high-speed internet access are relatively infrequent.

Notably, some Member States have held consultations on their draft NBPs. These include the Czech Republic ('Digital Czech Republic'), France ('National Programme for Very High Speed Broadband') and Slovakia ('National Strategy for Broadband Access in the Slovak Republic')*.

Some Member States (e.g. Sweden, the UK, France, Spain, Germany and Austria) have already started to adapt the targets of their NBPs to the new EU broadband targets for 2025 proposed by the Commission in its September 2016 Communication "Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society".

* OECD countries which ran public consultation procedures before drafting their NBPs are: Canada ('Improving Canada's Digital Advantage'), Ireland ('Next Generation Broadband'), Japan ('Path of light'), and the US ('Connecting America: The National Broadband Plan').

Broadband targets in national broadband plans

Although some NBPs **do not have targets** on penetration/take-up or **have set targets** on other features (e.g. upload speeds), the following general observations can be made:

- 11 Member States have set more ambitious objectives in their NBPs than the DAE-2020 targets (Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, Germany, Hungary, Luxembourg, Slovenia and Sweden);

- 14 Member States' NBP objectives are convergent with the DAE-2020 targets (Croatia, Cyprus, Czech Republic, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Slovakia and Spain);

- 3 Member States have partly less ambitious objectives in their NBPs than the DAE-2020 targets (France, Romania and the UK) as regards at least one parameter (e.g. speed, end date).

Declared broadband targets in NBPs are, first and foremost, intended as a guide. Their practical feasibility and actual success will depend on the use of appropriate means including legal measures and financial resources. Therefore, it is important that Member States have the necessary resources and tools in place, rather than merely policy targets, to facilitate the actual roll-out of broadband infrastructure on their territories.

To facilitate the exchange of best practice between Member States on adapting their NBPs to the gigabit targets for 2025, in 2017 the Commission set up a Communications Committee working group on 5G. The working group should also identify common elements and best practices which can potentially become part of the revised NBPs.

European Commission

Funding national broadband plans

In a number of cases, Member States decided to make extensive use of the European Investment and Structural Funds (ESIFs) for a total programmed amount of over EUR 6 billion by 2020. Member States' use focused particularly on the European Regional Development Fund (Poland and Italy more than EUR 1 billion) and the European Agricultural Fund for Rural Development (Italy EUR 273 million, Germany EUR 223 million and Sweden EUR 157 million). The roll-out of broadband projects remains challenging in many Member States and in specific regions, partly due to the lack of appropriate administrative capacity (e.g. for state aid notification, technological choices and business models). The Commission is working closely with Member States that envisage reallocating substantial parts of their initial programming from broadband measures to other sectors. To prevent reprogramming of this kind, in particular in rural areas, and to help improve technical assistance, the Commission has asked Member States to set up technically competent broadband competence offices and has put in place a broadband rural action plan. In addition, financial instruments including the ESIFs and the forthcoming Connecting Europe Broadband Fund are intended to maximise the leverage of public funding dedicated to the roll-out of the next generation of broadband networks.

ERDF and EAFRD programmed funds on broadband (2014-2020) — total EUR 6 071 million

Legend:
- > 55
- 40 - 55
- 25 - 40
- 10 - 25
- < 10
- No data
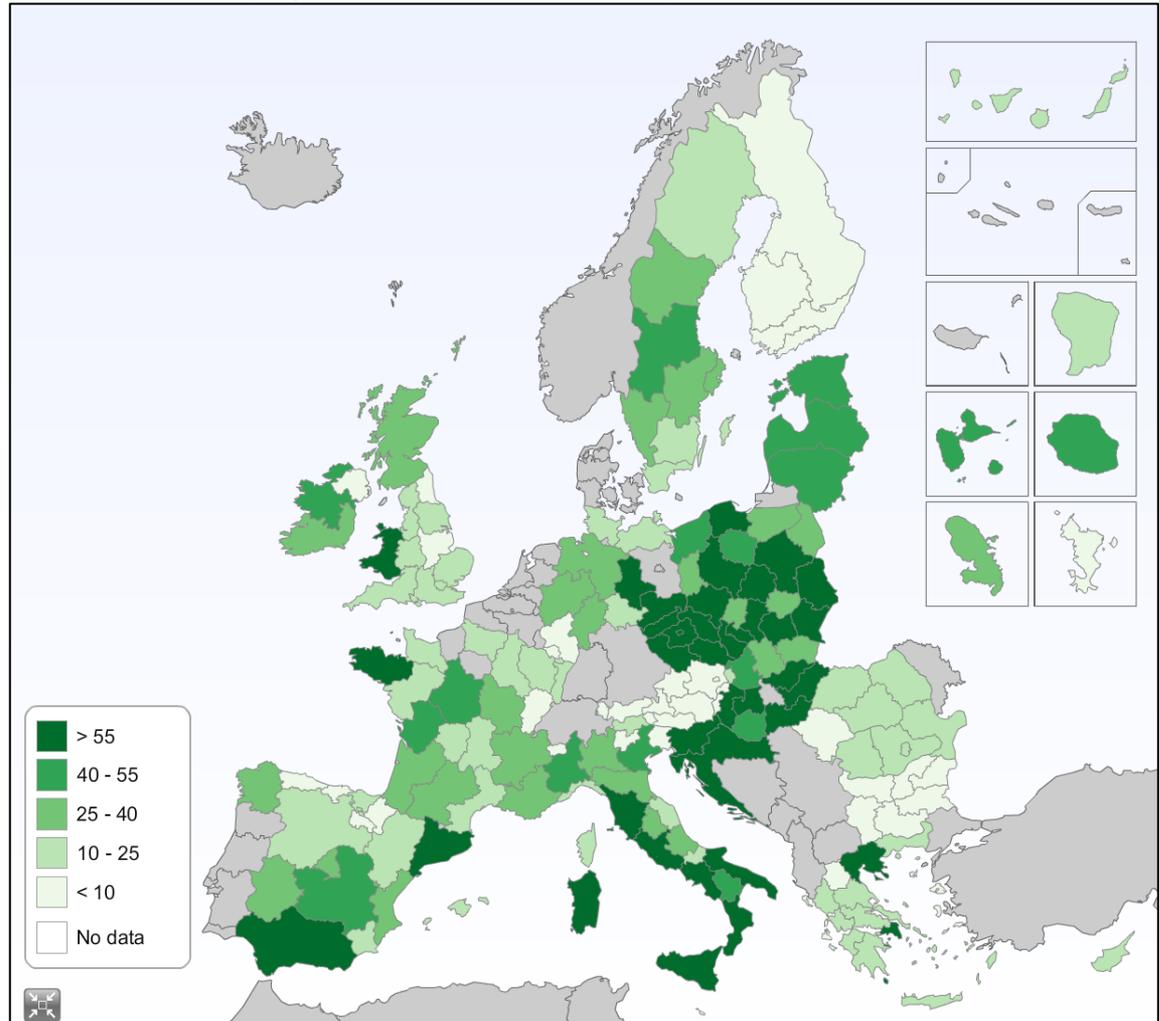
Source: European Commission, ICT monitoring Tool (http://s3platform.jrc.ec.europa.eu/ict-monitoring).

European Commission

5G Observatory - progress towards 5G market introduction

5G trials

• More than 80 pre-commercial 5G trials and pilots launched in Europe as part of the industry's 5G trial roadmap

• Seventeen Trial Cities appointed: Amsterdam, Barcelona, Bari, Berlin, Espoo, L'Aquila, London, Madrid, Malaga, Matera, Milan, Oulu, Patras, Prato, Stockholm, Tallinn and Turin

• Five "digital cross-border corridors" established inter alia accommodating live tests of 5G for Cooperative Connected and Automated Mobility

5G Spectrum plans

• 5G pioneer bands identified in Europe (700 MHz, 3.6 GHz and 26 GHz)

• Common roadmap for the availability of spectrum adopted by Member States

• Consultations on spectrum assignments launched by a first set of Member States (e.g. Austria, Denmark, Italy, Germany, France, Finland, Portugal, Sweden, UK)

Three Member States have published national 5G roadmaps (Germany, Sweden, and the UK) and 3 have launched a public consultation (France, Poland, Spain):

• National calendars for key milestones set by the government,

• Measures to stimulate investments in 5G infrastructures such as: reducing the cost of deploying small cells; wide-ranging support to 5G trials,

• Promoting partnerships between the telecom sector and vertical industries,

• Foster public services as a lead user for early 5G deployment.

More information is available on the European 5G Observatory, which has been set up by the Commission to provide qualitative and quantitative information on

• Actual and expected market developments,

• Initiatives and preparatory actions taken by private and public actors in the area of 5G.
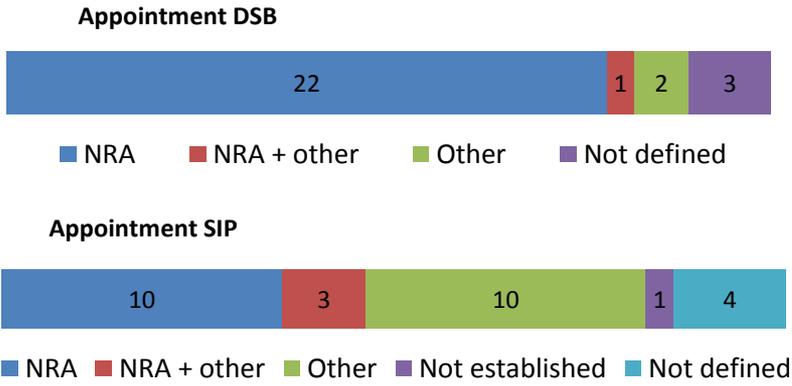
European Commission

Member States' implementation of the Broadband Cost Reduction Directive (Directive 2014/61/EU) (1/2).

Directive 2014/61/EU (**the Broadband Cost Reduction Directive**) aims to facilitate and incentivise the roll-out of high-speed electronic communications networks by: (i) promoting the joint use of existing physical infrastructure; and (ii) enabling synergies across sectors for a more efficient deployment of new physical infrastructure. The overall aim is for high-speed networks to be rolled out at a lower cost. Member States had until 1 January 2016 to transpose the Directive into national law. After significant time lags, most Member States have achieved this. The case against Belgium is still pending before the Court of Justice.

The fact that most Member States were late in transposing the Directive and have only recently achieved its full implementation means that transposition measures are only slowly starting to produce results. More tangible results can nevertheless be seen in those countries that had pre-existing legislation in place and that partially went well beyond certain requirements of the Directive (such as on mapping and in-house equipment).

The Directive also requires Member States to appoint one or more independent dispute settlement bodies ('DSBs') and one or more bodies to act as single information point ('SIP').

Tasks laid down in the Broadband Cost Reduction Directive appointed to NRAs in the EU

Appointment DSB

| NRA: 22 | NRA + other: 1 | Other: 2 | Not defined: 3 |

■ NRA   ■ NRA + other   ■ Other   ■ Not defined

Appointment SIP

| NRA: 10 | NRA + other: 3 | Other: 10 | Not established: 1 | Not defined: 4 |

■ NRA   ■ NRA + other   ■ Other   ■ Not established   ■ Not defined

Source: Body of European Regulators for Electronic Communications (BEREC)

European Commission

Member States' implementation of the Broadband Cost Reduction Directive (Directive 2014/61/EU) (2/2).

The tasks of the **dispute settlement body** were allocated to the national regulatory authority or partially to the NRA in most of the Member States and to other organisations only in two Member States.

In several countries, the NRA already had tasks to fulfil as DSB before the entry into force of the Broadband Cost Reduction Directive. An increase in the number of disputes can be observed since the application of the Directive. The most important challenges the NRAs have faced as DSB so far relate to: (i) setting the price for access to existing physical infrastructure; (ii) the appropriation of costs for coordination of civil works and: (iii) (un)justified refusal of access to existing physical infrastructure.

In several Member States, NRAs have also started developing rules or guidelines on dispute settlement (e.g. the process the NRA is likely to follow in resolving disputes). These may enhance legal certainty and overcome the general reluctance of the stakeholders involved.

The tasks of the single information point were allocated to the NRA (or partially to the NRA) in 14 Member States. In 10 Member States other organisations are in charge of performing this function: in most cases this is a ministry.

The Directive provides for the possibility to require all public-sector bodies to make minimum information they are holding on existing physical infrastructure available via the SIP. Several Member States have imposed such an obligation on public-sector bodies and some Member States have also obliged other organisations, for instance network operators, to make available information via the SIP.

The main challenges NRAs were faced with as SIP relate to collecting the data and the information which has to be provided, and on how to incentivise those who have to provide information to meet this obligation.

Long delays in permit granting, in particular for mobile network roll-out, also still pose a challenge in many Member States.

European Commission

Widespread use of roam like at home across Member States since 15 June 2017 (1/2).

Since 15 June 2017, mobile operators in the EU/EEA are not allowed to levy any roaming surcharges for any fair usage of roaming services by their customers ('roam like at home', RLAH), except in a few cases duly authorised by national regulators to avoid any increase in domestic prices (see below on sustainability derogations).

We observe broadly successful implementation of the new roaming rules, overall consumer satisfaction and a considerable rise in travellers' roaming data consumption, as well as substantial increases in roaming voice calls since 15 June 2017. According to the last BEREC International Roaming Benchmark Report, despite the introduction of RLAH, the average retail revenue per user slightly increased in most Member States in Q3 2017 (first RLAH quarter) compared to Q2 2017.

NRAs have the responsibility to monitor and enforce EU roaming rules in the Member States. It is therefore necessary that all Member States have equipped them with the appropriate powers to penalise non-compliance with the rules.

According to the last BEREC International Roaming Benchmark Report, more than 95 % of EU/EEA subscribers are roaming-enabled. Almost 90 % of them benefit from RLAH. Less than 9 % are on an alternative roaming tariffs.

Sustainability derogations have been granted by national regulators to operators falling in categories which were foreseen to be likely candidates for the derogation, i.e. some mobile virtual network operators in several Member States and some mobile network operators in some of the very low-data-price Member States with high roaming imbalances and/or low revenues per user (Estonia, Lithuania, Finland). Even in the latter countries, more than 70 % of subscribers benefit from RLAH. In total, less than 2 % of EU/EEA subscribers are subject to a small roaming surcharge due to a derogation (RLAH+).

According to the last BEREC International Roaming Benchmark Report, on average in the EU/EEA roaming traffic was multiplied by 5.3 and 2.4 respectively for data and voice in Q3 2017 compared to Q3 2016. The increase in outbound roaming traffic was particularly high for operators in Poland, Romania, Latvia, Bulgaria, Croatia and Slovenia.

European Commission

Widespread use of roam like at home across Member States since 15 June 2017 (2/2).

% of EU citizens that are aware that since 15th June 2017 EU residents can use their mobile phone while travelling in the EU and pay the same as they would at home, 2017

- 71% — Yes, I am aware
- 28% — No, I am not aware
- 1% — Refusal
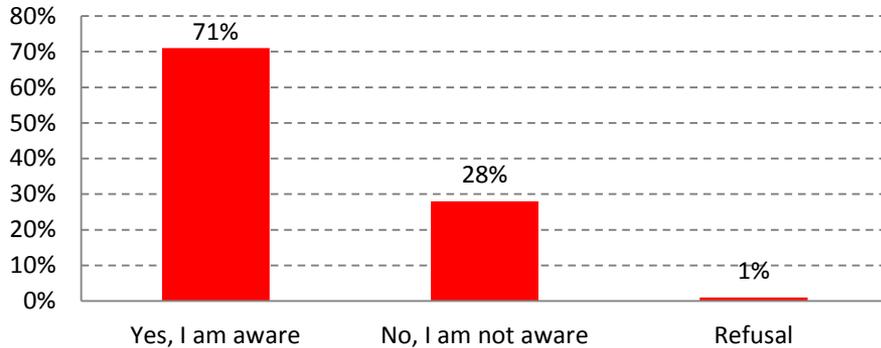
Do you think that you or someone in your family or among your friends will benefit from the end of roaming charges for the use of mobile phones abroad in the EU (multiple answers)? % of total answer, 2017

- Total "yes"
- Don't know
- No
- Yes, someone in your family or among your friends will benefit from it
- Yes, you will personally benefit from it
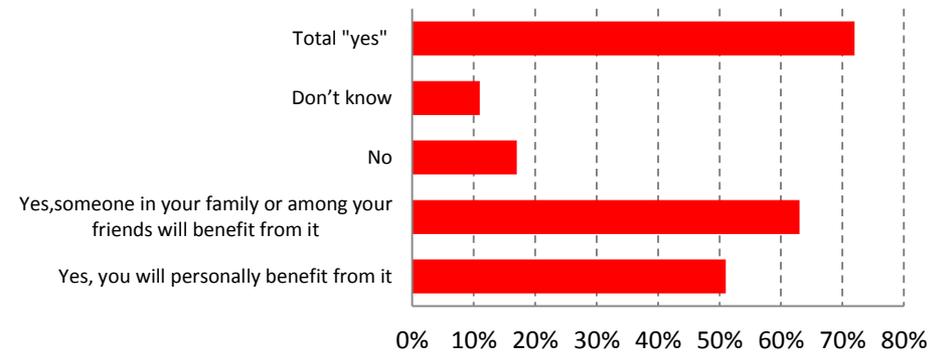
Domestic mobile service - monthly retail revenue per subscriber (ARRPU) - prepaid + postpaid, Q2-2017 - Q3-2017
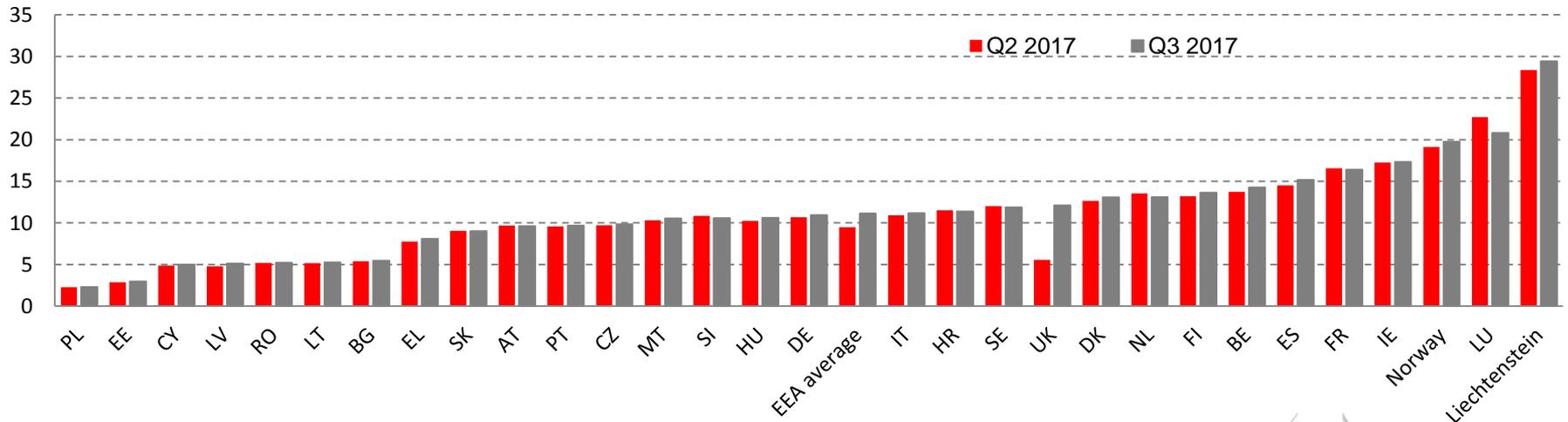
Legend: ■ Q2 2017 ■ Q3 2017

Categories: PL, EE, CY, LV, RO, LT, BG, EL, SK, AT, PT, CZ, MT, SI, HU, DE, EEA average, IT, HR, SE, UK, DK, NL, FI, BE, ES, FR, IE, Norway, LU, Liechtenstein

DESI Report 2018 – Connectivity

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European Commission

Member States' implementation of the net neutrality rules (Regulation (EU) 2015/2120) (1/2).

Under the EU net neutrality rules, Europeans must have access to the online content and services they wish, regardless of where this content originates from or is stored. These rights are established by directly applicable EU legislation and cannot be changed by mere administrative decision.

Specific BEREC guidelines and close cooperation between NRAs, BEREC and the Commission contribute to a consistent application of the rules throughout the EU.

Net neutrality issues

Many NRAs have started to analyse individual commercial offers emerging on the market on a case-by-case basis. Several NRAs launched investigations regarding zero-rating services and assessed them according to the BEREC guidelines. Some NRAs (e.g. in Germany, Hungary, Italy, Sweden, [Portugal]) found that the investigated zero-rating practice was in breach of Regulation 2015/2120, because it was accompanied by unlawful traffic management practices.

Several NRAs (e.g. in Belgium, Estonia and Latvia) found that the investigated zero-rating practice was compliant with the Regulation.

The business models on zero-rating services adopted by many EU operators have been generally open, without discriminating between specific content providers in a given category.

Other practices relevant from a net neutrality perspective were also identified: blocking of ports, availability of private IP addresses, video on demand as a specialised service, altering/routing of traffic, different treatment of traffic, use of deep packet inspection, free choice of modems and interruption of IP connections.

Net neutrality annual Reports

Under Article 5 of Regulation (EU) 2015/2120 national regulatory authorities are required to publish annual reports on their monitoring and findings and to share these reports with the Commission. The annual country reports on open internet from national regulators covering 2017 are available at:

https://ec.europa.eu/digital-single-market/en/news/annual-country-reports-open-internet-national-regulators-2017

European Commission

Member States' implementation of the net neutrality rules (Regulation (EU) 2015/2120) (2/2).

Net neutrality penalties

Article 6 of Regulation (EU) 2015/2120 stipulates that 'Member States shall lay down the rules on penalties applicable to infringements of Articles 3, 4 and 5'. The deadline to notify the Commission of these rules and measures was 30 April 2016.

By mid-February 2018 the Commission had received notifications in this regard from 22 Member States.

Penalties are in place in another three Member States (Croatia, Czech Republic, Italy), but these were not notified to the Commission.

In three Member States (Austria, Ireland and Portugal) there are as yet no penalties related to net neutrality.

Sanctioning power of NRAs

Most NRAs (e.g. in Belgium, Germany, Denmark, Finland, France, Greece, Hungary, Italy, Luxembourg, Latvia, Malta, Poland, Slovenia, Sweden, Slovakia and the UK) can impose such fines and penalty payments directly. There are only a few exceptions (e.g. Ireland).

Transparency measures

Several NRAs have adopted measures on the transparency obligations set out in the Regulation (for example: in Germany, Hungary and Lithuania)

The EETT in Greece is currently preparing a decision with more specific requirements for the implementation of Regulation (EU) 2015/2120. The decision will include requirements on the estimation of speeds, zero-rating and information transparency.

ANACOM in Portugal is considering preparing in 2018 some recommendations or communications to operators in order to support or improve implementation of the transparency measures in Article 4.

European Commission

Emergency Communications and the single European emergency number 112.

Main findings based on the 2018 report on the implementation of the European emergency number 112:

• The advanced mobile location (AML) handset-based caller location solution was launched in Belgium, Finland and Ireland, raising the number of AML countries to seven. Currently AML is deployed in Austria, Belgium, Estonia, Finland, Ireland, Lithuania and the UK. To boost the take-up of AML for the benefit of the public and emergency services, the European Commission launched in September 2017 a project to deploy AML in a further seven Member States in the next 2 years. AML provides an accuracy well below 100 m, which makes it possible to provide emergency assistance in good time.
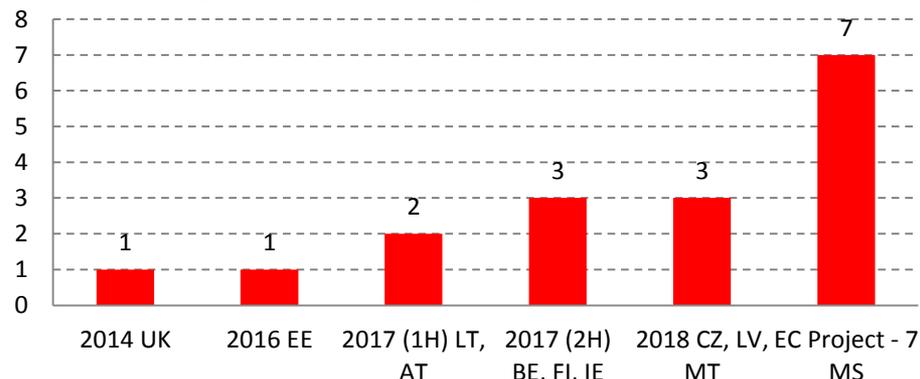
AML deployment and accessibility solutions for disabled end-users

Category	Value
2014 UK	1
2016 EE	1
2017 (1H) LT, AT	2
2017 (2H) BE, FI, IE	3
2018 CZ, LV, MT	3
EC Project - 7 MS	7

Source: EC - Implementation of the European emergency number 112

• In the reporting period AML was available only on phones with an Android operating system. As of spring 2018, Apple will also support AML as of the next update of iOS.

• 24 Member States reported implementing an alternative access to emergency services for users with disabilities. SMS to a long or short number is implemented in 20 Member States. User location for alternative means of access is available in only 10 Member States.

• According to the latest Eurobarometer e-communications household survey, almost half of EU citizens (49 %) identified 112 as the single number to call throughout the EU. This is a 1pp. increase since 2015 and 7pps since 2014.
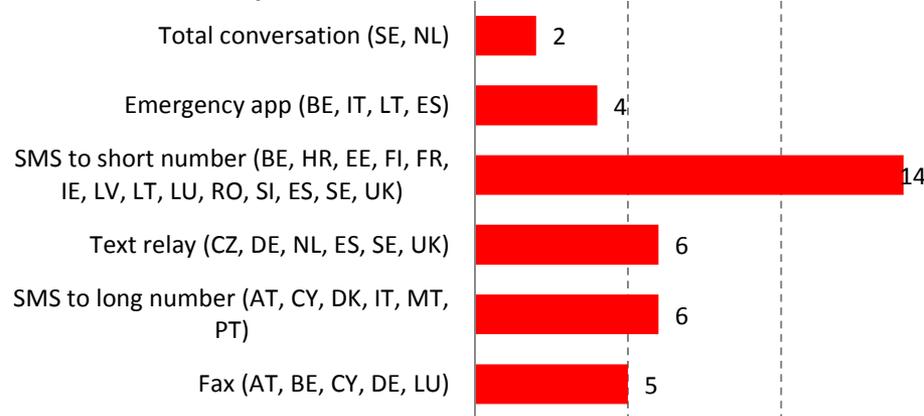
The Commission services are looking into the matter of the timely provision of caller location information and accessibility solutions for people with disabilities in several Member States.

AML accessibility solutions for disabled end-users

Category	Value
Total conversation (SE, NL)	2
Emergency app (BE, IT, LT, ES)	4
SMS to short number (BE, HR, EE, FI, FR, IE, LV, LT, LU, RO, SI, ES, SE, UK)	14
Text relay (CZ, DE, NL, ES, SE, UK)	6
SMS to long number (AT, CY, DK, IT, MT, PT)	6
Fax (AT, BE, CY, DE, LU)	5

Source: EC - Implementation of the European emergency number 112

European Commission