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**COMMISSION STAFF WORKING DOCUMENT**

# Digital Agenda Scoreboard 2013

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# Digital Agenda Scoreboard

## 1. EXECUTIVE SUMMARY

The EU economy was marked by recession in 2012. According to the latest Commission figures, annual GDP in 2013 is forecast to contract 0.1% in the EU and 0.4% in the Euro area. Unemployment is at unacceptable levels in many countries, particularly for the youth. Constrained by high levels of debt, governments are under pressure to cut public spending. Against this background, there are few potential sources of growth and employment. One of the most important sources is technological progress, including digitisation, and its adoption by society.

Adopting ICT and adapting businesses to new technology is a key factor of competitiveness for every company. Similarly, using ICT innovatively improves public services and reduces costs as well as making them easier for citizens and businesses to access from a distance. Moreover, despite the high overall unemployment, there are shortages of ICT specialists in the EU, forecast to reach up to 900 000 unfilled vacancies by 2015. Hence, completing the Digital Agenda for Europe[1] (DAE), adopted by the European Commission in 2010 is more than ever a priority for attaining the Europe 2020 objectives.

The Digital Agenda identified 101 specific policy actions across 7 domains: the digital single market; interoperability and standards; trust and security; fast and ultra-fast internet access; research and innovation; digital literacy, skills and inclusion; and ICT-enabled benefits for EU society. This combined set of actions is intended to stimulate a virtuous circle of investment in and usage of digital technologies. A review of the DAE adopted by the Commission in December 2012 outlined the areas where further emphasis was needed to attain those goals. The Digital Agenda Scoreboard reports on progress made in achieving the DAE goals.

This document is the third edition of the Digital Agenda Scoreboard, assessing overall impact on the basis of 13 key performance targets, and reporting on the progress of policy actions between June 2012 and May 2013. It is accompanied by a series of online publications looking in more detail at specific aspects of the Digital Agenda, such as digital competences or high-speed broadband[2]: http://ec.europa.eu/information_society/digital-agenda/scoreboard/index_en.htm.

There is much good news to report. For the last three years, regular internet usage has been rising steadily, especially among disadvantaged groups, while non-usage has been falling. Those users also do more online, more shop online and more use eGovernment services, including advanced ones. Roaming prices have fallen much faster than in the past, although this is primarily due to legislation, rather than to increased competition. Basic broadband coverage is nearly complete, although not all of it is ensured by fixed lines. Also, the market share of Light-Emitting Diodes continues its expansion course. In all of these areas, the targets are likely to be met.

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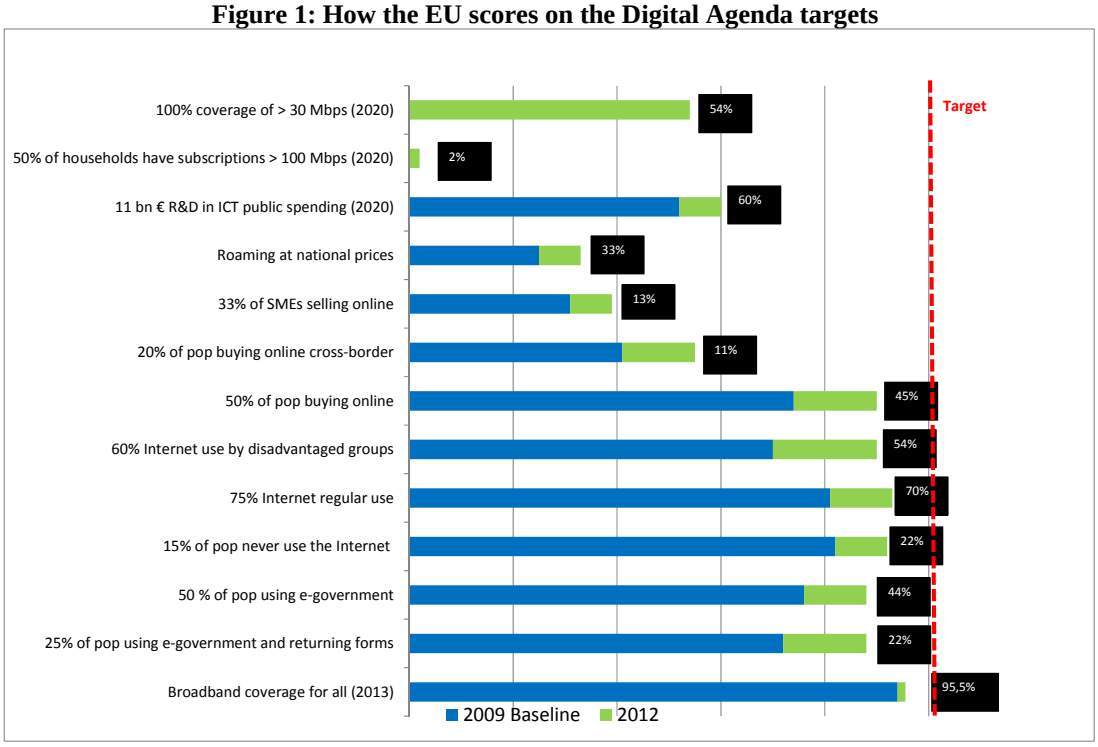
1 Available at http://ec.europa.eu/information_society/digital-agenda/index_en.htm.

2 The content of these online publications corresponds to what used to be published in the annual Digital Competitiveness Reports.

However, not all the news is good. On current trends, the target of 20% of citizens shopping online cross-border by 2015 is certain to be missed. Similarly, the share of SME selling online likely will remain far below the target of 33% by 2015.

Finally, for the 2020 targets it still is too early to tell. The take-up of high-speed broadband has started to accelerate, but is still very far away from the levels desired for 2020. Public R&D in ICT has grown, but so far by less than the average growth rate required to double by 2020.

**Figure 1: How the EU scores on the Digital Agenda targets**




*Source: Commission services*

The Commission has so far completed 61 actions under the Digital Agenda, while 8 have been delayed or are at risk of being delayed. The remaining 32 actions, under the responsibility of either the Commission or the Member States, are on schedule for completion by their respective deadlines.

The Digital Agenda was heavily front-loaded from the beginning, with a large number of actions scheduled for 2010 and 2011. As a result, the number of actions to be reported upon in this edition is smaller than in previous years. Indeed, for one of the pillars, R&D, there was no action to be completed this year. For some of the others, there was just one action to be named. Of course, this doesn't mean that no action is taking place; activities with a longer time horizon are on-going, as do activities not explicitly included in the Digital Agenda.

The Digital Agenda review, which was adopted at the end of 2012, defined 31 new actions. Nine of these actions have already been executed. These are included in this Scoreboard (section 5).

## 2. THE KEY PERFORMANCE TARGETS

Annex 2 of the Digital Agenda sets out the key performance indicators. This limited set of indicators provides numerical evidence of the progress towards a selected group of headline

targets. This section presents the performance of the EU with respect to these targets. As such, they do not follow the seven-pillar structure.

- **Key performance target 1a**: the entire EU to be covered by broadband by 2013.

The coverage of fixed broadband networks was stable in 2012 at 95.5% of the European population. Urban citizens in all Member states are well covered, but rural fixed coverage still stands below 80% in 10 member states, pointing to a gap in the use of structural funds, although it rises to above 90% in all but three (Slovakia, the Czech Republic and Estonia) if mobile coverage in rural areas is included. Including also satellite technology, coverage is almost complete at above 99.9%, but satellite take-up is not yet widespread in the rural areas.

At the same time, there are more and more public funding schemes supporting broadband rollout in Europe, but they are concentrated in the United Kingdom, Italy and Germany. In 2012, the European Commission took 21 decisions regarding broadband projects involving public funding. The total amount of broadband State aid approved in 2012 was approximately € 6.5 bn, which is more than three times higher than a year earlier, € 6 bn of which was accounted for by the three Member States mentioned.

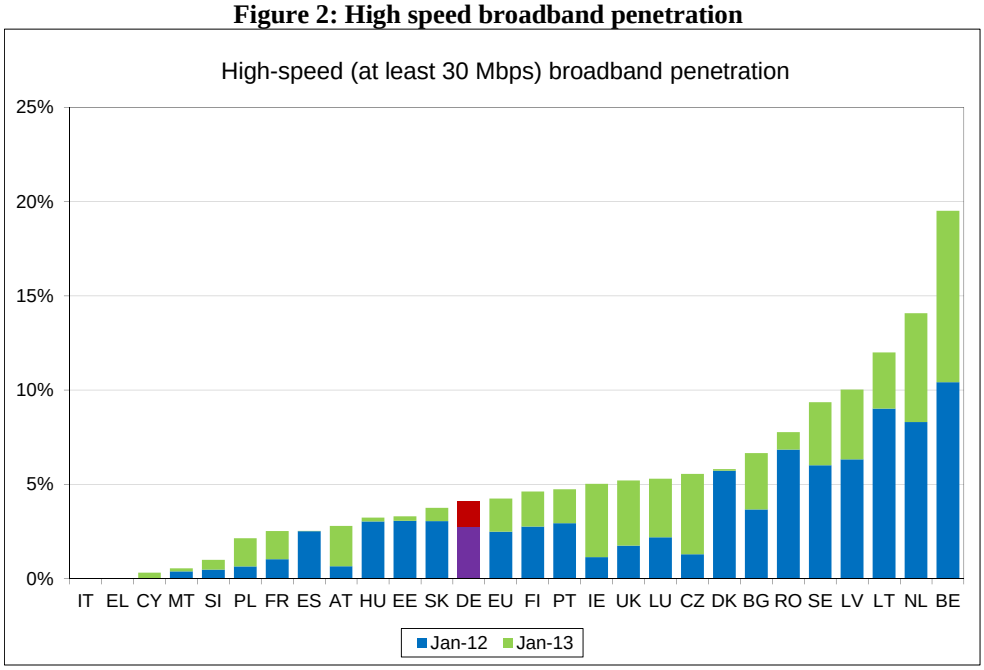
- **Key performance targets 1b and 1c**: the entire EU to be covered by broadband above 30 Mbps by 2020 and 50 % of the EU to subscribe to broadband above100 Mbps by 2020

High-speed broadband coverage and uptake is growing. Now, 54 % of households have access to fast or ultra-fast (above 30 Mbps) Internet access, up from 49% last year. The wider availability of high-speed connections is also reflected in uptake patterns. Indeed, 59% of all fixed broadband connections now provide speeds of 10 Mbps and above, and even growth in broadband subscriptions above 30 Mbps has taken off, with penetration going from 2.5% to 4.2% in one year (Figure 2). Interestingly, among the top six member states in terms of penetration above 30 Mbps, one can find Lithuania, Latvia and Romania, in a reversal of the ranking for basic broadband. The fastest growth by far can be observed in Belgium, adding 9.1 points in one year, which is more than the total achieved so far by 23 member states. Italy and Greece have only marginal high-speed broadband subscriptions. Superfast connections above 100 Mbps remain very scarce, but have doubled from 1.6 % to 3.4 % of total broadband connections.

- **Key performance target 2a**: 50 % of the population to buy online by 2015

Progress towards achieving the target of 50 % of the population using the internet to purchase goods and services is steady: in 2012 EU-wide the share stands at 45%, up another two percentage points since 2011 and eight since the Digital Agenda was launched. There are three groups of countries: the Nordics and the large Northwestern economies (plus Luxemburg) are already well beyond the target of 50%; especially the Nordics continue to progress rapidly, adding 3.5 points this year. A second group of countries from all regions is in line with the EU average and will most likely achieve 50% by 2015, as will the EU as a whole; Slovakia's performance of +8 points compared to 2011 stands out. Most of the Southern and Eastern member states are in a third group below 35%, which will find it quite a challenge to reach 50% by 2015. Nevertheless, some countries in this group made significant progress since 2011, with Portugal, Spain and Lithuania adding 4 points each.

**Figure 2: High speed broadband penetration**

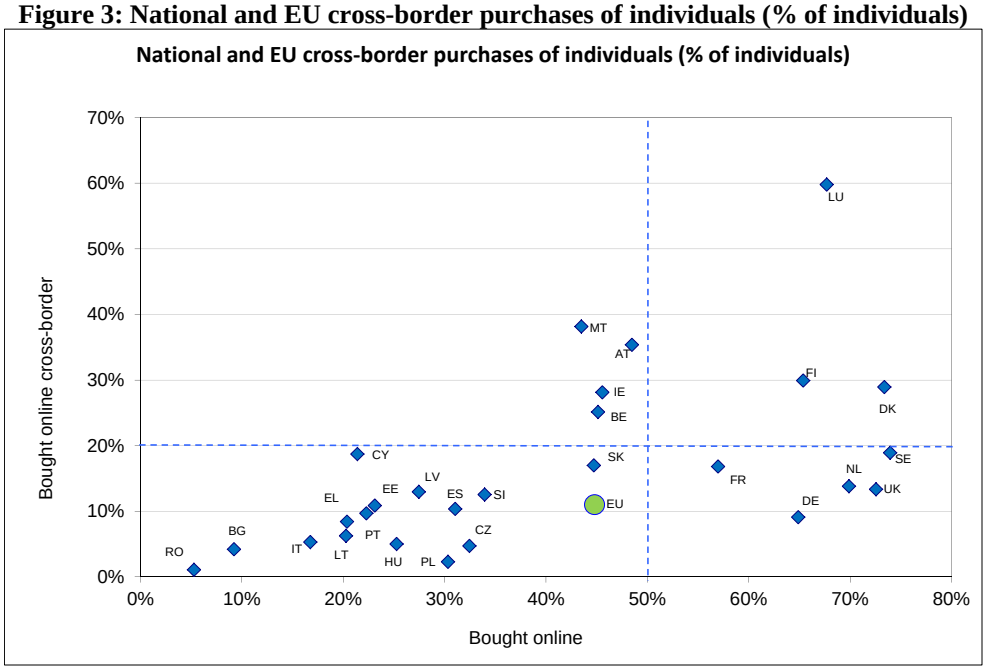



*Source: Commission services based on COCOM. Total number of subscriptions by households and enterprises divided by population.*

- **Key performance target 2b**: 20% of the population to buy online cross-border by 2015

The proportion of cross-border online purchasers remains low, reaching only 11%. While the gain of 1.4 points since 2011 is slightly larger than in the previous years, it remains too low to achieve the objective of 20% by 2015 (Figure 3)., Growth is concentrated in those countries already displaying relatively high levels, with Austria, Luxemburg and Ireland among the fastest growing, together with Slovakia and Latvia. However, in a number countries buying online from abroad remains a marginal activity, and in the Czech Republic, Poland and Romania there was no growth, either. At the other extreme, in the smallest countries Cyprus, Malta and Luxemburg, virtually all of those who buy online also buy from other member states.

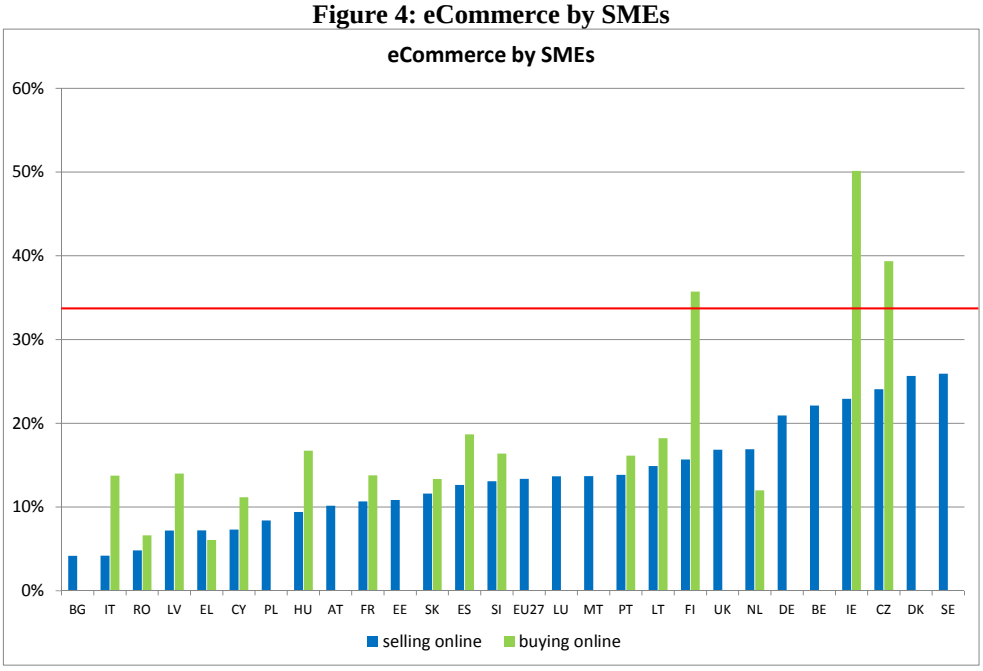
**Figure 3: National and EU cross-border purchases of individuals (% of individuals)**




*Source Eurostat, Community survey on ICT usage in households and by individuals, 2012: percentage of individuals between 16 and 74 who ordered goods or services for private use during the last year, and who ordered from sellers in other EU countries; horizontal lines represent targets*

- **Key performance target 2c:** 33 % of SMEs to make online sales/purchases by 2015

**Figure 4: eCommerce by SMEs**




*Source: Eurostat, Community survey on ICT usage and eCommerce in enterprises. (Enterprises with 10-249 persons employed purchasing/selling online in 2011at least 1 % of their orders/turnover; horizontal line represents both targets); data for eleven member states not available*

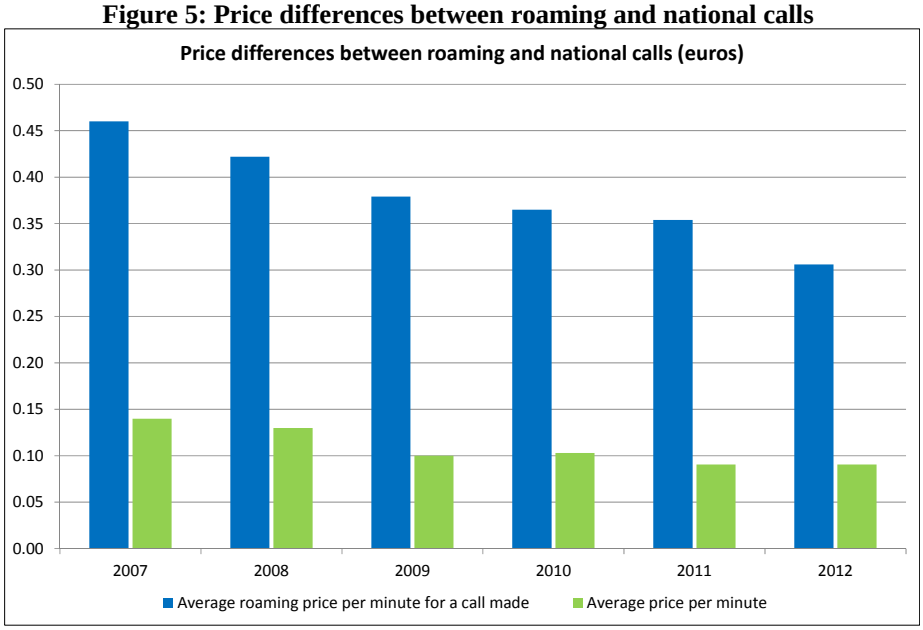
Online selling remains a niche activity for European SMEs, with only a quarter of SMEs using this distribution channel even in the best performing countries Denmark and Sweden (Figure 4). Moreover, adoption of eCommerce for selling is slow: across the EU the share went up by only 1 point from 12% to 13%. However, the fast growth of front runners Sweden

(+2) and Denmark (+3) shows that the slow increase is not due to natural saturation among SMEs; other relatively fast growing countries were the UK and Slovenia (+3). Online purchasing is much wide spread, but due to data limitations an EU level cannot be calculated[3].

- **Key performance target 2d**: the difference between roaming and national tariffs to approach zero by 2015

Roaming prices declined by 4.8 cents in 2012, which is four times faster than in the two previous years (Figure 5). However, roaming prices are still more than three times higher than national call prices. The decline is mainly due to the effects of the new roaming regulation which came into force on 1 July 2012 and is not the result of increasing competition.

**Figure 5: Price differences between roaming and national calls**




*Source: Commission services based on BEREC*

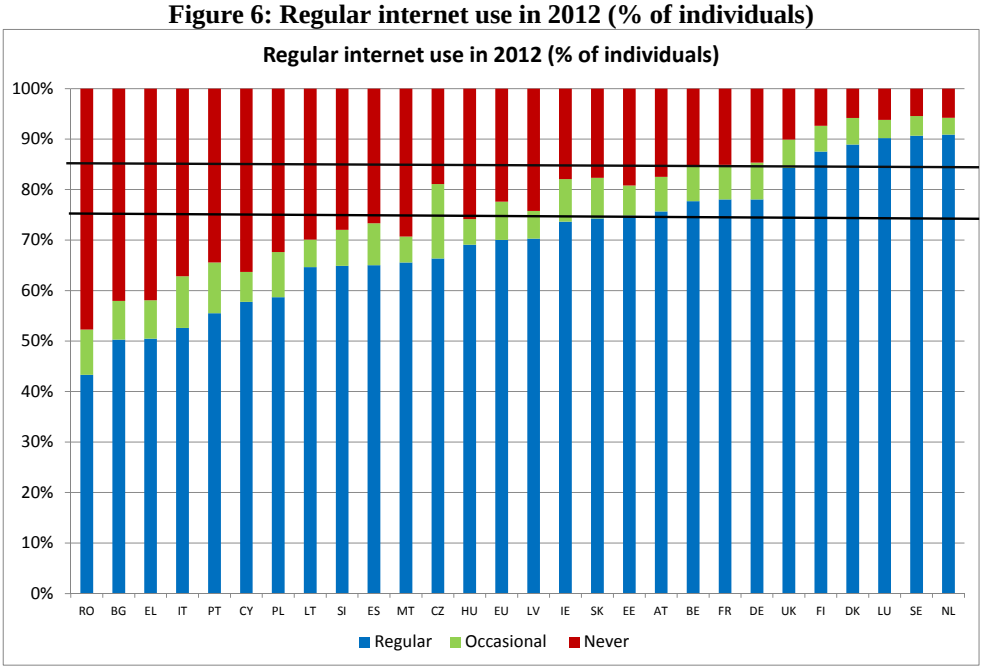
- **Key performance target 3a**: to increase regular internet usage from 60% to 75% by 2015, and from 41% to 60% among disadvantaged people.

- **Key performance target 3b**: to halve the proportion of the population that has never used the internet from 30% to 15% by 2015

Regularly Internet use continues its road to becoming the norm in Europe, adding another two percentage points in 2012 to reach 70% (Figure 6). This brings total progress since the launch of the Digital Agenda to 10 percentage points, two thirds of the targeted 15 points. Conversely, the percentage of non-users has fallen last year by 2 points to 22%, compared to an initial level of 30% in 2009. Most of the growth in use now comes from the lower half of the table, with Romania and Portugal both achieving the fastest growth in regular use (+6% and +4% respectively) and the fastest decline in non-use (both -6%). France and Luxemburg managed to add roughly 4 points despite already high initial levels, showing that even in the upper half of the table there is still room for growth.

[3] National data collection has become optional since 2011, which is why data are available only for sixteen Member States accounting for just over half of the EU population.

**Figure 6: Regular internet use in 2012 (% of individuals)**



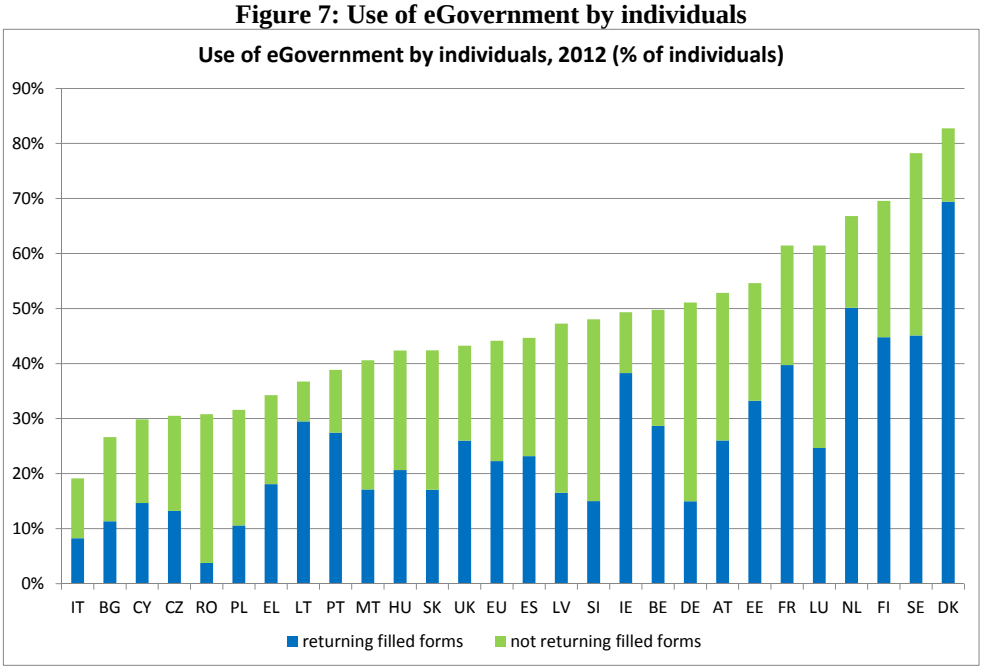

*Source: Eurostat, Community survey on ICT usage in households and by individuals; persons aged 16-74 using the Internet at least once a week or never; the rest is classified as occasional users; horizontal lines represent targets*

The use of the internet by disadvantaged groups continue to slowly catch with the overall population. Their level of regular Internet use went up last year by 3 percentage points to 54%, bringing overall progress to 13 points compared to 2009. The share of disadvantaged individuals who used the Internet daily was 43% in 2012, up from 40% the year before,, while regular but not daily use remained at 11%. Continuing progress at the current rates would result in achieving all three targets by 2015.

- **Key performance target 4a**: 50 % of citizens to use eGovernment by 2015, with more than half returning completed forms

The proportion of citizens using the internet to interact with public authorities has resumed growth, reaching 44% in 2012 after 41 % during the two preceeding years (Figure 7). Interestingly, the best performances were spread all the way from the bottom of the table (Romania with a jump of +24, Greece and Lithuania +7 each), through the middle (Latvia and Spain +6 each), to the top (Sweden and France +5). Remarkably, the share of those eGovernment users actually returning completed forms remains stable at 50 %, although national figures vary widely, between Romania, where only 10% of eGovernment users send back filled forms, to Denmark, where 85% do. One should note that low overall use can go along with a high share of sending back forms (Lithuania 80%), while high use can go along with a relatively low share (Luxemburg 40%).

**Figure 7: Use of eGovernment by individuals**




*Source: Eurostat, Community survey on ICT usage in households and by individuals, 2012; percentage of persons aged between 16 and 74 using eGovernment services in the last 12 months; horizontal lines represent targets*

- **Key performance target 4b**: all key cross-border public services, to be agreed by Member States in 2011, to be available online by 2015

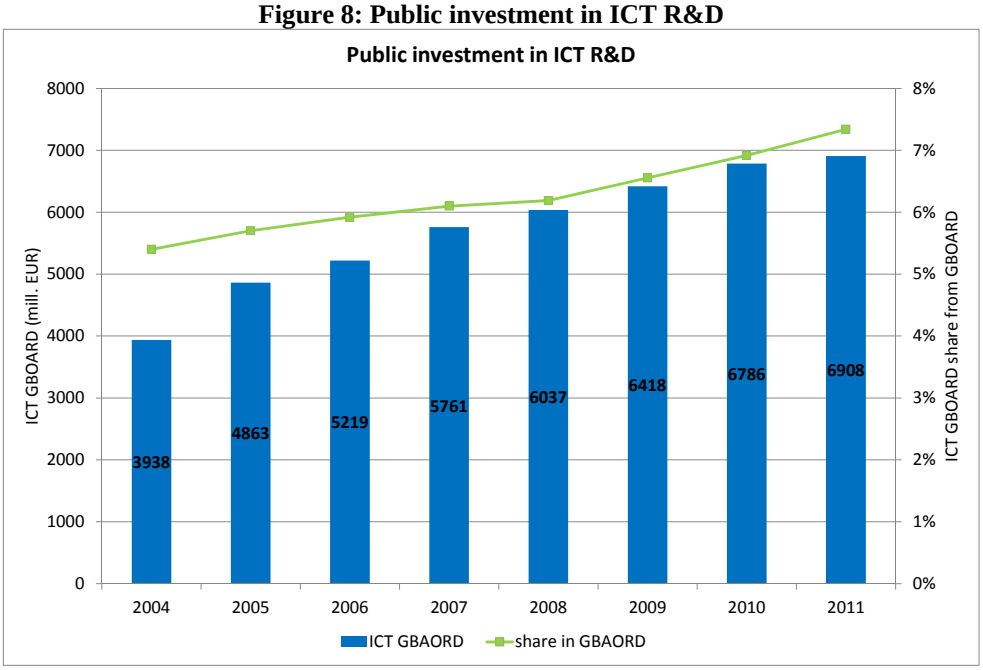
Member States have not yet agreed on a list and the discussion is ongoing.

- **Key performance target 5**: to double public investment in ICT R&D to €11 bn by 2020

In 2011, public investment in ICT R&D (Figure 8) suffered from the budgetary restraints in member states, increasing by only 1.8%, compared to a required annual growth of 5.5% between 2007 and 2020 in order to reach the target. Although recent estimates for the previous years have been slightly revised up, the result is that public R&D in ICT is currently roughly 3% below the required trajectory. It is also interesting to note that the share of ICT in publicly funded research continues to increase, reaching 7.3%. Indeed, it is thanks to this increased share that public R&D in ICT rose at all and did not fall like overall public R&D. Regarding business R&D in ICT[4], in 2010 it recovered a bit from the 7.4% fall of the previous year, growing by 2.7% according to provisional estimates. However, this partial recovery obviously was not yet sufficient to return to pre-crisis levels.

[4] Sectoral BERD figures are released with a significant delay, which is why values refer to an earlier year than estimates for public R&D in ICT

**Figure 8: Public investment in ICT R&D**




*Source: IPTS5. Values for EU-27 in EUR m. NB: the baseline estimate for 2007 has been revised due to a new methodology;*

- **Key performance target 6**: to reduce energy use of lighting by 20% by 2020

The shift towards energy-efficient lighting is happening fast. Indeed, the market share in value of solid-state lighting such as light-emitting diodes (LEDs and OLEDs), which consume little energy, increased from 12.8% in 2011 to 14.4% in 2012, an eight-fold increase compared to the Digital Agenda starting point of 1.7% in 2009. It is to be expected that this rapid growth will continue apace in the remaining years of the Digital Agenda, ensuring that the target will be met.

## 3. INVOLVING STAKEHOLDERS

The Commission will continue to cooperate and engage with Member States and stakeholders to ensure successful implementation of the Digital Agenda. Throughout last year, engagement helps to shape the policy approach; ideas and issues that emerged from online discussions, the Digital Agenda High Level Group and set-piece events such as the Digital Agenda Assembly 2012 and visits to all Member States ("Going Local") contributed towards the content of the DAE Review (see below under 6).

Online engagement was the focus of much of the outreach efforts, and was often tied in with events such as the Digital Agenda Assembly and the Going Local series of visits. Contributors were able to post comments and suggestions, and to respond to blogposts and tweets by Commission officials and Vice President Kroes.

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5 Stancik, J. (2013 Public ICT R&D Funding in the EU . Institute for Prospective Technological Studies, JRC Technical Report (forthcoming); will be available at http://http://is.jrc.ec.europa.eu/pages/ISG/PREDICT.html.

The annual Digital Agenda Assembly in Brussels in June 2012 facilitated discussions on progress towards implementing DAE targets, and seeking solutions to challenges. Around 1100 stakeholders attended and participated via a series of interactive workshops and plenary sessions, participation was also be possible via a variety of online and social media tools.

Going Local - the annual outreach initiative whereby the European Commission undertakes visits to each Member State –built upon the previous two exercises. Online and social media engagement before, during and after the visits enabled detailed discussions tailored specifically to the needs of each Member State.

Finally, the Digital Agenda High Level group, made up of Member State representatives, met regularly throughout the year to discuss implementation of the DAE at a national level. In 2012, Member States took part in a study to monitor progress of DAE actions specific to them; the data can be updated by Member States in real time, to reflect changes in status.

## 4. KEY POLICY ACTIONS IN THE THIRD YEAR

The Digital Agenda is structured into seven 'pillars': A vibrant digital single market, Interoperability and standards, Trust and security, Fast and ultra-fast internet access, Research and innovation, Enhancing digital literacy, skills and inclusion, and ICT-enabled benefits for EU society. The following sections address policy actions planned under these pillars for June 2012 to May 2013 in the Digital Agenda.

### 4.1. A vibrant digital single market

As shown by the data on eCommerce (see section 2), buying online is still very much a national activity. Moreover, growth rates for cross-border eCommerce are low, which poses a real challenge for the digital economy. After the numerous proposals in 2011, last year saw a more measured activity, focused on aspects related to intellectual property, consumer confidence, complemented by the new roaming regulation.

On intellectual property, on 11 July 2012 the Commission adopted a proposal for a Directive on collective rights management and multi-territorial licensing of rights in musical works for online uses. The proposal aims at ensuring that right holders have a say in the management of their rights and envisages better functioning collecting societies as a result of the set standards all over Europe. The proposed directive will also ease the multi-territorial licensing of authors' rights for the use of music on the Internet. This should lead to improved access to and more offer of music online.

On 18 December 2012, the Commission adopted a Communication on content in the Digital Single Market. It introduces a structured stakeholder dialogue, which was launched in February 2013 and seeks to deliver rapid progress in four areas through practical industry-led solutions: cross-border access and the portability of services; user-generated content and licensing for small-scale users of protected material; facilitating the deposit and online accessibility of films in the EU; and promoting efficient text and data mining for scientific research purposes. In parallel, the on-going review of the EU legal framework for copyright, based on market studies, impact assessment and legal drafting work, aims to reach a decision in 2014 on whether to table legislative reform proposals.

From December 2012 to March 2013, the Commission opened a public consultation on the efficiency of proceedings and accessibility of measures regarding civil enforcement of intellectual property rights. These data will enable the Commission to conduct a comprehensive assessment of the functionality of civil enforcement systems put in place in the Member States. The responses are currently being evaluated.

The Commission's work on payments has been pursued. Following the Green Paper on an integrated European market for card, internet and mobile payments, and the subsequent public consultation, the Commission plans to adopt a legislative initiative on multilateral interchange fees and a proposal for a review of the Payment Services Directive in the second quarter of 2013.

To increase consumer confidence in the Digital Single Market the Commission has completed two actions last year. On 17 December 2012, a Code of EU online rights, compiling the basic set of rights existing in EU legislation and related to the digital environment, was integrated in Your Europe - Citizen's portal. In fact, European citizens enjoy a series of rights that are relevant to the digital environment, such as freedom of expression and information, protection of personal data and privacy, requirements for transparency and universal telephone and functional internet services and a minimum quality of service. However, these existing rights are scattered across various EU legal instruments and are not always easy to grasp. The Code intends to raise awareness and understanding about key digital rights of EU citizens.

On 21 March 2013, Commission services published a study on "EU online Trustmarks – Building Digital Confidence in Europe". This study provides an analysis of the current state-of-play on trustmarks in Europe. Four policy options are reviewed by the study and the final report addresses the pros and cons of these options. The Commission is currently considering the results of the study.

Moreover, the 2011 Commission proposals for a Directive on Alternative Dispute Resolution for consumer disputes and for a Regulation on Online Dispute Resolution for consumer disputes were adopted by the Council and the European Parliament on 22 April 2013. They include in particular the setting up of a European online dispute resolution platform by the Commission which will allow consumers and traders resident in the EU to submit to the competent alternative dispute resolution entity, electronically and in any EU official language, their complaints relating to an online sales or service contract.

Finally, considering that the decline of roaming prices in recent years has been too slow, the new roaming regulation was adopted on 13 June 2012 and entered into force on 1 July 2012. It further lowers existing ceiling for voice calls and SMS, introduces a ceiling for data roaming, promotes transparency of roaming charges, and provides for a safeguard against unexpected roaming bills.

### 4.2. Interoperability and standards

Interoperability between ICT services and applications is a key necessity for a productive economy, and standards are vital for interoperability. Nevertheless, as far as envisaged measures to license interoperability information are concerned, following a public consultation on Access to Interoperability Information of Digital Products and Services, legislative measures do not appear to be appropriate to address the issues at stake. A staff working document describing the various outcomes will be published soon. Subsequently, the potential of non-legislative measures will be explored in 2013, such as the development of model licences for interoperability information and guidelines for estimating the value of interoperability information.

In addition, in the second quarter of 2013 the Commission intends to adopt a Communication presenting guidelines that should help public authorities to make better use of standards in order to avoid being locked-in into ICT systems. This should also increase the number of responses to call for tenders for ICT public procurements. In support of the approach outlined in the Communication, the Commission will organise meetings where public authorities can

exchange best practices and a light monitoring program will be set up in order to measure the effects of the better use of standards.

### 4.3. Trust and security

The increasing importance of ICT networks for the economy makes attacks on these networks both costlier and more attractive to cyber-criminals. For the Cybersecurity Strategy of the European Union, see the new actions under the refocused Digital Agenda (section 5).

### 4.4. Fast and ultra-fast internet access

A key objective of ICT policy in all advanced economies is to ensure ubiquitous Internet access at speeds fast enough to enable the network-based knowledge applications needed for tomorrow's competitiveness. In the past year. the Commission's focus was on discussions with member states on funding for high-speed broadband deployment.

As part of the revision of the European Structural and Investment Funds period for the 2014-2020, in October 2012 the Commission services adopted positions on the development of the Partnership Agreements and programmes underlining the need for broadband deployment where appropriate. Regarding the Connecting Europe Facility (CEF), in February 2013 the budget proposed by the Commission for digital networks and services infrastructure of €9.2 bn (in constant 2011 prices) was cut to € 1 bn in the conclusions of the European Council on the Multi-annual Financial Framework (MFF) for the period 2014-2020.

As far as the implementation of national broadband plans by the end of 2012 is concerned, Member States' national broadband plans remain incomplete, and not all of them address how to reach the DAE broadband targets.

For broadband state aid guidelines and civil engineering cost reductions, see the new actions under the refocused Digital Agenda (section 5).

### 4.5. Research and innovation

After the adoption by the Commission of the major revision of ICT R&D support by the European in the Horizon 2020 at the end of 2011, there was no legislative action due for completion in 2012/13.

### 4.6. Enhancing digital literacy, skills and inclusion

The Internet and ICT have reached most of society, but not all European citizens are equipped with the skills needed to achieve the goal of 'Every European Digital' by 2015, Europe needs to develop the ICT skills base of its population, in particular its labour force, and to ensure that all citizens can access the Internet.

On 3 December 2012, the European Commission adopted a proposal for a Directive on the accessibility of the public sector bodies' websites. This Directive would introduce mandatory EU standardised accessibility features, from the end of 2015, for 12 types of websites, including websites for essential government services like social security and health related services, job searches, university applications and issuing of personal documents and certificates.

Regarding digital literacy, the Gdansk Roadmap for Digital Inclusion was developed through stakeholder consultation and had already been launched in October 2011. However, the development by Member States of long-term e-skills and digital literacy policies, which was due by the end of 2011, is not yet complete in all Member States.

The development of an online interactive platform for consumer education, including materials on new media technologies and media literacy has resulted in a community educational website called "Consumer Classroom", aimed at teachers of 12-18 year-olds, which was launched on 15 March 2013. The updated Code of EU online Rights takes into account the latest legislative developments.

Last but not least, work on the identification and recognition of what one understands under digital literacy/competences has been integrated into the Grand Coalition on Digital Jobs (see the new actions under the refocused Digital Agenda, section 5).

### 4.7. ICT-enabled benefits for EU society

ICT is a cornerstone of many policy initiatives, therefore not limited to technology policy or to the ICT sector. In 2012, key initiatives concerned energy efficiency, intelligent transport, health, cultural heritage, and efficient public administration.

Concerning energy efficiency, the new Energy Efficiency Directive 2012/27/EU was adopted on 25 October 2012. The Directive foresees amongst other measures an exemplary role to be played by the public sector in driving energy efficiency improvements through public procurement of energy-efficient products (notably office equipment covered by the EU-US Energy Star Agreement) and services. Green Public Procurement criteria for street lighting and indoor lighting were published in early 2012. Moreover, the final results of a study on Methodologies to Measure the Potential of Smart Grids for Green House Gas Reductions was finalised on 4 June 2012.

Regarding intelligent transport and intelligent energy, on 10 July 2012 the European Commission launched a Smart Cities and Communities European Innovation Partnership (SCC), by joining ICT to the existing SET-PLAN Smart Cities and Communities Initiative. This Partnership will bring together the demand and the supply of innovative solutions, pool research and innovation resources from energy, transport and ICT, and focus them on actions that demonstrate and propagate cost-effective technological and innovative non-technological solutions that are on the verge of commercialisation. Regarding EU support to showcase commercial-scale solutions, for 2013 alone, € 365 million in EU funds have been earmarked for the demonstration of these types of urban technology solutions..

As far as health is concerned, the eHealth Network set-up by Article 14 of Directive 2011/24 on patients' rights in cross-border healthcare, which is composed of national authorities responsible for eHealth, plans to draw up guidelines on non-exhaustive data set for patients summary/electronic health records that can be exchanged across borders by November 2013. These guidelines will enhance interoperability between electronic health systems and continuity of care and to ensure access to safe and quality healthcare.

In terms of cultural heritage, on 26 September 2012 the Commission presented a strategy to unlock the full potential of the cultural and creative sectors in the EU to boost jobs and growth. This strategy focuses on the promotion of a modern regulatory environment and stronger partnerships between different policies, in particular culture, education, industry, economic affairs, tourism, urban and regional development, and territorial planning. It also proposes a €1.8 billion 'Creative Europe' programme for 2014-2020.

The Commission Recommendation on the digitisation of cinemas (originally planned for 2011) has been transformed into a proposal for a Council Recommendation on European film in the digital era, with an enlarged scope including film heritage, new models of on-line distribution and media chronology. It is now is due to be adopted in the second quarter of 2013.

Regarding the improvement of efficiency in public administration, the European Commission adopted its ambitious IT strategy "e-Commission 2012-2015" on 1 August 2012. The new strategy aims among others to improve the transparency of the Commission and to eliminate digital barriers between European public administrations. The strategy is guided by principles such as openness and reusability. It will be implemented via a rolling action plan, which is updated on annual basis.

On 17 December 2012 the review of the Public access to Environmental Information Directive was published, finding that application of the Directive has substantially improved access to environmental information on request. However, as the emergence of an information society requires a shift from an approach dominated by information-on-request needs to an approach centred on active and wide dissemination using the latest technologies, the Commission offers to help Member States to structure information better for active dissemination.

Finally, the 4th meeting of the eGovernment Expert Group took place on 22 February 2013. Member States and the Commission pointed out the progress on cross-border public service activities in the new Large Scale Pilot eSENS,. In their meeting the eGovernment Expert Group agreed to endorse a number of focus areas and key enablers for digital cross border public services.

## 5. THE DIGITAL AGENDA 2012 REVIEW

A large majority of actions having been scheduled for the first three years, the Commission revisited the strategy in a review adopted in December 20126 and refocused the Digital Agenda on the following key areas:

- Creating the world's largest and richest digital single market for content and services;
- Speeding up public sector innovation;
- Stimulating private investment in high-speed fixed and mobile broadband networks,;
- Creating the world's largest cloud enabled ICT market;
- Fostering a secure and trustworthy internet environment,
- Spurring innovative web-based ventures and promoting digital skills
- Funding key enabling technologies.

For each of these areas, the refocused Digital Agenda proposes one key transformative action, complemented by supporting actions, a total of 31 actions altogether. Despite the short time span since its adoption, nine actions have already been carried out.

6 The Digital Agenda for Europe – Driving European Growth digitally, COM (2012) 784 of 18.12.20012, available at http://ec.europa.eu/digital-agenda/en/news/digital-do-list-new-digital-priorities-2013-2014

- The European Cloud Partnership, bringing together industry and the public sector to establish a Digital Single Market for cloud computing in Europe, was established on 19 November 2012.
- On 5 December 2012, the Commission launched a Global Alliance against Child Sexual Abuse Online in close cooperation with the EU Member States and the United States.
- On 19 December 2012 the European Commission adopted revised guidelines for the application of EU state aid rules to the broadband sector, containing in particular a reinforcement of open access obligations and improved transparency rules.
- On 7 February 2013, the Commission adopted its cyber security strategy "An Open, Safe and Secure Cyberspace", representing the EU's comprehensive vision on how best to prevent and respond to cyber disruptions and attacks.
- Simultaneously, it adopted a proposal for a Directive on Network and Information Security, a key component of the overall strategy requiring all Member States, key Internet enablers and critical infrastructure operators to ensure a secure and trustworthy digital environment throughout the EU.
- On 4 March 2013, the Commission launched the Grand Coalition for Digital Jobs, a multi-stakeholder partnership to address the persistence of a large number of unfilled vacancies for ICT specialists.
- On 26 March 2013, the Commission adopted a proposal for a Regulation on cost reductions for civil engineering works, which account for up to 80% of the cost of installing broadband networks. By avoiding unnecessary digging, the Commission's draft Regulation could save between 40 and 60 billion euro or up to 30% of the total investment costs.
- On 24 April 2013, the Commission adopted a Green Paper: Preparing for a Fully Converged Audiovisual World: Growth, Creation and Values, exploring what convergence of digital technologies and content could mean for Europe's economic growth and innovation, cultural diversity, and consumers, especially those that may need protection, such as children.
- On 23 May 2013, the Commission proposed a New European Industrial Strategy for Electronics. By better coordinating public investments in micro- and nano-electronics (such as semiconductors and computer chips), it is designed to expand Europe's advanced manufacturing base and to mobilise €100 billion in new private investments. On the same day, five major projects were launched as a first step of implementation of the strategy.

Progress on the other actions will be reported in the future editions of the Digital Agenda Scoreboard.

## 6. READ MORE

The evidence provided in this document represents only a small part of the data available to measure the progress of the Digital Agenda. A more detailed analysis can be found under http://ec.europa.eu/information_society/digital-agenda/scoreboard/index_en.htm.

# ANNEXES

# 1. STATE OF THE TELECOMS SERVICES SECTOR IN EUROPE

## 1.1. Introduction

The European telecoms sector experienced a decline in revenues of -1.1%[7] in 2012. While this decline is less than in 2011 (-2.2%), it contrasts with the trend in other regions such as the US and the rest of the world, where revenues for telecoms services experienced 5.1% and 5.8% year-on-year increases respectively in 2012.

**Table 1: Revenues of the EU telecoms sector**

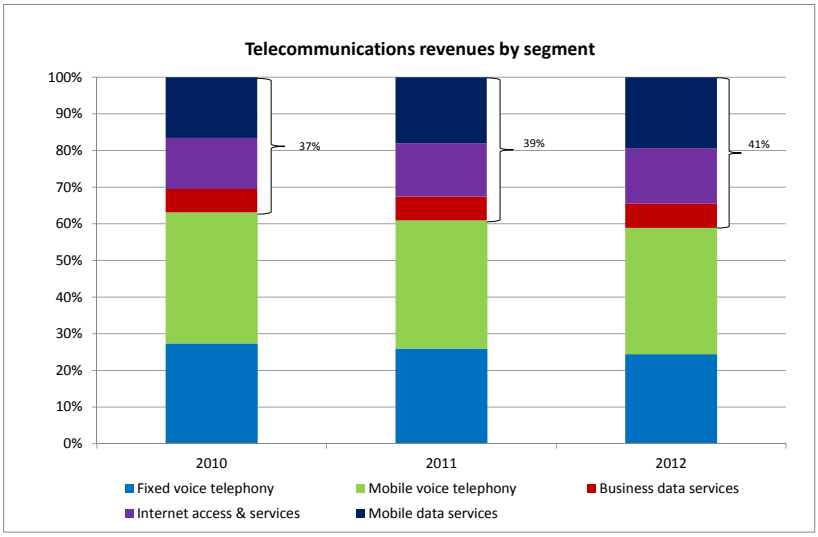
| | Growth rate 2010/2011 | Growth rate 2011/2012 | Share in e-comms service revenue |
|---|---|---|---|
| **Fixed voice and Internet access and services** | -2.2% | -1.1% | 39% |
| Fixed voice telephony | *-7.2%* | *-7%* | *24%* |
| Internet access and services | *2%* | *2.4%* | *15%* |
| **Mobile voice telephony and mobile data services** | -1%+ | 0.4% | 54% |
| Mobile voice telephony | *-4.4%* | *-2.7%* | *34%* |
| Mobile data services | *6.3%* | *6.3%* | *19%* |
| **Business data services** | 0.3% | 1.1% | 7% |
| **Total telecom services (carrier services)** | -2.2% | -1.1% | 100% |

*Source: EC services based on EITO 2012*

In absolute figures, carrier services revenues were estimated at EUR 234.6 billion in 2012. This compares to EUR 237.2 billion in 2011. Voice services (fixed and mobile) are still the main contributor, accounting for 59% of revenues of EU telecom operators, but their relative size continues to decrease (-7% growth in fixed voice telephony and -2.7% in mobile). Data revenues continue to grow, in particular revenues for mobile data services (6.3% growth compared to a 3.5% growth for fixed data). Data revenues account for 41% of the sector (Figure 1).

[7] EITO 2012. Figures on growth in the different segments are based on data for 13 Member States that represent around 85% of the EU market

**Figure 1: Telecommunications revenues by segment**




*Source: EC services based on EITO 2012*

## 1.2. Key developments in 2012

In 2012 telecoms operators struggled to reverse the declining trend in revenues and margins, focusing on retaining customers and increasing ARPU, amidst a combination of challenging elements:

- very high penetration of current generation of fixed and mobile telephony and of fixed-line broadband access[8] in several countries, with limited prospects for organic growth;
- downward pressure on telecoms pricing driven by a number of factors including competition and shrinking demand for services in several countries heavily affected by the financial and economic situation[9];
- rapidly growing demand for fixed and mobile data traffic driven by the fast spread of smartphones and tablets[10]. This brought about a further commoditization of voice, both in fixed and more and more in mobile services, that was not compensated by the steady increase of mobile data revenues.

### *1.2.1. Growth of mobile traffic*

The gap between the impressive growth in traffic and the much lower growth in data revenues is having a clear impact on the sector. Between 2010 and 2012, revenues from data services increased by 8%. By contrast, the proportion of the European population using a mobile phone to access the Internet nearly doubled, going from 14% to 27% in 2012[11] and the demand in traffic has been doubling every year. The volume of mobile data traffic in Europe is expected to grow more than tenfold in the period from 2010 to 2015[12] and global growth

[8] See chapter on broadband.

[9] Especially in Greece, Spain and Ireland. The state of the economy deteriorated in 2012 at European level with a -0.6% GDP growth rate in the euro area and -0.3% in the EU27 compared to 2011.

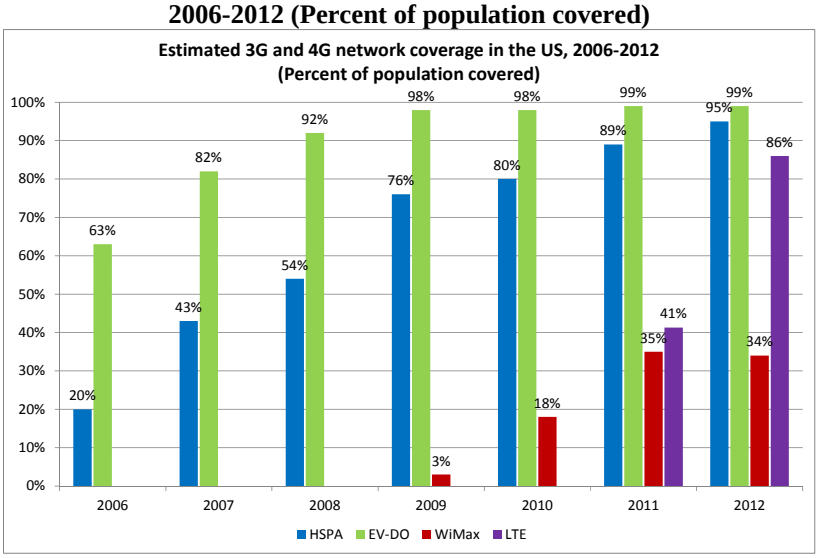
[10] In 2011, tablet shipment volume soared by more than 150% year-on-year in most Western European markets, with France and Italy both seeing shipment growth more than tripling and Switzerland and Austria seeing shipment volume almost tripling (EITO 2012). In 2012 the market for tablets was estimated at 117 million units (IDC, 19/09/12).

[11] Eurostat

[12] *Europe clears the way for 4G*, ScreenDigest, January 2012

surged by an estimated 350% between 2010 and 2012 (Figure 3). It is estimated that, in 2012 alone, mobile data traffic increased by 69%, with 3G data representing almost 50% of the total and with an acceleration of LTE traffic (+207% y-o-y growth)[13]. In 2012 a fourth-generation (4G) connection generated 19 times more traffic on average than a non-4G connection and although 4G connections represent only 0.9% of mobile connections they account for 14% of mobile data traffic. At the same time, the price of mobile data in the EU is amongst the lowest in the world, with some data plans being less expensive in the EU than in other regions of the world (Figure 4). Since achieving full coverage of 4G networks offering higher speed access may still take some years, rapid adoption of 4G services at higher prices is not expected. This compares badly to the rapid rise of LTE subscribers in South Korea, where it only took a few months to double the number of subscribers from ten to twenty million[14], or to the wide coverage of LTE networks in the US, which doubled from 41% to 86% of the population in one year[15].

**Figure 2: Estimated 3G (HSPA and EV-DO) and 4G (WiMax and LTE) network coverage in the US, 2006-2012 (Percent of population covered)**




*Source: FCC*

As in the fixed broadband markets, mobile operators need to find the right pricing strategies to convince mobile users of the benefits of adopting more expensive 4G services thereby increasing mobile ARPU[16].

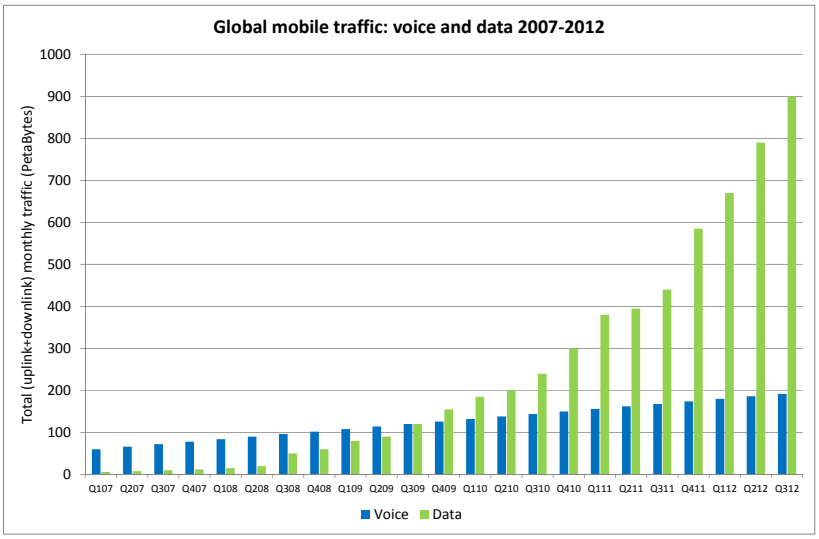
[13] ABI Research, March 2012

[14] *LTE subscriptions in South Korea top 20 million*, TeleGeography, April 2013

[15] *16th wireless service competition report*, FCC, March 2013

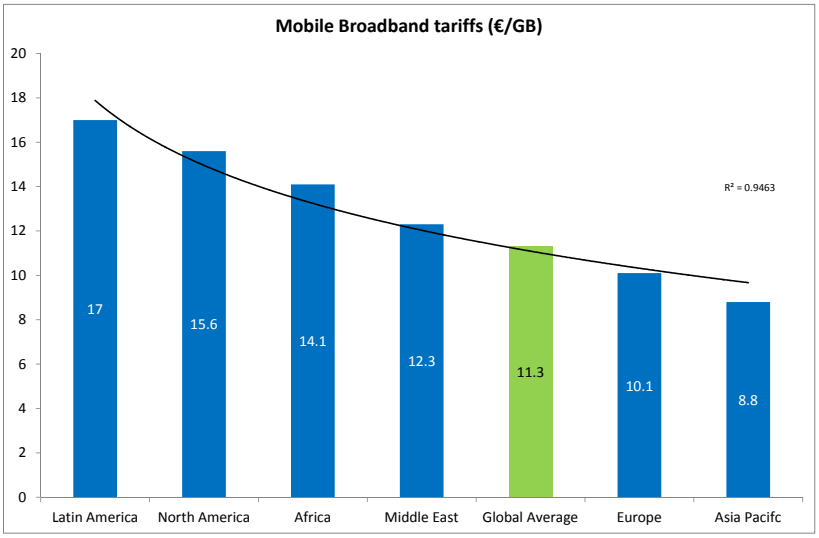
[16] *4G - going faster, but where?* Arthur D. Little - Exane BNP Paribas report 2013, April 2013. Chapter four provides additional data on the perceived barriers to the use of the mobile internet by consumers

**Figure 3: Global mobile traffic: voice and data 2007-2012**




*Source: Ericsson*

**Figure 4: Price of mobile broadband**



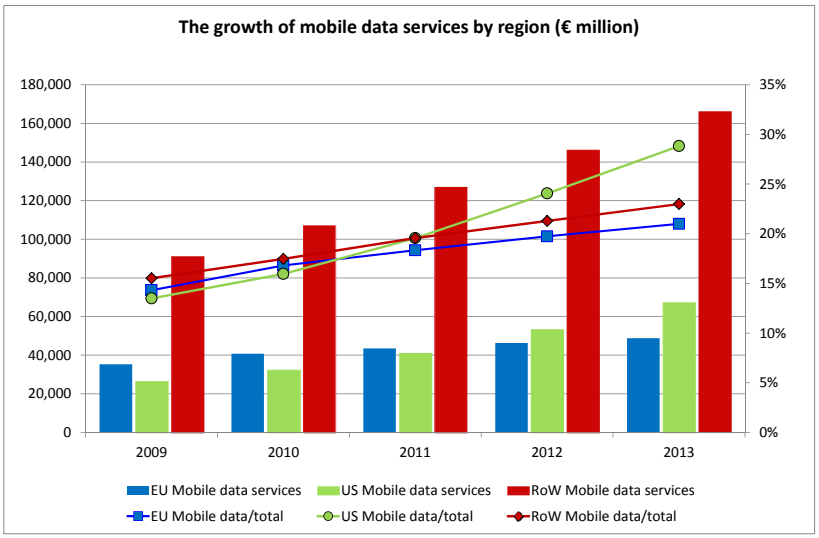

*Source: Quantum Web*

Compared to other regions, the EU market is lagging behind both in terms of mobile broadband revenue growth as well as with regards to the overall size of the market (Figure 5). According to some estimates[17], the average U.S. mobile subscriber used 450 MB per month in the first quarter of 2012, and this figure could have increased up to 750 MB per month at the end of the year. This compares for instance with an average 250 MB[18] per month in the UK. It is true though that mobile data consumption in the EU is very much determined by the dominance of limited data plans, and susbscribers to operators with unlimited or generous data plans tend to show comsumption patterns similar to the US. The relative size of the EU mobile market shrank in 2012 compared to the US or China (Figure 6).

[17] Nielsen, July 2012

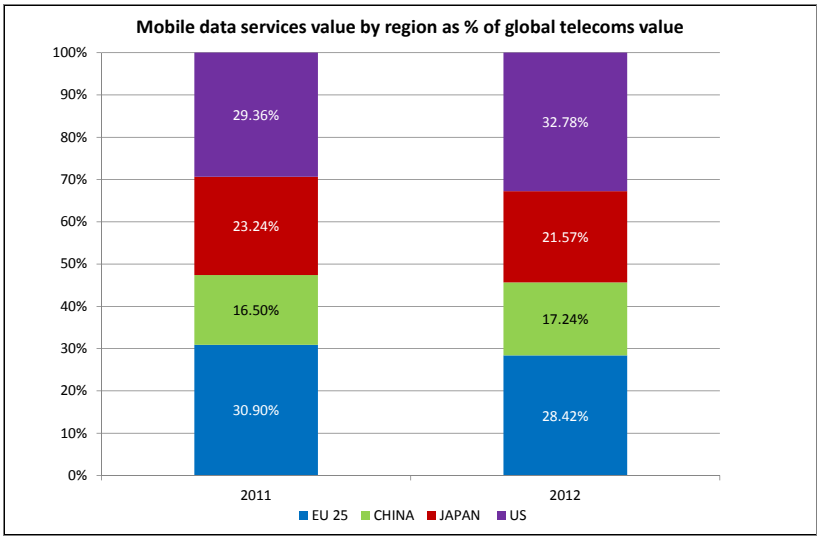
[18] Ofcom's Infrastructure Report - 2012 Update. http://stakeholders.ofcom.org.uk/market-data-research/other/telecoms-research/broadband-speeds/infrastructure-report-2012/

**Figure 5: Growth of mobile data revenues by region**




*Source: EC services based on EITO 2012*

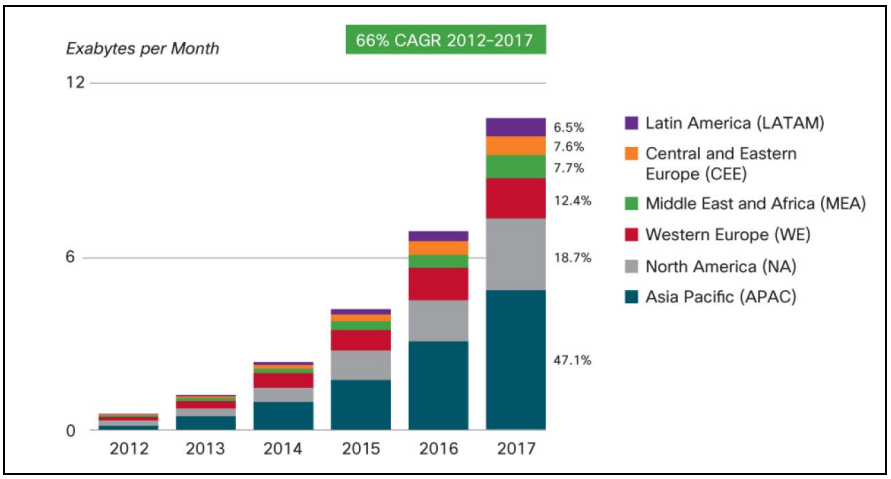
**Figure 6: Mobile data services value by region as % of global telecoms value**




*Source: EC services based on EITO 2012*

In terms of traffic, it is estimated that the EU market will not even take a fifth of the global mobile traffic in 2017, with Asia Pacific and North America accounting for almost two-thirds of global mobile traffic (Figure 7).

**Figure 7: Global Mobile Data Traffic Forecast by Region**




*Source: Cisco*

### *1.2.2. Fixed traffic*

Despite the extraordinary growth in mobile, in 2012 fixed traffic still represented the largest share of total internet traffic. In contrast with the growth in mobile data, some operators have expressed concerns about the sluggish demand for faster fixed broadband products and the lack of incentives to invest in this segment. They argue that there is a gap between current and projected availability and the actual take-up of high-speed broadband access, combined with the still significant level of revenues coming from traditional voice services. This reduces operators' capacity to price up new high-speed broadband products. To oppose this view, some analysts point to market signs indicating that demand for faster fixed broadband products is on the rise, as in the UK, for instance[19]. At EU level, fixed broadband access lines providing speeds equal or higher than 10 Mbps experienced a very high increase (+ 10 percentage points), accounting for almost 60% of all EU lines at the end of 2012, and the take up of broadband subscriptions above 30 Mbps went up from 2.5% to 4.1% in one year. Next Generation Access lines capable of providing much faster speeds account for 20% of all fixed broadband lines as opposed to 12% of one year ago. It is significant that the number of xDSL connections at global level decreased for the first time in the fourth quarter of 2012 to 366.66 million from 366.95 million in the previous quarter, trumpeting the arrival of faster access technologies[20]. Arguably, the arrival of the connected TV to the market, along with an ever increasing number of other connected devices per households (computers, smartphones, tablets, video players, game consoles, DVD players and set top boxes) triggers the demand for more capacity (Figure 8). Some analysts also argue that a surge of fixed internet traffic can be expected in the next five years: the absence of cost constraints, the faster speeds offered by fixed technologies and the proliferation of connected devices[21] are some of the reasons put forward for such renewed growth. Indeed traffic offloading to fixed and Wi-Fi networks and the use of femtocells as enablers of mobile broadband access was a very recurrent topic

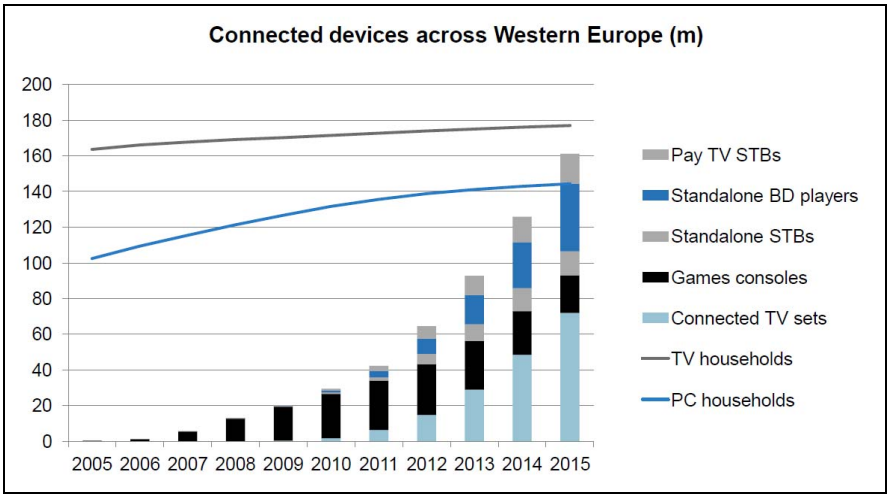
[19] *BT Q3 2012/13 results: Fibre take-up accelerates, but sports costs loom*, Enders Analysis, February 2013; OFCOM: Ofcom's latest report into fixed-line residential broadband speeds shows that the average actual UK speed has risen by a third (3.1Mbit/s or 34%) in the six months from May to November 2012, as take-up of 'superfast' services increased; In January 2012 Virgin Media announced an increase in broadband speeds to meet consumers demand.

[20] *The DSL king is dead long live the VDSL king*, Point Topic, April 2013. See the chapter on the broadband market for more information on the take up of NGAs.

[21] *Surging fixed Internet traffic should make operators and policymakers consider the effectiveness of rural LTE*, Informa, February 2013

throughout 2012[22]; 33% of total mobile data traffic was offloaded in 2012 and this figure is projected to increase to 46% in 2017[23]. The deployment of femtocell units at global level is expected to multiply by 20 times between 2011 and 2016[24].

**Figure 8: Connected devices by type in Western Europe**




*Source: ScreenDigest*

### *1.2.3. The platform battle*

The blurring of the boundaries between three market segments that were once very well delimitated (internet service providers; broadcasters and providers of online content and/services; manufacturers of consumer electronics and IT components[25]) has seriously affected telecom operators. Revenues in the global IT industry (manufacturers of servers, PCs, handsets and tablets, software, IT services) were estimated to have increased by 1.2% in 2012, although the actual figure could change depending on the performance of some economies.

New market actors are providing communications, content and value added services on top of the communications channels provided by network operators. While the provision of such services benefits telecom operators as it stimulates network effects, thereby increasing the value of being connected and driving demand by consumers for further and better connectivity, it also erodes the main source of revenues of network operators. The traditional voice service, which still contributes a quarter of overall telecommunications revenues, is fading away very quickly, replaced by voice applications provided by the OTTs (Skype, GTalk or even Facebook voicemails). Substitution of SMS text messaging by IP-based messaging services was another reason for margin erosion in several telecom operators[26], and this prompted many operators to develop new, more aggressive pricing structures as well as

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[22] *Mobile Data Offload & Onload*, Juniper Research, April 2013: The amount of mobile data generated by mobile devices (smartphones, featurephones and tablets will exceed 90.000 petabytes in 2017, but only 40% of data generated by these devices will travel through mobile neworks with the largest part of data sent through WIFI networks and small cells.

[23] Cisco Visual Networking Index Forecast, February 2013. http://newsroom.cisco.com/release/1135354

[24] Informa, *Small-cell deployments to be dominated by consumer-driven femtocells*, May 2012.

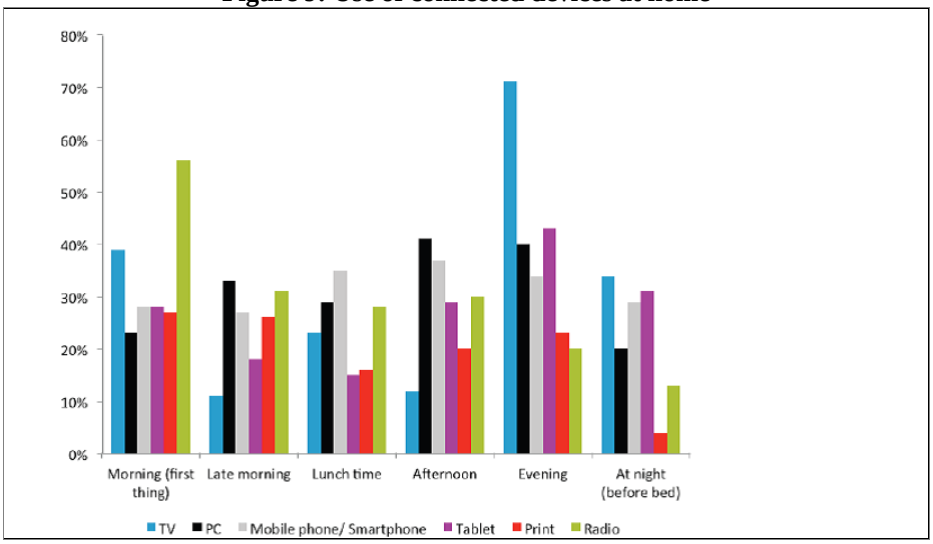
[25] Intel, a semiconductor manufacturer, was rumoured to be preparing the launch of a virtual cable TV service and set top box and. Smart Tv manufacturers also deploy their own Connected TV platforms.

[26] Daily OTT messaging traffic has overtaken daily P2P SMS traffic in terms of volume, with an average of 19.1 billion OTT messages sent per day in 2012, compared with an average of 17.6 billion P2P SMS messages, Informa, *OTT messaging traffic will be twice the volume of P2P SMS traffic by end-2013*, April 2013. According to recent estimates, the use of texting applications would have taken away $23 billion in revenue from carriers as of the end of 2012. (Ovum, http://ovum.com/press_releases/ovum-forecasts-social-messaging-will-cost-telcos-over-23-billion-in-sms-revenue-in-2012/). Whatsapp has more users than Twitter and the platform handles about 8 billion incoming and 12 billion outgoing messages per day.

their own IP messaging products[27]. Finally, voice revenues were also affected by reductions in mobile termination rates in 2012 (in nine EU countries average MTR were slashed by more than 50%), mobile number portability and, in some countries, by the competitive pressure of network challengers[28] and MVNOs.

Manufacturers of mobile devices and operating systems have also entered the picture by providing content and applications platforms linked to their devices, Apple's "app store" and Google's "Play store" being the typical examples; the arrival to the market of smartphones has been the main driver of the explosion of mobile broadband traffic, and this has certainly benefitted operators (newest versions of smartphones may consume twice as much data as the previous models[29]). Also more and more broadcasters are launching online TV services in an effort to attract larger audiences and generate more revenues from advertising[30] amidst a growing trend to switch from the traditional TV sets to other fixed and mobile devices[31], and this also spurs demand for more broadband capacity.

**Figure 9: Use of connected devices at home**




*Source: Deloitte/GfK, February 2013*

[27] At the 2012 Mobile World Congress the five largest EU mobile operators (Vodafone, DT, TI, Telefonica and France Telecom unveiled an application called Joyn under the Rich Communication Services programme created by the GSM Association. This application would in principle be free and not include advertising, and additional services (VoIP and IP video calls) would be added. France Telecoms has been selling its own OTT messaging app named *Libon*, Telefonica announced the preloading of its *TuMe* app in its smartphones and Vodafone introduced its *Red Package*, which may include unlimited calls and text messages for free.

[28] Iliad's Free Mobile managed to attract 2.6 million subscribers in 82 days. Informa Telcoms and Media. *Case study: Iliad's Free Mobile signs up 2.6 million subscribers in just 82 days*, June 2012.

[29] *Arieso reveals latest trends in smartphone data use*, Arieso, January 2012.

[30] 20% of all advertising budgets in Europe were dedicated to online in 2011. ADEX BENCHMARK 2011, July 2012. In 2012 mobile advertising revenues jumped by 111% to $3.4 billion. IAB *Internet Advertising Revenue Report*, April 2013. See also "White Smoke: The new era for video news", Associated Press, April 2013.

[31] *Zero-TV Doesn't Mean Zero Video*, Nielsen Research, March 2013. In Sweden owners of computers or tablets now have to pay television license fees and Finland will start collecting the public service broadcasting tax from general taxes. A 2011 survey by Google amongst 1 400 tablet users in the US showed that more than 1 in 3 respondents used their tablet more than they watched TV.

Here again there is a similar network effect: consumers that have several mobile devices value online content more than those with just one device[32]. But, the rapid adoption of smartphones and tablets, with their associated content and applications platforms, has had an impact in the commercial strategies of operators, which did not succeed in making their own content and services platforms profitable[33]. By subsidizing smartphones in an effort to gain new mobile data subscribers, network operators have indirectly supported the competing online platforms of the largest manufacturers, driving consumers away from their own content platforms. There are many different figures on the mobile applications market, the value of which could have reached 11 billion euros in 2012, with more than 50 billion downloads and 41 applications per user on average, which represents a 32% increase over 2011, when the average was 32 applications[34]. Other sources estimate a smaller market size with around 44 billion downloads for an estimated value of 4.15 billion euros[35]. While Android is the dominant operating system in the world, equipping up to 70 per cent of the smartphone market, App Store is estimated to be earning on average about 2.6x the app revenue of Google Play[36]. Consumption patterns are also very different from one country to another. In the US, Apple devices are very popular (35% of the smartphone market) and they generate twice as much mobile data traffic as Android based devices, which dominate the market with more than 50% of it[37]. The situation in Finland is the reverse: here Android owners consumed 2.07 GB of mobile data – nearly twice the 1.05 GB of iPhone owners. Telecom operators also need to be aware of these trends in their commercial and pricing strategies.

This battle to gain control of the platform is confirmed by the fact that some device manufacturers are willing to sell their devices at cost, with the objective of having more and more consumers buying content (music, films, application and books) from their online platforms[38] ,or by the new way to access Microsoft Office 2013, which would be based on a subscription model that would include some free minutes of VoIP per month. Operators are therefore understandably willing to support the emergence of alternative ecosystems that would put pressure on the dominant ones[39] and enter into alliances with providers of online content and services, bundling access to this content in their data plans[40]. Mobile payments is also another market segment where operators are exploring several strategies. In September

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[32] "There is a 41 percent increase in perceived media value when consumers add a second mobile device to their collection, another 40 percent increase when they add a third, and a 30 percent increase when they add a fourth". *Through the Mobile Looking Glass*, The Boston Consulting Group, April, 2013

[33] Operator platforms would account for just 6% of content downloads worldwide, with Google Play and Apple's App Store concentrating 70% of this market. Juniper Research, March 2013. Samsung, the number one manufacturer of Android-based smartphones, has announced partnerships with several publishers of games, travel tips, books and music and will be providing access to these applications through its hub. IDC estimates that games on smartphones are expected to outpace hand-held devices by the end of 2013. *Worldwide Gaming-Optimized Handheld, Smartphone, and Tablet Gaming 2013–2017 Forecast*, IDC, April 2013.

[34] *Survey Report: Mobile Apps - What Consumers Really Need and Want, Compuware*, March 2013, quoting data from Nielsen. http://www.compuware.com/about/release/747433/mobile-apps-vs-mobile-websites--and-the-winner-is

[35] HIS Screen Digest. Downloads for all smartphone and feature phone application stores excluding tablets.

[36] App Annie Index, Market Report Q1 2013 – *iOS App Store revenue 2.6x that of Google Play*, http://blog.appannie.com/app-annie-index-market-q1-2013/

[37] *16th wireless service competition report,* FCC, March 2013; Investing Analytics for Piper Jaffray, http://www.jailbreakauthority.com/apple-ios-devices-generate-double-the-web-traffic-than-android/; Big differences between Finnish Android smartphone and iPhone owners, Alekstra,

[38] AmazonMP3, had 22 percent of the market for music downloads in the United States in l2012 up from 7 percent in 2008. *Amazon gains against Apple's iTunes in music downloads*, Reuters, April 2013.

[39] At the last World Mobile Congress 18 large mobile operators announced their support to Mozilla as a third mobile operating system/platform. These were América Móvil, China Unicom, Deutsche Telekom, Etisalat, Hutchison Three Group, KDDI, Korea Telecom, MegaFon, Portugal Telecom, Qtel, SingTel, Smart, Sprint, Telecom Italia Group, Telefónica, Telenor, Telstra, and VimpelCom

[40] The latest example of such trend is the agreement between Deutsche Telekom and Evernote under which DT subscribers will get free access to the $45-a-year premium version of Evernote for one year. Other examples include Deutsche Telekom's deal with Spotify and Orange's deal with Deezer.

2012 the European Commission cleared the creation of a mobile commerce joint venture in the UK between Telefonica, Vodafone and Everything Everywhere.

### 1.3. Operators' strategies

Telecom operators are trying to find their way through this transition period from legacy PSTN to IP broadband networks where pricing for core and strategic telecom services proved to be either flat or in decline. Consequently, European telecom operators are adopting strategies, both short and long-term, in order to improve their ARPU and secure their revenues. More specifically, telecom operators are considering some of the following strategies:

- Geographic diversification of their businesses in emerging markets: Domestic revenue growth for some European carriers was negative in 2012 and some operators were able to experience some growth in overall revenue thanks only to international operations.

- Increasing line rental fees and developing more aggressive bundled products including services provided by OTTs. Replacing mobile handset subsidies policies with leasing and financing plans and the introduction of multi-device plans and shared-data schemes, which enables operators to retain customers while reducing the significantly high investments in acquiring new handsets. In a few cases, mobile and fixed data plans could be subject to price increases or the end of unlimited data plans, as in the UK or more recently in Germany[41].

- Creating ad-hoc tailor-made service at wholesale and business segments. Several studies developed by NRAs analysed business communications market and proved that incumbent operators, which are the largest telecom operators in Europe in their domestic markets, had a higher market share in this segment that one would expect when comparing to the retail market. On top of IT corporate services, there is an increasing trend for operators to bundle personal cloud storage and data management in their higher-end service packages. Examples include Vodafone Cloud, Orange's My Content Online and Deutsche Telekom's Telekom Cloud.

- Developing policies to retain existing consumers and attract new ones, which include diversified portfolios, better understanding of the changing consumer behaviour and strengthening customer care services, customer profiling and customization of products using big data. Price differentiation enables users to choose the option which best fits their needs; both in terms of usage and monthly expenditure. In these ways, European telecom operators look to diversify their product portfolio and to be able to build loyalty within their customers; by meeting their specific needs and offering value-added services - for instance operators may leverage on their billing relationship with customers[42]. Going beyond the telecom market, Magyar Telekom can be mentioned as an operator that has widely diversified its portfolio selling electricity and gas to its fixed line subscribers; by end-3Q12, 45% of its triple-play users had also bought its energy offerings[43].

[41] *Neue Spielregeln für DSL?,* Deutsche Telekom, April 2013

[42] *Mobile Content Business Models*, Juniper Research, March 2013

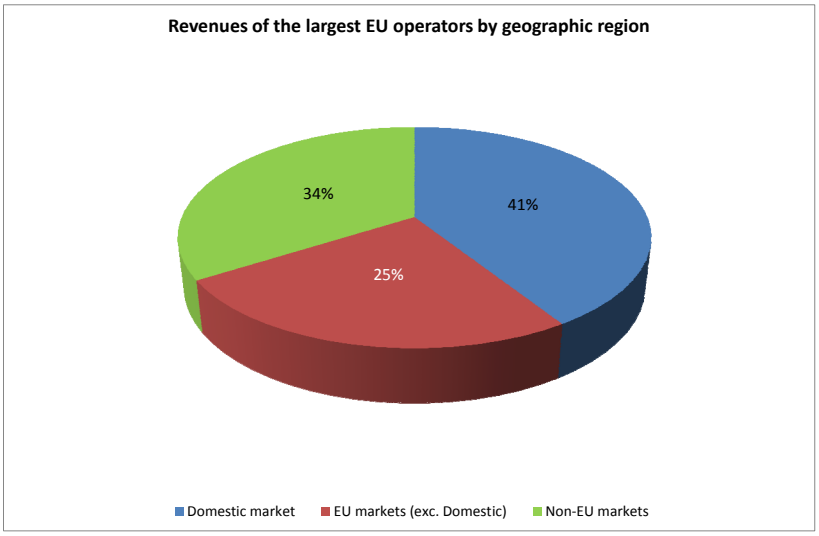
[43] Informa Telecoms and Media. *Case study: Magyar Telekom resells energy to diversify revenue portfolio,* April 2013

- A longer term approach refers to the Internet of Things. The number of machine-to-machine (M2M) device connections worldwide is expected to increase from 124 million in 2012 to 2.1 billion in 2021[44] and mobile operators are positioning themselves to compete in this emerging market. According to the mobile industry, mobile operator data revenues will overtake voice revenues globally by 2018 and much of the demand in data traffic will be spurred by connected devices and M2M traffic[45]. In 2012 there was a 42% rise in shipments of SIMs designed for M2M applications, according to the SIM alliance members[46].

### *1.3.1. Geographic diversification*

Several European telecom operators were able to experience growth at group consolidated basis due to business diversification in emerging markets; the non-EU operations of several operators gave them some breath in terms of revenues growth and increased their contribution to the overall group revenues[47]. On average[48], domestic operations accounted for around 41% of overall revenues, 25% originated in other EU countries and 34% in non-EU operations (Figure 10). Portugal Telecom, Telenor and Telefonica already source more than half of their revenues from non-EU countries and Vodafone, DT, Telecom Italia, Tele2 and BT also obtain between 30 and 40% of their revenues from non EU markets (Table 2).

**Figure 10: Revenues of the largest EU operators by geographic region**




*Source: EC services based on a sample of eighteen European operators*

[44] Analysys Mason.

[45] *GSMA-Connected Living*, http://www.gsma.com/connectedliving/. In March 2013 ComReg, the Irish regulator, launched a public consultation to investigate the possibility of a more targeted long term numbering resource for the exclusive use of M2M applications and services to satisfy the demand for numbers arising from the emerging M2M services. http://www.comreg.ie/_fileupload/publications/ComReg1333.pdf

[46] *Global SIM shipments rise 6% due to increased NFC, LTE and M2M demand*, Mobile Europe, April 2012

[47] "*Emerging markets were not that popular after the previous financial crisis in 2008, but under the current crisis, which has its origin in Europe, the case is different - Asia being beautiful*. Telenor sees Asian growth as antidote to Europe's woes, http://uk.reuters.com/article/2012/01/05/telenor-idUKL6E8C53PU20120105

[48] Based on a sample of eighteen European operators: Telefonica, Deutsche Telekom, Telecom Italia, Vodafone, France Telecom, KPN, Mobistar, TPSA, Tele2,Telia Sonera, Telekom Austria, Belgacom, TDC, Portugal Telecom, Elisa, BT, OTE and Telenor. Third quarter 2012- Third quarter 2011 data analysis.

**Table 2: Revenues of the largest EU operators by geographic region**

| TELECOM OPERATOR | COUNTRY | Other markets EU+ | Other markets (world) | Domestic market | EU markets (exc. domestic) | EU markets (inc. domestic) | Non-EU markets |
|---|---|---|---|---|---|---|---|
| Vodafone | UK | Germany, Italy, Spain, UK, , Malta, Netherlands | Albania, Turkey, India, South Africa, Mozambique, Tanzania, Australia, New Zealand, Egypt, Qatar, Ghana, Kenya, US | 11% | 58% | 69% | 31% |
| Telefonica | SPAIN | UK, Germany, Czech Republic, | Brazil, Argentina, Venezuela, Chile, Peru, Colombia, Mexico | 24% | 24% | 48% | 52% |
| Telenor | NORWAY | Sweden, Denmark, Hungary, Serbia, Montenegro | Thailand, Malaysia, Bangladesh, Pakistan, India | 25% | 20% | 45% | 55% |
| Tele2 | SWEDEN | Norway, Netherlands, Germany, Austria, Estonia, Latvia, Lithuania, Croatia, | Kazakhstan, Russia | 29% | 28% | 57% | 43% |
| Telia Sonera | SWEDEN | Finland, Norway, Denmark, Lithuania, Latvia, Estonia, Spain | Kazhakhstan, Azerbajian, Uzbekistan, Tajikistan, Georgia, Moldova, Nepal | 36% | 47% | 82% | 18% |
| Deutsche Telekom | GERMANY | Greece, Hungary, Netherlands, Poland, Czech Republic, Croatia, Austria, Slovakia | USA | 44% | 28% | 72% | 28% |
| Portugal Telecom | PORTUGAL | Hungary | Brazil, Angola, Macao, Namibia, Cape Verde, East Timor, Sao Tome and Principe, Kenya, Mozambique | 41% | | 41% | 59% |
| France Telecom | FRANCE | Spain, Poland, Romania | Egypt, Mali, Senegal, Ivory Coast, Cameroon, Guinea, Congo | 49% | 33% | 82% | 18% |
| KPN | NETHERLANDS | Germany, Belgium, | Mexico, US, | 58% | 34% | 92% | 8% |
| Telecom Italia | ITALY | | Brazil, Argentina | 61% | | 61% | 39% |
| British Telecom | UK | Ireland, Spain, France, Germany, Italy, Netherlands | Australia, Brazil, US, India, Singapore | 41% | | 41% | 59% |
| Telekom Austria | AUSTRIA | Bulgaria, Croatia, Slovenia | Belarus | 64% | 28% | 92% | 3% |
| OTE | GREECE | Cyprus, Romania, Bulgaria, | | 69% | 12% | 80% | 20% |
| Belgacom | BELGIUM | Luxembourg | Morocco | 77% | 23% | 100% | |
| TDC | DENMARK | Sweden, Norway, Finland | | 84% | 16% | 100% | |
| Elisa | FINLAND | Estonia | | 93% | 7% | 100% | |
| Mobistar | BELGIUM | Luxembourg | | 95% | 5% | 100% | |
| TPSA | POLAND | | | 100% | | 100% | |
| TOTAL (18 operators) | | | | 41% | 25% | 65% | 33% |

As indicated in Table 1, as much as 24% of sector revenues still originate from fixed voice services, a segment led by national operators, many of which do not operate outside their home markets. But it is estimated that no less than 45% of the EU fixed broadband lines are served by telecom operators with presence in several EU countries and this figure is even higher in mobile telephony, where around 80% of the market is in the hands of the five largest mobile providers. Two trends characterise European operators:

- Operators with a significant international footprint performed better than pure national players, due to stagnation of organic growth in EU markets and more demanding and budget concerned consumers in the EU;

- This also had an impact on investment trends, with operators active in Eurasia or Latin America having a slightly higher CAPEX percentage than EU only operators.

### *1.3.2. More aggressive bundled products*

Major operators now value retaining current customers as much as gaining new ones. Thus, they have created strategies based on different types of bundled offers in order to include data services, SMS and voice minutes[49]. The popularity of these products is increasing. By contrast, broadband standalone services are fading away, representing around 34 percent of all offerings in 2013, down from 64 percent six years ago.

There exist many different types of bundled services, which can include either a combination of fixed-line telephony and broadband access or fixed broadband access and television (double play), products combining fixed voice, broadband access and television (triple-play) and more recently quadruple play products, which offer mobile voice and data on top of triple play offerings. Some EU operators added quadruple play products to their portfolio with the aim to provide customers all telecom needed package in a row and reduce churn ratio. The number of quad play services doubled between 2011 and 2012[50]. There are still many differences in the retail offerings across EU Member States, and the market in France, for instance, is very different in this respect compared to Germany[51].

Bundles may reduce churn but have to be carefully designed so as to minimise loses in revenues. The configuration of the bundled products and their price depend very much on the kind of technologies most used by consumers and operators need to adapt their offer profile to better meet the requirements of consumers. A recent Commission market study[52] revealed that consumer survey respondents who had switched their internet provider in the last three years were more likely to have had standalone access with their previous connection than with their current connection (22% compared with 12%). This was mainly the result of an increase in packages including both fixed telephony and TV (with or without other services such as mobile telephony or mobile Internet).

## 1.4. European telecom operators investment overview

Capital expenditure (CAPEX) in 2012 was estimated at around 45 billion in 2012, representing on average 15% of group consolidated figures for the major European telecom operators, up from the 14% of total revenues in 2011[53] (Figure 11). This ratio was slightly lower for operators with a smaller size, which could be due to the fact that some of these operators have already supported and developed before and are now in a mature phase of their business development. Larger European operators with overseas activities had higher investment needs driven by the demand from these markets, including spectrum investment

[49] Spanish fixed line telecoms providers are gaining a bigger share of the country's shrinking mobile market as cash-strapped consumers switch to bundled packages offering mobile, internet and other services (...) In the UK cable-based Virgin Media, which has focused on selling mobile as part of bundled packages, has a contract customer base of 1.7 million compared with under 500,000 clients five years ago and is Britain's no.5 player with 3 million mobile clients overall. Reuters, *Spain's Jazztel, ONO make headway in shifting mobile market*, April 2013

[50] *Study on Broadband Internet Access Cost*, Van Dijk, September 2012

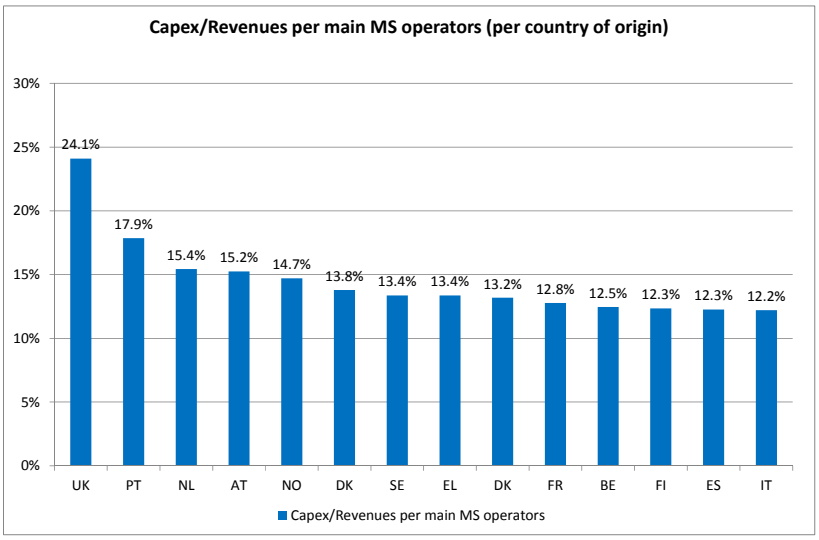
[51] *Vodafone, KDG and quad play in Europe*, Enders Analysis, March 2013.

[52] Consumer market study on the functioning of the market for internet access and provision from a consumer perspective (or else the 2012 ISP study, to be published in July 2013)

[53] Source: Commission services based on a sample of eighteen European operators – ETNO - ECTA

needs. Figures on investment in network equipment hide the fact that prices of network gear went down in the period; so in real terms the investment effort may have been higher.

**Figure 11: Capex/Revenues ratio per main operators (per country of origin)**




*Source: EC services based on a sample of eighteen European operators*

When it comes to mobile infrastructure, investment focused on HSPA and LTE roll-out, including expanding backhaul capacity. Many mobile operators continued their network sharing strategies in order to rationalize investments and achieve greater coverage more rapidly. Some operators estimate that the radio access network-sharing model is the best option for cost savings and enables savings of 40 to 60% on opex and capex.

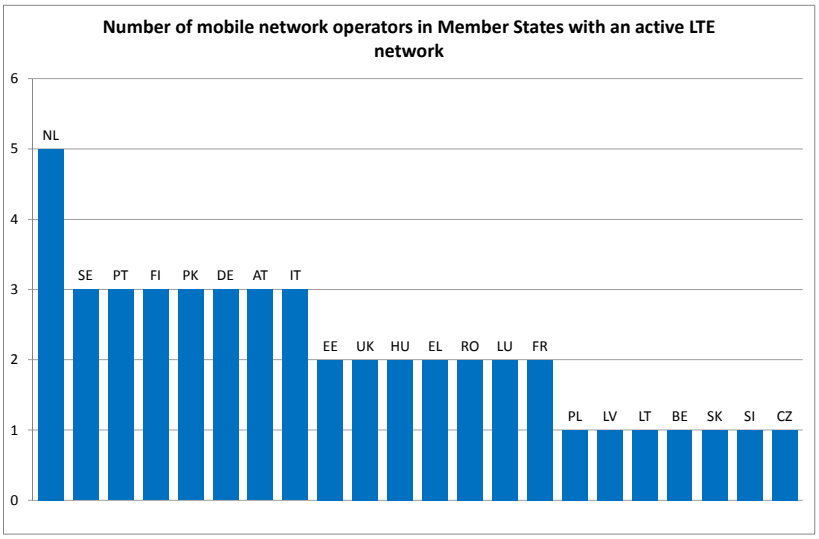
According to latest figures[54] while 47 European operators offered an active LTE network (Figure 12), there were only 5 Member States[55] where no LTE network was offered. The first LTE launch was in Sweden in December 2009. LTE networks were mainly located in Western European countries, with HSPA and HSPA+ being the major technology investment for Central and Eastern European countries. Yet EU LTE subscribers only represent a small percentage of global LTE subscribers, with the large majority of these located in North America and Japan[56].

[54] European Commission Services based on GSMA data (GSA Confirms 156 Commercial LTE Networks Launched and Increasing Global Reach), March 2013. Figures include wholesale and retail services.

[55] Bulgaria, Ireland, Spain, Italy, Cyprus, Malta

[56] EITO 2012

**Figure 12: Number of mobile network operators in Member States with an active LTE network**




*Source: EC services based on GSMA data*

Regarding investment in fixed broadband, most EU operators have planned significant investments in the coming years to expand the coverage of next generation fixed access networks, combining VDSL and Fibre to the Home (FTTH) technologies. VDSL appears to be the technology choice of large operators, accounting for around 60% of population coverage in the long term, followed by FTTH. The situation may however be significantly different in countries where cable modem and local area networks are strong competitors[57].

At the end of 2012 the coverage of NGA fixed networks in the EU was very uneven, with extensive NGA coverage in Belgium (97% of the population) and the Netherlands (98%). Other countries were much less advanced, with just 14% in Italy or 24% in France.

Announcements of NGA investment plans increased at the end of 2012. DT announced details in December 2012 of a plan to double its VDSL footprint in four years, with 65% "fiber" coverage targeted by 2016 and an option towards 80%, alongside a 85% LTE coverage. KPN plans to achieve 21% FTTH + 55% VDSL coverage by 2013; Telefonica 45% VDSL by 2013 and 3mln FTTH until Aug 2014. Belgacom has 80% VDSL coverage and Portugal Telecom 40% based on FTTH.

[57] *Market Functioning in Network Industries – Electronic Communications, Energy and Transport*, DG ECFIN, Occasional Papers 129, February 2013

**Table 3: Investment plans European operators**

| Company | Coverage 2012 | | Target | |
|---|---|---|---|---|
| | VDSL | FTTH | VDSL | FTTH |
| Belgacom | 83% | 0% | 83% | 20% |
| BT Group | 37% | 12% | 50% | 20% |
| Deutsche Telekom | 30% | 1% | 60% | 30% |
| France Telecom | 0% | 8% | 60% | 20% |
| KPN | 70% | 16% | 80% | 40% |
| Portugal Telecom | 0% | 40% | 20% | 40% |
| TDC | | 4% | 60% | 20% |
| Telecom Italia | 0% | 0% | 60% | 10% |
| Telefonica | 35% | 12% | 60% | 20% |
| Telekom Austria | 46% | 6% | 60% | 10% |
| Telenor | 30% | 1% | 60% | 20% |
| TeliaSonera | 11% | 13% | 60% | 13% |

*Source: Nomura. The timeframe of planned investments varies from one operator to another*

As indicated above, telecoms operators have yet to find the right balance between growth-enhancing investment and setting the right price premium to engage consumers in moving to faster access products.

## 1.5. The EU telecoms sector versus other regions

In 2012, the global telecommunications carrier services market was expected to grow by 4.2%. However, large regional differences exist in performance. While the EU telecoms sector is waning, in terms of traffic, revenues and users, in other regions of the world, where uptake of mobile broadband is much faster, there is significant growth.

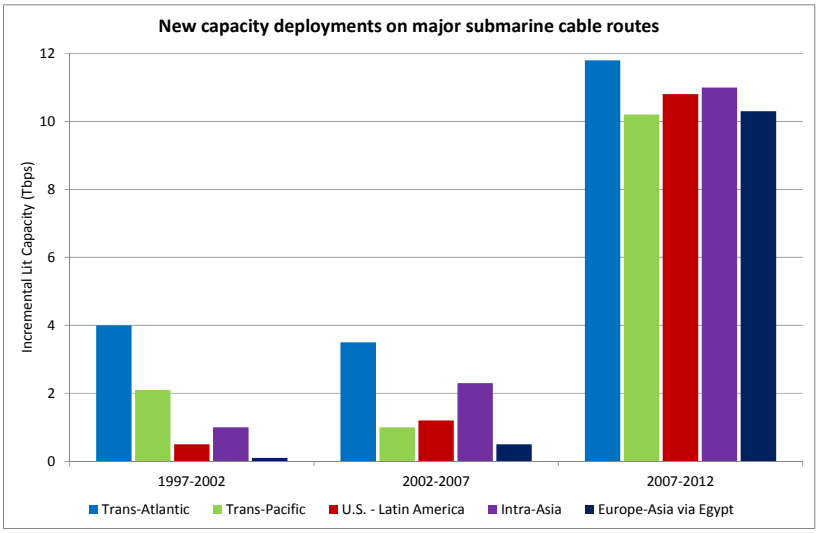
There are differences as well in the global ICT industry, with North America, Asia Pacific and some emerging economies experiencing much higher demand for software and ICT services than in Europe[58].

In the US, the ICT market was expected to increase by 6% in 2012, with positive figures in all segments - especially in mobile data. With regards to emerging economies, data show that their share of global ICT spending has increased in 2012 to account for an estimated 27% of worldwide ICT expenditure. The Asia Pacific region remains dynamic despite some

[58] EITO 2012

indications that regional economic growth is slowing. In 2012, ICT market growth in China and the BRIC countries was also dynamic, with spending in the latter also on the rise thanks again to mobile traffic. As a consequence of this growth, Brazil already has the world's fourth-largest telecommunications market. Data on demand for international bandwidth reflect this shift. Bandwidth demand on the trans-Atlantic route, which has long been the world's highest-capacity route, increased at a rate of 36% annually between 2007 and 2012. In the same period, demand for bandwidth on the Europe-Asia route via Egypt grew 87% per year and 70% from the US to Latin America.[59]

**Figure 13: Demand for international bandwidth: New capacity deployments on major submarine cable routes**

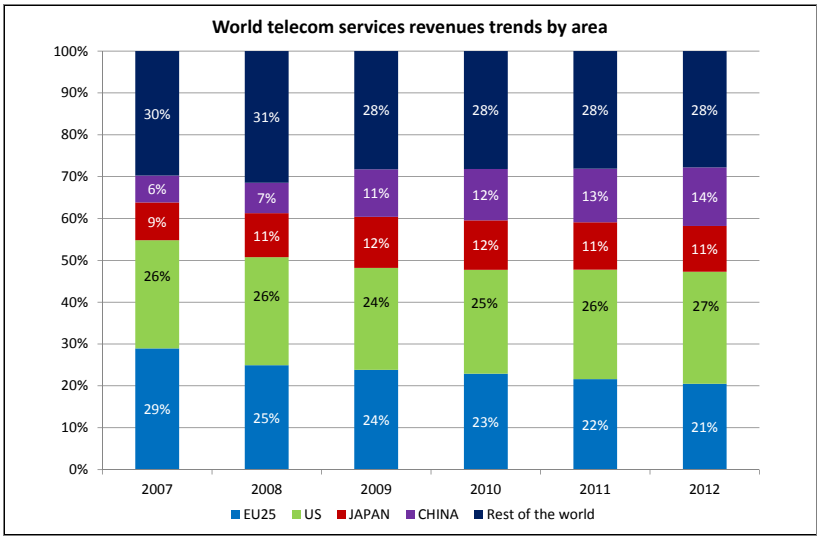



*Source: TeleGeography*

China is another example of the rebalancing of the international telecoms market. In 6 years, China doubled its weight in terms of telecom services revenues - from 6% to 14%. On the other hand, the EU25 market lost eight percentage points of world revenues - going down from 29% to 21% of World telecom services. US represented more than one quarter of the total market and Japan (11%) was half the size of the EU25 (Figure 14).

[59] *International bandwidth demand is decentralising*, TeleGeography, April 2013

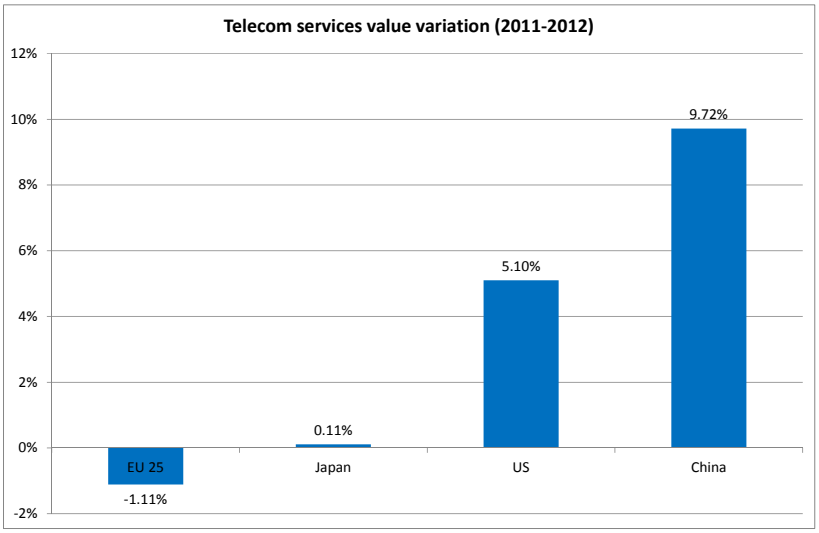
**Figure 14: World telecom services revenues trends by area**




*Source: EC services based on EITO 2012*

In 2012 the telecom services market in China was estimated to have grown by 9.72%, almost double the growth rate of the US (5.1%) and in stark contrast to the decline witnessed in the EU (-1.11%) (Figure 15).

**Figure 15: Telecoms services value variation (2011-2012)**




*Source: EC services based on EITO 2012*

## 2. FAST AND ULTRA-FAST INTERNET ACCESS

### 2.1. Introduction

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

**The total number of fixed broadband lines went up by 5.5 million, and the penetration rate** (number of lines over population) **reached 28.8% in January 2013**. 24% of European homes do not subscribe to internet[60]. Fixed broadband penetration is the highest in the Netherlands, Denmark and France, and the lowest in Romania, Poland, Bulgaria and Slovakia in the EU. Penetration increased the most in Lithuania, Latvia and Bulgaria.

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

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

### 2.2. The fixed broadband market

#### *2.2.1. Broadband coverage*

The Digital Agenda for Europe has set three targets related to broadband access, two of which refer to broadband coverage

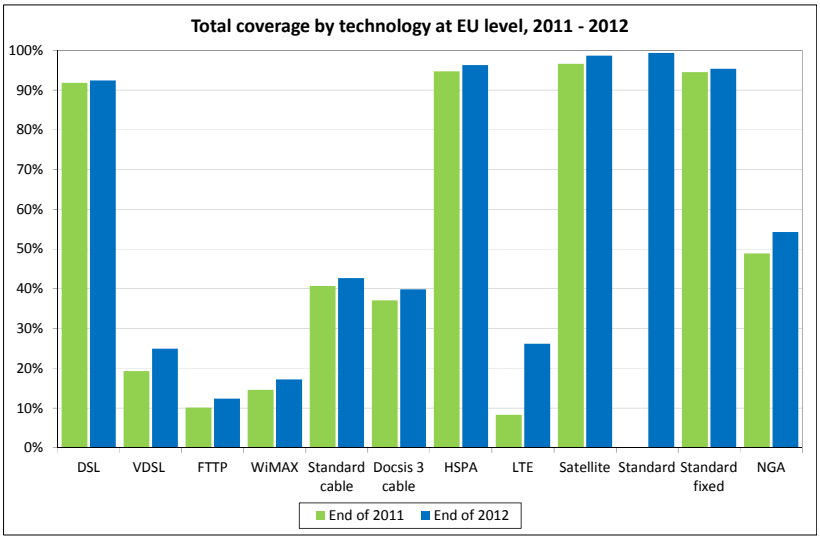
- All homes should have access to broadband of at least a basic quality by 2013,
- All homes should have access to high-speed broadband of at least 30 Mbps by 2020.

[60] According to Eurostat 76% of households with at least one member aged 16-74 years in the EU27 had access to the internet in 2012.

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

Next Generation Access technologies capable of at least 30 Mbps are available to 53.8% of homes as of end of 2012. Docsis 3.0 cable has by far the highest NGA footprint (39.4%) followed by VDSL (24.9%) and FTTP (12.2%)[61].

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

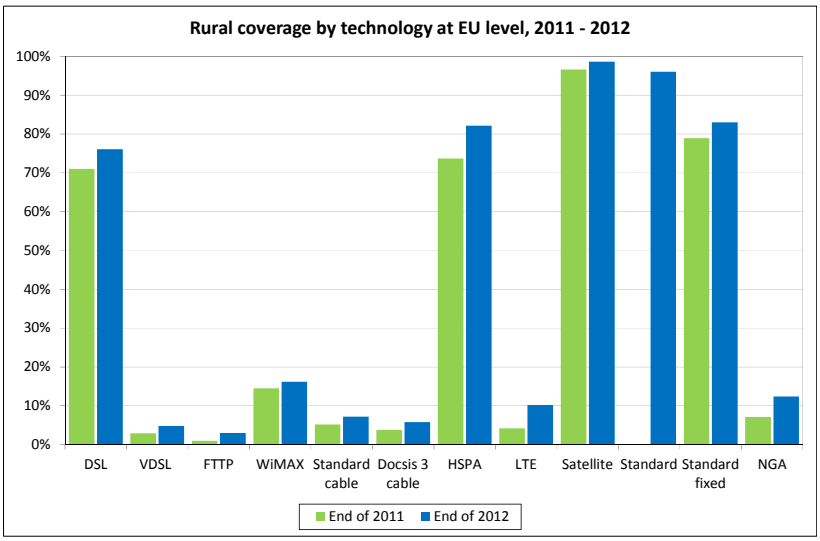



*Source: Point Topic*

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

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

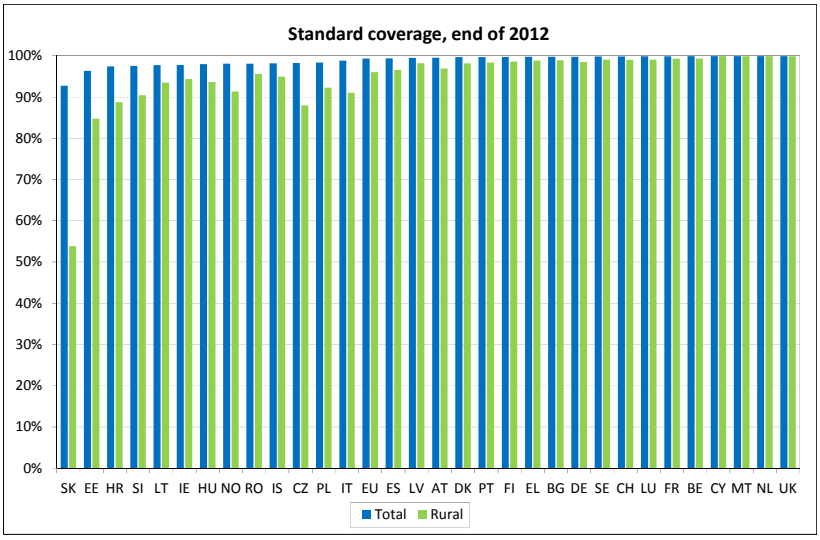
**Figure 17: Rural coverage by technology at EU level, 2011-2012**




*Source: Point Topic*

Standard broadband coverage exceeds 99% in 18 Member States. Countries with the lowest coverage are Slovakia, Estonia and Slovenia; of which Slovakia and Slovenia are fully covered by satellite broadband.[62]

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

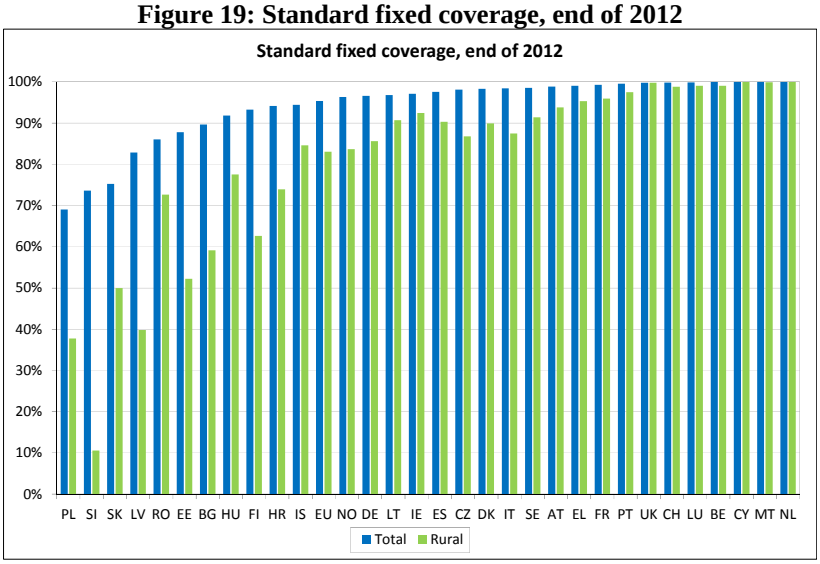



*Source: Point Topic*

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

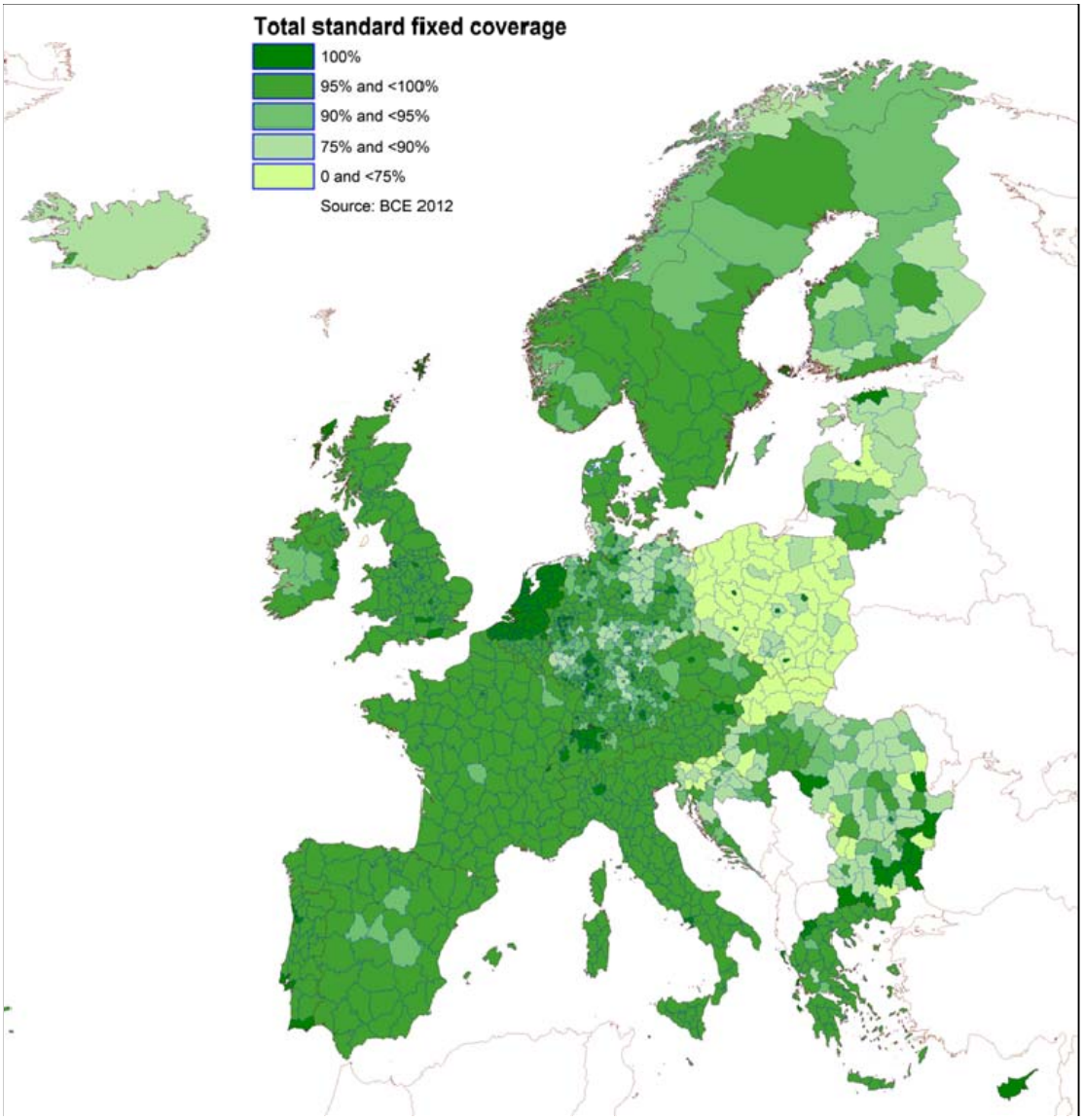
[62] The reason for presenting broadband coverage also with and without satellite technology is that currently the take-up of satellite broadband is marginal, which may partly be caused by the novelty of high-speed KA-band satellite technology.

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




*Source: Point Topic*

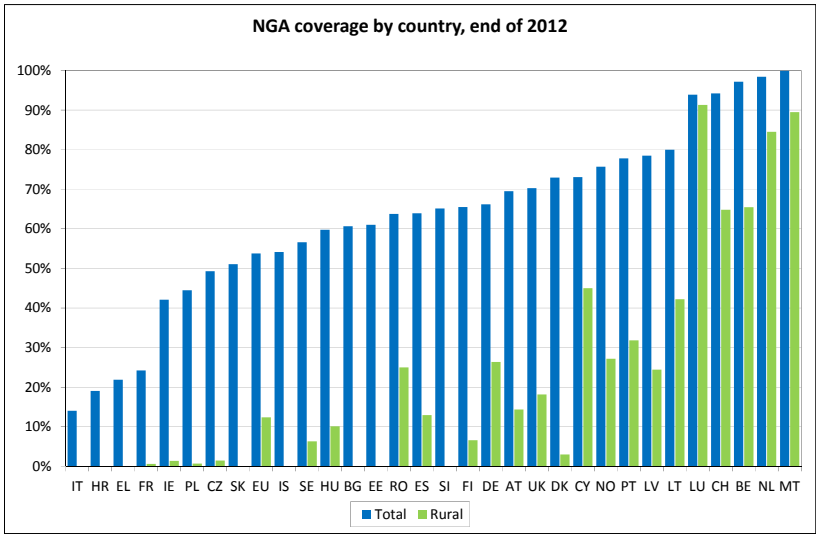
**Figure 20: Standard fixed coverage by region, end of 2012**




*Source: Point Topic*

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

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

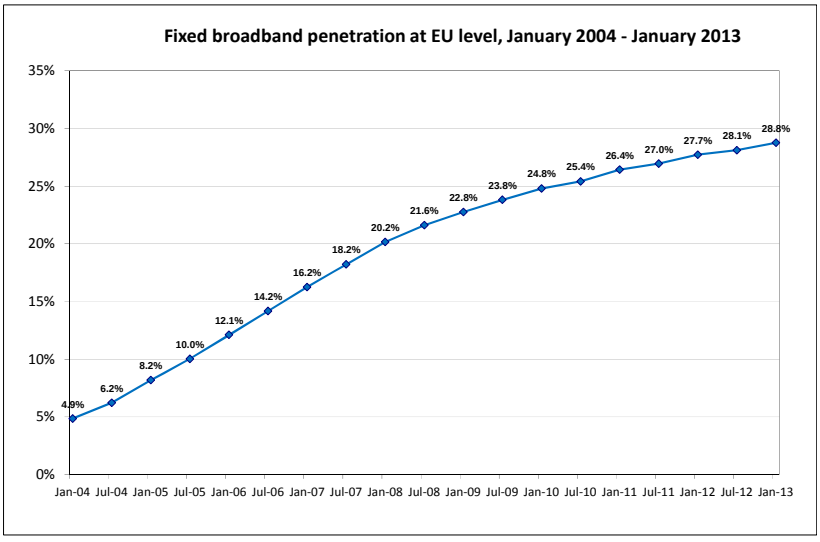



*Source: Point Topic*

### *2.2.2. Fixed broadband take-up*

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

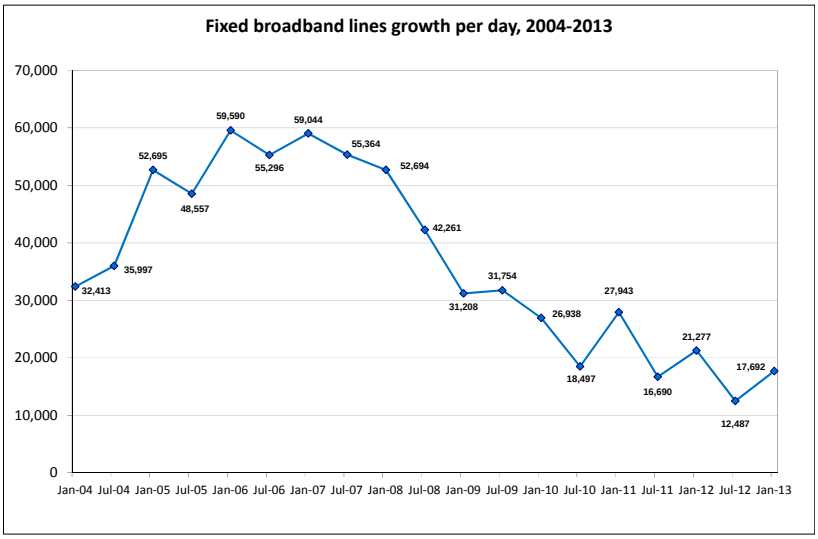
**Figure 22: Fixed broadband penetration at EU level, 2004-2013**




*Source: Communications Committee*

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

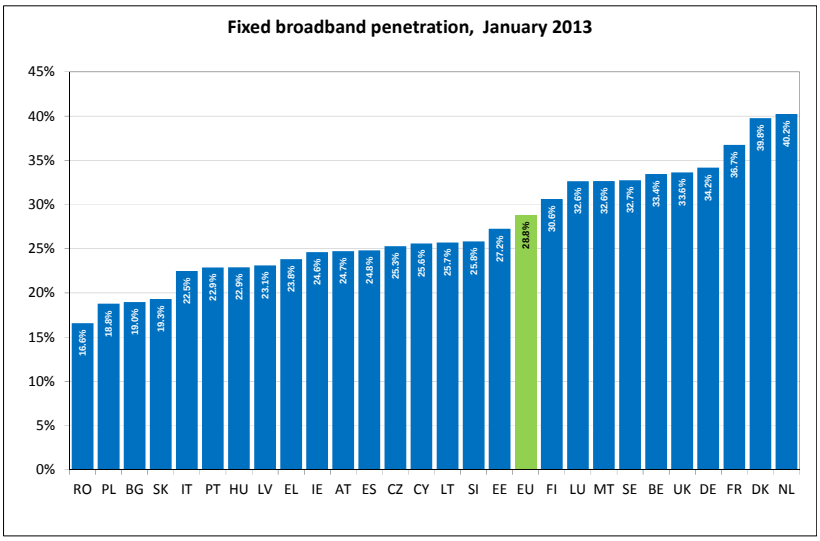
**Figure 23: Fixed broadband lines growth per day, 2004-2013**




*Source: Communications Committee*

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

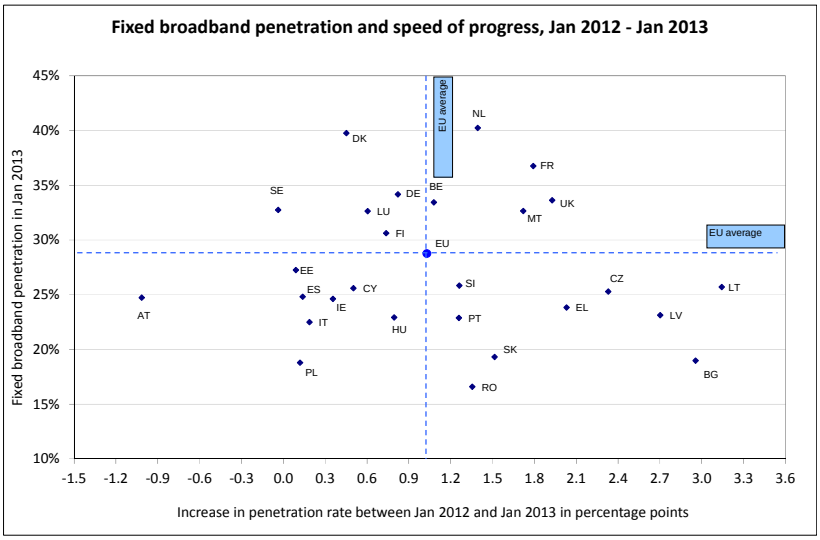
**Figure 24: Fixed broadband penetration, January 2013**




*Source: Communications Committee*

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

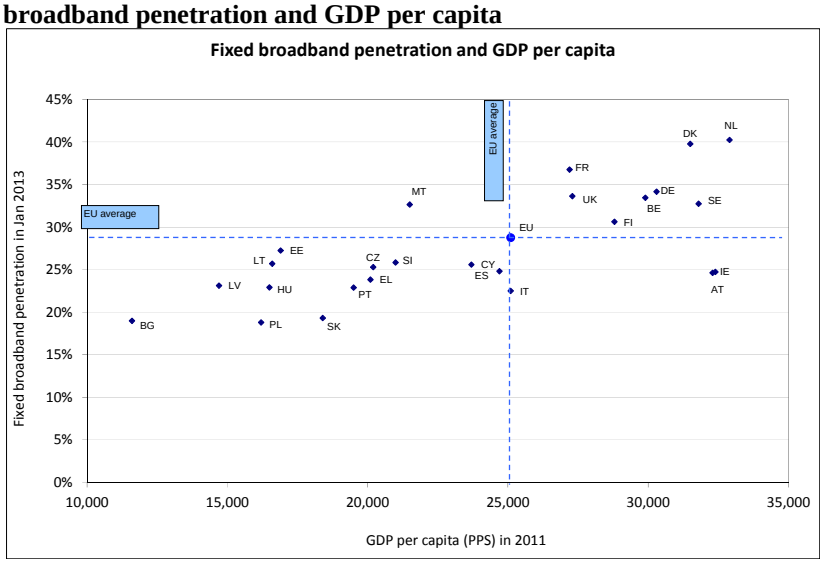
**Figure 25: Fixed broadband penetration and speed of progress, 2012-2013**




*Source: Communications Committee*

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

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

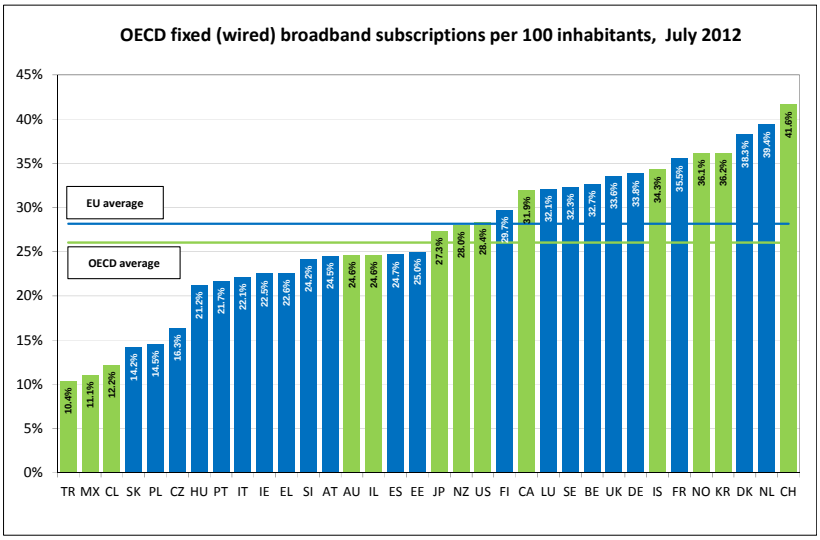



*Source: EC services based on Communications Committee*

### *2.2.3. An international comparison of broadband penetration*

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

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




*Source: Commission services based on the Communications Committee and OECD figures*[63]

### *2.2.4. Fixed broadband technologies*

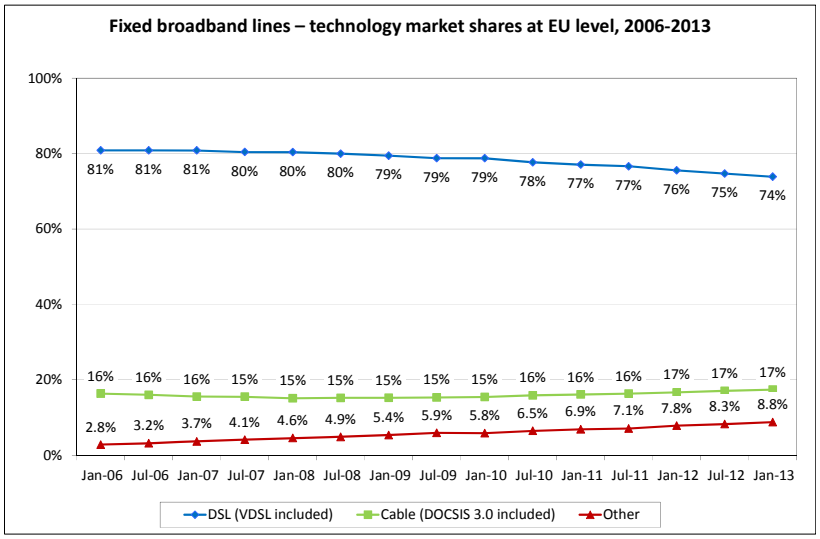
xDSL continues to be the predominant technology in the EU broadband market despite the decrease of its share from 80.9% of all fixed broadband lines in January 2006 to 73.8% in January 2013. Nevertheless, the number of xDSL lines increased by 1.7 million in 2012. All this increase can be attributed to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

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

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

[63] The OECD applies a slightly different definition of fixed broadband by excluding fixed-wireless and satellite access.

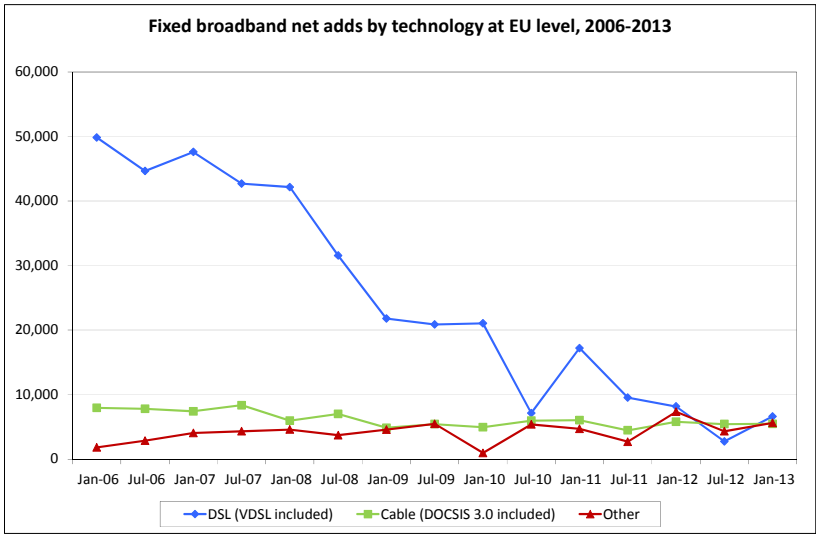
**Figure 28: Fixed broadband lines – technology market shares at EU level, 2006-2013**




*Source: Communications Committee*

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

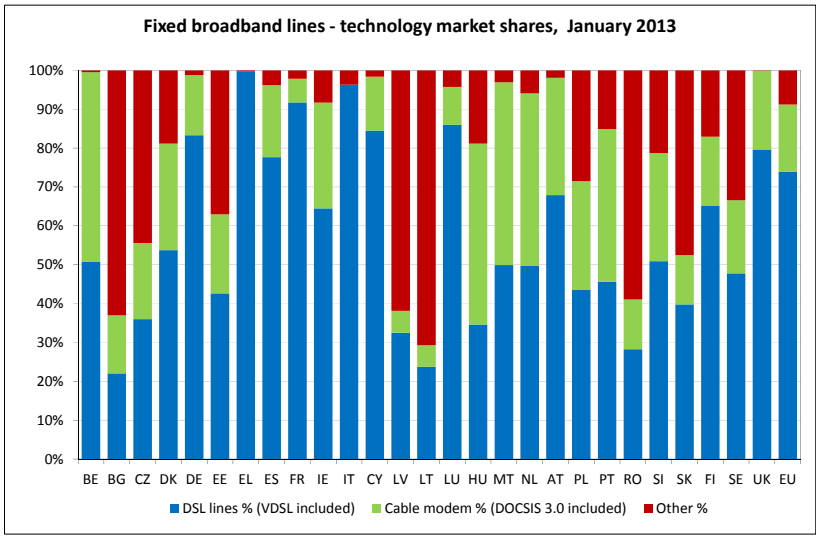
**Figure 29: Fixed broadband net adds by technology at EU level, 2006-2013**




*Source: Communications Committee*

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

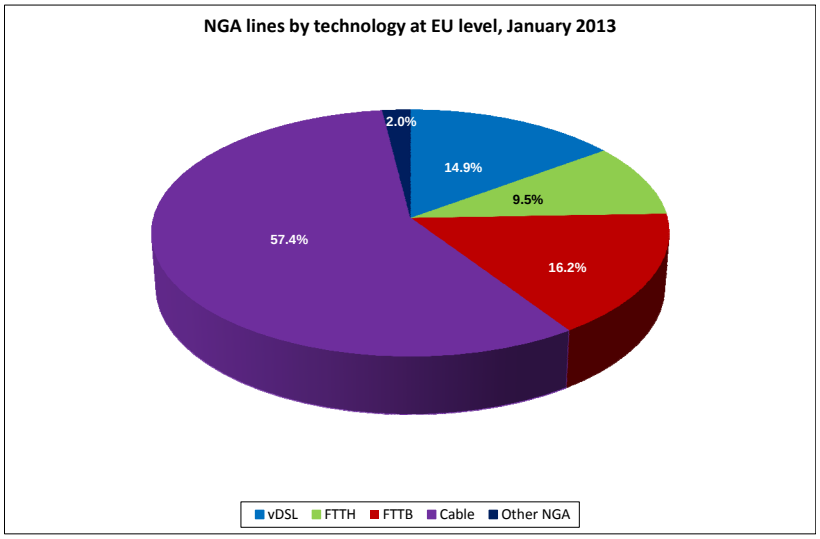
**Figure 30: Fixed broadband lines – technology market shares, January 2013**




*Source: Communications Committee*

In terms of NGA technologies, cable is by far the market leader having 57.4% of high-speed lines. Over 90% of European cable networks have been upgraded to Docsis 3.0 capable of download speeds well above 30 Mbps. Furthermore, cable operators have also migrated the majority of their customer base to NGA. VDSL has been progressing much more slowly, as only a fraction of xDSL lines have been upgraded to VDSL. FTTH and FTTB have a combined share of 25.8% within NGA lines, and only 5.1% of all fixed broadband lines as opposed to 42% in Japan, 58% in South Korea and 9% in the US[64]. NGA lines in total account for 20.3% of EU fixed broadband lines as opposed to 12.2% a year ago.

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



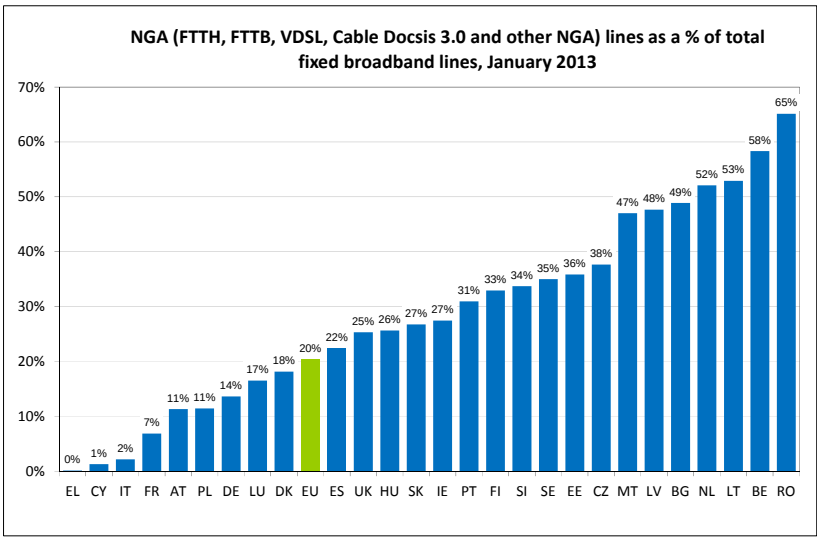

*Source: Communications Committee*

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

[64] Source: FTTH Council

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

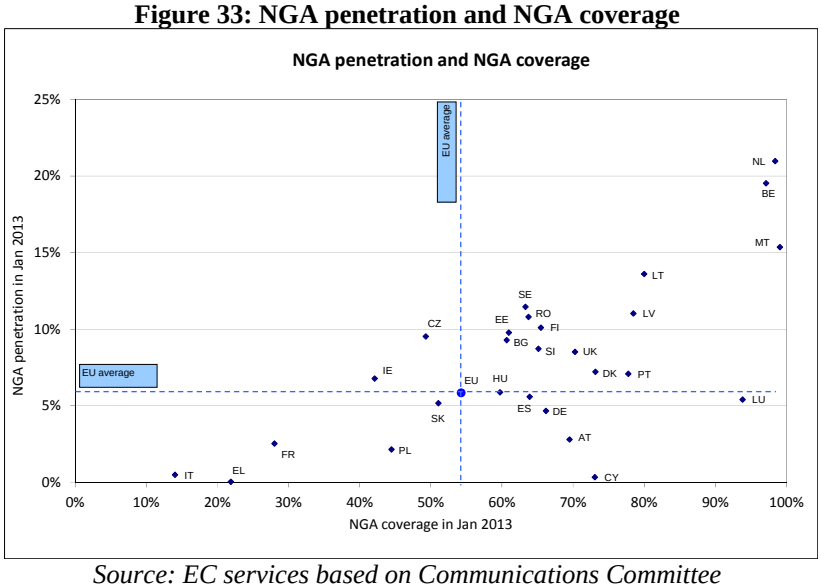
**Figure 32: NGA lines as a % of total fixed broadband lines, January 2013**




*Source: Communications Committee*

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

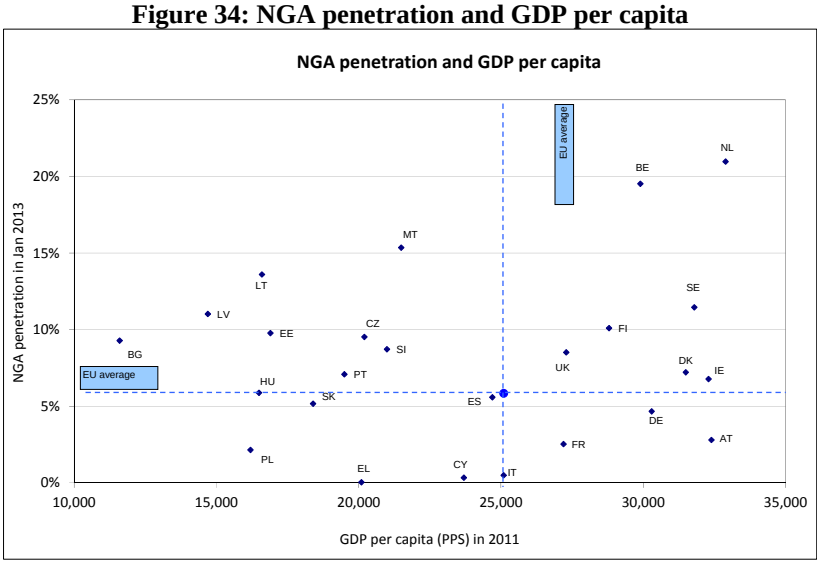
**Figure 33: NGA penetration and NGA coverage**




*Source: EC services based on Communications Committee*

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

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



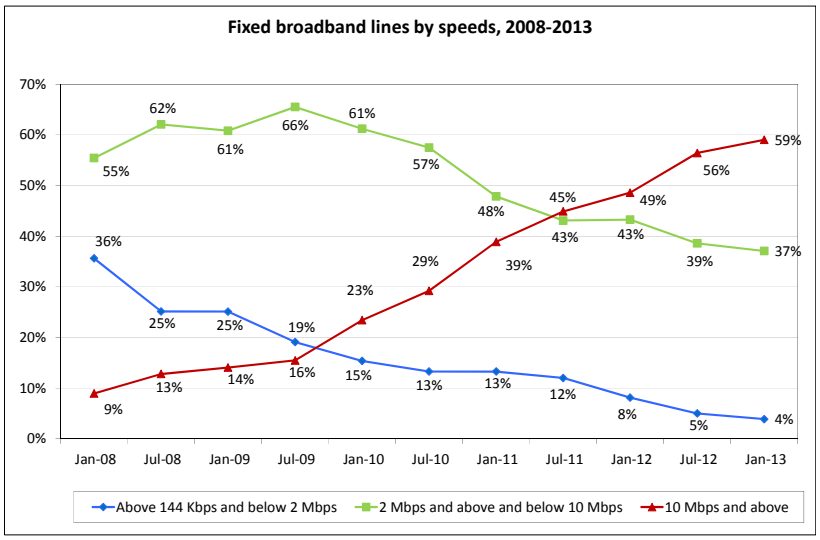

*Source: EC services based on Communications Committee*

### *2.2.5. Fixed broadband speeds*

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

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

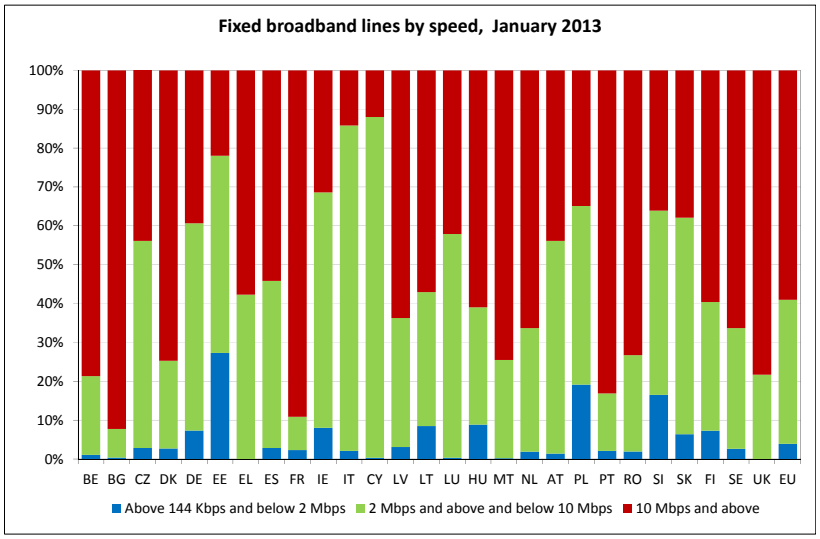
**Figure 35: Fixed broadband lines by speeds, 2008-2013**




*Source: Communications Committee*

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

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

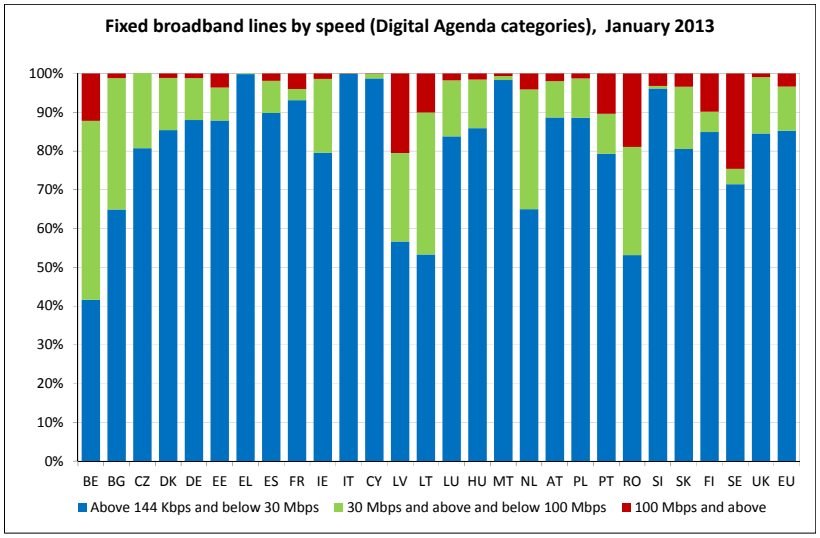



*Source: Communications Committee*

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

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

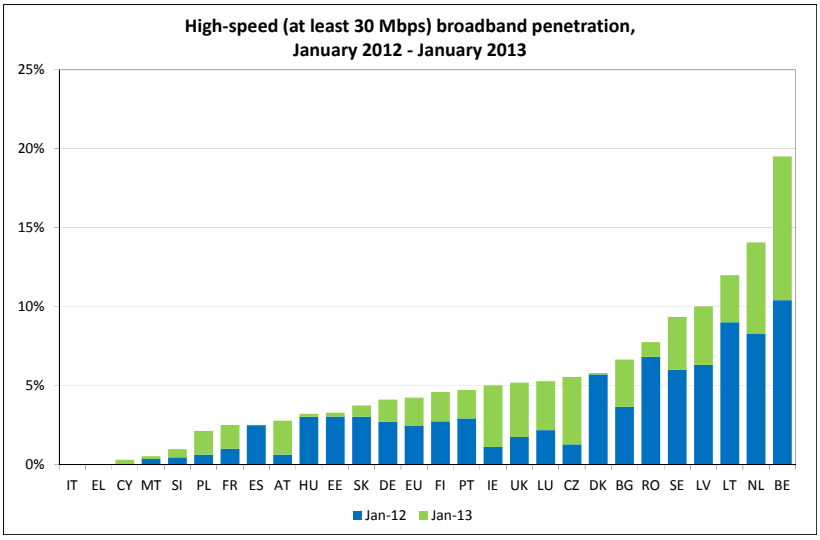
**Figure 37: Fixed broadband lines by speed (Digital Agenda categories), January 2013**




*Source: Communications Committee*

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

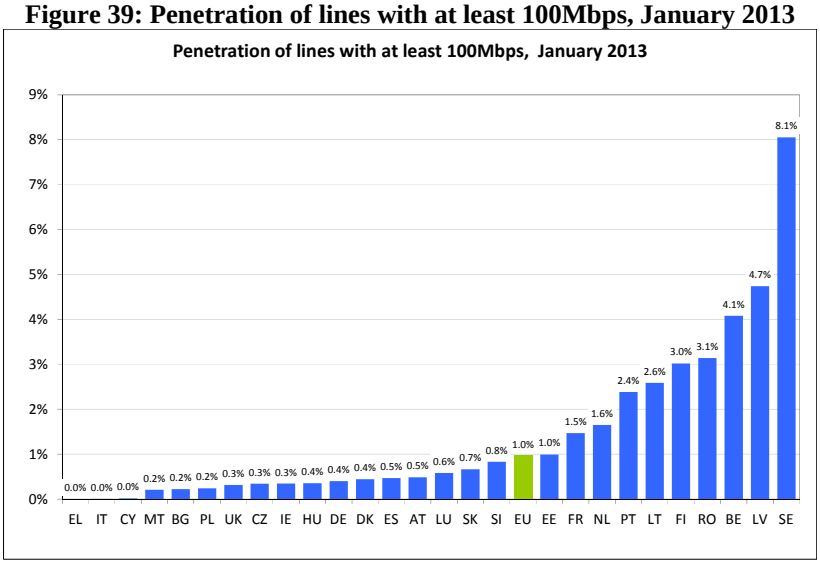
**Figure 38: High-speed broadband penetration, 2012-2013**




*Source: Communications Committee*

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

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




*Source: Communications Committee*

### *2.2.6. Actual versus nominal fixed broadband speeds*

Several studies[65] have shown that the effective speed of fixed broadband connections is typically less than the headline or advertised speed. In 2012 the Commission launched a study[66] to obtain reliable and accurate statistics of broadband performance across the different EU Member States. Measurements were taken from 9,104 measurement devices in March 2012 spread across all EU countries.

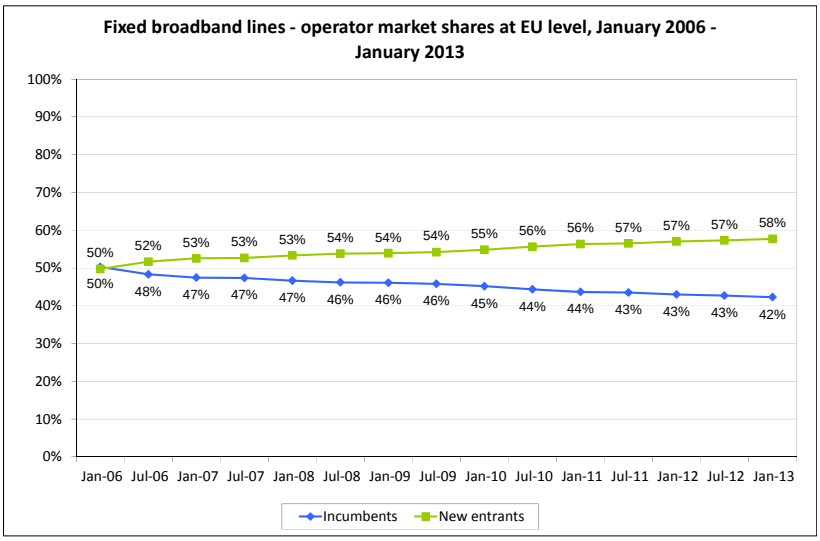
The average download speed across all countries was 19.47 Mbps during peak hours, and this increased slightly to 20.12 Mbps when all hours were considered. This figure represents 74% of the advertised headline speed. These are the overall results of the sample, and do not refer to the actual composition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

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

### *2.2.7. Competition dynamics*

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

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

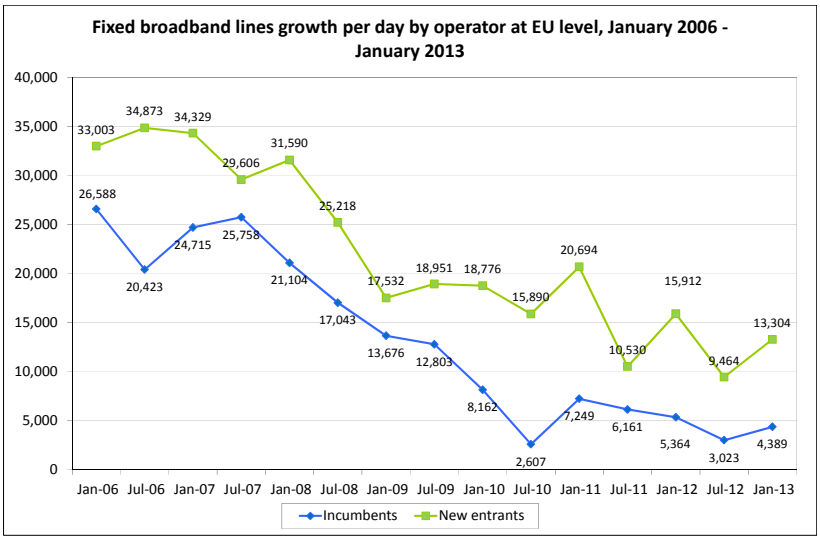



*Source: Communications Committee*

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

[65] Ofcom, Bundesnetzagentur.
[66] Available at http://ec.europa.eu/digital-agenda/en/scoreboard

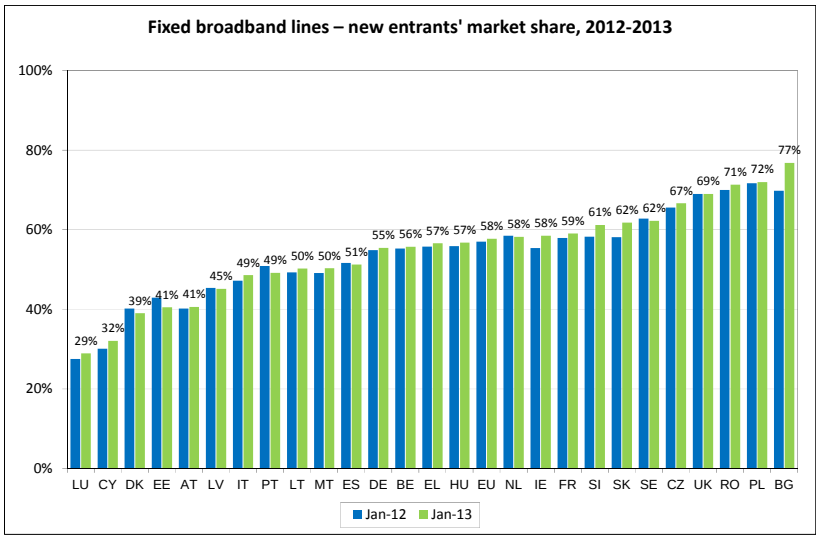
**Figure 41: Fixed broadband lines growth per day by operator, 2006-2013**[67]




*Source: Communications Committee*

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

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



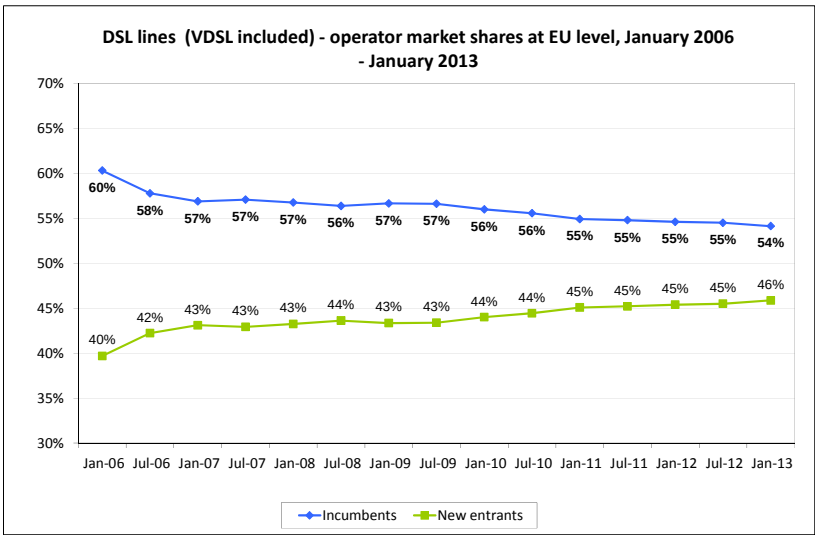

*Source: Communications Committee*

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

[67] The July 2010 figures are influenced by some adjustments in certain Member States

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

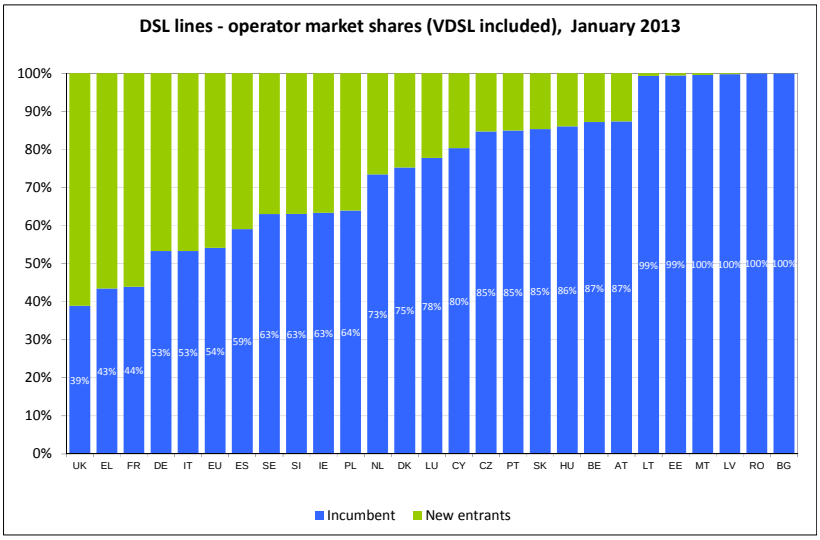
**Figure 43: DSL lines – operator market shares at EU level, 2006-2013**




*Source: Communications Committee*

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

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

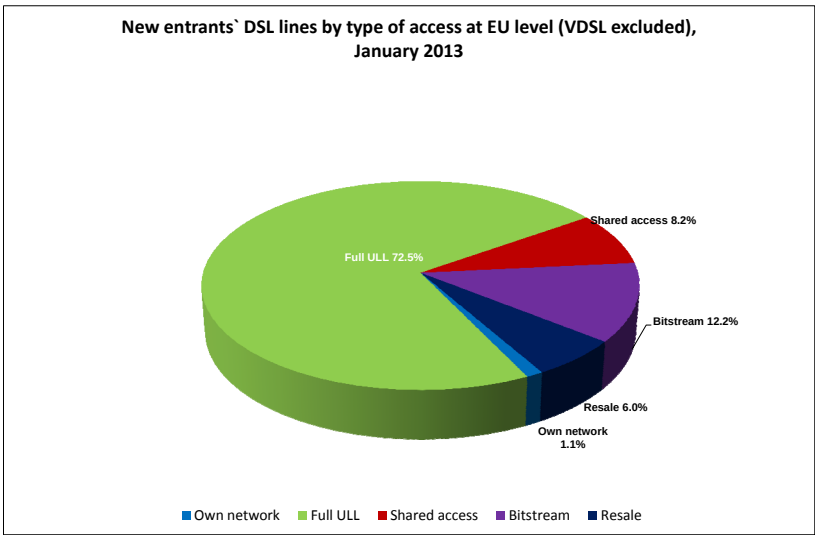



*Source: Communications Committee*

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

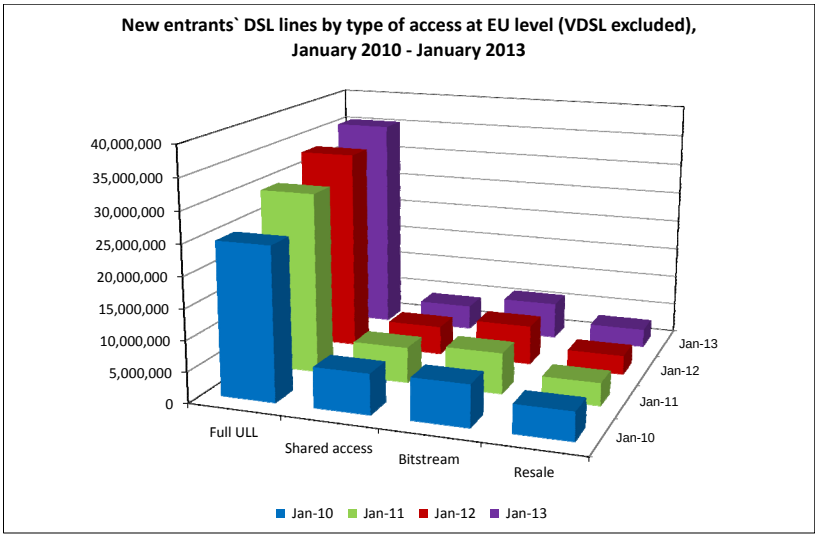
resale is the most popular access type, while in the Czech Republic, Hungary, Slovenia and Ireland bitstream is the most widely used.

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




*Source: Communications Committee*

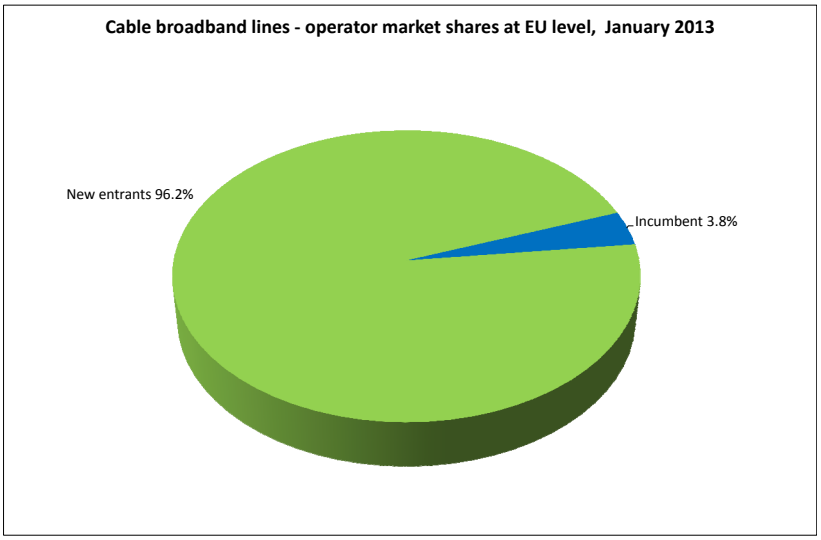
**Figure 46: New entrants' DSL lines by type of access at EU level, 2010 - 2013**




*Source: Communications Committee*

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

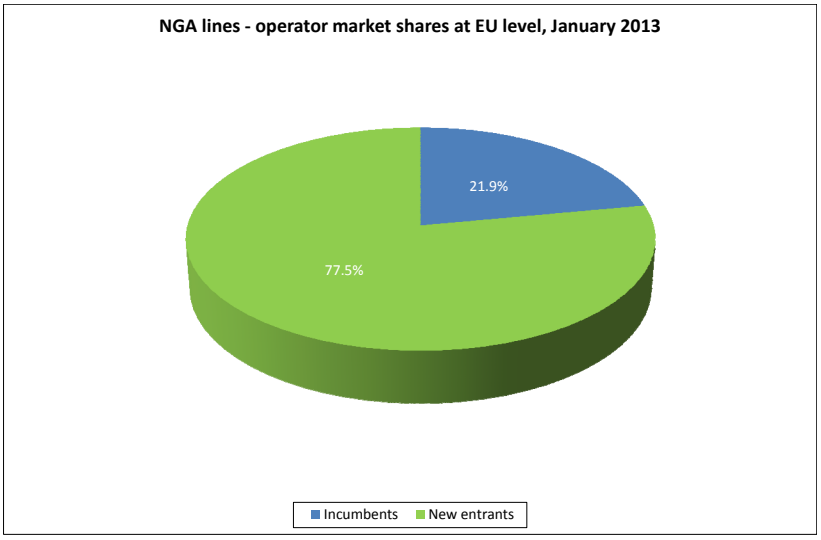
**Figure 47: Cable broadband lines – operator market shares at EU level, January 2013**




*Source: Communications Committee*

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

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



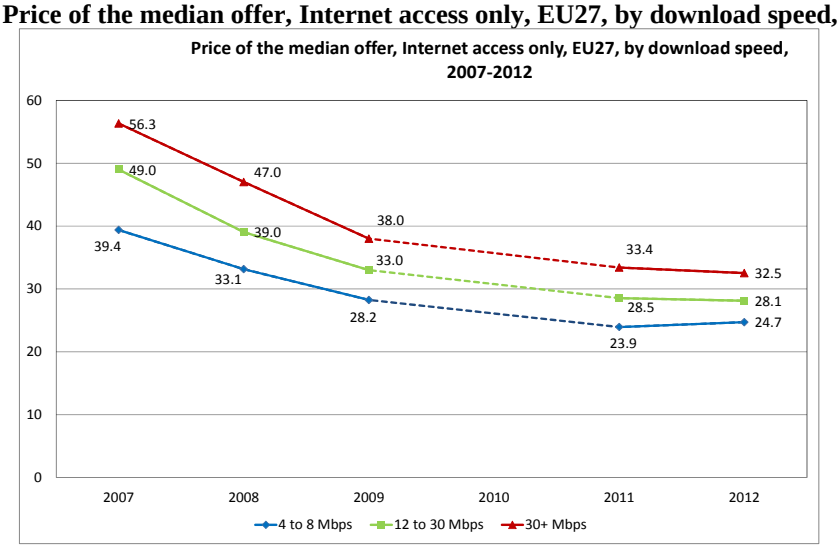

*Source: Communications Committee*

### *2.2.8. Prices of fixed broadband access*

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

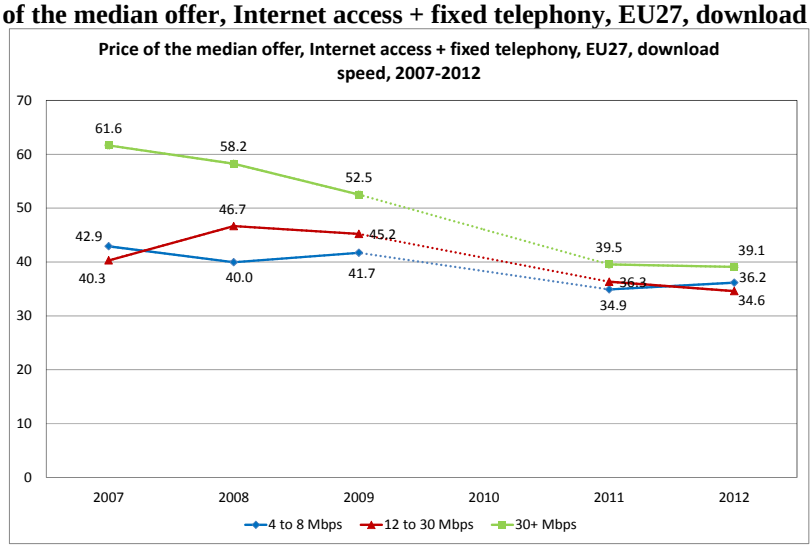
The sample includes around 3,700 commercial offers[68] and reveals a pattern of price reduction over the last six years.

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




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

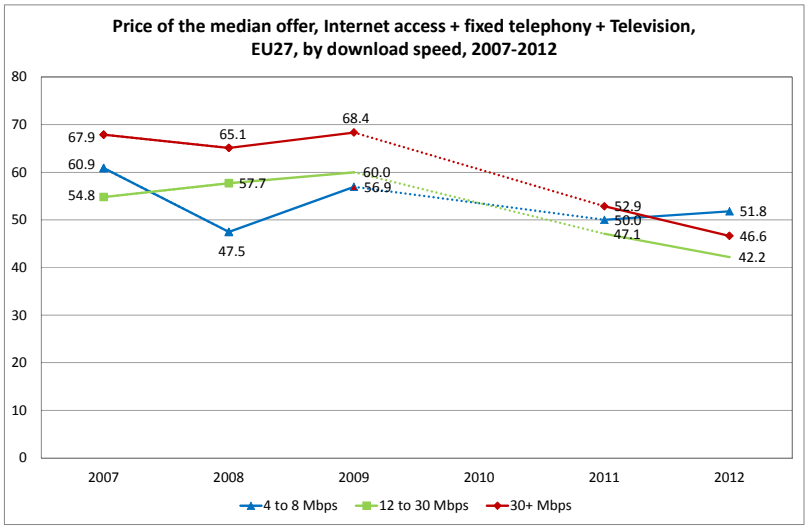
**Figure 50: Price of the median offer, Internet access + fixed telephony, EU27, download speed, 2007-2012**




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

[68] Broadband Internet Access Cost (BIAC). Report August, 2011. Van Dijk-Management Consultants

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

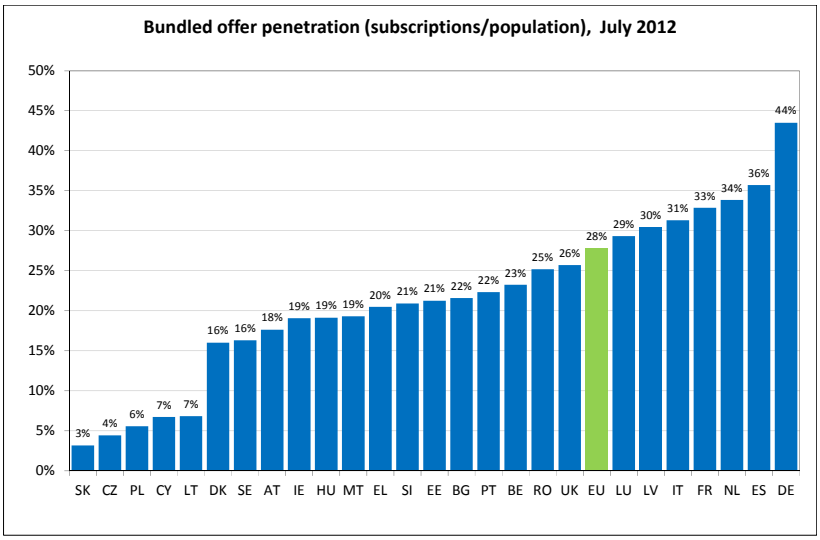



*Source: Broadband Internet Access Cost (BIAC) Reports by Van Dijk*

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

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

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




*Source: Communications Committee*

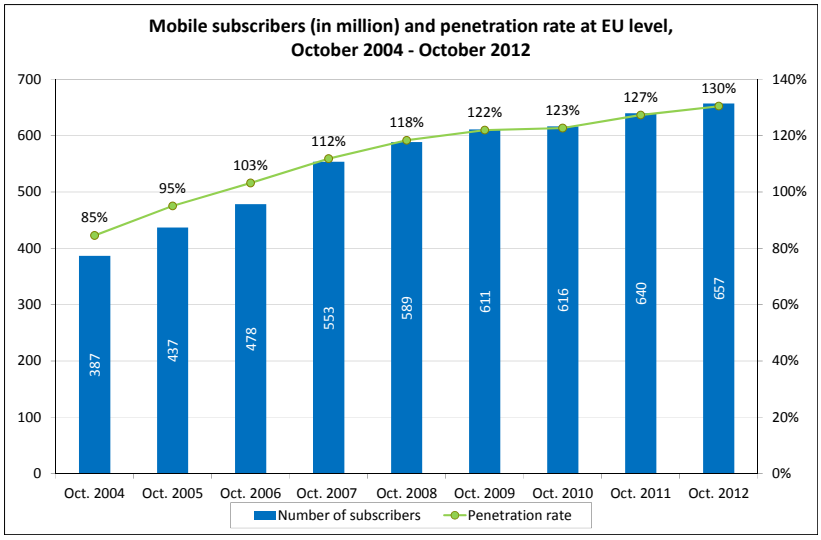
## 2.3. The mobile market

### *2.3.1. Mobile subscriptions*

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

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

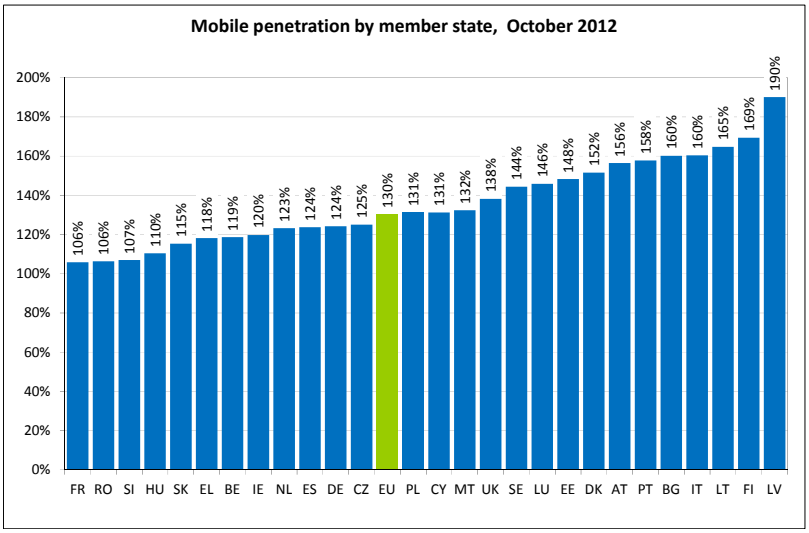
**Figure 53: Mobile subscribers and penetration rate at EU level, 2004-2012**




*Source: Communications Committee*

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

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

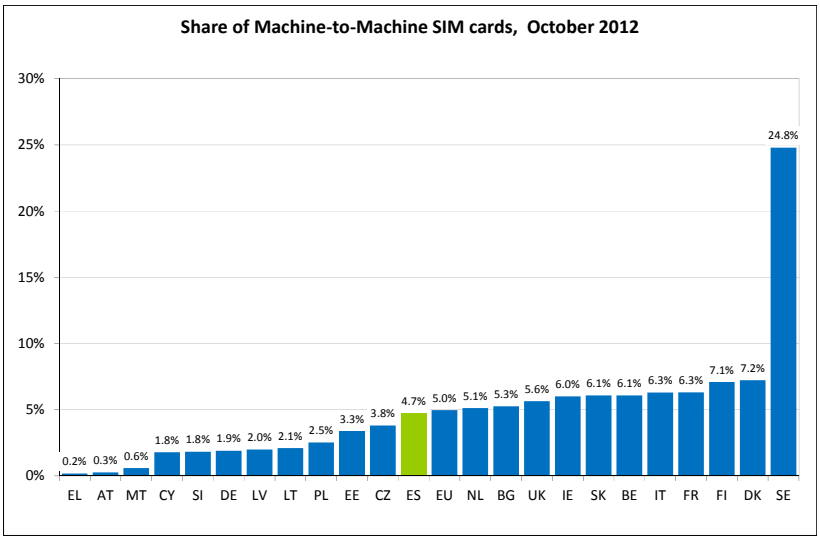



*Source: Communications Committee*

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

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

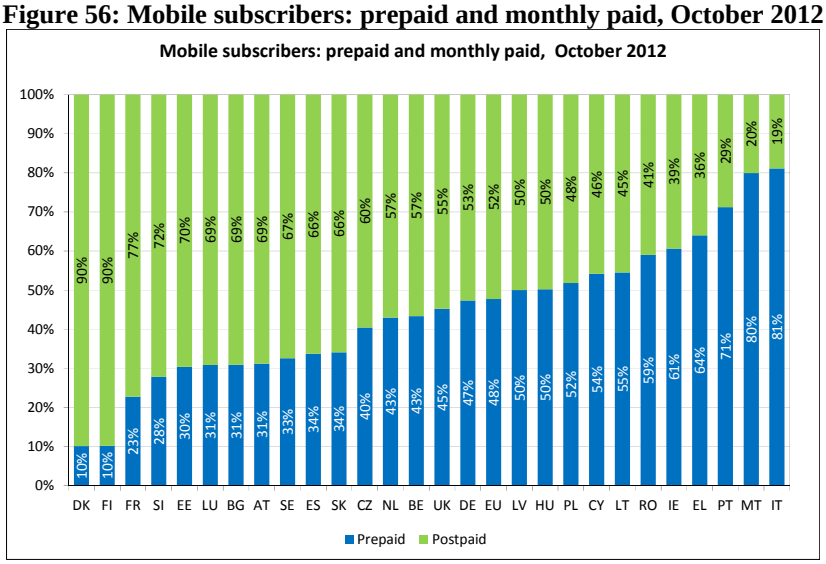
**Figure 55: Share of Machine-to-Machine SIM cards, October 2012**




*Source: Communications Committee*

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

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

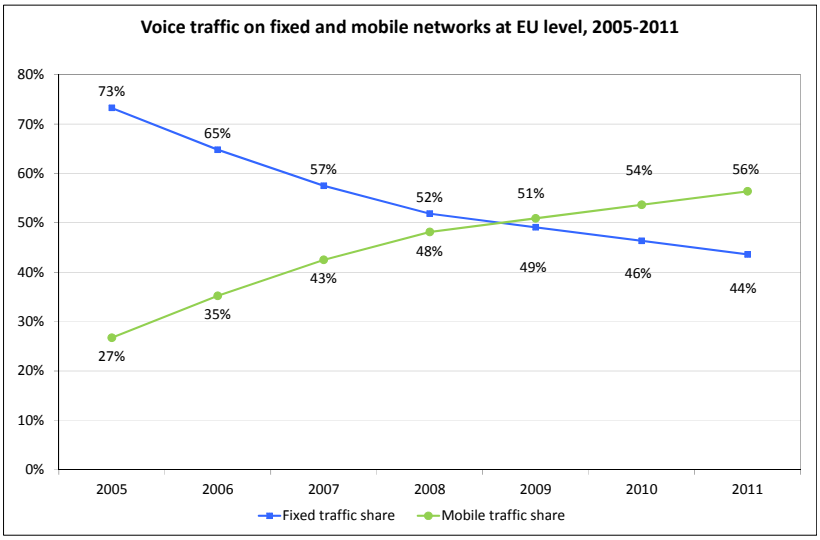



*Source: Communications Committee*

### *2.3.2. Mobile voice traffic development*

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

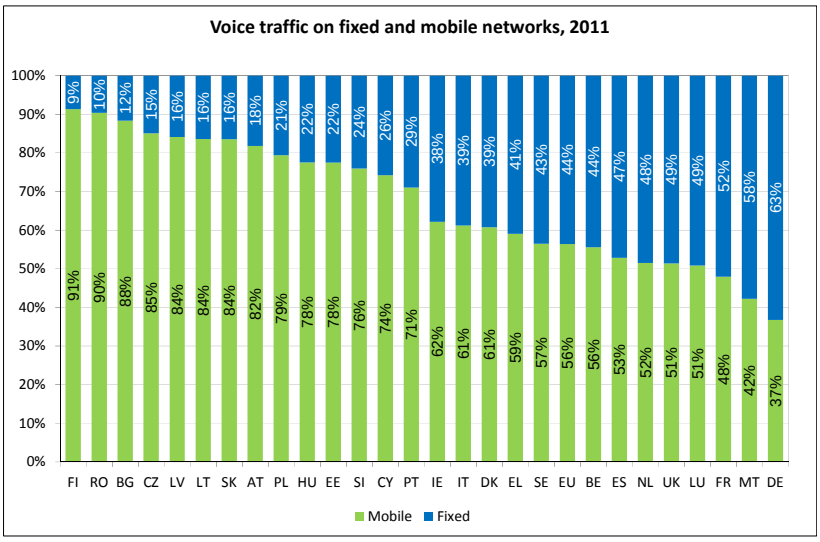
**Figure 57: Voice traffic on fixed and mobile networks at EU level, 2005-2011**




*Source: Communications Committee*

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

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



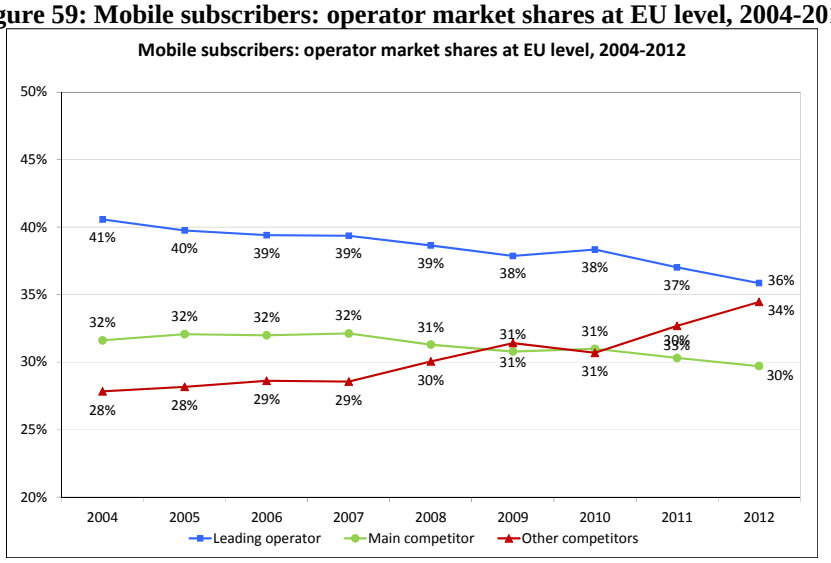

*Source: Communications Committee*

### *2.3.3. Competition in the mobile sector*

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

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

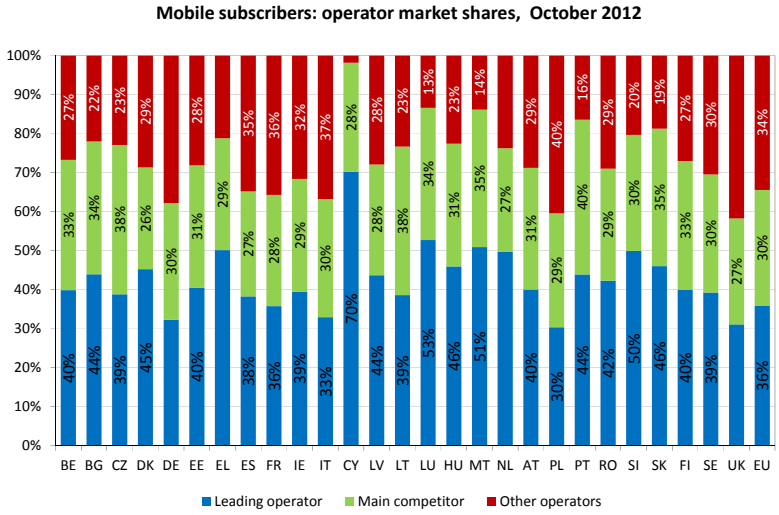
**Figure 59: Mobile subscribers: operator market shares at EU level, 2004-2012**




*Source: Communications Committee*

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

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

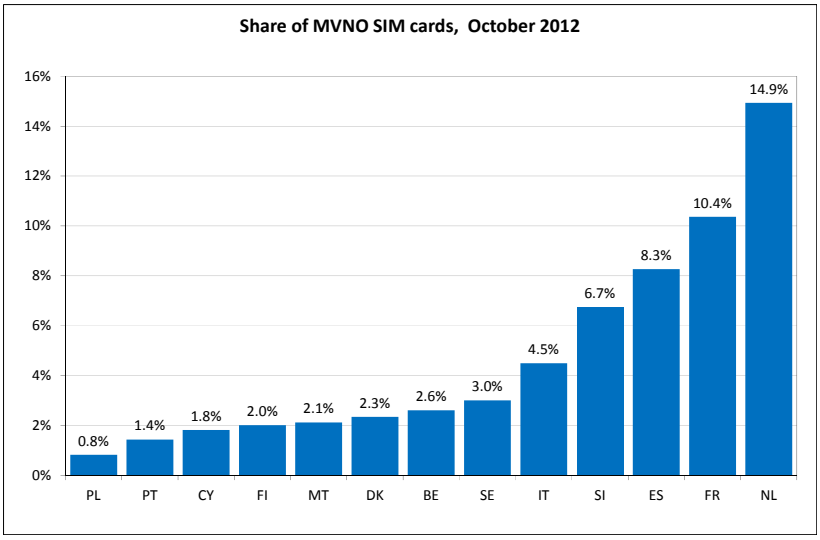



*Source: Communications Committee except for DE, EL, NL and UK (Screen Digest)*

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

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

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




*Source: Communications Committee*

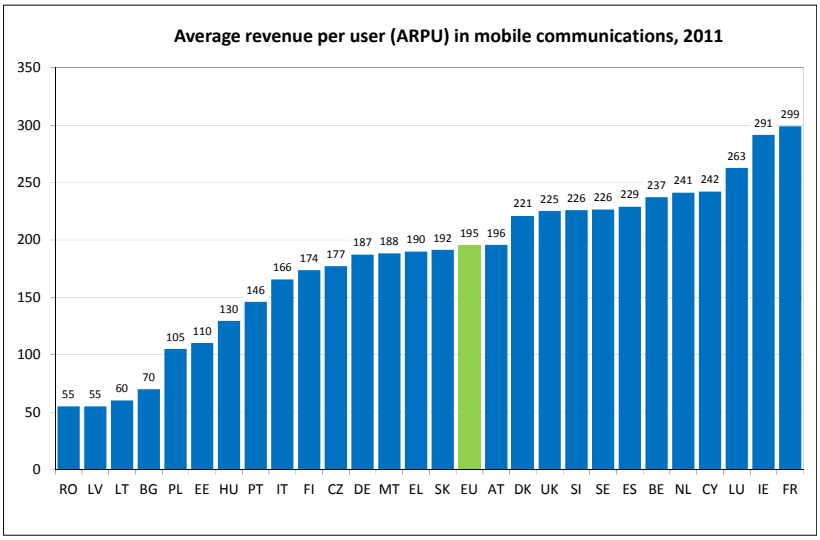
### *2.3.4. Average Revenue per Minute (ARPM) and Average Revenue Per User (ARPU)*

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

France had by far the highest ARPU (EUR 299), which is partly caused by the low penetration rate (it is not common in France to have more than one subscription per person).[69] There were four countries with an ARPU of less than EUR 100 per year: Bulgaria, Latvia, Lithuania and Romania (Figure 62). Low ARPU in these countries is mainly driven by the very low voice prices. At the top of the list, France, Ireland and Luxembourg have the highest ARPUs partly because of the relatively high voice fees.

[69] As the data is as of 2011, the effects of Free's market entry cannot be tracked.

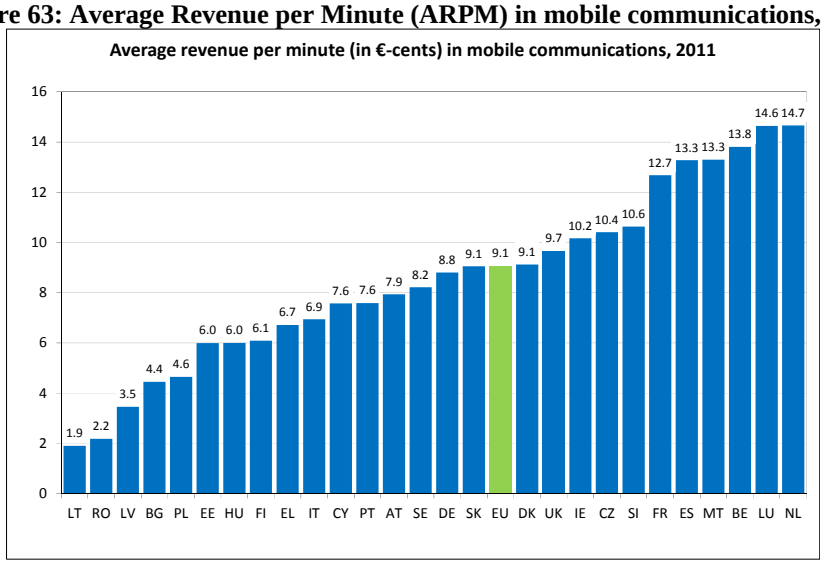
**Figure 62: Average Revenue per User (ARPU) in mobile communications, 2011**




*Source: Communications Committee*

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

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

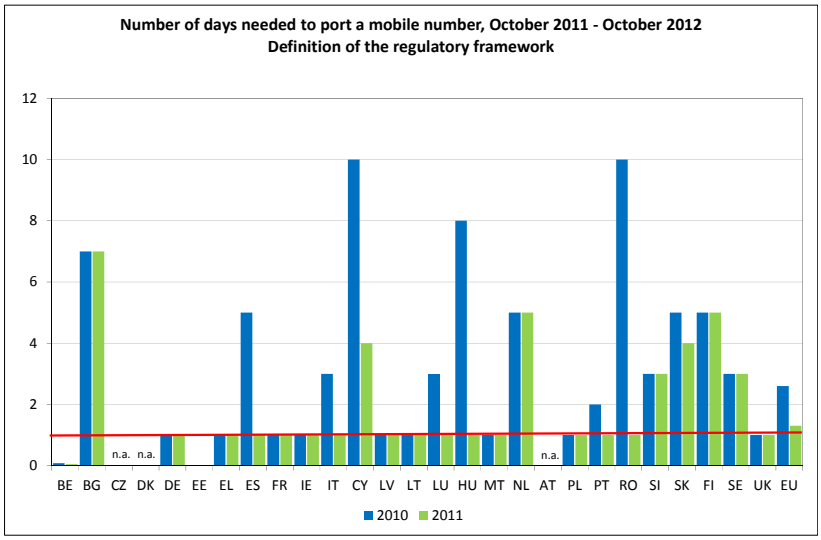



*Source: Communications Committee*

### *2.3.5. Mobile number portability*

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

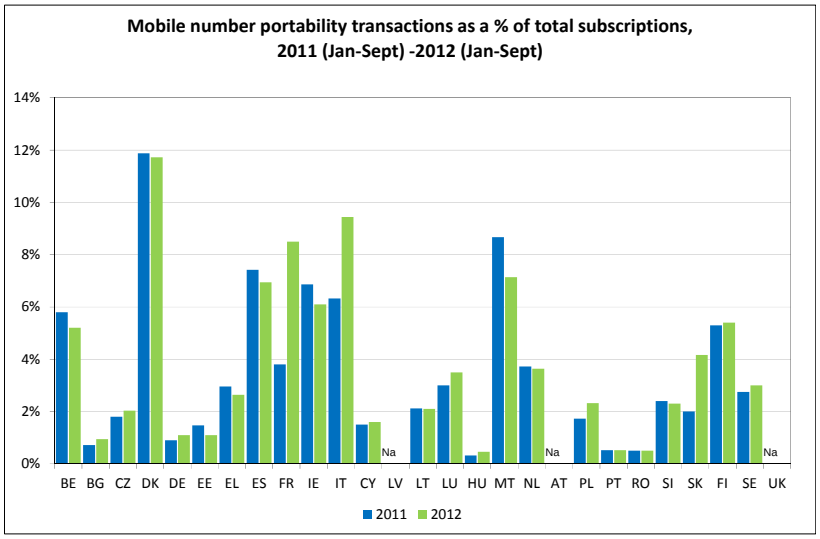
**Figure 64: Number of days needed to port a mobile number, 2011 - 2012**




*Source: Communications Committee*

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

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

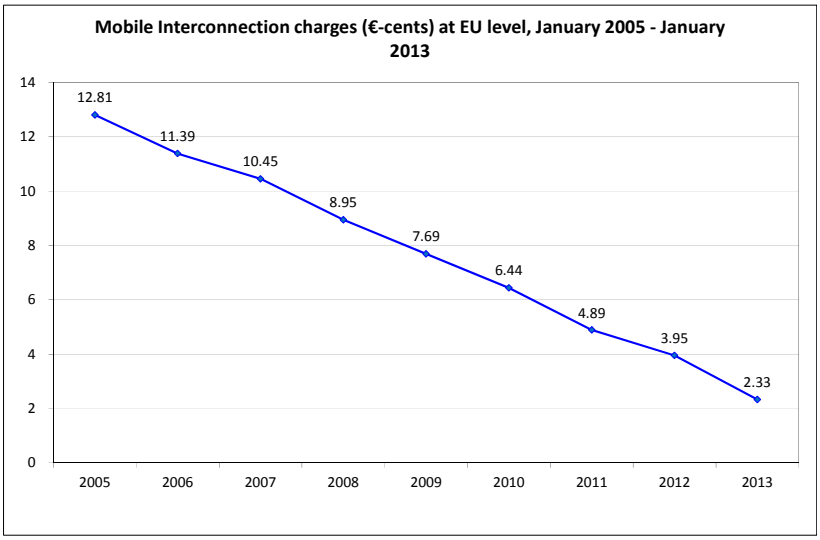



*Source: Communications Committee*

### *2.3.6. Mobile interconnection charges*

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

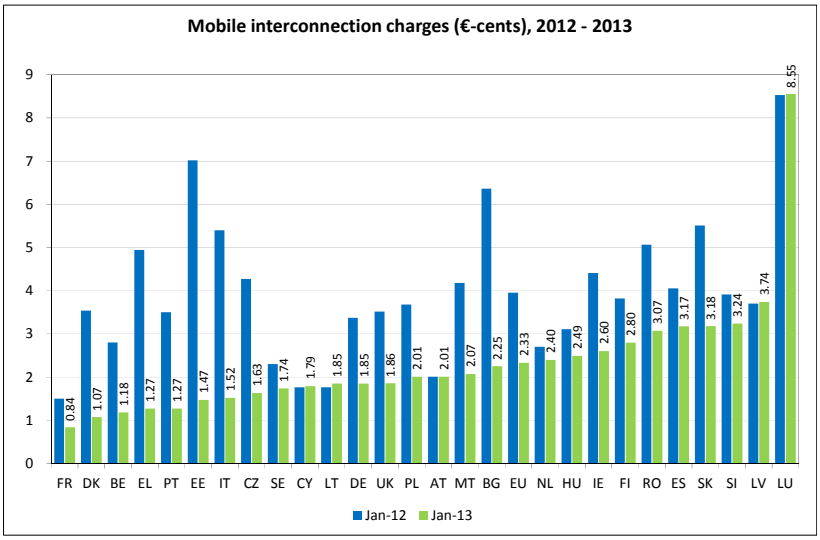
**Figure 66: Mobile interconnection charges at EU level, 2005-2013**




*Source: BEREC*

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

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




*Source: BEREC*

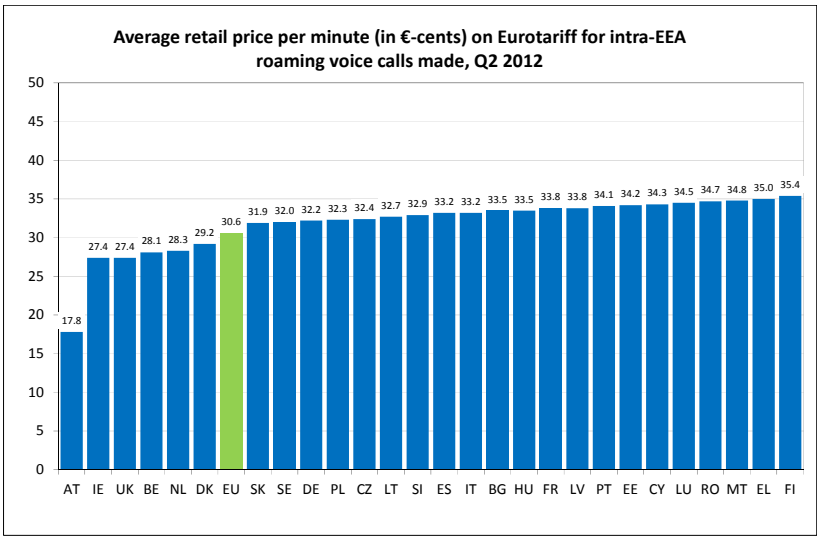
## *2.3.7. Mobile roaming prices*[70]

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

[70] Source: BEREC: International Roaming BEREC Benchmarking Data Report January 2012 – June 2012

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

**Figure 68: Average retail price per minute for intra-EEA[71] roaming voice calls made, Q2 2011**




*Source: BEREC*

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

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

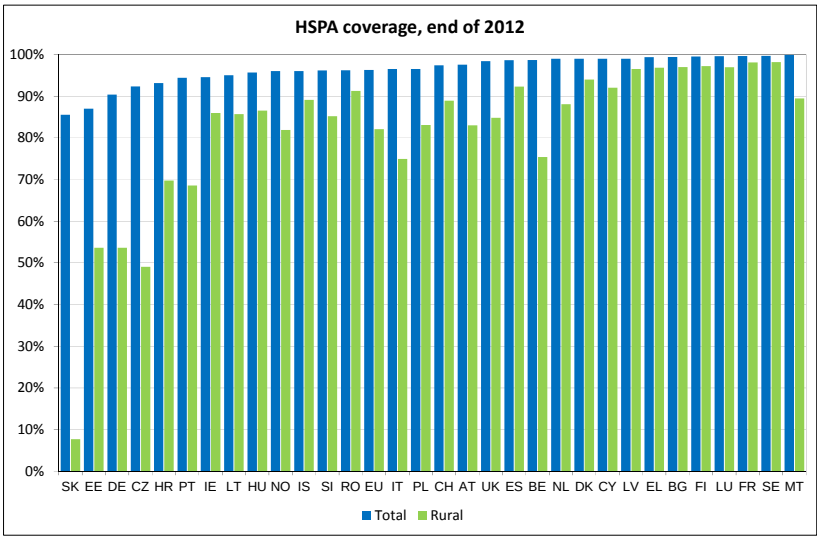
## 2.4. Mobile Broadband

### *2.4.1. Mobile Broadband coverage*

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

[71] European Economic Area

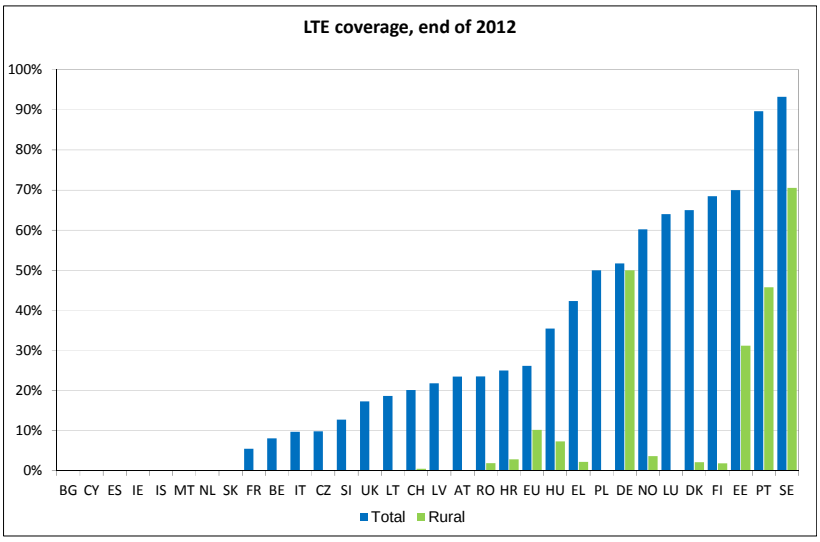
**Figure 69: HSPA coverage, end of 2012**




*Source: Point Topic*

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

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

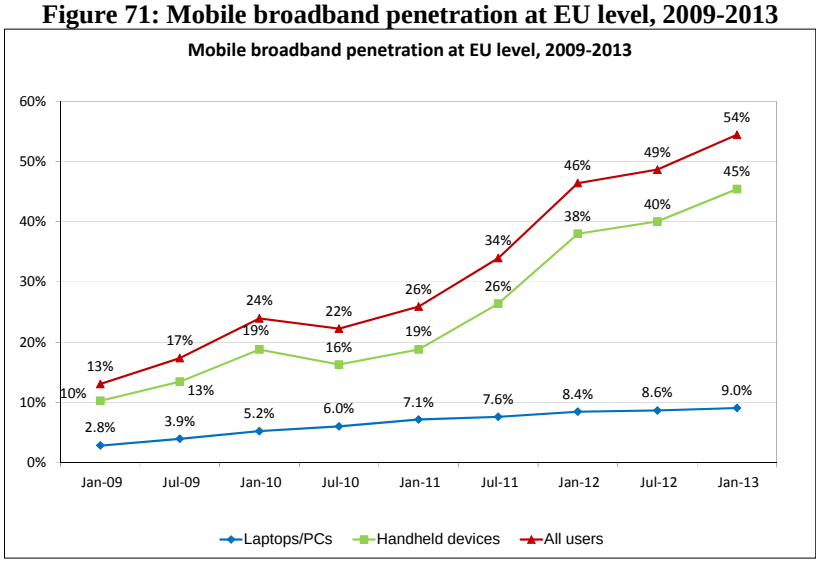



*Source: Point Topic*

### *2.4.2. Mobile broadband subscriptions/users*

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

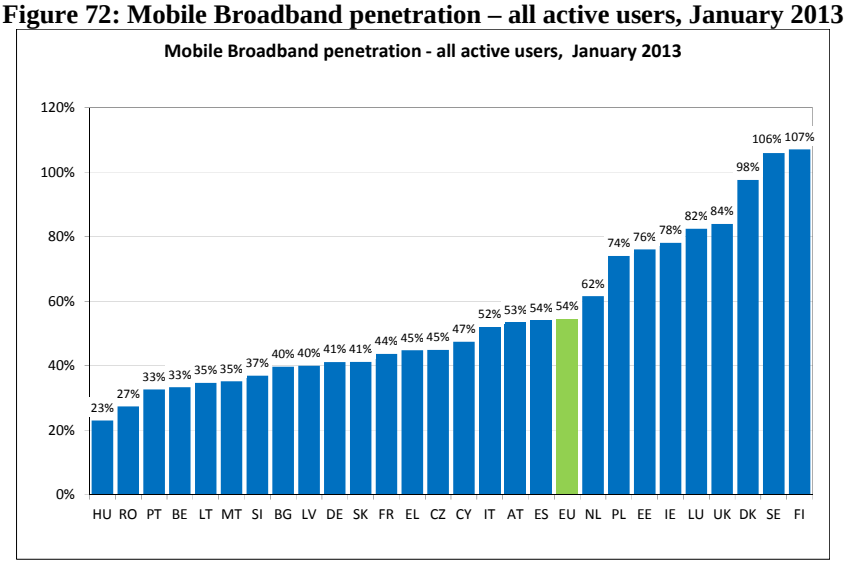
**Figure 71: Mobile broadband penetration at EU level, 2009-2013**




*Source: Communications Committee*

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

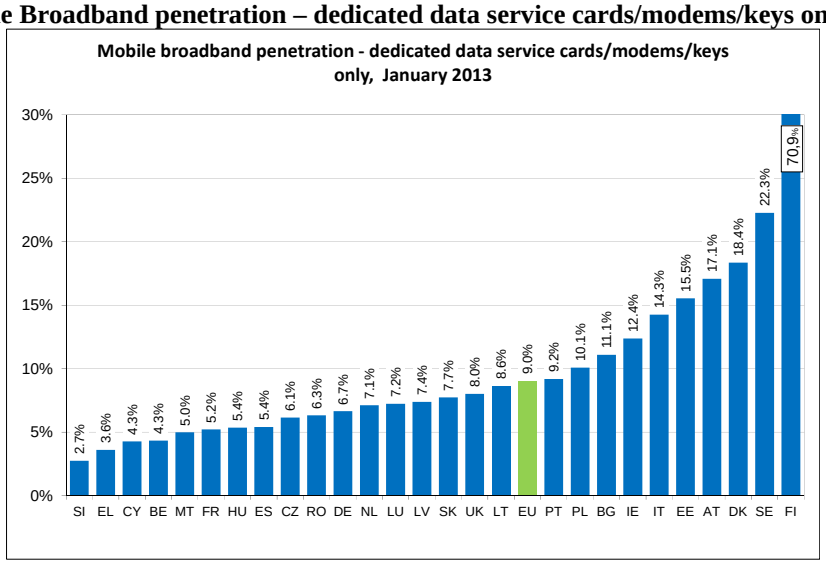
**Figure 72: Mobile Broadband penetration – all active users, January 2013**




*Source: Communications Committee*

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

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




*Source: Communications Committee*

# 3. INTERNET USE AND SKILLS

## 3.1. Introduction

This chapter looks at recent developments in internet usage and skills in the EU27, Iceland, Norway, Croatia and (for data on enterprises) the Former Yugoslav Republic of Macedonia. It first looks at progress in achieving the Digital Agenda key performance targets for regular internet use of the average population and of disadvantaged individuals and well as toward the overall Digital Agenda goal of making "Every European Digital". In doing so it also analyses the barriers to achieving these goals and the differences across countries. The chapter then looks at developments digital skills (user skills and ICT professional skills) and patterns in the use of various activities online, as well as the relationship between the two. It also looks in some more detail at developments in the use of eGovernment and eCommerce, both by citizens as well as by enterprises. The final section summarises the main results of the analysis contained in the chapter and makes some conclusions for policy in this area.

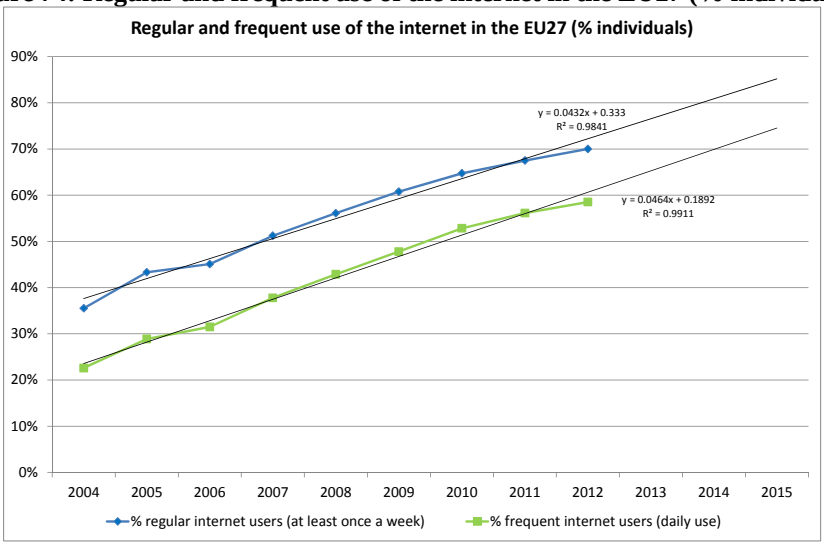
## 3.2. Regular and frequent use of the internet in the EU27+[72]

### *3.2.1. Developments at EU level*

***"Regular" (at least once a week) use of the internet*** increased by 2 p.p., from 68% in 2011 to 70% in 2012, in the EU27; showing continued steady progress towards the Digital Agenda key performance target for regular use of 75% by 2015. Indeed, forward projection of the linear trend in regular internet user in the EU indicates that the key performance target for regular internet use will be met before 2015.

***Frequent (daily) use of the internet*** grew by 3 p.p. between 2011 and 2012 in the EU27, from 56% to 59%; showing that not only is the proportion of the population going regularly online increasing, but that it is increasingly becoming a daily activity.

**Figure 74: Regular and frequent use of the internet in the EU27 (% individuals)**



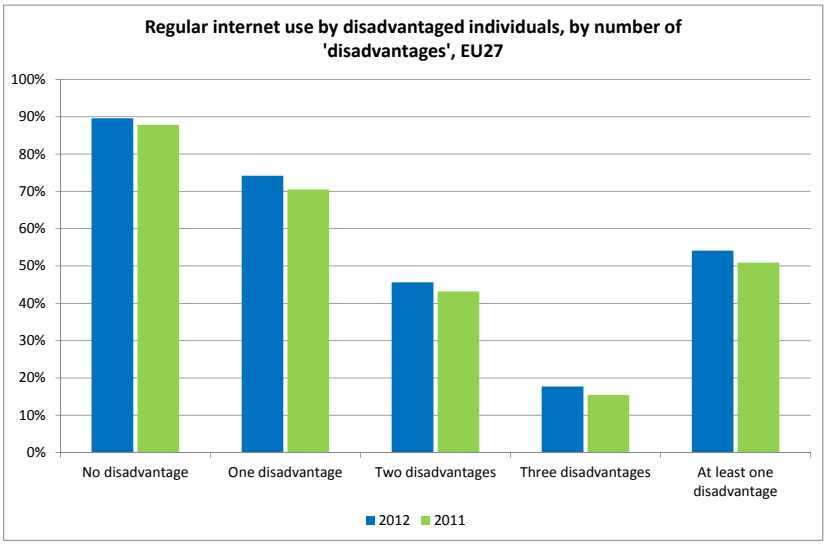

*Source: Eurostat*

[72] EU27+ refers to the 27 member countries of the EU plus Iceland, Norway and Croatia (Turkey and Macedonia are not included due to lack of available data). The use of EU aggregated data from Eurostat refers to the 27 Member States.

Over the past few years, convergence between regular and frequent use has been rather slow: since 2005 the proportion of the population using the internet weekly, but not daily, has fallen only by around 3 p.p. from around 14% to 11%. It can be expected however that as rates of regular internet use approach saturation, convergence is likely to pick up, as once new users become more experienced they tend to increase their frequency, and variety, of use – using the internet more and for more activities.

While the internet can do much to mitigate the effects on people's lives of certain economic and social disadvantages, it is true that rates of regular internet use of individuals with such disadvantages (in particular older individuals, the low educated and economically inactive) are often lower than for the average population. Furthermore, this effect is compounded by multiple disadvantages: as the number of disadvantages increases, rates of regular use fall. That is why the Digital Agenda also has a key performance target for the **regular internet use of disadvantaged people** of 60% by 2015. Good progress has been made in the last year towards this target: regular internet use of disadvantaged people rose by 3 p.p. between 2011 and 2012, from 51% to 54%; this trend in the regular use of disadvantaged people indicates that the target for disadvantaged people will also be met by 2015.[73]

**Figure 75: Regular internet use by disadvantaged individulas, by number of 'disadvantages', EU27**



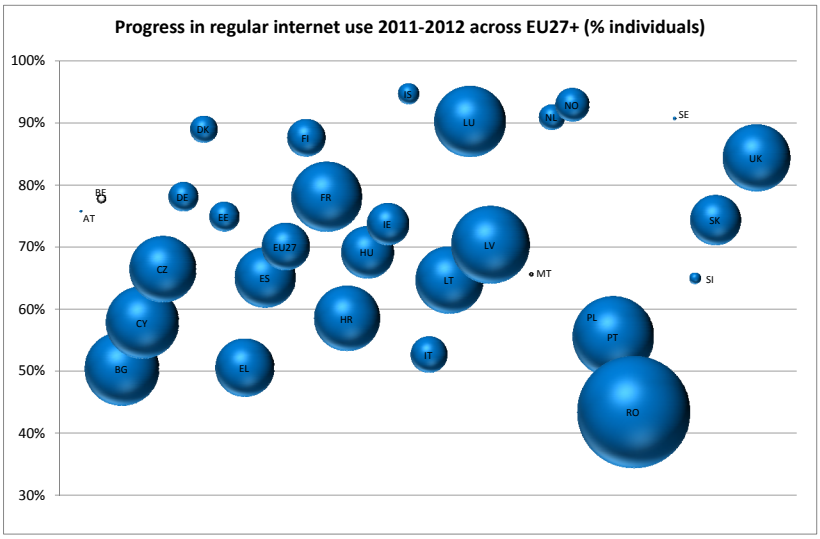

*Source: Eurostat*

### *3.2.2. Developments across EU27+ countries*

Across Europe rates of regular internet use are still rather dispersed and the rankings of countries with the highest and lowest rates have changed very little over time. The highest rates of regular internet use are found in the Nordic countries (Iceland (95%), Norway (93%), Sweden (91%), Denmark (89%) and Finland (88%), as well as the Netherlands (91%) and Luxemburg (90%), where rates are approaching saturation. At the other end of the scale, countries with the lowest rates of regular internet use (Romania (43%), Bulgaria and Greece (50%), and Italy (53%)) have around half of their populations, or more, not using the internet on a regular basis.

[73] 'Disadvantaged people' are individuals with at least one of the following disadvantages: aged 55-74; low education; unemployed or inactive or retired.

**Figure 76: Progress in regular internet use 2011-2012 across EU27+ (% individuals)**

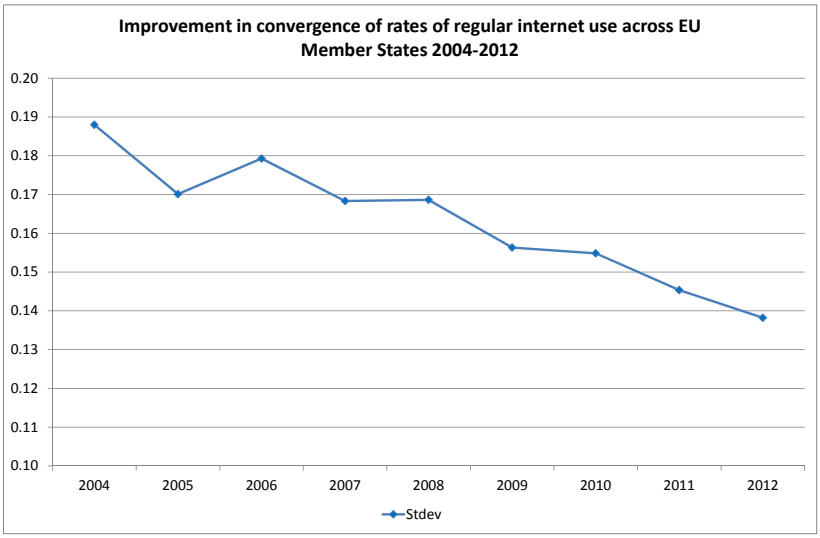



*Note: Bubble size represents the size of the increase in the rate of regular internet use between 2011 and 2012; Countries are in alphabetical order from left to right. Source: Eurostat*

Never-the-less, progress in rates of regular internet use over the last year shows that catch-up is taking place: on average countries with below (EU) average rates of regular internet use have made more progress than those with above average rates. The countries with the some of the largest percentage point increases in regular use between 2011 and 2012, were those with the lowest rates (e.g. Romania (+6 p.p.); Portugal, Bulgaria, Cyprus, the Czech Republic, Croatia, Lithuania and Latvia (+4 p.p.); Greece, Spain, Hungary and Croatia (+3 p.p.)). The major exception here is Italy: while Italy made some progress (+2 p.p.) in increasing its rate of regular internet use over the last year, this was less than the average in the EU, and resulting in Italy falling to one of the countries with the lowest rates of regular internet use in the EU27+. However, some countries with above average rates of regular use have also made substantial increases in the last year (e.g. Luxemburg, the UK and France (+4 p.p.). Little or no progress in regular internet use was achieved in the last year in Austria, Belgium, Slovenia, Poland, Malta and Sweden. While in the case of Sweden it is perhaps to be expected given the countries near saturation, in the other five countries this is not the case.

The development in measures of dispersion over time shows that convergence in regular internet use is a continuing trend: the difference between the maximum and minimum rates of regular internet use in the EU has fallen from 65 p.p. in 2004 to 48 p.p. in 2012, the standard deviation has fallen from 0.19 to 0.14.

**Figure 77: Improvement in convergence of rates of regular internet use across EU Member States 2004-2012**




*Source: Commission Services based on Eurostat data*

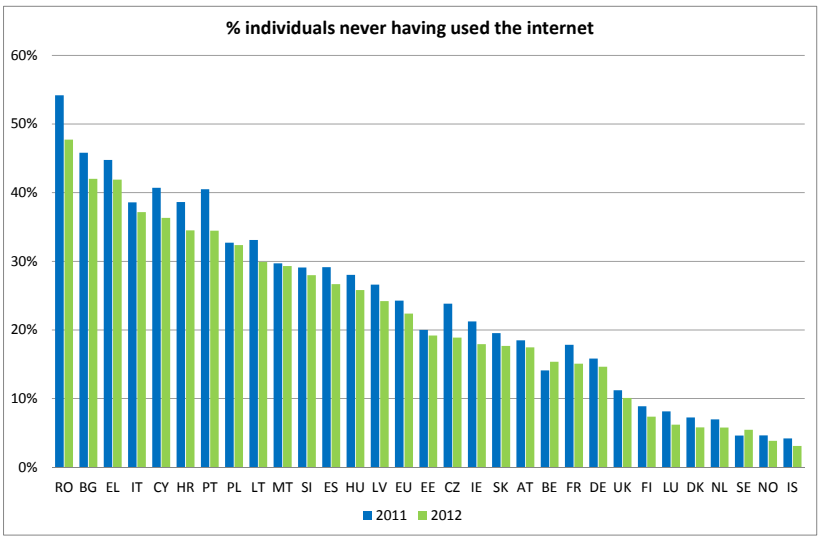
## 3.3. Making "Every European Digital" and the main barriers to getting there

### *3.3.1. Progress in getting people online*

**Non-use of the internet** is a major policy concern in Europe, indeed the overarching mantra of the Digital Agenda for Europe is "Every European Digital". This is why the Digital Agenda for Europe has a key performance target to halve the number of non-users from 30% (in 2009) to 15% by 2015. While the rate of non-users continued to fall in 2012 (by 2 p.p. over 2011) bringing it closer to this target, 22% of the EU population has still never used the internet. Furthermore, across the EU27+, rates of non-use vary substantially, from under 5% in the best performing countries (Iceland, Norway and Sweden) to above 40% in Bulgaria, Greece, and Romania.

As with regular internet use, however, good progress in reducing rates of non-use has been made in the last year by the countries with the largest rates of non-users: Portugal (-7 p.p., to 34%), Romania (-6 p.p., to 48%), Cyprus (-5 p.p., to 36%), Bulgaria (-4 p.p., to 42%), Croatia (-4 p.p., to 35%), Greece (-3 p.p., to 42%), Lithuania (-3 p.p., to 30%). The major exceptions here are Italy (-2 p.p., to 37%) and Poland (-1 p.p. to 32%), which made more moderate reductions. The Czech Republic, which is an average performer in terms on non-use, also made a substantial reduction in its rate of non-users over the last year (-5 p.p, to 19%). Finally, no reduction in rates of non-users were observed for Sweden and Belgium over this period; mirroring the lack of progress in increasing rates of regular users in these countries.

**Figure 78: Non-use of the internet (% individuals never having used the internet)**

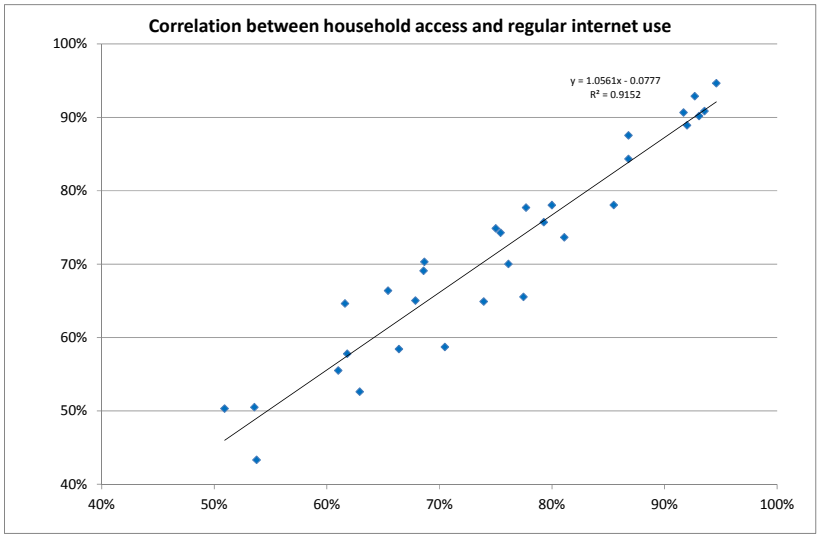



*Source: Eurostat*

### *3.3.2. Barriers to internet use*

A prerequisite to being able to use the internet is having access to it. Across the EU27+ household access is highly correlated with regular use of the internet (with a correlation coefficient of 0.96), confirming the importance of household access for regular use. However, not all households in the EU27 have access to the internet. In 2012, 76% of households had access to the internet, up from 73% in 2011, as such almost a quarter of households were without access.

**Figure 79: Correlation between household access to the internet and regular use of the internet in 2012 (% individuals)**

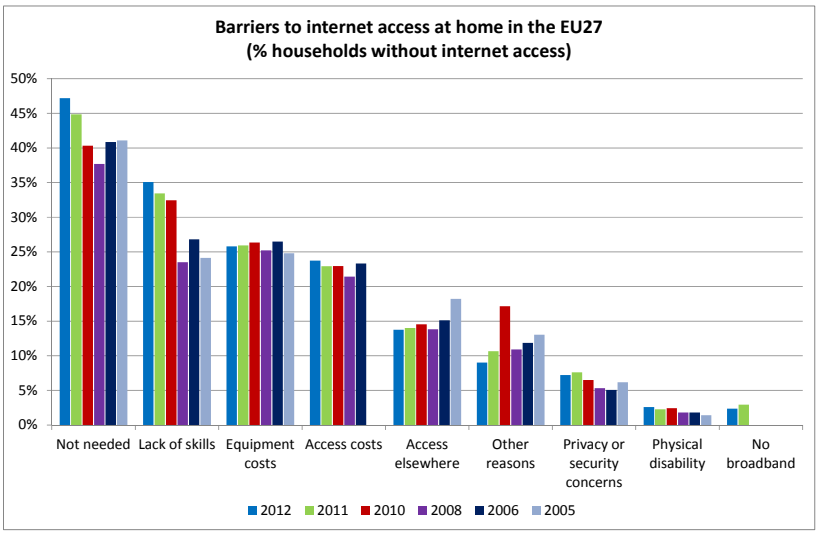



*Source: Commission services based on Eurostat data*

Understanding the barriers to household access to the internet is therefore important for policy towards the Digital Agenda goals on internet use. Evidence on barriers shows that as internet use increases, an increasing proportion of those who remain as non-users say that they don't need it (47% in 2012), and/or do not have the necessary skills (35% in 2012). Access (24% in 2012) and equipment (26% in 2006) costs are the next most important factors and their importance has changed little over time. Access elsewhere has been declining in importance

and other factors such as privacy and security concerns and no broadband availability are less mentioned. Physical disability remains a less mentioned barrier in the overall population; however, the share of the disabled in the population is also low. A declared lack of interest in the internet by non-users could relate to a number of things: lack of knowledge and skills, a genuine lack of interest, lack of an appropriate offer or not wanting to report financial reasons or lacking skills. The catch-all nature of this choice could help explain the importance of this reason.

**Figure 80: Barriers to internet access at home in the EU (% households without internet access)**

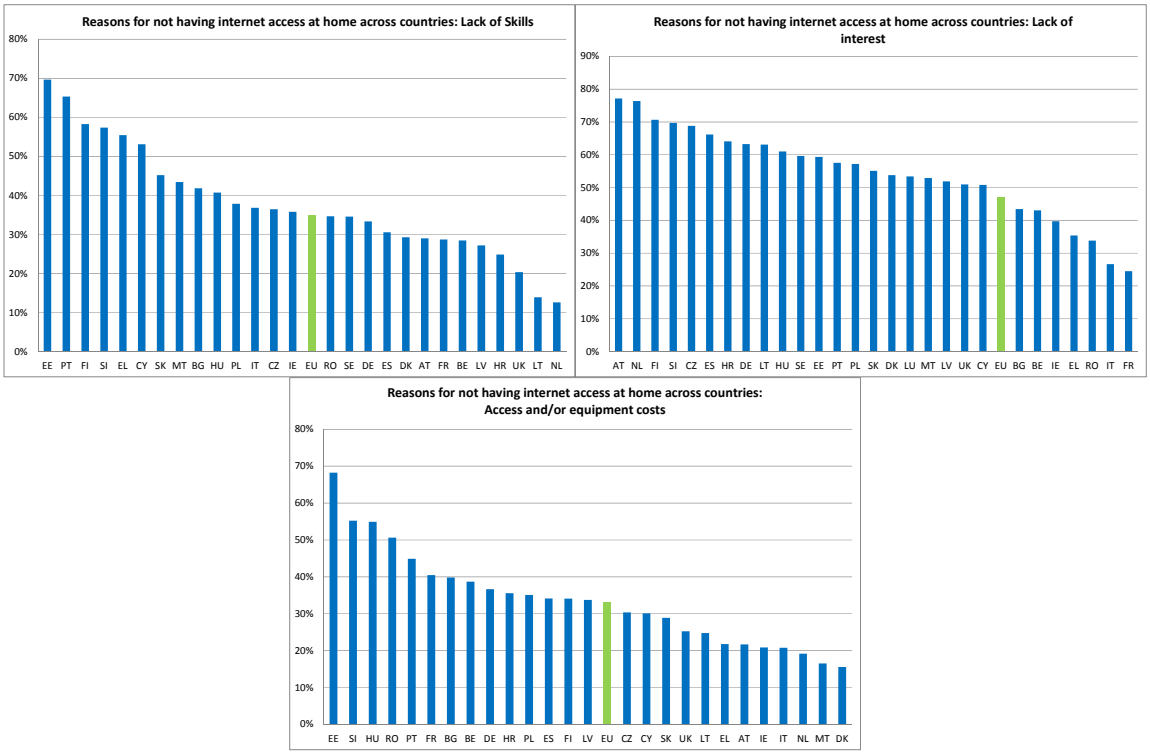



*Source: Eurostat*

Across the EU 27+ countries the three main factors remain lack of interest, lack of skills and cost. However, there is some variation in the importance of these three reasons. In the majority of countries, lack of interest is an important factor. However, lack of skills is also very important in Bulgaria, Cyprus, Estonia, Greece, Finland, Hungary, Malta, Portugal, Slovenia and Slovakia. Costs are particularly important as a reason in Belgium, Bulgaria, Germany, Estonia, France, Hungary, Portugal, Romania and Slovenia.

Generally speaking, it can be said that for countries with relatively higher rates of non-users all three reasons are important, while for countries with less non-users the overriding factor becomes lack of interest.

**Figure 81: Main barriers to internet access at home in EU27+ countries (% households without internet access)**




*Source: Eurostat*

Evidence on barriers suggests that getting the remaining part of the population that is offline to become regular internet users, policy increasingly needs to focus on two main issues: on the one hand, tackling the increasing importance of lack of skills and awareness among non-users by for example implementing awareness raising and skills development initiatives, and, on the other, enabling the persistent proportion of non-users for which financial constraints are an issue to overcome them, such as by providing vouchers or tax incentives to low income non-user households for their first computer and/or internet connection. Furthermore, in countries where costs for access are still relatively high, policy should be implemented to provide affordable access to all: this seems of particular importance in Hungary, Slovenia and Portugal where not only are average prices of popular telecoms bundles high but also countries were non-users complain the most about high costs.

## 3.4. Digital skills in the EU

### *3.4.1. ICT user skills*

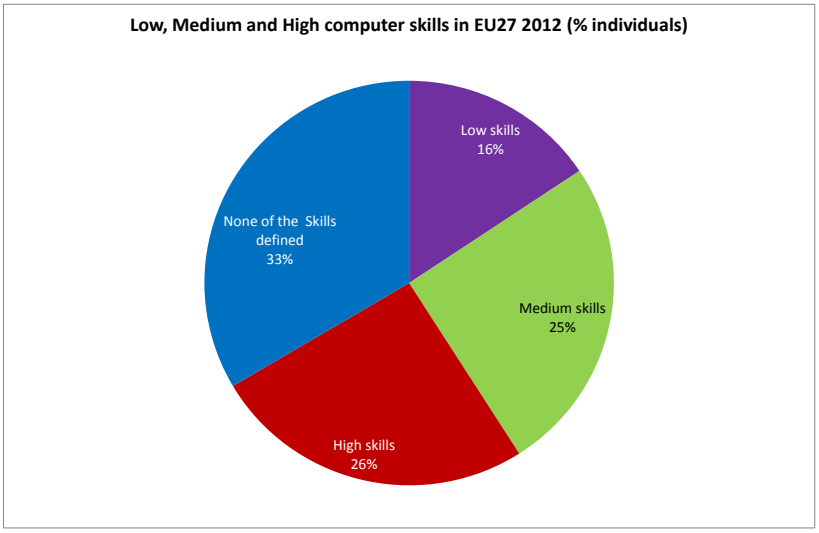
Digital skills are fundamental to an effective use of ICT. As such every year the Commission collects data on the digital skills of the EU population through its survey of ICT use by individuals and households. Digital skills are measured by asking individuals if they have ever performed certain computer and/or internet related activities. Low, medium and high skills are then calculated by whether individuals have performed 1 or 2, 3 or 4, or 5 or 6 of the listed internet or computer activities. In 2012, data were collected on computer skills only.

In the EU, 67% of individuals had some level of **computer skills**, unchanged from 2011: 26% of individuals had high skills (-1 p.p. over 2011), 25% medium skills (unchanged) and 16%

low skills (+2 p.p.). 33% had none of the defined skills. As such almost 50% of the EU population still has little or no computer skills (low skills + none of the defined skills[74]). While no data on internet skills is available for 2012, data from 2011 show that similar to computer skills around 70% of the population (73%) have internet skills. However, the distribution of skills is more shifted towards low (30%) and medium (32%): only 11% had high level skills.

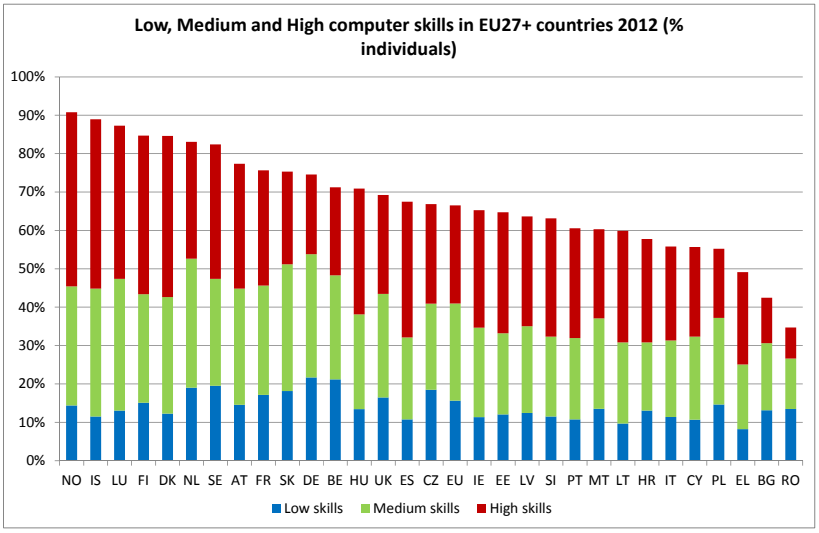
Given the growing necessity for digital skills in Europe – in particular, the projected 90% of jobs that will soon require some digital skills - it seems much needs to be done to improve the digital skills levels of EU citizens, and the perception of more than half of the labour force that their current digital skills are not sufficient were they to look for another job.

**Figure 82: Low, Medium and High computer skills in EU27 2012 (% individuals)**




*Source: Eurostat*

**Figure 83: Low, Medium and High computer skills in EU27+ countries 2012 (% individuals)**

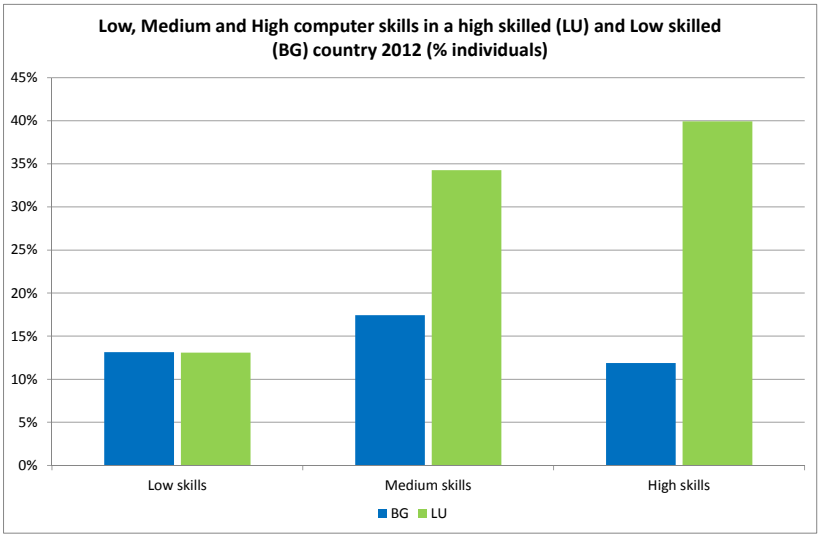



*Source: Eurostat*

[74] "None of the defined skills" refers to the proportion of individuals questioned that do not report having carried out any of the six computer related activities asked about or that answered having never used a computer.

Across the EU 27+ countries rates of skills vary from 35% in Romania to around 90% in Norway and Iceland. Furthermore, as rates of skills among the population increase so the skills distribution shifts towards higher skills. This can be seen most clearly by taking the example of a high skilled country like Luxemburg and comparing the skills distribution to that of a lower skilled country like Bulgaria. Data for these two countries show that while both countries have similar rates of low skilled individuals, Luxemburg has around twice as many medium skilled and three times as many high skilled individuals as Bulgaria. A similar pattern can be seen for other countries.

**Figure 84: Low, Medium and High computer skills in a high skilled (LU) and Low skilled (BG) country 2012 (% individuals)**



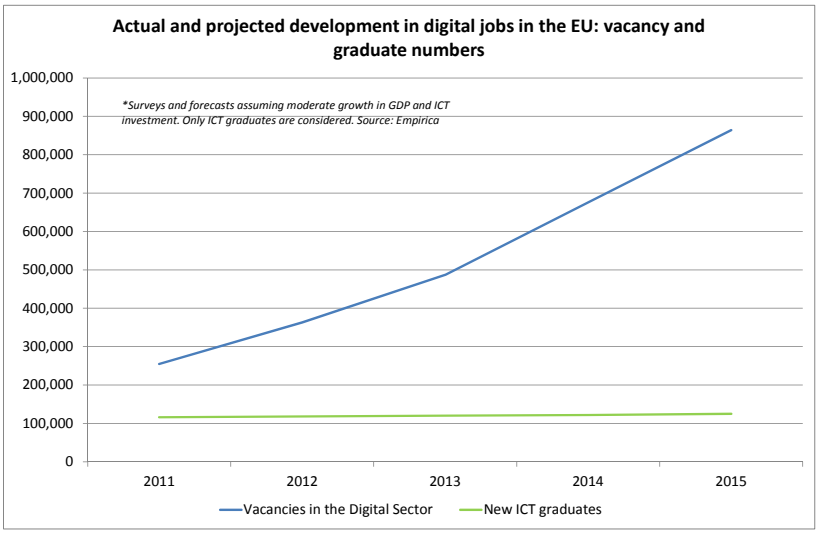

*Source: Eurostat*

### *3.4.2. Skills of ICT professionals*[75]

The EU is also in need of highly skilled ICT professionals. Evidence shows that there is a growing gap emerging in the supply and demand of ICT professionals in the EU. While ICT professional employment has grown by an average 3% over the last 10 years, graduate numbers have fallen. As a result, it has been projected that by 2015 there may be as many as 900,000 unfilled vacancies for ICT professionals in the EU. This growing gap is of major concern to European competitiveness, not only of the ICT sector itself, but for the economy as a whole given the growing integration of ICT across the economy.

[75] ICT specialists are those who have ICT as their main job and hence are capable of dealing with a wide range of tasks concerning ICT systems.

**Figure 85: Actual and projected development in digital jobs in the EU: vacancy and graduate numbers**

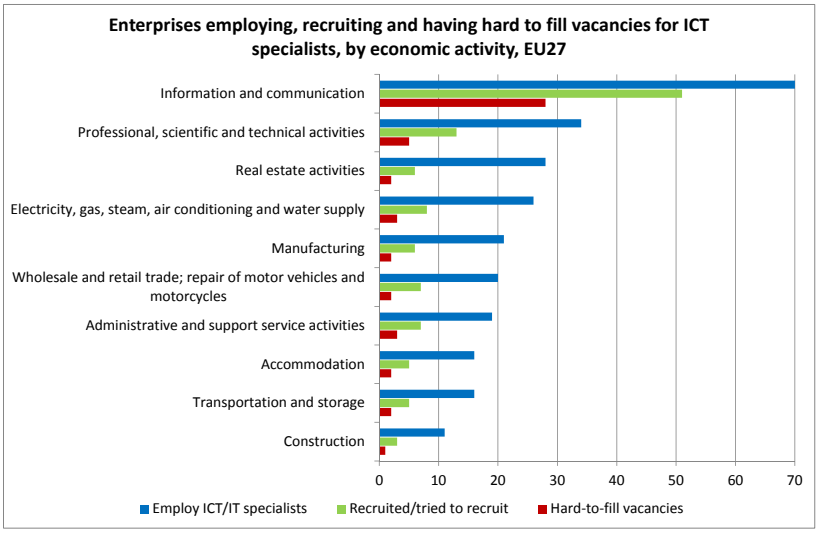



**Surveys and forecasts assuming moderate growth in GDP and ICT investment. Only ICT graduates are considered. Source: Empirica*

These trends are supported by recent Eurostat evidence on the employment and recruitment of ICT specialist in the EU. This evidence shows that, in 2012, one in five EU enterprises employed ICT specialists (21%). While 70% of enterprises in the information and communication sector employed ICT specialists, in other sectors the figure ranges from 12% (in construction) to 34% (for professional, scientific and technical activities).

As well as employing ICT specialists, the information and communication sectors (51% in 2011) dominated the proportion of EU enterprises recruiting them. However, demand for ICT specialists at lower levels was spread across enterprises in the rest of the economy. The percentage of EU enterprises other than in information and communication recruiting ICT specialists in 2011 ranged from 3% of enterprises in construction, to 13% in professional, scientific and technical activities.

**Figure 86: Enterprises employing, recruiting and having hard to fill vacancies for ICT specialists, by economic activity, EU27**



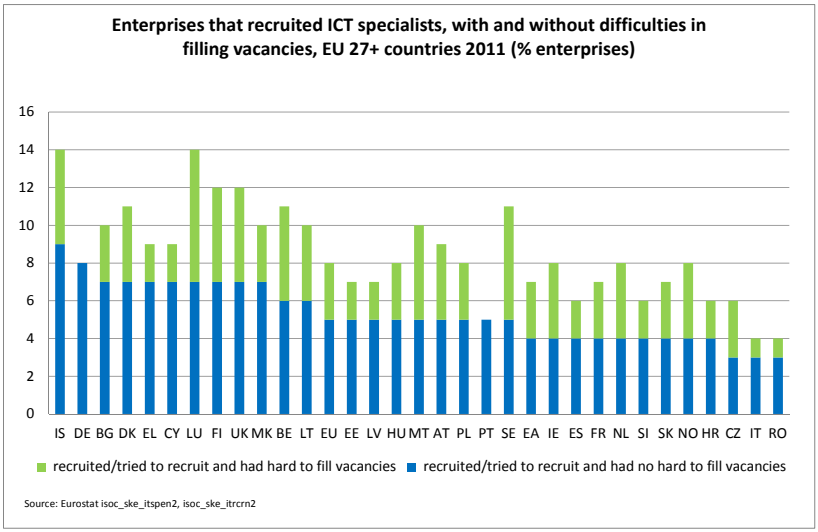

*Source: Eurostat*

On average, 8% of EU enterprises recruited or tried to recruit ICT specialists in 2011, while 3% reported having hard-to-fill vacancies for jobs requiring persons with relevant ICT skills. As such, around 40% of enterprises that recruited or tried to recruit ICT specialists in 2011,

reported difficulties in filling vacancies.Enterprises in all countries reported difficulties in recruiting ICT specialists. For those that did recruit specialists in 2011, the ratio of enterprises that reported hard-to-fill vacancies over those that did not report difficulties in recruitment was highest for Ireland, Luxembourg, Austria and Sweden.

To a certain extent internal training can replace the need to hire in external staff with certain ICT skills. Some 9% of EU enterprises provided their ICT specialists with training to upgrade their ICT skills in 2011. 17% provided training for other staff to develop their ICT skills.

**Figure 87: Enterprises that recruited ICT specialists, with and without difficulties in filling vacancies, EU 27+ countries 2011 (% enterprises)**




*Source: Eurostat*

To tackle the issue of lacking ICT professional skills in Europe, the European Commission has launched a "Grand Coalition for Digital Jobs"[76] an EU-wide multi-stakeholder partnership, with the goal of starting to increase the number of ICT professionals by 2015, so that by 2020 there is a sufficient number of them.

## 3.5. Activities online[77]

Looking at **what people do online** provides useful insights into the development of online life. Looking at the types of activities undertaken, *email* remains the most popular activity on the internet with 66% of individuals reporting using it in the last three months. This is an increase over 2010 (last available data) of 5 p.p. This is closely followed by *looking for information about goods and services* (62%, +5 p.p. over 2011) and then by reading online news or newspapers (45%, +5 p.p. over 2011).

The next most popular activities are *internet banking* (40%, +3 p.p. over 2011), *posting messages to social media sites or instant messaging* (40%, +8 p.p. over 2010 – last available data), using *travel and accommodation services* (36%, -3 p.p. over 2011), buying/ordering goods or services (35%, +1 p.p. over 2011), *playing /downloading games, images, films or music* (35%, +7p.p. over 2010) and *listening to web radio and/or watching web TV* (33%, +7p.p. over 2010 – last available data). The majority of these activities have also witnessed

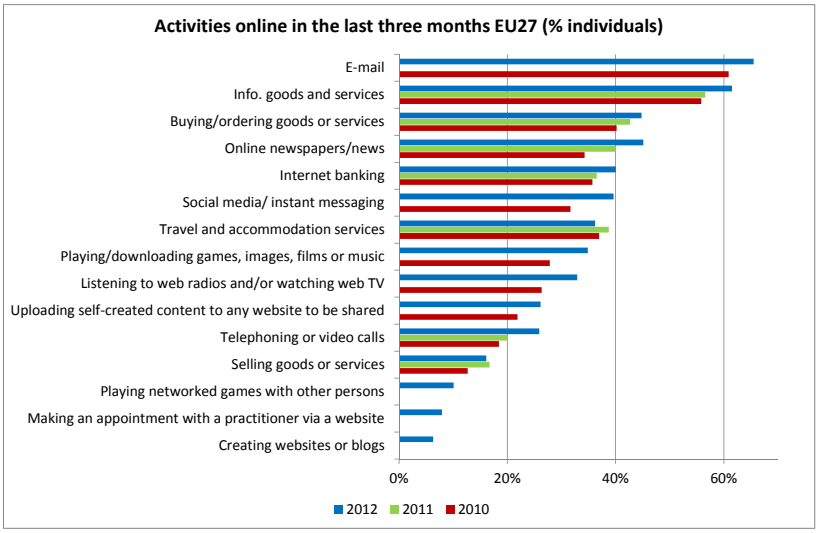
[76] https://ec.europa.eu/digital-agenda/en/grand-coalition-digital-jobs-0

[77] eGovernment and eCommerce are treated separately below.

strong growth over the last year or two, with the exception of *travel an accommodation services.*

Less popular activities include: *uploading self-created content* (26%, +4 p.p. over 2010), *telephoning or video calls* (26%, +6 p.p. over 2011), *selling goods or services* (16%, -1 p.p. over 2011), *playing networked games with other persons* (10%), *making a doctor's appointment* (8%) and *creating websites or blogs* (6%).[78] Never-the-less, many of these activities too have seen strong growth over the last couple of years, indicating that activity online is becoming more diverse as it develops.

**Figure 88: Activities online in the last three months EU27 (% individuals)**



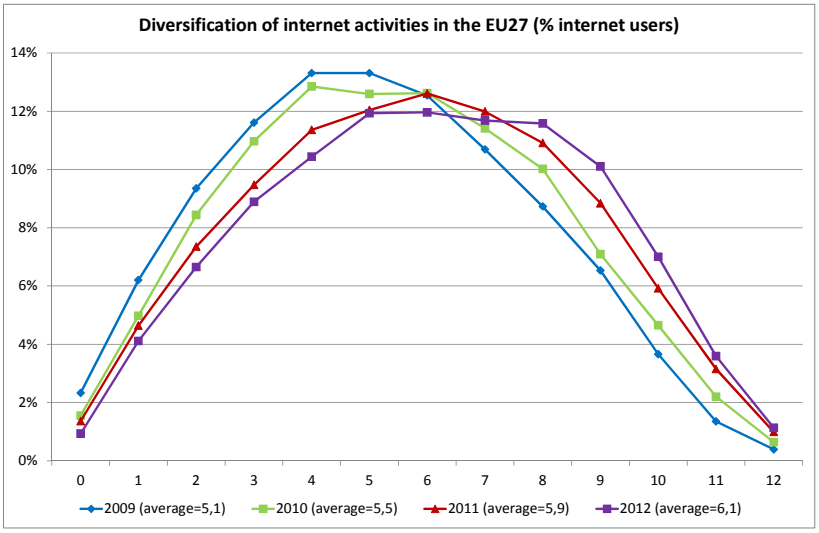

*Source: Eurostat*

**Increased diversification of internet use** is supported by the analysis of the number of activities carried out by individuals online. Data for the period 2009 to 2012, on the number of activities carried out online by internet users, shows that the mean number of activities undertaken – out of a selected group of 12 activities[79] - has grown continuously, from 5.1 in 2009 to 6.1 in 2012. This confirms the intuition that as people become more experienced and confident with internet use, and life online develops; users not only increase their frequency of use but also become increasingly diversified in their activities.

[78] No comparison data are available for the last three activities.

[79] The diversification index is based on 12 activities for which data are available every year since 2009. The index is calculated individuals having used the internet during last 3 months, and is computed simply as the number of activities realised out of the 12 selected. The list include: sending/receiving e-mails, browsing for information about goods and services, reading online newspapers/news, looking for information on travel/accommodation services, posting messages to social media, interaction with public authorities, internet banking, telephoning or video calls, selling goods or services, purchases of content (films, music, software), purchase of goods, purchase of services.

**Figure 89: Diversification of internet activities in the EU27 (% internet users)**




*Source: Eurostat*

Looking across the EU27+ countries shows that diversification of activities varies substantially from country to country While in 2012 internet users from Italy, Greece, Bulgaria, Romania and Croatia were performing on average only 4-5 activities, those from Scandinavia and the Netherlands were performing almost double the number: 7-8 activities on average, out of the selected twelve. There appears to be no relationship between a country's progression in the number of internet users and progression in diversification of activities.

Across the EU27+ there has been little variation in the progression of diversification of activities over time. Most countries have increased by around 1.0 between 2009 and 2012. Exceptions are Sweden, Slovakia and Bulgaria (1.5) which have moved a bit faster and Finland, France, Italy, Luxemburg, Estonia, Portugal, Spain, Lithuania, Austria and Belgium (0.5) which have moved slower. For some countries it is harder to say because micro-data are available only for the last two years: Croatia, Germany and the UK; although the latter looks like it has fast progression, at least since 2011. As such we can estimate that while the leading countries such as Denmark, Sweden, Norway and Iceland are around four and half years ahead of the EU average, the internet users of countries such as Romania, Bulgaria, Italy, Greece and Croatia are four and a half or more years behind the average in terms of diversification of their online behaviour.

**Table 4: Time matrix for the average of the diversification index – evolution 2009-2012**

| | 3,0 | 3,5 | 4,0 | 4,5 | 5,0 | 5,5 | 6,0 | 6,5 | 7,0 | 7,5 |
|---|---|---|---|---|---|---|---|---|---|---|
| DK | | | | | | | | | ... | **2010-12** |
| SE | | | | | | | 2009 | 2010 | 2011 | **2012** |
| NO | | | | | | | | 2009 | 2010-11 | **2012** |
| IS | | | | | | | | 2009-10 | 2011 | **2012** |
| FI | | | | | | | | 2009 | **2010-12** | |
| NL | | | | | | | 2009 | 2010-11 | **2012** | |
| LU | | | | | | | 2009-10 | **2011-12** | | |
| UK | | | | | ... | 2011 | | **2012** | | |
| DE | | | | | | | ... | **2011-12** | | |
| EE | | | | | | 2010 | **2012** | | | |
| SK | | | | 2009 | | 2010-11 | **2012** | | | |
| EU27 | | | | | 2009-10 | 2011 | **2012** | | | |
| IE | | | | | 2009-10 | 2011 | **2012** | | | |
| FR | | | | | | 2009 | **2010-12** | | | |
| MT | | | | | 2009-10 | | **2011-12** | | | |
| SI | | | | | 2009-10 | 2011 | **2012** | | | |
| BE | | | | 2011 | 2009-10 | **2012** | | | | |
| AT | | | | | 2009-10 | **2011-12** | | | | |
| LT | | | | | 2009-10 | **2011-12** | | | | |
| ES | | | | | 2009-11 | **2012** | | | | |
| LV | | | | | 2010 | **2012** | | | | |
| HU | | | | 2009 | 2010-11 | **2012** | | | | |
| CZ | | | | 2009-10 | **2012** | 2011 | | | | |
| PT | | | | 2009-11 | **2012** | | | | | |
| CY | | | 2009 | 2010 | **2011-12** | | | | | |
| PL | | | 2009 | 2010-11 | **2012** | | | | | |
| HR | | | ... | **2011-12** | | | | | | |
| EL | | 2009 | 2010 | **2011-12** | | | | | | |
| IT | | | 2009-10 | **2011-12** | | | | | | |
| BG | 2009 | | 2010-11 | **2012** | | | | | | |
| RO | 2009 | 2010 | **2011-12** | | | | | | | |

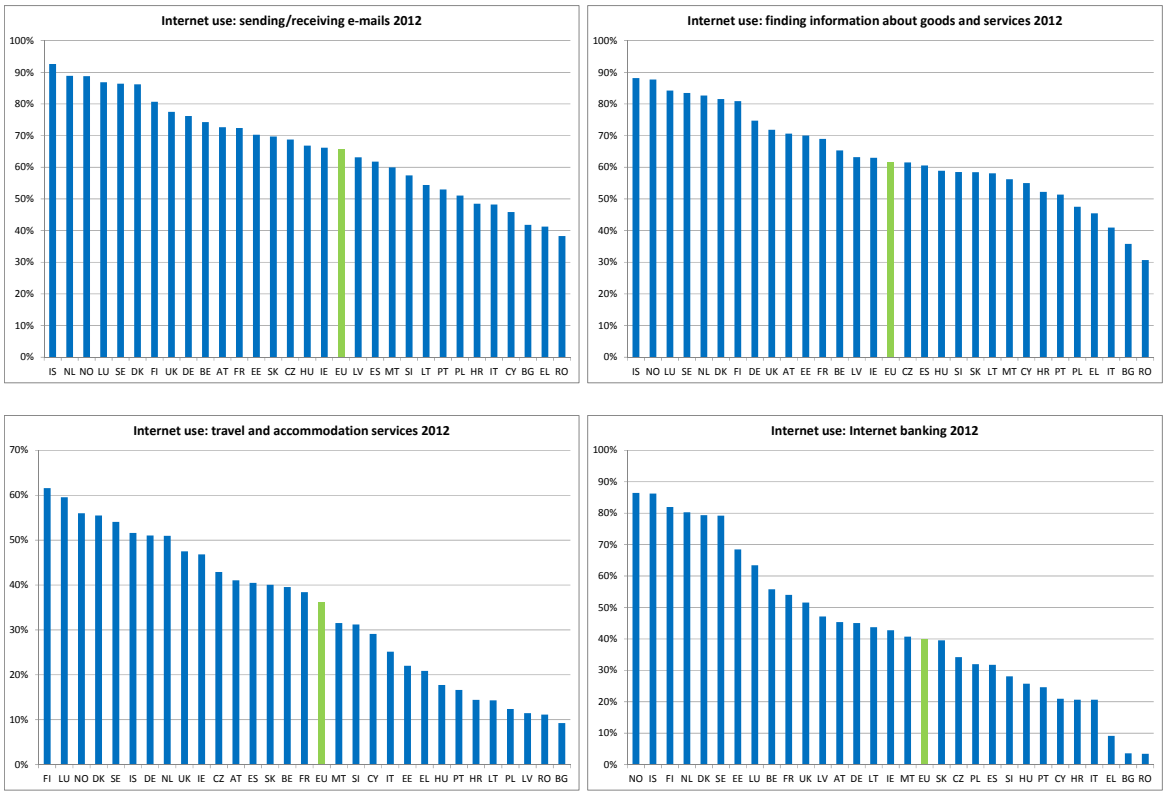
*Source: EC services based on Eurostat data*

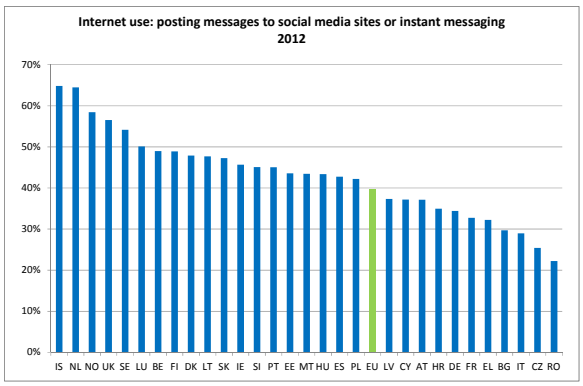
**Across the EU27+ use of different internet activities by the population varies substantially by country.** Looking first at the *most popular activities* across Europe; while *email* is used by above 80% of the population in Iceland, the Netherlands, Norway, Luxemburg, Sweden, Denmark and Finland, it is used by less than half the population in Romania, Greece, Bulgaria, Cyprus, Italy and Croatia. *Finding information about goods and services* is also above 80% in Iceland, Norway, Luxemburg, Sweden, the Netherlands, Denmark and Finland; while it is below 50% in Romania, Bulgaria, Italy, Greece and Poland.

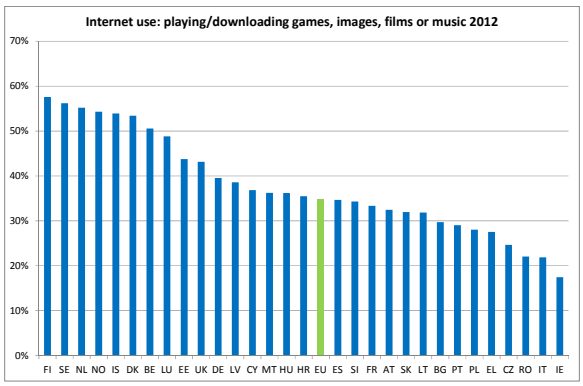
Of other relatively popular activities, *Internet banking* is carried out by around 80% of the population or more in Norway, Iceland, Finland, the Netherlands, Denmark and Sweden; however, rates of below 10% are found in Romania, Bulgaria and Greece; in Italy, Croatia and Cyprus rates are just above 20%. 80% of the population or above in Iceland, Norway, Sweden and Finland also *read online news*, whereas it is only around a third of the population in six countries (Poland, Italy, France, Ireland, Romania and Bulgaria). Use of *social media and/or instant messaging* is most popular in Iceland, the Netherlands, Norway, the UK and Sweden, where it is above 50%; while it is at or below 30% in Romania, the Czech Republic, Italy and Bulgaria. Use of *travel and accommodation services* is over 50% in Finland, Luxemburg, Norway, Denmark, Sweden, Iceland, Germany and the Netherlands; however it is around 10% in Bulgaria, Romania, Latvia and Poland. *Playing/downloading games, images, films or music* is most popular in Finland, Sweden, the Netherlands, Norway, Iceland, Denmark and Belgium (above 50%); while it is less popular in Ireland, Italy and Romania (around 20%). Finally, *web radio and web TV* are popular in Norway, Sweden, the Netherlands and Finland (around and above 50%), but are significantly less so in Italy and Romania (about 20%).

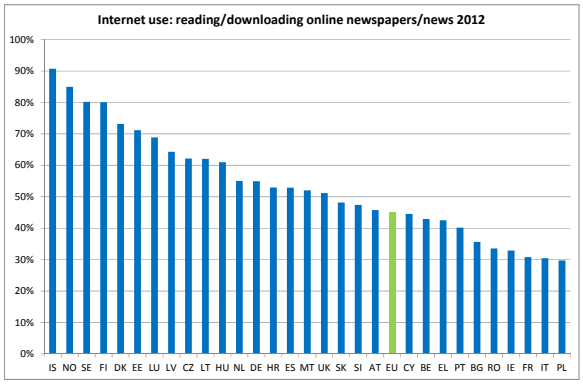
Of the less popular activities, *uploading self-created content* is most popular in Iceland, the Netherlands and Denmark (above 40%); whereas it is at or below 20% in a number of countries (Belgium, Italy, Greece, Bulgaria, Poland, Romania and Malta). Use of the internet for *telephoning and video calls* is popular a number of countries (Iceland, Lithuania, Slovakia, Estonia, Latvia, Denmark, Bulgaria and the Czech Repbulic) where 40% or more of individuals engage in these activities. However, lowest rates of use are just under 20% of the populations in Italy Portugal and Slovenia. *Selling goods and services* over the internet by individuals is most popular in Slovenia, France and Norway; where a quarter to a third of the population participates in such activities; less than 5% of the populations of Cyprus, Romania, Greece, Portugal, Latvia and Lithuania do so. *Playing networked games with other persons* is as high as 20% and more in Denmark and Iceland and between 15 and 20% for in Croatia, Sweden, Norway and the Netherlands. In a majority of countries, however, it is around 10% or less. While *making an appointment with a practitioner* is an internet activity carried out by almost 30% of people in Denmark, 26% in Finland and 22% in Spain, for the majority of the countries the rate is at or below 5%. Finally, *creating websites or blogs* is most popular in the Netherlands, Iceland, Hungary, Denmark, Norway, Luxemburg and Sweden (10-15%), however the lowest rates are only around 2-4% (Cyprus, Italy, Poland, Bulgaria, Lithuania, Romania and Ireland).

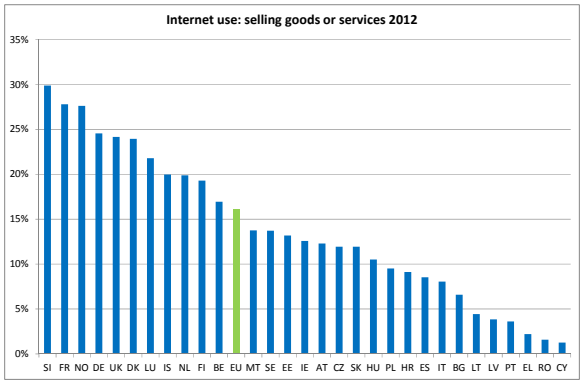
**Figure 90: selected activities online in the last three months across EU27+ countries (% individuals)**

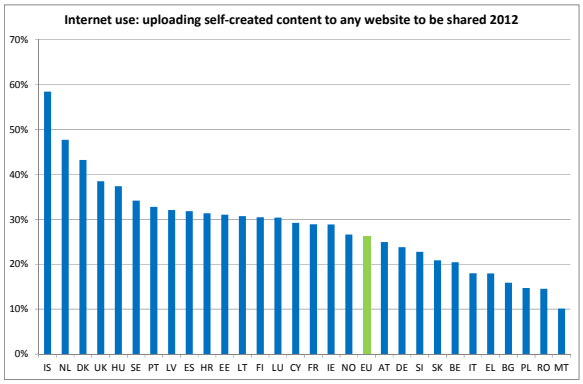


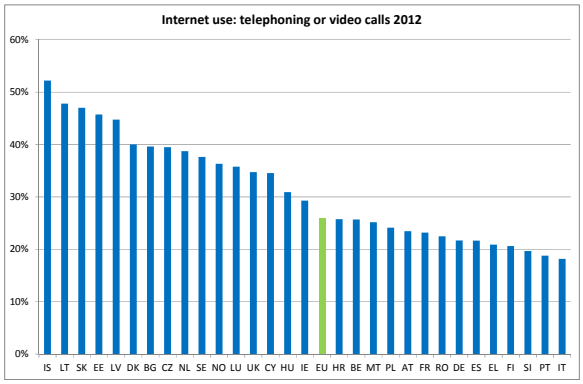

Internet use: posting messages to social media sites or instant messaging 2012
70%
60%
50%
40%
30%
20%
10%
0%
IS NL NO UK SE LU BE FI DK LT SK IE SI PT EE MT HU ES PL EU LV CY AT HR DE FR EL BG IT CZ RO

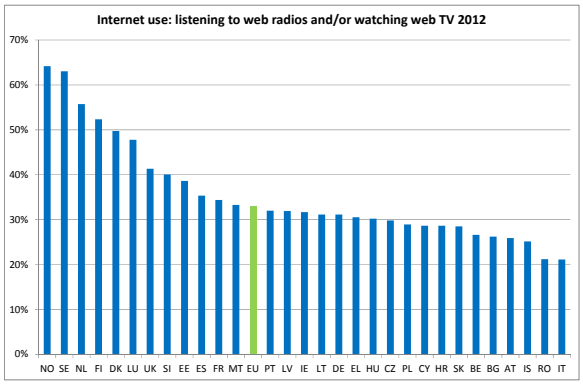

Internet use: playing/downloading games, images, films or music 2012
70%
60%
50%
40%
30%
20%
10%
0%
FI SE NL NO IS DK BE LU EE UK DE LV CY MT HU HR EU ES SI FR AT SK LT BG PT PL EL CZ RO IT IE

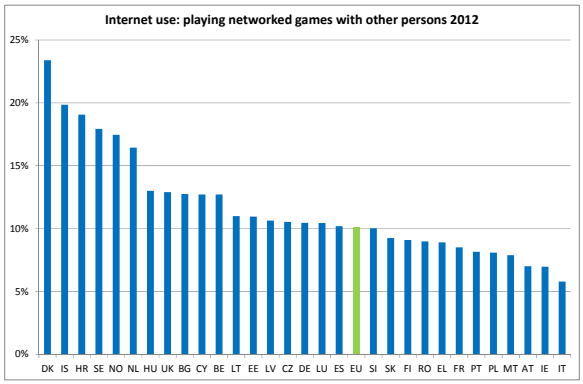

Internet use: reading/downloading online newspapers/news 2012
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
IS NO SE FI DK EE LU LV CZ LT HU NL DE HR ES MT UK SK SI AT EU CY BE EL PT BG RO IE FR IT PL

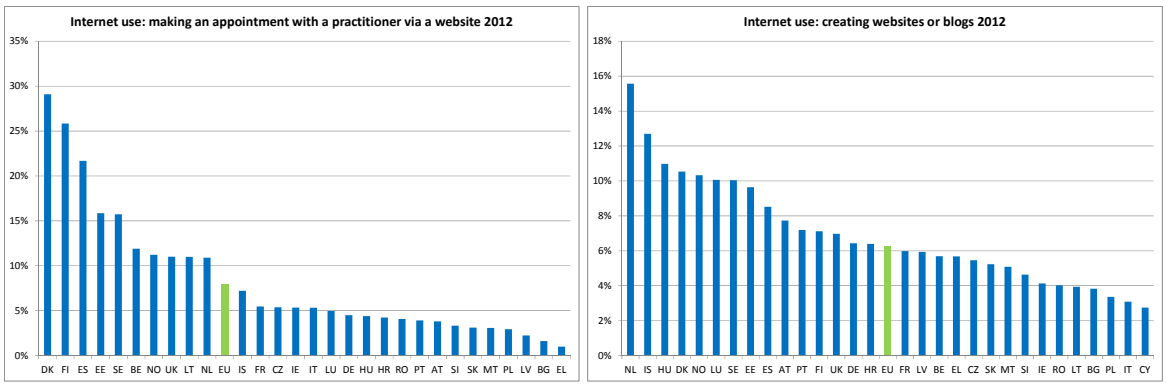

Internet use: selling goods or services 2012
35%
30%
25%
20%
15%
10%
5%
0%
SI FR NO DE UK DK LU IS NL FI BE EU MT SE EE IE AT CZ SK HU PL HR ES IT BG LT LV PT EL RO CY


Internet use: uploading self-created content to any website to be shared 2012
70%
60%
50%
40%
30%
20%
10%
0%
IS NL DK UK HU SE PT LV ES HR EE LT FI LU CY FR IE NO EU AT DE SI SK BE IT EL BG PL RO MT


Internet use: telephoning or video calls 2012
60%
50%
40%
30%
20%
10%
0%
IS LT SK EE LV DK BG CZ NL SE NO LU UK CY HU IE EU HR BE MT PL AT FR RO DE ES EL FI SI PT IT


Internet use: listening to web radios and/or watching web TV 2012
70%
60%
50%
40%
30%
20%
10%
0%
NO SE NL FI DK LU UK SI EE ES FR MT EU PT LV IE LT DE EL HU CZ PL CY HR SK BE BG AT IS RO IT


Internet use: playing networked games with other persons 2012
25%
20%
15%
10%
5%
0%
DK IS HR SE NO NL HU UK BG CY BE LT EE LV CZ DE LU ES EU SI SK FI RO EL FR PT PL MT AT IE IT




*Source: Eurostat*

Across the EU27+ countries, rates of use of the more popular activities such as email and searching for information about goods and services, as well as internet banking, follow a similar pattern to that of rates of regular internet use – having correlation coefficients of 0.98, 0.98 and 0.95, respectively, with regular internet use. Quite high correlations are also found between regular use of the internet and use of travel and accommodation services (0.85), playing/downloading games, images, films or music (0.82), posting messages to social media sites or instant messaging (0.78), selling goods and services (0.74), reading/downloading online newspapers/news (0.71) and listening to web radios and/or watching web TV (0.69).

However, the level of regular internet use is not the only factor determining use of activities across countries, as shown by a number of outlier countries for certain activities. The main outliers are Estonia and Latvia, which both have higher rates of use of internet banking than would be expected given their rates of regular internet use. Also Slovenia and France have relatively high rates of selling online; while Latvia, Lithuania and Cyprus in particular have relatively low rates of selling online.

Uploading self-created content (0.63), Playing networked games with others (0.50), making an appointment with a practitioner (0.50) and telephoning and video calls (0.41) are less correlated with regular internet use, showing that in some countries these activities are undertaken by relatively large numbers of individuals, despite them ,not having the highest rates of internet users and vice versa. Good examples here are the popularity of making appointments with practitioners in Spain, of uploading and sharing self-created content in Hungary, of playing networked games with others in Croatia and of using the internet for telephoning and video calls in Bulgaria.

### 3.6. Activities and skills levels

Data on activities by skills level (computer skills)[80] shows that engagement in most activities is strongly skills dependent. Only highly popular activities such as email and finding information about goods and services, where most users are active and the least popular activities, like playing networked games, creating websites or blogs, making an appointment with a practitioner and selling goods or services, where few individuals engage in the activities, show lower variation in rates of use by skills level.

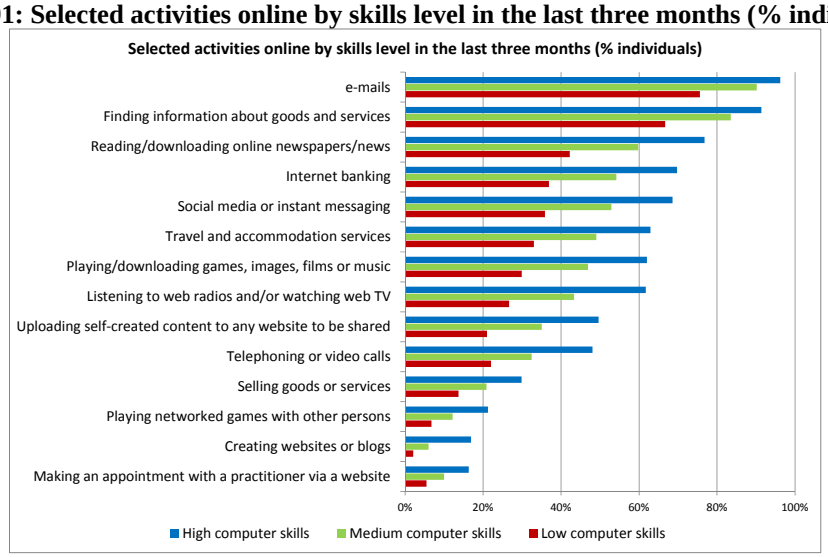
For email, the most popular activity online, for example the rate of use of highly skilled individuals is 96%, compared to 76% for low skilled individuals, a 20 p.p. difference. For

[80] For the definition of levels of skills, see part 3.4.1.

creating websites or blogs, one of the least popular activities, for example the rate of use of highly skilled individuals is 17%, compared to 2% for low skilled individuals, a 15 p.p. difference.

Most other activities are more skills dependent. For most activities there is around a 30 p.p. gap between the rate of use of highly skilled and low skilled individuals; ranging from 29 p.p. for uploading self-created content to 35 p.p. for reading/down loading newspapers/news and listening to web radios and/or watching web TV.

**Figure 91: Selected activities online by skills level in the last three months (% individuals)**



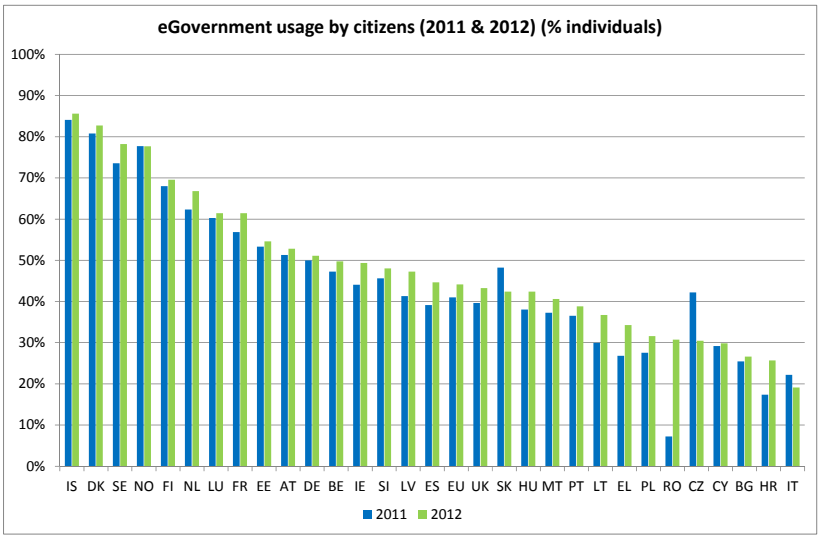

*Source: Eurostat*

## 3.7. eGovernment

**Use of eGovernment services by citizens** saw moderate growth between 2011 and 2012 in the EU27 increasing from 41% to 44%. Usage increased in all countries, except the Czech Republic (-12 p.p.)[81], Slovakia (-6 p.p.) and Italy (-3 p.p.). Large increases in the use of eGovernment services by citizens were recorded for Romania (+24 p.p.), Croatia (+8 p.p.) and Greece (+7 p.p.). Strong performance over the last year in these countries shows that catch-up of lagging countries is taking place. However, some of the top users have also seen substantial increases in the last year; like Sweden (+ 5 p.p. to 78%), France (+5 p.p. to 61%) and the Netherlands (+5 p.p. to 67%) for example.

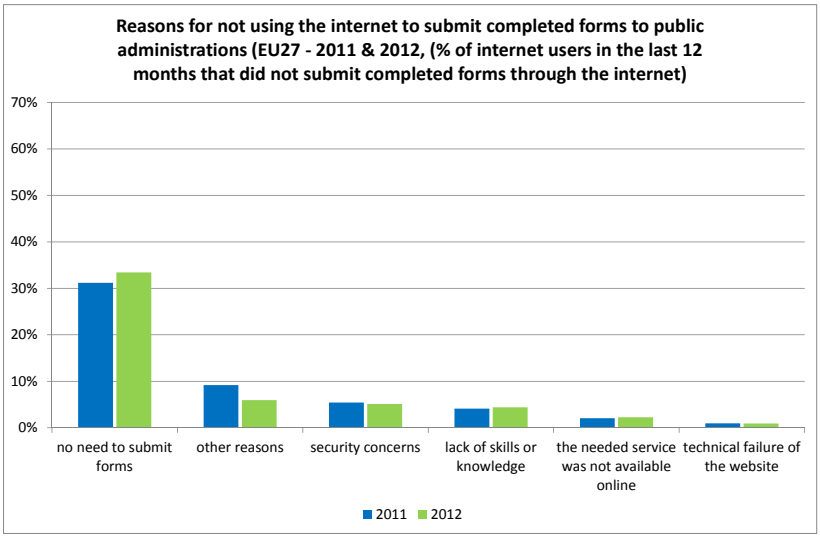
[81] The Czech Republic experienced a sudden doubling in the share of citizens using eGovernment services in 2011, from 23% in 2010 to 42% in 2011. This relates to the fact that in 2011 there was a census in the Czech Republic and it was (for the first time) possible to fill in the census form on-line.

**Figure 92: eGovernment usage by citizens (2011 & 2012) (% individuals)**




*Source: Eurostat*

**Figure 93: Reasons for not using the internet to submit completed forms to public administrations, EU27 - 2011 & 2012, (% of internet users in the last 12 months that did not submit completed forms through the internet)**




*Source: Eurostat*

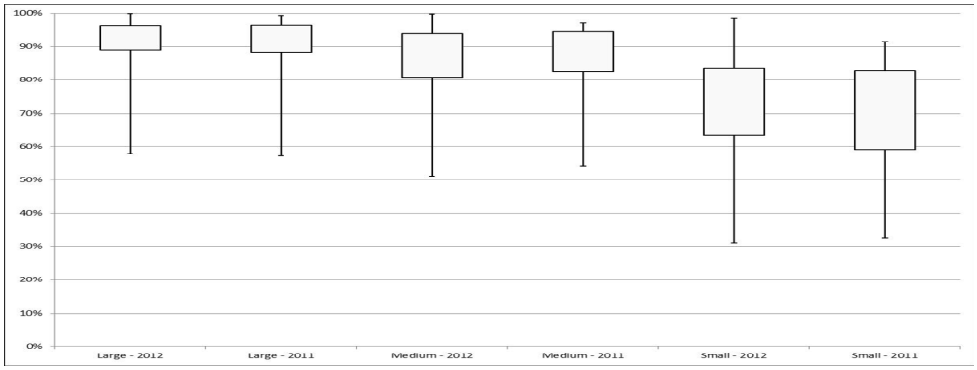
Looking at the **reasons why citizens don't use interactive eGovernment services** (i.e. sending completed forms through the internet), a lack of need increased in importance (+4 p.p.) and "other reasons" fell (-6 p.p.). The importance of other named reasons, such as security concerns (10%), lack of skills (8%), lack of supply (4%), and quality of supply (2%), remained largely unchanged. Interestingly, lack of need has increased in importance despite an unchanged reference population[82]. If we take into consideration only citizens that actually needed to contact the public administrations (and who were also internet users), then the proportion of eGovernment users raises to 53% of potential users[83] for the EU27 in 2012. The

[82] The percentage of internet users in the last 12 months that did not submit forms through the internet, which was equal to 53% of the population in both 2011 & 2012.

[83] This percentage is defined as the % of population that sent completed forms divided by that percentage plus percentage of internet users in the last 12 months that didn't have to submit completed forms

ranking also changes dramatically as countries like BE, DE and LU shift down by many positions and countries like RO, BG and EL move forward significantly.

**Figure 94: Percentage of enterprises using the internet for sending filled in forms electronically – by firms' size[84] (boxplot* - variation across EU 27 countries in 2011 & 2012)**




| | | | | | | |
|---|---|---|---|---|---|---|
| EU 27 | 91.1% | 90.0% | 86.0% | 84.7% | 68.6% | 66.1% |

** Boxplot: The length of the bar represents the range of variation between countries in the first and fourth quartiles (25% highest and lowest values) for the selected variable (interactive use of online public services by businesses), while the box represents the range of variation of the second and third quartiles.*

For what concerns **eGovernment usage by Enterprises**, the comparison between 2011 and 2012 suggests that, for advanced eGovernment usage, there has been a pronounced improvement of 2.5 p.p. for small enterprises coupled with a small reduction in dispersion in the central part of the distribution (the boxes in Figure 94). For the rest the situation is quite stable, with modest improvements of 1.0 p.p. and 1.4 p.p. for large and medium enterprises respectively; and with almost unchanged dispersion from last year. This may signal some saturation of usage, with the still existing non-users which could well have outsourced the discharge of obligations toward the public administrations to external service providers. Unfortunately, the amplitude of the phenomenon of outsourcing is not measurable with existing methodologies.

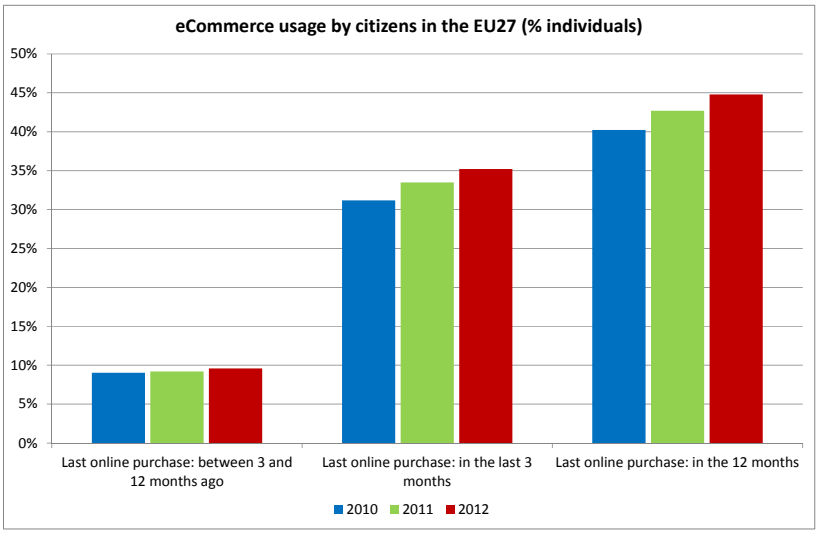
## 3.8. eCommerce

### *3.8.1. eCommerce by Citizens*

**Citizens' engagement in eCommerce** showed continued moderate growth in the last year. The percentage of individuals ordering or buying goods or services for private use over the internet in the last 12 months prior to the survey rose to 45% in 2012, up from 43% in 2011 and 40% on 2010; suggesting that the Digital Agenda target of 50% of the population buying online by 2015 is well on its way to being met. Most of this increase was due to more individuals having bought items within the last 3 months (+2 p.p. over 2011). The percentage of the population having made purchases between 3 to 12 months ago hardly changed.

[84] The size class of a firm is determined with reference to the firm's number of employed persons with the following thresholds:10-49 for small firms, 50-249 for medium firms and 250+ for large firms

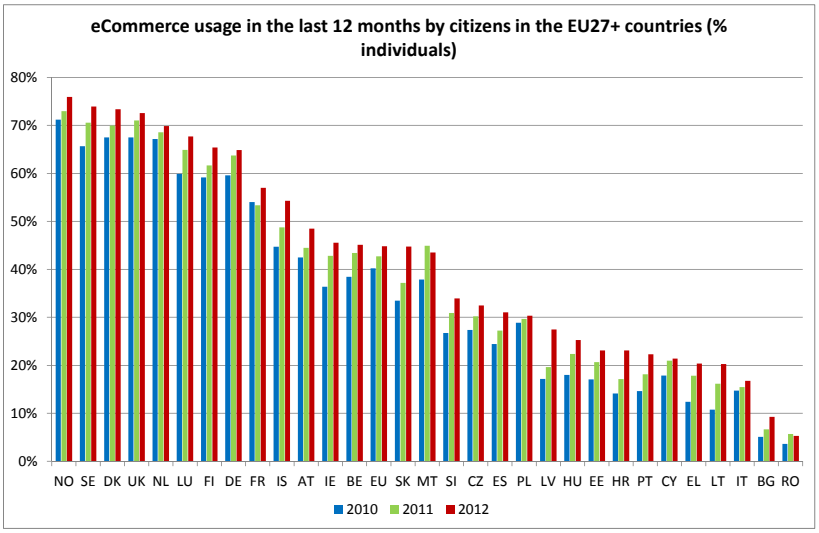
**Figure 95: eCommerce usage by citizens in the EU27 (% individuals)**




*Source: Eurostat*

Across the EU27+ countries, the **top performers in terms of online purchasing in the last 12 months** by citizens are the Nordic countries (Norway, Sweden Denmark and Finland), the UK (73%, +2 p.p. over 2011), the Netherlands (70%, +1 p.p.), Luxemburg (68%, +3 p.p.) and Germany (65%, +1 p.p.). In these countries around two thirds, or more, of citizens make purchases online. Countries with particularly low rates of eCommerce use in the last 12 months include Romania (5%), Bulgaria (9%), Italy (17%), Lithuania (20%), Greece (20%), Cyprus (21%), Portugal (22%), Croatia and Estonia (2%); with less than a third of their populations engaging in eCommerce.

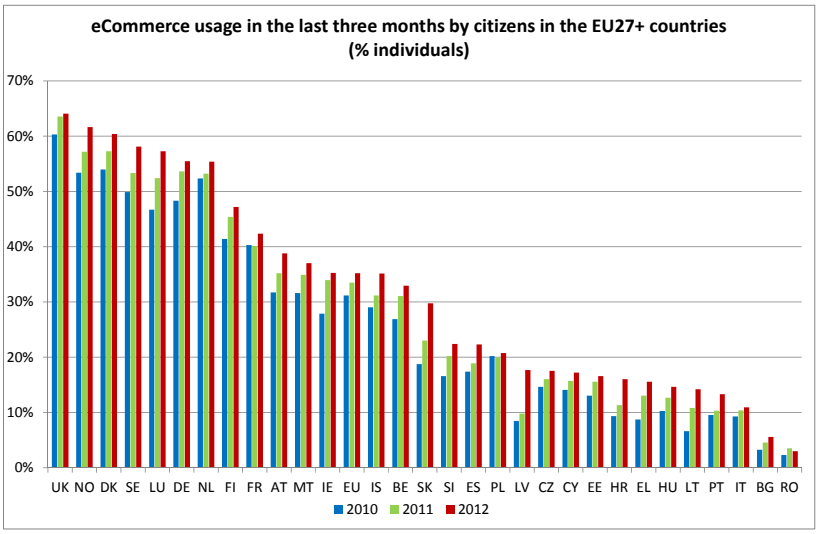
**Figure 96: eCommerce usage in the last 12 months by citizens in the EU27+ countries (% individuals)**




*Source: Eurostat*

Looking at a **higher frequency of eCommerce use** (within the last three months), the rank order of countries changes somewhat. In particular, the UK (64%) performs significantly better, jumping from rank four to the top position, and Germany (55%) climbs two positions to rank 6, showing that significant proportions of eCommerce users in these countries are higher frequency users. Iceland (35%) drops significantly in the ranking to position 13, below the EU average (35%). Portugal (13%) also drops significantly from rank 24 to rank 27. The Czech Republic (17%) falls three positions to rank 20. This shows that large proportions of the eCommerce users in these countries engage in less frequent eCommerce use.

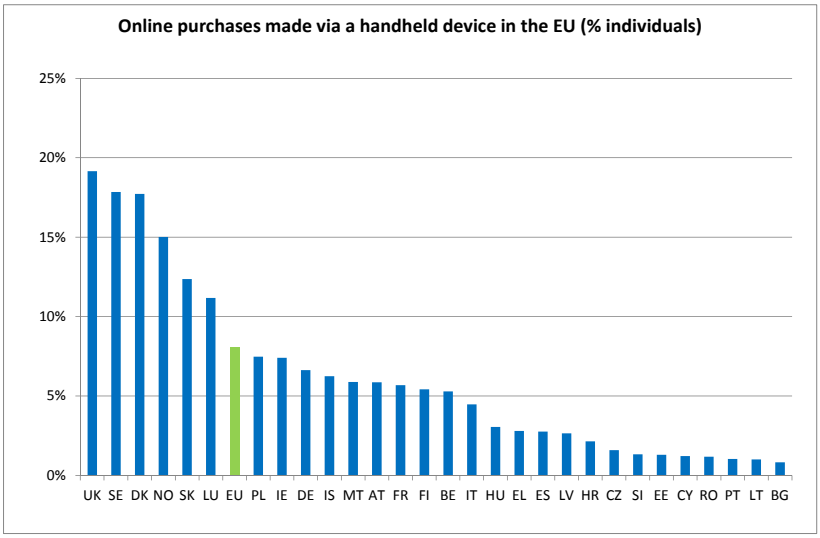
**Figure 97: eCommerce usage in the last three months by citizens in the EU27+ countries (% individuals)**




*Source: Eurostat*

On average, most eCommerce takes place over a computer (laptop/desktop or tablet computer). Very little is done over handheld devices (e.g. mobile phones). Only 7% of individuals in the EU ordered goods or services from a hand held device in the previous 12 months in 2012. However, in a few countries it is more prevalent. The countries with the highest figures are: UK (19%), Sweden and Denmark (18%). Particularly low rates of use by individuals (below 5%) are found in an array of countries (Bulgaria, Lithuania, Portugal, Romania, Cyprus, Estonia, Slovenia, Czech Republic, Croatia, Latvia, Spain, Greece, Hungary, and Italy).

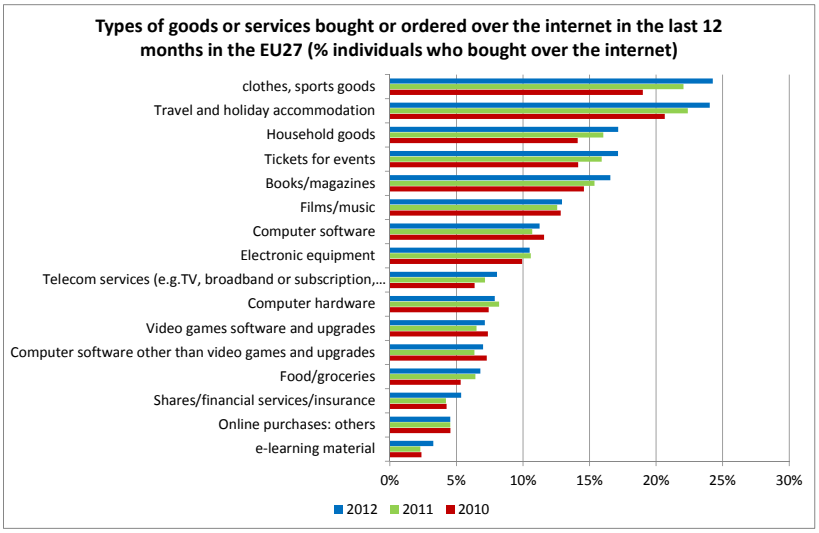
**Figure 98: Online purchases made via a handheld device in the EU (% individuals)**




*Source: Eurostat*

In terms of **what people buy online**, by far the most popular purchases are for clothes and sports goods and travel and accommodation services (both 24%). In particular, clothes and sports goods have risen in popularity in recent years (+2 p.p. over 2011; + 5 p.p. over 2010), to become the most popular activity. The next most popular purchases are for household goods, tickets for events and books and magazines (all 17%; up 1 p.p., 1 p.p. and 2 p.p. over 2011 respectively). Thereafter follow film/music, computer software, and electronic equipment. Purchases of other goods and services are less represented and have seen slower progression in recent years.

**Figure 99: Types of goods or services bought or ordered over the internet in the last 12 months in the EU27 (% individuals who bought over the internet)**




*Source: Eurostat*

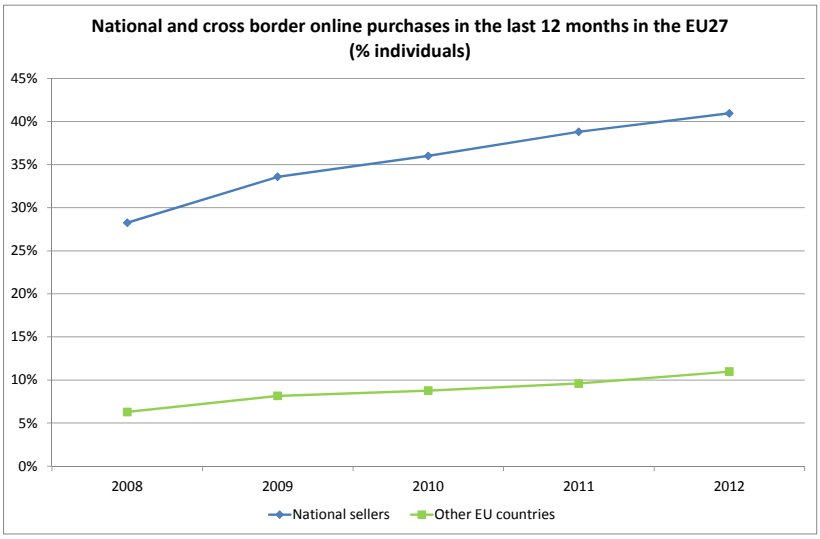
Looking at data on purchases by individuals who had made online purchases in the previous 12 months, we can examine **purchasing patterns across the EU27+.** Looking first at the most popular activities in 2012, it can be seen that the percentage of such individuals purchasing *clothes and sports goods* was highest in Bulgaria (64%), Germany (63%) and the UK (62%); significantly above the EU average of 54%. While purchases of *travel and accommodation services* were made by 54% of individuals buying online across the EU, they were as high as 76% in Sweden, 75% in Ireland and 72% in Norway. The percentage of individuals buying online who bought *tickets for events* was well above average in Iceland (73%), Sweden (66%) and Denmark (65%). With regard to purchasing *household goods*, the percentage of individuals buying online that bought these types of goods was highest in the UK (55%), Germany (50%) and Poland (45%); the EU average was 38%. Finally, buying *books and magazines* was particularly popular in Luxemburg (63%), Germany (51%), and Austria (47%); significantly above the EU average of 37%.

Of the less popular activities, it is noteworthy that purchasing medicines is rather popular in Germany (27%) and Romania (15%) - the EU average is 10% of online purchasers. It should be noted, however, that national differences and the general lack of popularity might reflect the fact that such sales for pharmaceutical products are often banned in Member States, and, even where they are allowed (such as in the two countries mentioned), they are extremely regulated. Finally, purchasing telecom services is very popular in Iceland (62%), Denmark (37%), Portugal and Sweden (34%) – well above the EU average of 18%.

In the EU, **the majority of eCommerce continues to takes place at national level**. In 2012, 41% of individuals made purchases from national sellers, up from 39% in 2011. The proportion of individuals in the EU making purchases from other EU member states remained low (11%) - marginally higher than in 2011 (10%). Looking at the trend over time it can be seen that while gradual progress is being made towards the Digital Agenda target of 20% of individuals buying online from other EU Member States, it is clear that if this trend continues, the target will only be met by around 2020, rather than the current target date of 2015. It should however be taken into account that measurement of progress towards this target is based on self-reporting by consumers and on the assumption that consumers can differentiate

between domestic and cross-border transaction; which is not always the case.[85] This may lead to under-reporting of cross-border buying. Furthermore, above a certain volume retail sales across borders are not the most efficient strategy for companies. There is an incentive for companies to establish a physical presence in countries where they have significant online sales, thus turning what was cross-border eCommerce into domestic eCommerce, suggesting that there may also be a limit to the growth of cross-border eCommerce.

**Figure 100: National and cross border online purchases in the last 12 months in the EU27 (% individuals)**




*Source: Eurostat*

### *3.8.2. eCommerce by Enterprises*

Ordering online goods and services is an opportunity not only for consumers but also for the exchanges between enterprises and all their business partners.

The percentage of ***small and medium sized enterprises (SMEs)*** selling online is progressing slowly, gaining around one percentage point every two years. In 2011, 15% of SMEs in EU27 received orders via "computer mediated networks". Behind the latter concept there are two different technologies: web-sales and EDI (electronic data interchange or XML formats). Web-sales is the main channel, used by 12% of SMEs, and the majority (9% of EU SMEs) use only this channel. 3% use both web-sales and EDI and 3% use only EDI.

eCommerce sales by ***large enterprises*** is more developed than that of SMEs and the means by which it takes places also differs. For large enterprises EDI is somewhat more prevalent (26%) than web-sales (23%).Looking more closely at web sales (which is the channel holding most opportunity for a variety of customers, such as final consumers, other enterprises and public administrations), data on total turnover of SMEs via this channel can shed light on its relative importance vis-à-vis non-web sales. The data show that on average in the EU web sales are responsible for between 1 and 10% of turnover in almost 5% of SMEs. For just under 4% of SMEs it is responsible for between 10 and 50% of turnover. For just over 2% it is responsible for less than 1% and for only 1.5% of SMEs are web sales responsible for over half of turnover.

[85] Multinational companies may estabilish national websites dedicated to clients from a ertain country, which may look to consumers as domestic eCommerce even if the actual purchases may be cross-border.

**Table 5: Relevance of selling via the web for SMEs (2011) – proportion of turnover from web sales (% SMEs)**

| | |
|---|---|
| anecdotal = less than 1% of their turnover | **2,2%** |
| low = 1% or more but less than 10% | **4,8%** |
| consistent = 10% or more but less than 50% | **3,8%** |
| dominant = 50% or more of their turnover | **1,5%** |
| **Total** | **12,3%** |

*Source: Eurostat*

Looking at the distribution of web-sales across countries, it can be seen that while on average in the EU around 12% of SMEs have web-sales, this rises to 20% and above in Norway, Iceland, Croatia Denmark, Sweden, Germany and Ireland; while it is 6% or less in Bulgaria, Macedonia, Italy and Romania. Interestingly, it can be seen that in the countries where eCommerce is more diffused, it largely remains a complementary channel involving less than 10% of their turnover. The main exceptions to this are the Czech Republic, Lithuania, Croatia and Luxemburg; where for the majority of enterprises doing online sales they represent a more significant part of their turnover. Similarly, on the bottom side of the ranking, we have countries where few SMEs sell via the web, but for these few enterprises it is a relevant source of business: Slovakia, Estonia, Portugal, Poland, Greece, Macedonia and Romania.

**Table 6: Relevance of web-sales across the EU27+**

| | | Relevance of web-sales: distribution of SMEs having web-sales into four classes based on the percentage of their turnover coming from web-sales | | | |
|---|---|---|---|---|---|
| | % SMEs having web-sales | anedoctical < 1% | low 1-10% | consistent 10-50% | dominant >50% |
| NO | 34,5% | 10% | 49% | 31% | 10% |
| IS | 29,4% | 20% | 45% | 20% | 14% |
| HR | 24,8% | 16% | 27% | 31% | 26% |
| DK | 22,9% | 11% | 53% | 27% | 8% |
| SE | 20,8% | 2% | 49% | 37% | 11% |
| DE | 20,1% | | not declared | | |
| IE | 20,0% | 0% | 49% | 37% | 14% |
| BE | 18,0% | 5% | 51% | 31% | 13% |
| UK | 16,2% | 20% | 37% | 31% | 12% |
| MT | 15,8% | 22% | 42% | 25% | 11% |
| CZ | 15,5% | 7% | 37% | 35% | 21% |
| NL | 15,3% | 16% | 45% | 29% | 10% |
| LT | 14,9% | 15% | 27% | 37% | 21% |
| FI | 14,4% | 25% | 40% | 25% | 10% |
| LU | 13,3% | 14% | 36% | 50% | 0% |
| **EU27** | **12,3%** | **18%** | **39%** | **31%** | **12%** |
| SI | 12,0% | 20% | 31% | 39% | 10% |
| AT | 11,2% | 38% | 32% | 23% | 7% |
| SK | 10,9% | 17% | 37% | 28% | 19% |
| FR | 10,2% | 26% | 30% | 32% | 12% |
| ES | 10,0% | 13% | 40% | 33% | 14% |
| EE | 9,4% | 16% | 32% | 35% | 18% |
| HU | 8,8% | 21% | 37% | 30% | 11% |
| PT | 8,6% | 7% | 40% | 53% | 0% |
| PL | 8,2% | 23% | 27% | 50% | 0% |
| EL | 7,9% | 23% | 23% | 36% | 18% |
| LV | 7,3% | 26% | 31% | 28% | 15% |
| CY | 7,2% | 8% | 49% | 37% | 6% |
| BG | 5,6% | 40% | 37% | 16% | 7% |
| MK | 5,2% | 19% | 27% | 35% | 20% |
| IT | 4,6% | 35% | 29% | 28% | 8% |
| RO | 4,6% | 6% | 29% | 48% | 16% |

*Source: Eurostat*

The 2012 survey has started to investigate also the relative part of these web-sales coming from consumers and the part coming from other enterprises or the public sector. The indicator is available only for few countries (Austria, BBulgaria, Spain, Finland, France, Hungary, Ireland, Lithuania, Luxemburg, Malta, the Netherlands, Portugal, SI, SK) because the question was optional for this first pilot exercise.

Around one third of the volume of web-sales comes from consumers and the two thirds come from B2B or B2G transactions. The situation varies according to the economic sectors, and as expected the reverse is valid in the retail sector (70% of web sales are from B2C), in telecommunication (61%) and in the accommodation sector (52%).

Bearing in mind the previous analysis which shows how that selling online is often only a minor part of total turnover, the survey estimates that only 1% of all SMEs turnover comes from web-sales to consumers, with the exception of Ireland (4%), Lithuania and Malta (both 3%). The sectors with the largest proportion of their turnover from online selling, as could be expected, are tourism (accommodation and travel), transport arrangements (booking flights,

train, etc) and telecommunications; also retail but with a lower percentage because the traditional "bricks and mortar" channel remains dominant.

**Table 7: B2C Sales via a website over the last calendar year – as a % of turnover (leading sectors)**

| Sales B2C via a website over the last calendar year - as a % of turnover (leading sectors) | |
|---|---|
| Accommodation 10+ | 9,3% |
| Adm&support services: Travel agency; tour operator reservat | 8,3% |
| Telecommunications 10+ | 4,8% |
| Transport and storage 10+ | 4,6% |
| Retail trade, except of motor vehicles and motorcycles 10+ | 3,3% |
| Publishing activities; films & television, sound & music publi | 1,8% |

*Source: Eurostat*

Finally, the data in the table below confirm that, in most cases, those enterprises investing in the organisation of web-sales attract or include final consumers as a relevant part of their clients. Two out of three SMEs having web-sales, have consumers covering at least 10% of the sales realised through the web channel.

**Table 8: Enterprises with significant B2C sales**

| | Enterprises where B2C sales via a website over the last calendar year are 10% or more of the total websales | Enterprises having received orders via a website |
|---|---|---|
| MT | 14,3% | 15,8% |
| LT | 11,8% | 14,9% |
| NL | 9,1% | 15,3% |
| LU | 8,9% | 13,3% |
| AT | 8,8% | 11,2% |
| SI | 8,4% | 12,0% |
| SK | 8,4% | 10,9% |
| **EU27** | 8,3% | 12,3% |
| IE | 7,6% | 20,0% |
| FI | 7,3% | 14,4% |
| HU | 6,9% | 8,8% |
| ES | 6,3% | 10,0% |
| FR | 5,8% | 10,2% |
| BG | 4,8% | 5,6% |
| PT | 4,2% | 8,6% |
| MK | 4,0% | 5,2% |

*Source: Eurostat*

## 3.9. Summary and conclusions

This chapter has looked at recent developments in internet use and digital skills in the EU27 , Iceland, Norway, Croatia and (for data on enterprises) the Former Yugoslav Republic of Macedonia. The chapter finds that ***progress towards the Digital Agenda key performance targets on internet use are on track.*** More people are going online than ever before (70%) and most are doing so every day (59%). Furthermore, disadvantaged people are catching up with the average population in terms of their use of the internet (54%) and the target for internet use by this group will also most likely be met. Across the EU countries, ***rates of regular internet use are still quite dispersed*** and the leaders and laggards have changed little over time. However, ***catch-up is taking place*** for the majority of those with the lowest rates of use; though there are some exceptions. The major exception is Italy, which is seeing its relative position slip and now belongs to the group of countries with the lowest rates of use. Furthermore, there are a number of "average performers" which have also made little recent progress (Austria, Belgium, Slovenia, Poland and Malta); they also risk seeing their relative position slip. Never-the-less, overall catch-up is confirmed by the gradual decline over time in measures of dispersion.

***Progress is also being made in making "Every European Digital".*** The percentage of non-users has declined once more in the last year. However, in some countries, rates are still substantial: 40-50% in Bulgaria, Greece and Romania; and above 30% in Italy, Cyprus, Croatia, Portugal and Poland. As the number of non-users falls, reasons for not having access to the internet concentrate around a "lack of need" and "lack of skills"; and to a lesser extend "costs". There is some variation across countries in reasons. However, in general it can be said that for countries with relatively high rates of non-users all three reasons are important, whereas for countries with less non-users the overriding reason given is lack of interest. This evidence suggests getting the remainder of the population online policy should increasingly focus on, on the one hand, talking the increasing importance of lack of skills and awareness among non-users by for example implementing awareness raising and skills development initiatives, and, on the other, enabling the persistent proportion of non-users for which financial constraints are an issue to overcome them, such as by providing vouchers or tax incentives to low income non-user households for their first computer and/or internet connection. Furthermore, in countries where costs for access are still relatively high, policy should be implemented to provide affordable access to all: this seems of particular importance in Hungary, Slovenia and Portugal where not only are average prices of popular telecoms bundles high but also countries where non-users complain most often about high costs.

Turning to digital skills, latest evidence shows that there has been ***little improvement in the digital skills*** of the EU population over the past year. The proportion of those having digital skills has remained unchanged at 67% and the composition low/medium/high saw a slight deterioration: increased low skills/ fall in high skills. As a result, almost half of the EU population has low or no skills; an increasingly concerning situation given the growing necessity for digital skills in Europe: the projected 90% of jobs that will soon require some digital skills and the more than half of the labour force that says it feels its skills would be insufficient if it they were to need to look for a job. Again skills vary substantially by country. The analysis contained in this chapter has shown that ***as countries develop digitally, with higher rates of internet users so skills levels shift up towards medium and high levels and also diversity of internet use increases***. In particular, analysis on progress in diversity of internet activities shows that on average both laggard and leading countries are developing at a similar rate: with the laggards being around four and a half years behind the EU average in

terms of the number of activities undertaken online, while the leaders are about four and half years ahead. While internet users in the least developed online countries undertaking around 4-5 activities, those in the most advanced engage in twice the number. ***Across countries, variations in rates of use of internet activities follow to a large extend rates of regular use***, especially for the most diffused activities. However, there are some exceptions. Looking at the interrelation between skills and activities shows that ***most activities are skills dependent***: rates of use of all activities are higher for those individuals with higher skills.

***ICT professional skills are also lacking in Europe*** and it is projected that there could be as many as 900,000 unfilled vacancies for ICT professionals in Europe. ICT professional skills are needed throughout the economy in many sectors, not only in the ICT sector. However, evidence shows that around 40% of enterprises seeking to recruit such professionals have difficulty doing so. Difficulty in filling ICT vacancies is a cross-European issue; however particular difficulties are evidenced in four countries (IE, LU, AT, SE). To counter this trend, the European Commission has launched an EU-wide "Grand Coalition for Digital Jobs". ***Use of eGovernment also saw moderate growth*** over the last year from 41% in 2011 to-44% of individuals in 2012. Some catch-up was also witnessed here. The overriding reason given by internet users for not using interactive eGovernment services was "no need" and this reason grew in importance despite an unchanged reference population (% internet users not submitting filled in forms remained unchanged at 53%), suggesting that citizens do not find enough (net) benefit in doing so or are unaware of the benefits. In terms of enterprises, there has also been an increase in eGovernment use, though the improvement was more pronounced for SMEs than larger enterprises, suggesting large enterprises are reaching saturation.

Finally, the chapter looked in some detail at developments in eCommerce use by citizens and enterprises. eCommerce by citizens showed continued positive growth in 2012, suggesting that the Digital Agenda for Europe ***target relating to eCommerce use by citizens of 50% will be met*** by the target date of 2015. Across countries there are large differences in eCommerce use, the top performers were the Nordic countries, the UK, the Netherlands, Germany and Luxemburg with around two thirds of citizens making purchases online. In the countries with the lowest rates (Romania, Bulgaria, Italy, Lithuania, Greece, Cyprus, Portugal, Croatia and Estonia) less than a third of citizens do so.

***Purchasing patterns across the EU differ.*** While buying clothes and sports goods was most popular among online buyers in Bulgaria, Germany and the UK; travel and accommodation was most popular in Sweden, Ireland and Norway. Tickets for events were popular in Iceland, Sweden and Denmark, while purchasing of household goods was popular in the UK, Germany and Poland. Books and newspapers were particularly sought after in Luxemburg, Germany and Austria. Of the less popular purchases, noticeable that purchasing medicines was popular in Germany and Romania, while telecoms services was popular in Iceland, Denmark, Portugal and Sweden.

***Most eCommerce remains national***. Cross-border eCommerce remains low (11% of individuals) and it is clear that the ***2015 target of 20% of individuals buying over the internet from other EU countries is unlikely to be met***, based on current trends.

In terms of eCommerce by enterprises, ***eCommerce by SMEs is developing slowly*** and reached 15% in 2011 (latest data). Most is done by web-sales (12%), while 6 % is done with EDI (electronic data interchange or XML formats); 3% use both. ***eCommerce by large enterprises is more developed*** and EDI (26%) is somewhat more prevalent than web-sales (23%). SME turnover from web-sales is usually less than from non-web sales. For only 1.5%

of SMEs is it the dominant part. Across countries, eCommerce by SMEs is above 20% in a hand full of countries (NO, IS, HR, DK, SE, DE and IE), it is around 6% or less in four countries BG, MK, IT and RO. As such turnover from eCommerce also varies. Finally, the analysis shows that on average the largest proportion of web-sales come from the B2C and B2G channels, rather than from B2C. However, this varies by country and sector and is the reverse for retail, telecommunication and accommodation/travel services.

In analysing recent developments in internet use and skills in the EU27 and selected other countries, this chapter has touched upon developments in the use of various online content, as well as mobile use of the internet. The following two chapters are devoted to a more in-depth analysis of available data thereon.

# 4. THE MOBILE USE OF THE INTERNET BY INDIVIDUALS AND ENTERPRISES

## 4.1. Introduction

This chapter looks at mobile use of the internet by individuals and enterprises, benefiting from new data collected in special modules on mobile use of the internet contained in the 2012 Eurostat survey on ICT (Information and Communication Technology) usage in households and by individuals and in the survey of enterprises. With regard to individuals, it first looks at progress made in the development in use by individuals of mobile internet in the EU and its Member States, and the types and frequency of access. It then looks at the relationship between skills levels and mobile internet use and between household income and mobile internet use. It also looks at the perceived barriers to mobile use of the internet. Finally, the chapter examines the types of activities undertaken online via mobile device and problems encountered. With regard to enterprises, the chapter presents data on provision of mobile devices to staff, how this varies by enterprise size, the sophistication and main uses of mobile devises and obstacles to use. The last section summaries and concludes the chapter.

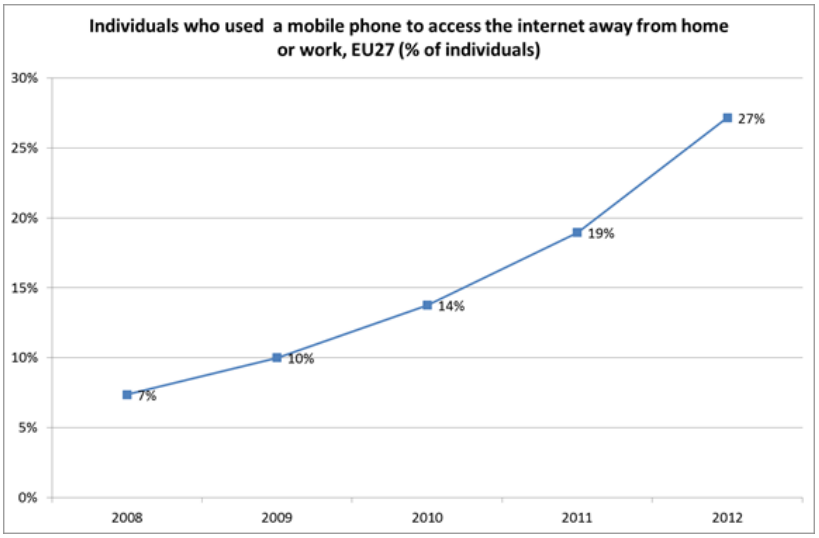
## 4.2. Mobile use of the internet by individuals in the EU27

### *4.2.1. Progression in individuals mobile use of the internet in the EU27*

In 2012, 87% of the EU population used a mobile phone or a smart phone (last three months). About one in three used them to access the internet. At the same time, the percentage of people who used the Internet on the move with a portable computer or a handheld device was 36%. Regarding portable computers, 7% of people have used a tablet.

In particular, accessing the internet via mobile phone or smart phone has seen a substantial increase in popularity in the EU27 over the past few years. The proportion of the population using a mobile phone to access the Internet has increased by 20 p.p., from 7% in 2008 to 27% in 2012, and the rate of growth has increased – while the increase was a mere 3 p.p. between 2008 and 2009, over the last year the increase was some 8 p.p..

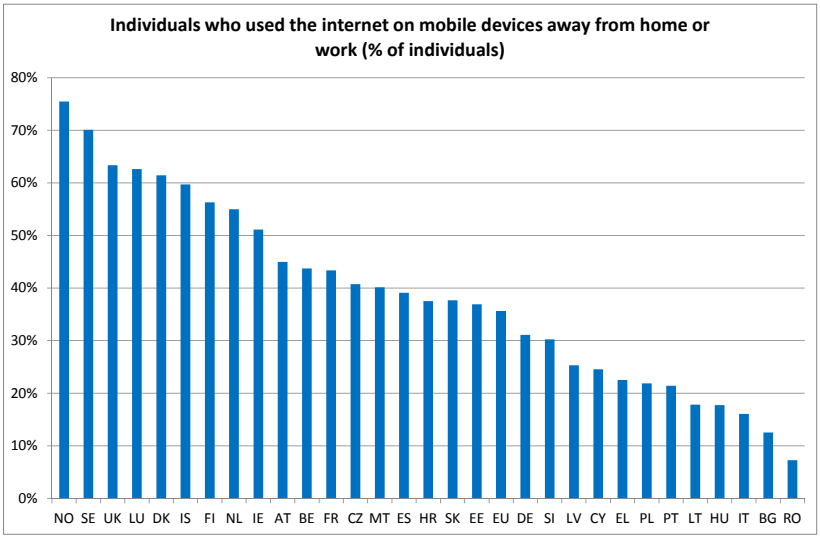
**Figure 101: Individuals who used a mobile phone to access the internet away from home or work, EU27 (% of individuals)[86]**




*Source: Eurostat*

***Across the EU27 Member States***, the percentage of people accessing the internet on the move in 2012 varies substantially. The percentage of the population using the internet on mobile devices (portable computer or handheld device[87]) away from home or work was higher than 60% in four Member States: Denmark (61%), Luxembourg (63%), the United Kingdom (63%) and Sweden (70%). However, it was less than 20% in Lithuania (18%), Hungary (18%), Italy (16%), Bulgaria (13%) and Romania (7%).

**Figure 102: Individuals who used the internet on mobile devices away from home or work (% of individuals)**




*Source: Eurostat*

[86] Data for 2008-2010 refers to the use of a mobile phone to access the Internet at any place.

[87] Portable computers include e.g. laptops, netbooks, tablet computers. Handheld devices include e.g. mobile phones or smartphones, mp3 player, games console, PDA.

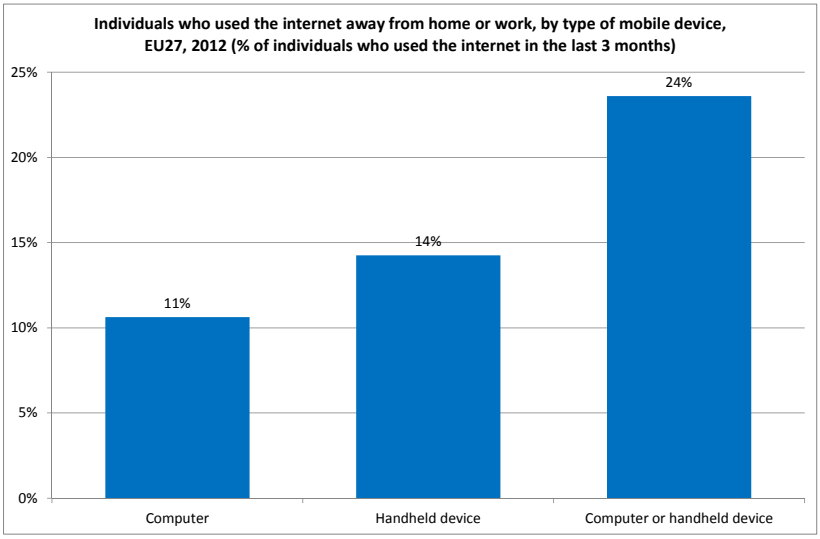
### *4.2.2. Type and Frequency of mobile access to the internet*

Looking at the at the devices used to access the internet on the move shows that most internet users use both a computer and a handheld device, significantly fewer people use only one or other: In 2012, 11% of the individuals who accessed the internet on the move did so by using a portable computer only, 14% of them used a handheld device only and 24% used both a portable computer and a handheld device.

Data on ***frequency of mobile internet access in the EU*** shows that most users are frequent users, accessing the internet via a mobile device every day or almost every day. On average in the EU, 62%of individuals who used the internet on the move with a portable computer in 2012 did so at least once a week. 41% of them used the Internet on the move on a daily basis, while 21% did so at least once a week, but not every day.

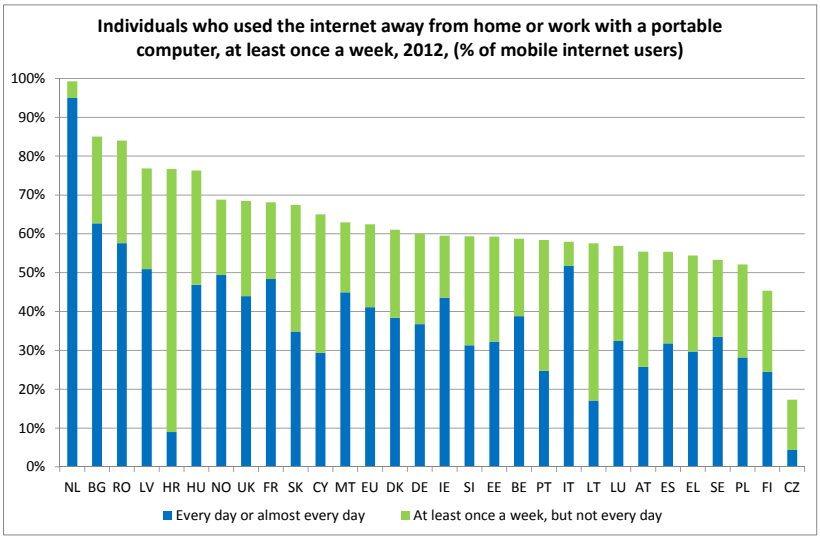
Across the EU27, the percentage of individuals who used the Internet on the move with a portable computer at least once a week was above 80% in three Members States: the Netherlands (99%), Bulgaria (85%) and Romania (84%). While at the other end of the scale it was less than 50% in Finland and less than 20% in Czech Republic.

**Figure 103: Type of device used for mobile access to the internet (% individuals who used the internet in the last three months)**




*Source: Eurostat*

**Figure 104: Individuals who used the internet away from home or work with a portable computer at least once a week, 2012 (% of mobile internet users)**

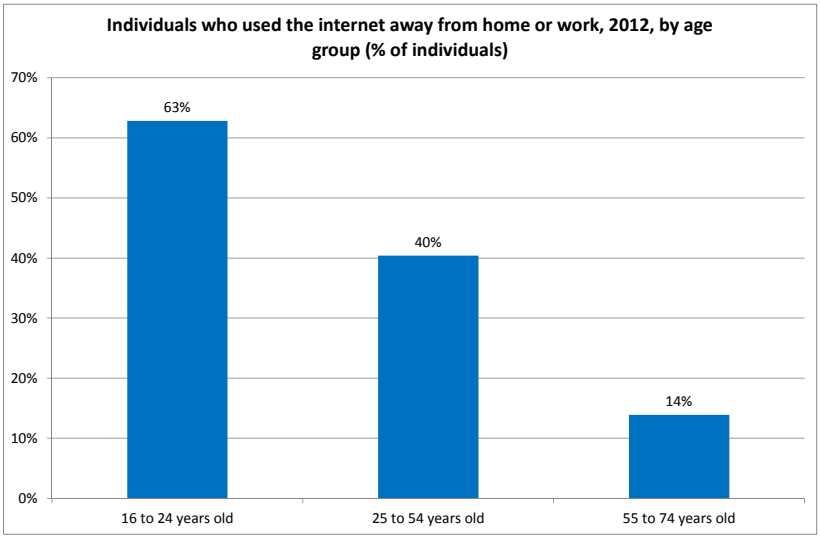



*Source: Eurostat*

### *4.2.3. Mobile use of the internet by age category*

In general, the young population is adopting mobile internet use more readily than other population segments. While 63% of the people aged 16-24 used the Internet on the move, for individuals aged 55 to 74 it is less than 15%.

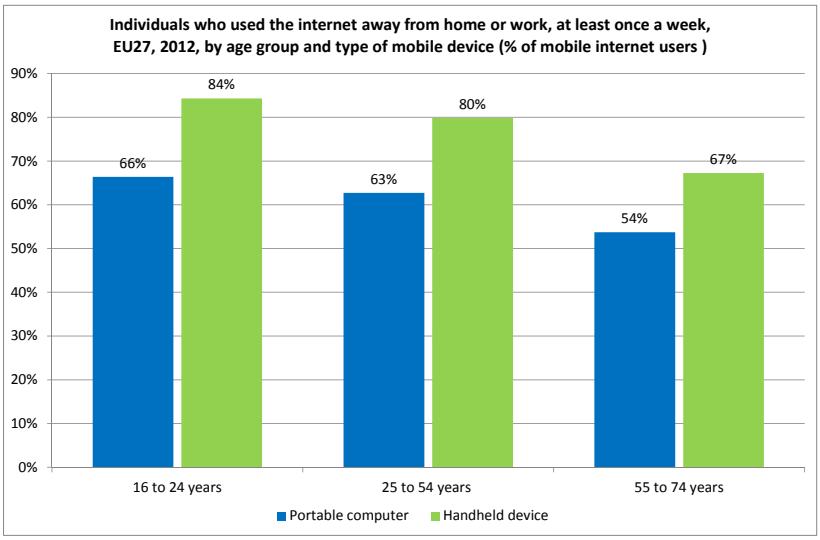
**Figure 105: Individuals who used the internet away from home or work, 2012, by age group (% individuals)**




*Source: Eurostat*

Their frequency of use is also higher: young people tend to use mobile internet more often than people aged 55 to 74. 84% of individuals who used the internet on the move aged 16-24 do so at least once a week with a handheld device. This falls to 67% for the 55-74 years age group. For portable computer use, which is somewhat less popular, the figures are 66% for the 16 to 24 age group but 54% for those aged 55 to 74 years.

**Figure 106: Mobile use of the internet by age group, at least once a week, 2012 (% mobile internet users)**

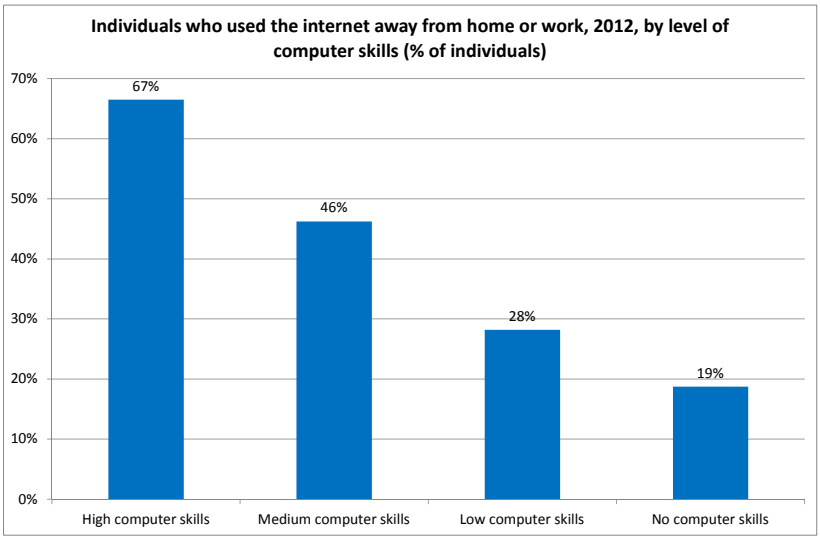



*Source: Eurostat*

### *4.2.4. Skills and mobile use of the internet*

The level of computer skills has a big influence on the use of the internet on the move in the EU27. [88] Indeed, 67% of people who had high computer skills used the Internet on the move in 2012. The rate falls already substantially to 46% for those with medium skills and again to 28% for those with low skills. For individuals with no computer skills at all it is less than 20%.

**Figure 107: Individuals who used the internet away from home or work, 2012, by level of computer skills (% individuals)**




*Source: Eurostat*

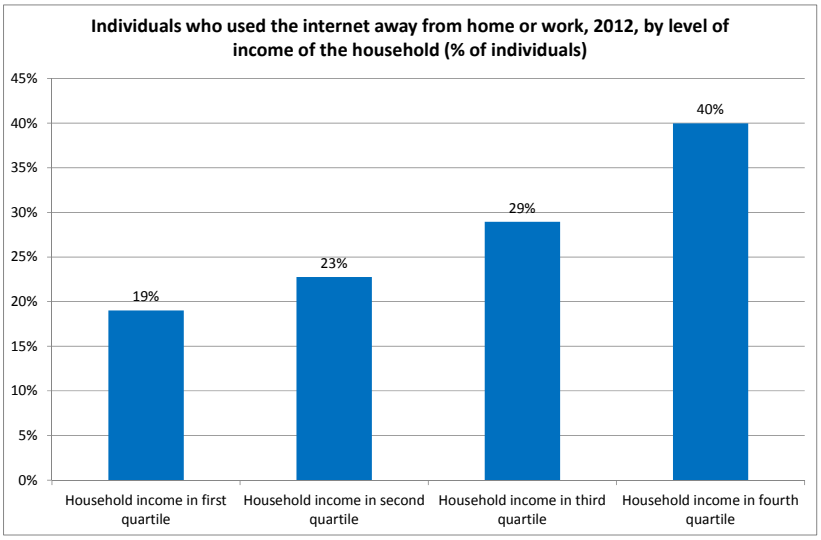
### *4.2.5. Mobile internet use by income category*

Mobile use of the internet is also significantly influenced by household income. In 2012, people belonging to a household with the highest income used about two times more the

[88] For the definition of levels of skills, see chapter 3.4.1.

Internet on the move than the ones with the lowest income. People belonging to a household with a lower income were also about 25% to give the cost of the service as a reason not to use it. In particular, students were about one third to declare that they didn't use the Internet on the move because the service was too expensive. One in four unemployed evoked the same reason. Retired and other inactive people were 16% to see the cost as a barrier.

**Figure 108: Individuals who used the internet away from home or work, 2012, by level of household income (% individuals)**

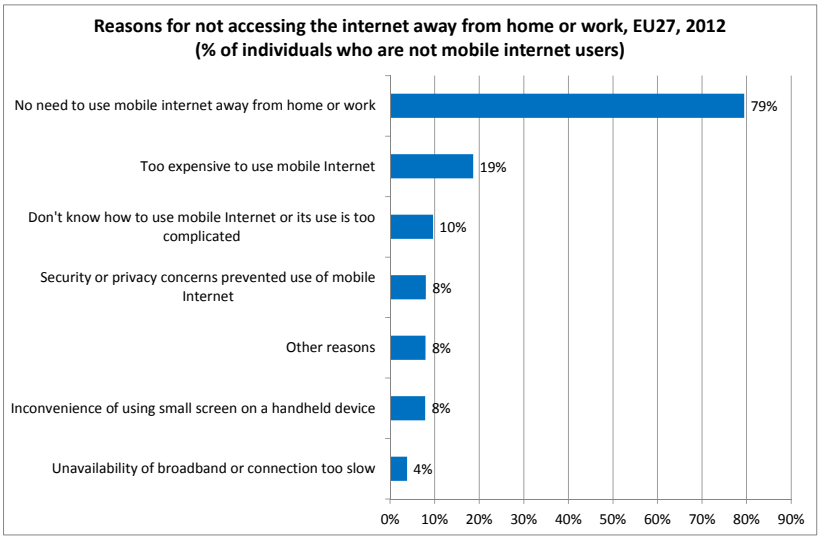



*Source: Eurostat*

### *4.2.6. Perceived barriers to mobile use of the internet*

As with use of the internet overall, individuals who do not use mobile internet report a lack of need, lack of skills and costs as the three main factors preventing them from using mobile internet. However, the first factor, lack of need, is reported as by far the most important one – unlike for internet access in general. Indeed, about 80% of people who did not access the Internet on the move in 2012 replied that they didn't need it. It may well be the case that mobile access is perceived as less needed by non-mobile users than overall access to the internet by non-internet user, as many of them will have fixed internet access. However, mobile access is still in its relative infancy, as it develops lack of need may well become a less dominant reason for non-use, as both the supply of mobile internet services and the knowledge thereof increases.

**Figure 109: Reasons for not accessing the internet away from home or work (% of individuals who are not mobile internet users)**

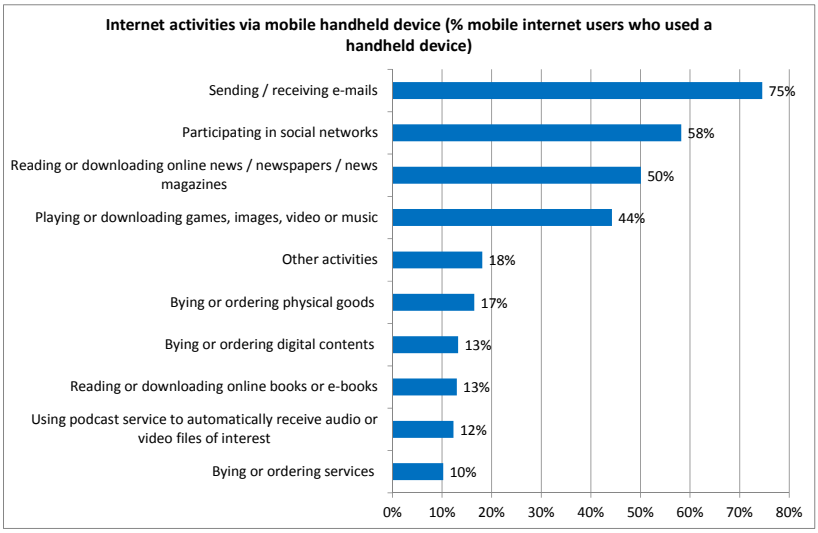



*Source: Eurostat*

### *4.2.7. Internet activities via handheld device*

In the EU27, around three quarters of people who used the internet on the move communicated with their handheld device by email. Social media is an important mean of communication too, especially among young people. In 2012, 58% of people who used the internet on the move with a handheld device participated in social networks. About half of them used their handheld device to read the online news, newspapers or news magazines. 17% of the people bought or ordered some physical good (e.g. electronics, clothes, toys, food, groceries, books, CD/DVDs) via their handheld device, while 13% of them bought or ordered digital content (e.g. films, music, e-books, e-newspapers, games, paid applications, etc.). Of course, the size of the screen influences the type of activities for which people have used the internet on the move. In particular, it seems that buying goods and services via handheld device is a lot less frequently done via a handheld device than that over a computer, as the data on online purchases via any device in chapter 3.8.1 suggest.

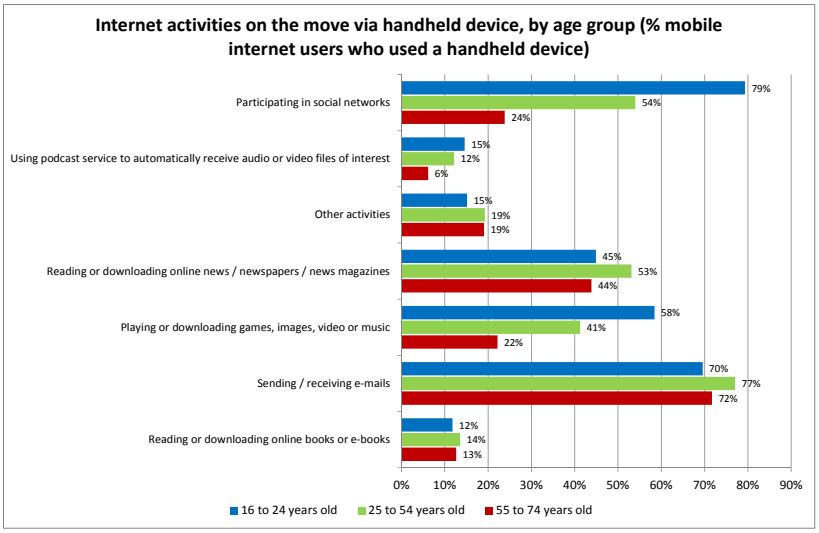
**Figure 110: Internet activities via handheld device (% mobile internet users who used a handheld device)**




*Source: Eurostat*

While age does not seems to affect activity levels via mobile device for most activities, for two activities there are marked differences in rates of use by age segment. In particular, contrary to people aged 55 to 74, young people use more social networks. Around 80% of them who used the internet on the move with a handheld device were active on these networks. Furthermore, while 58% of those aged 16 to 24 play games or download music, videos or images, it is only 22% for people aged 55 to 74; illustrating differences in choice of ways of communicating and social activities between age groups.

**Figure 111: Internet activities on the move via handheld device, by age group (% mobile internet users who used a handheld device)**

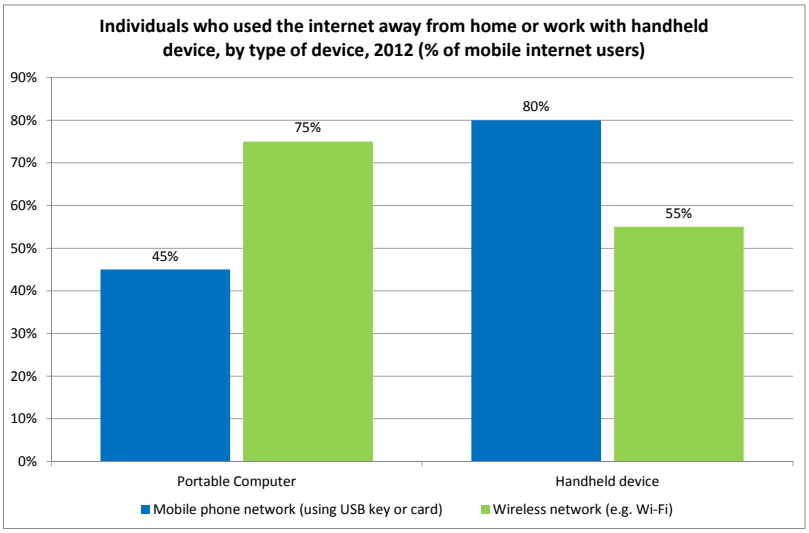



*Source: Eurostat*

### *4.2.8. Type of mobile connection used and problems encountered with them*

In 2012, 80% of people who used a handheld device to access the Internet on the move used their mobile phone network and 66% of them used at least a 3G connection. More than half of the people who used a handheld device to access the Internet on the move used a wireless network. In comparison, 45% of people who used a portable computer to access the Internet on the move used their mobile phone network, with a USB key or card, while 75% of them used a wireless network (for example Wi-Fi).

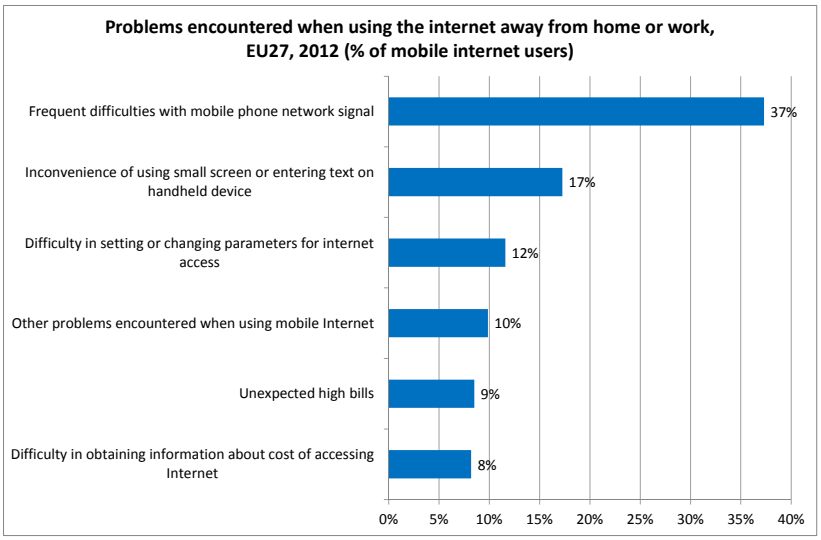
**Figure 112: Individuals who used the internet away from home or work with handheld device, by type of device (% of mobile internet users)**



*Source: Eurostat*

In the EU27, mobile Internet users had some issues with the quality of their network. For instance, 37% of them said they had frequent difficulties with their mobile phone network signal. Apart from that, 17% of the people who used the Internet on the move think that using small screen or entering text on handheld device is an issue. In that case, people aged 16-24 were less likely to raise the size of the screen as an issue. Finally, 12% of the users also had some difficulties in setting or changing parameters for their mobile Internet access.

**Figure 113: Problems encountered when using the Internet away from home or work (% mobile internet users)**



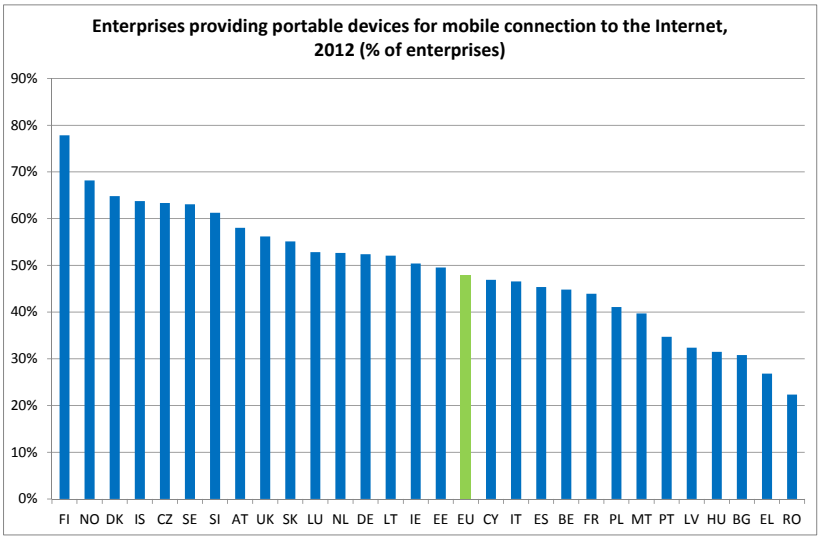

*Source: Eurostat*

## 4.3. Mobile use of the internet by enterprises in the EU27

### *4.3.1. Provision of devices to staff*

In 2012, 48% of enterprises in the EU27 provided some staff with portable devices for mobile connection to the Internet. The proportion of enterprises providing portable devices to some of their employees was more than 60% in Finland (78%), Denmark (65%), Czech Republic (63%), Sweden (63%) and Slovenia (61%). These shares were the lowest in Bulgaria (31%), Greece (27%) and Romania (22%).

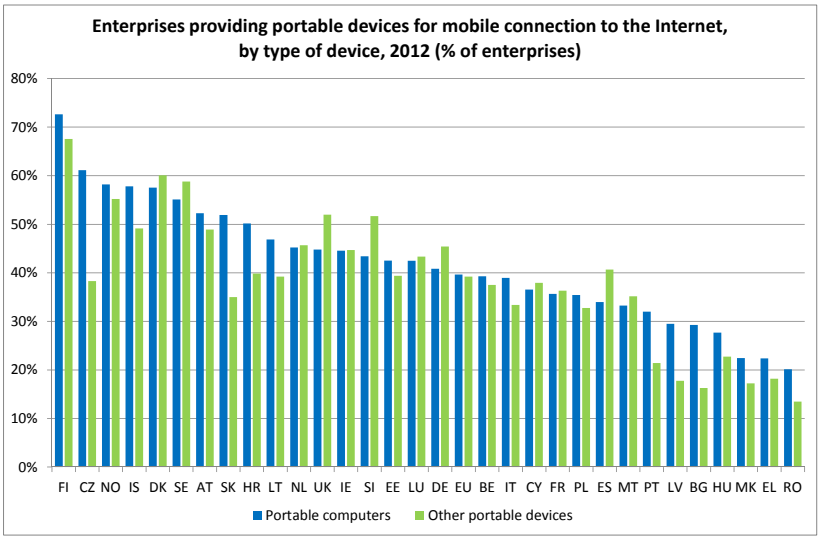
**Figure 114: Enterprises providing portable devices for mobile connection to the internet, 2012 (% enterprises)**




*Source: Eurostat*

In the EU27, enterprises provided portable computers (e.g. laptops, notebooks and tablets) and other portable devices (smartphones, PDA, etc.) in equal proportion. Some 40% of enterprises provide portable computers and 39% of enterprises provide other portable devices. Across countries, it is also pretty even; except in the Czech Republic, Slovakia, Portugal, Latvia and Bulgaria where portable computers outweigh considerably other portable devices.

**Figure 115: Enterprises providing portable devices for mobile connection to the internet, by type of device, 2012 (% enterprises)**

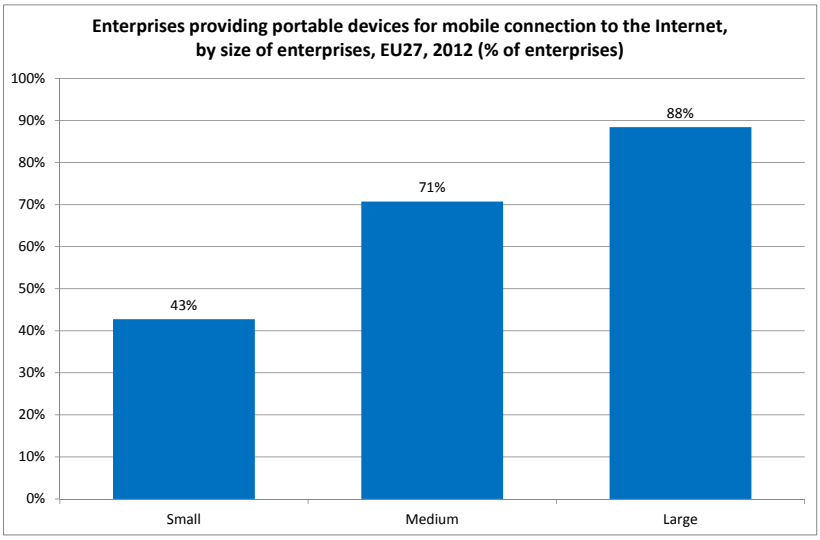



*Source: Eurostat*

### *4.3.2. Companies supporting mobility*

Almost 90% of large enterprises provided a portable device for mobile connection to the Internet in 2012. The proportions of small and medium enterprises were respectively 43% and 71%.

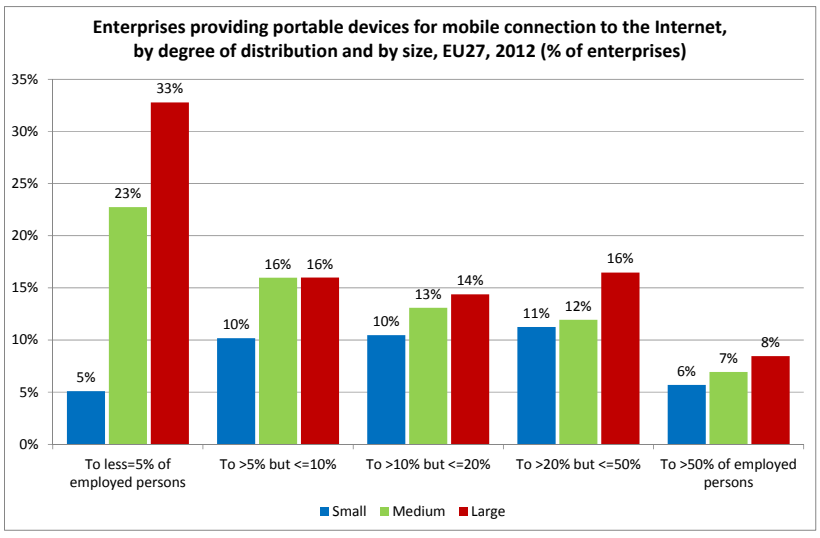
**Figure 116: Enterprises providing portable devices for mobile connection to the internet, by size of enterprise, 2012 (% enterprises)**




*Source: Eurostat*

More than a third of large enterprises providing a portable device for mobile connection to the Internet provide such portable device to less than 5% of their staff. This means that a lot of large enterprises tend to limit the provision of such devices to their management. The proportion of enterprises providing such device to more than 10% of their staff is relatively similar among small, medium and large enterprises.

**Figure 117: Enterprises providing portable devices for mobile connection to the internet, by degree of distribution, 2012 (% enterprises)**

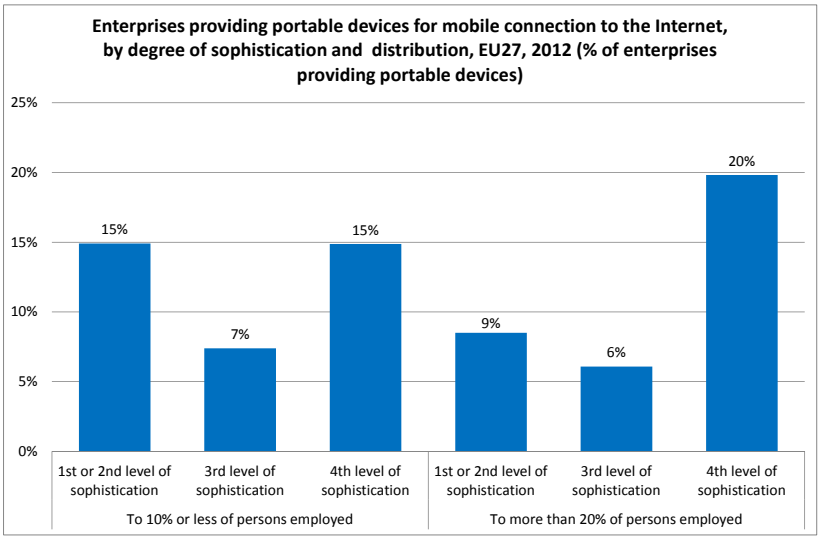



*Source: Eurostat*

### *4.3.3. Sophistication and main uses of mobile devices*

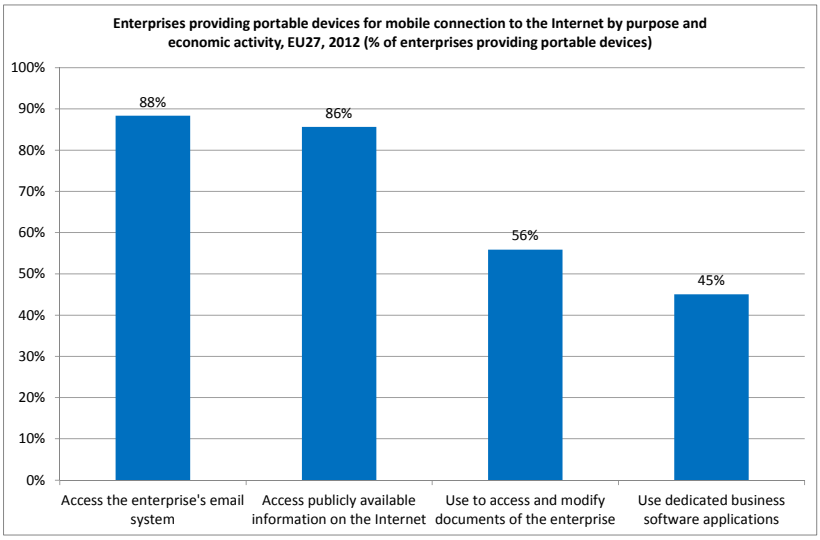
In 2012, 88% of enterprises providing portable devices used them to access the enterprise's email system. During the same period, 86% of enterprises used portable devices to access publicly available information on the internet. More than a half of these enterprises used such portable devices to access and amend documents (third level of sophistication) and 45% to use dedicated business software applications (fourth level of sophistication).

**Figure 118: Enterprises providing portable devices for mobile connection to the internet, by purpose and economic activity, *EU27*, 2012 (% enterprises providing portable devices)**




*Source: Eurostat*

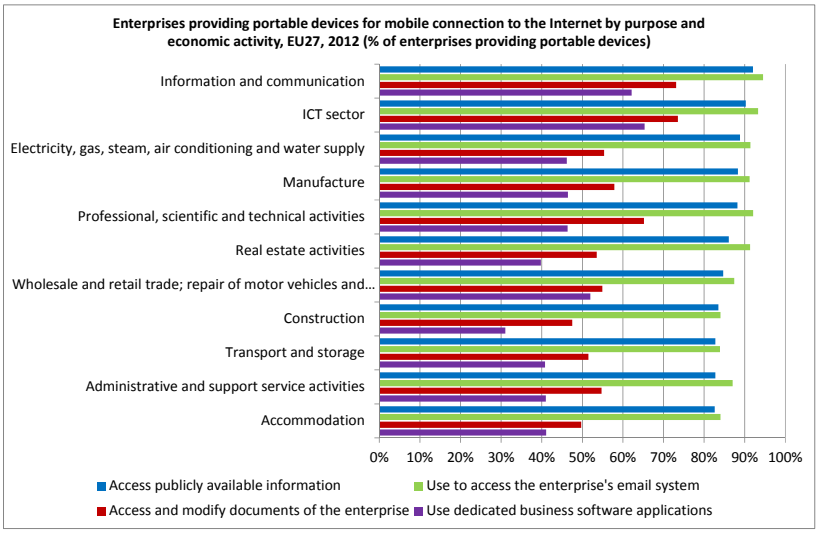
**Figure 119: Enterprises providing portable devices for mobile connection to the internet, by degree of sophistication and distribution, *EU27*, 2012 (% enterprises providing portable devices)**




*Source: Eurostat*

The use of mobile device to have access to e-mail was one of the main business uses of portable device in 2012. This is true across all sectors of activity. Enterprises in the ICT sector make more use of mobile devices to have access and to modify documents than enterprises in other sectors. They also make more use of dedicated business software applications.

**Figure 120: Enterprises providing portable devices for mobile connection to the internet, by purpose and economic activity, 2012 (% enterprises providing portable devices)**



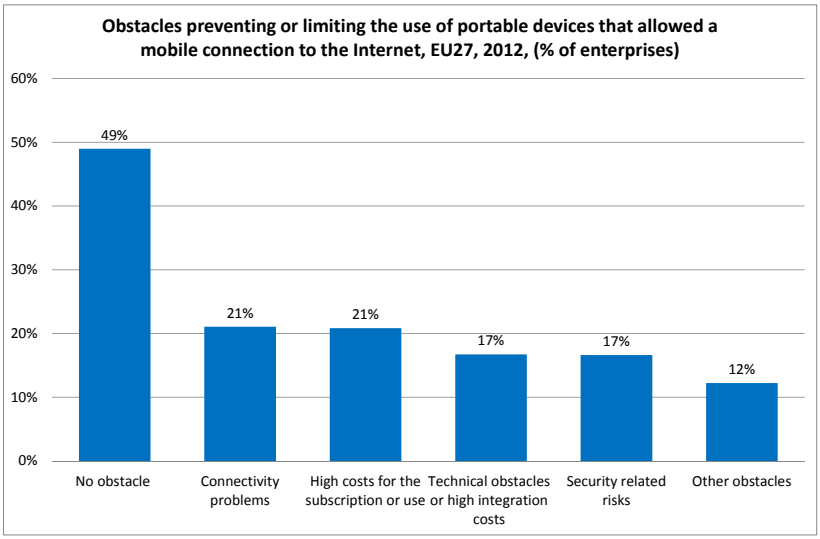

*Source: Eurostat*

### *4.3.4. Obstacles to the use of mobile devices*

Among enterprises that provided their staff with a portable device, about 40% reported no major obstacle. The main obstacle reported by these enterprises was the quality of the mobile telephone network. In general, large enterprises seem to be more concerned by security related risks than small enterprises.

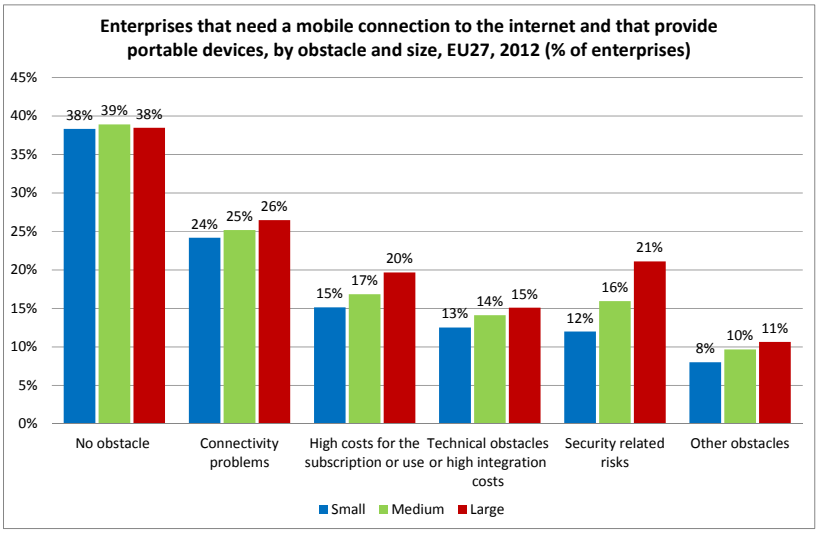
Some 21% of enterprises reported connectivity problems related to their mobile telephone network as a limitation. High cost for the subscription or use of the Internet was an obstacle for 21%. 17% of enterprises also mentioned the technical obstacles and the security related risks as an obstacle.

**Figure 121: Obstacles preventing or limiting the use of portable devices that allowed a mobile connection to the internet, EU27 2012 (% enterprises)**




*Source: Eurostat*

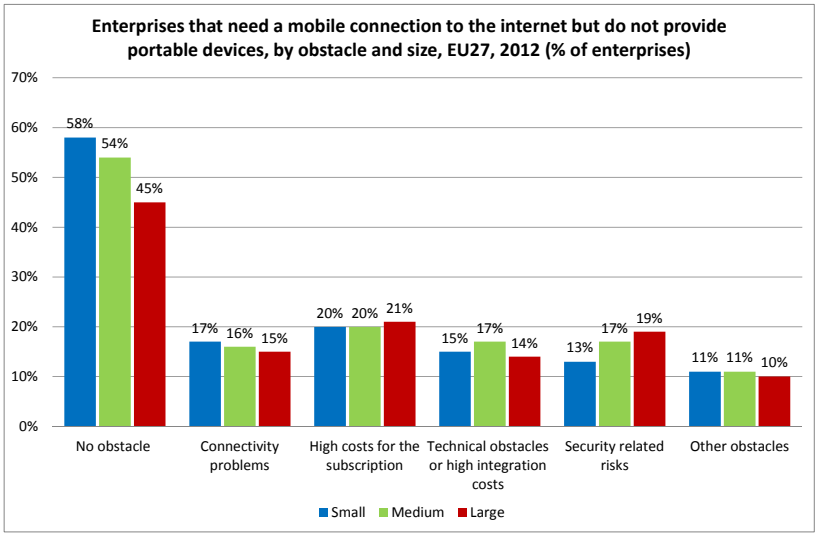
**Figure 122: Enterprises that need a mobile connection to the internet and provide portable devices, by obstacle and size, EU27, 2012 (% of enterprises[89])**




*Source: Eurostat*

A large proportion of enterprises that did not provide their staff with portable devices but could identify some need for a mobile connection to the internet reported other obstacles. These enterprises might not yet have considered providing their staff with mobile devices. They may not be able to identify which potential obstacles might limit or prevent their use of mobile devices. Among the enterprises that have reported some obstacles, the connectivity problems and the high cost of subscription are seen as an important obstacle, especially for small enterprises.

**Figure 123: Enterprises that need a mobile connection to the internet but do not provide portable devices, by obstacle and size, EU27, 2012 (% of enterprises[90])**




*Source: Eurostat*

[89] % of enterprises that need a mobile connection to the Internet for business uses and that provide to the persons employed portable devices that allow a mobile connection to the internet.

[90] % of enterprises that need a mobile connection to the Internet for business uses but that do not provide to the persons employed portable devices that allow a mobile connection to the internet.

## 4.4. Summary and conclusions

This chapter has looked at mobile use of the internet by individuals and enterprises, benefiting from new data collected in special modules on mobile use of the internet contained in the 2012 Eurostat survey on ICT (Information and Communication Technology) usage in households and by individuals and in the survey of Enterprises.

First turning to **mobile use of the internet by individuals**: this new data show that mobile use of the internet is becoming increasingly popular: 27% of individuals now use their mobile phones to access the internet and 36% do so via a portable computer or handheld device. Most mobile internet users are frequent users, going online every day. As with internet access via any device, mobile use varies across countries. It is also strongly age dependent, with significantly higher rates of younger users (62% of those aged 16-24) accessing the internet on the move than older age categories (14% of those aged 55-74). Younger people accessing the internet on the move also show somewhat higher frequency of access than older users. Skills levels have a big influence on mobile use of the internet; with more than twice as many individuals with high skills going online on the move than those with low skills. Income too affects rates of use.

As with use of the internet overall, individuals who do not use mobile internet report a lack of need, lack of skills and costs as the three main factors preventing them from using mobile internet. However, the first factor, lack of need, is reported as by far the most important one – unlike for internet access in general. Indeed, about 80% of people who did not access the internet on the move in 2012 replied that they didn't need it. It may well be the case that mobile access is perceived as less needed by non-mobile users than overall access to the internet by non-internet user, as many of them will have fixed internet access. However, mobile access is still in its relative infancy, as it develops lack of need may well become a less dominant reason for non-use, as both the supply of mobile internet services and the knowledge thereof increases.

The most popular internet activities undertaken on the move via handheld device are sending and receiving email, participating in social networks, reading/down loading news and playing or downloading games, video, images or music. Making purchases online, reading and downloading books/eBooks and using podcast services were less popular; no doubt partly influence by screen size but also impracticality of performing such activities while on the move. Generally speaking age does not seem to affect which activities mobile internet users undertake. The main exceptions to this are for use of social networks and play games or download music, videos or images which are undertaken more often by younger people; illustrating differences in choice of ways of communicating and social activities between age groups. The most popularly cited issue surrounding internet access on the move was problems with network signals. To some extent screen size was a problem, but more so for older people than the young.

Turning to **mobile use of the internet by enterprises**, the data show that in enterprises too mobile use of the internet is popular. Almost 50% of enterprises provide staff with portable devices for mobile access to the internet in 2012, ranging from above 60% in Finland, Denmark, Sweden, the Czech Republic and Slovenia, to around 30% or less in Bulgaria, Greece and Romania. In most countries, portable computers and other portable devices are provided in more or less equal proportion. Larger companies (88%) more readily provide portable devices for access to the internet than small (43%) and medium (71%) sized firms. 88% of enterprises used portable devices to access the enterprise's email system, 86% to

access publicly available information on the Internet and around half used portable devices to access and amend documents as well as used dedicated business software applications. Across sectors, email and accessing publicly available information were the two most popular activities. Accessing and modifying documents was particularly popular in the Information and Communication and ICT sectors. The most reported problems regarding mobile access to the internet by enterprises related to connectivity problems and high costs for the subscription or use. (21% of enterprises each). Larger firms report more obstacles. Of firms that do not provide such devices, high cost is the most reported obstacle.

# 5. INTERNET CONTENT

## 5.1. Introduction

Increased frequency of internet usage, coupled with faster speeds and the growth of mobile access are accelerating recent trends in internet use and inducing new and different behaviour patterns by users. On the other hand, consumers increased demand for services, information and entertainment "anytime, anywhere", is putting pressure on providers of services, content and equipment for constant innovation. This dynamic interplay between demand for new services and the development of technologies making them possible is generating a fast-changing landscape in the industry.

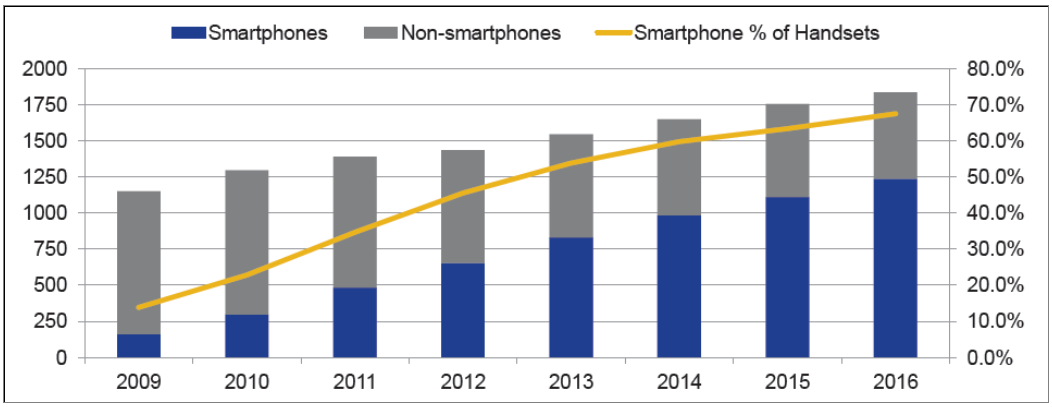
## 5.2. Market trends

### *5.2.1. Mobile Internet access*

Mobile data traffic is driving an exponential increase in data transmission through the internet. Mobile devices like smartphones and tablets are increasingly moving away from being purely "utility" devices, with entertainment occupying more and more of a central role in the usage of internet on the go.

Smartphones are expected to account for more than half of all handset shipments in 2013, and the percentage is expected to continue to grow, mainly due to decreasing prices and the perceived value and greater integration of mobile apps into everyday life (Figure 124).

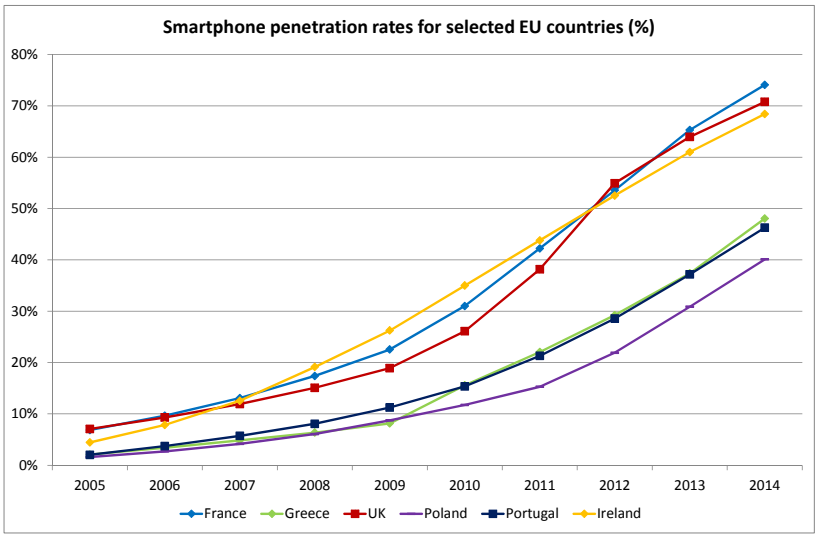
**Figure 124: Handset shipments evolution**




*Source: HIS ScreenDigest*

But adoption levels are not homogeneous across Europe: While in France, the UK and Ireland the penetration rate of smartphones already exceeds 60% in 2013, Greece, Portugal and Poland have adoption rates below 40% (30% in the case of Poland) (Figure 125).

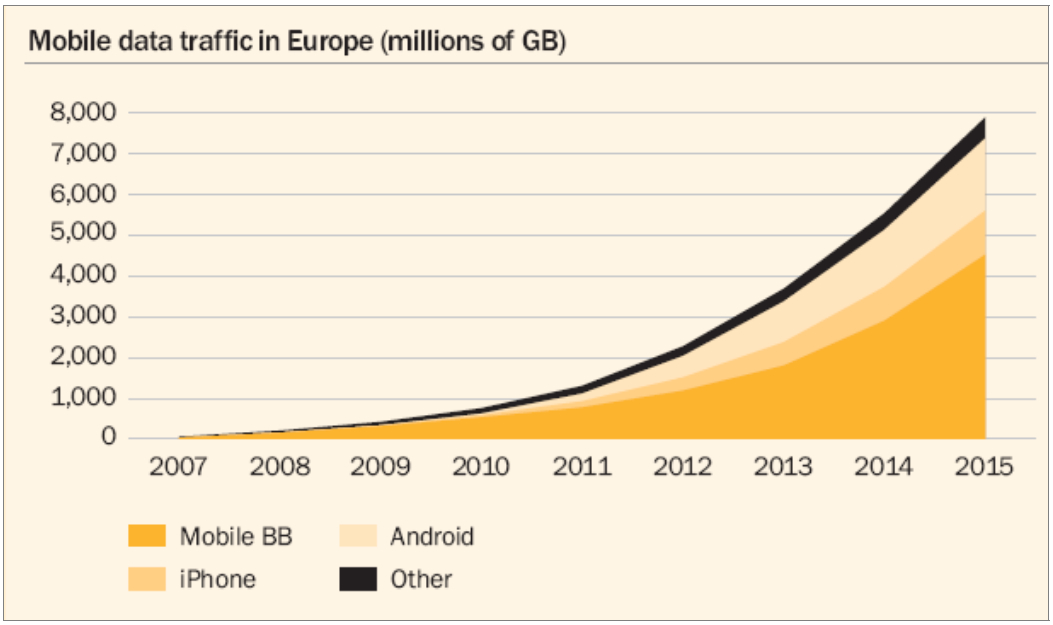
**Figure 125: Smartphone penetration rates for selected EU countries**




*Source: HIS ScreenDigest*

Smartphones and mobile broadband services are driving the exponential increase in mobile data traffic in Europe. The volume of mobile data traffic is expected to grow more than tenfold in the period from 2010 to 2015, reaching almost 8.000 million GB of data (Figure 126).

**Figure 126: Mobile data traffic in Europe (millions of GB)**



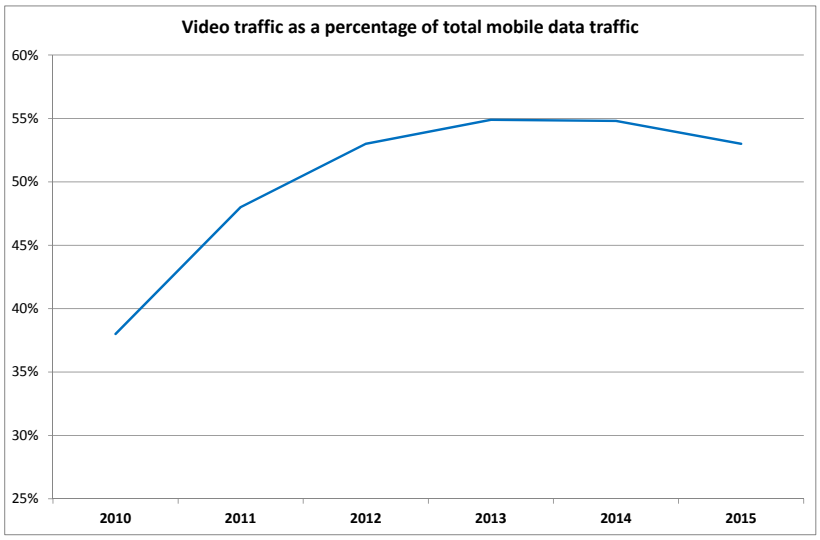

*Source: HIS ScreenDigest*

The enhanced speed of 4G or Long-term Evolution (LTE) is also increasing the attractiveness of games, video and interactive services. And it is projected that mobile video data traffic will grow nearly 14 times by 2015[91], representing over half of total data traffic (Figure 127). This will be mainly driven by YouTube (1 billion unique users are now visiting Youtube every

[91] ScreenDigest January 2012 report

month, nearly one out of every two people on the Internet), but with 4G long form video becoming more viable over mobile networks (Figure 128).

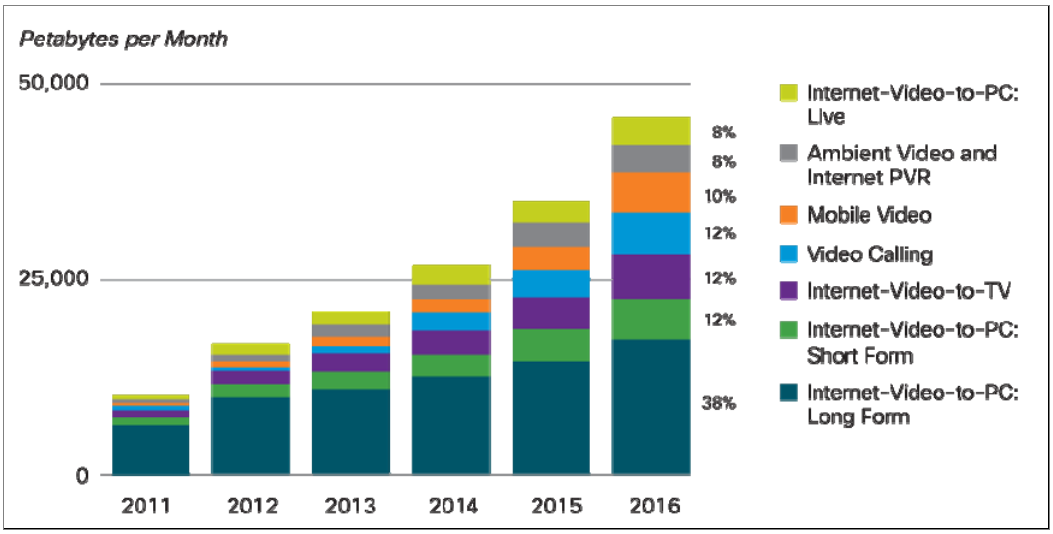
**Figure 127: Video traffic as a percentage of total mobile data traffic**




*Source: HIS ScreenDigest*

Yet mobile video is just around 10% of total Internet video traffic. While long form video-to-PC is expected to account for the biggest share of video traffic, other forms are expected to grow further in relative importance.

**Figure 128: Global Consumer Internet Video Traffic**

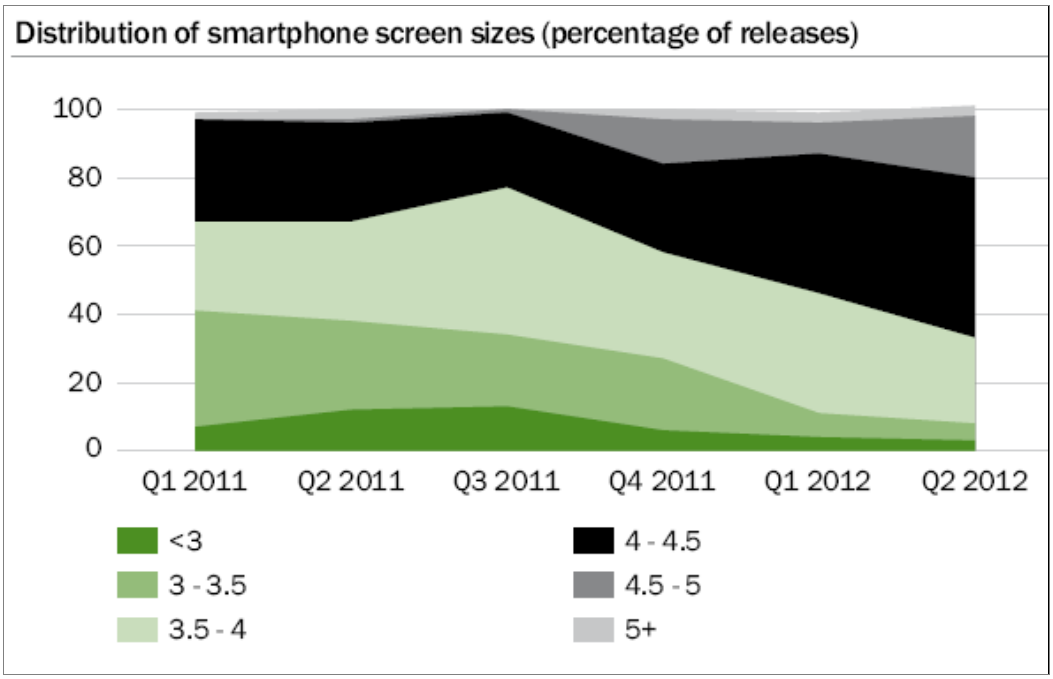



*Source: Cisco VNI Global Forecast, 2011-2016*

### *5.2.2. Technology meets demand*

The growing importance of video traffic in total mobile data traffic is coming hand in hand with changes in mobile devices themselves. Smartphone producers are now delivering models with better colour reproduction and easier to view in daylight, as well as larger screens to make them more suitable to video viewing than previous models (Figure 129):

**Figure 129: Distribution of smartphones screen sizes (percentage of releases)**




*Source: HIS ScreenDigest*

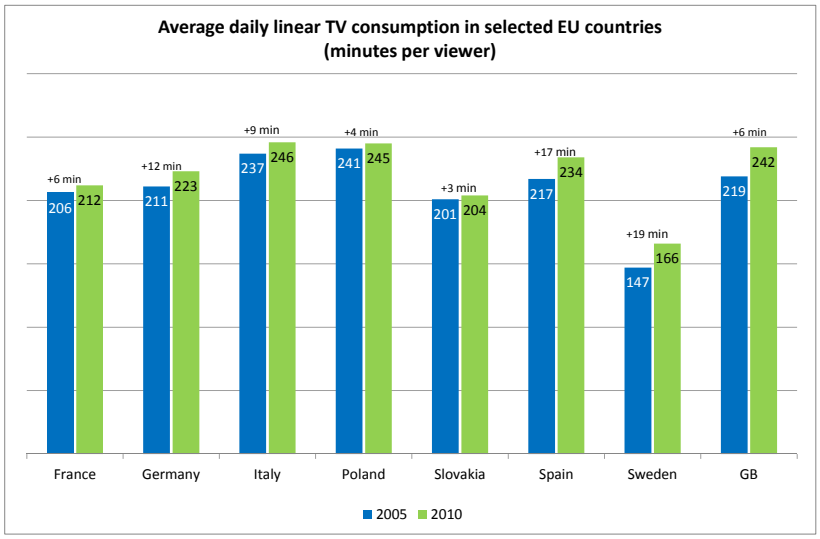
This is a very new trend that began in late 2011 with the launch of new devices and has continued throughout 2012. It is having a very noticeable effect on consumer behaviour, with mobile video consumption, as observed before, finally becoming a mainstream activity after many years of trials, launches and commercial failures. Consumer demand now for HD content for their large smartphones is in turn driving the deployment of faster 4G networks. It is also having a noticeable impact on both the movie and the television industries. Besides the ones mentioned in the next point, it is worth mentioning the emergence of Social TV apps that allows the user to interact and share comments about specific TV shows or movies while watching.

### *5.2.3. Television "anytime, anywhere" and online movies*

The emergence of faster and widely accessible internet connection is having an impact on the television and movie sectors, the outcome of which is still hard to realize. Still, concepts like SmartTV, PayTV or VoD (video-on-demand) should soon become more familiar than traditional direct television or movie viewing.

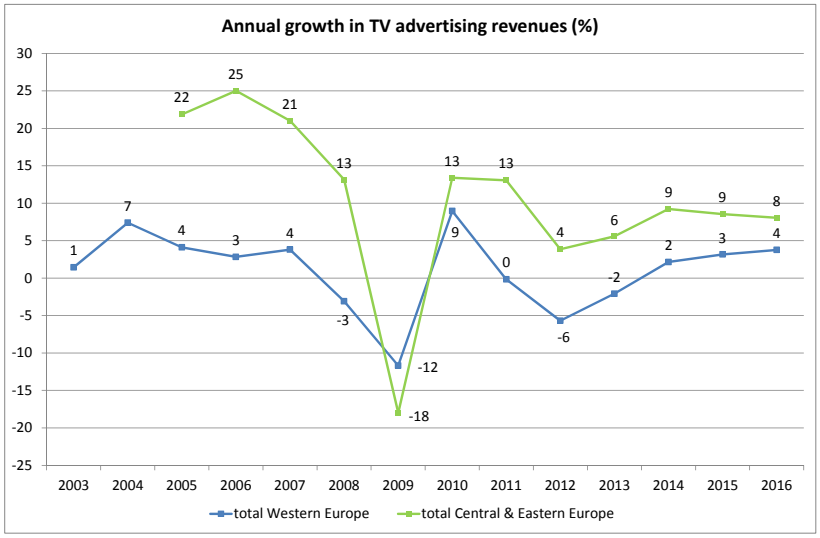
The traditional TV sector is showing considerable resilience to the changing ecosystem. The once fashionable belief that the Internet would "kill off" television has lost all credibility. The European television business is holding on: Average daily linear TV viewing times have been increasing in most major European countries (Figure 130), and the growth in TV advertising revenues has been mainly on positive ground (let aside the severe dip in 2009 and 2012 associated with the economic crisis) (Figure 131).

**Figure 130: Average daily linear TV consumption in selected EU countries (minutes per viewer)**




*Source: 2013 e-Media Institute*

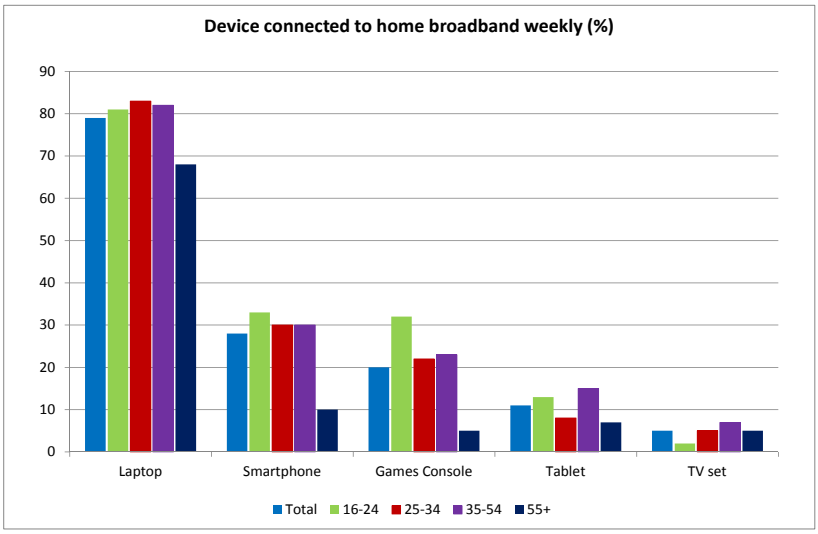
**Figure 131: Annual growth in TV advertising revenues (%)**




*Source: HIS ScreenDigest*

But the emergence and rise of connected viewing is changing the rules of the game, and is expected to increasingly keep doing so. More than one out of every four television sets shipped worldwide in 2012 was a smart TV. This will increase to over half in 2015. Continuing growth in wired broadband and Wi-Fi access and the recent launch of 4G are benefiting the downloading and streaming experience in different connected devices, which have as well been catching up in terms of screen size and colour reproduction quality. Even though the laptop is still the leader device used in connecting to the internet at home, smartphones, game consoles and tablets are increasingly being used by individuals, while connected TV sets are still expected to pick up in the coming years (Figure 132).

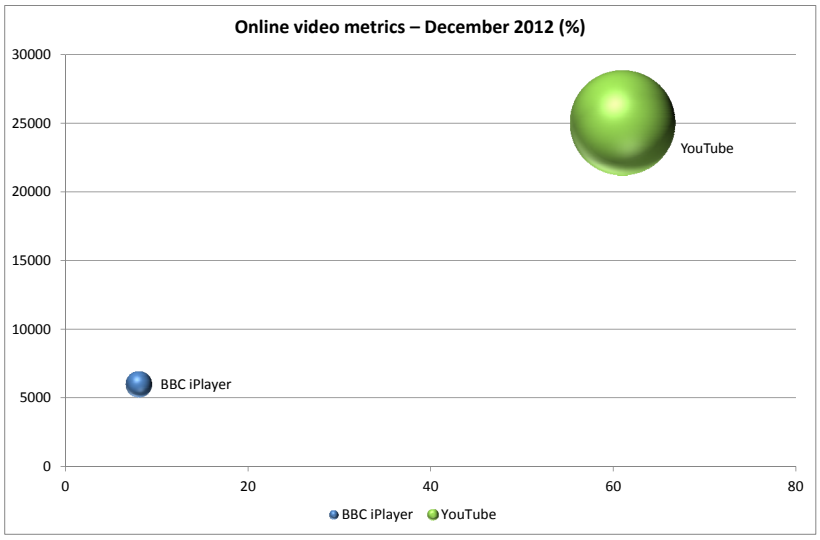
**Figure 132: Device connected to home broadband weekly (%)**




*Source: Ofcom; GfK*

One reason for the much higher volume of online access on other screens than the TV is the prominence of short-form content. Viewing stats for the PC, 59% of total online video time in December 2012 in the UK was consumed by YouTube, which dwarfed all other online video sites (Figure 133).

**Figure 133: Online video metrics – December 2012 (%)**



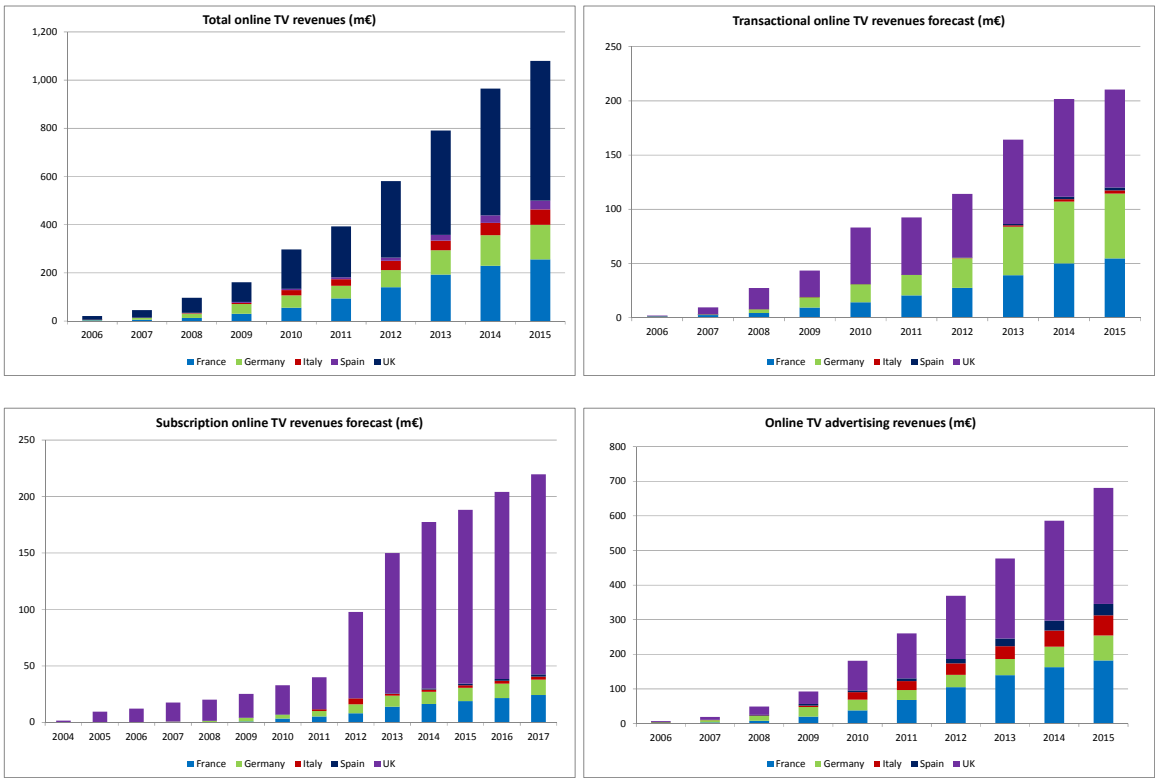

*Source: Nielsen*

But established broadcasters have not sat back and are at the forefront of innovation in the sector, investing significantly in content for online and multi-device distribution, with broadcasters' own sites among the most popular online video destinations in many European countries[92]. The European audiovisual industry has grown 56% in the decade between 2000 and 2010, and it was worth around €279 billion (2.3% of GDP) in 2010. Broadcasters are very active and reinvesting about 50% of their turnover in new content[2], an increasing share of that being invested in dedicated online content. For example, the European broadcaster RTL Group reported a 25 per cent increase in online video consumption in 2012, with its services

[92] Creative Media Europe, Audiovisual Content and Online Growth, March 2012

generating over 2.4bn user-requests for professionally-produced content. Additionally, for the major broadcasters in Europe, video consumption via mobile devices accounts for between 15 and 20 per cent of video requests, which is also a noticeable impact of the previously mentioned increase in video-suitable mobile devices available. The established broadcasters are feeding this trend, and *Youtube* recently announced that it is launching more than 60 new video channels with content from Britain, Germany and France.

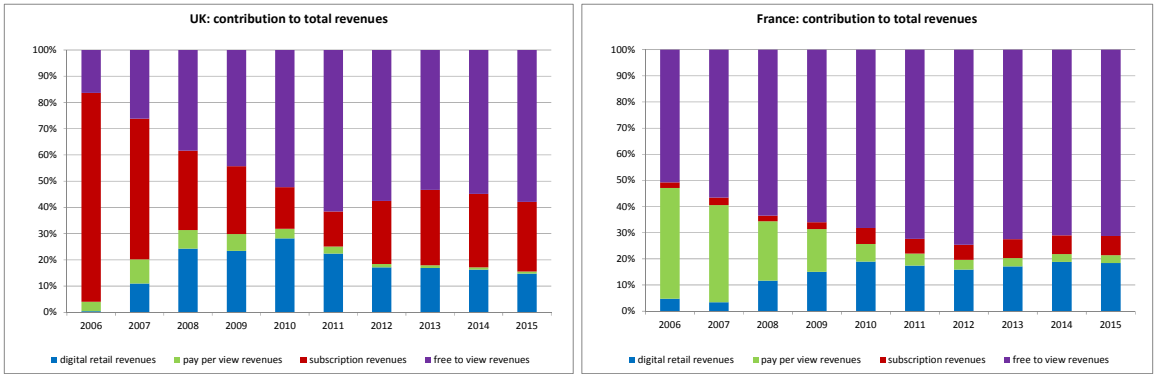
**Figure 134: Online TV revenues by category (m€)**




*Source: HIS ScreenDigest*

In the five largest EU markets, total online TV revenues have been increasing exponentially, and are forecasted to surpass a thousand million Euros in 2015. The UK, France and Germany are the largest contributors to this trend, while in other countries this market is still rather small. While with regard to transactional online TV revenues (consisting of digital retail revenues and pay per view revenues) these 3 countries share similar relevance, online TV advertising is bigger in the UK and France, while the subscription sector is significantly more advanced in the UK than in any other country (Figure 135).

**Figure 135: Contribution of each category for total Online TV revenues (%)**

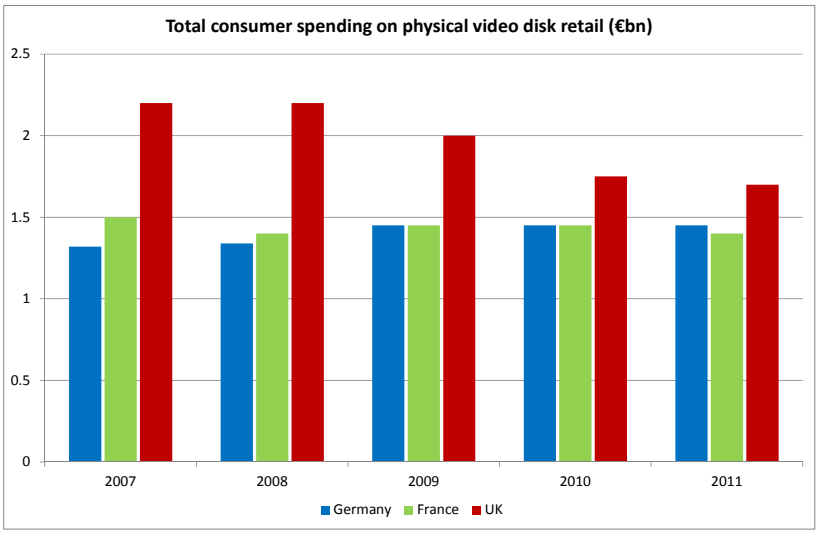



*Source: HIS ScreenDigest*

Comparing the contribution of the different segments to total online TV revenues, in both countries free-to-view revenues make up 60% or more of total online TV revenues, digital retail make up 20% or less, and the subscription sector is quite relevant in the UK, accounting to more than 20% of revenues (where Netflix, Lovefilm and Virgin Media try to challenge the clear leading position of BskyB).

The increase in subscription services is also taking its toll on physical video retail (Figure 136). There is a slow but steady downward trend throughout Europe in consumer spending on physical video disk retail. This trend is quite visible in the case of the UK, and still perceivable in France.

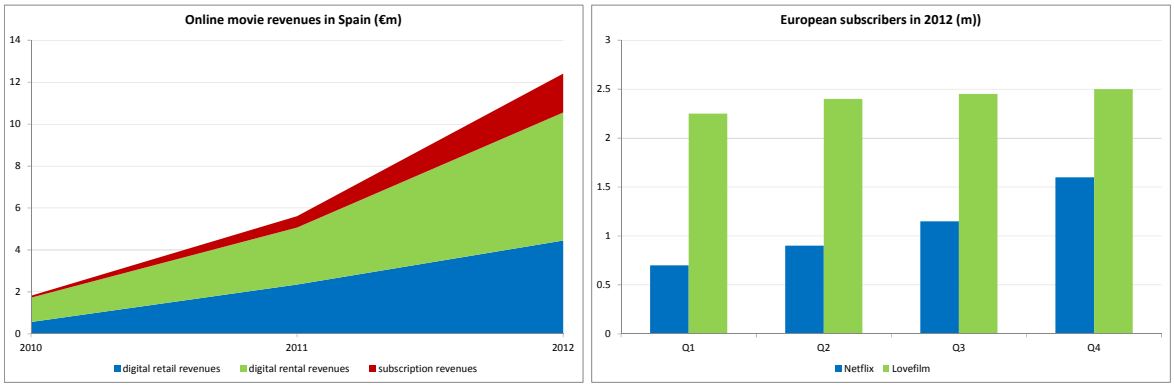
**Figure 136: Total consumer spending on physical video disk retail (€bn)**




*Source: HIS ScreenDigest*

Part of the reason behind these trends can be exemplified with the help of the following figures. The chart on the left shows the increase from online movie revenues in Spain. The market for online movies in Spain was worth €5.7m in 2011, showing 211 per cent growth and the market is expected to more than double in 2012, reaching €12.5m. Additionally, the figure on the displays the increase in the number of European subscribers throughout 2012 to Lovefilm and (mainly to) Netflix, two online video providers.

**Figure 137: Online movie revenues in Spain (€m) and European subscribers to Netflix and LoveFilm**




*Source: HIS ScreenDigest*

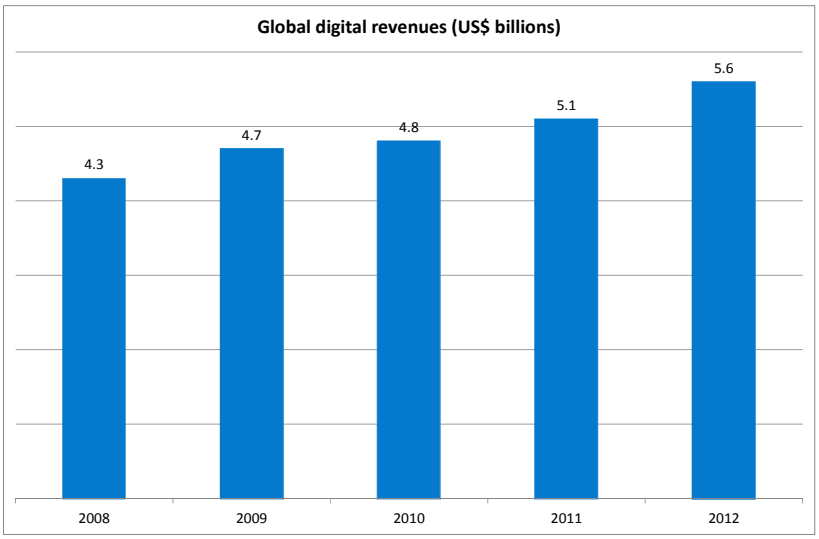
Regarding online viewing of TV and video content, differences can still be observed at the extremes of the age spectrum, between groups aged 16-24 and +55. In the UK, watching

video clips (for example through *Youtube*) is the most common activity, while Video on Demand (VoD) movie watching has not yet gained that much popularity.

### *5.2.4. The online music market*

Digital revenues increased by an estimated 9 per cent to EUR 4.3 billion in 2012, now accounting for around 34% of global industry revenues, continuing the growing trend of previous years (Figure 138). These results are of growing importance to the industry, which recorded growth in 2012 for the first time since 1999. The EUR 12.6 billion revenues represent an increase of 0.3%[93].

**Figure 138: Global digital revenues (US$ billions)**

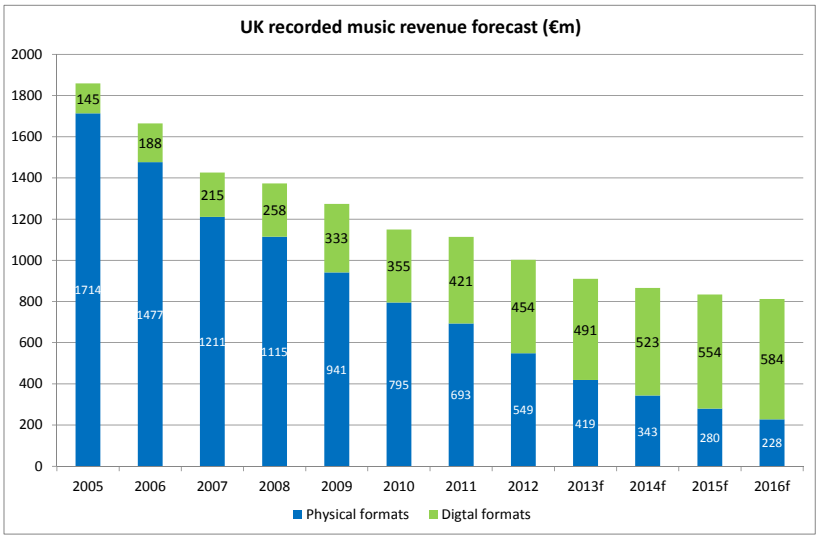



*Source: EFPI*

But when considering Europe alone, the picture looks less optimistic for the industry as a whole. For example in the UK, by far the largest music market in Europe, the evolution of the recorded music revenues reveals a daunting prospect (Figure 139):

[93] IFPI Digital Music Report 2013

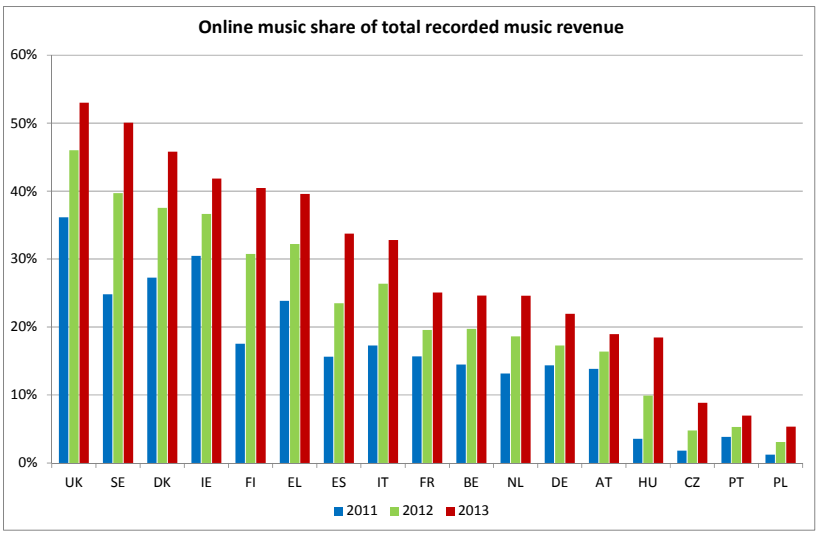
**Figure 139: UK recorded music revenue forecast (€m)**




*Source: Enders Analysis*

Two striking features emerge: the decline in the overall size of the market, and the stark increase in the contribution of digital formats to overall revenue. The turning point is expected to occur in 2013 for the UK, when more than 50% of the revenues will come from digital formats. Other European countries (like Sweden, Denmark and Ireland) will approach this pattern, with more than 40% of recorded music revenues expected to come from digital formats in 2013, but significant cross-country differences still persist: for example, in Portugal and the Czech Republic this contribution will still fall below 10%. The average for Europe is in line with the global share mentioned above: some 34% of global industry revenues come from digital formats (Figure 140).

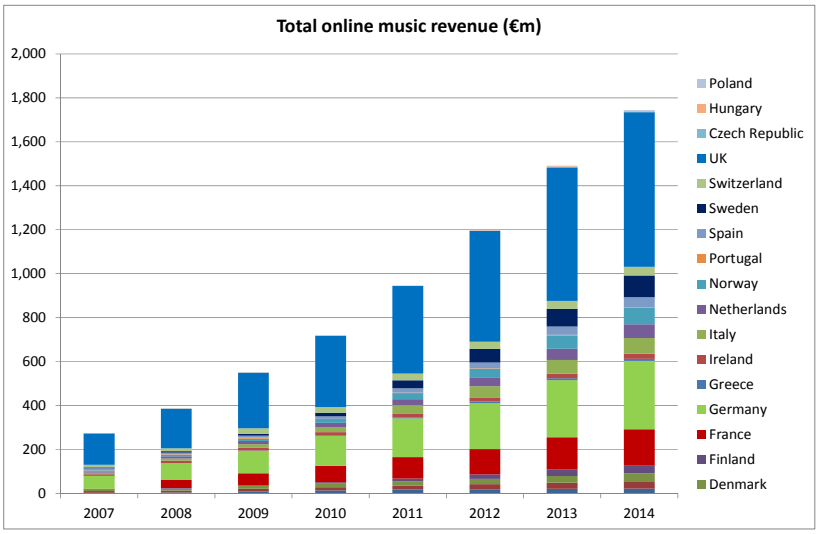
**Figure 140: online music share of total recorded music revenue (%)**




*Source: HIS ScreenDigest*

The mentioned increase in absolute revenues from online music for the UK is featured as well in other European countries. Even though the UK is by far the largest market and the biggest contributor to its growth, the German online music market is also growing and gaining importance. France is the third biggest market, but it is interesting to observe the noteworthy growth in Sweden, and as well in Norway and Italy (Figure 141).

**Figure 141: online music revenue (€m)**

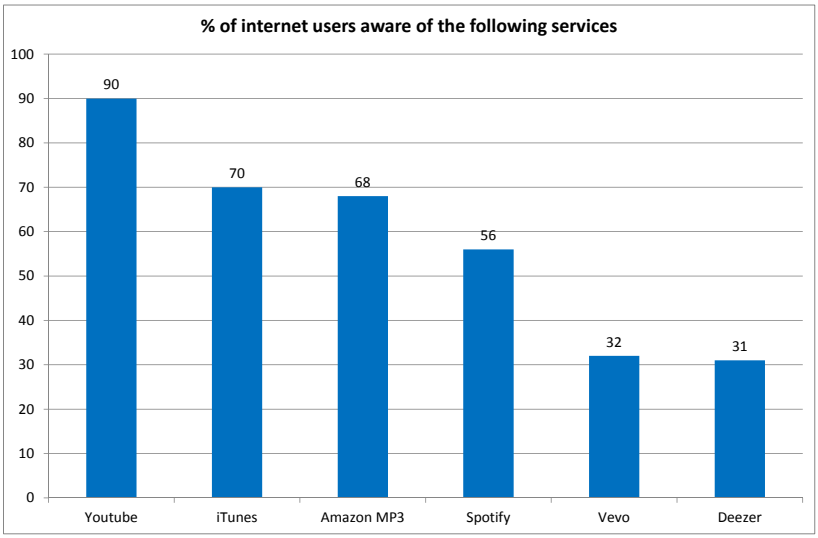



*Source: IHS Screen Digest*

The importance of online music in not confined to its own borders. Though the CAGR of 38% from 2006 to 2016 of total online music consumer revenue is impressive in itself, music is an engine of the digital world, helping drive a wider digital economy, ranging from social networks to devices, broadcasters and live performance. Music is also helping power social media platforms. For example, nine in 10 of the most watched videos of all time on *YouTube* are music videos. Nine in 10 of the most liked people on *Facebook* are artists. Seven of the top 10 most followed people on *Twitter* are artists[94].

*Youtube* is the leading platform in terms of consumer awareness in what regards listening to music online as well, way ahead of services like *Spotify* (Figure 142). It has also been observed to be one of the leading means through which young people listen and share music and are aware of new artists (in association with social networks).

**Figure 142: % of internet users aware of the following services**



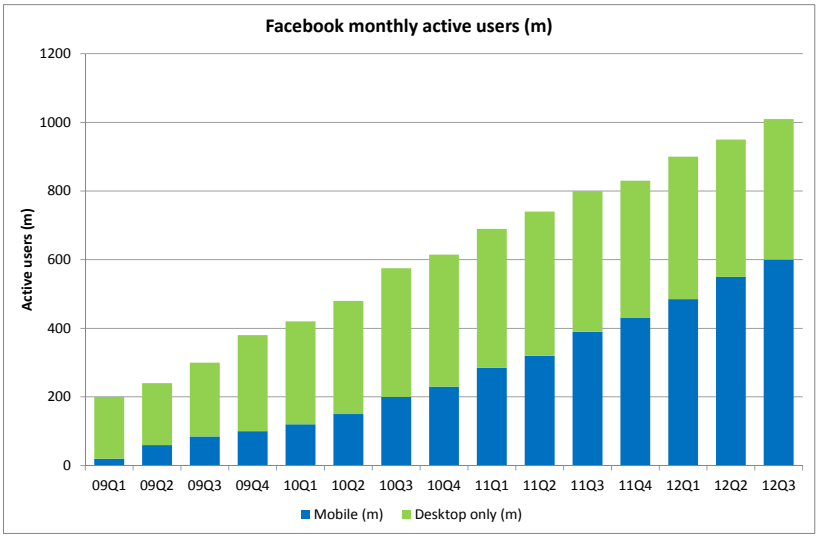

*Source: Ipsos Media CT*

[94] IFPI Digital Music Report 2013

### *5.2.5. Social networks and online gaming*

As described above, the use of social media sites has grown over the past few years and posting messages to social media sites or instant messaging has become one of the most popular activities of European internet users with same levels of take-up as reading newspapers or internet banking. Social networking is above all a mobile activity; in 2012 58% of people who used the internet on the move with a handheld device participated in social networks. Facebook is by far the largest social network in the EU. With more than 1bn total active users, 60 per cent of them access it on mobile devices **(**Figure 143**).**

**Figure 143: Facebook monthly active users (m)**



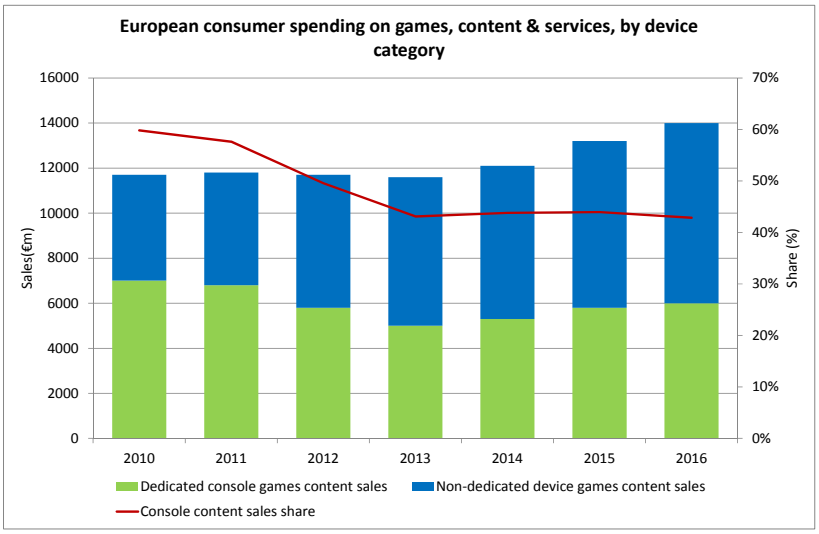

*Source: HIS ScreenDigest*

Social networks like *Facebook* are also driving another trend: that of video games played online in non-dedicated devices (Figure 144). In 2012 there was an increase in the number of cheap connected devices used as games consoles. These devices are commonly based on custom versions of smartphone applications and are built to offer more advanced games that, while not at the level of established consoles and PC games, are a more competitive offering than many existing smart TV apps.

Social network services are also one of the driving factors behind the production and uptake of casual games played on general purpose devices supported by online app stores, including the PC browser, smart phones and tablets, and to a lesser degree smart TVs and TV connected boxes. Surveys in 2012 put gaming rates of smartphone users at around 40%. Casual gaming on these platforms is reaching a much broader market and demographic than that tied to dedicated consoles and handhelds, reaching older age groups and levels of female players almost equalling that of male players. This is accompanied by radical shifts in the business models away from a product to a service model, with revenues from freemium services such as game purchases, virtual currencies, subscriptions, upgrades and in-game advertising and marketing games. Growth is occurring not only in game production, but in dedicated social gaming platforms that provide messaging, monetisation and gamification services[95].

[95] Stewart J and Misuraca G (2012) The Industry and Policy Context for Digital Games for Empowerment and Inclusion: Market Analysis, Future Prospects and Key Challenges in Videogames, Serious Games and

**Figure 144: European consumer spending on games, content & services, by device category**

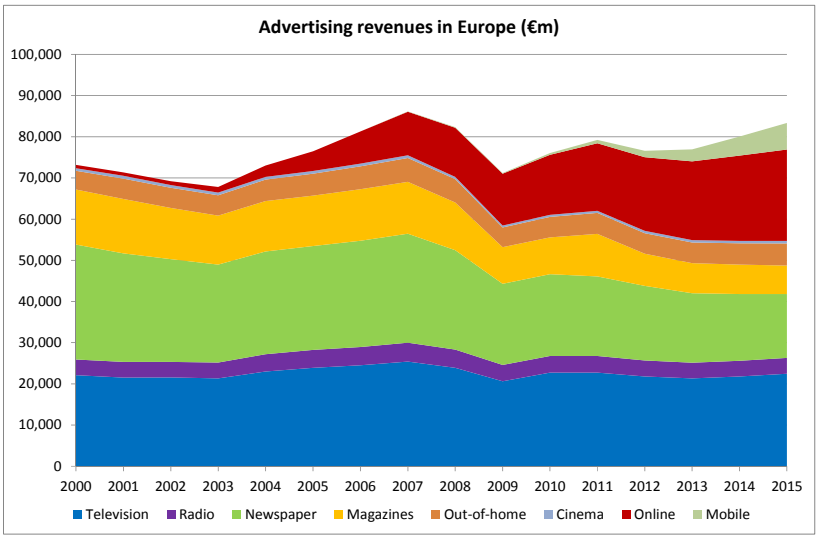



*Source: HIS ScreenDigest*

### *5.2.6. Advertising*

The financial crisis had deep consequences for advertising revenues throughout Europe. After the severe dip in advertising revenues in 2009, the recovery in the traditional sectors has been meagre. In contrast, the online advertising segment has experienced a consistent increase in revenues ever since (Figure 145).

**Figure 145: Advertising revenues in Europe (€m)**




*Source: HIS ScreenDigest*

This increase in advertising revenues in Europe is quite remarkable considering the dire economic situation in most European markets. In 2011, advertising revenues grew at a rate that was twice that of European economic growth (Figure 146). Central and Eastern Europe (CEE) countries were very dynamic in driving growth, and confirm the vital importance on the online segment in driving this growth.

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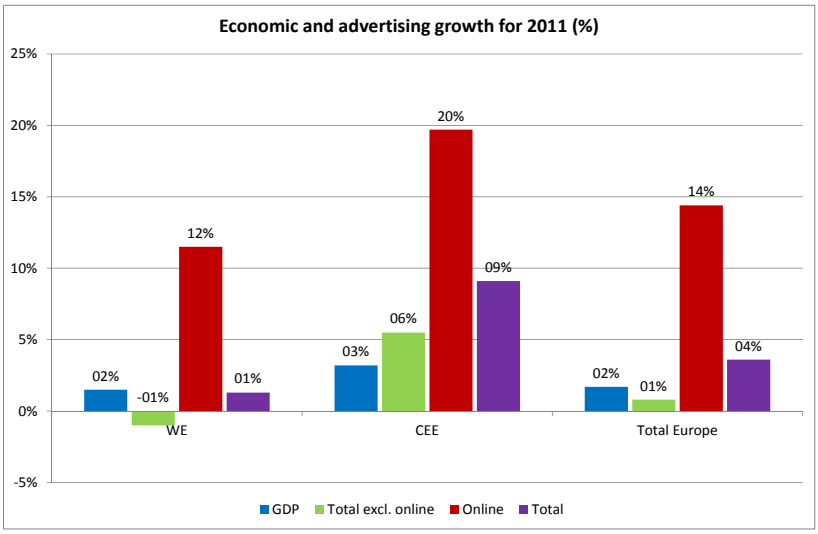
Gamification, JRC Scientific and Technical report, JRC77656, available at: http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6099

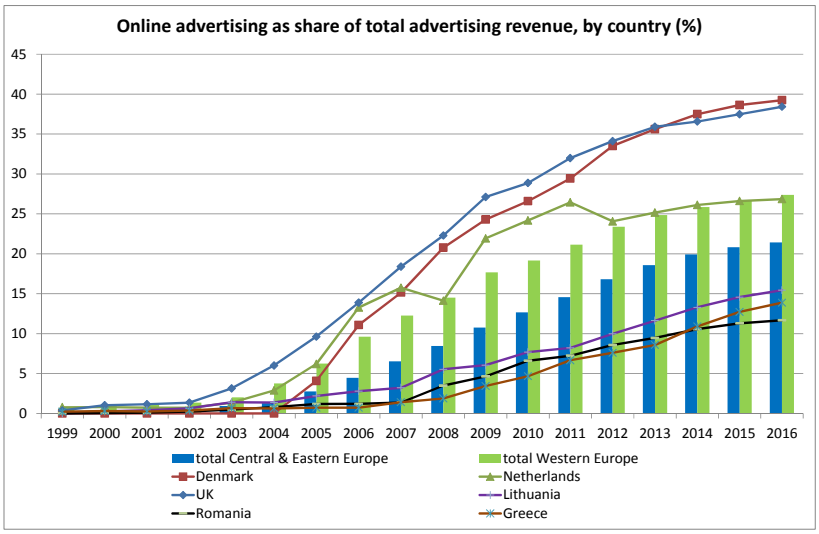
**Figure 146: Economic and advertising growth for 2011 (€m)**




*Source: HIS ScreenDigest*

The pronounced growth of the online segment and stagnation in traditional advertising has brought about a steep increase in the importance of online advertising as a share of total advertising revenues. But this phenomena is still in quite different stages in different countries: while mature markets like the UK, Denmark and the Netherlands display the highest shares (near or above 35%) and some level of saturation (a decrease in the rate of growth), Greece, Romania and Lithuania exhibit shares around 10% and a potential for further growth (Figure 147). There is a fast increase in Western Europe and a catching-up process derived from an even faster growth of online advertising as a share of total advertising revenue.

**Figure 147: Online advertising as share of total advertising revenue, by country (%)**




*Source: HIS ScreenDigest*

In conclusion, traditional means like TV advertising still amount for the bulk of the revenue, but flat growth in many markets (1.4% on average in Western Europe) calls for diversification of the traditional ad model. Broadcasters must advance their IP-delivered video advertising strategies to ensure sustainable growth in the monetization of content, since through the proliferation of tablets, mobile video consumption will escalate.

In 2012, mobile advertising grew 81 per cent globally. This was driven primarily by mobile internet advertising (display and search), which accounted for 71 per cent of total mobile advertising. For most advertisers, mobile has now become a fixture in their marketing mix.

Global mobile advertising revenue is predicted to increase 73 per cent year-over-year in 2013. Yet, the diversity of mobile advertising companies in terms of business models and philosophies also points to larger questions around the best way forward for mobile.

### 5.3. Conclusions

The growth of digital content is forecasted to accelerate in the coming years, with digital formats accounting for more than half of revenues in the music industry, and sharply gaining importance in the audio-visual, advertising and videogames industries, replacing traditional physical formats. The widespread and increase in speed of broadband internet access and the development of more modern devices allows for a range of new usages whose demand, in turn, accentuate the pressure for technological development and innovation on the part of service providers.

Still, despite the overall increase in relevance of the overall economy, there are some relevant disparities across member states. The largest markets are at the forefront of change. In particular, the UK is by far the biggest market in what concerns for example online digital music sales, as well as subscription to online TV. Nordic countries as well display leading roles, for example on online videogames. But regardless of where countries are located in the adoption curve, and the speed at which new developments are being adopted, the trends are quite clear. Central and Eastern European countries are displaying very strong growth in the online advertising markets, outpacing Western Europe in its rates of growth. Digital content is blossoming, and video sites keep shaping the landscape, adding up to their user-generated content new offers of online channels and dedicated content generated by traditional broadcasters, who are themselves increasing their online offers.