

























Overview of progress on the 101 Digital Agenda actions

Action	Digital Agenda deadline	Progress	Status	Completion date	Expected completion date
<u>Pillar 1 - A vibrant digital single market</u>					
<u>001 Key Action1a - Framework Directive on collective rights management</u>	31/12/2010	Delayed			Legislative proposal by the Commission scheduled for second half of 2011.
<u>002 Key Action1b - Directive on orphan works + stakeholders dialogue on out-of-print works</u>	31/12/2010	Partially completed		<u>Directive on orphan works adopted 24 May 2011.</u>	Completion of stakeholder dialogue on out-of-print works expected first half of 2011.
<u>003 Key Action1c - Review the Directive on Re-Use of Public Sector Information</u>	31/12/2012	On track			
<u>004 Wide stakeholder debate on further measures</u>	31/12/2012	On track		<u>IPR strategy adopted 24 May 2011.</u>	Green Paper (see action 5) in preparation of this dialogue scheduled for second half 2011.
<u>005 Greenpaper online distribution of audiovisual works and other creative content</u>	31/12/2010	Delayed			Green Paper scheduled for second half of 2011.
<u>006 Review of the Directive on the enforcement of intellectual property rights</u>	31/12/2012	On track			Legislative proposal scheduled for first half 2012.









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007 Key Action 2 - Fix a date for migration to Single Euro Payment Area (SEPA) & eInvoicing	31/12/2012	Completed		Proposal for SEPA migration end-date adopted 16 December, Communication on e-Invoicing adopted 2 December 2010.	
008 Key Action 3 - Revision of the eSignature Directive	31/12/2011	Risk of delay			Legislative proposal scheduled for first half 2012.
009 Proposals on e-Commerce Directive	31/12/2011	On track			
010 Member States - Implement key directives supporting the digital single market	31/12/2015	On track			
011 Member States - Transpose the VAT Directive	31/12/2013	On track			
Key Action 4 - Review the Data protection Directive	31/12/2010	Delayed			Legislative proposal scheduled for second half 2011.
013 Optional contract law instrument complementing Consumer Rights Directive	31/12/2012	On track			
014 Alternative Dispute Resolution Greenpaper /Online dispute resolution	31/12/2012	On track			Proposal scheduled for second half of 2011.
015 Stakeholder consultation and measures on collective redress	31/12/2015	On track			











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016 Code of EU Online Rights	31/12/2012	On track			
017 Stakeholder platform for EU online trustmarks	31/12/2012	On track			
018 Harmonisation of numbering resources	31/12/2011	On track			
019 Spectrum Policy Plan	31/12/2010	Completed		Adopted 20 September 2010.	
020 An investigation into the cost of non-Europe in telecommunication markets	31/12/2011	On track			
101 Roaming	31/12/2012	On track			
Pillar 2 - Interoperability and standards					
021 Key Action 5 - Propose legal measures to allow use of certain ICT fora and consortia standards	31/12/2010	Delayed			Framework communication and legislative proposal scheduled for first half of 2011.
022 Promote rules via guidelines for ex-ante disclosure	31/12/2011	Completed		Adopted 14 January 2011.	
023 Guidance on link between ICT standardisation and public procurement	31/12/2011	Risk of delay			Commission proposal first half of 2012.









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






024 Adopt a European Interoperability Strategy and European Interoperability Framework	31/12/2010	Completed		Adopted 16 December 2010.	
025 Measures to license interoperability information	31/12/2012	On track			
026 Member States - Implement European Interoperability Framework at national level	31/12/2013	On track			
027 Member States - Implement Malmö and Granada declarations	31/12/2013	On track			
<u>Pillar 3 - Trust and security</u>					
028 Key Action 6 - Reinforced and high level Network and Information Security Policy	31/12/2012	On track			
029 Key Action 7 - Combat cyber attacks against information systems	31/12/2010	On track			
030 Establish a European cybercrime platform	31/12/2012	On track			
031 Examine the feasibility of a European cybercrime centre	31/12/2011	On track			











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032 Work with global stakeholders on targeted actions against computer-based crime and security attacks	31/12/2015	On track			
033 Support EU-wide cyber-security preparedness exercises	31/12/2011	On track			
034 Explore the extension of security breach notification provisions	31/12/2012	On track			
035 Guidance on implementation Telecoms rules on data privacy and personal data	31/12/2011	On track			
036 Support reporting of illegal content online (hotlines) and awareness campaigns	31/12/2015	On track			
037 Self-regulation of European and global service providers as regards use by minors	31/12/2015	On track			
038 Member States - network of CERTs covering all of Europe	31/12/2012	On track			
039 Member States - Carry out large scale attack simulation and test mitigation strategies	31/12/2010	On track			
040 Member States - Fully implement harmful content alert hotlines	31/12/2013	On track			
041 Member States - National alert platforms to the Europol cybercrime platform	31/12/2012	On track			









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<u>Pillar 4 - Fast and ultrafast broadband access</u>					
<u>042 Key Action 8a - Broadband Communication common framework for actions</u>	31/12/2010	Completed		<u>Adopted 20 September 2010.</u>	
<u>043 Key Action 8b - Proposals on funding of high-speed broadband</u>	31/12/2014	On track			
<u>044 Key Action 8c - European Spectrum Policy Programme</u>	31/12/2010	Completed		<u>Adopted 20 September 2010.</u>	
<u>045 Key Action 8d - Recommendation on Next Generation Access networks</u>	31/12/2010	Completed		<u>Adopted 20 September 2010.</u>	
<u>046 Member States - Develop and make operational national broadband plans</u>	31/12/2012	On track			
<u>047 Member States - Measures to facilitate broadband investment</u>	31/12/2015	On track			
<u>048 Member States - Use fully the Structural and Rural Development Funds</u>	31/12/2013	On track			
<u>049 Member States - Implement the European Spectrum Policy Programme</u>	31/12/2015	On track			

<u>Pillar 5 - Research and innovation</u>					
<u>050 Key Action 9 - Leverage more private investment</u>	31/12/2015	On track			
<u>051 Reinforce the coordination and pooling of resources</u>	31/12/2015	On track			
<u>052 Propose measures for 'light and fast' access to EU research funds in ICT</u>	31/12/2011	On track			
<u>053 Financial support to joint ICT research infrastructures and innovation clusters</u>	31/12/2015	On track			
<u>054 Develop a new generation of web-based applications and services</u>	31/12/2015	On track			
<u>055 Member States - Double annual public spending on ICT research and development</u>	31/12/2020	On track			
<u>056 Member States - Engage in large scale pilots financed by the CIP</u>	31/12/2015	On track			
<u>Pillar 6 - Digital literacy, skills and inclusion</u>					










057 Key Action 10 - Digital literacy and competences a priority for the ESF	31/12/2012	On track			
058 Key Action 11 - Tools for competences of ICT practitioners and users	31/12/2012	On track			
059 Make digital literacy and skills a priority of the "New skills for new jobs" Flagship	31/12/2010	Completed		Adopted 23 November 2010.	
060 Promote a higher participation of young women and women returners in ICT	31/12/2015	On track			
061 Develop an online consumer education tool on new media technologies	31/12/2011	Risk of delay			
062 Propose EU-wide indicators of digital competences and media literacy	31/12/2013	On track			
063 Systematically evaluate accessibility in all revisions of legislation	31/12/2015	On track			
064 Make sure that public sector websites are fully accessible by 2015	31/12/2011	Risk of delay			
065 Memorandum of Understanding on Digital Access for persons with disabilities	31/12/2012	Completed		Signed 14 September 2010.	
066 Member States - long-term e-skills and digital literacy policies	31/12/2011	Risk of delay			

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067 Member States - Implement provisions on disability in Telecoms Framework and Audiovisual Media Services Directive	31/12/2011	On track			
068 Member States - Mainstream eLearning in national policies		Risk of delay			
<u>Pillar 7 - ICT-enabled benefits for EU society</u>					
069 Key Action 12 - ICT sector common energy and emission measures	31/12/2011	Risk of delay			
070 Support partnerships between the ICT sector and major emitting sectors	31/12/2013	On track			
071 Assess contribution of smart grids and define minimum functionalities to promote the interoperability	31/12/2011	Risk of delay			
072 Green Paper on Solid State Lighting (SSL)	31/12/2011	On track			
073 Member States - Agree common additional functionalities for smart meters	31/12/2011	Risk of delay			
074 Member States - specifications for total lifetime costs for public lighting	31/12/2012	On track			

075 Key Action 13 - Secure online access to their medical health data and wider deployment of telemedicine	31/12/2015	On track		
076 Key Action 14 - Recommendation to define minimum common set of patient data	31/12/2012	Risk of delay		
077 EU-wide standards, interoperability testing and certification of eHealth	31/12/2015	On track		
078 Reinforce the AmbientAssisted Living (AAL) Joint Programme	31/12/2013	On track		
079 Key Action 15 - Sustainable model for financing for Europeana	31/12/2012	On track		
080 Propose measures on cultural and creative industries	31/12/2012	On track		
081 Recommendation on promoting digitisation of European cinema	31/12/2011	Risk of delay		Proposal scheduled for first half of 2012.
082 Implementation of the provisions of the Audiovisual Media Services Directive on cultural diversity	31/12/2011	On track		
083 Key Action 16 - Council and Parliament Decision on mutual recognition of e-ID	31/12/2012	On track		

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084 Seamless cross-border eGovernment services in the single market	31/12/2015	On track		
085 Review the Public access to Environmental Information Directive	31/12/2011	Risk of delay		Proposal may slip into first half of 2012.
086 Implement cross-border eEnvironment services	31/12/2015	On track		
087 White Paper on inter-connecting e-procurement capacity in EU	31/12/2011	Risk of delay		Commission proposal scheduled for first half of 2012.
088 eCommission 2011-2015 action plan	31/12/2010	Delayed		Commission proposal scheduled for first half of 2011.
089 Member States - Make eGovernment services fully interoperable	31/12/2015	On track		
090 Member States - Points of Single contact function as fully fledged eGovernment centres	31/12/2015	On track		
091 Member States - Agree a common list of key cross-border public services	31/12/2011	Risk of delay		Formal agreement with Member States is targeted for end 2012.
092 Apply proposed ITS Directive in support of interoperability and rapid standardisation	31/12/2015	On track		

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093 Adopt the Air Traffic Management Solutions for (SESAR)	31/12/2010	Delayed			Commission proposal on governance and funding mechanisms for the SESAR deployment phase is planned for second half of 2011.
094 Directive for the deployment of e-Maritime services	31/12/2011	On track			Commission proposal scheduled for second half of 2011.
095 Directive setting out technical specifications for telematic applications for rail passenger services	31/12/2011	Completed		Regulation adopted on 5 May 2011.	
096 Member States - Fulfil obligations under European Rail Traffic Management System (ERTMS) 2015	31/12/2015	On track			
International issues					
097 Promote the internationalisation of internet governance	31/12/2015	On track			
098 Support the continuation of the Internet Governance Forum (IGF) beyond 2010	31/12/2015	Completed		Decision at 65th UN General Assembly in December 2010 , extending the IGF to 2015.	
099 Improve international trade conditions including IPR	31/12/2015	On track			
100 Seek mandate to update Information Technology Agreement (ITA)	31/12/2015	On track			

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ELECTRONIC COMMUNICATIONS MARKET INDICATORS

METHODOLOGICAL NOTE

The main sources for the data presented in this Annex are National Regulatory Authorities (NRAs), exceptions are noted. A validation meeting with representatives from NRAs took place in November 2010. Furthermore, draft versions of the charts in this annex were distributed to the NRAs before this report was finalised for their comments.

The source for the population figures is Eurostat.

The source for the exchange rates is the European Central Bank. Prices are in Euros. Purchase power parity methodology is not used for the specific objective of this Report.

In each Report figures from previous years are revised, therefore the figure for a certain date may diverge from previous Reports.

This document replaces Annex 2 of the Implementation Report.

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1. FINANCIAL INDICATORS

1.1 Revenues and Investment of the Telecom Sector

Both retail and wholesale revenues are considered.

Figure 1: Telecom investment over revenue, 2009

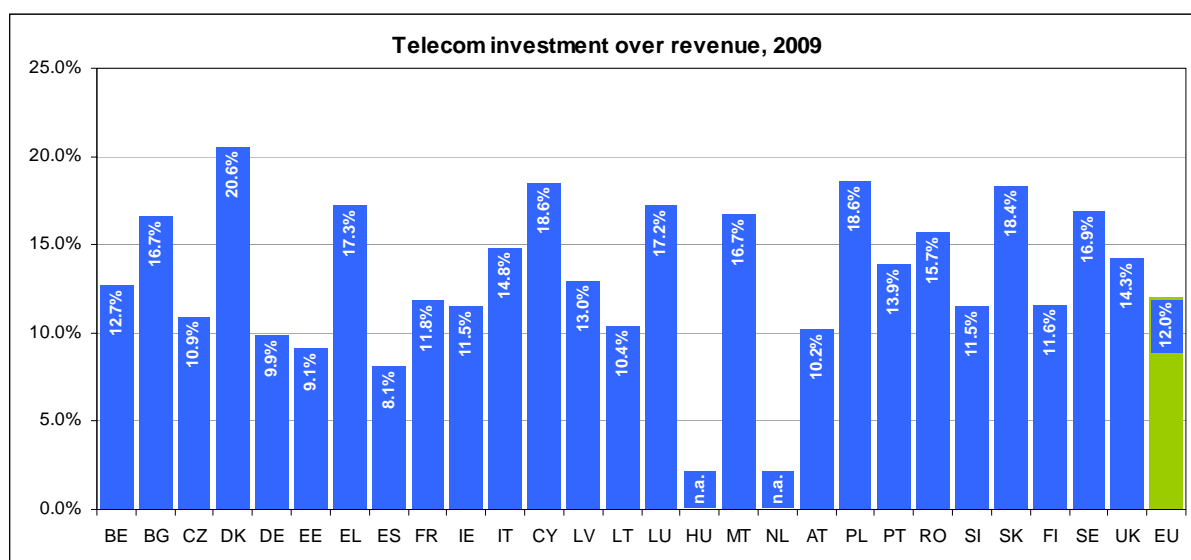


Figure 2: Telecom revenue and investment over GDP, 2009

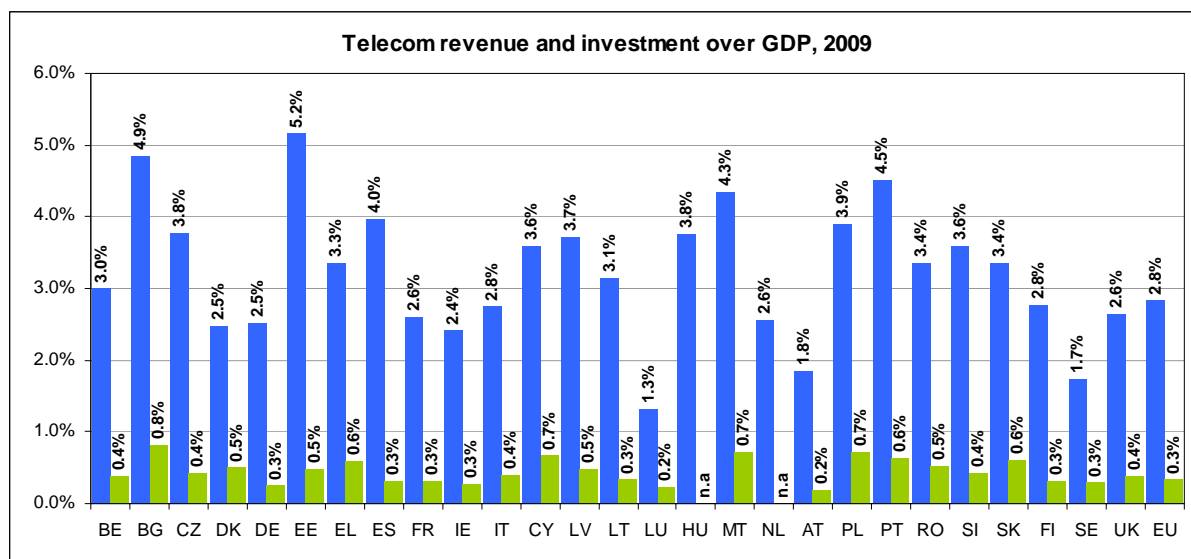


Figure 3: Telecom revenues growth, 2008-2009

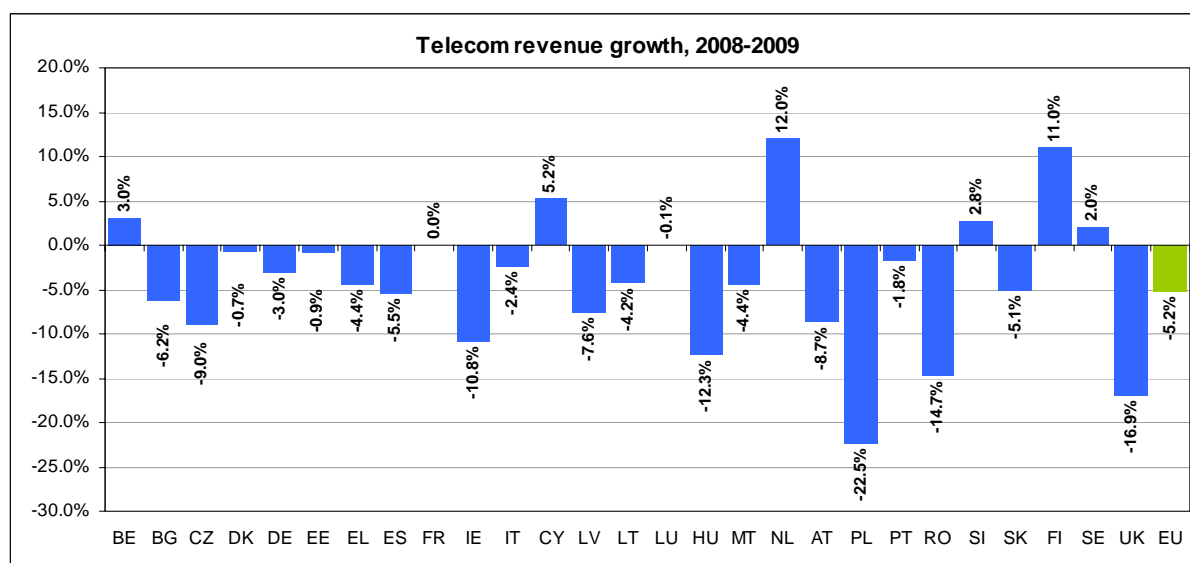
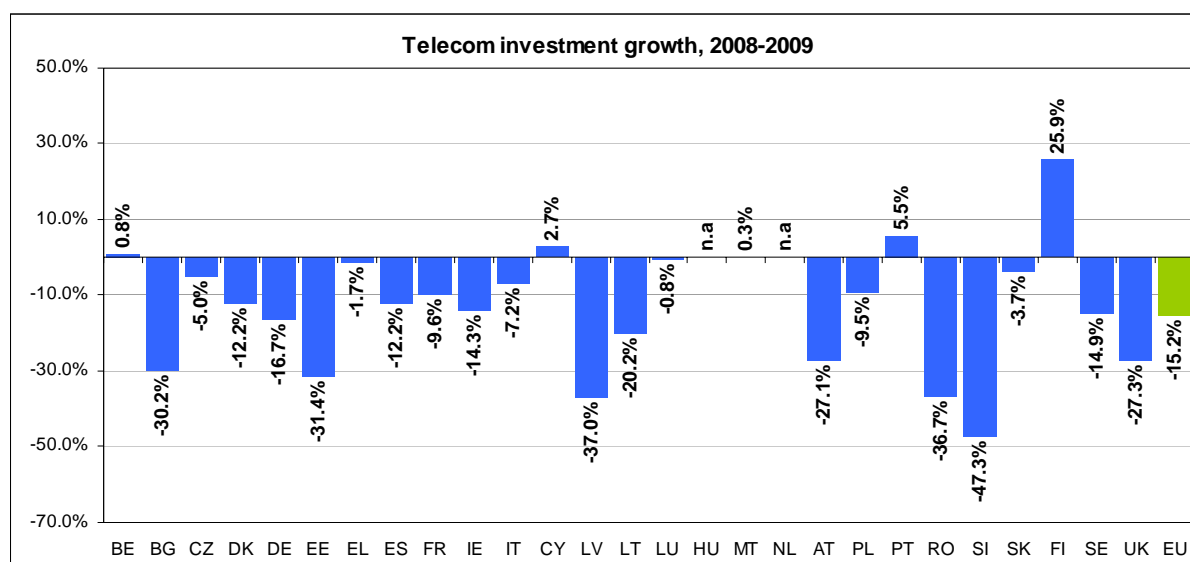


Figure 4: Telecom investment growth, 2008-2009



Spain: Broadcasting services are included and they add 4,540.7 euros overall.

Italy: Source: Agcom Annual Report 2010. Revenue is consolidated turnover excluding revenues from "Terminals and devices".

Poland: Gross values.

Romania: The total turnover includes revenues from broadcasting (1.897 million RON) and other electronic communications services (90 million RON). The total investment in telecom networks includes investment in cable networks as the majority of these networks are used for internet access and/or fixed telephony (202 million RON). The value of the Investment in other EU member States is not included in Total investment in telecom networks.

Austria: Investments in acquiring property (land and building) not included.

Czech Republic: Tangible and intangible investments indicated.

Greece: The figures concern total investments.

Germany: Aggregate data include estimations for investment.

Netherlands: Investment data are not available.

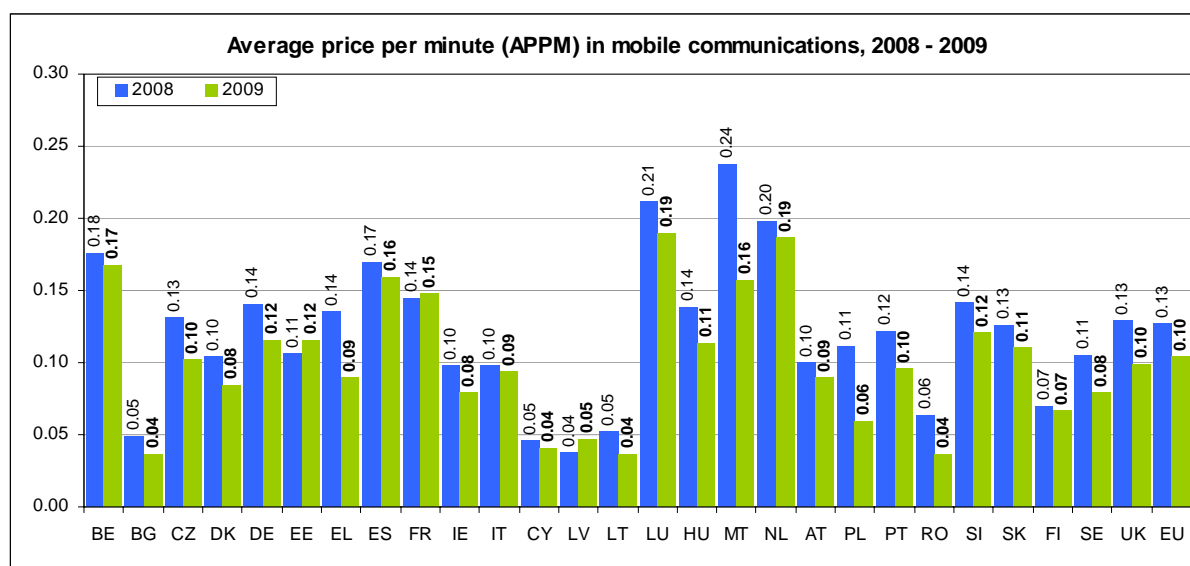
Portugal: 2008 figures for investment were re-stated.

Slovakia: Both tangible and intangible investments are included.

1.2 Average Price per Minute (APPM) in mobile communications

The Average Price per Minute is defined as the revenues from mobile voice communications divided by the total outgoing minutes of voice communication excluding VAT, but including access charges.

Figure 5: Average price per minute (APPM) in mobile communications, 2008-2009



Austria: revenues include monthly fees and subscription fees.

Belgium: monthly fees are included.

Bulgaria: The "free minutes" traffic, paid with the monthly fees is included in the total amount of generated traffic. On the other hand, the revenues from monthly fees are not included.

France: A part of the data revenues (corresponding to data used via bundled offer) are included.

Germany: Wholesale revenues between MNOs and MVNOs are excluded. Aggregate data include estimations.

Italy: Source: Agcom Annual Report 2010. Revenue definition changed in 2009

Netherlands: The revenue for 2009 includes acquisition costs, fixed costs, handsets and accessories revenues, too.

Portugal: Monthly subscription revenues are not included.

Slovenia: Revenues include access charges (i.e. monthly subscriptions not including connection fees). Monthly subscriptions for bundled services may in addition to free voice minutes include also free SMS, MMS, data services, etc. Retail roaming included.

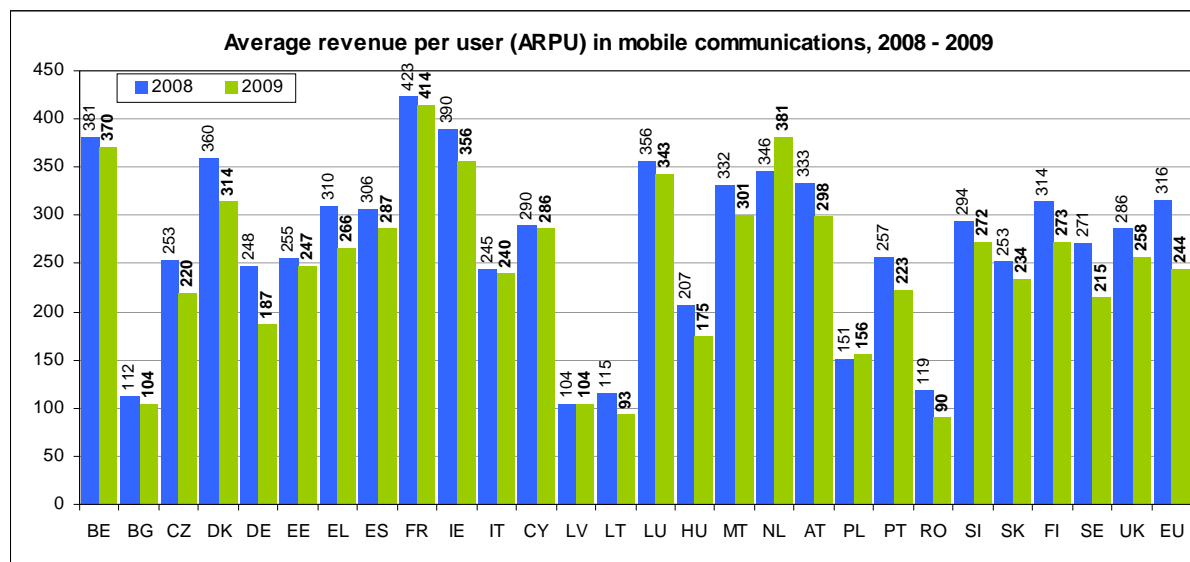
Luxembourg: Revenues include subscription fees, outgoing roaming and international traffic For two operators all kinds of flat rate revenues are included

United Kingdom: Revenue figures include revenue from access charges and bundled texts and data allowances.

1.3 Average Revenue per User (ARPU) in mobile communications

The ARPU is defined as the total revenues (including also retail roaming, interconnection as well as handset subsidies) divided by the average number of subscribers (number of subscribers at the beginning and end of the year divided by two). VAT is excluded.

Figure 6: Average revenue per user, 2008-2009



Estonia: The operator OÜ Top Connect is not included.

Germany: Wholesale revenues between MNOs and MVNOs are excluded. Aggregate data include estimations.

Ireland: One operator's prepaid data is excluded.

Italy: Source: Agcom Annual Report 2010. Total revenues exclude terminals and devices. Revenue definition changed in 2009.

Slovenia: Revenues include retail service revenues (incl. roaming) and interconnection revenues.

Sweden: Retail roaming revenues and interconnection revenues are not included.

Luxembourg: Revenues include subscription fees, outgoing roaming and international traffic.

2. MOBILE MARKET

2.1 Mobile penetration and market share

Figure 7: Mobile subscribers and penetration rate at EU level, October 2004 – October 2010

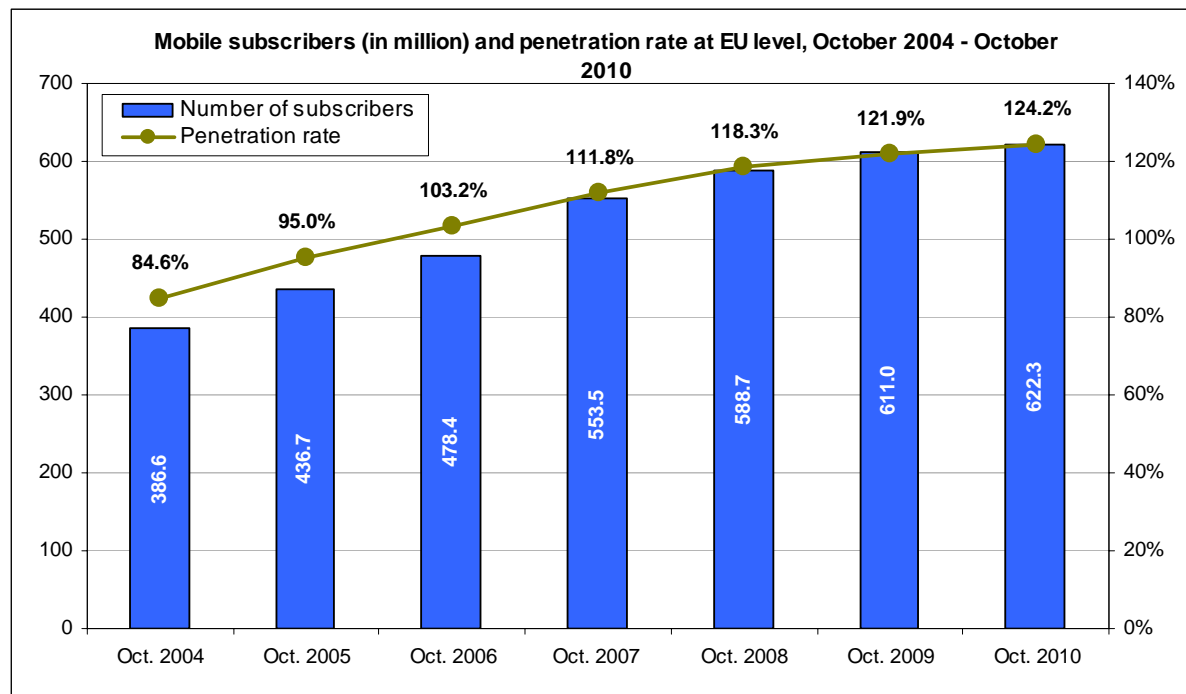


Figure 8: Mobile penetration rate, October 2009 – October 2010

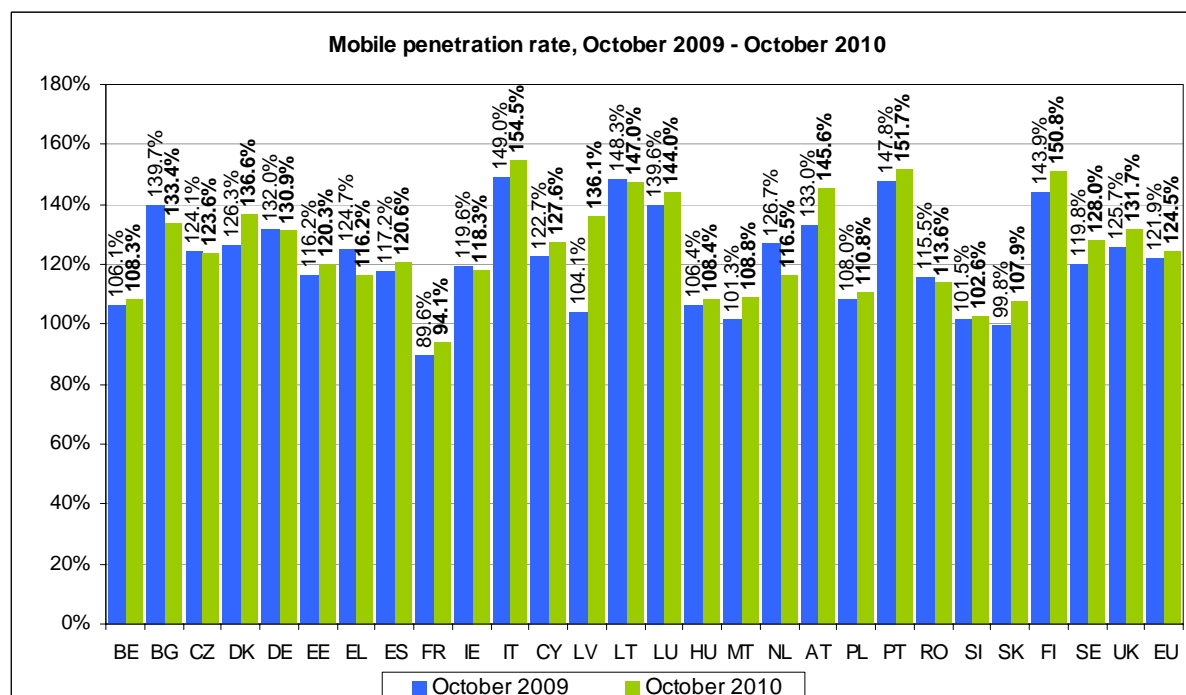


Figure 9: Mobile subscribers: prepaid and monthly paid, October 2010

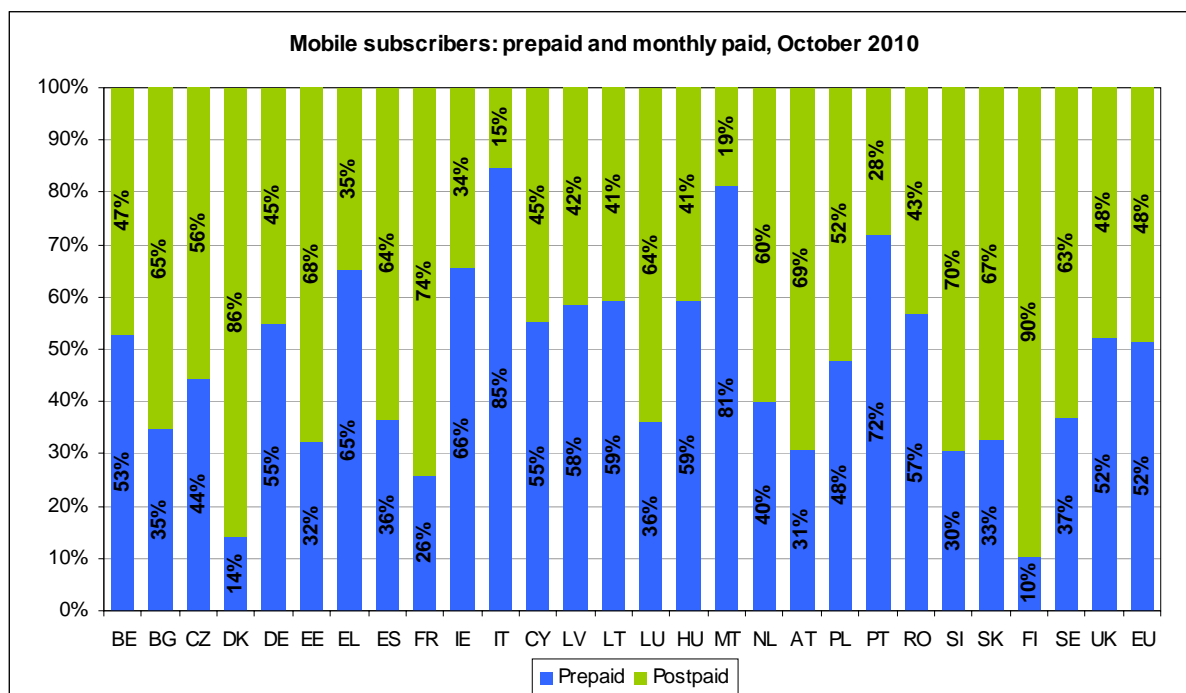
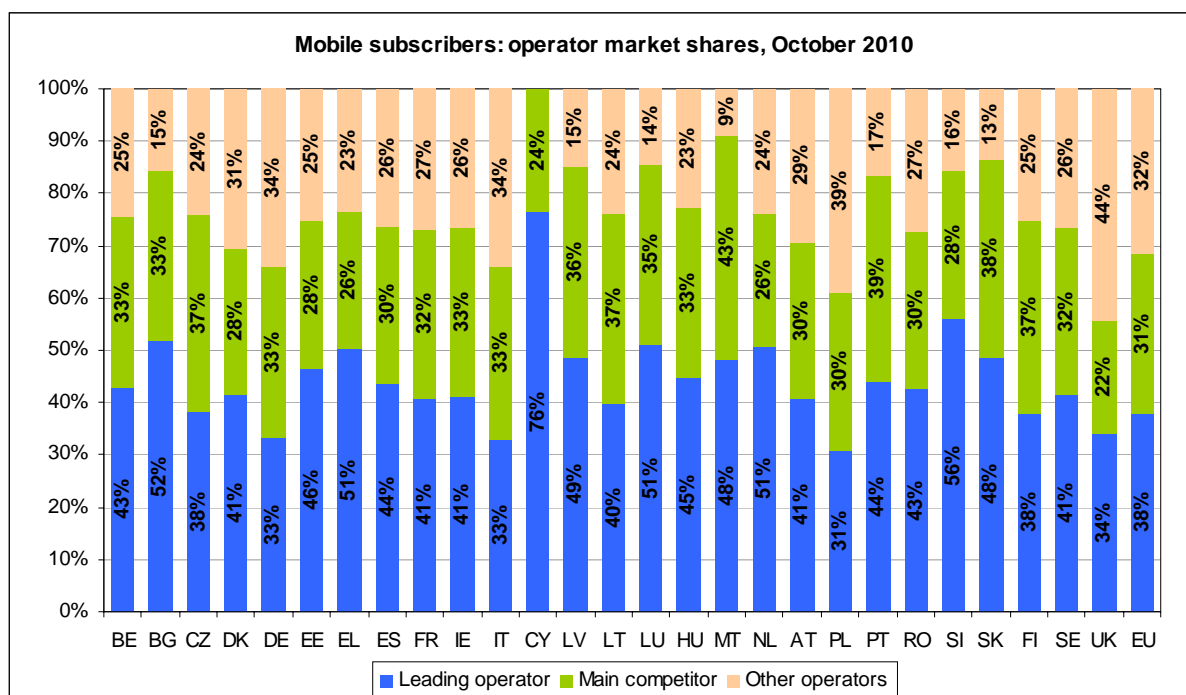


Figure 10: Mobile market share based on subscribers, October 2010



Data on market shares for The Netherlands and Greece come from Screen Digest.

Austria: Data as of June 30 2010. Source of the operator market shares: RTR Telekom Monitor 4/2010

Bulgaria: The active period of the pre-paid cards for all mobile operators is 12 months.

Cyprus: Data for 2009 have been restated.

Denmark: Data as of the 30th of June 2010.

Estonia: Subscribers of TarveSIM are excluded as these SIMs are mostly used outside of Estonia and many of them are not active.

Spain: data as of 1.9.2010.

Germany: The leading operator changed its definition of active pre-paid subscribers.

Luxembourg: Data is as of end of the year for EPT/Luxgsm, Tango, Orange (just pre-paid).

United Kingdom: All data refers to end September 2009 and March 2010.

Portugal: OPTIMUS Post-paid includes hybrid tariff plans. TMN (post and pre paid) values for 1.10.2010 are estimates. TMN post paid includes hybrid tariff plans

Finland: Data as of 1 July of the given year.

Netherlands: Prepaid postpaid split is not available for some small operators. Penetration decreased in 2010 due to the removal of inactive prepaid customers at T-mobile and KPN.

2.2 Mobile number portability

Mobile number portability enables subscribers to retain their number when moving from one operator to another.

Figures are provided by NRAs and include the number of transactions calculated up to 1 October each year. Data also include the average number of days taken to port a number as well as the cost of porting a number. Inter-operator prices for number portability refer to the amount charged by the leading operator to the recipient operators for porting one telephone geographic number (excluding VAT). This price may vary depending on a number of factors. In some countries the price for a non - geographic number is different. Where available, information on price for non-geographic number portability is added in the footnote. In some countries there is no charge for the porting of numbers.

Two different measurements were used on number portability. `Transactions` refer to the total number of number portings between 1 January and 30 September each year. `Ported numbers` refer to the number of those numbers that are held by another operator than the range holder on 30 September each year.

Figure 11: Mobile number portability – transactions, 2009-2010

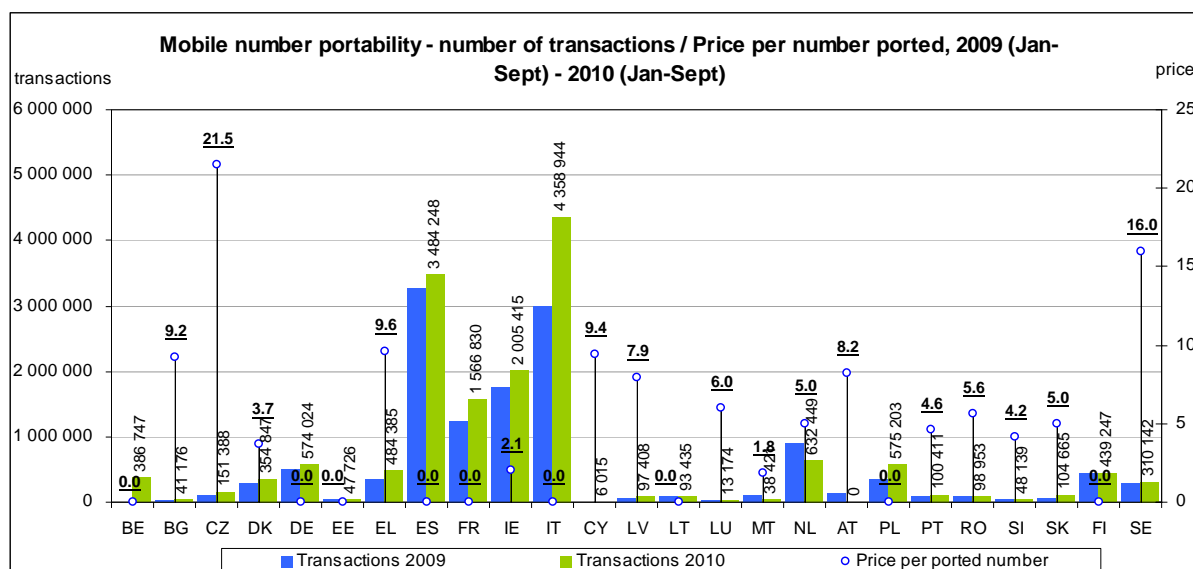


Figure 12: Mobile number portability – number of ported numbers, 2009-2010

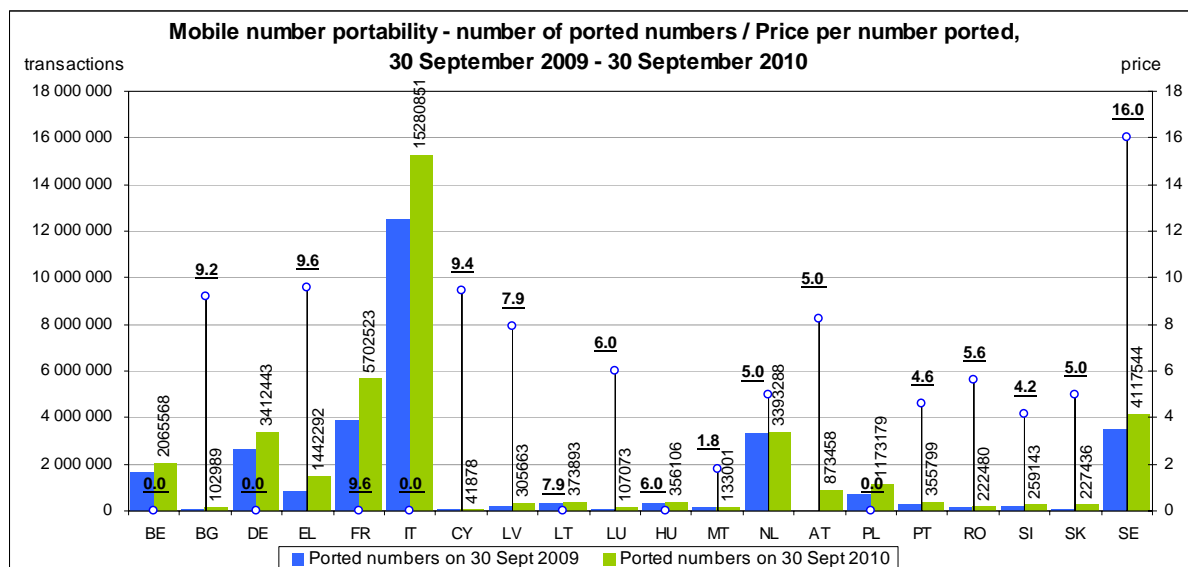
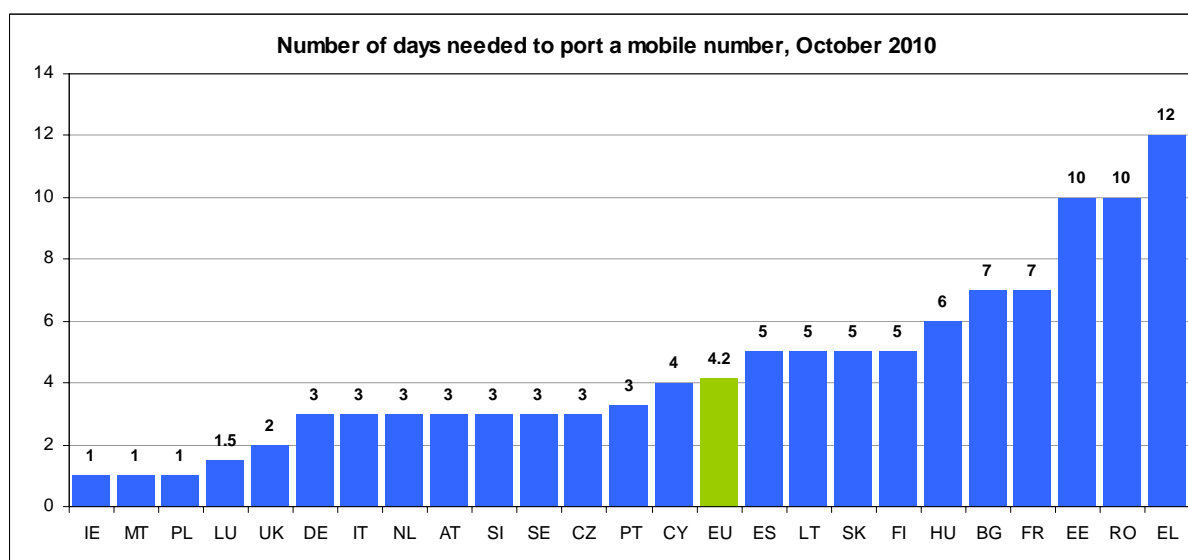


Figure 13: Time taken in number of days for mobile number portability, October 2010



Czech Republic: The time limit for making a number available for porting is 5 hours (prepaid) or 3 days (postpaid). The day of port is set by the customer; the choice is possible between 1 and 10 days.

Germany: The interruption of service is less than a day, if notified on time. Transactions are at least 574,024 in 2010 and 508,518 in 2009. For mobile numbers, one transaction concerns one number. As some numbers have been ported more than one time, the real figures are higher.

France: Average current time is 7 days, maximum 10 days; interruption time is 4 hours. There is no price for porting.

Italy: Time needed for porting is 3 working days

Hungary: Time needed for porting is maximum 8 working days and an average of 6 working days. Price is subject to commercial negotiations.

Portugal: Since July 2009, according the up-dated NP Regulation, the minimum time enforced to the donor for number portability is 2 working days. This time is managed by the recipient.

Bulgaria: Time limit for mobile number portability is same for all operators - 7 working days.

Netherlands: Technical porting: is less than 2 hours. For the end-user (from request to end of technical porting): Average: 3 days (max 10 days). Price is between 0 and 5 EUR.

Austria: The porting process is completed within 3 days at maximum. Typical cases are shorter but no detailed information is available. The porting user is reachable at all times during the porting process for incoming calls. Maximum price is provided.

Poland: Needed time for porting depends on the mode of transfer: 1 day or any period set by the client, from 30 to 59 days with notice of the donors.

Slovenia: Time needed is maximum 3 working days. Maximum price is provided.

Romania: Time needed: maximum time allowed is shown. Maximum price is provided.

Finland: Time needed refers to working days

United Kingdom: 2 working days remains the current time taken to port 25 or less (non-bulk) mobile numbers. Following a review in 2010 this will be reduced to 1 working day from April 2011.

Denmark: Transactions refer to the period between 1 January and the 30 June.

Spain: For mobile numbers: data cards are included. M2M are not included.

Belgium: Price is not applicable (subject to legal base).

United Kingdom: No data is available

2.3 Mobile Interconnection

Figure 14: Interconnection charges for terminating calls on mobile networks at EU level, 2005-2010

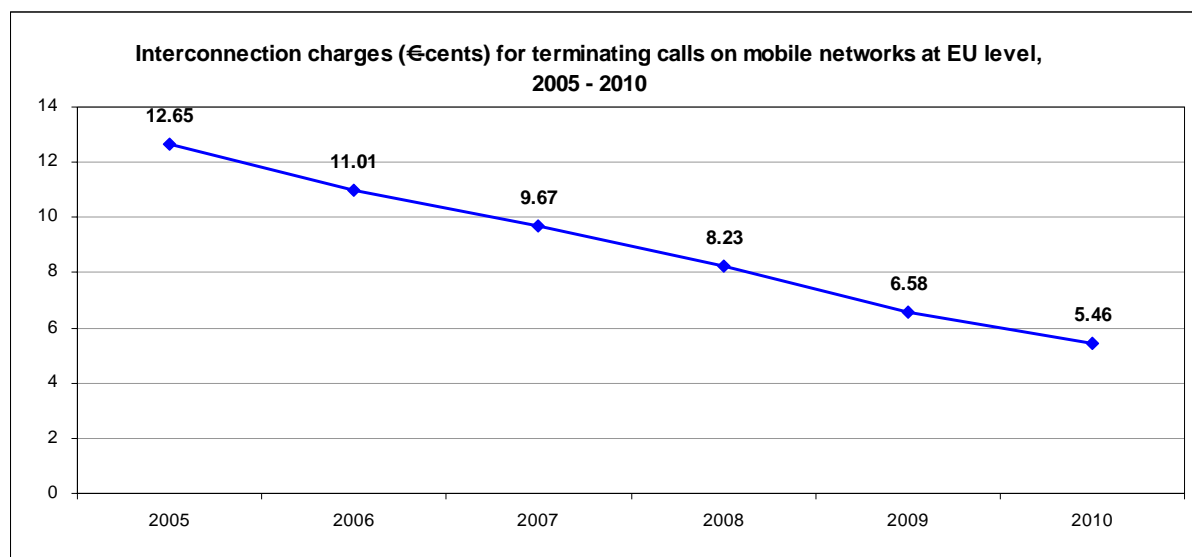


Figure 15: Interconnection charges for terminating calls on mobile networks, October 2009 - October 2010

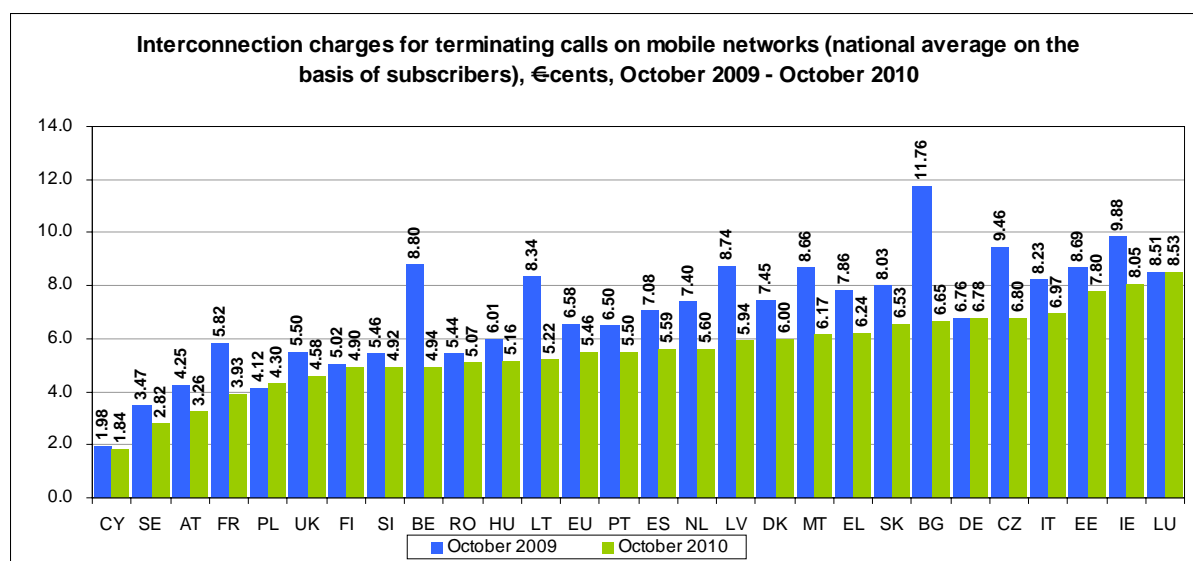
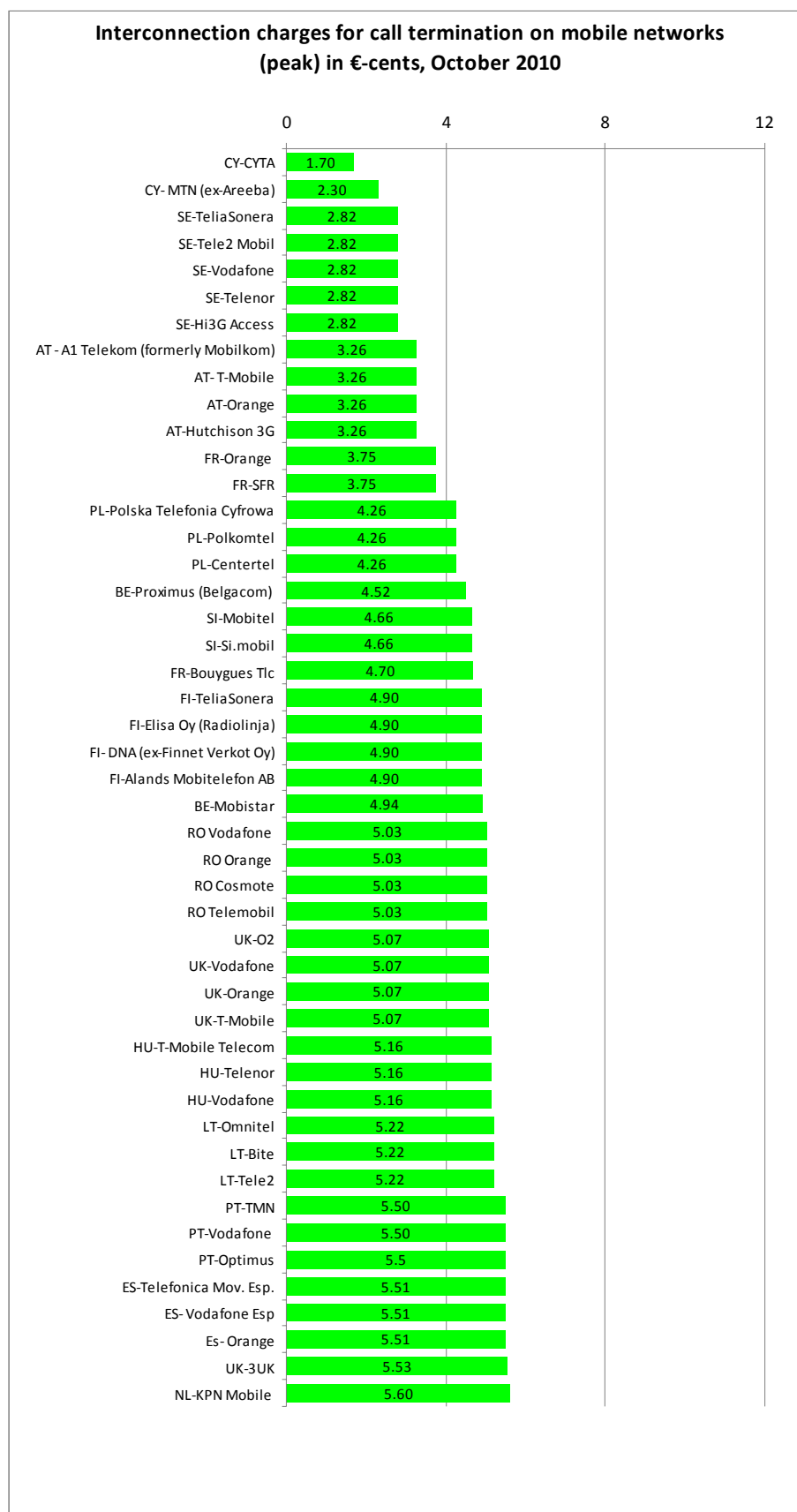
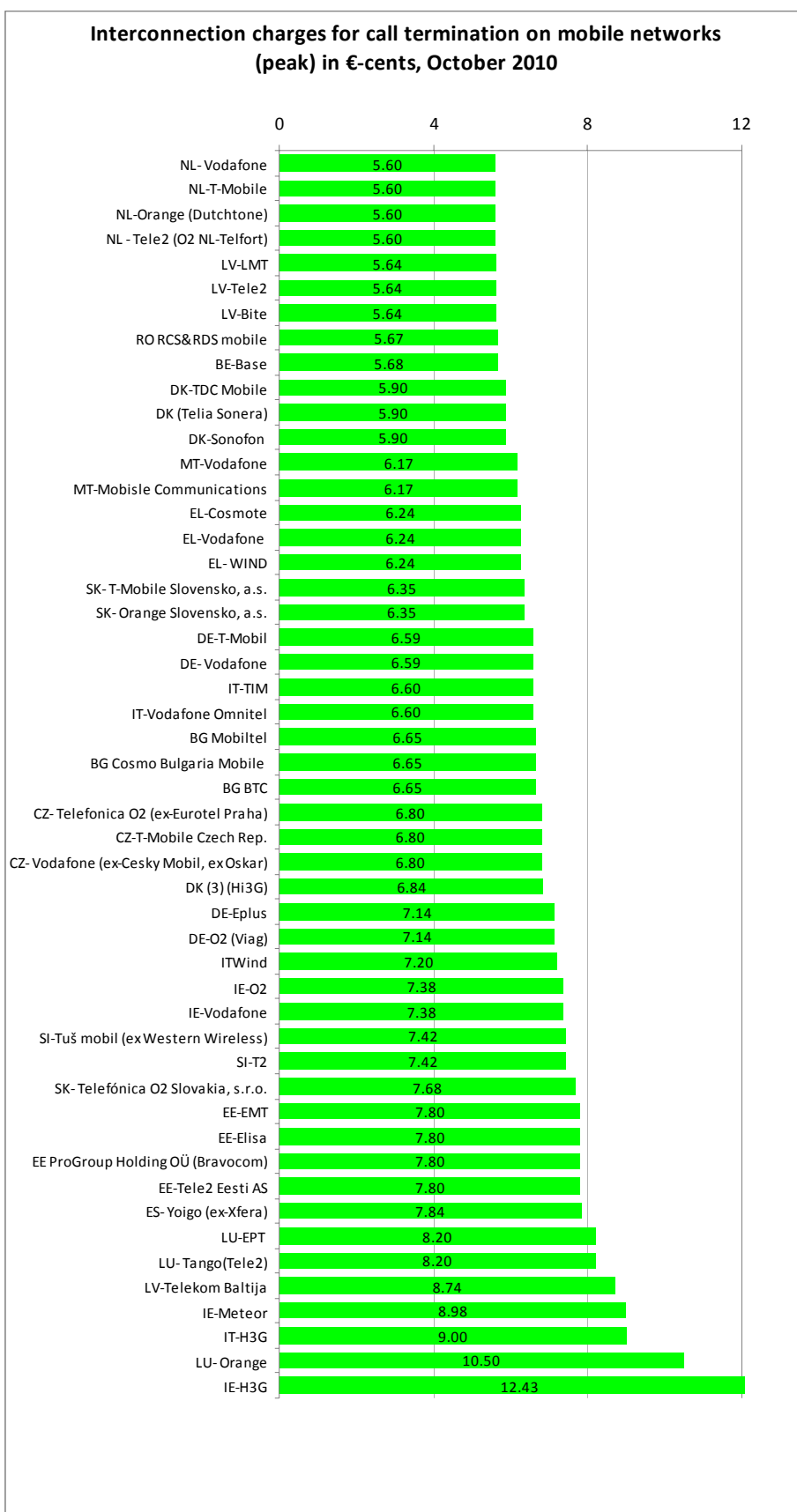


Figure 16: Interconnection charges for terminating calls on mobile networks by operator, October 2010





2.4 Traffic

Figure 17: Voice traffic on fixed and mobile networks at EU level, 2005-2009

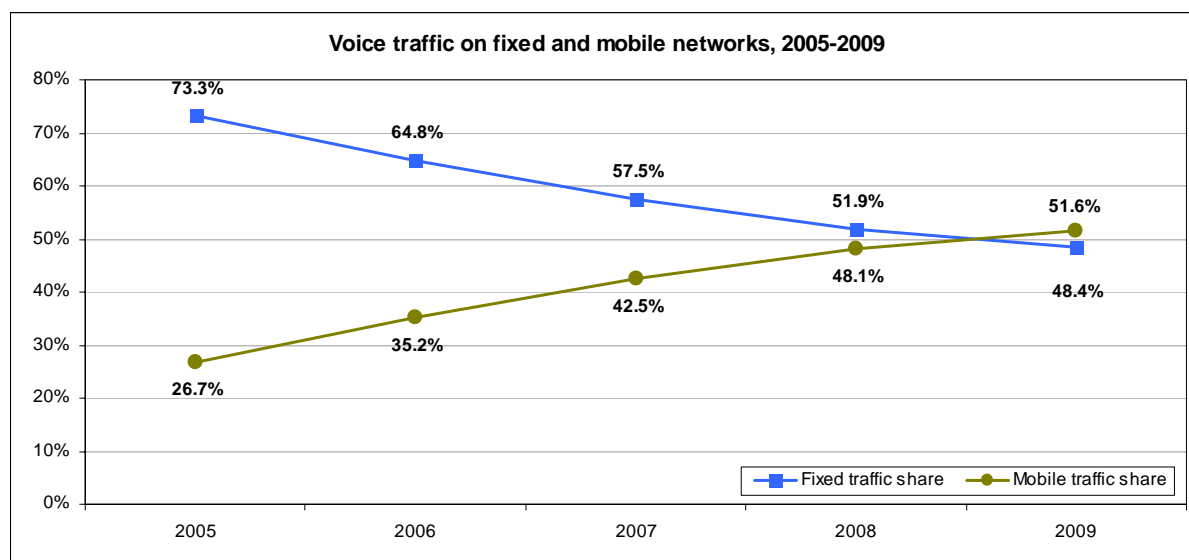
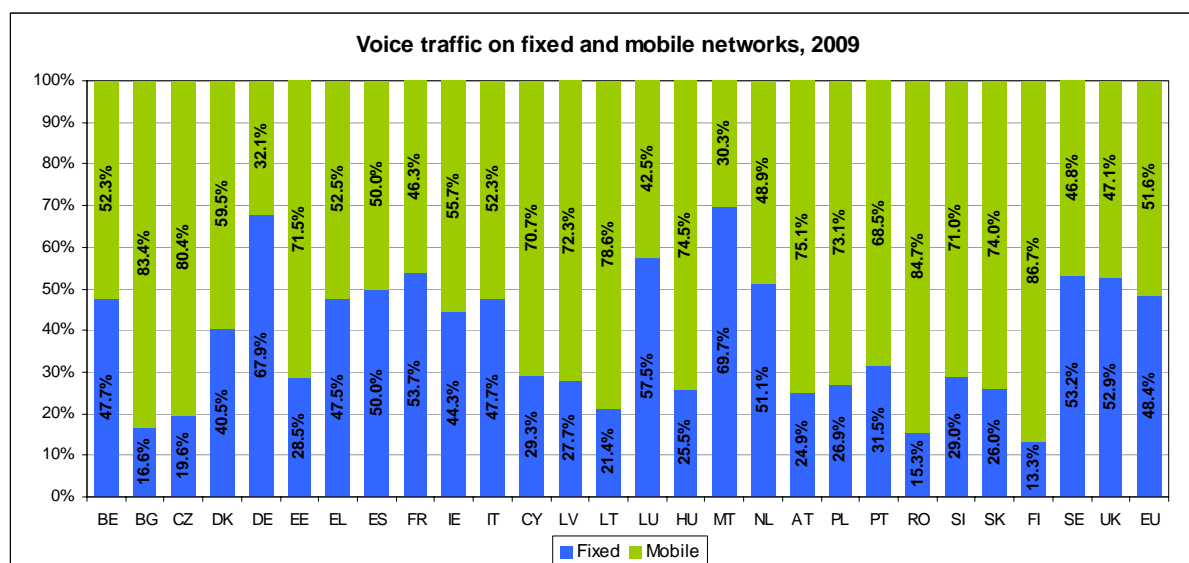


Figure 18: Voice traffic on fixed and mobile networks, 2009



Bulgaria: In mobile telephony, international roaming traffic is also included.

Greece: For fixed telephony traffic volumes include international traffic through cards, regarding the payphones, only the international traffic is included.

Italy: Source: Agcom 2010 Annual Report.

Germany: Mobile telephony traffic includes calls to service numbers, in 2009 it includes additionally visitor's calls.

Romania: Roaming outbound traffic (222 mil. min. in 2008 and 222 mil. min. in 2009) is excluded.

3. FIXED MARKET

3.1 Fixed market share

This section shows the incumbents' market share in the fixed voice telephony markets.

Apart from the overall fixed voice telephony market, submarkets for fixed calls to mobile networks, national fixed calls (including phone local calls, local calls to internet, long-distance calls and fixed calls to mobile networks) and international fixed calls are also shown.

Figures for market shares are calculated on retail revenues and outgoing minutes of traffic. Market shares based on retail revenues exclusively refer to revenues from call markets and do not include any access revenue.

The EU averages are weighted according to the population of each Member State.

The market shares are based on traffic/revenues from publicly available telephone services and include managed Voice over IP services (VoIP) and calls made from public payphones. Traffic/revenues from peer-to-peer VoIP, simple reselling and calling cards are excluded. However, the above criteria are not followed by all Member States. For this reason the figures are not strictly comparable between countries.

Figures have been provided by NRAs and unless otherwise indicated refer to 31 December 2009 (data for the United Kingdom are for the calendar year). Data for some countries are estimated by NRAs, as indicated in the footnotes.

The following chart shows the trend for the EU weighted average of the incumbents' market share in the fixed voice telephony market since 2004.

Figure 19: Incumbents' overall average market share on the fixed voice telephony market at EU level, 2004-2009

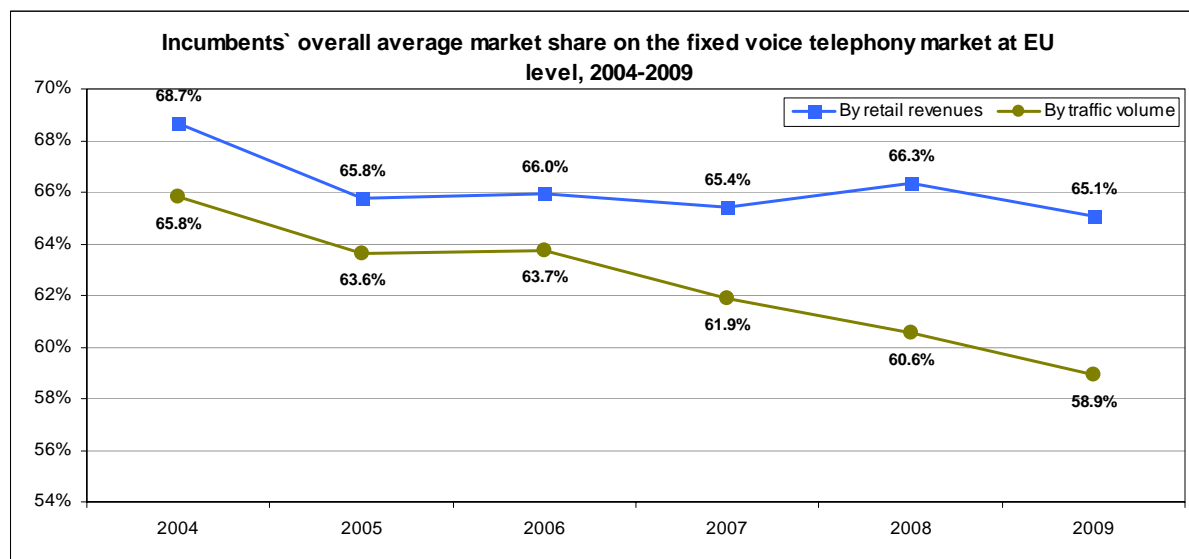
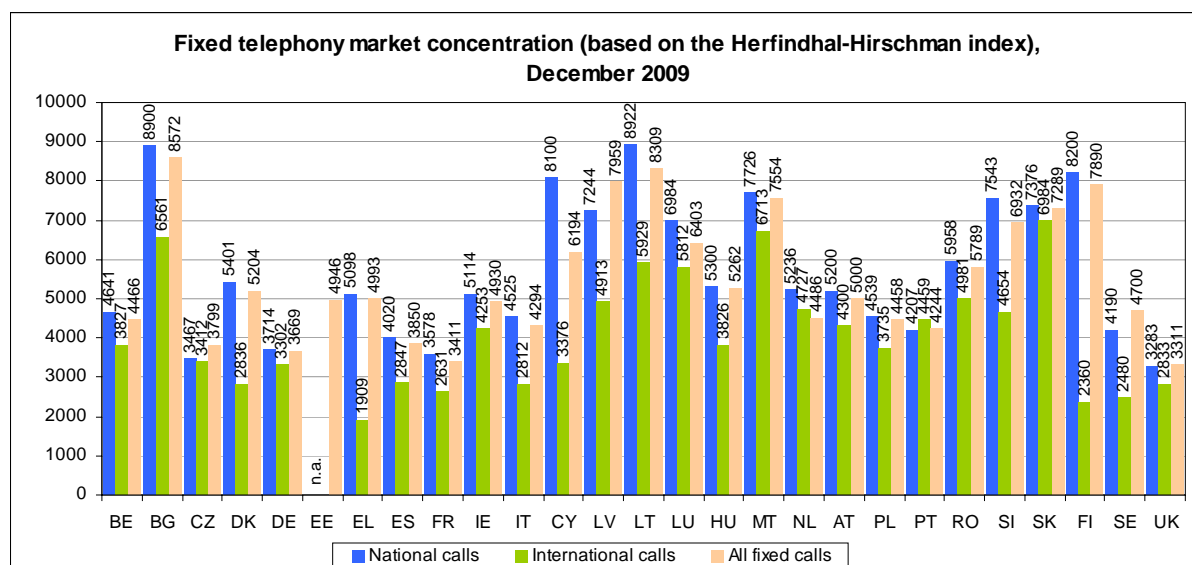


Figure 20: Fixed telephony market concentration (based on the Herfindhal-Hirschman index), December 2009



Bulgaria: Revenue from fixed telephony through public payphones is taken into account.

Denmark: Based on outgoing minutes

Estonia: Data not available

Greece: Based on traffic

Germany: Based on outgoing call minutes via direct access (PSTN and VoIP). Excluding call minutes via indirect access.

France: Based on traffic

Ireland: 91% of International calls = Eircom and 8 OAOs; 92% of National calls = Eircom and 4 OAOs; 94% of all fixed calls = Eircom and 8 OAOs.

Italy: Source: Agcom 2010 Annual Report raw data.

Cyprus: National Calls estimated.

Luxembourg: Based on traffic

Hungary: Based on traffic

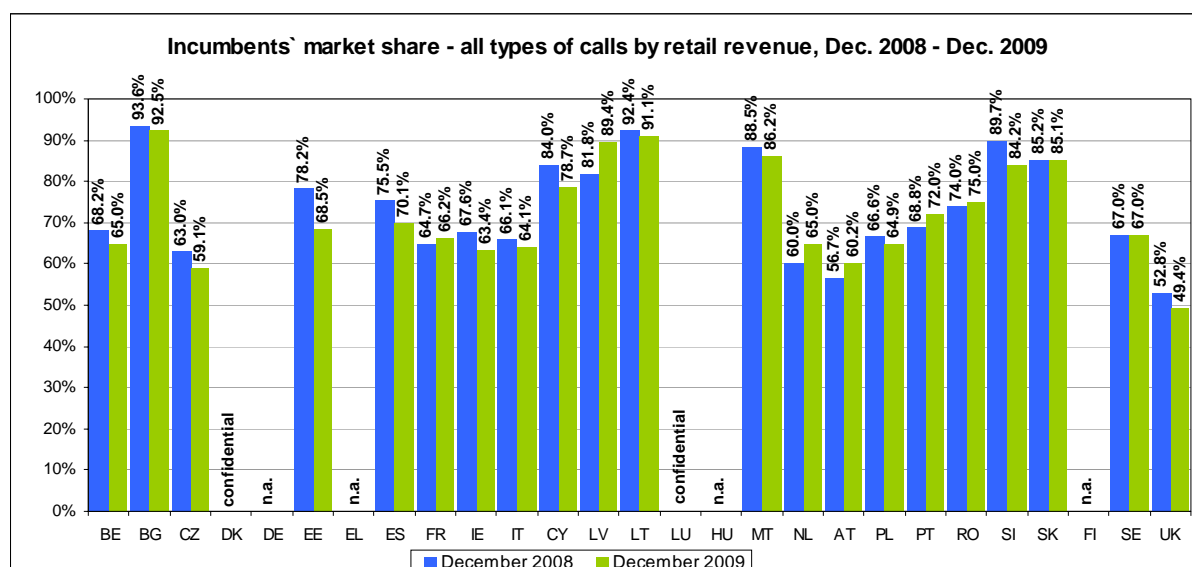
Austria: Estimates, based on revenues.

Poland: HHI is calculated based on the revenues of 123 operators.

Finland: Based on traffic. National calls estimated average in each operating area. International calls based on SMP analysis conducted in 2005. Fixed Calls estimated average in each operating area.

United Kingdom: Figures are based on call revenues and are for Q4 2009

Figure 21: Incumbent's market share – all types of calls by retail revenues, 2008-2009



Denmark: Confidential

Germany: Not available

Greece: Not available

Italy: Source: Agcom 2010 Annual Report raw data. Figures refer to the switched network. If broadband services were included, the incumbent market share would decrease from 57.6% (2008) to 55.2% (2009)

Cyprus: Figure for 2008 revised

Luxembourg: Confidential

Hungary: Not available

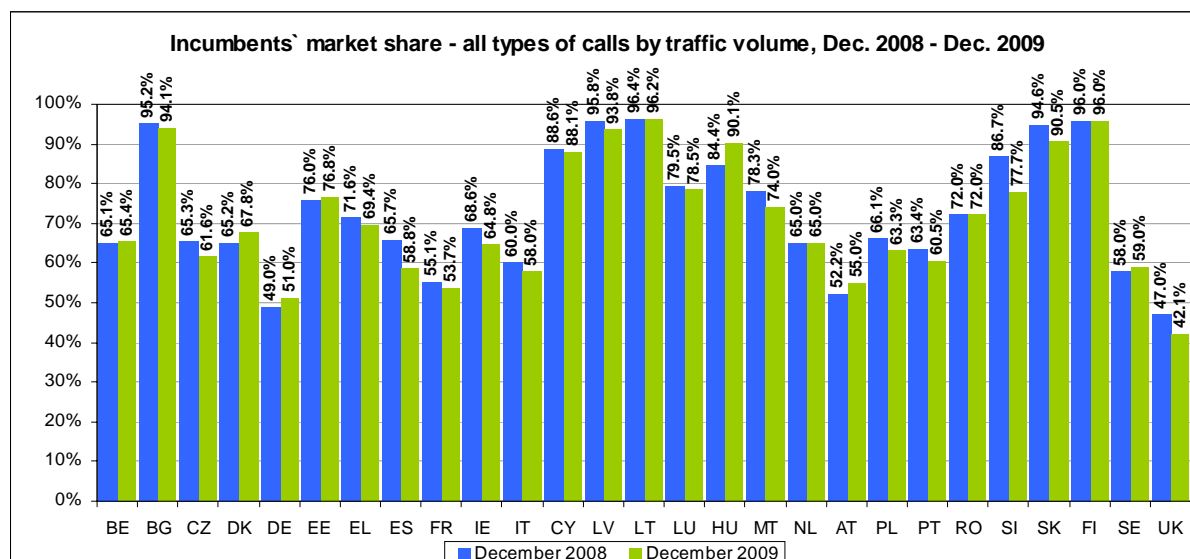
Netherlands: Approximation, the exact market share is confidential

Austria: Figure for 2008 revised

Poland: Zonal + long distance + international + to mobile networks

Finland: Not available.

Figure 22: Incumbent's market share – all types of calls by volume, 2008-2009



Germany: Including flat tariffs. National fixed calls include calls made to the internet

France: Figures are estimated for 2009 and actualized for 2008

Italy: Source: Agcom 2010 Annual Report-raw data. Figures refer to the switched network

Netherlands: Approximation, the exact market share is confidential

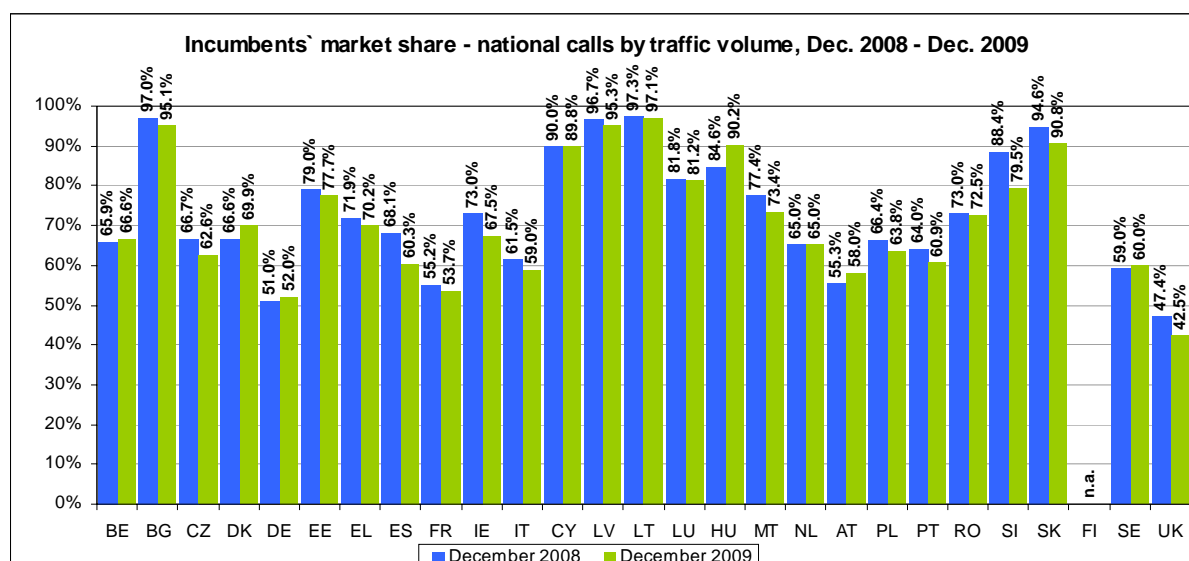
Austria: Figure for 2008 revised

Poland Zonal + long distance + international

Incumbent's market share in the different segments of the market

The following charts show the incumbents' market share in the national, international and fixed to mobile calls markets by minutes of outgoing traffic. The national calls market includes local phone calls, local calls to internet, long-distance calls and fixed calls to mobile networks. Figures are not available for some Member States.

Figure 23: Incumbent's market share – national calls by volume, 2008-2009



Germany: Including flat tariffs. National fixed calls include calls made to the internet

France: Figures are estimated for 2009 and actualized for 2008

Italy: Source: Agcom 2010 Annual Report-raw data. Figures refer to the switched network

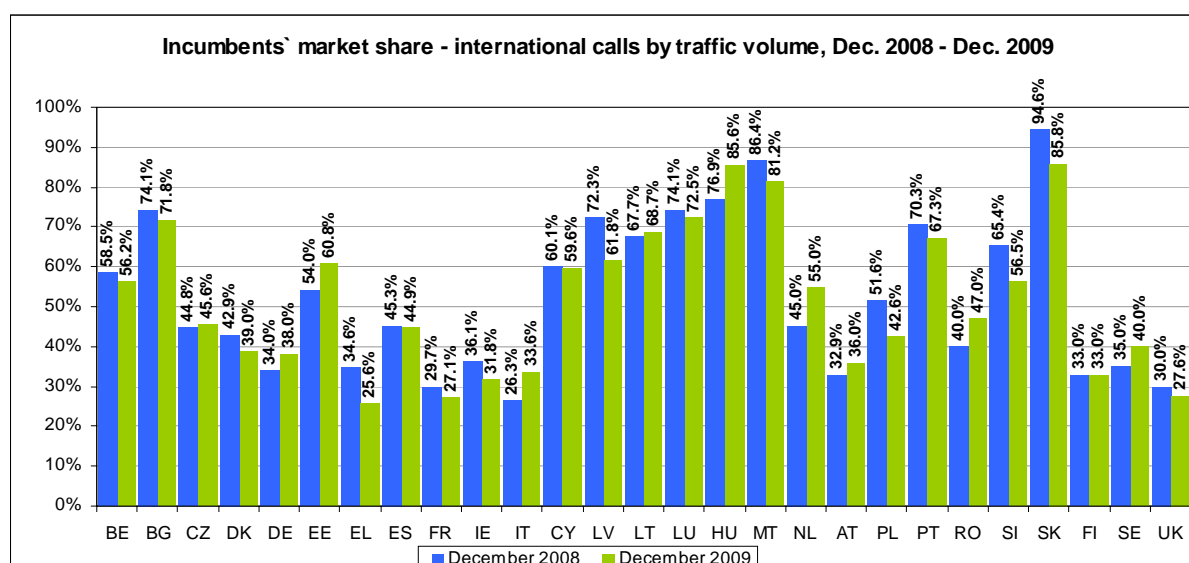
Netherlands: approximation, the exact market share is confidential

Austria: Figure for 2008 revised

Poland: Local + long distance

Finland: Not available

Figure 24: Incumbent's market share – international calls by volume, 2008-2009



Greece: International calls through cards have been taken into account

France: Figures are estimated for 2009 and actualized for 2008

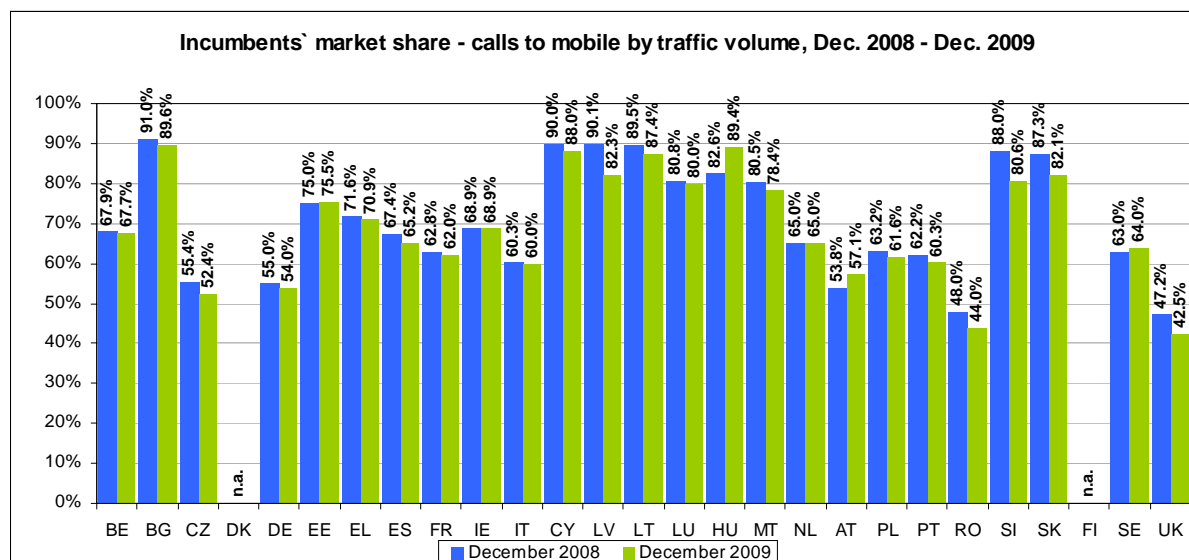
Germany: Including flat tariffs.

Italy: Source: Agcom 2010 Annual Report-raw data. Figures refer to the switched network

Austria: Figure for 2008 revised

Netherlands: Approximation, the exact market share is confidential

Figure 25: Incumbent's market share – calls to mobile by volume, 2008-2009



Denmark: Not available

France: Figures are estimated for 2009 and actualized for 2008

Germany: Including flat tariffs.

Italy: Source: Agcom 2010 Annual Report-raw data. Figures refer to the switched network

Austria: Figure for 2008 revised

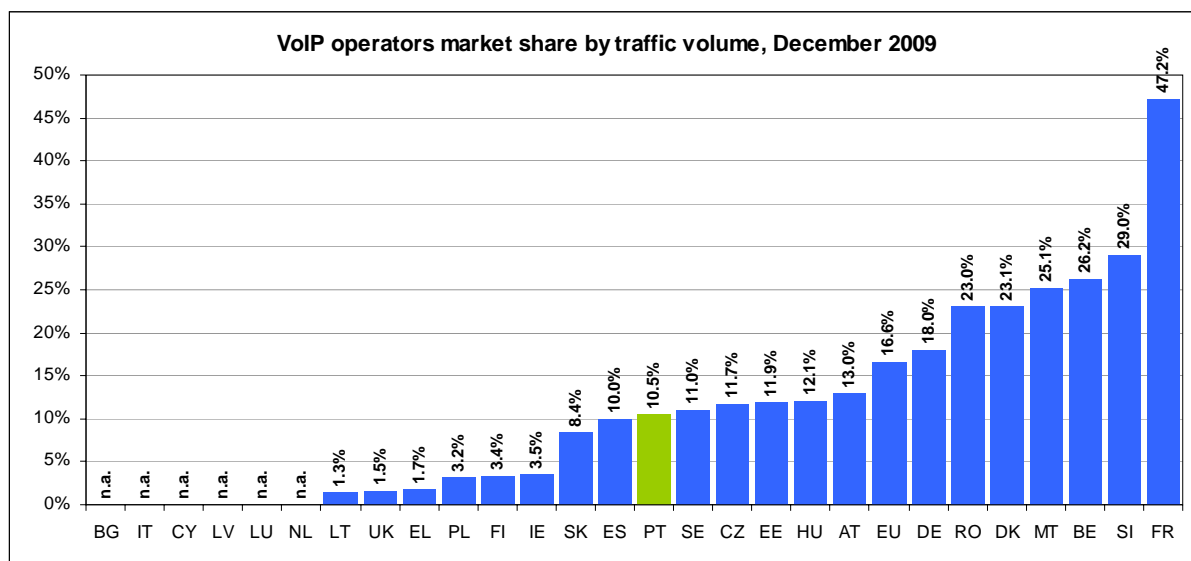
Netherlands: Approximation, the exact market share is confidential

Finland: not available.

VoIP market share

The following chart shows the available data for operators' market share on the voice over internet market. The market shares have been calculated on the basis of outgoing minutes of traffic for all fixed calls as of 31 December 2009. The figures consider only managed VoIP services meaning Publicly Available Telephone Services (PATS) using Voice over Internet Protocol technology), whereby the operator controls the quality of service provided through an IP network, at a speed over 128 Kbit/sec. Unmanaged Voice over IP and peer-to-peer services are not included. However, the above criteria are not followed by all Member States and the figures are not strictly comparable between countries.

Figure 26: Market share of VoIP operators by volume, 2009



Bulgaria: Fixed voice telephony, provided over IP based networks through the geographic numbers from the National numbering plan is not treated as a separate voice service, as far as the operators observe the legal requirement on the quality of the voice service.

Italy, Cyprus, Latvia and Luxembourg: Not available

Netherlands: Not available. Based on subscriptions, the market share of VoB within all fixed telephony is 46% (Q4 2009).

UK: Estimate, around 1-2%.

Finland: Estimate based on number of subscriptions.

Ireland: As of December 2009 VoIP's proportion of overall fixed minutes was 3.5%.

Austria: Estimate. Including the incumbent, approx. 13% of all fixed lines are managed VoIP.

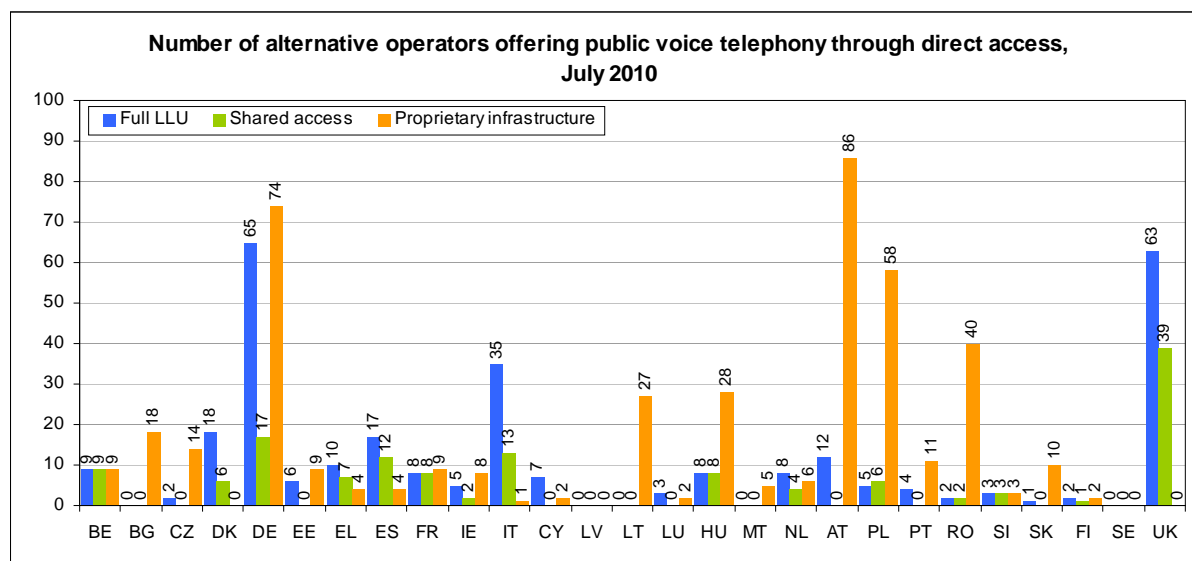
Denmark: Incl. VoIP with no quality of service.

Belgium: All voice traffic over cable networks is considered as managed VoB.

3.2 Direct Access

Direct access means that customers buy services from an alternative operator using the incumbents' or another operator's network via Local Loop Unbundling. The table below shows what percentage of national and international calls were made through direct access in 2009 and 2010. It is also presented, what percentage of direct access customers used the incumbents' networks.

Figure 27: Number of alternative operators offering voice telephony through direct access, July 2010



Austria: Figures are estimates based on national data request for 2007.

Belgium: Data are as of 01.01.2010.

Denmark: Data refers to number of agreements between the incumbent and alternative operators. Information about whether these operators are actually offering public voice telephony through the LLU's is not available.

France: For shared access and proprietary infrastructure figures, the numbers of local operators are higher if public initiatives networks are taken into account.

Germany: For proprietary infrastructure as of 01.07.2009 only cable operators are included. For proprietary infrastructure as of 01.01.2010 cable operators and FTTB/FTTH-operators with more than 100 access lines are included. Pilot projects are not considered.

Italy: For full LLU and shared access those companies are included, who have signed specific agreements with Telecom Italia

Lithuania: Proprietary infrastructure includes IP operators, cable TV and other operators that provide fixed telephony.

Netherlands: Data for full LLU and shared access are as of 31.12.2009.

Poland: Data refers to the operators actually using LLU and operators who offer services based on LLU.

Romania: Data for 1 July 2010 are provisional

Slovenia: Number of alternative VoIP operators: 10

United Kingdom: For LLU the figures given are the number of agreements with BT - the actual number of operators providing service will be smaller; data for proprietary infrastructure operators is not available.

Figure 28: EU subscribers using an alternative provider for fixed voice services, July 2008 – July 2010

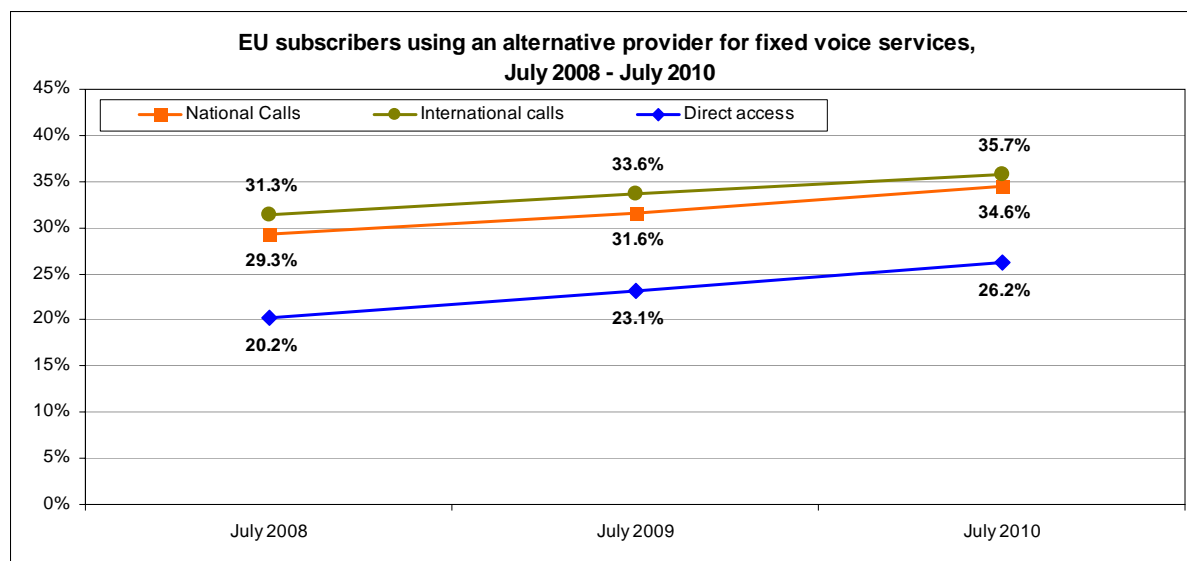


Figure 29: Subscribers using an alternative provider, July 2010

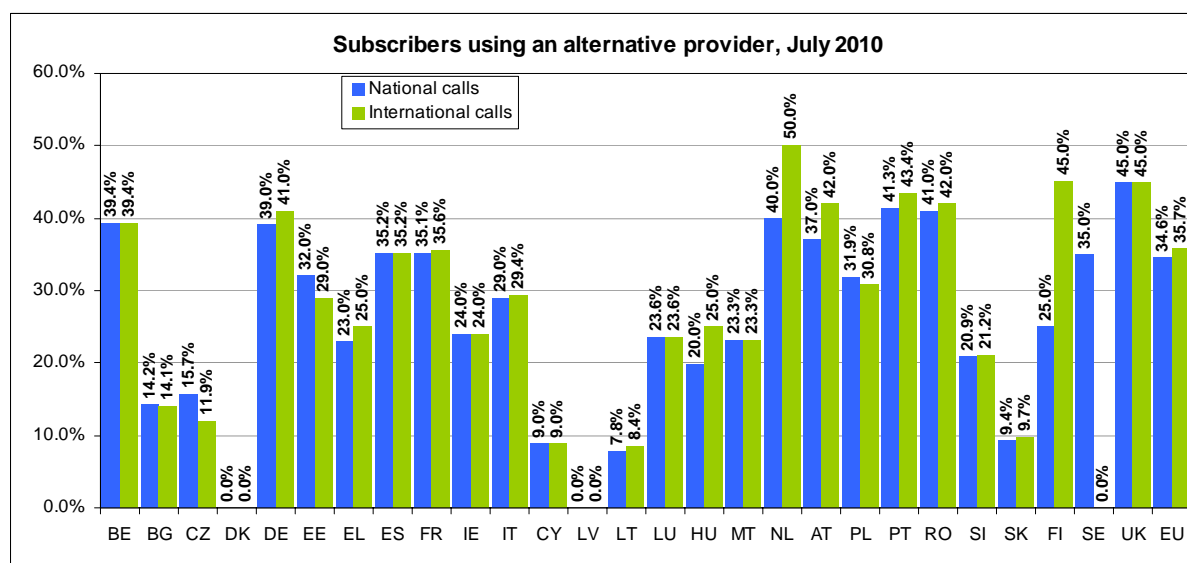


Figure 30: Subscribers using the incumbent for direct access, July 2010

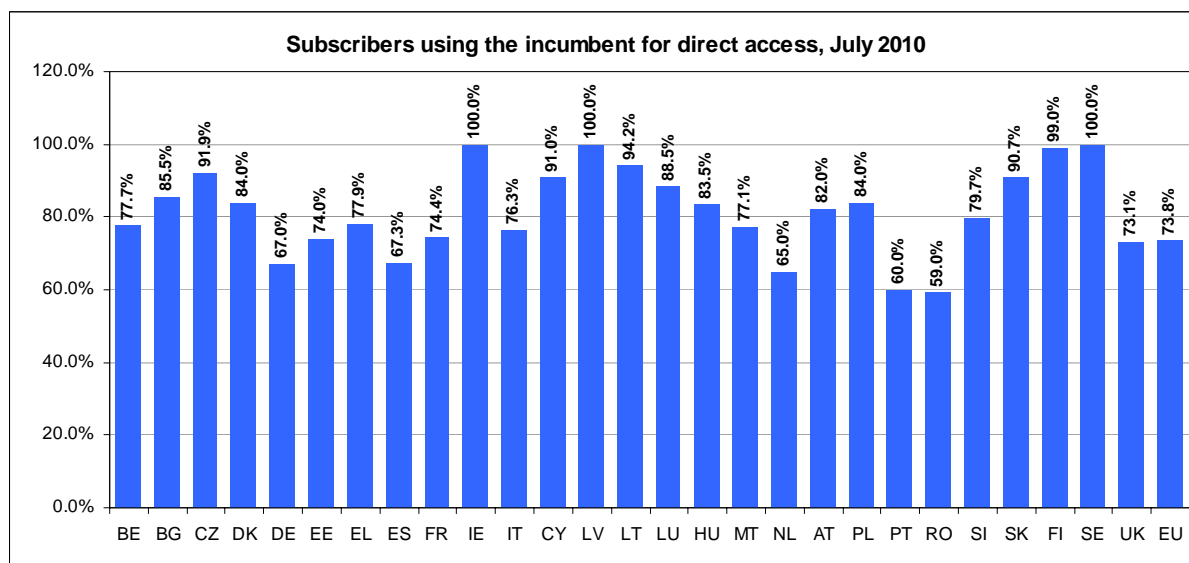
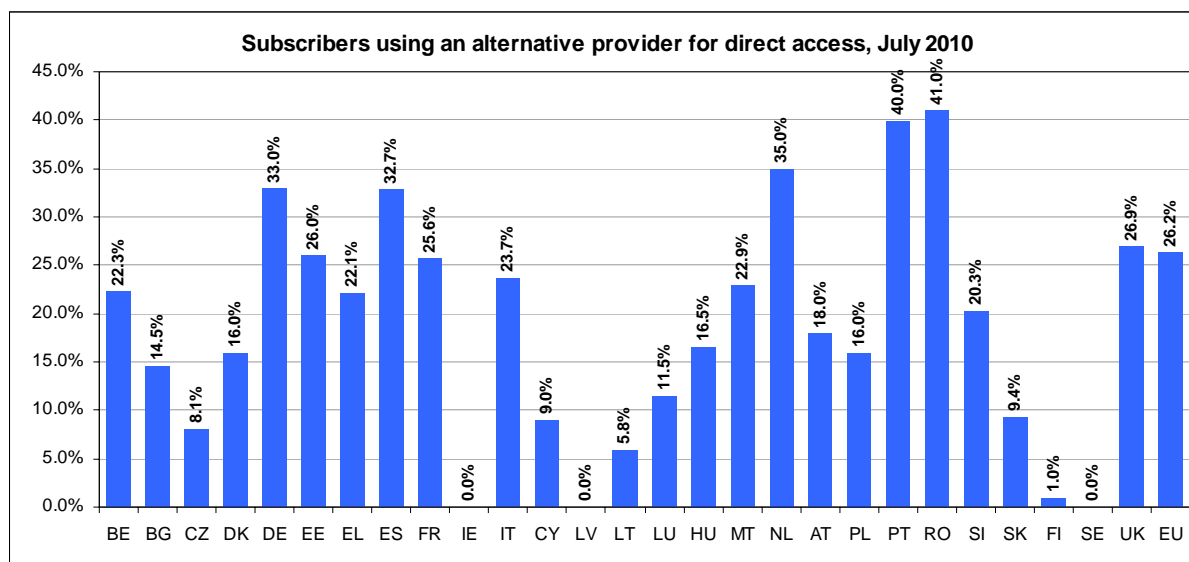


Figure 31: Number of subscribers using an alternative provider for direct access, July 2010



Austria: Data are as of 01.04.2010.

Belgium: Data are as of end 2009

Bulgaria: Figures are calculated on the base of number of fixed telephone subscriptions as of December, 31, 2009.

Denmark: The indicated figure on direct access comprises only direct access via PSTN or ISDN. Figures for alternative operators owned by incumbent were counted as part of the incumbents figures.

Greece: National and international calls figures refer to 31/12 of the previous year. Direct Access refers to 1/7 of the respective year.

Germany: Unbundled IP access lines are included. Figures for international calls are NRA estimates.

France: Data are as at 31 March 2010.

Italy: New way of calculation was applied in 2010 for some operators

Netherlands: Data are as of 31-03-2010. The presented percentages are approximations, the exact data is confidential.

Poland: The data for 2010 is given based on the 33 largest operators of subscribers selected on the basis of the number of users.

Romania: The data for 1 July 2010 are provisional.

United Kingdom: The proportion of subscribers using a provider other than BT for national and international calls will be slightly understated as they exclude BT lines using CPS. 2010 data is as of Q1 2010 (2009 data is for Q2 2009). Direct access figures are calculated as direct access operator share plus that of cable operators and other licensed operators (including those using full LLU but excluding WLR connections).

3.3 Fixed number portability

Fixed number portability enables fixed subscribers to retain their number when they move from one operator to another.

Figures are provided by NRAs, and include the number of transactions calculated up to 1 October each year. Data also include the the average number of days taken to port a number as well as the cost of porting a number. Inter-operator prices for fixed number portability refer to the amount charged by the incumbent to the recipient operators for porting a geographic telephone number (excluding VAT). This price may vary depending on a number of factors. In some countries the price for a non - geographic number is different. Where available, information on price for non-geographic number portability is added in the footnote. In some countries there is no charge for the porting of fixed numbers.

Two different measurements were used on number portability. 'Transactions' refer to the total number of number portings between 1 January and 30 September each year. 'Ported numbers' refer to the number of those numbers that are held by another operator than the range holder on 30 September each year.

Figure 32: Fixed number portability - transactions, 2009-2010

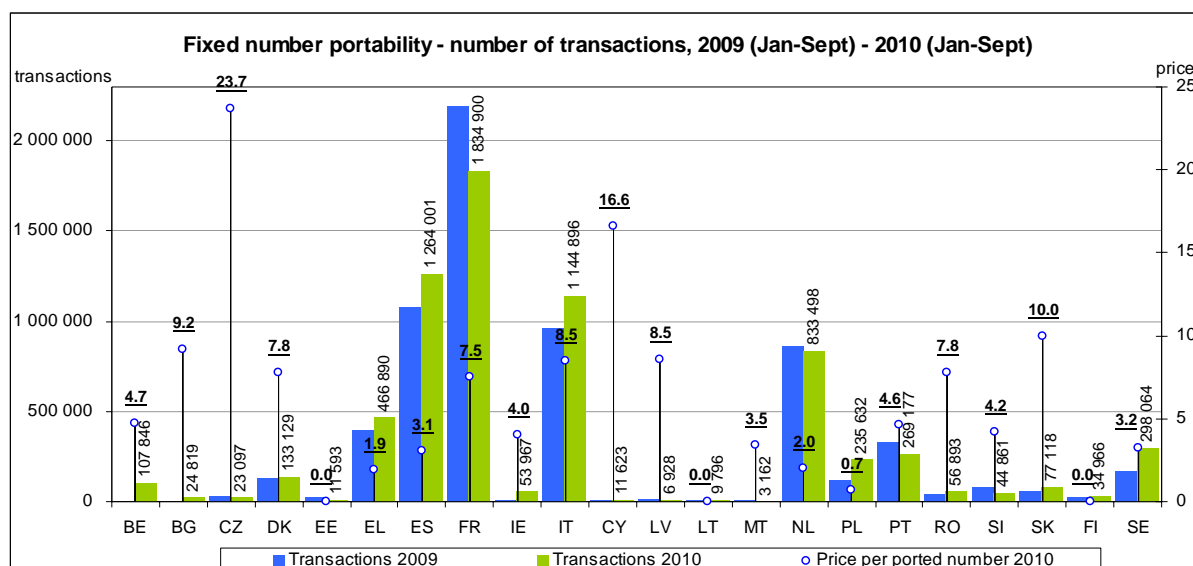


Figure 33: Fixed number portability – number of ported numbers, 2009-2010

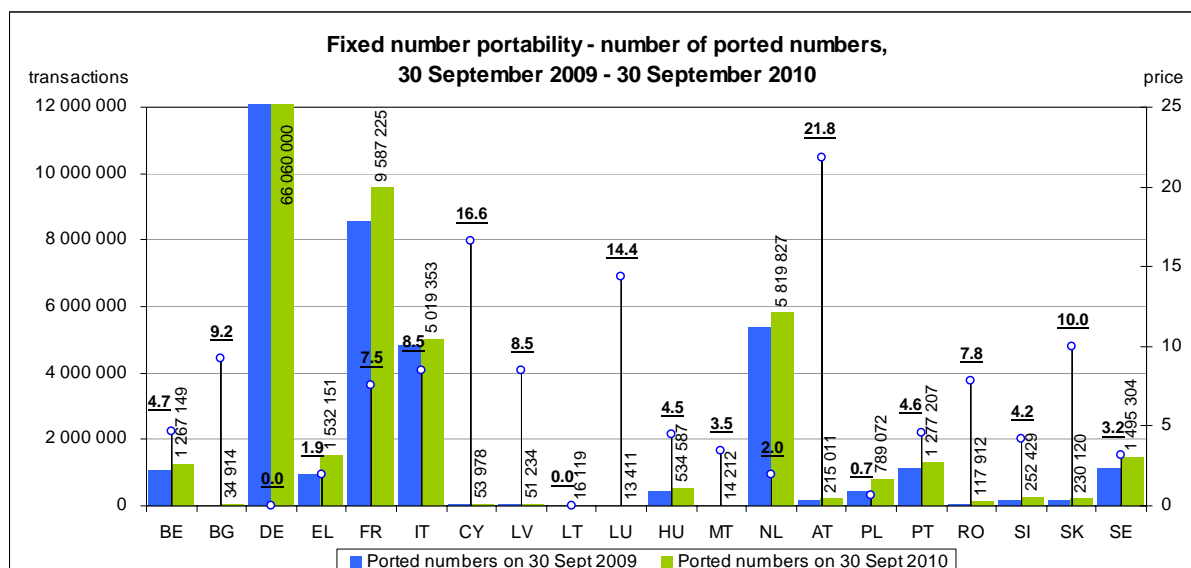
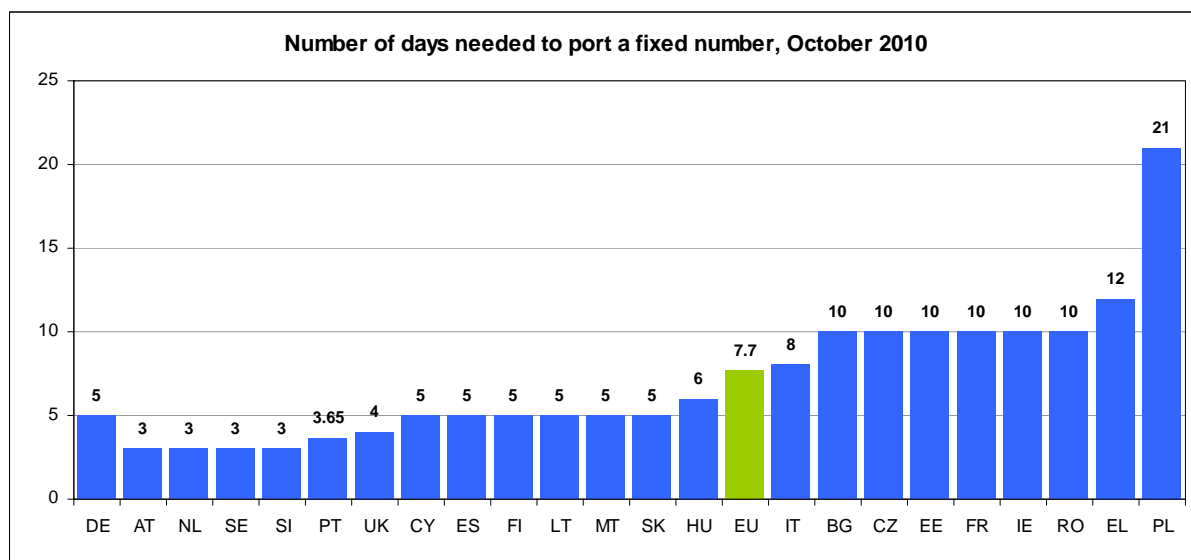


Figure 34: Time taken in number of days for fixed number portability, October 2010



Austria: Time needed is maximum 3 days. Typical cases are shorter but no detailed information is available. Only a total sum of ported numbers quarterly is available.

Bulgaria: Time limit of portability is same for all operators: 7 working days for single number ported and 10 working days for a group of numbers. The price for number portability is same for all operators. In year 2010 it is 18 BGN per one number, excluding VAT and it is subject to agreement between the operators. The agreement is part from the fixed number portability procedure. The agreement includes price reduction for over 300 ported numbers.

Germany: The interruption of service is less than a day, if notified on time. Figures on the transactions between the 1 January and the 30 September are not available. 15 230 000 represent the total number of transactions from introduction of number portability by 31 December 2009. Price is 0.

Finland: Time needed is 5 working days.

France: Maximum current time is 10 days, minimum time 4 days when associated with ULL delivery (related to ULL average time; ULL and porting is done the same day). Interruption time is maximum 6 hours. This figure (7.53 €)

corresponds to the cost for one number when the procedure to port the number is not fully automated (i.e. on the business market). When it is fully automated (i.e. when associated with ULL product), the cost is 3.03 € for one number.

Malta: Time needed is maximum 5 days.

Netherlands: Technical porting is less than 2 hours. For the end-user (from request to end of technical porting) the average is 3 days and the maximum is 10 days.

Portugal: Since July 2009, according the up-dated NP Regulation, the minimum time enforced to donor for number portability is 2 working days. This time is managed by the recipient. The wholesale price per ported number of the incumbent includes a reduction in case of DDI: € 1,59 for DDI blocks between 10 and 99 numbers, € 0,74 for DDI blocks with 100 numbers or more numbers.

Poland: Time needed depends on the mode of transfer: 1 day or any period set by the client, from 30 to 59 days with notice of the donors. The price represents the fee for each commenced 100 numbers transferred geographically.

Romania: Time needed is maximum 10 days. The price represents the maximum price allowed by regulations at 1.10.2010.

Slovenia: Time needed is maximum of 3 working days. The price represents the maximum.

United Kingdom: 4 days is the minimum order leads time. Data on the number of fixed porting transactions for any given period is not available. The cost is from £0.49, this is a minimum price and is BT Openreach's published price for porting a single geographic telephone number.

Belgium: Data are not available for time needed. The cost per simple installation is given

Denmark: Data are not available for time needed. Transactions refer to the period 1 January to 30 June.

Luxembourg: Data are not available for time needed.

Ireland: All numbers refer to cumulative ports.

3.4 Fixed Interconnection

Figure 35: Fix interconnection charges for call termination on incumbent's network at EU level, 2005-2010

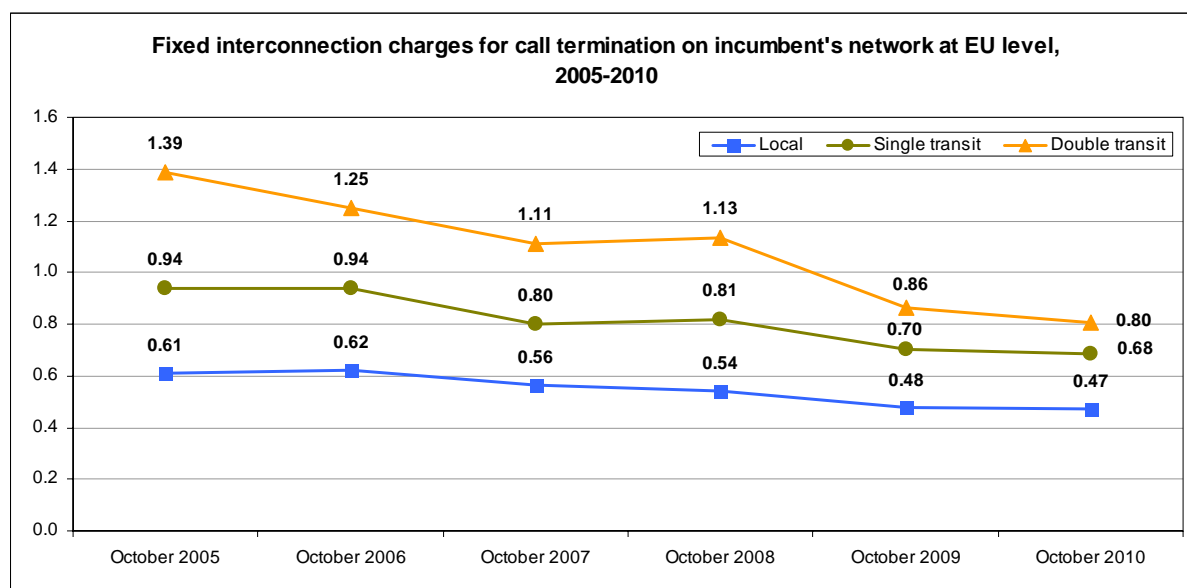
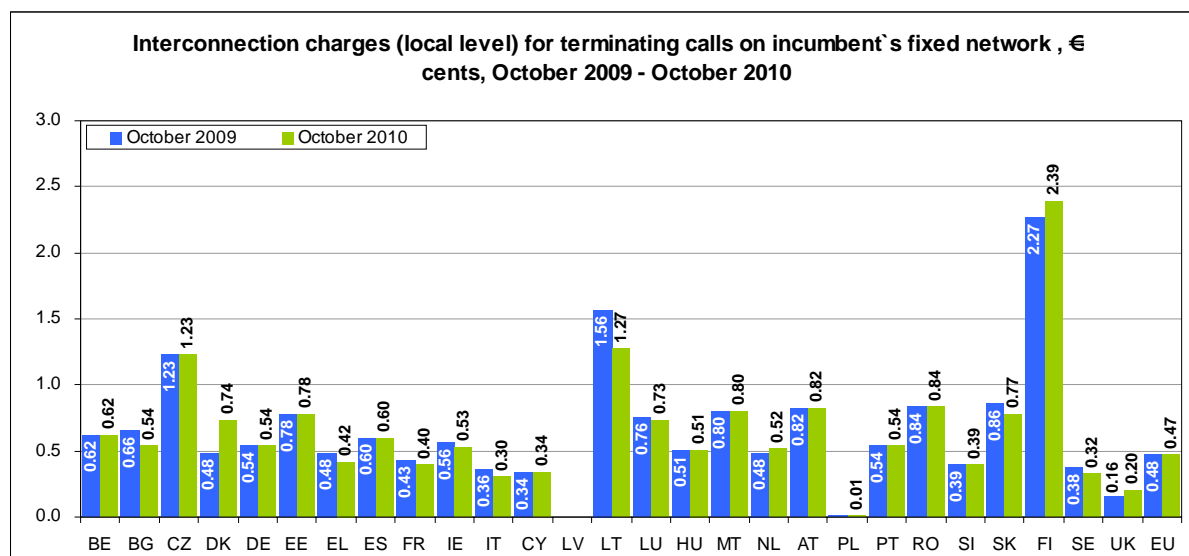


Figure 36: Interconnection charges – Local level, October 2009 – October 2010



Bulgaria: Prices for call termination are imposed as a price control remedy according CRC's Decision № 237/17 of March 2009. According to the glide-path of the Decision, the termination charges at 01.10.2009 are in force from 1 July 2009 and termination charges at 01.10.2010 are in force since 1 July 2010. Set-up charge is not applied. According to Decision № 237/17 of March 2009 the use of Metro Segment is allowed until 1 January 2010. With regards to mobile-to-fixed termination rates, Decision № 237/17 of March 2009 imposed symmetry between the termination rates for mobile-to-fixed and for fixed-to-fixed network. According to the obligation imposed, the incumbent has to terminate mobile traffic in all transit levels at the same prices as the fixed traffic.

Czech Republic: Local level is still regulated but it is not used at present. Mobile-to-fixed charges are the same as for fixed-to-fixed interconnection.

Spain: For year 2010, data as of 30-06-2010

Finland: Based on the average of 33 SMP-operators call termination charges. Termination charges varies from 2,20 €cent/min to 2,51 €cent/min. Average is 2,39 €cent/min and median charge is 2,4 €cent/min.

France: The termination rate is regulated by an overall price cap in Euro/cents per minute. Operators have freedom to set the tariffs of different components of termination (eg. depending on time of the day, on a per call basis, on a per minute basis, etc.) providing they respect the overall price cap, based on a consumption basket predetermined by ARCEP. The figure refers to the overall price cap and not to the average revenue per minute as generated on the incumbent's network at peak time.

Germany: Peak tariffs. A new decision is expected in June 2011.

Latvia: Local level is not applicable

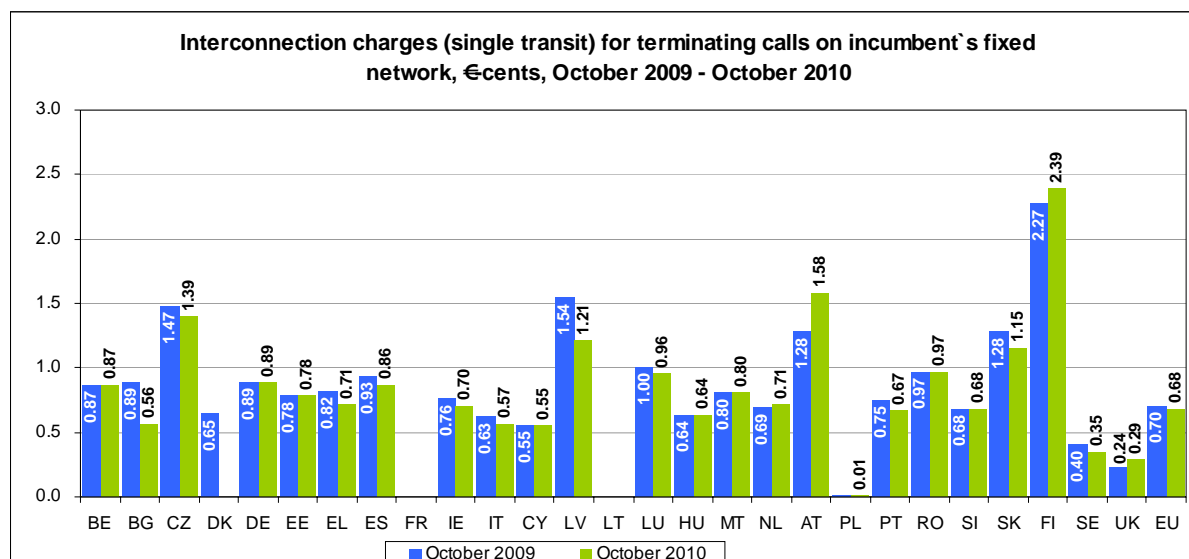
Malta: For comparison purposes only. The figure refers to single transit, as local level is not applicable to Malta due to the islands' geographical size.

Portugal: Through determination of 21/07/2010, ICP-ANACOM approved the 2010 interconnection prices (<http://www.anacom.pt/render.jsp?contentId=1038911&languageId=1>).

United Kingdom: Weighted average of disaggregated day, evening, week-end rates.

Romania: Maximum average tariffs.

Figure 37: Interconnection charges – Single transit, October 2009 – October 2010



Bulgaria: Prices for call termination are imposed as a price control remedy according CRC's Decision № 237/17 of March 2009. According to the glide-path of the Decision, the termination charges at 01.10.2009 are in force from 1 July 2009 and termination charges at 01.10.2010 are in force since 1 July 2010. Set-up charge is not applied. According to Decision № 237/17 of March 2009 the use of Metro Segment is allowed until 1 January 2010. With regards to mobile-to-fixed termination rates, Decision № 237/17 of March 2009 imposed symmetry between the termination rates for mobile-to-fixed and for fixed-to-fixed network. According to the obligation imposed, the incumbent has to terminate mobile traffic in all transit levels at the same prices as the fixed traffic.

Denmark: Single transit (metropolitan) is deregulated

Spain: For year 2010, data as of 30-06-2010

Finland: Based on the average of 33 SMP-operators call termination charges. Termination charges varies from 2,20 €cent/min to 2,51 €cent/min. Average is 2,39 €cent/min and median charge is 2,4 €cent/min.

France: Single transit is deregulated

Germany: Peak tariffs. A new decision is expected in June 2011.

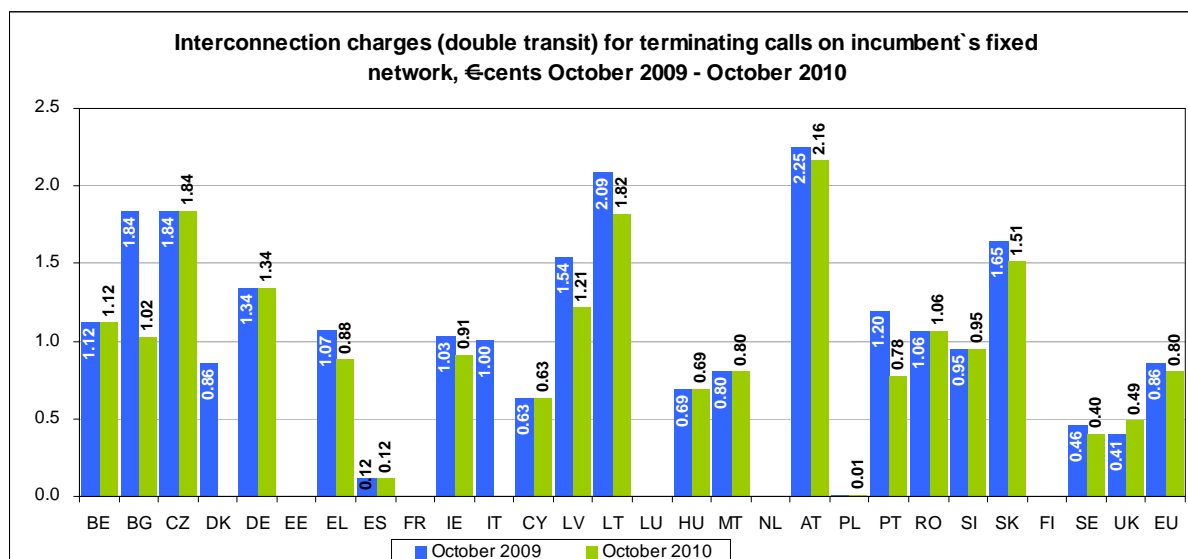
Lithuania: Single transit is not applicable.

Portugal: Through determination of 21/07/2010, ICP-ANACOM approved the 2010 interconnection prices (<http://www.anacom.pt/render.jsp?contentId=1038911&languageId=1>).

Romania: Maximum average tariffs.

United Kingdom: Weighted average of disaggregated day, evening, week-end rates.

Figure 38: Interconnection charges – Double transit, October 2009 – October 2010



Bulgaria: Prices for call termination are imposed as a price control remedy according CRC's Decision № 237/17 of March 2009. According to the glide-path of the Decision, the termination charges at 01.10.2009 are in force from 1 July 2009 and termination charges at 01.10.2010 are in force since 1 July 2010. Set-up charge is not applied. According to Decision № 237/17 of March 2009 the use of Metro Segment is allowed until 1 January 2010. With regards to mobile-to-fixed termination rates, Decision № 237/17 of March 2009 imposed symmetry between the termination rates for mobile-to-fixed and for fixed-to-fixed network. According to the obligation imposed, the incumbent has to terminate mobile traffic in all transit levels at the same prices as the fixed traffic.

Czech Republic: The stated charge of double transit is specified by RIO and is not regulated by the NRA.

Denmark: Double transit (national, 2010) is deregulated

Estonia: Double transit not applicable

Spain: For year 2010, data as of 30-06-2010

France: Double transit is deregulated

Finland: Double transit not applicable.

Germany: Peak tariffs. A new decision is expected in June 2011.

Italy: According to last market analysis national double transit is no longer subject to price control. Remain subject to price control terminating prices at metropolitan level

Luxembourg: Double transit not applicable.

Malta: For comparison purposes only. The figure refers to single transit, as double transit is not applicable to Malta due to the islands' geographical size.

Netherlands: Double transit is not regulated.

Portugal: Through determination of 21/07/2010, ICP-ANACOM approved the 2010 interconnection prices (<http://www.anacom.pt/render.jsp?contentId=1038911&languageId=1>)

United Kingdom: Weighted average of disaggregated day, evening, week-end rates.

Romania: Maximum average tariffs.

4. BROADBAND MARKET

4.1 Broadband access definitions

This section provides data on the number and type of broadband lines supplied by both incumbent operators and new entrants/alternative operators in the EU. It also contains information on access lines provided by means of alternative technologies such as fixed wireless access (WLL), fibre and cable modem. Data on mobile broadband access is also available; however data is not of the same quality for all countries. Data on speeds is partially available.

Information has been provided by the national regulatory authorities through the COCOM questionnaires on data for local broadband access. Given the rapid developments in this sector, it has been agreed with NRAs to update the questionnaires on a regular basis every January and July. Unless otherwise stated, the data below refer to the market situation on 1 January 2010.

The definitions used in the charts and data below are as follows:

- **Fully unbundled lines:** Fully unbundled lines supplied by the incumbent operator to other operators (new entrants), excluding experimental lines. In the case of full unbundling, a copper pair is rented to a third party for its exclusive use. As fully unbundled lines (LLU) supplied by the incumbent operator to the new entrants could in principle be used for services other than broadband, the total number of LLU for access to internet will be lower than the total number of LLU.
- **Shared access lines:** Shared access lines supplied by the incumbent to other operators (new entrants), excluding experimental lines. In the case of shared access, the incumbent continues to provide telephony service, while the new entrant delivers high-speed data services over that same local loop.
- **Bitstream access:** It refers to the situation where the incumbent installs a high-speed access link to the customer premises, and makes this access link available to third parties (new entrants), to enable them to provide high-speed services to customers. Bitstream depends in part on the PSTN, and may include other networks such as the ATM network. Bitstream access is a wholesale product that consists of the provision of transmission capacity in such a way as to allow new entrants to offer their own, value-added services to their clients. The incumbent may also provide transmission services to its competitor, to carry traffic to a 'higher' level in the network hierarchy where new entrants may already have a broadband point of presence.
- **Simple resale:** In contrast to bitstream access, simple resale occurs when a new entrant receives and sells on to end users a product (with no possibility of value added features to the DSL part of the service) that is commercially similar to the DSL product provided by the incumbent to its own retail customers, irrespective of the ISP service that may be packaged with it. Resale offers are not a substitute for bitstream access because they do not allow new entrants to differentiate their services from those of the incumbent (i.e. when the new entrant simply resells the end-to-end service provided to him by the incumbent on a wholesale basis).
- **Incumbent's DSL lines:** Lines provided to end users by the incumbent, its subsidiaries or partners (for example an associated company such as a joint venture providing ISP services).
- **WLL:** Broadband internet connections by means of wireless local loop (sometimes referred to as fixed wireless access).
- **Cable modem:** Broadband internet connections by means of cable TV access.
- **L.L. or Other traditional wireline access:** Broadband internet connections by means of dedicated capacity (Leased Lines) provided over metallic copper pairs, including tail ends or partial circuits. "Incumbent's leased lines" include only retail lines and excludes lines provided to other operators. "New entrants' leased lines" include all retail lines provided to end users, even if based on wholesale lines supplied by the incumbent.
- **Fibre to the home (FTTH):** Broadband internet connections by means of fibre optic.
- **Satellite Internet:** Broadband internet connections via satellite.

- **Powerline communications:** Broadband internet transmitted over utility power lines.
- **Other categories:** Internet broadband connections by means of local area networks and other.
- **Retail access:** Access provided to end users.
- **Incumbent:** Organisations enjoying special and exclusive rights or *de facto* monopoly for the provision of voice telephony services before liberalisation, regardless of the role played in the provision of access by means of technologies alternative to the PSTN.
- **New entrant:** Alternative telecommunications operators, as well as internet service providers (ISPs).
- **Mobile Broadband:** Internet access using 3G or higher mobile standards. Mobile Broadband can be accessed either by means of dedicated data devices (modems, cards and USB keys) and mobile handset enabling 3G or higher standard technologies. In the case of access through dedicated data devices the total number of subscribers is taken into consideration. In the case of access through mobile handsets, only active users (those who used the service in the past 90 days) are included.
- **Broadband connection:** an internet connection enabling higher than 144 Kbit/s download speed. As of January 2010 it is estimated that 1-2 Mbps is the minimum download speed and that just a fraction of all retail broadband lines provide speeds of 144 Kbit/s.

4.2 Wholesale access

This section shows the availability of fixed wholesale access lines supplied by incumbent operators to new entrants. Separate figures are provided for fully unbundled lines, shared access, bitstream access and resale.

Table 1: Number of wholesale lines and agreements (full LLU, shared lines, bitstream and resale lines) on 1 January 2011

Date	Incumbent's PSTN activated main lines	Availability of wholesale access									
		Fully unbundled lines			Shared access lines supplied by the			Wholesale DSL lines supplied			
		Unbundled lines	FUL Requested lines	FUL N. of agreements	Shared lines	SAL Requested lines	SAL N. of agreements	Bitstream access		Simple resale	
Bitstream N. lines	Bitstream N. agreements							Resale N. lines	Resale N. agreements		
January 2011											
Country											
BE	3 199 330	84 736		9	22 248		9	156 388	14	25 396	15
BG	1 787 418				1	10	3	163	7		
CZ	1 728 963	48 175		6	5 399		6	70 192	20		
DK	1 668 639	1 584 022	N/A	18	35 337	N/A	6	130 795	14	39 719	23
DE	34 167 000	9 500 000		173	67 000		22	832 600	26	1 185 200	12
EE	389 000	8 022	4	6				105	1		
EL	5 203 000	1 346 498	37 839	13	33 250	108	10	37 493			
ES	13 991 449	2 213 149		17	263 962		11	572 033	29	12 131	3
FR	9 128 000	7 690 000			1 194 000			1 799 000			
IE	1 533 295	14 179	confidential	confidential	36 820	confidential	confidential	182 594	confidential		
IT	15 486 402	7 003 661	46 047	35	607 076	172	13	1 882 991	173		
CY	369 622	na		3	168		3	1 946	6		
LV	550 000			2			2	276	12		
LT	627 202	695		2	167		2	1 282	10		
LU	214 000	18 326	426	5	1		5			13 139	7
HU	2 262 274	19 933	136	8	3 947	6	7	137 047	17		
MT	189 543							580			
NL	6 691 000	612 000		9	123 700		5	241 500	ca 20	confidential	confidential
AT	2 430 000	277 852	1 136	37	57		2	43 000	45		
PL	6 874 654	89 458	n/a	6	40 401	n/a	7	525 976	12		
PT	2 632 748	242 103	nd	4				38 763	9	457	2
RO	2 600 000	978		13	244		13	N/A	N/A	N/A	N/A
SI	696 272	61 710	358	3	17 175	38	3	23 494	4		
SK	1 043 611	31	26	1				33 879	18		
FI	2 071 000	295 400			29 200			43 400			
SE	3 959 000	216 224	N/A	N/A	319 069	N/A	N/A	12 554	N/A	99 115	N/A
UK	16 957 820	4 006 629	n/a		3 481 926	n/a	39	160 991	29	2 241 184	435

4.3 Retail fixed broadband access

This section provides information on the deployment of fixed broadband access lines by incumbents (and their subsidiaries or partners) and by new entrants (alternative telecom operators or Internet Service Providers) to end-users.

Fixed broadband access can be provided by different means: DSL lines, cable modem, Wireless Local Loop (WLL), fibre, dedicated leased lines and other technologies (such as satellite, powerline communications, local area networks, etc.).

New entrants' DSL lines can be provided to end users by means of fully unbundled or shared access lines, bitstream access or resale. In some Member States, new entrants have started rolling out parallel DSL networks. In all the charts below on fixed broadband retail lines data refer either to 1 January 2009 or 1 January 2010. In some cases only estimates are available or data are as of 1 July or 1 October 2009.

The following table shows the total number of fixed broadband access lines for each Member State, provided by both incumbents and new entrants/alternative operators, and including all types of fixed broadband connections.

Table 2: Number of fixed broadband lines by operator and technology on 1 January 2011

January 2011	Country	Incumbent's DSL lines	New entrants' DSL lines on PSTN					Incumbents' access lines by other means									
			Own network	Full ULL	Shared access	Bitstream access	Resale	Total new entrants DSL lines	WLL	Cable modem	Leased lines	Fiber to the home	Satellite	PLC	Other	Public access WIFI Hotspots	Tot. (exc. WIFI)
	BE	1 560 736		39 260	6 115	39 386	188 708	273 469			7 236					733	7 969
	BG	343 358				139		139			989				48		1 037
	CZ	735 702	600	48 175	5 399	70 192		124 366				10 400					10 400
	DK	905 052		164 689	45 928	90 319	36 626	337 562	586	368 354		16 421	N/A	N/A	33 096	n/a	418 457
	DE	11 900 000	13 000	9 000 000	67 000	832 600	1 185 200	11 097 800			30 000	n.a	18 800		8 000		56 800
	EE	147 616	1 750	6 738		105		8 593	6 418			34 637			2	479	41 536
	EL	1 102 396		1 070 918	33 250	37 493		1 141 661	74		196	134	1 129				1 533
	ES	5 647 411		2 213 149	263 962	572 033	12 131	3 061 275				49 337	9 293				58 630
	FR	9 128 000		7 690 000	1 194 000	1 799 000		10 683 000									
	IE	confidential		14 179	36 820	182 594		233 593	confidential		confidential		confidential			766	confidential
	IT	7 175 000	2 436	3 789 090	113 643	1 882 991	1 191	5 789 351			315	5 930	731		448	2 487	9 911
	CY	144 790		30 154	168	1 946		32 268			1 946	73				95	168
	LV	173 165		13	4	54	292	363	1 043			55 957				57	57 057
	LT	211 666			50	1 282		1 332	29 105			55	90 117		13 640	3 785	136 702
	LU	110 999		16 169			13 020	29 189		565	402	804				41	1 812
	HU	660 683		19 933	3 947	137 047		160 927	600	147 340	n.a.	19 125	n.a.	n.a.	n.a.	n.a.	167 065
	MT	62 934				580		580									
	NL	2 661 400		612 000	123 700	241 500	confidential	confidential				confidential					confidential
	AT	1 080 000		256 350	57	43 000		299 407				270					270
	PL	1 985 237	460 795	89 458	40 401	525 976		1 116 630				238	138		6 996		7 372
	PT	892 557		229 098		38 763	457	268 318			329	110 794	11			confidential	confidential
	RO	878 000	400	400				800				5 400				333	5 733
	SI	182 936		61 710	17 175	23 494		102 379				30 139				57	30 196
	SK	355 281	42	31		33 879		33 952	confidential			confidential			confidential	22	confidential
	FI	766 400		295 400	7 500	43 400		346 300	20 300	235 400		15 200			147 800		418 700
	SE	1 005 000		216 224	319 069	12 554	99 115	646 962				118 000			8 000	N/A	126 000
	UK	5 577 381	confidential	4 006 629	3 481 926	160 991	2 241 184	confidential									

January 2011	New entrants' access lines by other means									TOTAL
Country	WLL	Cable modem	Leased lines	Fiber to the home	Satellite	PLC	Other	Public access WIFI Hotspots	Tot. (exc. WIFI)	broadband lines
BE	16 544	1 512 265	1 341	1 514			38		1 531 702	3 373 143
BG	10 772	144 815	56	13 596			611 817	N/A	781 056	1 125 590
CZ	720 000	504 000		17 400			156 600		1 398 000	2 268 468
DK	48 057	190 599		154 887	N/A	N/A	95 607	n/a	489 150	2 150 221
DE	29 860	2 900 000	37 000	115 400	23 490	9 600		n.a	3 115 350	26 161 950
EE	33 108	74 650		37 806			14 967	662	160 531	357 797
EL	1 040		1 700	4 323					7 063	2 252 653
ES	119 140	1 997 783	1 066	3 928	1 944		1 342		2 125 203	10 892 519
FR		1 200 000		115 000			135 000		1 450 000	21 261 000
IE	confidential	202 605	confidential	confidential	confidential			1 096	confidential	1 035 772
IT	2 529		3 654	278 777	15 000	1 420	1 243	n.a.	302 623	13 274 398
CY		16 332			488		504	30	17 324	194 455
LV	18 649	25 671	6 423	20 706	39		132 639	174	204 127	434 655
LT	59 586	48 819	1 045	920			227 767	209	338 137	684 052
LU	5	24 233	62					90	24 300	166 259
HU	101 000	748 779	n.a.	3 750	n.a.	89	215 527	n.a.	1 069 145	2 057 820
MT	4 765	53 600		1				12	58 366	121 880
NL		2 562 000		confidential					confidential	6 416 886
AT	28 000	580 000		10 000		4 400	230		622 630	2 002 307
PL	14 052	1 665 816	1 387	4 336			1 321 020	506	3 006 611	6 115 850
PT	22 401	859 574	1 683	19 748			264	nd	903 670	2 175 679
RO	20 000	428 000	10	89 000	551		1 578 000	716	2 115 561	2 999 761
SI	3 884	125 458	23	48 040	1		1 205	974	178 611	494 065
SK	200 328	94 486	285	66 285	327		115 123	56	476 834	893 221
FI	6 400	5 200		5 200			11 200		28 000	1 559 400
SE	3 000	590 000		610 000			1 000	N/A	1 204 000	2 981 962
UK	No data	4 027 516	No data	No data	No data	No data	18 000	No data	4 045 516	19 610 363

Austria: Several figures are estimates.

Czech Republic: New entrants' FTTH lines are included in new entrants' other lines.

Germany: DSL lines include FTTC (VDSL). Fibre lines include FTTB and FTTH, but exclude FTTC (VDSL). Several figures are estimates (new entrants' own network DSL, other traditional wireline access /leased lines/). Full LLU includes wholesale DSL lines (Bitstream access, DSL resale) supplied by alternative operators to other alternative operators on the basis of unbundled local loops provided by the incumbent. Bitstream and resale access include only lines supplied by the incumbent to new entrants. FWA refers to number of subscribers.

Poland: Figures in LAN and WLAN are estimates.

Romania: Data are provisional.

Figure 39: Fixed broadband lines at EU level, January 2004 - January 2011

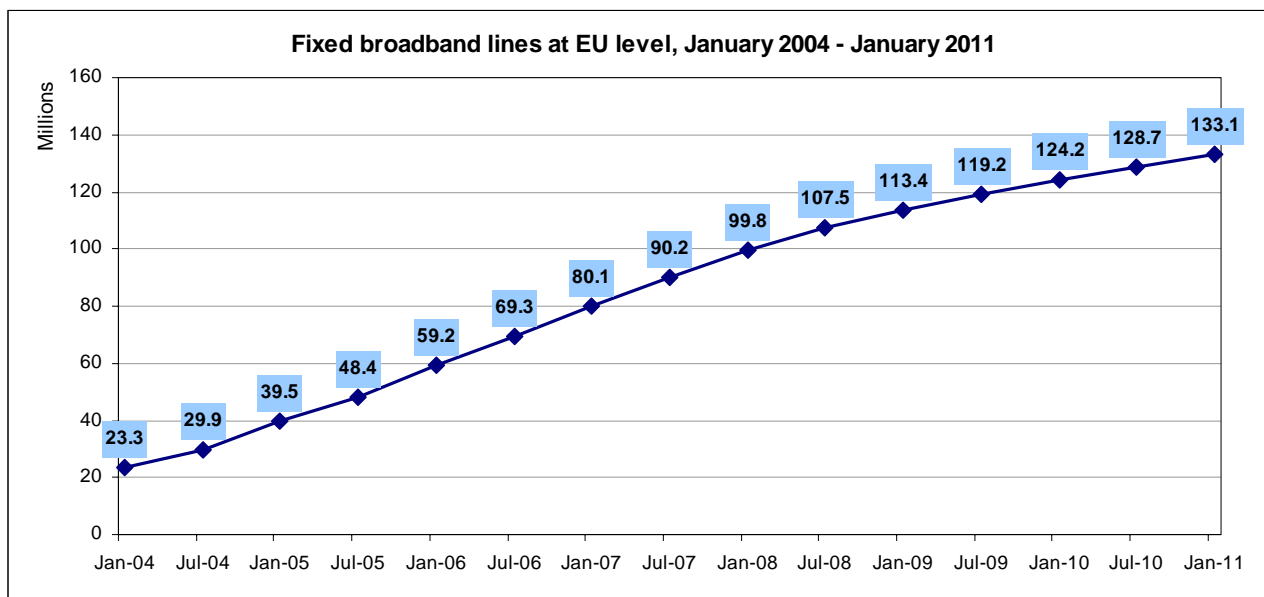


Figure 40: Fixed broadband penetration at EU level, January 2004 - January 2011

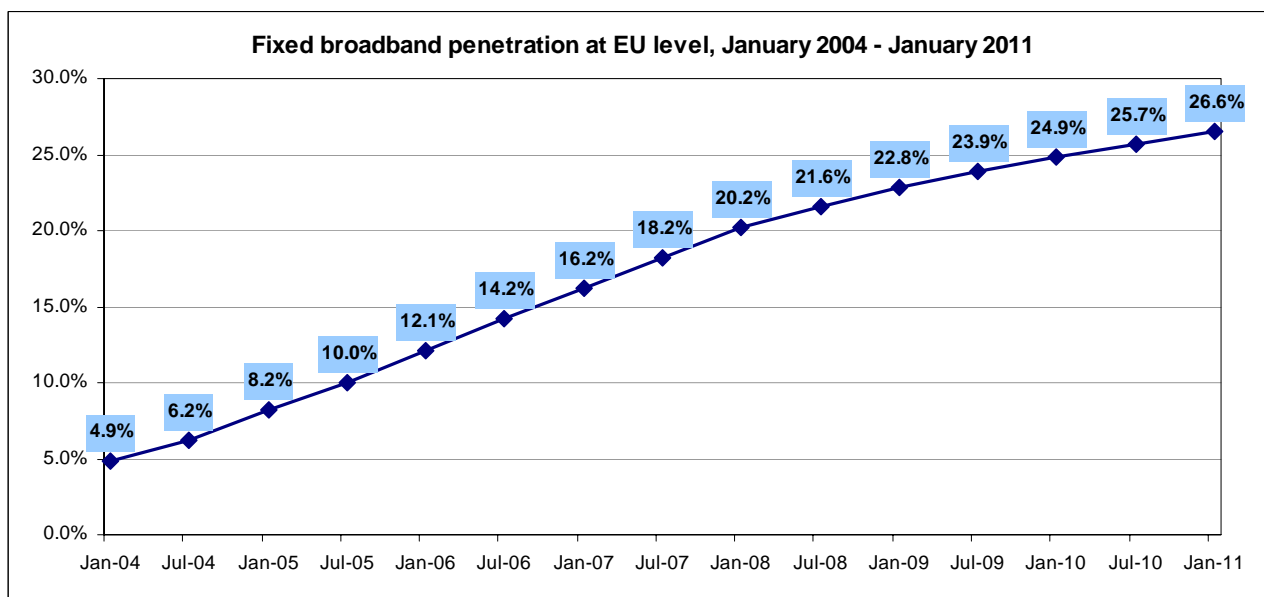


Figure 41: Fixed broadband lines growth per day at EU level, January 2004 - January 2011

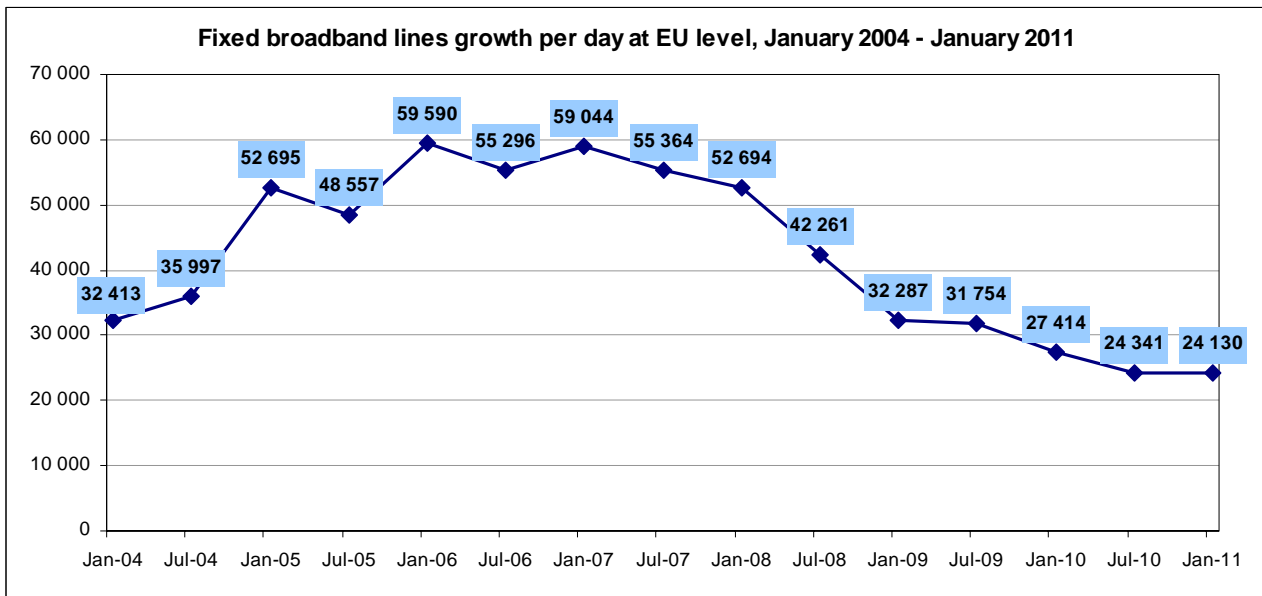


Figure 42: Fixed broadband lines, January 2011

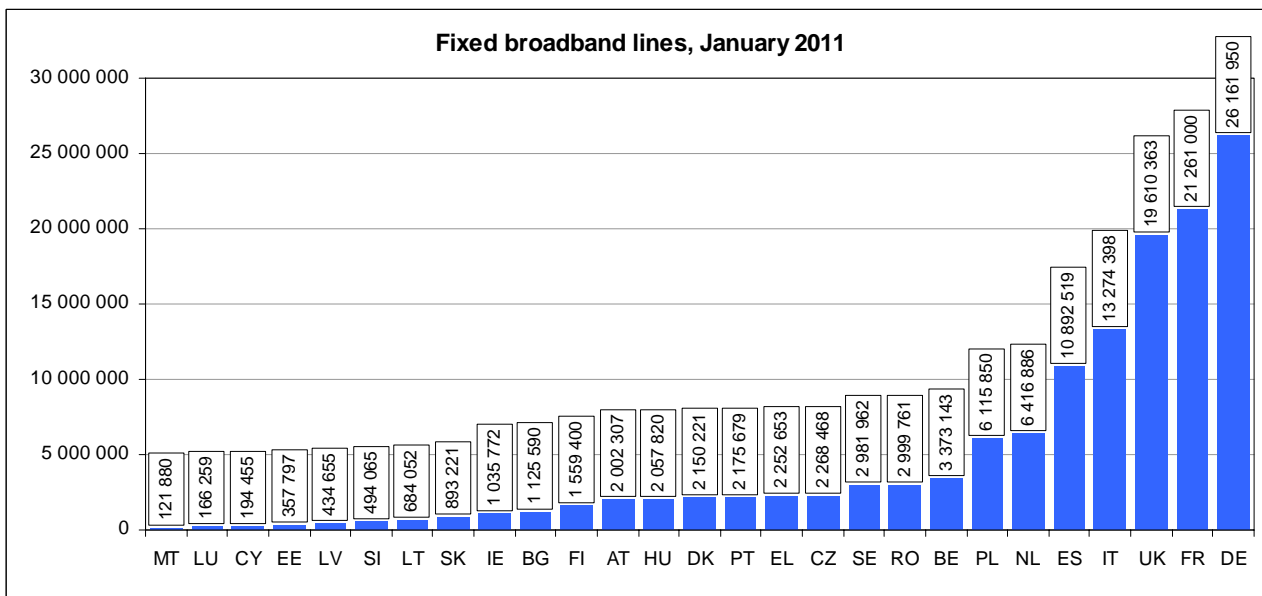


Figure 43: Fixed broadband penetration, January 2011

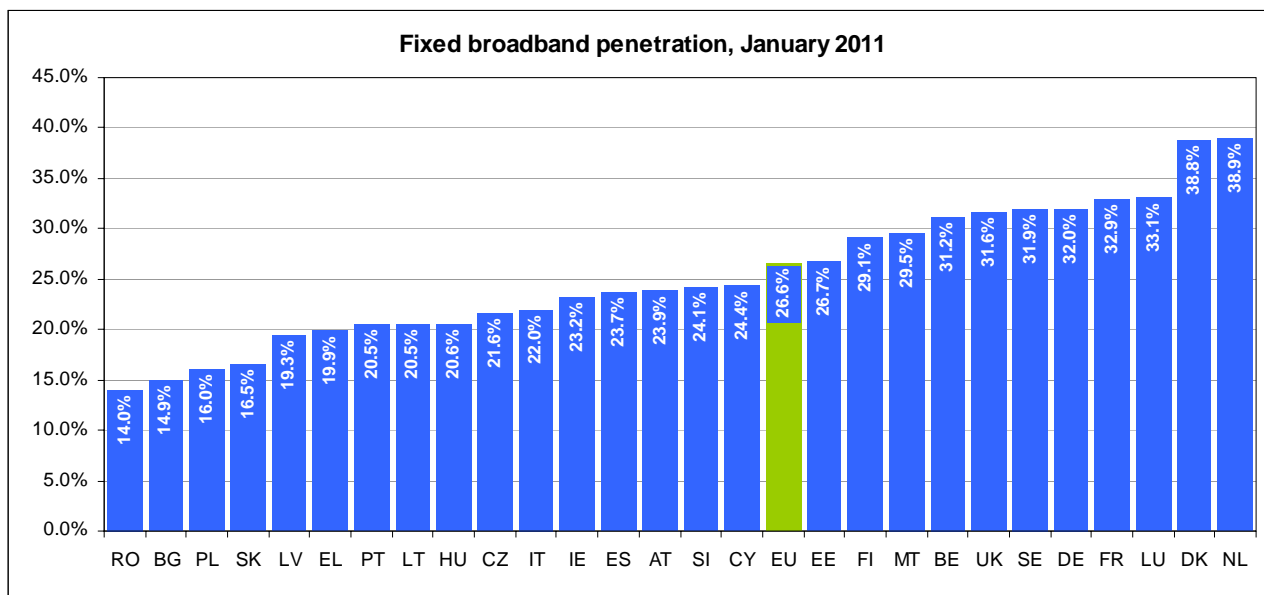


Figure 44: Fixed broadband penetration and speed of progress, January 2010 – January 2011

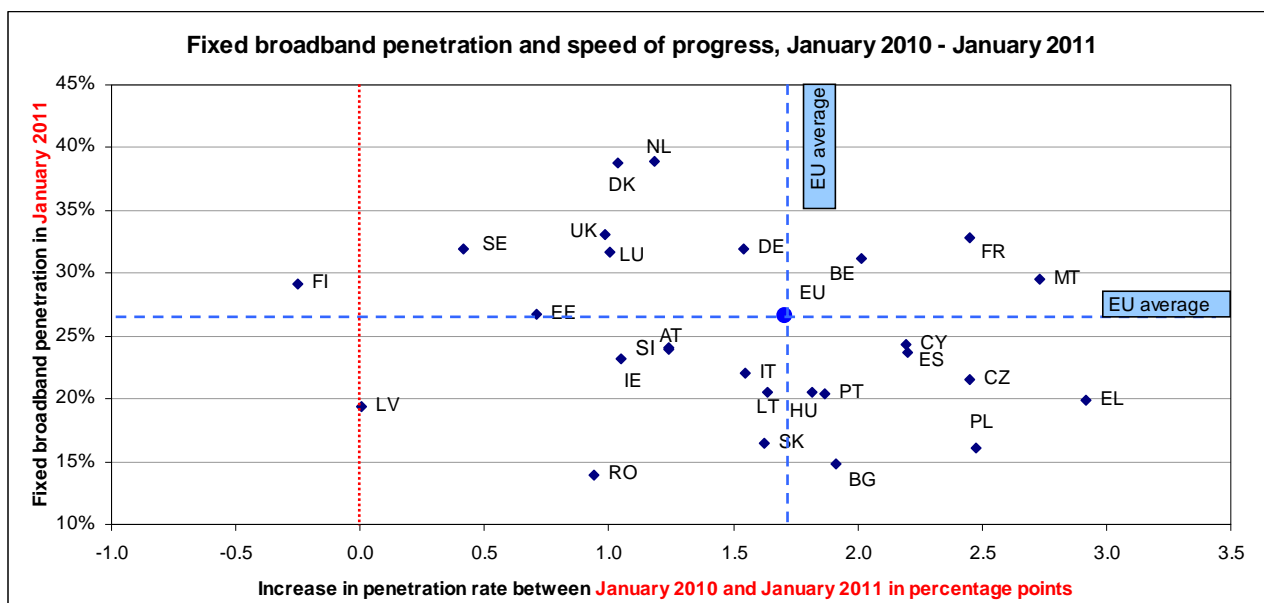


Figure 45: EU fixed broadband lines – operator market shares at EU level, January 2006 – January 2011

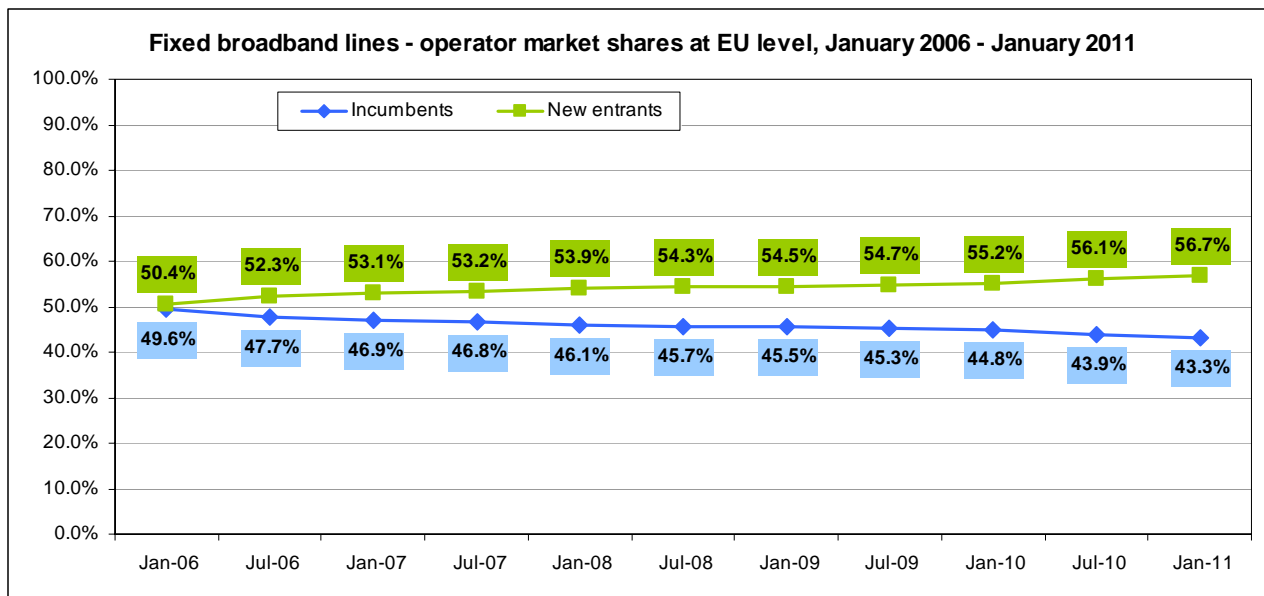


Figure 46: EU fixed broadband lines – net adds per day by operator at EU level, January 2006 – January 2011

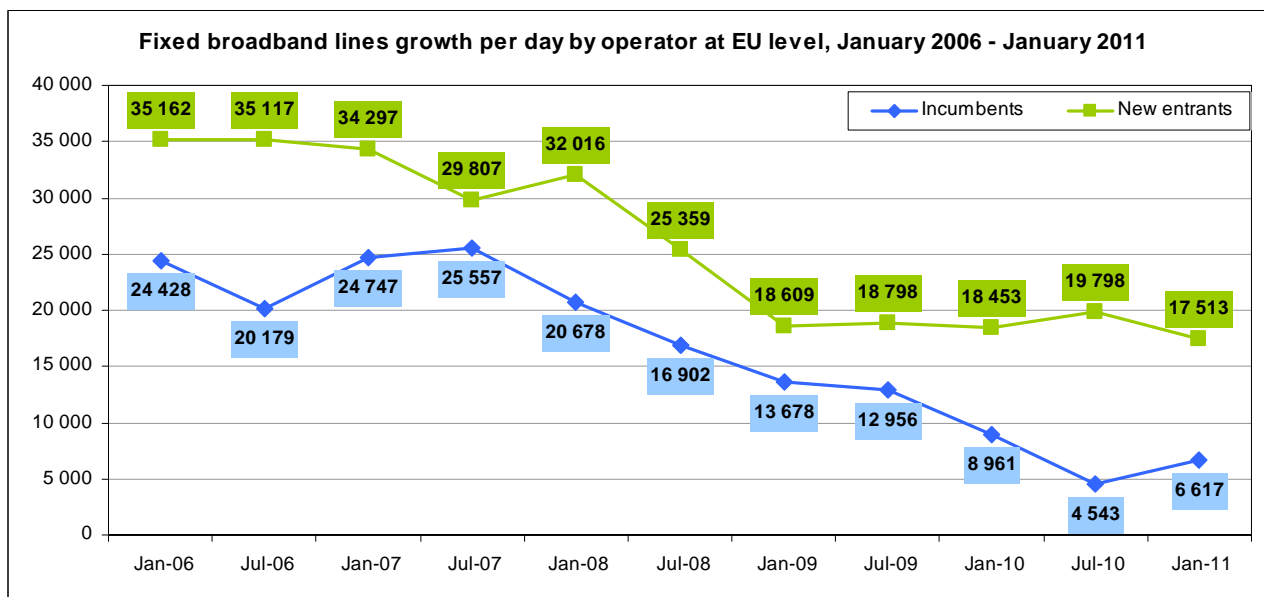


Figure 47: EU fixed broadband lines – operator market shares, January 2011

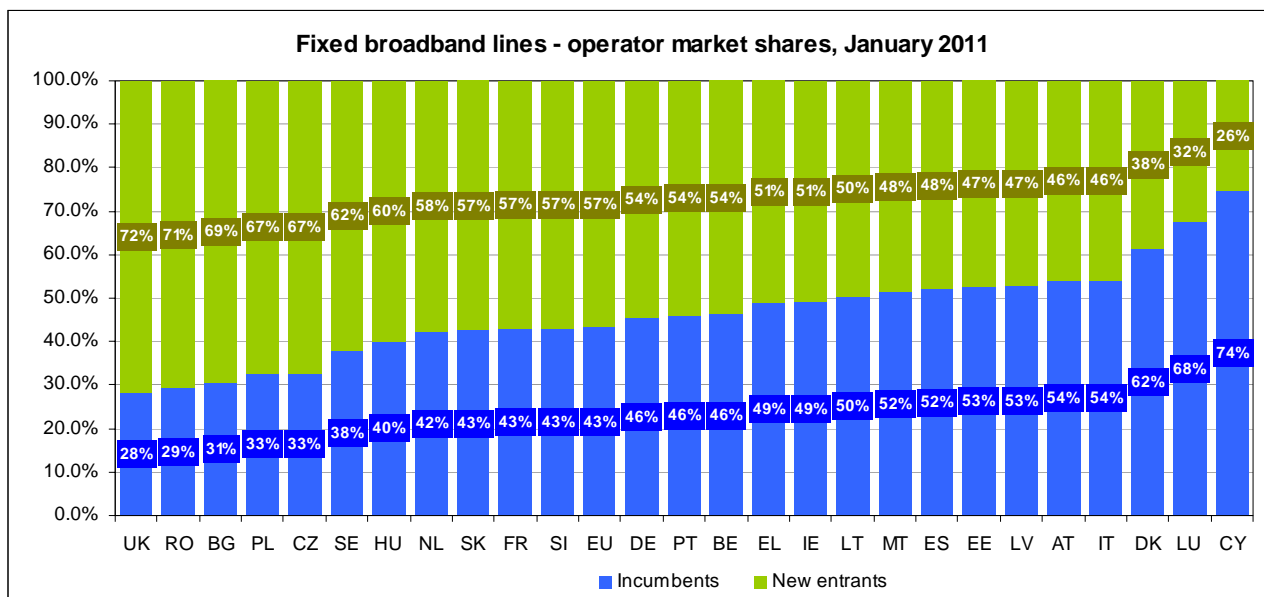


Figure 48: Fixed broadband lines – new entrants' market share, January 2009 – January 2011

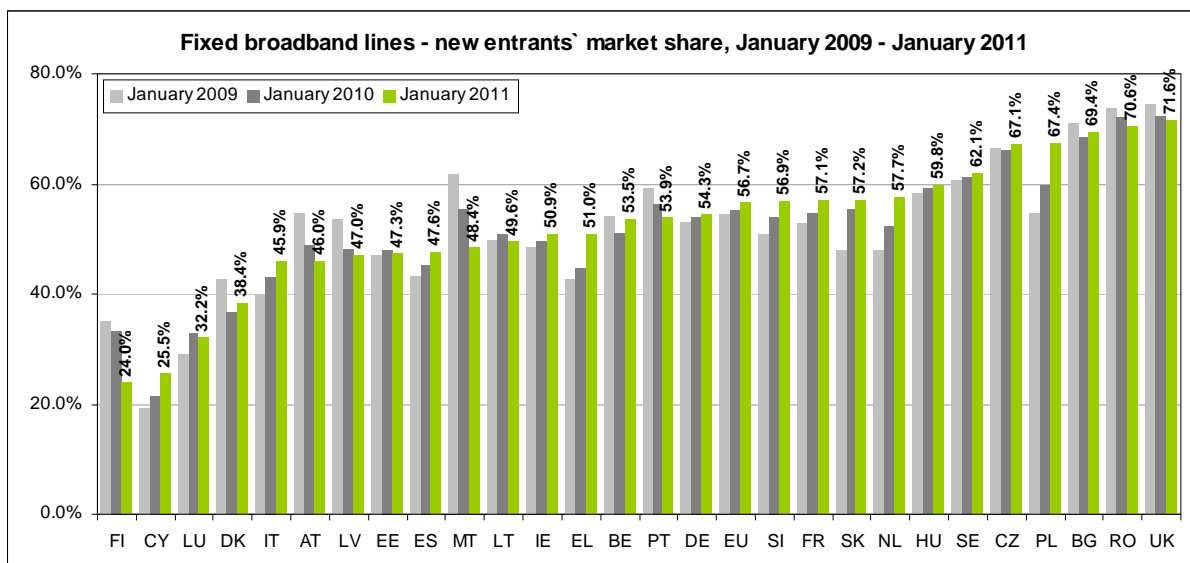


Figure 49: Fixed broadband lines – operator market shares at EU level (resale shown separately), January 2011

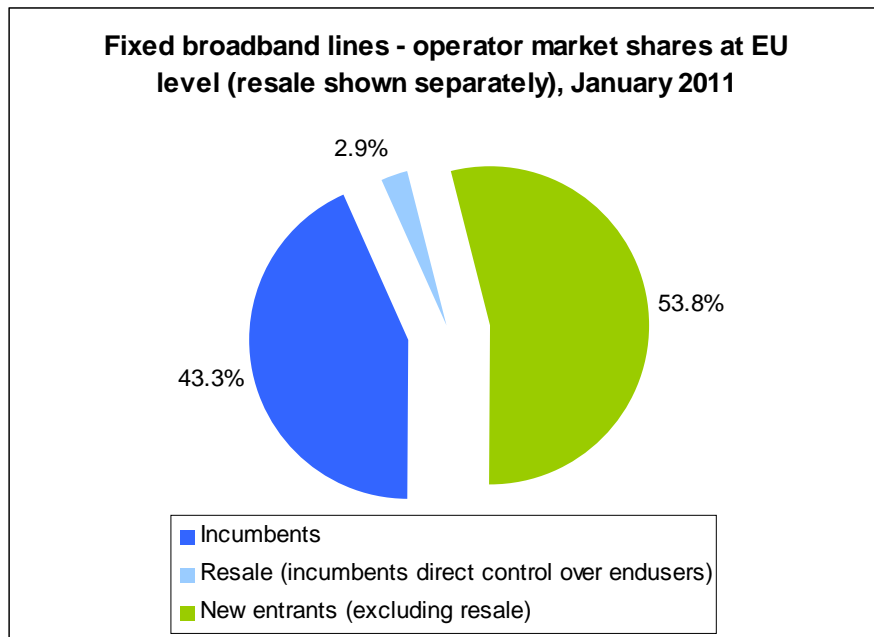


Figure 50: Fixed broadband lines – operator market shares at EU level (resale shown separately), January 2006 – January 2011

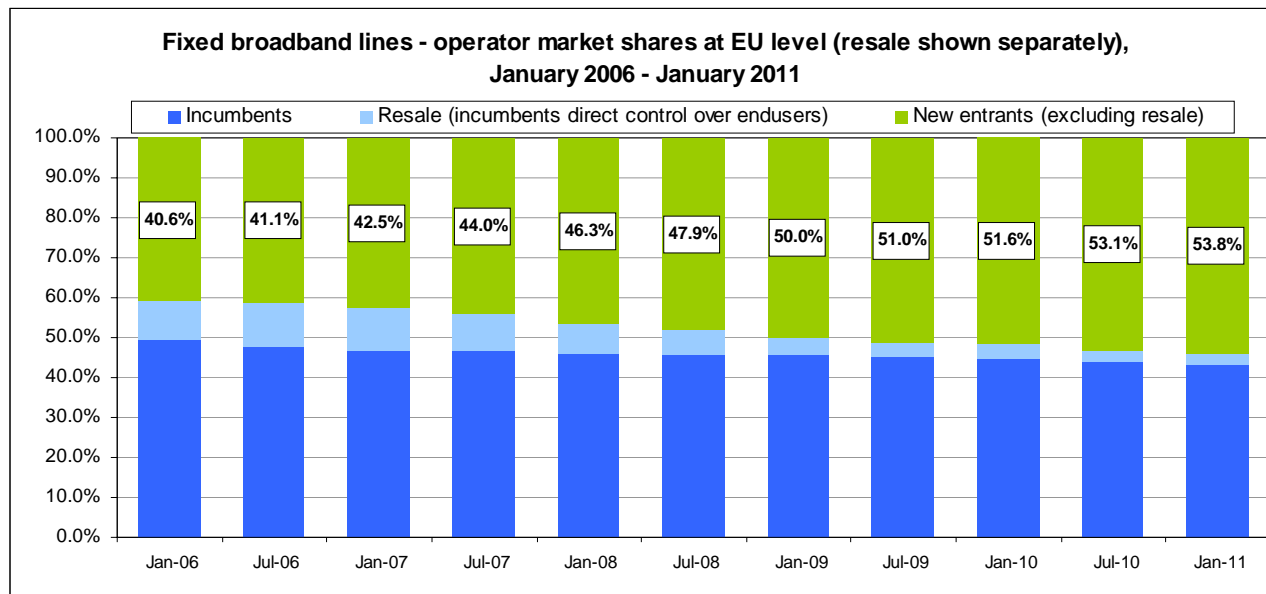


Figure 51: Fixed broadband lines – incumbents' market share excluding/including resale lines, January 2011

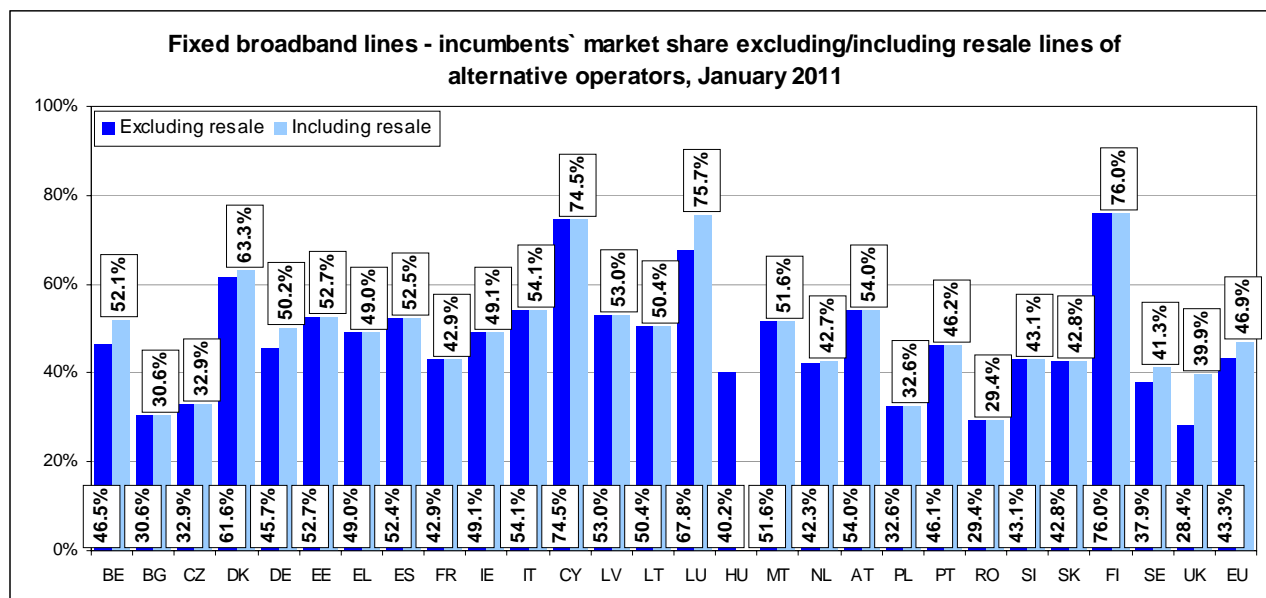


Figure 52: Fixed broadband lines – technology market shares at EU level, January 2006 – January 2011

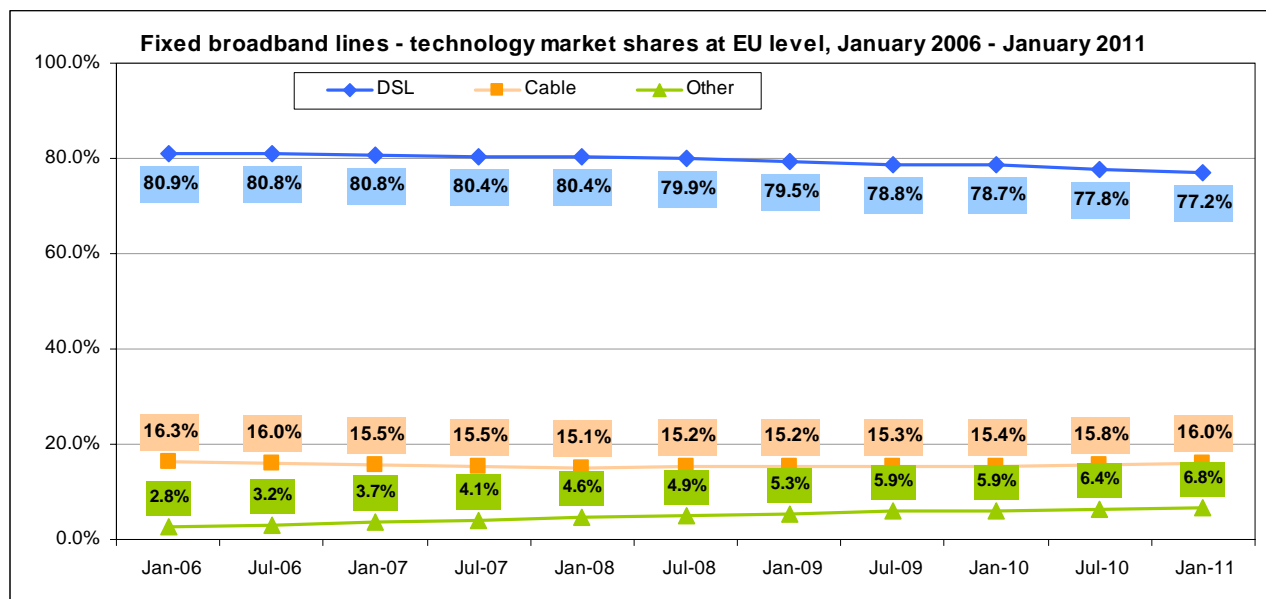


Figure 53: Fixed broadband lines – technology market shares, January 2011

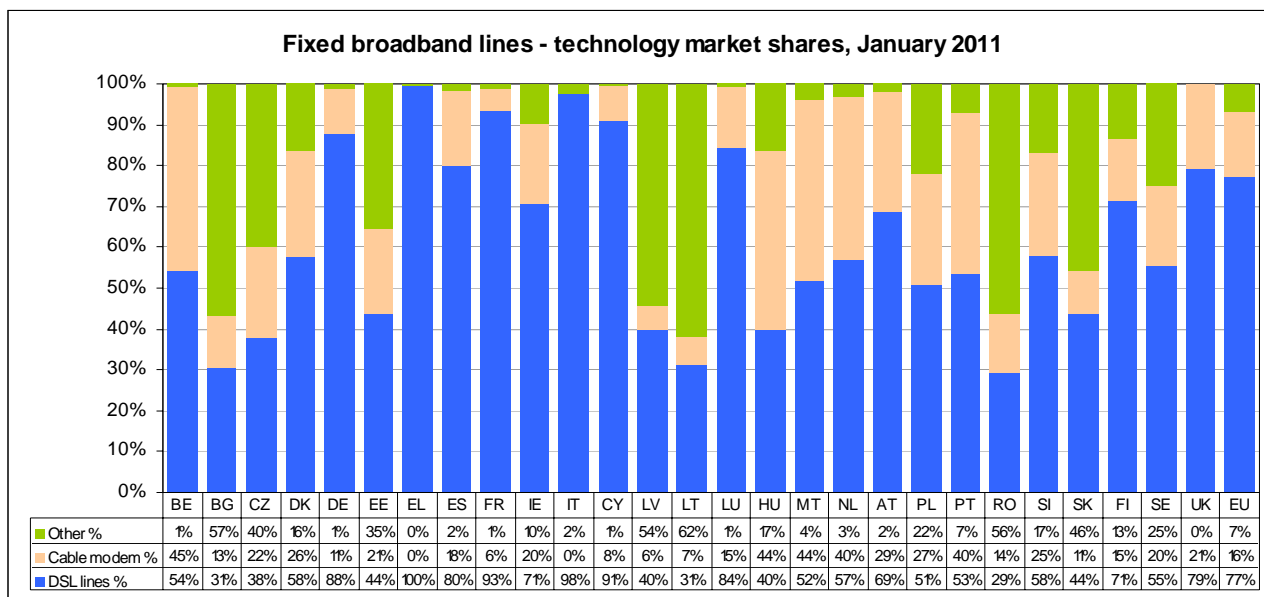


Figure 54: Fixed broadband net adds by technology at EU level, January 2006 – January 2011

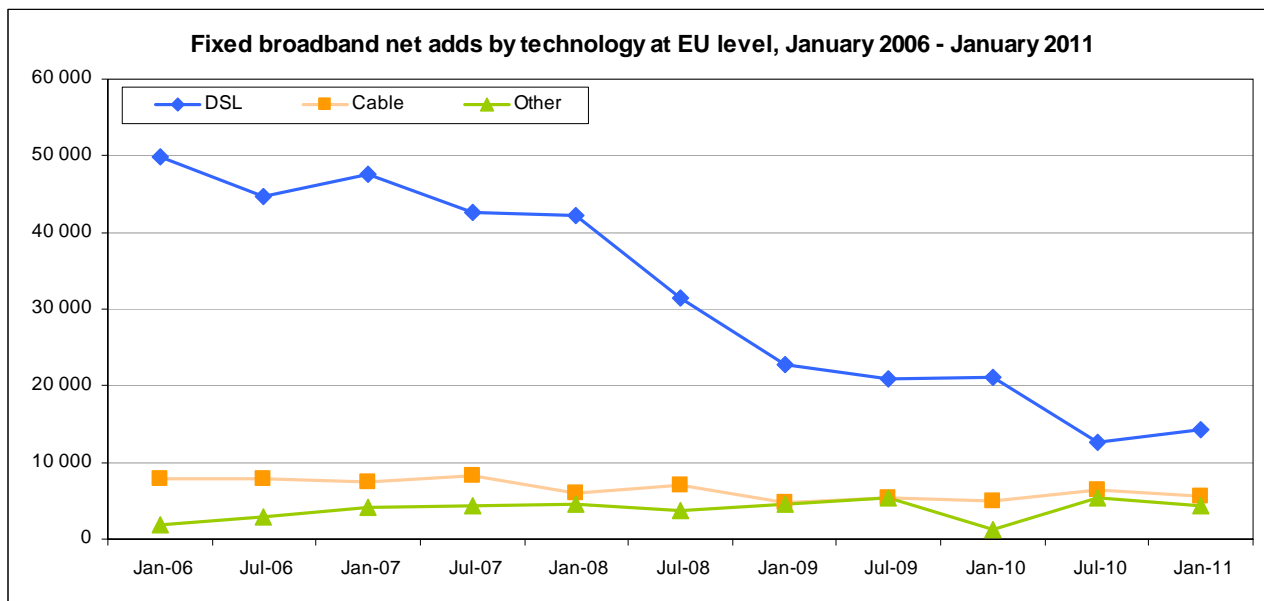


Figure 55: DSL lines, January 2011

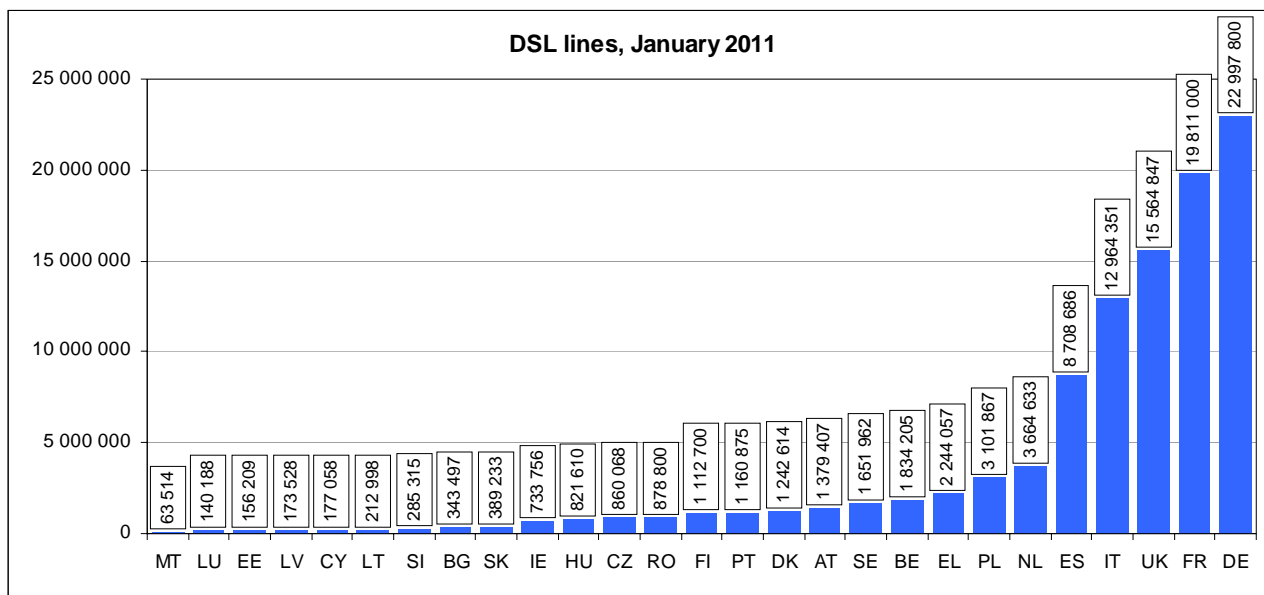


Figure 56: DSL lines and market share at EU level, January 2006 – January 2011

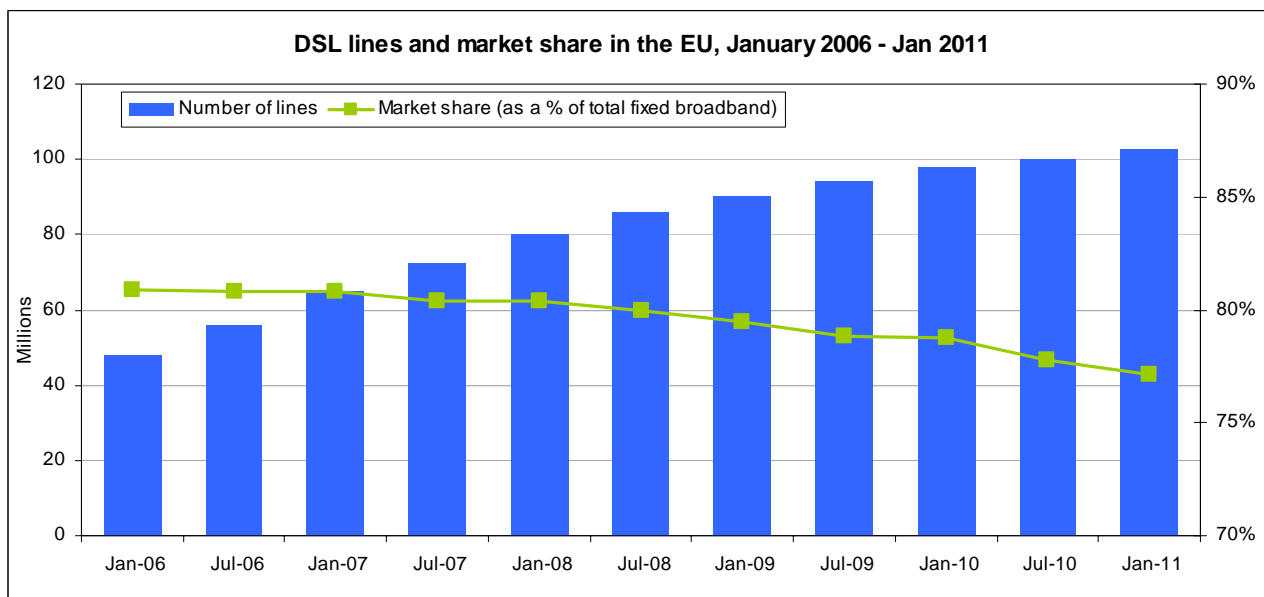


Figure 57: DSL lines – operator market shares at EU level, January 2006 - January 2011

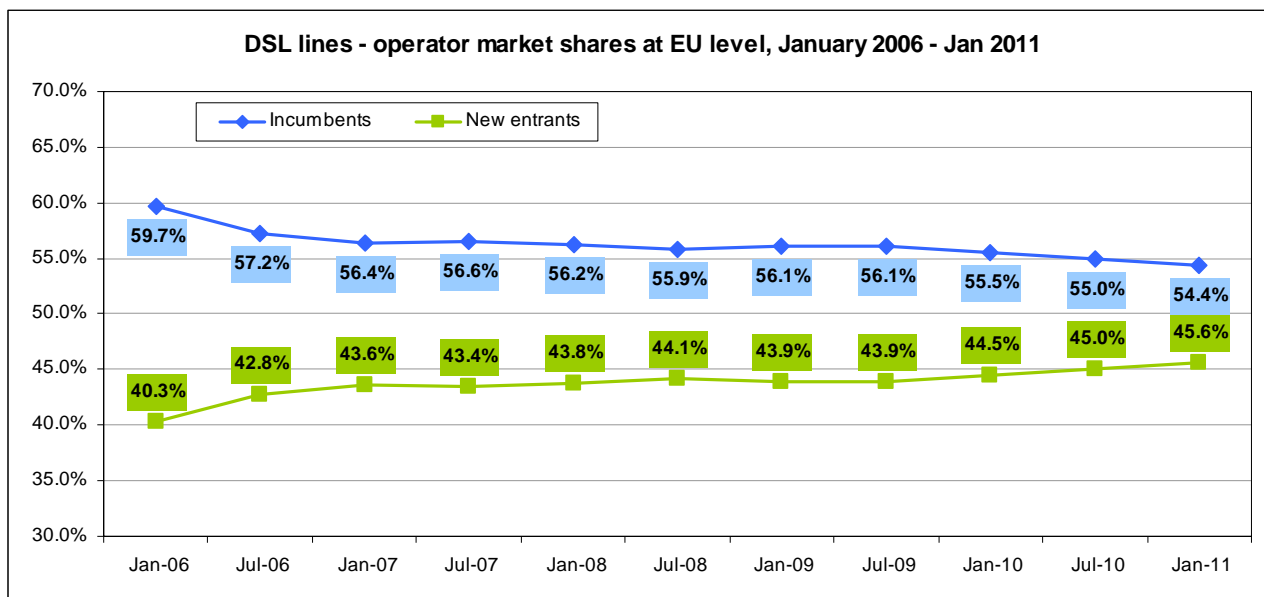


Figure 58: DSL lines – operator market shares, January 2011

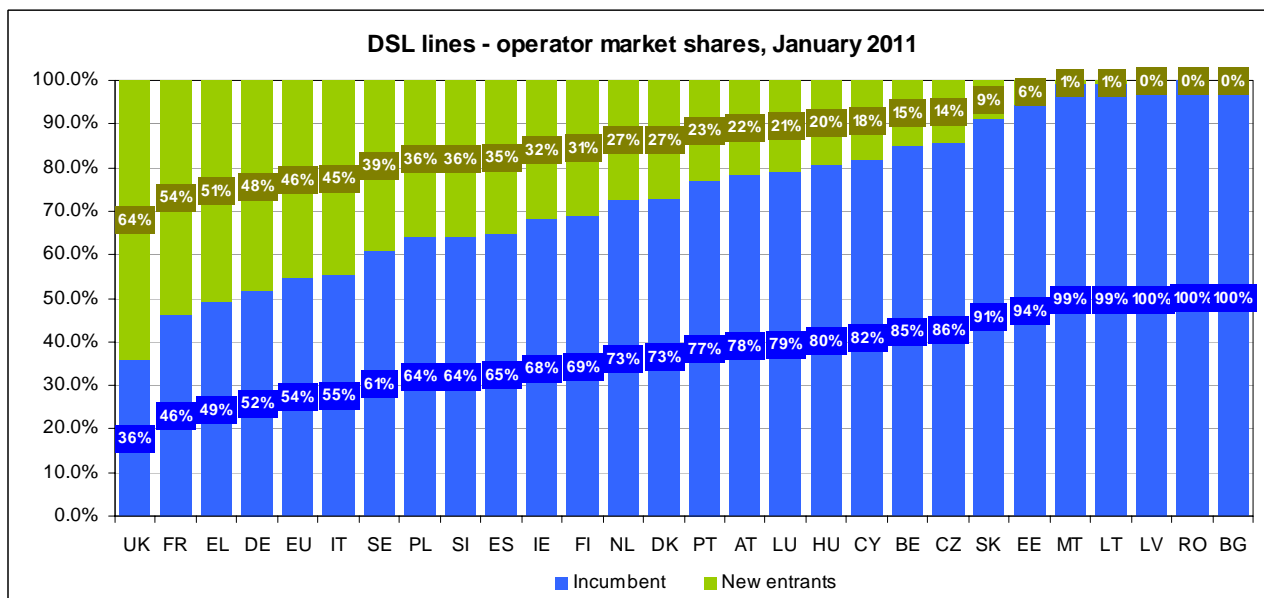


Figure 59: DSL lines – new entrants' market share, January 2009 - January 2011

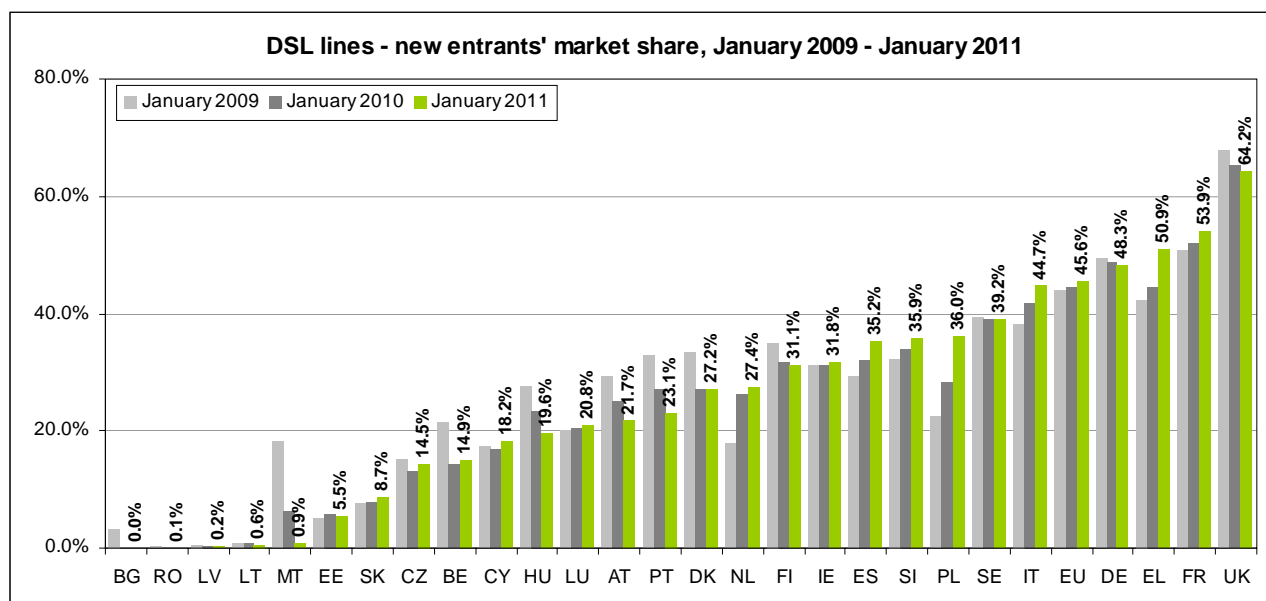


Figure 60: New entrants' DSL lines by type of access at EU level, January 2011

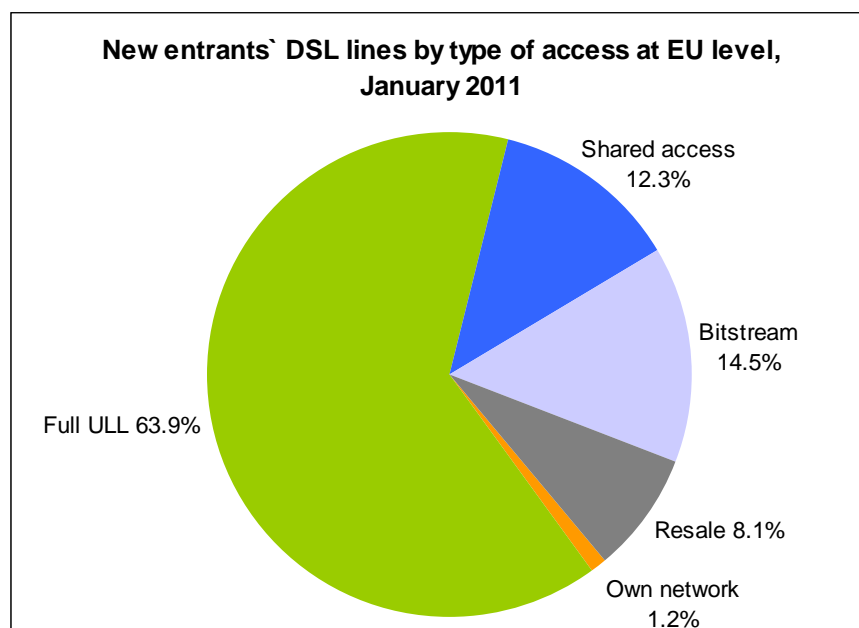


Figure 61: New entrants' DSL lines by type of access at EU level, January 2008 - January 2011

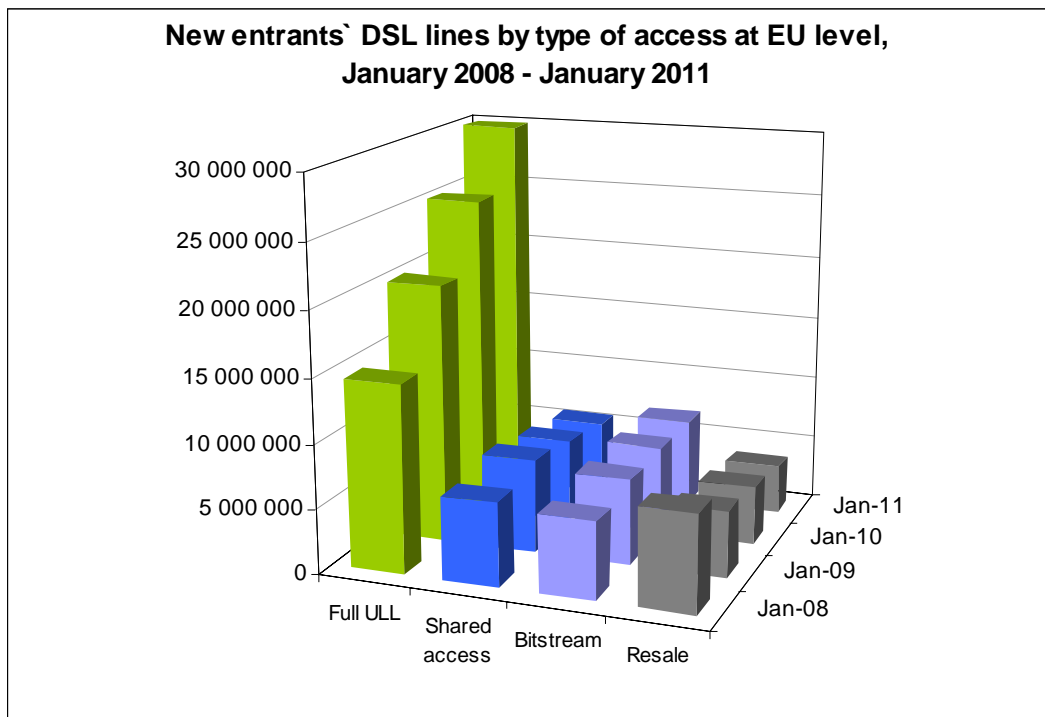


Figure 62: New entrants' DSL lines by type of access, January 2011

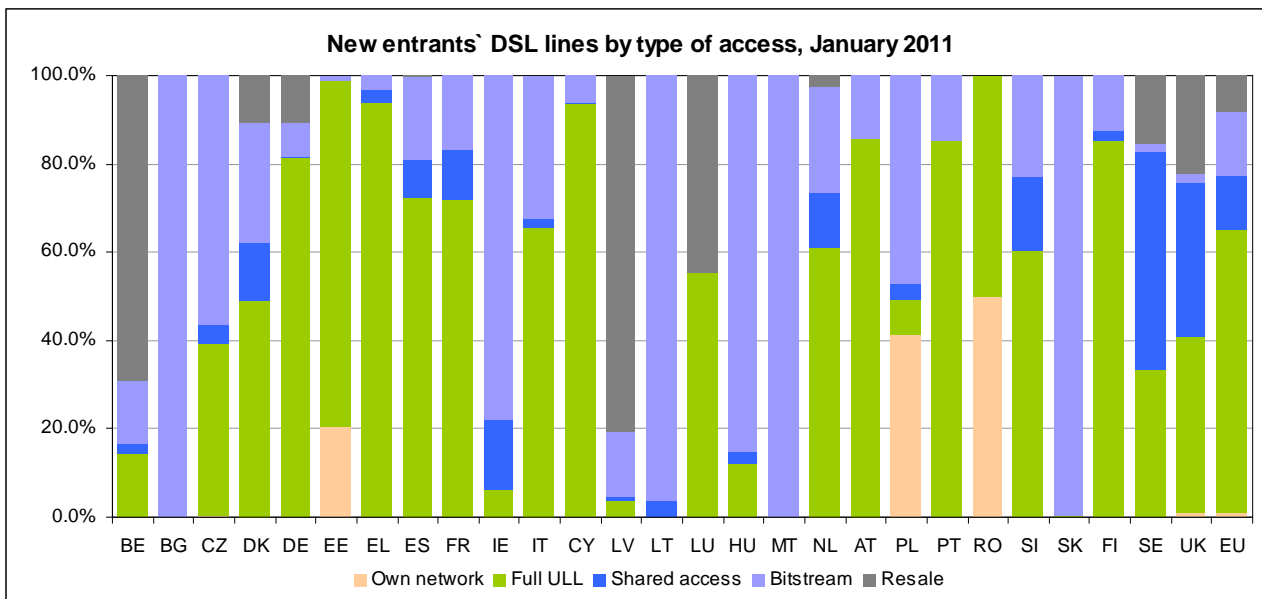


Figure 63: Cable internet lines, January 2011

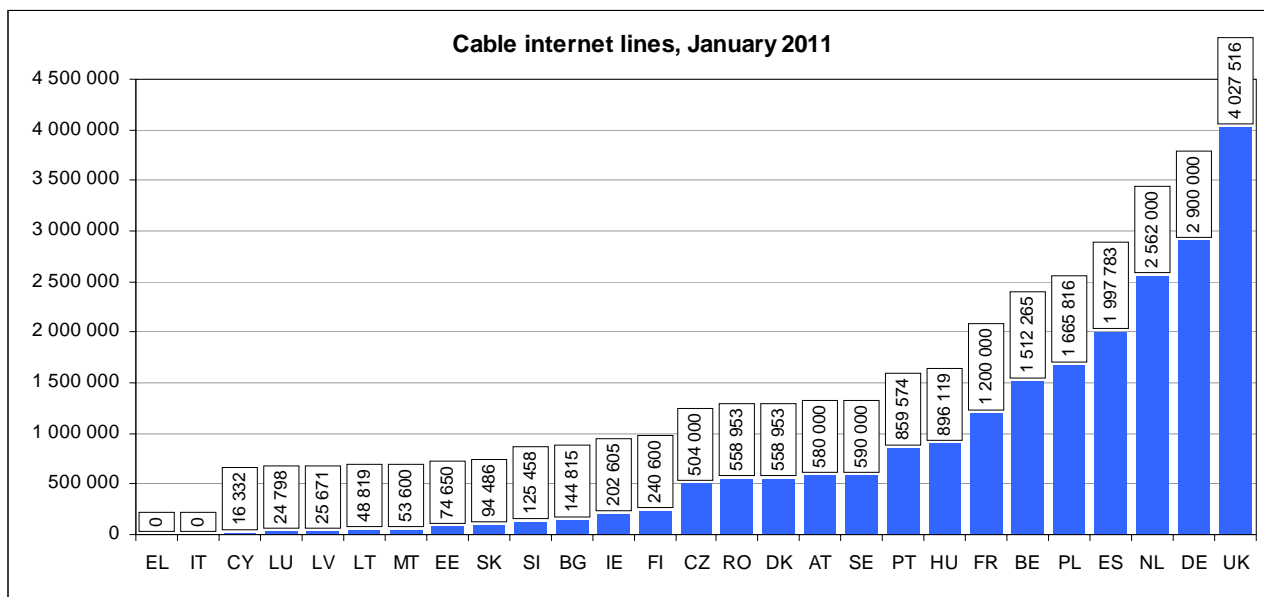
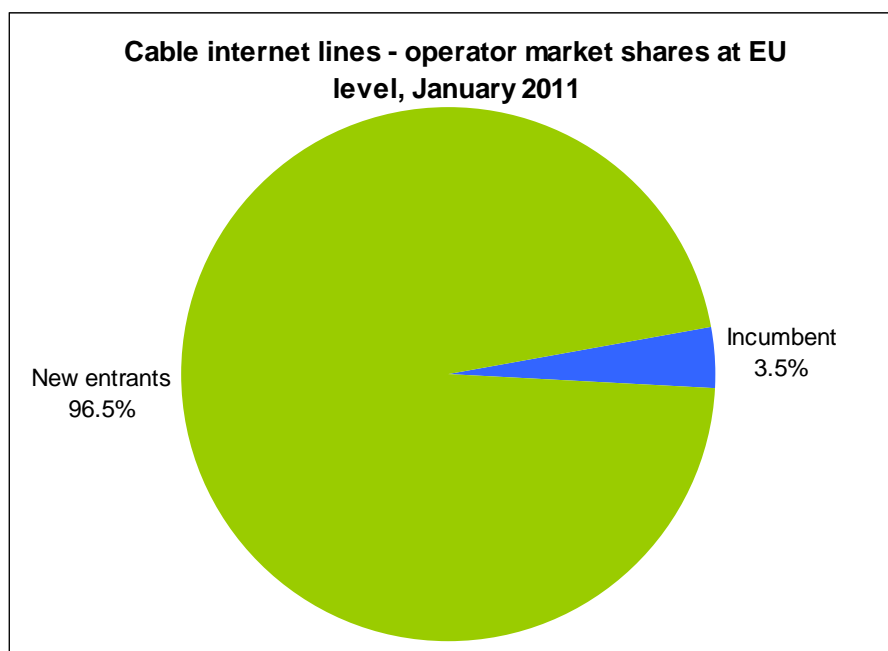


Figure 64: Cable internet lines at EU level, January 2011



4.4 Fixed broadband lines by speed

Figure 65: Fixed broadband lines by speed at EU level, January 2008 – January 2011

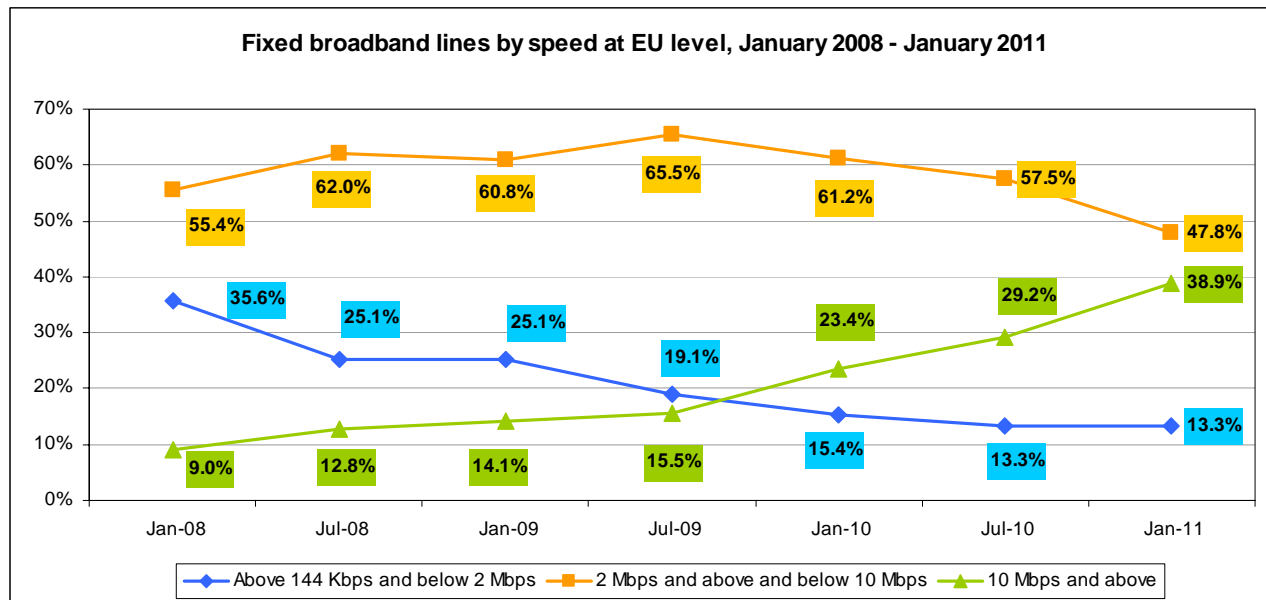


Figure 66: Fixed broadband lines by speed, January 2011

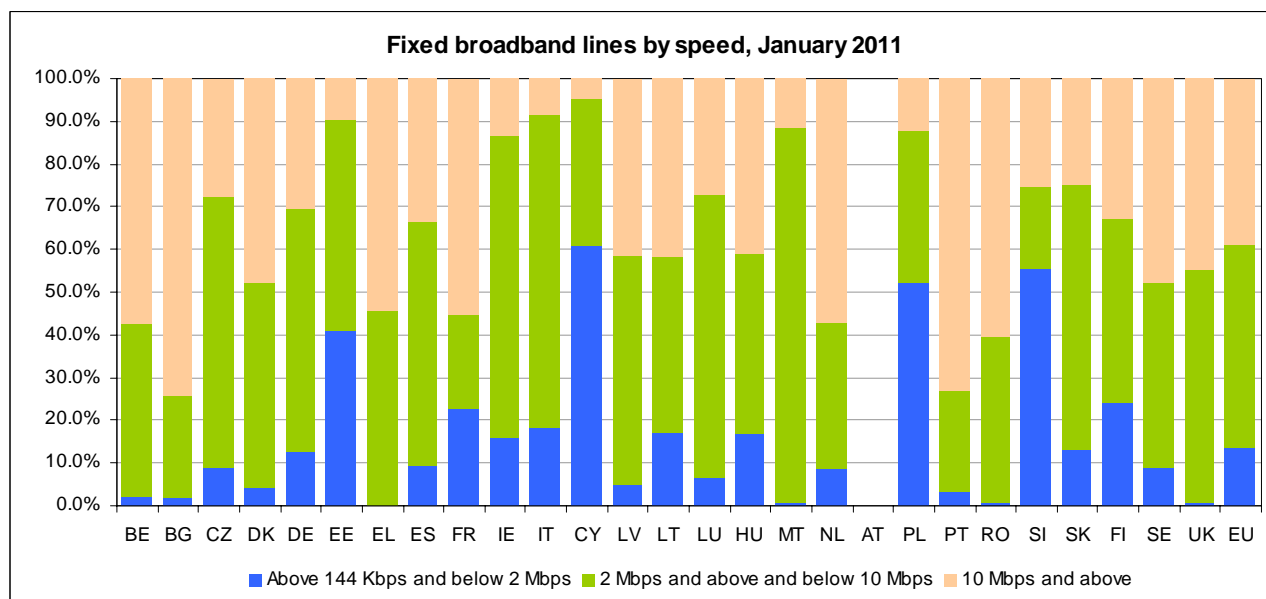
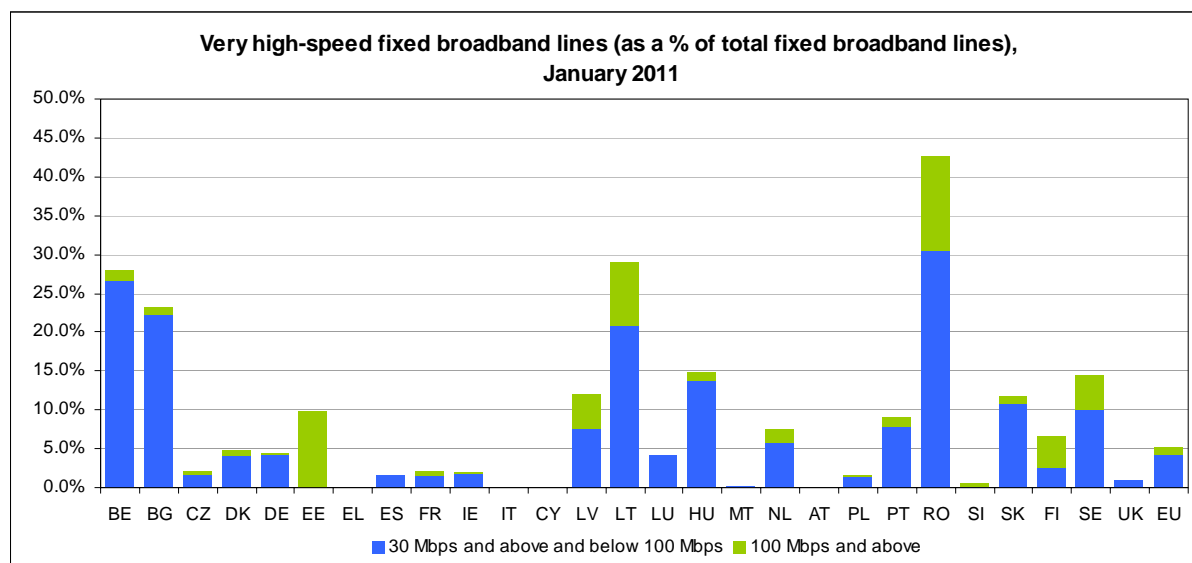


Figure 67: Very high speed fixed broadband lines, January 2011



Austria: Data are not available.

Germany: Figures are partly based on estimates.

Finland: Slightly different speed categories were used. The category between 10 Mbps (included) and 30 Mbps only includes between 10 Mbps (included) and 25 Mbps. The category between 30 Mbps (included) and 100 Mbps only includes between 25Mbps (included) and 100 Mbps.

France: Figures are partly based on estimates.

Hungary: Speed breakdown is not available for LLU lines.

Netherlands: Data for some small operators are not included.

Romania: Data are provisional. Data for alternative operators are estimated.

4.5 Retail mobile broadband access

Figure 68: Mobile broadband – all active users, January 2011

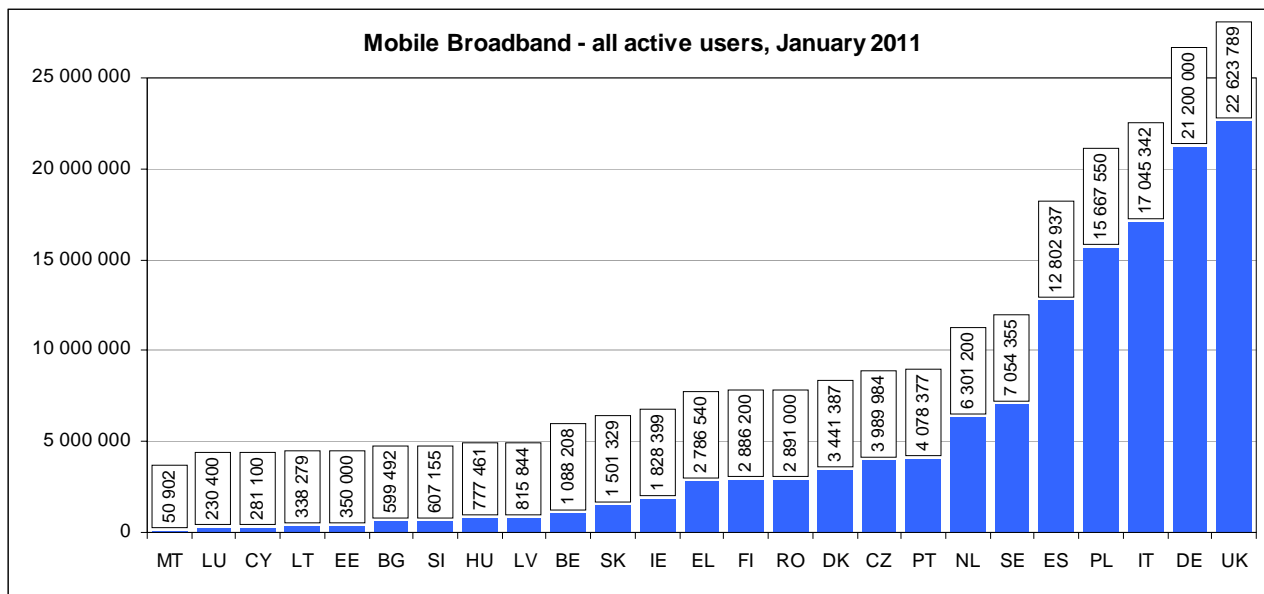


Figure 69: Mobile broadband penetration – all active users, January 2011

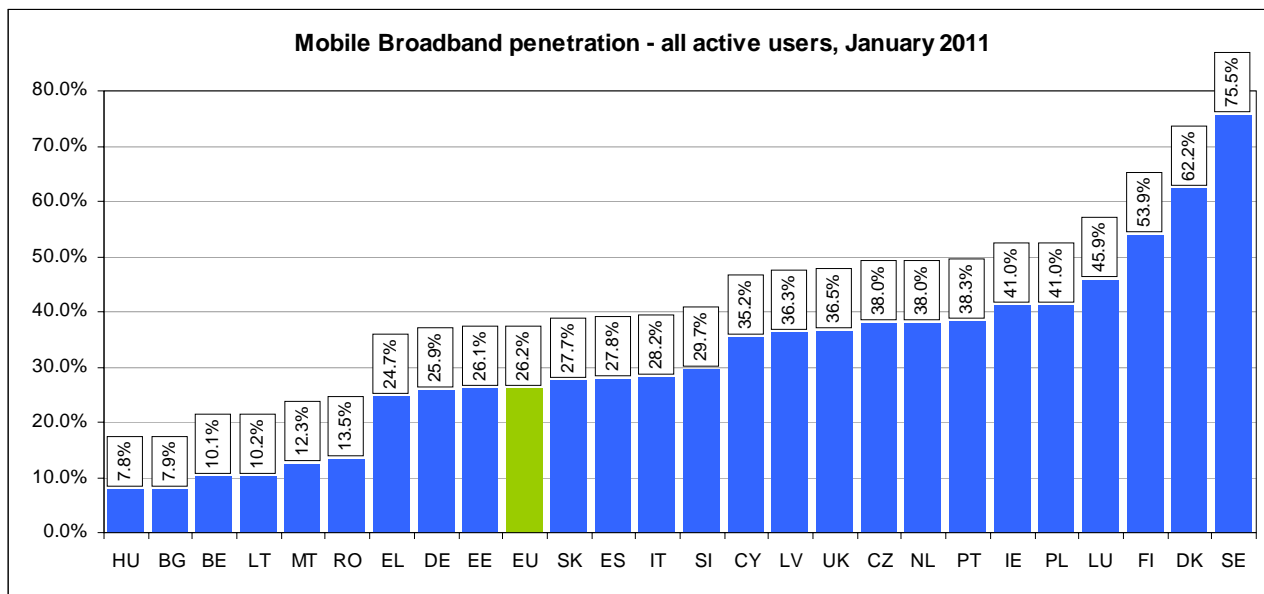


Figure 70: Mobile broadband users – dedicated data service cards/modems/keys only, January 2011

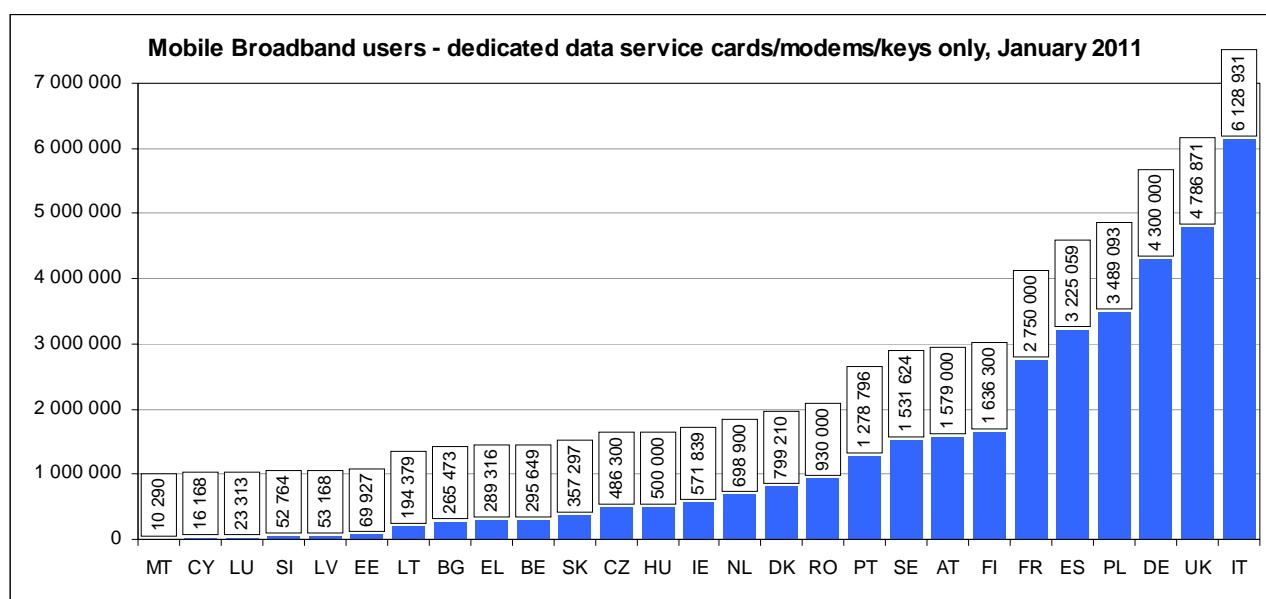
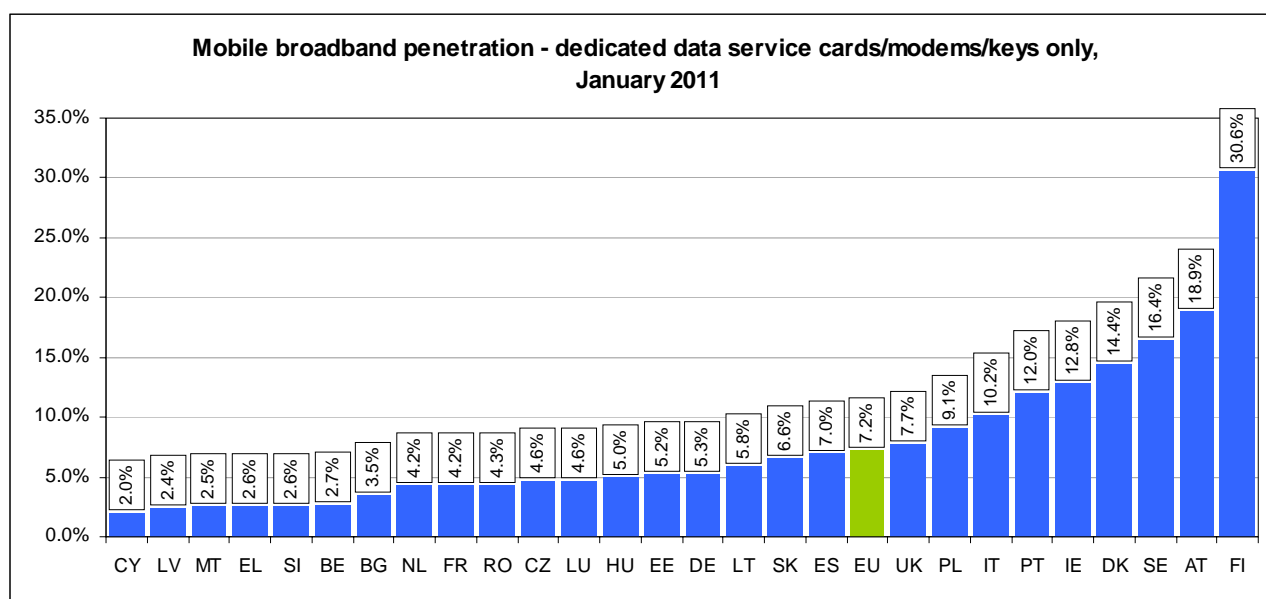


Figure 71: Mobile broadband penetration – dedicated data service cards/modems/keys only, January 2011



Austria: Figures are estimates. Mobile BB dedicated data services via cards/modems/keys" includes the number of contracts with dedicated data volume of 250 MB or more per month as well as dedicated prepaid data services (UMTS/HSPA) with at least 750 MB/quarter downloaded.

Germany: Figures are estimates.

Estonia: Figure on all active users is an estimate.

France: "Mobile BB dedicated data services via cards/modems/keys only" also includes inactive subscriptions.

Hungary: Figure on "Mobile BB dedicated data services via cards/modems/keys only" is an estimate.

Ireland: Data on all active users does not include one of the operators. Data on Mobile BB dedicated data services via cards/modems/keys only refers to download speeds of 2-10 Mbps.

Luxembourg: Figure on "mobile BB dedicated data services via cards/modems/keys only" includes only two operators.

Netherlands: Data is as of 1 July 2010.

Portugal: Those subscriptions are included that made a mobile broadband connection in the last 30 days.

Romania: Data are provisional.

4.6 Price of the Local Loop

This section illustrates the cost of connection and monthly rental for both Fully Unbundled Access (full LLU) and Shared Access (SA) to the loop. Monthly rental and connection fees are presented as well as the total average monthly cost, which is calculated as the monthly fee + the connection fee amortised over three years.

Unless otherwise stated in the footnotes, connection fees include the technical expertise to assess the speed that can be conveyed through and disconnection fees (where applicable). Furthermore, only the price for a single line is presented here (charges may be different in the case of subsequent access). It is assumed that the loop is active and it will be used to provide both telephony and DSL services. Unless otherwise stated, figures exclude a whole range of additional one-off costs that may exist in some Member States like cost of co-location, cost for the cable termination point, cost for installation at the end-user premises, etc.

Data is not always comparable with those of the previous reports, due to changes in methodology in some countries.

The following charts illustrate the monthly total cost for the full Local Loop Unbundling and Shared Access (connection and monthly fees) based on the assumption that the loop is used for three years. The EU average since 2005 is also shown.

Figure 72: LLU monthly average total cost at EU level, October 2005 – October 2010

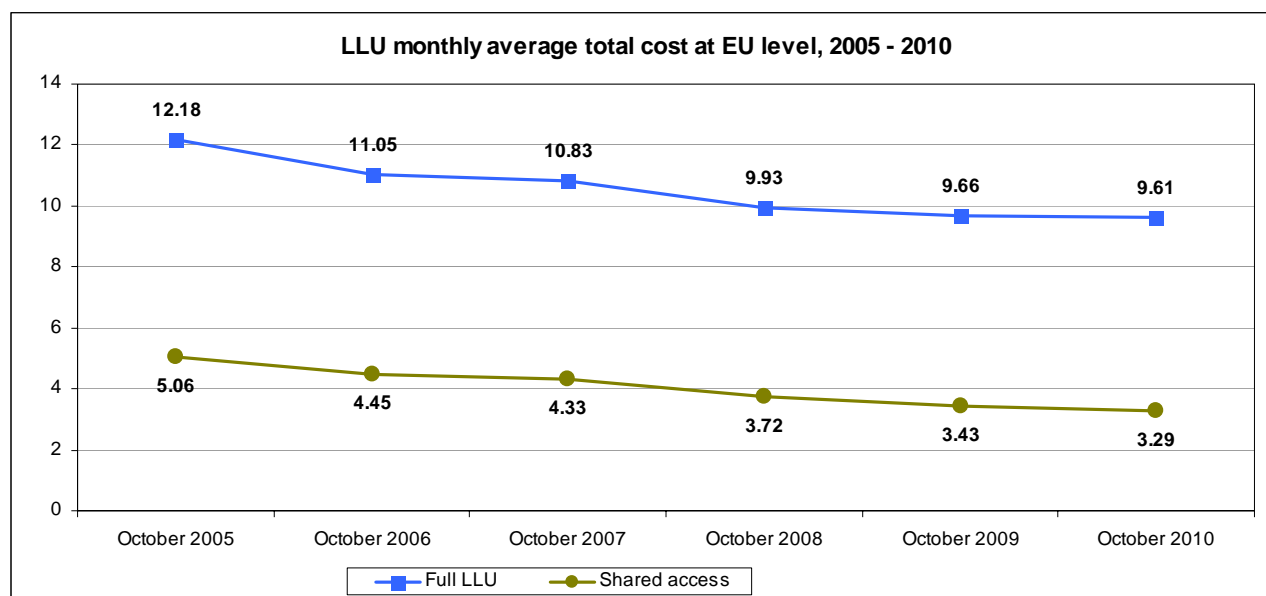
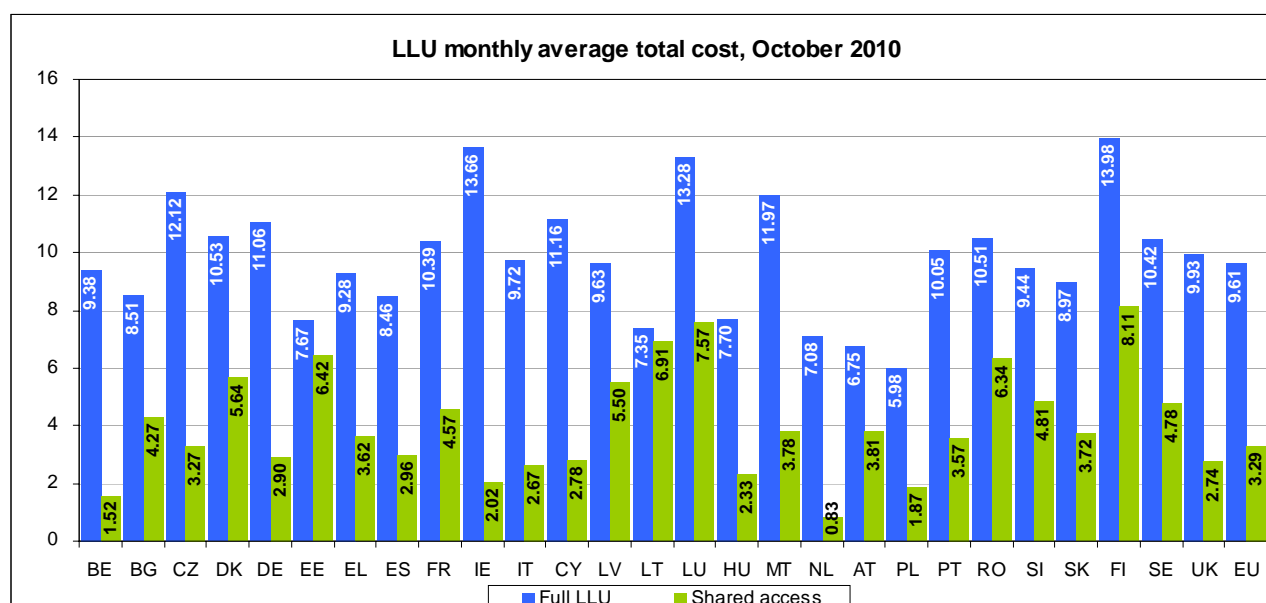


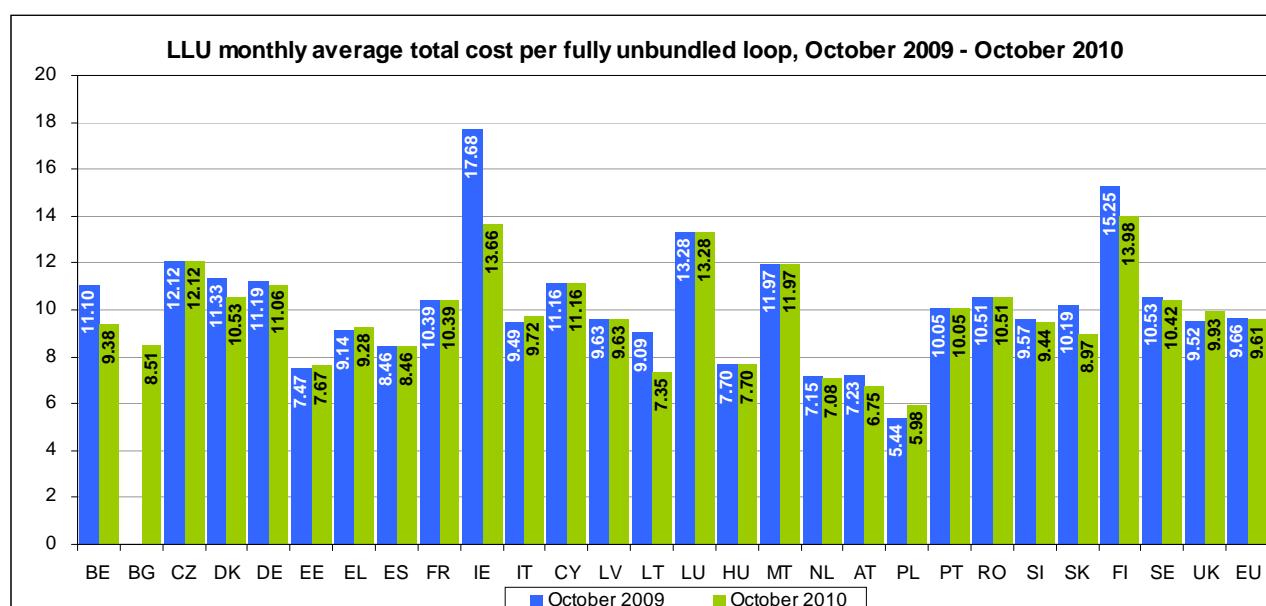
Figure 73: LLU monthly average total cost, October 2010



Czech Republic: 2010 prices were revised on 18/10/2010.

United Kingdom: On 14/10/2010 the monthly rental for full unbundled local loop and for shared access was changed to £7.42 and to £1.25 respectively following appeal of the charge controls.

Figure 74: LLU monthly average total cost per fully unbundled loop, October 2009 – October 2010

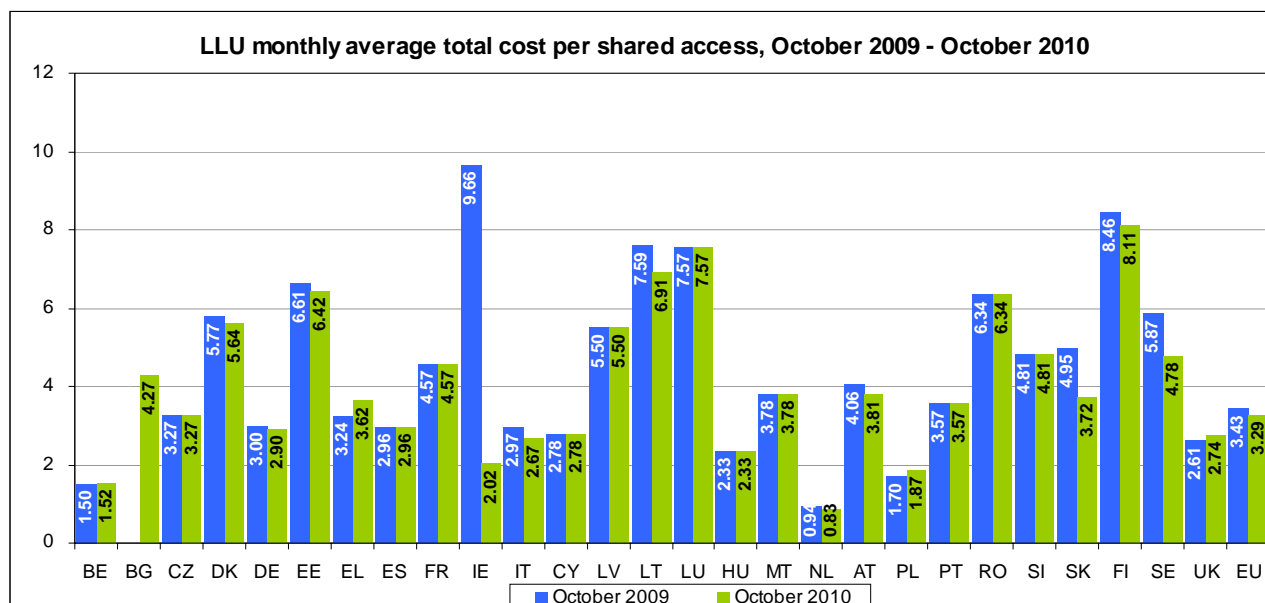


Bulgaria: 2009 data are confidential.

Czech Republic: 2010 prices were revised on 18/10/2010.

United Kingdom: On 14/10/2010 the monthly rental for full unbundled local loop was changed to £7.42 following appeal of the charge controls

Figure 75: LLU monthly average total cost per shared access, October 2009 – October 2010

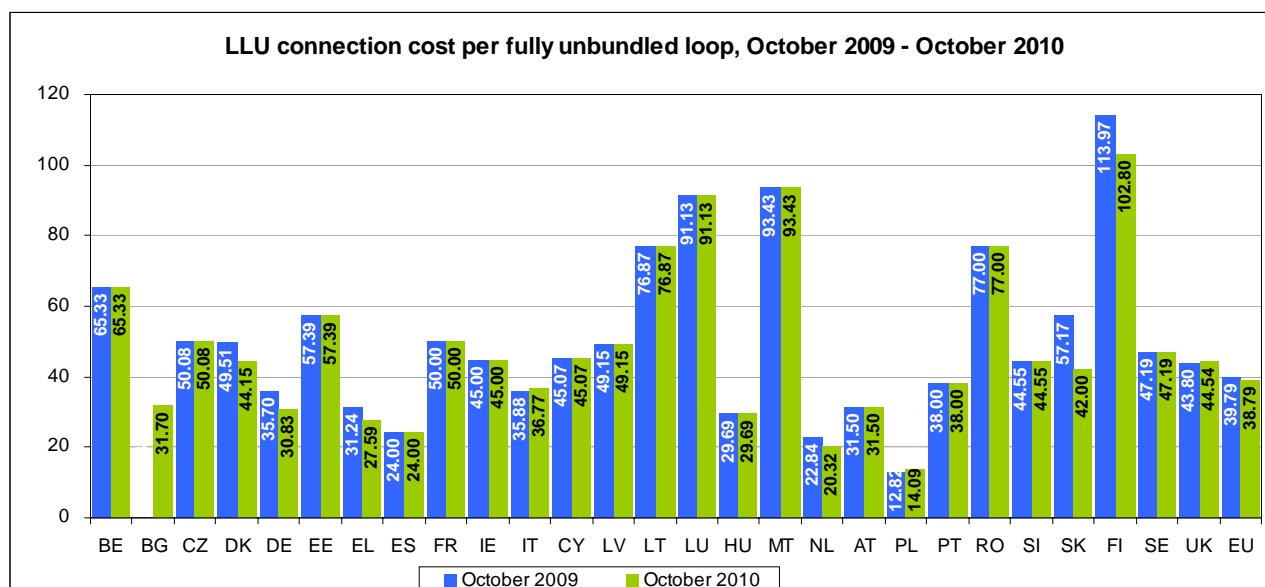


Bulgaria: 2009 data are confidential.

Czech Republic: 2010 prices were revised on 18/10/2010.

United Kingdom: The monthly rate for shared access was adjusted on 14/10/2010 to £1.25 following appeal of the charge controls.

Figure 76: LLU connection cost per fully unbundled loop, October 2009 – October 2010



Bulgaria: Prices are part of the incumbent Reference offer for LLU and are available on Vivacom web site (at 01.10.2010). Price includes a twisted copper pair installation fee of 35,00 BGN, an internal copper installation fee of 12,00 BGN per pair. Including 15,00 BGN disconnection fee. The cost of the test to assess the speed is not included. 2009 data are confidential.

Czech Republic: Connection fee includes possible reconfiguration of the local loop in order to enable OLOs to provide the final retail service in high quality. No disconnection fees are applicable. 2010 prices were revised on 18/10/2010.

Denmark: No disconnection fee

Spain: The cost of the synchronization test and the NTU (Network Termination Unit) installation are optional services and are not included in the price. Data are not comparable with figures provided in previous reports.

Italy: The reported prices do not include both the charge to assess speed that the disconnection cost. In particular, the cost of the test to assess the maximum speed ("qualification cost") is equal to 7,71 Euro. It is optional and is only due in the case the line was not previously qualified for the same xDSL service. Disconnection charge, equal to 32,72 euro from 1 May 2010, is not due in the case the customer migrates to a different OLO or to the incumbent. Colocation costs are excluded. All prices are applicable from May 2010 and the final decision was notified to the European Commission. Connection price is referred to an Active couple without number portability.

Latvia: Connection (7.78 LVL) and testing (27.08 LVL) included.

Lithuania: Figures include the cost of the test to access and disconnection cost.

Malta: Disconnection fees are included (Full unbundled €33.54).

Ireland: ULMP connection charge with successful completion (existing metallic path) – PU & PUI Order Type

Austria: no installation or connection fee during promotion periods.

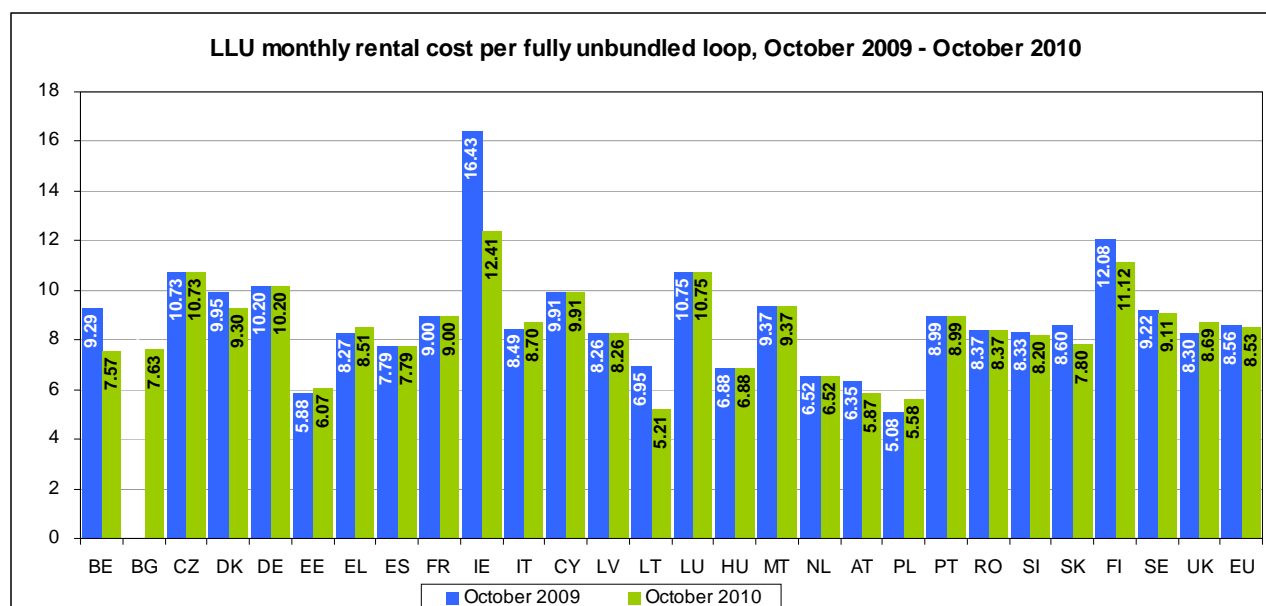
Poland: Collocation costs not included. The cost of the splitter is not included because it depends on the incumbent's estimated cost (the price is not included in the reference offer). Disconnection costs included, speed test not included. The fee applies to both active and inactive links. The specified fee is for an active link, the fee for inactive link is 143.83 PLN.

Portugal: The test to assess the speed is not requested.

Romania: Cost of the test to assess the speed and disconnection fees included.

Finland: Weighted average of 31 SMP operators providing ULL.

Figure 77: LLU monthly rental cost per fully unbundled loop, October 2009 – October 2010



Belgium: Decision of 3 August 2010 available at <http://www.bipt.be/ShowDoc.aspx?objectID=3307&lang=en>

Bulgaria: Prices are part of the incumbent Reference offer for LLU and are available on Vivacom web site (at 01.10.2010). Price includes a twisted copper pair rental fee of 14,50 BGN and an internal copper rental fee of 0,43 BGN per pair. 2009 data are confidential.

Czech Republic: 2010 prices were revised on 18/10/2010.

Austria: Regular ULL price lowered to the value of the former promotional price.

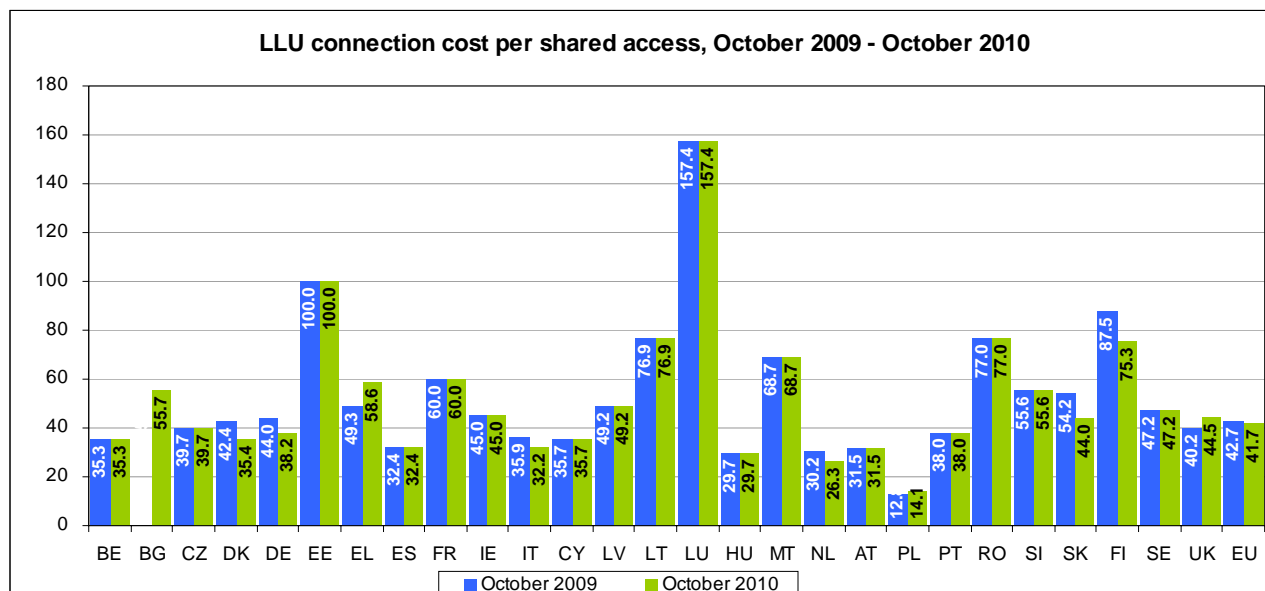
Finland: Weighted average of 31 SMP operators providing ULL.

Poland: The fee applies to both active and inactive links.

Portugal: The splitter is not provided by the incumbent.

United Kingdom: On 14/10/2010 the monthly rental for full unbundled local loop was changed to £7.42 following appeal of the charge controls

Figure 78: LLU connection cost per shared access, October 2009 – October 2010



Bulgaria: Includes a twisted copper pair installation fee of 68,00 BGN, an internal copper installation fee of 29,00 BGN per pair. Including 12,00 BGN disconnection fee. The cost of the test to assess the speed is not included. 2009 data are confidential..

Czech Republic: 2010 prices were revised on 18/10/2010.

Denmark: No disconnection fee

Spain: The cost of the synchronization test is not included. The price of the splitter provided by the incumbent included.

Finland: Weighted average of 31 SMP operators providing ULL.

Ireland: LS Connection Charge with successful completion (existing metallic path - access seeker provides exchange splitter)

Italy: The reported prices do not include both the charge to assess speed that the disconnection cost. In particular, the cost of the test to assess the maximum speed ("qualification cost") is equal to 7,71 Euro. It is optional and is only due in the case the line was not previously qualified for the same xDSL service. Disconnection charge, equal to 32,72 euro from 1 May 2010, is not due in the case the customer migrates to a different OLO or to the incumbent. Colocation costs are excluded. All prices are applicable from May 2010 and the final decision was notified to the European Commission. The splitter cost is included (price on public consultation)

Lithuania: Figures include the cost of the test to access and disconnection cost. Frequency splitter's price is included.

Latvia: Connection (7.78 LVL) and testing (27.08 LVL) included. Connection of splitter is 640 LVL.

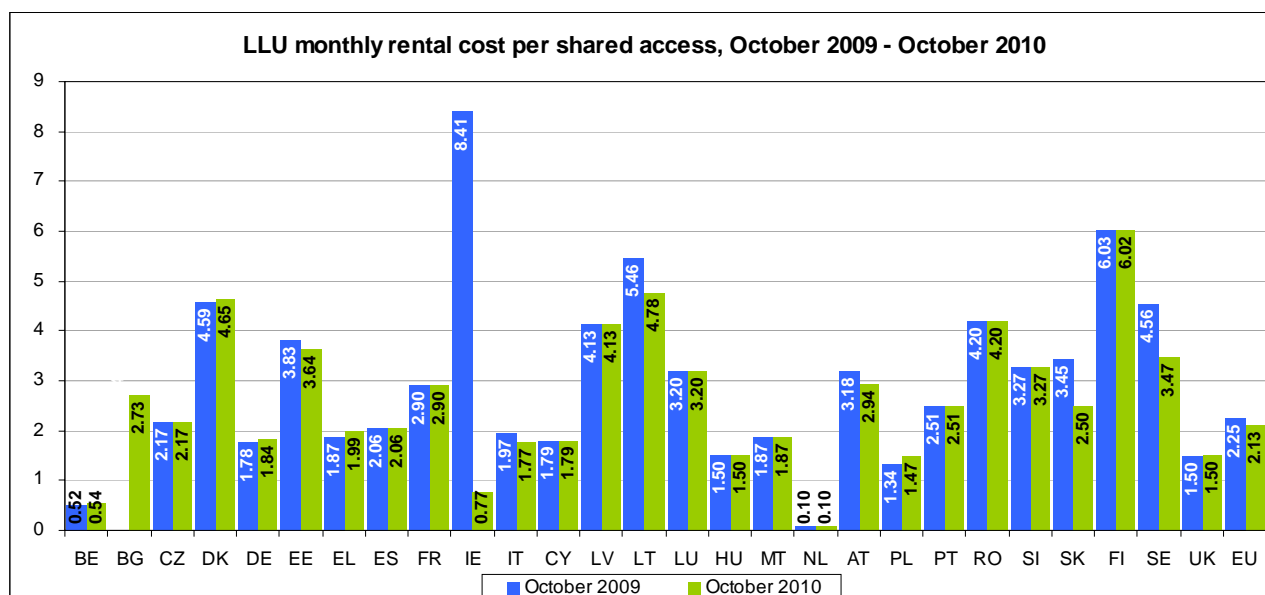
Malta: Disconnection fees included: Shared Access €26.76

Poland: Colocation costs not included. The cost of the splitter is not included because it depends on the incumbent's estimated cost (the price is not included in the reference offer). Disconnection costs included, speed test not included. The fee applies to both active and inactive links. The specified fee is for an active link, the fee for inactive link is 143.83 PLN.

Portugal: The test to assess the speed is not requested.

Romania: Splitter price included

Figure 79: LLU monthly rental cost per shared access, October 2009 – October 2010



Belgium: €0,87 (incl. splitter maintenance fee)

Bulgaria: Includes a twisted copper pair rental fee of 4,90 BGN and an internal copper rental fee of 0,43 BGN per pair. 2009 data are confidential.

Czech Republic: Price of the splitter is included in the monthly rental price. 2010 prices were revised on 18/10/2010.

Austria: 50% of full ULL monthly rental.

Finland: Weighted average of 31 SMP operators providing ULL.

France: 1,8 € for line and 1,1 € for splitter.

Latvia: Cost of splitter is 13.87 LVL.

Malta: Splitter to be procured by OAOs.

Poland: The specified fee is for an active link, the fee for inactive fee link is 22 PLN

Portugal: The splitter is not provided by the incumbent.

Romania: Maximum average tariffs

United Kingdom: The monthly rate for shared access was adjusted on 14/10/2010 to £1.25 following appeal of the charge controls.

5. CONVERGED SERVICES - BUNDLED OFFERS

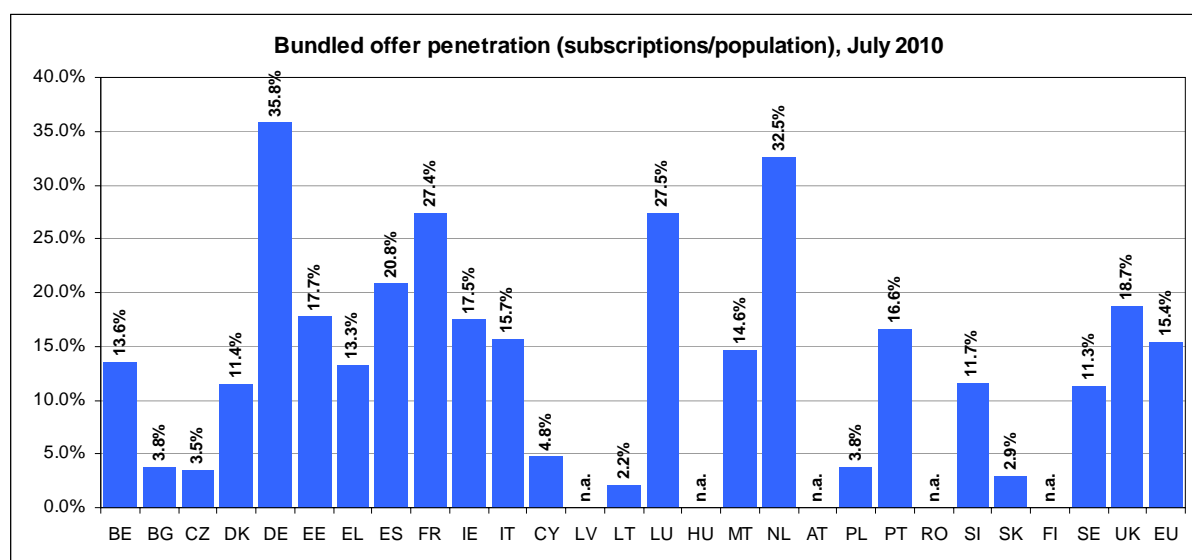
Fixed broadband offers are increasingly bundled to other services (e.g.: fixed telephony or television). Although bundling is hard to measure (sometimes services in one offer are invoiced separately, sometimes not), it is becoming a key element of the fixed electronic communications markets.

'Bundled offer' means a commercial offer of a single operator which includes two or more services such as fixed and mobile public telephony services, access to TV programmes and broadband internet access, offered for a single price and as part of one bill. NRAS however may use different definitions, so the figures shown in this report are not always comparable.

Data in this section is purely indicative and can be completed with the Eurostat E-Communications Household survey. The differences with this Progress Report results can be attributed to a different definition (due to the billing of the services) and the lack of data for some countries. Although not every Member State is collecting data to measure the extent of this market development, the situation is likely to improve in the following Reports.

The charts show the penetration of bundled services (measured as the % of the population subscribing to such offers) and the number of operators providing these offerings.

Figure 80: Bundled offer penetration, July 2010



Belgium: Data as at 1 October 2010.

Bulgaria: Data of subscribers as of December, 31, 2009. Bundles include VPN and Data VPN, Voice VPN, data VPN and Internet access, Voice over WiMax network and Internet access, Fixed telephony, Voice over WiMax network and Internet access).

Czech Republic: Bundled offers include jointly offered services which are provided for a sole discount price. Bundled offers do not include services that are offered separately (e.g. incumbent services).

Denmark: Triple play comprises internet, telephony (either mobile or fixed) and TV.

France: Subtotals for double and triple play are estimates.

Germany: Double Play: The figure for Mobile voice telephony and BB are based on NRA's estimates. Triple Play: Cable operators are not included. Access to TV programs, broadband internet access and fixed voice telephony is marketed as a single offer by cable operators but not for a single price. Therefore, bundled offers provided by cable operators do not fall under the definition used by the European Commission in this report.

Latvia: Not available.

Netherlands: Data as of 31-12-09. Cable TV is always offered separately. OPTA counts dual play + cable TV as triple play. Figures do not necessarily refer to a single offer with a single price.

Hungary: Not available

Austria: Data not available

Portugal: All figures refer to 31-12-2009. Double play and triple play subscriptions are billed, marketed and sold together (and perceived by the consumers as multiple play offers according to the market research by the NRA) but might not have a single price (every part of the bundle has one individual price).

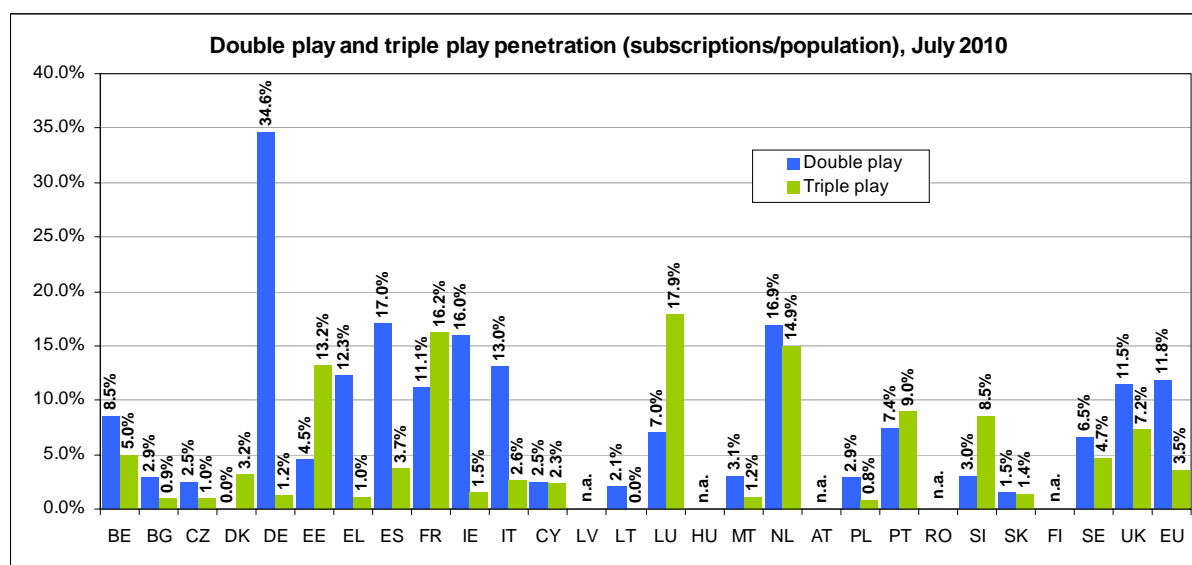
Romania: Not available

Finland: Data not available.

Sweden: All figures as of 31 December 2009.

United Kingdom: A small number of households claim to have more than one bundle, so sub-totals (and any subsequent adding together) may contain a small amount of double counting.

Figure 81: Penetration of double and triple play, July 2010



6. BROADCASTING

Figure 82: Household penetration of different broadcasting services, July 2010

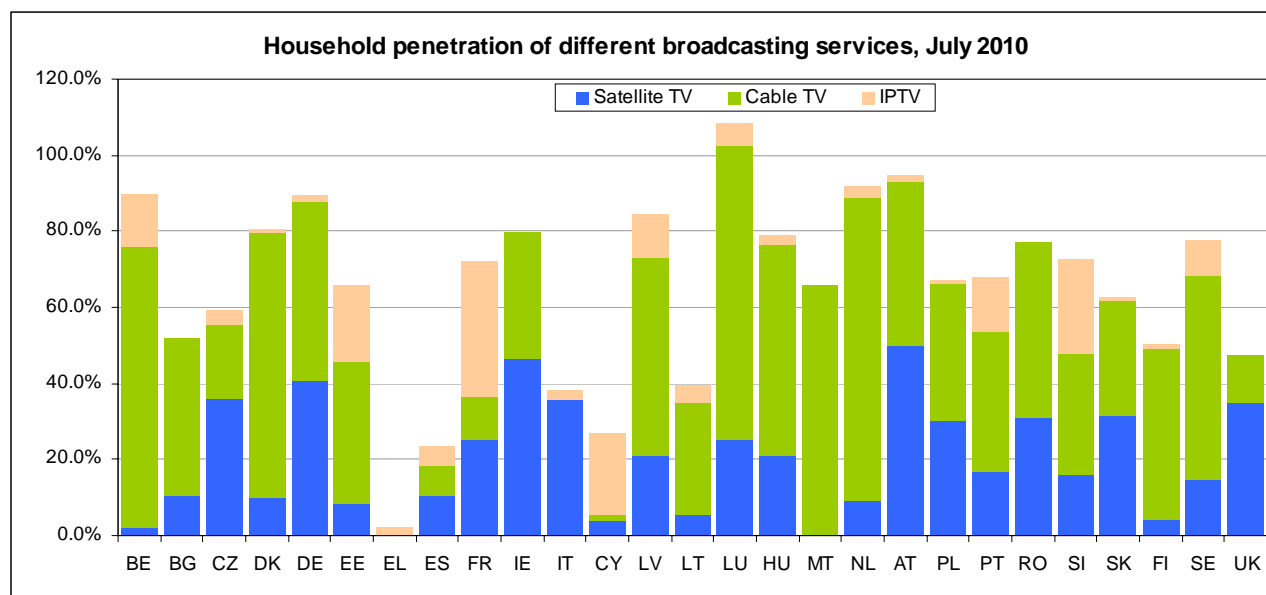
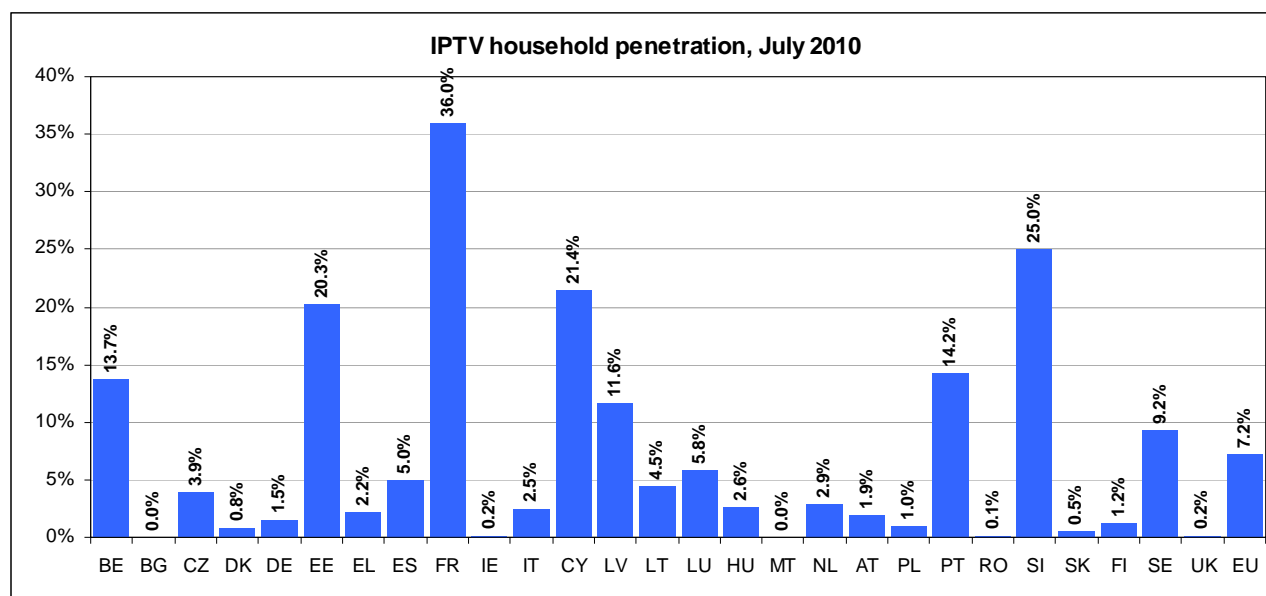


Figure 83: IPTV household penetration, July 2010



Belgium: Data are as of 1.1.2010, Source satellite TV: journal De Tijd 30.12.2009

Bulgaria: Data are as of December, 31, 2009

Czech Republic: Only digital satellite TV is included.

Germany: Data are as of 01/01/2010. DVB-T (2,0 Mio.) is excluded. Source: SES ASTRA

Denmark: The figures are based on an annual survey and should therefore be considered estimates.

Estonia: Number of TV households using satellite TV is estimation.

Italy: As at march 2010. Source of data for satellite is Digita n.18/2010 on Makno data. IPTV subscriptions include Fastweb, Telecom Italia and Wind.

Luxembourg: Figures are estimates.

Latvia: Figures are estimates by the Latvian Association of Electronic Communication. Figures represent HS using the particular technology as main technology.

Netherlands: the figure for IPTV includes only IPTV delivered over DSL.

Romania: The value for Satellite TV represents only the DTH subscriptions. July 2010 figures are provisional

Slovenia: Satellite TV includes also households without subscriptions. Number for paying satellite TV households is 25.351.

Pillar 1

Regulatory developments

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INSTITUTIONAL FRAMEWORK

Independence and organisation of national regulatory authorities

Effective and independent national regulatory authorities (NRA) have been a requirement for ensuring impartial regulation since the liberalisation of electronic communications markets. Independent regulators contribute to a consistent and coherent implementation of the regulatory framework to support the digital single market. While initially the notion of independence focused around the principle of separation between regulatory and operational functions, more recently it has been acknowledged that independence of the national regulatory authorities should be strengthened in order to ensure a more effective application of the regulatory framework and to increase their authority and the predictability of their decisions. To this effect, the Better Regulation Directive amended the Framework Directive by requiring *inter alia* that national regulatory authorities responsible for *ex-ante* market regulation or for resolution of disputes are protected against external intervention or political pressure. Moreover, the revised Directive mandates that rules are laid down which would allow for dismissal of the heads of an NRA only when they no longer fulfil the conditions required for the performance of their duties. In order to allow them to effectively perform their functions, it must also be ensured that NRAs have appropriate human and financial resources including their own budget. Member States must transpose the revised Directive by 25 May 2011.¹

The Commission continues to monitor closely the institutional arrangements with regard to the independence and effectiveness of national regulatory authorities. The Commission constantly follows developments concerning the appointment and dismissal of the heads of NRAs as well as the availability of adequate financial and human resources. Where necessary, the Commission has taken action and in a number of cases the issues have been resolved in 2010.

As regards the requirement of effective structural separation of regulatory functions from activities associated with the ownership or control of electronic communications providers, this continued to cause concern in certain Member States. In November 2010, the Commission decided to refer Lithuania to the EU Court of Justice for lack of effective structural separation as the Ministry of Communications, which is directly involved in regulatory activity, continued to exercise control over electronic communications operators. In Romania, despite commitments to transfer all regulatory powers from the Ministry to the NRA, the rules on structural separation remained unchanged and on 24 November 2010 the Commission decided to send a Reasoned Opinion. The Commission services were also looking into a similar situation in Estonia concerning the Ministry of Economic Affairs and Communications. At the same time, the case concerning the lack of structural separation regarding the Ministry of Transport in Latvia was finally resolved with its regulatory functions regarding frequency and numbering management being transferred to the Ministry of Environmental Protection and Regional Development.

Clear rules regarding the formal establishment and dismissal of the NRA are a prerequisite for the impartiality and the transparency of the NRA's functioning. In June 2010 the Commission

¹ In order to assist with the implementation of the revised EU rules in this respect, the Commission services provided initial guidance to Member States in the Communications Committee's Working Document on the *Independence of the NRA* (COCOM10-16).

was able to close the infringement proceeding against Slovakia after the relevant amendments to national legislation setting out the rules for dismissal of the NRA management had become effective. Also in Slovenia following the launching of an infringement procedure by the Commission in March 2010 on the need to establish clear rules for the dismissal of the head of the regulatory authority, legislative amendments to the Electronic Communications Act aimed at addressing the issue were underway. In Romania, an additional letter of formal notice was sent in May 2010, prompted by the concern that the regime granting the government a large discretion to restructure the NRA by way of emergency acts would not be consistent with EU law. However, following the parliament's approval of the emergency ordinance which secured a stable statute for the NRA, the infringement proceeding was closed in November 2010.

In Austria, the NRA responsible for the regulation of the broadcasting sector which had been a subordinate administrative body of the Federal Chancellery became an independent authority.

The issue of whether a legislative body is suited to act as a national regulatory authority was the subject of a preliminary ruling request of the Belgian Constitutional Court (case C-389/08). The ECJ held that while this is not in principle precluded, the requirements of competence, independence, impartiality and transparency must be met and that its decisions can be made the object of an effective appeal.

A number of structural changes were witnessed in 2010. In Hungary, following legislative changes, the NRA was merged with the National Radio and Television Commission and the new management including a vice president responsible for electronic communications was elected for 8 years and was vested with strong safeguards against dismissal. As regards the attribution of additional responsibilities, in the Netherlands new consumer protection tasks were entrusted to the NRA. In Ireland the regulation of premium rate services was attributed to the NRA and in Belgium the regulator's internal structure was reorganised. Finally in the UK, the Government proposed to relieve the NRA of some of its tasks in the media and content field and at the same time to transfer to it the regulation of the postal sector.

Resources and powers

In order to be able to effectively perform their tasks, national regulatory authorities need to be able to rely on the necessary resources in terms of staffing, expertise and financial means. In the context of the economic downturn, limitations on human and financial resources have been faced in a number of Member States. Reductions in the number of NRA staff were reported in Slovakia and the UK while pressure to decrease personnel was also felt in the Czech Republic. In Romania and Bulgaria the number of Board members was reduced and this was also proposed in Spain.

The availability of sufficient financial resources is essential for an effective and independent functioning of the NRA. In 2010, cuts in budgetary resources were reported in France and the Netherlands. Significant salary cuts were reported in Greece. In Malta, a lack of organisational flexibility was felt due to delays in the government's approval of the authority's budget and in Belgium strong concerns have been expressed again regarding the human and financial resources of the NRA and in particular regarding the use of the budget.

Legislative amendments with regard to NRA budgets were also reported in 2010. For instance in Cyprus the presentation of the NRA's budget has been amended and now provides for a

more specific classification of items and amounts allocated to this body. To that end, any potential disapproval on the part of the Cypriot Parliament of the regulator's budget would now relate to a specific item, and not to its totality. In Luxembourg new legislation strengthened the autonomy of the NRA's budget, complementing an earlier legislative measure that allowed for staff increases.

As regards the powers of the NRA with regard to market analysis and regulation, the German legislation of 2007 on the regulatory treatment of 'new markets' was in the process of being annulled by draft legislation adopted by the government in May 2010 and expected to enter into force in March 2011. This followed a judgment by the ECJ in case C-424/07 where it declared that an NRA's discretionary powers cannot be limited as to its responsibility to carry out market analyses. In March 2010, an infringement proceeding was launched against Poland as it appeared that Polish law allowed the NRA to deviate significantly from imposed cost orientation remedies without a new market analysis. Also in Poland an amendment to the Telecommunications Act entered into force in December 2010 which allows the NRA to approve voluntary commitments by operators.

The need to increase the transparency of NRA decisions was noted in several countries including Slovakia, Slovenia and Greece. In Ireland and Italy operators expressed a desire for greater predictability and certainty regarding the regulator's work plan.

Dispute resolution

In the event of disputes arising between providers of electronic communications networks or services, the NRA should be able to issue a binding decision in the shortest possible time frame and in any case within four months except in exceptional circumstances. The need for a swifter reaction when dealing with dispute resolution requests was noted in some Member States.

In Sweden, following legislative amendments which entered into force in August 2010, the Commission was able to close the infringement case concerning the limited competence of the NRA to settle disputes regarding interconnection agreements.

Appeals

In accordance with Article 4 of the Framework Directive, any user or undertaking providing electronic communications networks and/or services that is affected by a decision of a national regulatory authority has the right of appeal against the decision to an independent appeal body.

Institutional changes to the appeal process were being considered in some Member States. In Greece, a decision was still awaited on the issue of the handling of appeals of the regulatory decisions of EETT. In the context of a case examined by the Council of State in December 2009, a division of it decided that the Administrative Court of Appeal would only have the competence to annul or repeal the regulatory decisions taken by the Greek national regulator, and not to amend these decisions. As for individual administrative decisions, the said Court would have the competence to amend the decisions without having to request EETT to issue a revised decision. The case is still pending in front of the Plenary. In Latvia, legislative amendments have been proposed whereby dispute resolution decisions of the NRA would no longer be open to appeal to the Administrative Court but the appellant would have to bring proceedings against the other party to the dispute in the civil court. In the UK, the government

proposed replacing the current appeals system in the Competition Appeal Tribunal (CAT) with an “enhanced” judicial review.

The effectiveness of the appeal mechanism and the frequency of appeals varied between Member States. Frequent and systematic appeals had been reported in Sweden, Bulgaria, Slovenia, Poland, as well as in the UK. By contrast, in Ireland no appeals had been registered in 2010. The number of proceedings had also gone down significantly in Poland as a result of the agreement between the incumbent and the NRA on non-discriminatory treatment of alternative operators.

In accordance with Recital 14 to the Better Regulation Directive, in order to ensure legal certainty for market players, appeal bodies should carry out their functions effectively; in particular, appeals proceedings should not be unduly lengthy. In Sweden in order to address the issue of lengthy proceedings, new legislation was adopted requiring that each appeal should only take six months in each instance. Long delays in addressing appeals were reported in Greece. A lack of improvement as regards the effectiveness and timely resolution of appeals by the Communications Appeal Board has also been noted in Malta.

In Germany, lack of sufficient motivation of certain decisions imposing obligations led to the repeal of decisions by German courts and the Swedish regulator's decisions were also often overruled by the Courts including on the grounds of insufficient justification of decisions.

IMPLEMENTATION OF REGULATORY MEASURES

Main trends in Article 7 procedures

In 2010 the Commission issued 131 decisions under the Article 7 procedure, compared to 134 in 2009. Of these, 96 decisions included comments on regulatory draft measures and in 33 other cases the Commission did not make any comment. On two occasions the Commission opened a second phase investigation which resulted in one veto decision. Nine notifications were withdrawn by regulatory authorities, one of which during phase II.

The Commission veto decision of March 2010 concerned a Polish notification of the market for IP traffic exchange. The Commission concluded that the data provided by the regulator did not support the finding of two separate markets for IP traffic exchange. The Commission could also not agree with the SMP finding on those markets. An appeal against this Commission decision has subsequently been filed with the General Court by the President of UKE.

Other important cases concerned the infrastructure access and wholesale broadband access markets and the consistent treatment of next generation access (NGA) networks from a market definition and remedies perspective. With regard to market definition the Commission opened one second phase investigation where the exclusion of fibre optic infrastructure from the infrastructure access market was not sufficiently substantiated. With regards to remedies the Commission issued comments to NRAs in those cases where the NGA Recommendation was not fully taken into account. As will be reported below, this concerned among others (virtual) access remedies which fell short of full unbundling, clauses which made full unbundling conditional on other factors, and the lack of an appropriate costing method for the fibre loop.

In this context the Commission also assessed French proposals for symmetric regulation of fibre optic networks, which foresee access to the terminating segment plus certain backhaul obligations in less densely populated areas. The French proposals are based on Article 12(3) of the Framework Directive and the Commission services raised concerns about the compatibility of the French regulator's approach with EU law.

During 2010 the Commission has on a number of occasions assessed the extent to which draft measures in both fixed and mobile termination markets comply with the Termination Rates Recommendation. The general trend in mobile markets is towards lower and symmetric rates and the majority of those NRAs which have notified MTRs appear to be broadly on track to adopt the recommended approach by the end of 2012. In fixed termination markets the Commission has on two occasions reminded NRAs that different network topologies and degrees of interconnection of alternative fixed network operators should not normally justify higher termination rates, which should be geared towards the cost of an efficient operator.

Three regulators have proposed regulation of the market for SMS termination. Although not listed in the Recommendation on Relevant Markets the Commission did not contest that this market can fulfil the three criteria test for ex-ante regulation in the specific Member States. The Commission did, however, express strong concerns with regard to the introduction of so called reciprocity clauses or other attempts to make regulated rates available only to operators resident in the country concerned.

The Commission has noted that calls markets but also retail leased lines are still subject to ex ante regulation in a number of Member States, although these markets are no longer listed in the Recommendation on Relevant Markets. When assessing the draft measures the Commission found that competition problems at retail level often result from insufficient wholesale regulation. Consequently, the Commission asked regulators to address competition problems at wholesale level, and, once such regulation is properly implemented, re-examine the three criteria before the end of the review period.

The last important group of cases concerned the setting of prices for key access products such as the local loop and bitstream products and the Commission has asked NRAs, in particular, to apply appropriate cost methods in a consistent manner along the value chain. Similar consistency issues also arose in the context of non-discrimination remedies. In this respect the Commission is aiming to provide further guidance to regulators on costing methods and non-discrimination remedies.

Broadband Implementation

The Digital Agenda for Europe and the Europe 2020 strategy have underlined the importance of broadband deployment to promote social inclusion and competitiveness in the EU. To this aim, the Digital Agenda for Europe has set ambitious targets with regard to the availability and take-up of fast and ultra-fast broadband. The Communication on broadband² which was adopted by the Commission on 20 September 2010 outlines a common framework within which EU and national policies should be developed to meet these targets.

In this context, the past year saw the launch by several Member States of new broadband strategies setting out future policy plans for broadband development; while other Member States registered progress towards achieving their existing national broadband targets (see

² Commission Communication, European Broadband: investing in digitally driven growth, COM(2010) 472

section on broadband market development). Moreover, in some Member States expert forums have been set up in order to discuss issues linked with broadband and NGA deployment. This shows that broadband development has become a firmly established political priority throughout the EU, although work remains to be done in those Member States where no comprehensive national broadband plan with clear targets is yet in place.

To foster the continuous development of broadband, an essential part of the process is to ensure that the regulatory environment remains in line with evolving market circumstances by carrying out timely and regular market reviews. Throughout 2010, regulators in a number of EU countries started – and in a number of cases completed – new rounds of wholesale broadband market(s) analyses (e.g Sweden, Cyprus, Austria, Germany, the Netherlands, Denmark, Belgium, the Czech Republic, Romania, Bulgaria, Latvia, Hungary, Poland, Slovenia, Lithuania and the UK). Moreover, reviews of market analyses have been announced for 2011 by the Czech Republic, Denmark, Finland, Portugal, France and Malta. In contrast, a few NRAs have focused their activity in 2010 on monitoring markets and obligations, such as in Finland, or on implementing market remedies, such as Italy.

With respect to the market for wholesale physical network access, new obligations on the incumbent have been introduced or envisaged in a number of countries, such as Romania, Bulgaria, Slovakia, Poland, Ireland, Belgium and the UK. In some of these countries, this may facilitate the take-up of LLU and thus lead to a richer broadband offering.

As to the wholesale broadband market, the reviews carried out in Austria, Romania and the UK resulted in total or partial deregulation of the market, which brings the number of countries in which this market is currently not (or not fully) subject to *ex-ante* regulation to 7 EU countries (Romania, Luxembourg, Sweden, Malta, Austria, Portugal and the UK). In Luxembourg and Malta, it was reported that commercial offers are not considered satisfactory by alternative operators. As far as remedies in the wholesale broadband market are concerned, a new wholesale product at regional level based on an Ethernet interface has been defined in Spain and is perceived as essential for the maintenance of competition in the market.

In terms of the implementation of remedies, several regulators have adopted new methodologies for a price control obligation (e.g., Denmark, Estonia, Greece, Italy and Belgium). As significant divergences still remain in applied cost accounting methodologies, the Commission has repeatedly emphasised the need to apply consistent prices for key access products. In addition, some regulators have started working on a new margin squeeze evaluation model, for example in Cyprus, Denmark and Italy. Furthermore, 2010 has seen a high level of activity by NRAs with respect to the adoption or update of Reference Offers (e.g. in Malta, Portugal, Spain, Cyprus, Belgium, Poland, Italy, Greece and Luxembourg).

NGA

In a number of countries, regulators have set out the framework conditions for the roll-out of NGA networks, or are in the process of doing so, by conducting new market analysis and extending existing remedies to NGA networks or adopting new remedies. The number of countries in which regulators have included or proposed to include fibre in market definitions is growing (e.g Sweden, Denmark, the UK, Ireland, Austria, Germany, the Netherlands, Poland, the Czech Republic, France, Estonia, Finland, Slovenia and Italy). In the Czech Republic notably, the regulator re-assessed the second review of the wholesale network access market in 2010, the original market review notification having been withdrawn in 2009 due to the failure to include fibre networks in the market definition. Furthermore, the Commission

opened a second phase investigation procedure concerning a notification of the market for wholesale network access by the Lithuanian NRA, on the grounds that the exclusion of fibre optic infrastructure from this market was not sufficiently substantiated.

As regulatory clarity is key to fostering a competitive environment for long-term investments in super-fast broadband networks, the Commission adopted in September 2010 a Recommendation on the regulatory treatment of NGA networks³. This instrument was designed to preserve investment incentives for the roll-out of these next-generation networks while at the same time ensuring that such networks remain open to alternative operators. Following the adoption of the NGA Recommendation the Commission expects NRAs to revise their market analyses and remedies imposed on wholesale broadband markets as soon as possible and, in doing so, take utmost account of the NGA Recommendation. However, in 2010 the Commission noted that some NRAs had departed significantly from important provisions of the Recommendation.

A number of NRAs have adopted a differentiated regulatory approach concerning fibre and metallic local loops and are thus imposing less burdensome remedies on fibre. In most cases, these consist only of transparency obligations, including concerning the migration from current to next generation access products. Access or pricing obligations with respect to NGA networks are however not imposed yet in a number of cases (e.g., in the Czech Republic, Finland and Estonia), or not yet set out in detail.

In contrast, specific regulatory obligations related to NGA have been adopted by NRAs in other Member States, such as for example virtual unbundling where LLU access obligations need to be replaced or supplemented in areas of NGA roll-out. The UK has pioneered the imposition of such virtual unbundling local access products and has been followed by Austria. The Danish NRA was also considering the possibility of virtual unbundled local access for its wholesale regulation of the broadband market. In its comments, the Commission stressed that such a remedy should just be a transitory measure and should be replaced by fibre unbundling as soon as it is technically and economically feasible.

In France, the regulator adopted a decision setting out symmetrical rules and conditions for access to in-house fibre optic lines, obliging all operators to provide access to their in-building fibre network to alternative operators. The French proposals are based on Article 12(3) of the Framework Directive and the Commission raised concerns about the compatibility of the French regulator's approach with EU law, since the symmetrical remedies are extended beyond what is foreseen in that provision.

As far as access to passive infrastructure is concerned, a duct and poles access remedy for broadband services was notably imposed on the fixed incumbent by the regulator in the UK and an obligation of access to ducts was introduced in Estonia. In Austria, access to ducts and dark fibre were part of the list of obligations imposed by the NRA. Overall, access to dark fibre is being mandated in an increasing number of Member States, although in certain countries only as a last resort remedy. In other countries however, such as Bulgaria, access conditions to passive infrastructure still appear problematic.

³ Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA), SEC(2010) 1037 final

Mobile Implementation

Mobile Termination Rates

Mobile call termination markets were subject to a review in a number of Member States (e.g. Malta, Poland, Romania and the UK). Meanwhile in Germany, the NRA set mobile termination rates (MTR) based on an interim measure until the new rates were set in February 2011 following the EU consultation. The Commission has assessed these cases in the light of the Recommendation on the regulatory treatment of termination rates, according to which the NRAs ensure that termination rates are implemented at a cost-efficient, symmetric level by 31 December 2012.

NRAs have continued to set glide paths, with rates falling across the EU. Overall, the effects of the regulation of MTRs has led to a reduction in the EU average rate from 6.70 €-cents in 2009 to 3.73 €-cents in October 2010.

In some cases rates are still set using benchmarking (e.g. Estonia, Malta, Portugal and Slovakia). In commenting on benchmarking, the Commission has emphasised that inappropriate benchmarks imply persistent competitive distortions and has invited NRAs to use the benchmarks only of those countries which already apply the rates of an efficient operator.

Regarding symmetry of termination rates, further progress was made. Symmetry has already been achieved in a number of Member States (e.g. Finland, Greece, Hungary, Latvia and Slovakia) and is planned in others, e.g. Belgium (2013), Denmark (2011), Italy (2012) and the UK (2012).

In Bulgaria, the practice of exempting calls originating from outside the territory from MTR regulation was of a major concern. The Commission urged the NRA to remedy this urgently and is following the matter closely.

Regarding SMS termination, the Danish and the Polish NRAs concluded that the market was susceptible for *ex ante* regulation. Also, France continued the regulation of SMS termination market and decided to continue on the glide path of termination rates towards 1€cent. Although not listed in the Recommendation on Relevant Markets the Commission did not contest that this market can fulfil the three criteria in the specific Member States. The Commission did, however, strongly object to the introduction of so called reciprocity clauses or other attempts to make regulated rates available only to operators resident in the country concerned. In each case the Commission has asked the three NRAs to monitor the development of this market and consider removing the currently proposed regulation.

Roll-out of next generation mobile networks

Long Term Evolution (LTE) technology was launched commercially over the course of 2010 in a number of Member States (Austria, Denmark, Estonia, Finland, Germany, Poland and Sweden). MNOs in most of the remaining Member States were testing the technology.

Roaming Regulation

Retail prices were generally at or very close to the maximum level permitted by the Roaming Regulation. Prices for data services on the other hand, have generally remained high despite the decrease in prices at wholesale level. Alternative roaming packages are available in a

number of Member States (e.g. Romania, Slovakia). Operators in some Member States (e.g. Estonia, Finland, Germany and Sweden) reported difficulties with meeting the requirement to set cut off limits for data. Spain reported problems regarding the implementation of transparency measures for data roaming. Hungary and Portugal ran awareness campaigns on the new rules and tariffs. Luxembourg reported problems with inadvertent roaming in border areas. Finally, in June 2010 the ECJ confirmed⁴ the validity of the legal basis for the 2007 Roaming Regulation, which was challenged in the UK by the leading mobile operators, as well as the subsidiarity and proportionality of the European legislator's action.

Fixed Implementation

Retail regulation

In 2010, the market for retail access at a fixed location was found to be competitive and de-regulated in Finland. In contrast, regulation was maintained in the retail access market in Cyprus, the Czech Republic, Hungary, Estonia and Austria. The Czech NRA decided however not to impose price regulation in this market. Furthermore, in several countries NRAs have decided not to impose a wholesale line rental remedy (e.g. in the Czech Republic, Estonia, Hungary and in Austria, where it has been replaced by VOB access). In continuity with 2009, *ex-ante* regulation was withdrawn by several NRAs from retail fixed calls markets that are no longer listed in the current Commission Recommendation on relevant markets (e.g. in Slovakia, Cyprus and partially in Italy).

Interconnection

Further reviews of the wholesale markets for fixed call origination and/or termination were notified or completed by several Member States throughout 2010 (e.g. Austria, Czech Republic, Cyprus, Malta, Italy, Poland, Estonia, Greece, Slovakia, the Netherlands, Latvia and the UK).

In revised Reference Interconnection Offers adopted in 2010, it can be noted that the current implementation of cost accounting principles still differs widely across the EU. There is therefore a clear need for NRAs to align their methodologies with the principles recommended by the Commission. As regards the call termination market, a number of countries have indicated that they are in the process of developing new cost models in line with the Commission Recommendation (e.g. the Czech Republic, France, Portugal and Malta).

Asymmetry in the application of remedies between the incumbent and the alternative operators remained in the fixed termination market in Austria, Italy, Poland, Greece and Czech Republic. In some countries, this coincided with persistently high fixed interconnection charges. In contrast, in Lithuania the NRA has removed the asymmetry of remedies imposed in this market, while in Luxembourg the NRA had to do the same following a ruling by the Administrative Court.

New market developments have so far only been addressed by a limited number of NRAs. In Spain, while the revised Reference Interconnection Offer does not include details for direct

⁴ Case C-58/08: Judgment of the Court (Grand Chamber) of 8 June 2010 (Reference for a preliminary ruling from the High Court of Justice of England and Wales, Queens's Bench Division (Administrative Court) (United Kingdom)) — The Queen on the application of Vodafone Ltd, Telefónica O2 Europe plc, T-Mobile International AG, Orange Personal Communications Services Ltd v Secretary of State for Business, Enterprise and Regulatory Reform (Regulation (EC) No 717/2007

interconnection services for VoIP, a working group involving several operators will work on developing a new IP interconnection model. With regard to next-generation access networks (NGA), the UK regulator is engaged in industry discussions regarding the provision of voice services over FTTH networks and will consider this issue in the next calls market review.

Leased lines

The market for wholesale terminating segments of leased lines was re-assessed in several countries and regulation was maintained in Austria, Czech Republic, Poland, Estonia, France and Romania. In Italy however, it was partially deregulated whereas in the Netherlands the 2008 market decision of the regulator was annulled by the Appeal Court, resulting in the absence of regulation of this market. In Austria, the current general cost orientation obligation was replaced with price-cap regulation. In Spain, the NRA adopted a revised reference offer for leased lines.

Broadcasting Implementation

Regulation of broadcasting markets

In 2010 several Member States carried out the second round of market analysis for broadcasting transmissions, which are not included in the 2007 Commission Recommendation on relevant markets. In some cases the existing regulatory remedies have been repealed, as the three criteria test for *ex-ante* regulation was not met. This happened in the Czech Republic (analogue terrestrial television), Germany (markets for feeding broadcasting signals into the cable network) and Italy (analogue terrestrial television). On the other hand *ex ante* regulation has been confirmed and remedies, including price control, have been imposed in other cases, such as Sweden (for both digital terrestrial television and analogue radio), Romania (analogue terrestrial television), Poland (wholesale radio and television broadcasting transmission services), Spain (terrestrial broadcasting transmission services) and Germany (analogue radio).

In the Netherlands *ex ante* regulation was imposed on the two largest cable operators in 2009, following the second market review; however in August 2010 the regulator's decision was annulled by the courts. Currently there is no regulation in place.

As far as "must carry" is concerned, Finland has just reviewed its rules, with new legislation expected to enter into force by July 2011. Must-carry channels have been reduced and they have a special obligation to provide subtitling and special voice services for disabled people. Cyprus included must carry obligation for existing analogue channels in the auction for digital terrestrial multiplexes. Moreover in March 2011 the ECJ ruled on the incompatibility of Belgian "must carry" obligations *vis à vis* the Universal Service Directive in the Brussels area. It held that Belgium had failed to fulfil its obligations by designating entire undertakings, rather than specific channels, as beneficiaries of the obligation, and by not establishing a transparent procedure for designating "must-carry" channels, based on clear and foreseeable objectives.

Digital switchover

The gradual switch-off of analogue terrestrial broadcasting transmissions across Europe progressed and in many cases it appeared to be in line with the target deadline recommended by the Commission, i.e. 1 January 2012⁵.

In 2010 switch-off of analogue transmission has been completed in five Member States (Belgium, Estonia, Latvia, Spain, Slovenia), adding to the ones having switched off previously (Denmark, Finland, Germany, Luxembourg, the Netherlands, Sweden). In addition to that in 2010 a number of Member States showed substantial progresses towards completion of the switch-off (Czech Republic, France, Italy).

Overall, while by the end of 2011 four Member State are planning to complete their switch-off (Austria, Cyprus, France and Malta), in further eleven Member States final switch off is envisaged by the end of 2012 (Greece, Hungary, Ireland, Italy, Lithuania, Portugal, Slovakia, United Kingdom) or even later (2013 in Poland; 2015 in Romania and Bulgaria, which decided to postpone it). In Czech Republic, while it is expected that analogue transmission will be switched off mostly in 2011 (11 November 2011), in two regions the switch-off is envisaged on 30 June 2012. In Greece, due to delays in defining the secondary legislation there are doubts on whether the original switch-off date will be met. In Hungary it may be postponed to 2014 if certain conditions on coverage and decoder availability will not be met. From a technical point of view, difficulties with cross-border coordination have sometimes affected the smooth transition to digital broadcasting, due to cross-border interference.

In the meantime, licensing of rights of use for digital terrestrial broadcasting multiplexes progressed in several countries. In 2010 licenses were granted, via comparative or competitive procedures, e.g. in Belgium, Bulgaria (in addition to ones already granted in 2009), Cyprus and Portugal. In other countries the process was still on-going, sometimes with some delays (as in Ireland, Italy and Romania). The Commission is monitoring legal and procedural arrangements during the transition towards full implementation of digital television as to their compliance with EU law.

HORIZONTAL REGULATION

Spectrum management

Digital dividend

In line with the Digital Agenda objectives, in 2010 the Commission intensified its efforts to promote efficient management of the digital dividend - high-quality radio spectrum freed as a result of the switch-over from analogue to digital television broadcasting - and, in particular, in order to ensure that sufficient spectrum is made available for wireless broadband. In May 2010, the Commission adopted a Decision (2010/267/EU) establishing EU harmonised conditions of use of radio frequencies in a part of the digital dividend, the so-called 800 MHz band⁶, when allocated by Member States for electronic communications services, in particular for deploying high-speed wireless Internet services. Furthermore, in September 2010 the

⁵ COM(2009) 586 and C(2009) 8287.

⁶ Commission Decision 2010/267/EU on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union, in OJ L 117, 11.5.2010

Commission submitted to the Council of Ministers and the European Parliament a proposal for the first radio spectrum policy programme. This draft programme, spanning a period of five years, includes specific measures to facilitate the introduction of wireless broadband services including the obligation for Member States to effectively open the 800 MHz band for wireless broadband services by January 2013⁷, on the basis of the technical conditions set in the previous Decision.

Notably, several Member States have already embraced the digital dividend as part of their overall strategy to address the wireless broadband challenge. In May 2010, the 800 MHz band, as well as spectrum in the 1800 MHz, 2 GHz and 2.6 GHz bands, has been assigned for wireless broadband use in Germany through a competitive procedure. In early 2011 the digital dividend in the 800 MHz band was also auctioned in Sweden. Several Member States also envisage assigning the digital dividend already in 2011 (namely Denmark, France, Ireland, Italy, Spain) or in 2012 (the United Kingdom, Austria, the Czech Republic). Even if a specific roadmap has not yet been adopted, the debate on the allocation of the digital dividend to mobile broadband has taken off in most Member States, with official declarations and/or plans put to consultation in Cyprus, Finland, Hungary, the Netherlands, Poland and Slovakia. The rights of use shall generally be assigned by means of competitive procedures, sometimes with attached coverage obligations (e.g. Cyprus, Czech Republic, Germany, France and Sweden) or subject to a spectrum cap (the Czech Republic, Slovenia and Spain). In many countries the 800 MHz band will be available after 1 January 2013 (or even in 2014, as in Spain and in some areas of the United Kingdom).

Some Member States are also considering a multi-band approach, with plans to assign other spectrum bands suitable for innovative technologies and services along with the digital dividend (mostly in the 2.6 GHz band, as envisaged in France, Poland and the United Kingdom, but sometimes also involving other comparable or technologically/commercially linked bands, such as 900 and/or 1800MHz, for example in Cyprus, the Czech Republic, Slovenia and Spain).

Notwithstanding the above positive developments, the timely use of the digital dividend is still subject to the successful resolution of cross-border spectrum coordination issues, both *vis à vis* neighbouring third countries (e.g. with Russia, Belarus) and within the European Union (potential issues regarding frequency coordination have been reported by Luxembourg, Italy, Slovenia and Malta). Coordination with neighbouring countries is still on-going in Estonia, Latvia, Lithuania and Luxembourg, whereas an agreement for trials has been reached by Finland with Russia, which also signed a Memorandum of Understanding with Poland according to which both sides agreed to streamline co-ordination on this issue. In the CEPT (European Conference of Postal and Telecommunications Administrations) context, a template (so-called framework agreement) for spectrum coordination in the 800 MHz band between individual Member States affected and RRC (Regional Radiocommunication Conferences) countries was drafted.

Overall the choice to allocate the digital dividend to broadband is increasingly gaining political support from Member States, although there are still significant coordination issues that might hinder its smooth implementation. In this regard the adoption of the Radio Spectrum Policy Program should accelerate the resolution of those technical challenges.

⁷ COM (2010) 471

Spectrum liberalisation and refarming

In 2010, Member States took steps towards the introduction of market-based approaches in their spectrum management practices, in order to ensure a more efficient use of this scarce resource. In 2010 provisions aiming at extending or regulating spectrum trading have been proposed or introduced in Spain (regarding the main frequency bands for mobile services), Estonia (along with the implementation of the Revised Regulatory Framework) and Belgium, whereas in contrast spectrum trading has been limited to rights of use acquired through an auction in Latvia.

On 9 May 2010 the deadline for transposition of the amended GSM Directive (2009/114/EC) allowing new advanced, next generation wireless technologies to co-exist with GSM in the 880-915MHz and 925-960 MHz frequencies, expired. Following this date the European Commission monitored the effective transposition of the GSM Directive in all EU countries and in 2010 infringement proceedings were opened against Austria, Cyprus, France, Hungary, Italy, Spain and United Kingdom for lack of notification of transposition measures. While most of these countries adopted and notified to the Commission the final decisions amending the allowed use included in national allocation tables at the latest in early 2011, Hungary and Spain had failed to do so at the end of the reporting period.

The Directive requires that Member States shall examine whether the existing assignment of the 900 MHz band to the competing mobile operators in their territory is likely to distort competition in the mobile markets concerned, also in view of the broader national spectrum strategy. In general public consultations on the refarming process have been carried out, sometimes before the adoption of the Directive, in Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Malta, the Netherlands, Portugal, Spain and the United Kingdom, whilst they are expected to be launched or to be completed by 2011 in Cyprus, Germany, Luxembourg, Slovenia and Slovakia.

Most Member States have amended the actual terms of the existing licenses, ex officio or following a specific request of the right holders. The Commission is closely following the refarming process in order to ensure its compliance with the requirements of the GSM and Authorisation Directives.

In 2010 other slots for wireless broadband in the 900MHz and 2.6, 3.6, 3.8GHz bands were assigned in 2010, following competitive or comparative procedures, in Austria, Denmark, Estonia, Germany, Latvia, Malta, the Netherlands, and Portugal. In Sweden the final assignment of slots in the 900 and 1800MHz bands is still subject to the outcome of judicial review, in Belgium the auction for the 4th 3G license has not been finalised and in Cyprus the tender for a slot on the 1800MHz was not successful. Finally, it appears that 2x5MHz slots in the 2GHz band have been assigned to the major mobile operator in Bulgaria without a comparative or competitive procedure and the Commission is looking into the matter.

Implementation of Spectrum harmonisation decisions

As far as the Commission's Spectrum Decisions adopted until 2009 are concerned, Cyprus, Germany, Italy, Luxembourg, Portugal and Romania modified relevant implementation measures in 2010, whereas the infringement procedure opened against Bulgaria involving the implementation of Decision 2005/928/EC on the harmonisation of the 169,4-169,8125 MHz frequency band has been closed, following clarification by the Member State on its specific requirement for use for the purposes of national security.

It appears that there is not yet full availability of information regarding spectrum use from several Member States, as mandated by Decision 2007/344/EC. Moreover, Romania has not yet implemented Decision 2009/381/EC amending Decision 2006/771/EC on harmonisation of the radio spectrum for use by short-range devices and the Commission is still assessing the compatibility of the measures adopted in March 2010 by Germany with regard to the implementation of Decision 2008/477/EC on the harmonisation of the 2500-2690 MHz frequency band for terrestrial systems capable of providing electronic communications services.

Moreover, according to a Study conducted for the Commission, at the end of the reporting period not all of the necessary preparation, which would facilitate the granting of an authorisation to the operators of systems providing mobile satellite services (MSS) selected by the Commission in accordance with European Parliament and Council Decision 626/2008/EC, has been made in twenty-one Member (namely in Belgium, Bulgaria, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, The Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain and the United Kingdom).

As far as Mobile Communication on Aircraft (MCA) is concerned, in accordance with Decision 2008/294/EC in 2010 two service providers notified to the Commission several new airlines providing the service on their aircrafts.

In 2010, three spectrum harmonisation Decisions were adopted by the Commission related to harmonisation of radio spectrum for use by short-range devices (Decision 2010/368/EU), harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services (Decision 2010/267/EU) and harmonised conditions of use of radio spectrum for mobile communication services on board vessels (Decision 2010/166/EU). The process of verification of the state of implementation of the Decisions adopted in 2010 is on-going.

Rights of way and facility sharing

Aimed at a flourishing digital economy by 2020, the Digital Agenda for Europe⁸ outlines policies and actions to maximize the benefits of a digital revolution for all. To that end, the roll-out of open and competitive broadband networks is imperative to stimulate a virtuous cycle in the development of the digital economy. Proposals depicted in the Broadband Communication⁹ suggest that national and local authorities may play an important role in lowering investment costs for the deployment of these networks. For example, at a time when a number of operators in Member States are deploying next generation networks (NGNs especially using fibre), efforts by national and local authorities to simplify and accelerate procedures for the granting of rights of way (mainly using town planning rules or access remedies) and to enhance facility sharing may considerably help to reduce the costs of network deployment.

⁸ See also Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on *A Digital Agenda for Europe*, 26 August 2010.

⁹ See also Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on *European Broadband: investing in digitally driven growth*, September 2010.

As stipulated by the regulatory framework, the procedures for granting of rights of way to install facilities on, over, or under public or private property must be timely, non-discriminatory, and transparent so that conditions of fair and effective competition are guaranteed. When considering an application of rights of way, competent authorities must act without discrimination and delay. The provisions in the revised regulatory framework¹⁰ substantially reinforce the need for timely procedures requiring that decisions for rights of way should be taken within six months of their application, except in cases of expropriations.

A number of issues in connection with network deployment relating to the lack of legislative acts, difficulties in obtaining permits, conditions for road excavations, and to health consideration were reported in certain Member States. The framework and procedures for the granting of rights of way still remains incomplete in Greece and Romania, while in Bulgaria, lengthy administrative procedures delay the issuance of permits by municipalities. Fragmented procedures in Italy, unnecessary constraints in Malta imposed by Local Councils, and the alleged problematic application of rights to excavate by local municipalities in Sweden has hindered the excavation work on public property.

New legislation was adopted or was under preparation in some Member States in 2010 to facilitate network deployment. In Cyprus, the national regulatory authority was working on amending the procedures for rights of way in areas under development realising the need for a more efficient excavation techniques based on fewer manholes that would reduce the cost of network rollout addressing in parallel the possibilities of developing multiple networks, in particular NGNs. New legislation adopted in Portugal reinforces operators' rights of way by establishing a harmonised procedure for local authorities and coordinating underground intervention. In Poland, legislation was adopted which would facilitate the investment process by removing numerous administrative obstacles in particular with regard to rights of way. In addition, action towards establishing infrastructure inventories or centralised information systems on infrastructure works (e.g. in Lithuania, Portugal, and Luxembourg) was underway. New legislative provisions in Slovenia oblige investors in public infrastructure to provide information relating to new constructions to the national regulator, which publishes them online to facilitate new investment plans. In Italy, the national regulator held a public consultation in December 2010 a regulatory framework on rights of way and access over existing infrastructure of public authorities and concessionaries for the deployment of backbone networks. This framework also envisages an inventory of all existing ducts and infrastructures suitable for deployment of the network.

As stipulated in Article 12 of the Framework Directive¹¹, national regulatory authorities shall encourage the sharing of facilities and/or property for the benefit of town planning, public health or environmental protection. These provisions on facility sharing are further reinforced through the revision of the regulatory framework enabling the national regulatory authorities to impose mandatory sharing of facilities or property in certain circumstances taking full account of the principle of proportionality. Specific legislation was adopted in certain Member States to facilitate network deployment in buildings in 2010. This was the case in France, where the national regulator adopted a decision concerning fibre regulation for less densely populated areas, thereby complementing existing decision applying to mostly populated areas adopted a year ago. In Slovenia, the new amended version of the Electronic Communications Act adopted in January 2010 set provisions for facilitating the utilisation of communications infrastructure in private buildings by all operators. In Cyprus, a harmonised

¹⁰ OJ L 337 18.12.2009

¹¹ OJ L 108 24.02.2002, pp. 33-50.

approach for access to in-building wiring and private land was being formulated to establish infrastructure standards for building owners based on a technology neutral approach. In addition, two draft legislative initiatives to facilitate network deployment in Spain, one for common infrastructure for telecom services inside buildings upgrading previous rules for the NGA era (adopted in March 2011), and the other on the deployment on roads and railways in public domain (work on this was ongoing).

Facility sharing of other utility infrastructure which can be of benefit for town planning, public health and security, or environmental reasons, was considered in certain Member States (UK and Germany). In Finland, Best Practises on Join Construction of Infrastructure Networks were published in December 2010 providing examples of coordinated construction.

Administrative charges

The EU regulatory framework expressly restricts the amount of administrative charges that may be imposed by NRAs to cover the administrative costs resulting from their regulatory work, such as management, control and enforcement of the general authorisation scheme and of rights of use. Appropriate adjustments also need to be made in light of the difference between the total sum of the charges and the administrative costs. Systems for administrative charges should not distort competition or create barriers to market entry. The European Court of Justice has consistently maintained that administrative charges must relate to the costs of regulatory activities provided by the framework and may not be used in order to organise the financing of other activities or costs.¹²

The Commission launched an infringement proceeding against France and Spain in January and March 2010, respectively, as reforms of financing arrangements for their national public broadcasters resulted in the imposition of specific taxes on the revenues of operators in their capacity as authorised providers of electronic communications networks or services. The Commission questions the compatibility of the taxes with Article 12 of the Authorisation Directive, which provides that administrative charges should only cover the administrative costs for management, control and enforcement of the authorisations.

The Commission services were also looking into a similar issue in Hungary, which imposed a special tax on electronic communications services due on activities defined as being registered under the general authorisation scheme, and into Portugal's plan on imposing a charge on telecoms operators' revenues.

Throughout 2010, the Commission has been following the development in Latvia concerning administrative charges for ensuring electro-magnetic compatibility, which is subject to infringement proceedings. The Commission received a complaint from some operators regarding Portugal's legislation of 2008 approving a new system for the fees including administrative charges and rights of use for spectrum and a numbering resource. The Commission services are examining this issue.

¹² This concerns such costs as research activities in the field of telecommunications (Case C-104/04, Commission vs. France) or state investments aimed at ensuring the liberalisation of the telecommunications sector (joined cases C-292/01 and C-293/01, Albacom and Infostrada). See also joined cases i-21 Germany GmbH (C-392/04) and Arcor AG & Co. KG (C-422/04). On the other hand, fiscal measures imposed on owners of communications infrastructure, as opposed to charges imposed on undertakings as holders of authorisation to provide electronic communications services, do not fall within the scope of application of the rules on administrative charges. See joined cases Mobistar SA (C-544/03) and Belgacom Mobile SA (C-545/03).

In Luxembourg and Italy the rate of administrative charge on operators increased in 2010, in order to offset the corresponding reduction in public funds or the NRA's increased workload. In Ireland, the rate was decreased and in Spain a decrease was expected. In Romania, in 2010 electronic communications providers were waived the obligation to pay the administrative charge as the NRA was financed from other resources such as the spectrum tariff.

The Commission services were looking into the matter of the German NRA that does not provide an analysis of how the levels of collected administrative charges reflect underlying administrative costs. The issue of the transparency of the differences between the total sum of the charges and the administrative costs, and appropriate adjustments to be made, concerns also Bulgaria, Lithuania and Slovakia. The Commission services were looking into the practice in Belgium, where the revenues collected by NRAs through administrative charges exceed NRAs' expenses and the surplus is then transferred to the state treasury. Under the EU regulatory framework, such surpluses, including savings realised through cuts in the budgetary resources of NRAs, should be refunded to the sector.

THE CONSUMER INTEREST

Universal Service

There are three Member States where universal service is available in the market without a formal designation: Germany, Luxembourg and Sweden. The remaining EU countries have designated universal service provider(s), albeit many have chosen to withdraw certain components from the universal service obligations following a conclusion that these are provided satisfactorily by the market under normal commercial conditions.

New designations for some or all components of universal service were carried out in 2010 in the Czech Republic, Slovenia, Greece, Spain, Finland, Ireland and Malta. However, there were still several Member States in 2010 where universal service was provided on the basis of a transitional regime where the undertakings involved have not been designated on the basis of the procedure envisaged by the 2002 framework. This is the case in Italy, the Netherlands, Portugal, Belgium (for components other than social tariffs) and Bulgaria, although in the latter a new designation procedure has already been launched. In this context, the Commission notes that designations respecting the framework should be initiated as soon as possible.

Several Member States have carried out reviews of the scope of their national universal service obligations, or a review of the provision of non-designated components to verify whether a formal designation was unnecessary. A reduction of the number of required public payphones is thus envisaged in the Czech Republic, Italy and Romania, while the results of the review do not foresee any imminent changes to the current universal service regime in Poland. Romania, on the other hand, proposes significant modifications to its current concept of access at a fixed location to align it with the requirements of the EU framework.

Finland was the first Member State where the scope of universal service obligations was extended to delivery of broadband connections (at 1 Mbps). Considerations on broadband are being taken also in other countries¹³. In Spain, the new draft legislation proposes to establish 1

¹³ In order to assist with the implementation of the revised EU rules in this respect, the Commission services provided initial guidance to Member States in the Communications Committee's Working Document on *Implementation of the revised Universal Service Directive: Internet-related aspects of Article 4* (COCOM10-31).

Mbps as functional access to the Internet within the scope of universal service from 2011. Malta has launched a public consultation on the inclusion of broadband connections permitting a minimum speed of 4Mbps within the scope of universal service. Sweden envisages extending its public procurement process to encompass broadband connections at 1 Mbps as of 2011. Romania has proposed to define functional Internet access as 144 kbps ('best effort'). In contrast, several other Member States do not intend to include broadband connections in the scope of universal service at national level, such as for example Czech Republic, Denmark, Estonia, Hungary, Poland and Slovakia.

Measures for disabled users have in general not been subject to substantial modifications in the reporting period. In Poland, however, the draft law proposes to require all operators to enact facilitating measures for disabled users. The revised scope of universal service in Romania also envisages a series of new provisions for end users with disabilities enabling inter alia better access to emergency services, payphones and directories, as well as information adapted to their needs. A new video-relay telephony system is available for disabled users in Germany.

Finland, Sweden, and most recently also the Czech Republic envisage the financing of universal service from public funds. A mix of both public and sector-specific funding is allowed for in Portugal and Malta. The compensation mechanism for universal service remained activated only in Belgium (for social tariffs), Italy, France, Romania, Latvia, and Spain. The administrative proceedings on compensation requests for the period of 2006-2010 are ongoing in Poland. Although a request for compensation has been received in several other Member States, such as Ireland, Greece and Slovakia, and, compensation has not been granted either due to a rejection of compensation request (Greece) its withdrawal (Ireland), or a conclusion that no unfair burden was found (Slovakia).

The net cost calculation, evaluation of unfair burden and setting up of the sector-specific fund appears to be a complicated and time-consuming process in a majority of the countries involved. For example in Italy, consistent delays in the calculation of the net cost from 2004 onwards have been noted, mainly due to a new net cost calculation methodology (established in 2008 and revised again in 2009). Moreover, the net cost decisions for 1999-2003 were annulled in 2010, giving rise to regulatory uncertainty. No progress in financing has been reported in Belgium. Similarly, there were no developments concerning the introduction of sector funding in Latvia (envisaged by law) although the terms of state compensation were agreed in 2010. The Czech NRA is revisiting the net cost calculations for 2001-2006 as a result of a judicial decision, although the designated undertaking already received compensation.

The need to increase transparency and legal certainty in universal service costing and financing is thus apparent. In fact, several Member States have already started preparations for regulatory action in this regard. Poland, for example, proposes measures aimed at increasing transparency in the process of granting compensation in its draft legislation. Public consultations on the net cost calculation methodology and the assessment of unfair burden have been launched in Portugal and Ireland.

Three ECJ rulings with respect to universal service were delivered in 2010 in relation to infringement proceeding against Belgium¹⁴ (financing of social tariffs) and Portugal¹⁵

¹⁴ C-222/08.

¹⁵ C-154/09.

(designation of universal service). In the former case, the ECJ confirmed that benefits, including intangible benefits, have to be assessed in the net cost calculation, and that the NRA is requested to determine whether the net cost of universal service obligations represent an unfair burden individually for each designated undertaking.

Consumer complaints

Issues related to billing, tariff transparency and contracts are traditionally the most frequent sources of consumer complaints. As regards the latter, consumers have voiced their concerns mainly in relation to difficulties in the termination of mobile subscriptions, unfair advertising, unclear contractual conditions and a lack of information on switching providers. The quality of service provided by operators appears to be of increasing concern in a number of Member States, in particular with regard to broadband speeds actually delivered over subscriber connections. Besides the general tariff transparency issues, an increasing number of complaints has been noted with respect to value-added services and premium-rate SMSs.

The volume of consumer complaints received across the EU shows a mixed picture for 2010. Some Member States report a steady increase of consumer complaints (e.g. Belgium), whereas in others the tendency for complaints is decreasing, mainly as a result of previous actions of the regulator to address the most prominent issues (e.g. Greece). In this context, several Member States took specific measures to alleviate consumer concerns. The Polish NRA is very active in consumer initiatives, issuing for example a new consumer guidebook clearly setting out subscriber rights and duties, as well as leaflets on safe telephony and safe Internet use, for the disabled and senior citizens.

Tariff transparency and quality of service

Many Member States have taken specific action to further advance measures on tariff transparency and quality of service, including the imposition of fines or consumer compensation where tariff transparency or the specified quality of service were not respected. In particular, a lot of attention was paid in 2010 to the development and updates of web-based tools for tariff comparisons. For example, a tariff calculator based on customer profiles is newly available in Austria. In a similar fashion, an online tariff comparison and optimal tariff selection tool became operative in Italy. Sweden, Estonia and Slovenia have updated or redesigned their tariff transparency portals.

The unclear pricing of services provided over non-geographic numbers, in particular premium rate call services and premium rate SMSs have been reported as an issue of concern in an increasing number of Member States (Austria, Hungary, Spain, Netherlands, Poland and the United Kingdom) and in many instances measures aimed at facilitating consumer confidence in non-geographic numbers have been considered. In the United Kingdom, for example, the regulator launched a consultation to identify the best option for regulatory treatment of calls to non-geographic number ranges, which included a possibility of unbundling the charges for the service provider and those for the originating telecoms provider.

The broadband speeds actually delivered to end-users over fixed or mobile networks have been the centre of attention as regards quality of service. This is in reaction to an increasing number of subscriber complaints on unreliable and often unpredictable broadband speeds. In Poland, for example, the new draft law proposes that broadband service providers are obliged to declare the minimum guaranteed data transfer speed in the contract which could not be less than 90% of the connection speed advertised in promotional material. To test the speed of

Internet connection in real time, speed testing facilities are already available by the NRAs in Denmark, Italy, Latvia, Greece, and have been proposed in Romania. The United Kingdom has strengthened the requirements on information provided with regard to estimated maximum broadband speeds.

Number portability/switching

The key actions of Member States related to number portability in 2010 revolved around the reduction of the time it takes to port a number and the simplification of national porting procedures. This is a welcome development in view of the revised EU rules for number portability, where it is envisaged that subscribers who have concluded an agreement to port a number should have that number activated within one working day.

Regulatory measures to shorten the porting time have been taken in Italy, Portugal, Greece, Sweden, and the United Kingdom. Further simplification of porting procedures has been facilitated via one-stop-shop in Bulgaria and Slovakia (for mobile numbers). A new centralised database for porting has been launched in France and Luxembourg. A move to a centralised system for mobile number portability has also been taken in Spain. In contrast, a central database has been reported as an issue of concern where this facility does not exist (e.g. Slovakia for fixed numbers).

The average time it takes to port a fixed number ranges from 3 days (Austria, Netherlands, Sweden, and Slovenia) to 21 days (Poland¹⁶). The best performers for the speed of mobile number portability are Ireland, Malta and Poland (1 day), while Greece with 12 days is at the opposite side of the range. A similar pattern of a wide range for wholesale prices applies, from zero to charges of €21.5 for mobile and € 23.7 for fixed numbers in the Czech Republic. As regards retail prices, no charges are applied to consumers in a number of countries, such as for example Spain, United Kingdom, Luxembourg, Latvia and France.

Few developments were reported in 2010 with respect to the switching of Internet providers. A new obligation on Internet service providers to allow their end-users to use their original email address during a certain period of time was imposed in Belgium. An innovative decision regarding email portability was taken by the Maltese NRA, requiring operators to forward free of charge, and within a certain time period, emails sent to the previous email address to the new one.

An infringement proceeding is pending against Bulgaria on the non-implementation of fixed number portability with respect to analogue fixed lines and certain digital fixed lines.

Net neutrality

In 2010 the debate on net neutrality issues intensified both on the national and EU level. While no major net neutrality issues have been reported in the majority of Member States, the relevant authorities generally share the Commission's view on the importance of preserving the open and neutral character of the Internet. A number of Member States (e.g. France, Poland, Denmark, Italy, UK and the Netherlands) held public consultations, set out forums for discussions or published reports and recommendations on the neutrality of the Internet and networks.

¹⁶ In Poland, fixed number portability may take from 1 day up to two months, depending on the choice of subscribers. The indicated time period of 21 days therefore represents the average time requested by subscribers.

A potential issue of concern is access to voice over IP which is not always offered on mobile networks (with some exceptions e.g. the Netherlands), or is subject to premium tariffs in many Member States. Furthermore, mobile operators generally offer tariff plans according to which the speed of the Internet connection may be degraded once the end user exceeds a certain traffic threshold. This applies for example to peer-to-peer traffic consuming large bandwidth. The Commission, together with BEREC, will continue to monitor the situation and gather more information on such practices. Traffic management by operators was reported in many Member States, particularly in the case of mobile networks, but also on fixed networks (Italy, the Netherlands and UK). The authorities in France and in the UK stressed that when providers apply traffic management, they should keep end users properly informed.

The prevailing opinion of NRAs is that the revised telecom package provides sufficient regulatory tools to safeguard net neutrality. In their view, competition in the market together with transparency for end users and the possibility of switching should render *ex-ante* regulatory intervention unnecessary. As a matter of fact, the new framework strengthens transparency requirements and provides the NRAs with powers to set quality of service parameters so as to prevent the degradation of services and the hindering or slowing down of traffic over networks.

The European Commission, in line with its Declaration on net neutrality attached to the Telecoms package, has conducted a public consultation and held a joint summit with the European Parliament in November 2010. At the time of writing this report, the communication to the Parliament and the Council setting out the Commission's conclusions was expected to be finalised by May 2011.

European emergency number 112

The Commission gives primary importance to ensuring the availability and service quality of the single EU-wide emergency number 112 as well as to raising citizens' awareness about this essential service. While Member States must ensure that citizens are kept informed about the existence and purpose of 112, only 26% of EU citizens could spontaneously identify 112 as the number to call for emergency services from anywhere in the EU¹⁷ (just a marginal increase of one percentage point compared to the previous year). This alarming trend calls for further action and more information campaigns.

The Commission has been closely monitoring the implementation of the EU provisions related to 112 in the Member States. Particular topics of concern in 2010 were citizen's awareness and caller location information. The Universal Service Directive imposes on Member States the obligation to ensure that their citizens are adequately informed about the existence and use of 112, and operators provide emergency authorities with information to locate people calling 112 from fixed or mobile phones. In this regard, the Commission urged all Member States in letters of February 2010 to step up efforts in informing their citizen's about the availability of 112 services across the EU.

The Commission services are currently investigating the availability of caller location information for roaming users or for users whose subscriber data are not included in the directories in Estonia, Finland, France, Hungary, Ireland, Lithuania, Malta, Poland, Sweden,

¹⁷ Eurobarometer Survey on 112 (February 2011):
http://ec.europa.eu/information_society/activities/112/docs/survey_summary2011.pdf

Spain, the Netherlands and the UK. As a result of a pending infringement proceeding, the Italian authorities have set up a provisional nationwide caller location system and in parallel announced the development of an advanced system for handling calls to all emergency numbers. The Commission closed in January 2011 another infringement case against Italy on 112 call handling issues.

The Commission has continued to promote the cooperation and exchange of 112 best practices among Member States, concerning issues related to the performance and enhancement of 112 services, through the Communications Committee and the Expert Group on Emergency Access. The Commission is also working to make 112 more accessible for all citizens by financing research projects and coordinating standardisation initiatives.

The revised regulatory framework enhances the scope of obligations regarding emergency services and 112. In particular, it includes strengthened provisions on the prompt transmission of caller location information, awareness raising for travellers, access obligations for certain categories of Internet telephony providers and improved access for disabled users. National regulators have to specify accuracy and reliability criteria for caller location information.

Harmonised numbers for services of social value - the 116 numbering range

The harmonised numbers for services of social value aim to enable citizens to reach such services by using the same recognisable numbers in all Member States. In 2007, Commission Decision 2007/116/EC¹⁸ (116 Decision) reserved the national numbering range beginning with '116' for harmonised numbers for services of social value. Following the adoption on 30 November 2009 of the second Commission Decision¹⁹, five numbers have now been reserved. As of January 2011, four of these numbers were operational, but not in all Member States: 116000 (Hotline for missing children) was functioning in 15 Member States, 116006 (Helpline for victims of crime) in two and 116111 (Child helpline) in 17, while 116123 (Emotional support helpline) was operational in seven Member States. The Non-emergency medical on-call service (116117) was not yet operational in any Member States, although three organisations have already been assigned by national authorities. Although the numbers adopted in 2007 were not yet operational in the majority of Member States in January 2010, there have been a number of assignments throughout the year, and the take-up showed signs of growth in the second semester²⁰. In order to promote take-up, the Commission services have engaged in discussions with Member States in the Communications Committee throughout the year. Furthermore, in November 2010, in its Communication "Dial 116 000: The European hotline for missing children", the Commission renewed its call on Member States to implement the missing children hotline as a matter of priority and to ensure that the same high quality of service is offered throughout the Union.

¹⁸ 2007/116/EC: Commission Decision of 15 February 2007 on reserving the national numbering range beginning with 116 for harmonised numbers for harmonised services of social value (notified under document number C(2007) 249) (Text with EEA relevance), OJ L 49, 17.2.2007, p. 30–33

¹⁹ 2009/884/EC: Commission Decision of 30 November 2009 amending Decision 2007/116/EC as regards the introduction of additional reserved numbers beginning with 116 (notified under document C(2009) 9425) (Text with EEA relevance), OJ L 317, 3.12.2009, p. 46–47

²⁰ See: Working Document COCOM11-01 on the implementation of the reserved '116' numbers as of 1 January 2011

E-Privacy

The Digital Agenda for Europe recognises that a lack of trust in the online environment is seriously hampering the development of Europe's online economy, and that privacy must also be effectively enforced online. The ePrivacy Directive²¹ further develops and complements the general Data Protection Directive²² in the area of electronic communications. It provides for basic requirements to ensure the security and confidentiality of communications over EU electronic communications networks, and gives consumers a set of tools to protect their privacy and personal data. The revised regulatory framework provides for reinforced enforcement powers, e.g., penalties must be effective, proportionate, and dissuasive. Better cross-border cooperation is also expected following the inclusion of the ePrivacy Directive in Regulation 2006/2004/EC on consumer protection cooperation. While the transposition of the ePrivacy Directive as amended by the Citizens' Rights Directive was ongoing in a number of Member States, a review of the general Data Protection Directive was launched in November 2010.

Marketing techniques using electronic communications, in particular online behavioural advertising, continued to focus attention in 2010²³. The Commission services notably facilitated discussions between stakeholders, including consumer associations, on an EU self-regulatory initiative led by the advertising industry aimed at more effective protection of consumers online. Self-regulatory discussions are also being held in a number of Member States (e.g. United Kingdom, the Netherlands, Denmark, Bulgaria, and France). Investigations into illegal marketing practices using browsing information were ongoing in Spain. Finally, the Commission decided to refer UK to the Court of Justice in a case of incorrect transposition of the EU law requirements on the confidentiality of communications. At the end of 2010, UK authorities were running a public consultation on amendments to the Regulation of Investigatory Powers Act 2000.

As regards unsolicited phone calls, the Commission opened a case against Italy as databases had been set up for telemarketing purposes on the basis of public subscriber directories with no explicit consent. In reaction, Italy has adopted secondary legislation introducing an opt-out approach, which would become operational in early 2011. In Germany, against the background of a substantial increase in complaints, the NRA issued a number of fines in 2010 and started an awareness campaign towards users. Increasing activity was reported in relation to unsolicited marketing by SMS (e.g. the Netherlands, Sweden). This led to significant fines in the Netherlands.

Some Member States have taken measures to ensure the integrity and security of electronic communications. Hungary adopted in December 2010 legislation restricting the processing of certain data of public interest to public entities. Authorities in a number of Member States

²¹ Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (OJ L 201, 31.07.2002, p. 37).

²² Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data (OJ L 281, 23.11.1995, p. 31).

²³ In order to assist with the implementation of the revised EU rules on storage and access to information on users' terminals (e.g. cookies), the Commission services provided initial guidance to Member States in a Communications Committee's Working Document on the implementation of Article 5(3) of the ePrivacy Directive (COCOM10-34).

(e.g. Portugal, Lithuania, and the Czech Republic) were also taking preventive steps, including awareness raising campaigns in relation to online security risks.

In Austria, Greece and Sweden, the Data Retention Directive 2006/24/EC had not been transposed at the end of the reporting period. In addition, the constitutional courts of Germany and Romania annulled national transposition measures as incompatible with their Constitution. While Luxembourg has finally transposed the directive in 2010, other Member States have adjusted (e.g. Bulgaria, Slovenia) or are considering adjusting their laws (e.g. Estonia) on for example retention periods or financing. In the meantime, the Commission services held a series of preparatory activities related to the application of the Data Retention Directive, in view of its review in 2011.

MONITORING AND ENFORCEMENT

Enforcing effective implementation of the regulatory framework for electronic communications remained a priority in 2010. This is in line with the Digital Agenda for Europe, which recognises that a swift and consistent implementation of the revised regulatory framework is a priority in order to reinforce the single market for telecommunications services.

In the course of 2010, the Commission opened seventeen new infringement proceedings. Infringement priorities in 2010 remained focused in particular on structural issues and consumer protection. In total, there were 27 proceedings for incorrect implementation pending at the end of 2010. In addition, the Commission opened seven infringement proceedings for non communication of measures transposing the revised GSM Directive, which was due to be transposed in May 2010²⁴. The Commission continues to frequently issue press releases on infringement proceedings. These press releases are available on the implementation and enforcement website dedicated to the Information Society and Media sector²⁵ together with overview tables.

Structural issues included in particular the functioning and the independence of the national regulatory authorities. As regards independence, the Commission has systematically monitored the requirement for independence of national regulatory authorities (NRAs), and has taken action when necessary. An infringement was still pending in Slovenia in relation to the rules for dismissal of NRA management, while a Slovakian and a Romanian case could be closed following legislative amendments. Secondly, concerns remained regarding the effective structural separation between regulatory and control functions in some Member States e.g., Romania, Latvia, and Lithuania. In the latter case, the Commission decided to refer Lithuania to the Court of Justice.

Moreover, attention was also being paid to the full application of the Community consultation procedure involving national regulatory authorities and the Commission which aims to consolidate the internal market for electronic communications (Article 7 procedure). In addition to the pending infringement against Germany concerning the absence of communication to the Commission of mobile termination rates, a case was opened against Poland concerning the absence of communication to the Commission of wholesale broadband access rates and costing methodology.

²⁴ OJ L 274, 20.10.2009, p. 25

²⁵ http://ec.europa.eu/information_society/policy/ecomms/implementation_enforcement/index_en.htm

Finally, an increasing area of concern has been the imposition of specific telecom taxes on providers of electronic communications, in contradiction with the EU rules on administrative charges. Reasoned opinions were sent to France and Spain in this regard.

A second priority concerned the protection of consumer rights including privacy. Consumer protection goes hand in hand with the growth and diversification of electronic communication services and a growing number of service providers. Infringement cases in this respect included: the functioning of the European emergency number 112 (Italy); the possibility to keep one's number when changing telecom operators, thereby allowing consumers to fully benefit from competition (Bulgaria); an effective mechanism to settle disputes between consumers and service providers that offers a light and inexpensive alternative to court proceedings (Luxembourg); and respect for consumer privacy (United Kingdom, Italy).

As certain Member States have not complied with the regulatory framework following infringement proceedings, the Court of Justice ruled in 2010 on 3 cases. It found breaches of EU law concerning broadband retail regulation without prior market analysis in Poland (C-545/08), universal service – a financing mechanism for special rates to certain categories of low-income or disadvantaged customers in Belgium (C-222/08) and designation of a universal service provider in Portugal (C-154/09). The Commission was closely following whether the judgments of the Court of Justice were fully complied with. In particular, as Italy was not complying with the judgement concerning the availability of caller location information for the 112 emergency number, it was decided to refer Italy to the Court of Justice under Article 260 TFEU which allows imposing financial sanctions on Member States that have not complied with a judgement of the Court of Justice. In view of the progress made by Italy to comply with the judgement, the Commission decided to suspend the application to the Court of Justice. At the same time, the Commission was able to close the case against Poland (with regard to judgement C-492/07 delivered in 2009) as the issues were resolved.

The Commission welcomed the progress made by Member States, even after the initiation of infringement proceedings, and continued to apply its policy of closing cases as soon as the problems were resolved. A total of seven cases were closed in 2010 following progress in Member States. As the definition of subscriber was amended in Polish law in line with the requirements of the Framework Directive, the relevant case was closed by the Commission. Following modifications of national law, the Spanish case related to universal service, as well as the Swedish case in relation to dispute resolution, have been closed. As the handling of calls to the European emergency number "112" in Italy became effective, the relevant case has been closed as well. Other closed cases concerned the rules for dismissal of NRA management in Romania and Slovakia. Both cases could be closed following modifications of national law. Finally, the case of non implementation of spectrum decisions concerning the 169 MHz frequency band in Bulgaria was closed following clarifications provided on the use of frequencies for security and defence purposes in line with the said Decisions. In addition to the pending infringement proceedings, the Commission was able to close 10 presumed infringements based on complaints. At the end of 2010, there were only two complaints pending.

In line with the Commission Communication on better monitoring of the application of Community law²⁶ and the Commission Communication 'A Europe of Results – Applying Community Law'²⁷, the Commission services have continued to prevent the recourse to

²⁶ COM(2002) 725, of 11 December 2002.

²⁷ COM(2007) 502, of 5 September 2007.

infringement proceedings by making use of bilateral contacts with the relevant national authorities. They also provided general guidance on implementation requirements via the Communications Committee (COCOM) and the Radio Spectrum Committee (RSC).

The Commission monitors the correct application of the provisions contained in the EU regulatory framework, also via contacts with stakeholders and complaints received from EU citizens. The online web tool 'EU Pilot' has been increasingly used to facilitate contacts with the participating Member States on the implementation of the EU rules relating to electronic communications. Three Member States joined the project in 2010, leading to 18 participating Member States. 21 new cases concerning electronic communications were opened in 2010 (out of 41 cases opened since the launching of the project). 10 cases were closed in 2010, leading in two cases to the launch of an infringement proceeding.

Pillar 1

Internet usage and online content

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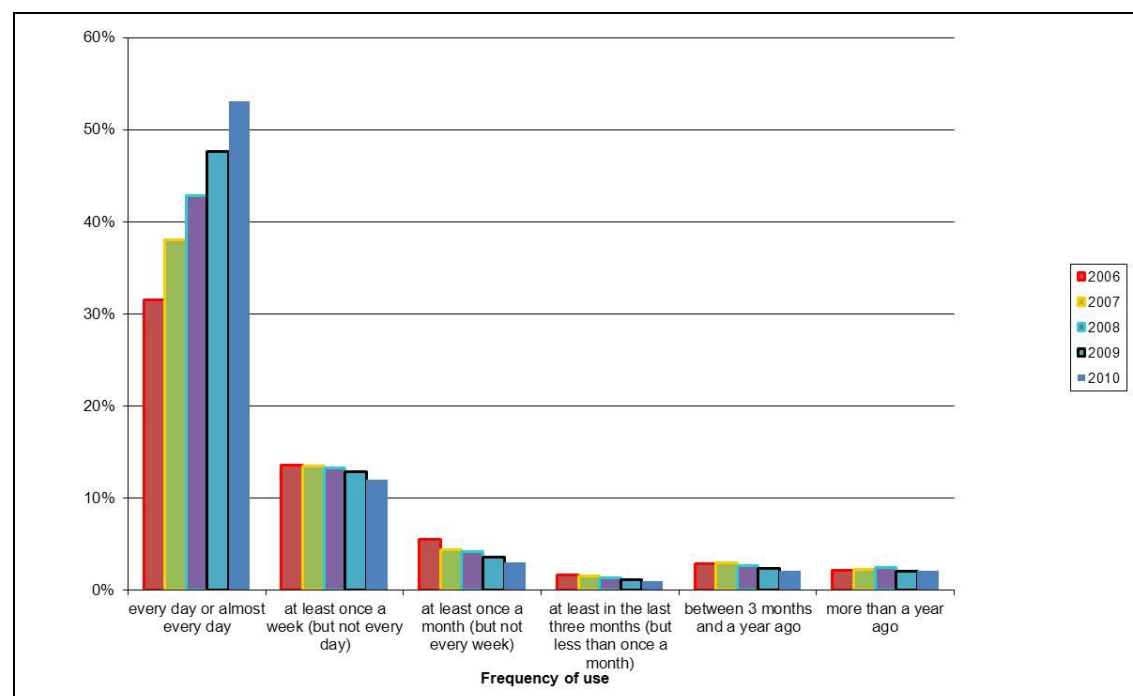
1. INTRODUCTION

More and more citizens use the Internet regularly – by now around two-thirds of the population are regular users. Conversely, the number of non-users has dropped. In short, using the Internet is fast becoming as self-evident as reading a newspaper or watching TV. Nevertheless, usage is not evenly spread. Some groups use the Internet more, others less. The first three sections of this report take a close look at how certain socio-economic factors such as age or education affect Internet usage. Then it explores the role of the Internet with respect to some specific everyday activities – banking, education etc., and addresses questions relating to what people actually do when using the Internet and which are their favourite online content.

2. INTERNET USE FREQUENCY

In 2010, 74% of the EU population had used the Internet at least once, an increase of 4 pp from 2009. Even more remarkably, frequency of use continued to rise. By now, nine out of ten people that have ever used the Internet are regular Internet users¹. Regular Internet users currently represent 65% of the population, up from 60 % in 2009. At this rate, the European Digital Agenda target of 75% will already be met in 2012, well ahead of 2015. However, maintaining the pace of growth will be no easy task since for the "easiest" classes of users saturation levels have been reached and further progress will mostly depend on the catching up of lagging socio-economic groups.

Figure 1: Internet use as a % of population (EU-27) by usage frequency



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

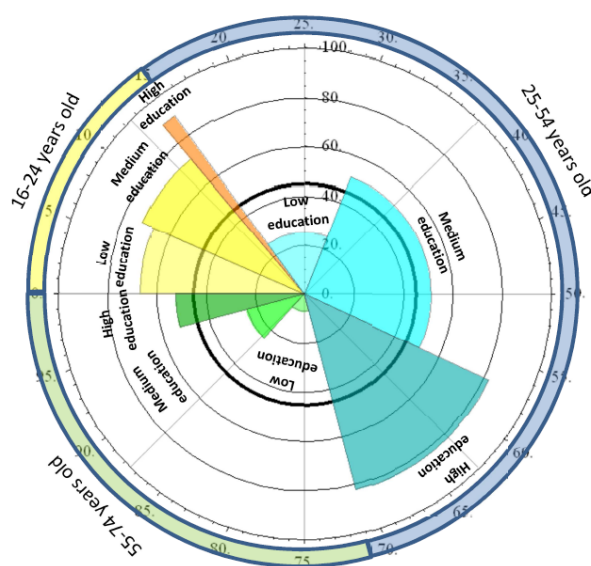
¹ Regular Internet users are defined as those that use the Internet at least once a week.

3. INTERNET USE BY SOCIO-ECONOMIC CATEGORY

Internet use data can be grouped into smaller socioeconomic categories such as age groups (16-24 years, 25-54 years, and 55-74 years²) and educational attainment (low, medium, high). In fact, age and education are two key factors in determining the probability of using the Internet as well as using ICT more in general.

The use of the Internet can be broken down by education levels for each of the three age groups (Figures 2 and 3). The groups are weighted by their importance in the population. Figure 2 provides data from 2006, while figure 3 shows the same data for 2010.

Figure 2: **Regular Internet use in the EU27 in 2006 – breakdown by age-education groups**



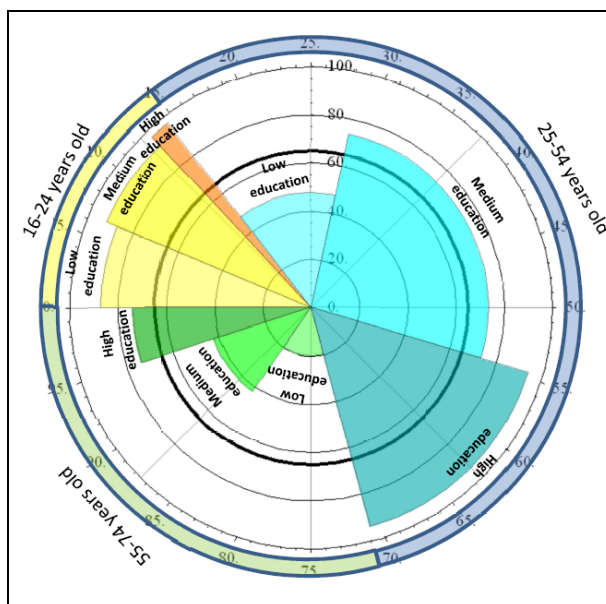
Sector chart: the amplitude of each sector represents the demographic weight of each age-education group in total EU27 population while its height represents the percentage of regular Internet use for that group.

Source: Commission services on the basis of Eurostat Community Survey on ICT Usage in Households and by Individuals.

The darker circles in both figures represent the average share of regular Internet use in the EU. They show an increase from 45% to 65%, i.e. of 20 percentage points (pp), almost half the initial value in only four years. The group breakdown shows that in both 2006 and 2010 young people were among the most active Internet users, surpassed only by working age university graduates. In 2006 the attainment of higher education still made a difference among young citizens, probably due to exposure in universities, given the importance of the Internet as a research tool. By 2010 the difference between young people with low/medium education and high education had been considerably reduced, probably because of the introduction of Internet as an educational tool in schools or in homework activities. Another big factor is the growing demographic importance of children born in the digital era, the so called 'digital natives'. As a result in 2010 regular Internet use among young people ranged from 87% of the low educated to 97% of the highly educated ones.

² Only population aged between 16 years and 74 years is sampled in the statistics on Internet use.

Figure 3: **Regular Internet use in the EU27 in 2010 – breakdown by age-education groups**



Sector chart: the amplitude of each sector represents the demographic weight of each age-education group in total EU27 population while its height represents the percentage of regular Internet use for that group.

Source: Commission services on the basis of Eurostat Community Survey on ICT Usage in Households and by Individuals.

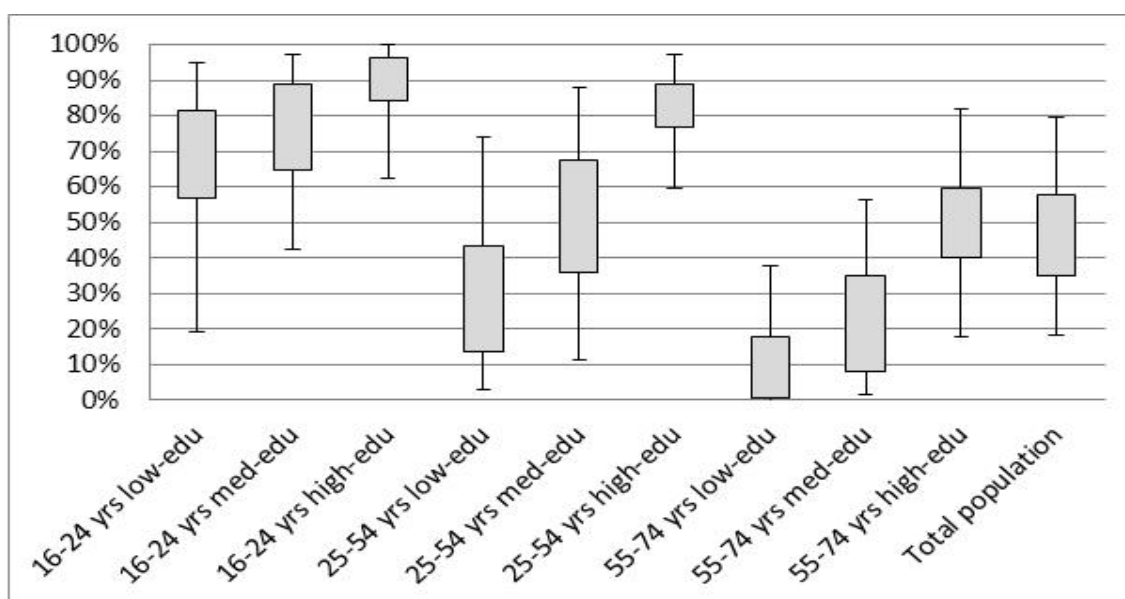
For the middle-aged group (25-54 years old) education continues to make a great difference, although differences have been somewhat reduced because the levels for highly educated people were already close to saturation, reaching 94% in 2010. Finally, regular Internet use by older people (55-74 years old) remains largely below average. Whilst highly educated older people display an average use of 74% in 2010, those with medium education (42%) and particularly those with low education (20%) remain far below. Nevertheless, even these categories are now much closer to average use than four years ago.

Looking at the demographic weights of the different age-education groups, middle age and old people with low education represent each 14% of the population, while old people with medium education make up another 10% of the total. That means that the three groups with substantially below-average Internet use make-up around 40% of the population. In the long term, demographics, i.e. is the passage of young people into the older age groups, helped by a better educational attainment of young generations, will contribute to the wider diffusion of Internet use. However, given the demographic weights of these different age groups, this process will take a long time. In order to increase overall levels of Internet use in the next couple of years, policies such as digital skills are needed to target those ‘at risk groups’.

4. INTERNET USE BY SOCIO-ECONOMIC CATEGORY, VARIATION BETWEEN COUNTRIES

Results for the same age-education group vary across Member States. Figure 4 provides this data for 2006, and figure 5 for 2010. The dispersion of the overall Internet use total population has been slightly reduced between 2006 and 2010, with the interquartile range³ declining from 22 pp. to 19 pp. and the difference between maximum and minimum value falling from 61 pp. to 54 pp.

Figure 4: **Regular Internet use in the EU27 countries in 2006 – box plot of country values in the different age-education groups**



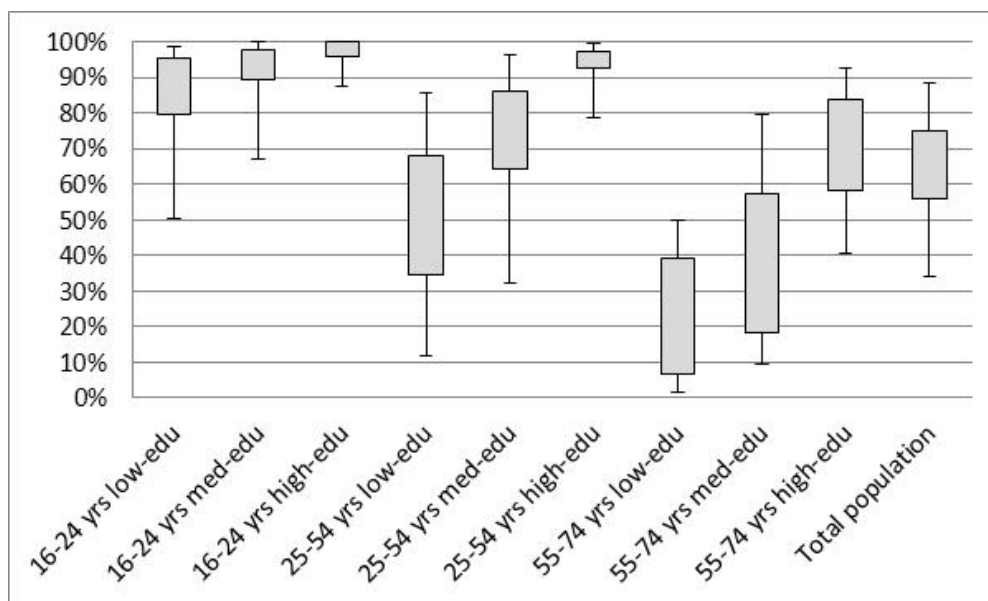
Box-plot chart: it represents country dispersion of values for regular Internet use for various age-education groups. the boxes represent the dispersion of country values for half the countries closest to the median values while the upper and lower bars represent the dispersion for the other half countries further away

Source: Commission services on the basis of Eurostat Community Survey on ICT Usage in Households and by Individuals.

However, this slow development masks several remarkable results for specific age-education groups. Firstly, there is a strong increase in Internet use by the young population, which is a common feature of all countries and leads to a huge reduction in the dispersion of values (the height of the boxes that is decreasing significantly). This effect is most impressive for the highly educated young people, with more than three quarters of Member States displaying at least 96% regular Internet use for this age-education group and with the remaining countries displaying values above 87%. A reduction in dispersion similar to young graduates can be observed for highly educated people in working age (25-54 years old), albeit at a slightly lower speed. Finally, the medium-educated working age group also displays the same trend.

³ The difference in value between the third and first quartile of country values, i.e. the size of the boxes in the figure

Figure 5: Regular Internet use in the EU27 countries in 2010 –box plot of country values in the different age-education groups



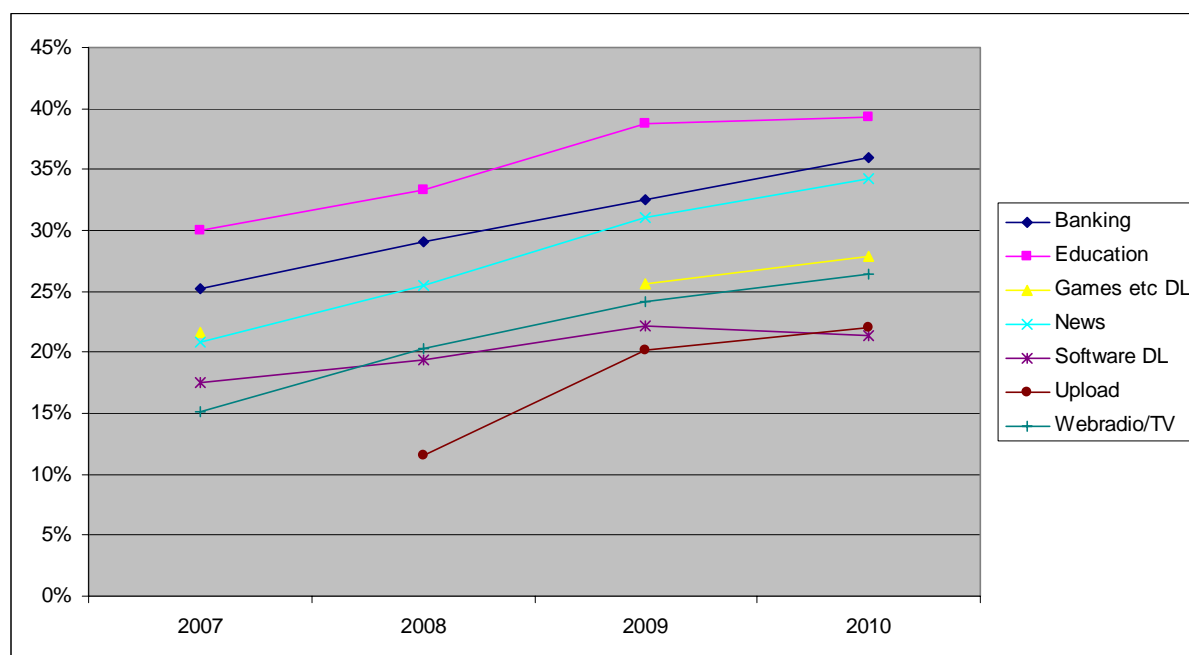
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Source: Commission services on the basis of Eurostat Community Survey on ICT Usage in Households and by Individuals.

On the other hand, ‘at risk groups’, i.e. older people and the low educated middle-aged, show - despite progress in Internet use - an increase in dispersion across countries. This means that there is no or limited catching up between countries inside these groups, the opposite of what happens for the young and/or highly educated groups. Given the demographic weight of these ‘at risk groups’, this explains the limited convergence observed in Internet use by the total population across countries.

5. ONLINE CONTENT

Given the rising numbers of Internet users in all age groups, and in all Member States, what do all these people actually use the Internet for? For a number of formerly offline activities, such as education, banking or news gathering, the Internet has become one of the key channels of distribution, with a third or more of the population turning to the Internet for those purposes (Figure 6).

Figure 6: **Online content⁴ trends as % of citizens⁵**

Source: Eurostat Community Survey on ICT Usage in Households and by Individuals.

More generally, it becomes evident that growth has been similar for most of these different kinds of services, with the result that usage rates have somewhat converged. In fact, in 2007 usage rates of different services were still distributed more widely, and several areas were still on the fringes, such as webradio/TV and content upload; these have become much more popular in 2010. The following sections will look at each of the different kinds of online content⁶.

Education and training

In 2010, almost 40% of the population used the Internet for education and training purposes, up from 30% only three years ago. However, growth has declined compared to 2009. Using the Internet for education and training purposes increased by only 2 pp in 2010. Its use is most widespread where the information society is developed the most. Indeed, in most of the

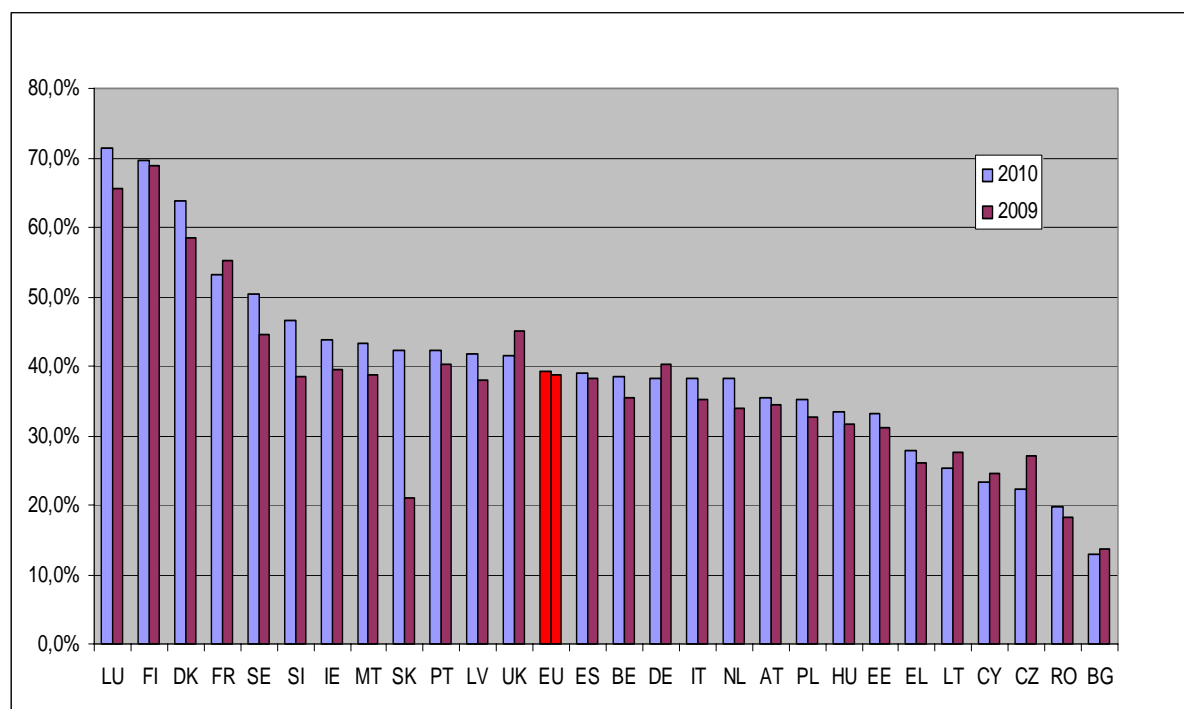
⁴ Data excludes use of On-Demand movie (for which only revenue numbers are available), posting messages and P2P exchange (for both only 2007 and 2010 data is available). See below for more details.

⁵ This table refers to citizens. Please note that some of the tables below will instead indicate the share of Internet users performing a given activity.

⁶ To measure online content we are looking at ten important areas: education and training; online banking; reading/downloading of news/newspapers/magazines; messaging (chat sites, discussion forums, newsgroups); downloading of games (including playing of games), music, films and images; use of webradio/TV; uploading of self-created content (music, films, images etc.); software downloading (other than game software); P2P exchange activity; and revenues of On-Demand Movie services. The areas have been selected among other considerations with regard to data availability.

Nordic countries, as well as in Luxembourg, between 50% and 70% of citizens used online education and training.

Figure 7: Use of the Internet for education and training, in % of citizens



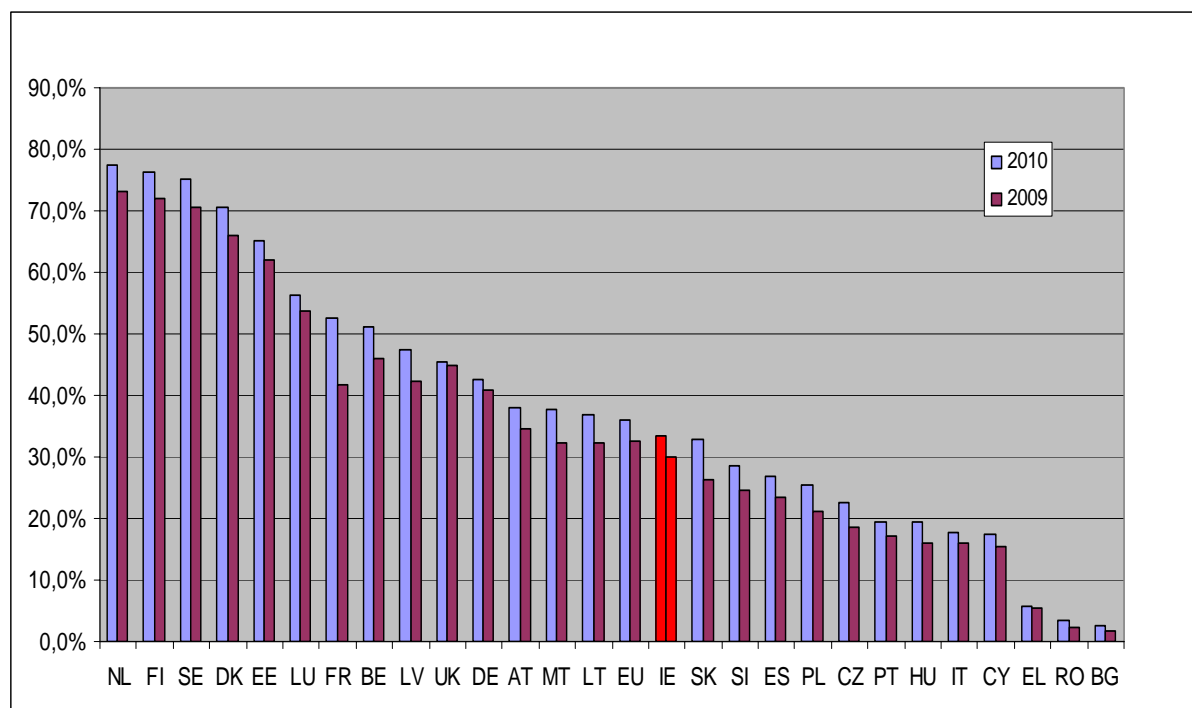
Source: Eurostat Community Survey on ICT Usage in Households and by Individuals.

Banking

Online banking continued its regular growth. Like in 2008 and 2009, the share of citizens engaging in online banking increased by nearly 4 pp, now reaching 36% at EU level. It became a majority activity in the Nordic countries, the Benelux and France, and a mainstream way of banking everywhere else, with the exception of Greece, Romania and Bulgaria, where it remained a rarity in 2010.

Looking at the relationship between 2010 levels of online banking and its growth, those countries with high levels have continued to increase strongly, whilst those with low shares have seen low or no growth at all, just like in the previous years.

Figure 8: Use of online banking, in % of citizens



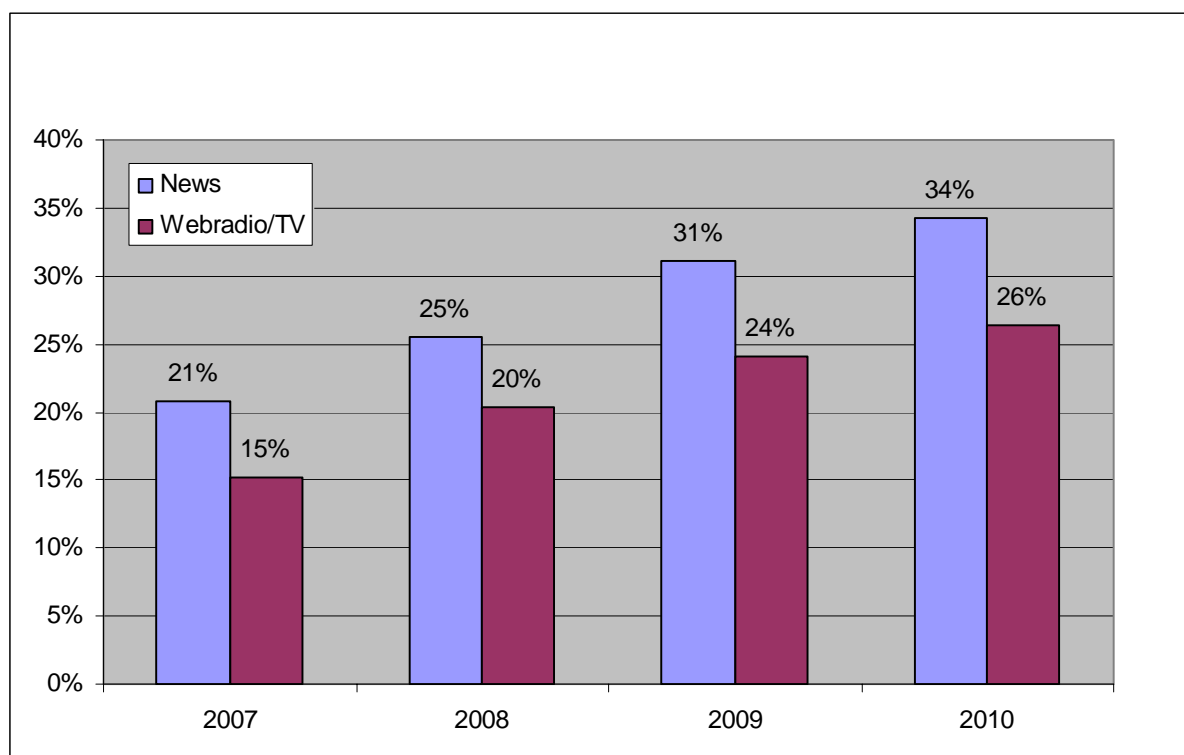
Source: Eurostat Community Survey on ICT Usage in Households and by Individuals.

Webradio/TV and News

More and more people rely at least partially on the Internet as a source of news. Both online Webradio/TV as well as online news/newspapers/news magazines have experienced constant and solid growth rates throughout the EU. More than a third of all citizens read news online in 2010, and more than a quarter listened or watched to webradio or webTV. There is, however, a strong geographic angle to this. In fact, it is only in the Nordic countries where the majority of citizens listened to webradio or watched web TV. For consumption of online news, it is the Nordics and the Baltics together which lead the field.

Interestingly, for both webradio/TV and online news there is a tendency for higher growth in Member States with already high levels. In other words, the Nordics not only have the highest level, but also the highest growth. For news, the converse also holds true: those countries in which online news consumption was lowest also exhibit the weakest growth. This is especially the case for France, Belgium and Poland.

Figure 9: Use of webradio/TV and news, in % of EU citizens

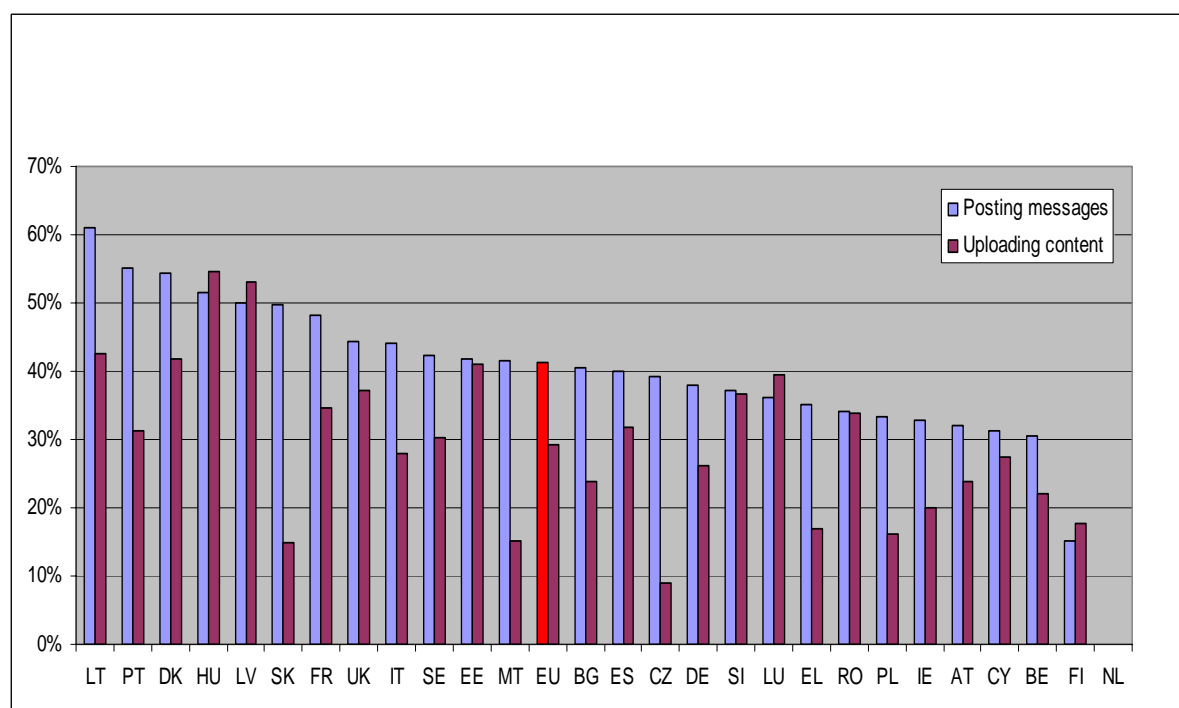


Source: Eurostat Community Survey on ICT Usage in Households and by Individuals.

User-generated content

User-generated content displayed a more stable picture than in the past. The share of broadband Internet users uploading content such as pictures, video or music seems to have stabilised at a fairly high level (30%), after a big jump of 10 pp in 2009. On the other hand, 4 pp more users than in 2007 decided to post messages to chat rooms, online discussion fora or news groups. It is noteworthy that from the country comparison the two activities appear to be neither complementary nor substitutable, as there was very little correlation between those countries where one was strong and those where the other was strong.

Figure 10: User-generated content, in % of citizens living in household with broadband access



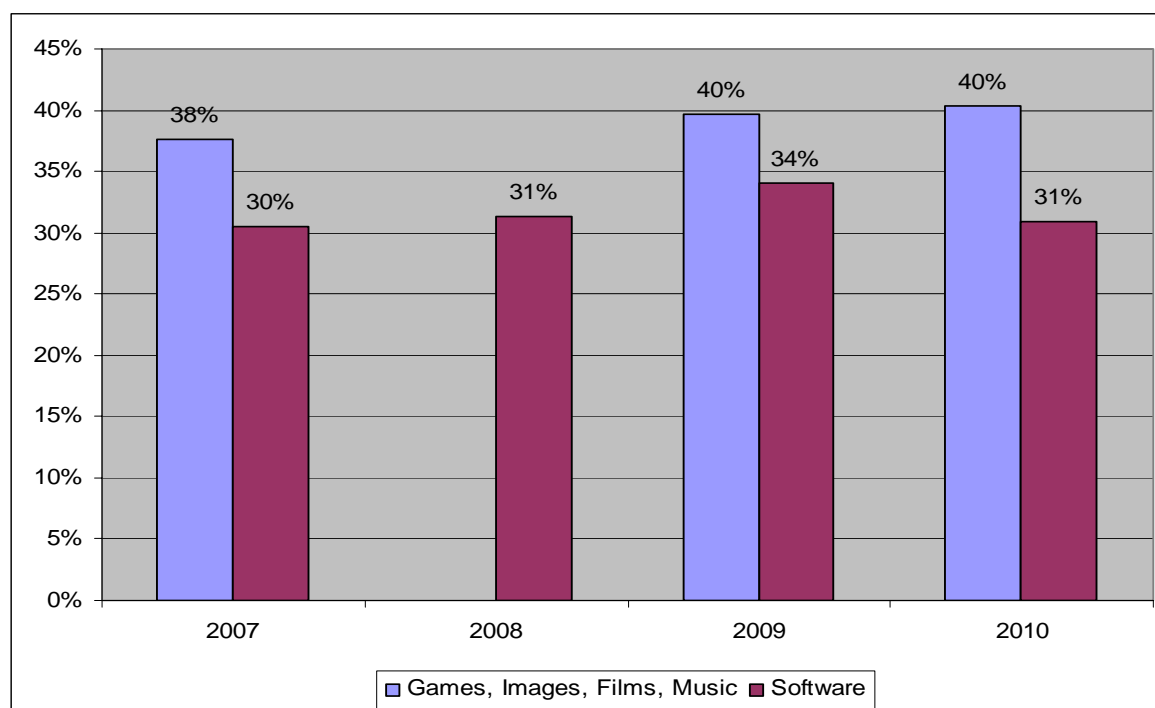
Source: Eurostat Community Survey on ICT Usage in Households and by Individuals.

It is also interesting to note that the growth in posting messages was concentrated in a few countries which already had high shares previously: in Sweden (19 pp), the UK (16 pp) and Lithuania (15 pp). However, they are not part of any particular regional pattern. In contrast, the stagnation in uploading was distributed relatively well across all Member States.

Downloading of software and games, images, films and music

The share of Internet users downloading games, images, films and music has been mostly stable over the last four years, indicating that new Internet users exhibit a similar behaviour as established users. Given the different demographic characteristics of new users – the biggest source for growth were medium-educated middle-aged people – this is quite remarkable. Downloading this kind of content is clearly not the preserve of highly-educated or young people anymore. On the other hand, these new users appear recently a bit less inclined to download software, which requires more technological understanding.

Figure 11: **Downloading of Software and Games, Images, Films and Music, in % of Internet users**



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals.

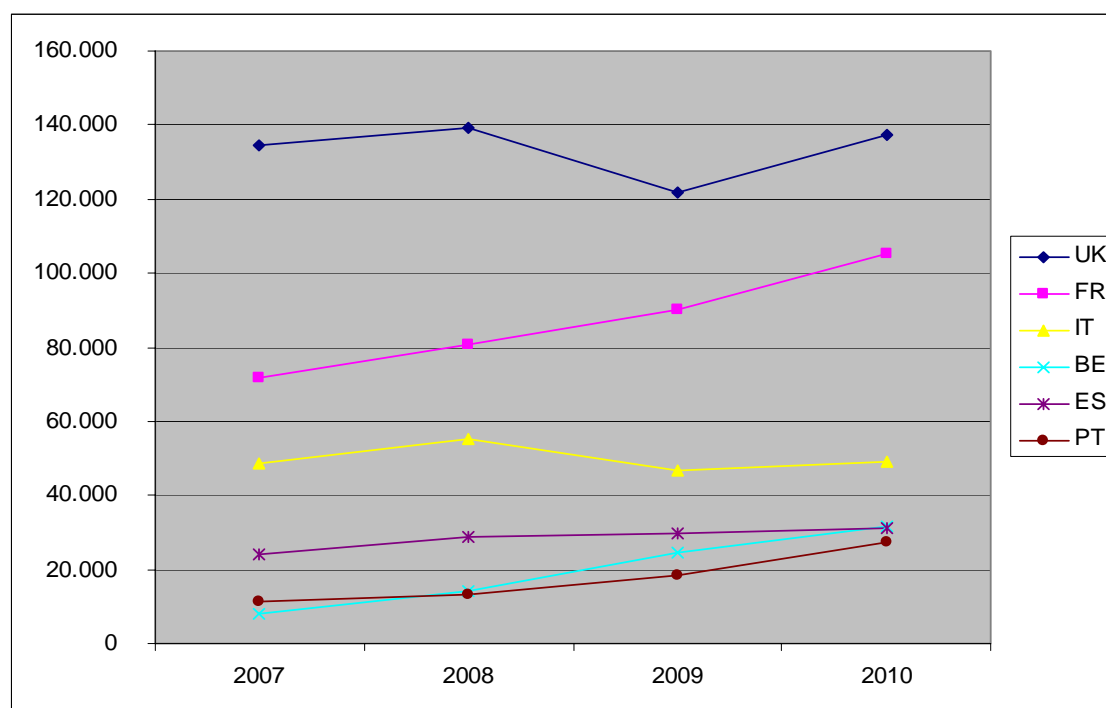
For software, the highest growth can be found in the countries with the highest shares (Denmark, Poland), but for games, images, films, and music the countries in which the share of Internet users downloading is highest are also among the few countries in which the share has fallen.

On-Demand Services

On-demand revenue includes income from individual on-demand transactions as well as on-demand monthly access fees and subscription video-on-demand in different content categories such as movies, events, sports and TV.

Irrespective of definitional issues, the on-demand market only reached relevant levels in the largest Western European countries, with France and the UK accounting for over half of the market, and Spain, Italy and Germany making up most of the rest. The rest of the EU Member States together only accounted for 15%, with the majority of countries having less than 1% of the overall revenue.

Figure 12: Total On-Demand revenue of countries with >5% market share in 1000 €



Source: ScreenDigest

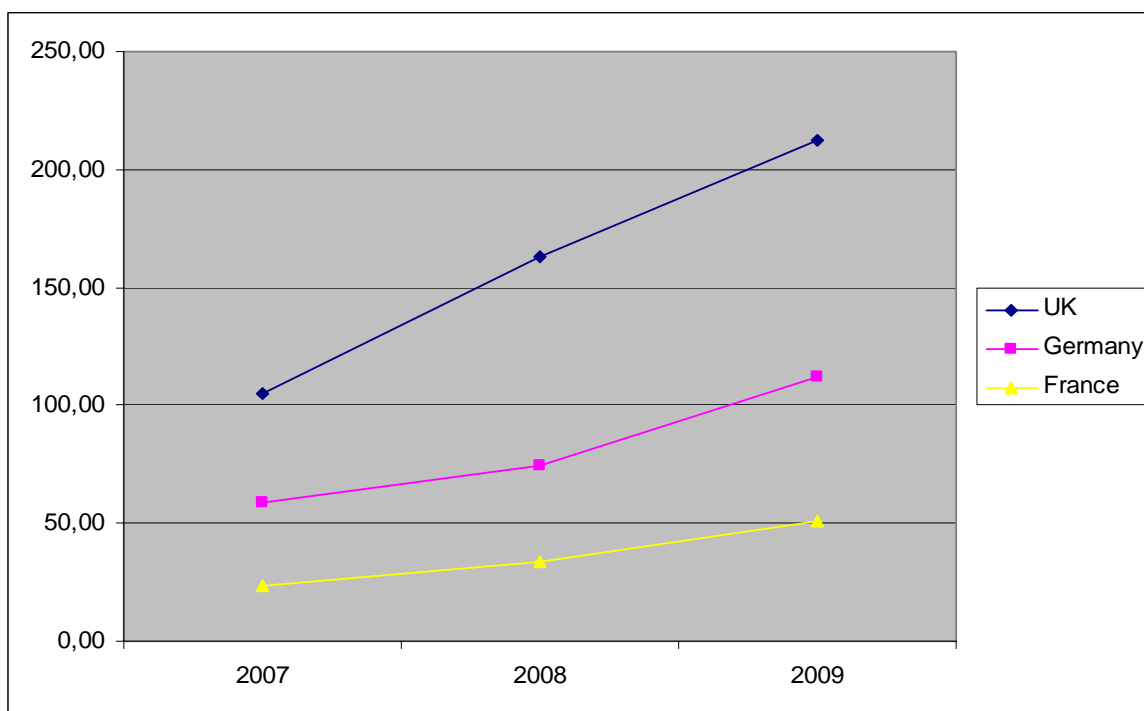
The growth pattern has been rather unequal during the last four years. France and Germany have seen constant growth: France fast growth from a high level, Germany slow growth from a low level. Spain and especially Italy saw falls in market value after 2008. The value in the UK started to fall earlier, but recovered in 2010.

As a result, the total EU market was only marginally higher in 2010 than it was in 2007, which is rather disappointing for the industry, given, increasing numbers of Internet usage, increasing bandwidth and increasing offers of on-demand services. As a typical premium good, one is tempted to ascribe the drop in demand to the financial crisis; however, this does not explain why Italy had a steeper drop than Spain, or why UK demand recovered so early. Clearly, other factors must have played a significant role, too.

Online Music

Revenues from music downloading are geographically even more concentrated than on-demand services, with the UK accounting for almost half of the market, and Germany and France for a large part of the rest.

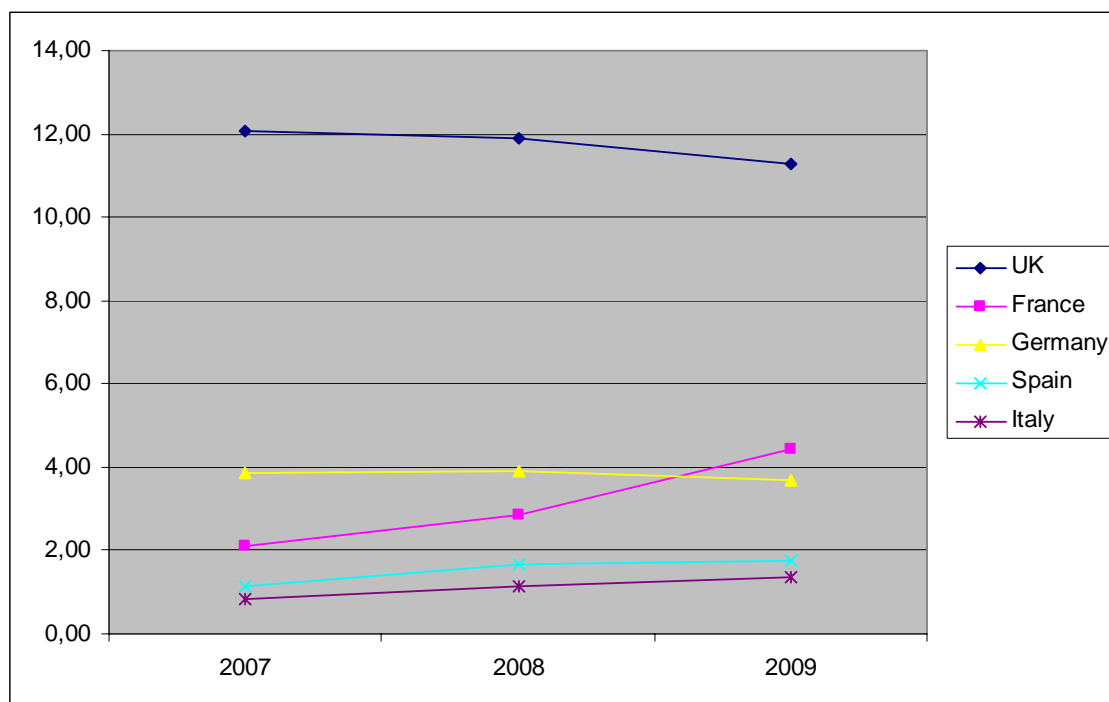
Figure 13: Total music download (albums + singles) of countries with >5% market share in €m



Source: ScreenDigest

Contrary to the on-demand market, growth has been constant for online music, even accelerating in 2009 when on-demand services were falling. This is most likely due to improved supply of attractive online music offers.

Figure 14: Online music subscription revenues (€m) in countries with >5% market share in €



Source: ScreenDigest

For online music subscriptions (as opposed to paying for an individual download), France is the main engine of growth while Spain and Italy increase marginally, and the UK and Germany even witnessed decreases. Thus, it would appear that in the UK and Germany the trend has been away from subscription to more individual downloads, while in France both grow simultaneously.

6. CONCLUSIONS

The share of population using the Internet has continued to progress as expected. Most of recent growth has come from medium-educated middle-aged and low-educated young citizens. For young citizens, usage rates have become more similar across countries, while for old citizens the opposite is true. The latter is probably due to the success of inclusion policies in some Member States, creating a gap with the other Member States which have not pursued this objective as consequently.

Daily activities which used to be performed offline, such as banking, reading the news, watching TV and listening to the radio are increasingly performed online. However, growth rates have decreased in almost all areas, although saturation levels are still far away.

Not only have nearly all areas of online content become more popular, the difference in popularity between the different kinds of online content has also been somewhat reduced. One possible explanation could be that the new user groups, such as the middle-aged, have a wider range of interests which they are performing online.

Finally, new audiovisual content such as on-demand services and online music subscriptions constitute a significant market only in the largest Western European countries. With increasing numbers of Internet users, as well as rising supply, these online contents should be able to develop significant market in smaller countries and in Eastern Europe as well. However, this seems to take more time than might have been thought.

Pillar 3

Security concerns

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This chapter analyses the 2010 results of two special surveys on the use of ICT by Europeans with reference to security risks on the internet. It explores three main dimensions: the level of concern; the damages effectively encountered; and the attitudes and initiatives undertaken to protect one self from the most common threats.

If the goal of "Every European Digital" is to become a reality, security concerns need to be addressed, as bad experiences may limit the internet experience. Lack of adequate skills relating to computer/data and identity protection online may endanger usage and participation, and as such represent important policy concerns.

The first part of this report analyses results of the survey proposed to citizens, aged 16-74, having used the internet during the last year. The second part will present some indicators concerning the experience of European enterprises, having 10 or more persons employed, in the main manufacturing and service sectors. The annex provides the key methodological notes and references.

1. CITIZENS' CONCERNS

The following table illustrate the reaction of European internet users to six of the more common threats and risks usually present when going online.

Table 1: Internet users level of concern with regard to security issues on the internet

How concerned are you about the following possible problems related to internet usage for private purposes? (% of internet users during last year, EU27)			
	strongly	mildly	not at all
a) catching a virus or other computer infection (e.g. worm or Trojan horse) resulting in loss of information or time	33%	45%	21%
b) unsolicited emails sent to me ('Spam')	29%	41%	29%
c) abuse of personal information sent on the Internet and/or other privacy violations (e.g. abuse of pictures, videos, personal data uploaded on community websites)	35%	36%	28%
d) financial loss as a result of receiving fraudulent messages ('phishing') or getting redirected to fake websites asking for personal information ('pharming')	32%	32%	36%
e) financial loss due to fraudulent payment (credit or debit) card use	35%	30%	35%
f) children accessing inappropriate web-sites or connecting with potentially dangerous persons from a computer within the household	34%	23%	42%

Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

A majority of internet users shows some level of concern for each of the six security issues and around a third voice strong concerns. On the whole, more internet users show mild levels of concern than strong levels. Among those expressing mild concerns, a ranking emerges whereby users are mostly concerned with catching a virus or other computer infection.

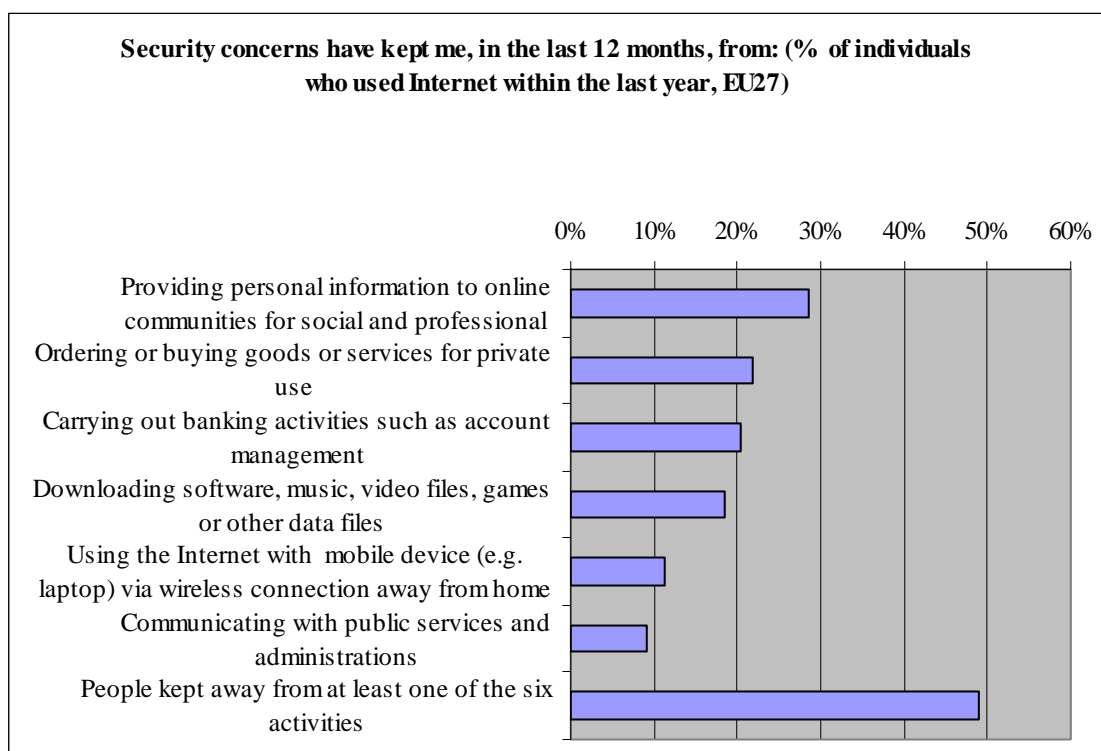
However, this pattern is not the same across countries. Furthermore not all users have the same main concerns: for some it is the abuse of personal information, or spam and viruses, for others the possible financial losses, as well as the inappropriate content for children or dangerous contacts. Only 8% of internet users are not at all concerned about any of the six security issues.

Country level analysis reveals that in only three countries (Estonia, Lithuania and Ireland) are more than 20% of internet users not at all concerned. Although for most countries no strong ranking emerges across the six items, there are some exceptions:

- in some countries strong concerns about children accessing inappropriate content rank 20 percentage points (pp) more than unsolicited emails (spam) (BE, CZ, ES, PT, and a bit less in IT). This may reflect concern raised by recent child abuse scandals.
- in EL, FR, SK catching viruses or receiving spam is at the top of people's worries, well over financial losses and children accessing inappropriate content/dangerous contacts.
- financial loss during payments is of highest concern in UK, SI, LV and to a lesser degree also in SE and FI, the countries in which eCommerce is more widely diffused;
- in the NL, as well as in DE and AT, the main strong concern is about the abuse of personal information.

The less people are concerned with security issues, the less they are kept away from using the internet. Information security is critical to sustain trust in electronic transactions. Trust in the security of electronic means of communication is an important precondition for realising many potential benefits of internet use. In 2010, half of EU27 internet users have limited their use of the net because of security concerns. This proportion is quite homogeneous across social groups of the population. Youngsters/students are slightly more confident. Much more variation is observed between countries: higher percentages of people limiting their use of internet because of security concerns are observed in IT, BG, FI (65-75%), lower in IE, EE, MT, LT, RO, CZ (less than 25%). The general profile shows the following ranking:

Figure 1: **Limitations of internet use because of security concerns**



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals, 2010

There is a clear and diffused reluctance to provide personal information to online communities. 55% of internet users have not posted messages on social networking sites, and 29% of internet users have made that choice, at least once, in the last 12 months prior to the survey because of security concerns. Moreover, more than a fifth of internet users did not engage in eCommerce in the last 12 months prior to the survey because of security concerns (half of those that did not buy online). Similar proportions can be observed for internet banking. Country analysis reveals that:

- for a majority of countries the more frequent decision by internet users is not to disclose personal information. This behaviour suggests significant presence of internet savy.

- the decision not to buy online is strongest in Italy (44% of internet users do not buy online for security concerns) and Greece, with significant values also in Spain, Bulgaria and France (more than 30%).

- the pattern in lack of use of online banking reflects that of eCommerce, with the notable exception of Finland, where trust in banking services is much higher than in online commerce.

- Finnish people also appear to be the most concerned with security issues to have been kept most frequently from downloading software, music, video files, games or other data files.¹

- Italy and Germany are the countries with the lowest trust in communicating online with public administrations and services, with 20% and 13% of declared "opt-out" respectively.

2. THE CONCRETE EXPERIENCE OF ICT SECURITY RELATED PROBLEMS

One of the most common experiences is the receipt of unsolicited emails (known as "Spam"). Spam is reported by more than half of European internet users (56%) across most countries, with the notable exception for IE, AT, CY, RO and EL. Here incidents have been reported by less than one in three internet users. In any case spam is considered a strong concern only by one in two of those that reported such experience.

Spam represents an important part of all emails sent around the world. Botnets² are often used to diffuse such types of un-requested mails. The enduring character of the problem suggests that the issue cannot be solved by users alone. Important progress in this fight has been achieved since the adoption of the EU directive 2002/58 on privacy and electronic communications. The basic regulatory tools are there, and the Digital Agenda is focused around coordination activities and awareness raising initiatives to support the fight against spam.

Other, possibly more important problems encountered by users when surfing are (i) catching a virus, serious enough so as to result in loss of information or time; (ii) abuse of personal information; and (iii) financial losses due to phishing, pharming, or fraudulent payments associated with card use. About a third of internet users report having caught a serious virus over the previous 12 months; 4% have experienced an abuse of personal information and 3% financial losses. 34% of internet users have experienced at least one of these three. In particular (Figure 2):

- Loss of information or time due to virus infections is reported by around half of internet users in BG, MT and SK. By contrast it is less than 15% in RO, IE and AT.
- Reported financial losses are highest in LV, UK and MT (reported at between 5 and 8% of internet users). However, eCommerce is very differently diffused in these three countries: in the UK 67% of internet users report having ordered some goods or services during last year, in MT 38% and in LV only 17%. Therefore, in general, it cannot be concluded that there is a relation between eCommerce adoption and diffusion of such types of fraud. Indeed, the reverse is true for SE, DE and DK where

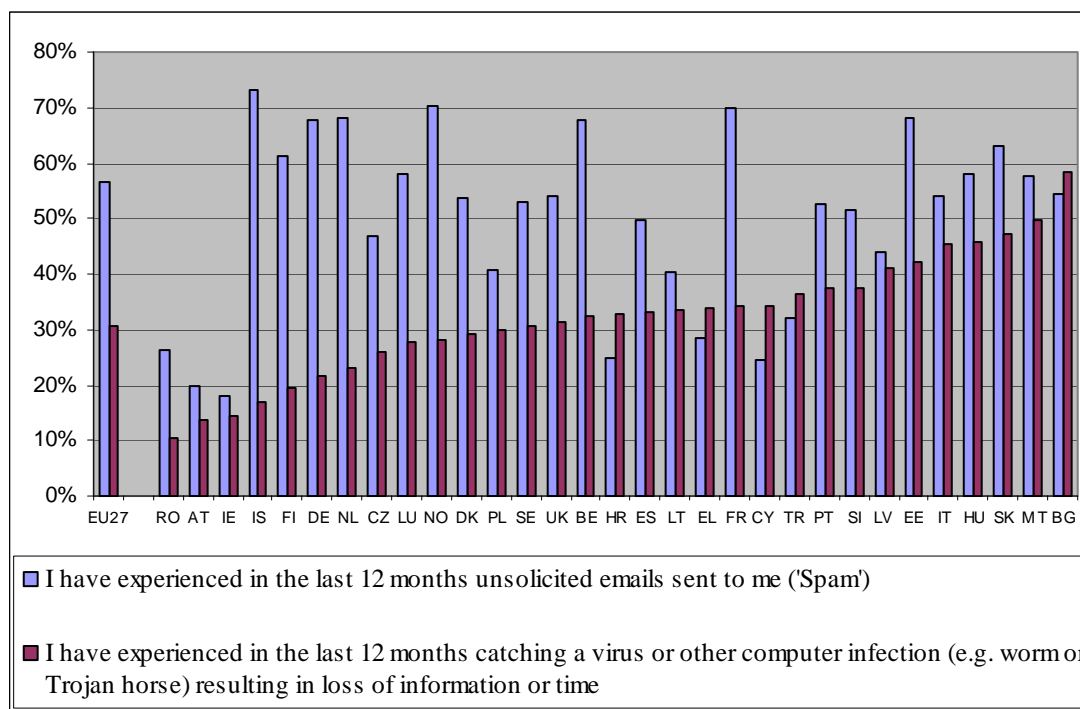
¹ An important national debate was open in Finland beginning of 2010 on the subject of legislative measures to reduce piracy.

² A Botnet is a network of private computer infected by malicious software that allow for some kind of remote control of them.

eCommerce is high but the rate of reported losses is low compared to EU average.

- The abuse of personal information is relatively highly reported in BG, ES and IT, with frequencies between 6 and 7%, significantly above the EU27 average of 4%.
- Children accessing inappropriate content/dangerous persons is a case similarly highly reported by interviewed adults in IT, LV and BG.³

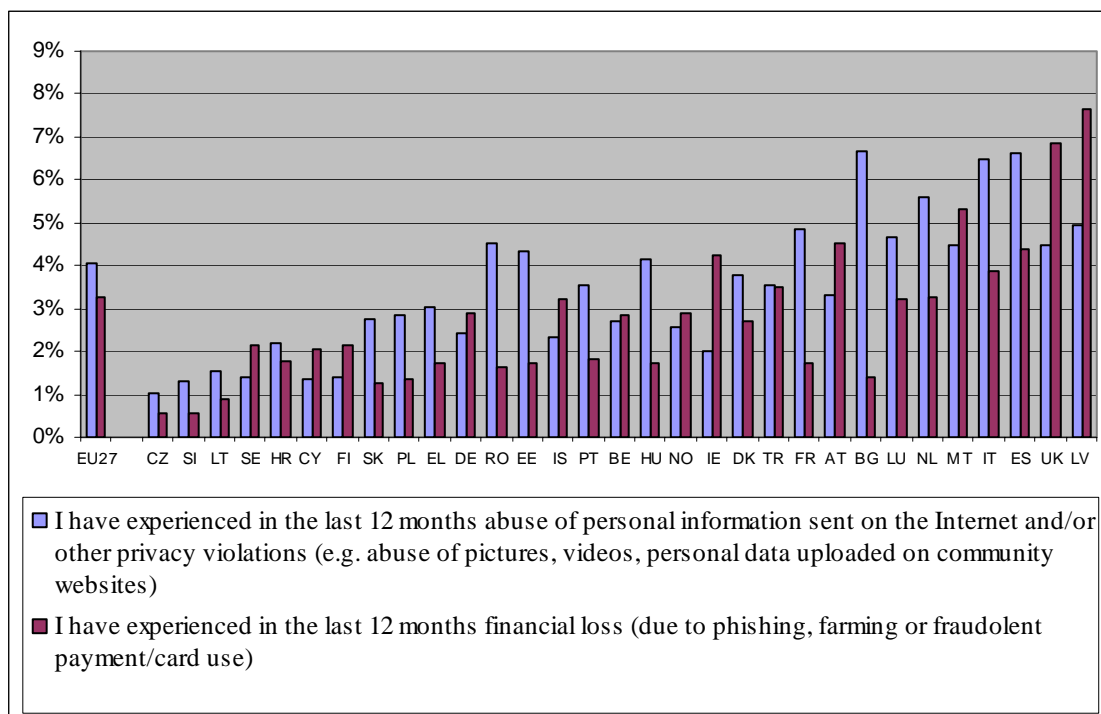
Figure 2: **Receiving Spam or catching a virus, in % of individuals who used Internet within the last year**



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals, 2010

³ See Eurostat press release of 7/02/2011 for the distribution of individuals who live in a household with dependant children and used the internet in the last 12 months and that reported incidence of children accessing inappropriate web-sites or connecting with potentially dangerous persons, available at : http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/4-07022011-AP/EN/4-07022011-AP-EN.PDF

Figure 3: Abuse of personal information and financial losses, in % of individuals who used Internet within the last year



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals, 2010

There is a relationship between the spread of experiencing a particular security problem and the concerns expressed. Half of the 31% of internet users having experienced virus infections during last year express strong concerns for that phenomenon. And the other way round, a bit less than half of the 33% expressing strong concerns about viruses have experienced it with losses of information and time. This quite extended overlap between “perceptions” and “experience” indicates that there is an important group of internet users, 15% at EU27 level, for which virus infection is a serious security problem. This reinforced conjunction of concern and experience is particularly strong in LV, PT, BE, CZ, UK and MT.

Spam is widely experienced (56% of internet users) but considered a concern by 30% of them only. The majority of users consider it a disturbing phenomenon although not too damaging. The main outlier is FR, where spam is diffused and represents a strong concern for a majority of internet users. The other problems of financial losses and abuse of personal information are more rare but perceived as more relevant and considered a strong concern, ten times more (32/35%) than they are actually experienced, illustrating the much more relevant damages and risks associated with them.

The large majority (two thirds) of those experiencing abuse of personal information have been using the internet for social networking and are people active in posting messages to chat sites, blogs, newsgroups or online discussion forum or instant messaging, and/or uploading self-created content (text, images, photos, videos, music, etc.), suggesting that the risk of abuse of personal information is slightly increased by the fact of being an active social net worker. Similarly, 67% of those having experienced one of the three more rare problems have

been ordering goods or services over the internet. As 57% of all internet users during last year have ordered goods or services, then buying online slightly increases the real risk of experiencing security threats.

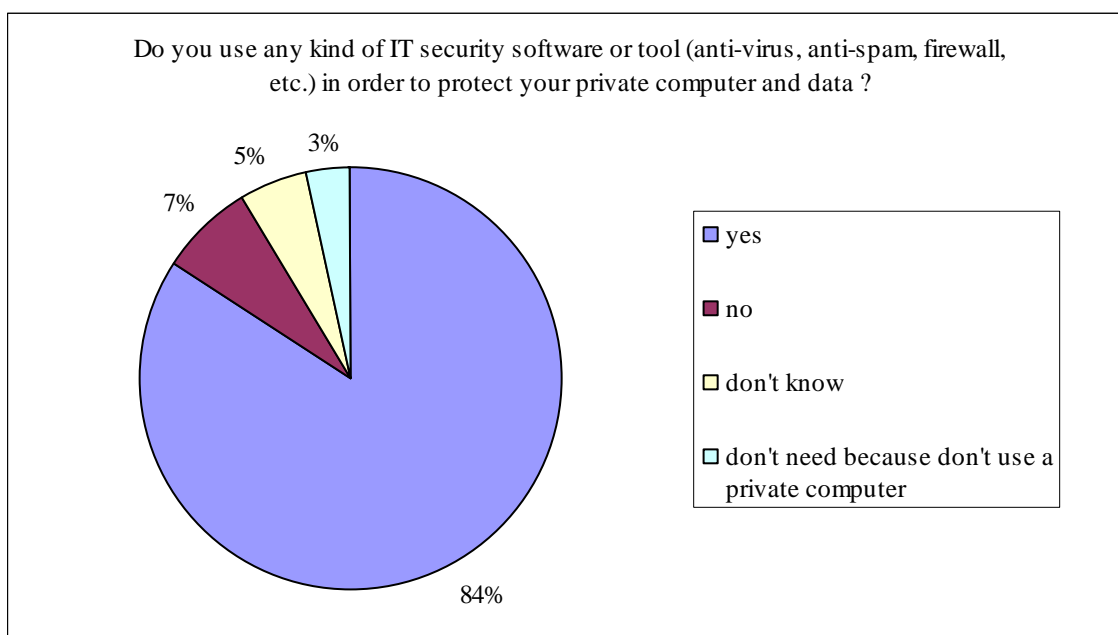
There are more victims of viruses (or users aware of having been victim of viruses), between students/16-24 than across other age groups, particularly if with high education (40% instead of 30%). Moreover, there are slightly more victims of abuse of personal information, as well as for financial losses, among highly educated people (5% instead of 4%, or 4.6% instead of 3%). On the contrary, children exposure is a bit more reported by adults with no or low education (4.4 instead of 3%).

These data should be interpreted carefully because they refer to facts that internet users are aware of and do not include events people have not had the opportunity or the ability to perceive. A second caveat comes from the absence of measures of the intensity of use. For example, it is likely that the risks of experiencing credit card related frauds increase with frequency of use. There are also qualitative aspects of individual behaviour online (e.g. the opening of files attached to e-mail received from unknown persons, etc) that could seriously change the exposure to major risks. Much more detailed research is needed on the subject.

3. ATTITUDES AND ACTIONS AGAINST PROTECTION

European citizens are trying to protect themselves from security risks. The two major tools they have at their disposal are running specific software and the practice of making regular backups of their data. A very large majority of internet users declares to use some sort of IT security software (84% on EU27 average). Only in LV, RO, EE, IT and CZ this percentage falls between 62 and 68%.

Figure 4: Use of IT security software or tool, in % of individuals who used Internet within the last year



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals, 2010

5% of internet users do not know whether they are using some security software. This could be related to the fact that someone else in the household takes care of the issue. Moreover, software (IT tools) may be installed by default when computers are new. Some of the internet users have been unable to describe the security software running on their computer when surfing online. This is particularly true in CZ, EE, IT, CY, LV, BG and RO with frequencies between 24 and 12%.

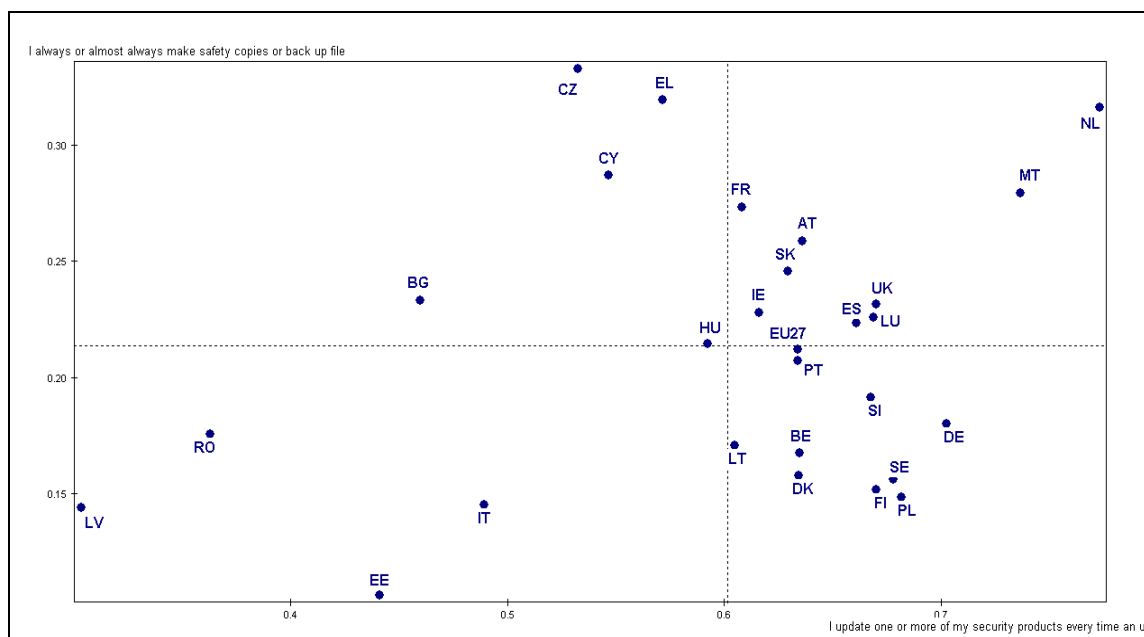
Lack of skills is also reflected by a small percentage of users of IT security software (13%) who are not aware of what the software does. Moreover, the effectiveness of this software very much depends on the frequency of its updates (because of the fast changing environment in terms of viruses, spam and other threats). Three out of four users do update the software, in particular when automatic updates are available, but a quarter risks to weaken its effect because they do not update it often enough or at all.

More than 40% of those who do not update their software do not do so because they don't know how to, and 8% because it's too expensive. This result reflects the importance of the lack of skills rather than the importance of affordability considerations.

A minority of internet users protects data through making safety copies or back up files. A third of internet users does so occasionally, and only 21% in a regular way. Results are correlated with the education level. As expected, the highest use of back-up and safety copies is done by ICT professionals (42%).

The use of IT security software (regularly updated) and regularly making safety copies or back up files are both correlated with skills and education and therefore between themselves (Figure 5).

Figure 5: Use of "regularly updated security software" and of "back up files" by countries, in % of individuals who used Internet within the last year



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals, 2010

4. BUSINESSES' CONCERNS

ICT Security is a very relevant concern for enterprises because incidents may yield important damage with reference to destruction or corruption of data, disclosure of confidential data, unavailability of services. Security issues come hand-in-hand with increased ICT and eBusiness adoption by enterprises: the more ICT and eBusiness solutions are used, the more enterprises become dependent and potentially vulnerable to any type of malfunctioning or failure. The growing importance of collaboration and networking, together with the growing adoption of web-enabled applications and the diffusion of mobile solutions, is pushing companies to share data along extended value chains. There is an inevitable correlation between security investments and investments in collaborative data sharing technologies.

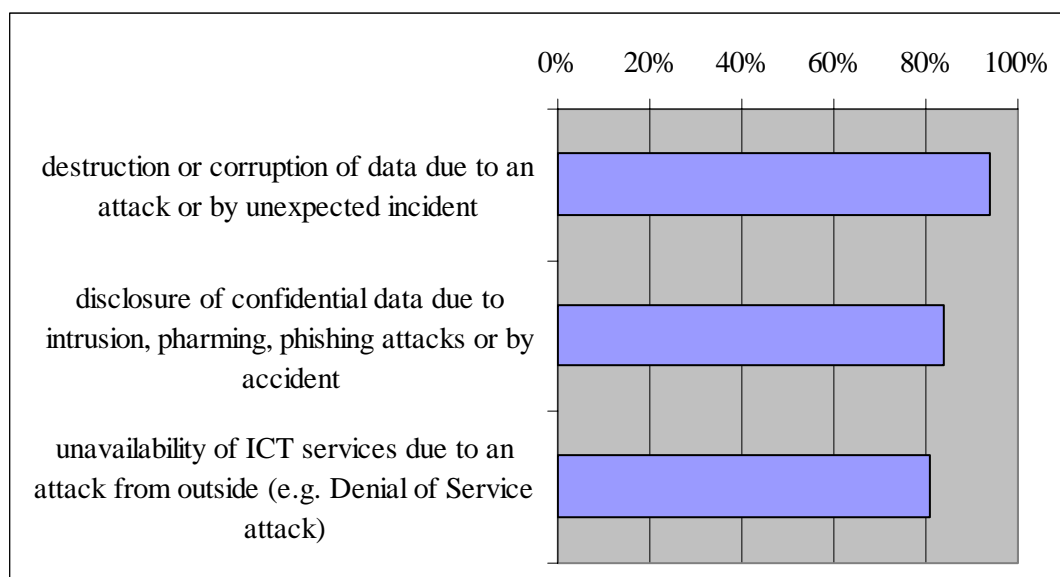
Large and small enterprises differ in their take-up of ICT and eBusiness: Large enterprises (those with 250 or more persons employed) take up ICT more intensively than SMEs and hence experience security issues in a different way. The following section reviews the security policy of large firms. A separate paragraph is afterwards dedicated to the characteristics of SMEs.

5. LARGE EUROPEAN ENTERPRISES' ICT SECURITY POLICY

Enterprises' concerns regarding security risks are addressed by the implementation of specific security policy with a plan for regular review. A majority of large European enterprises have such a policy (65% in 2010).⁴ Almost all of them consider the risk of data destruction or corruption, due to an attack or any other unexpected incident. But two other important risks are very often also addressed: the disclosure of confidential data and the unavailability of ICT services due to an explicit attack from outside. Three quarters of ICT security plans address all three of these risks (Figure 6).

⁴ Manufacturing and services, excluding the financial services.

Figure 6: **Risks addressed by ICT security policy or plans of large enterprises having ICT security policies, EU27, in % of large enterprises**



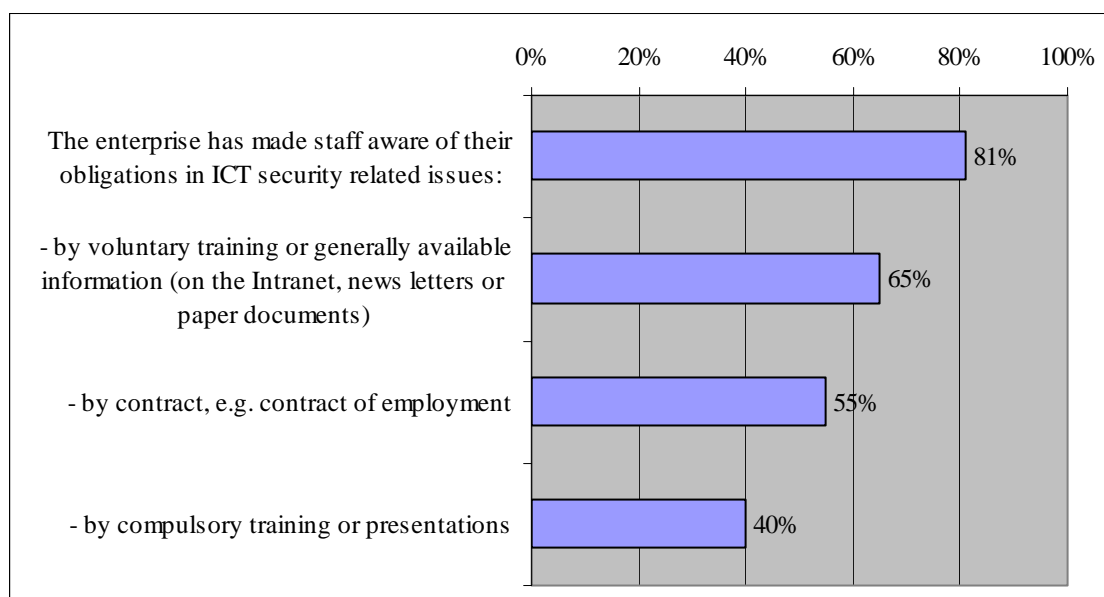
Source: Eurostat, Community Survey on ICT Usage and eCommerce in Enterprises

Nevertheless, 35% do not have a regularly reviewed security policy. They are particularly concentrated in PL, RO and BG (more than 60% of the large enterprises of these countries). But many of them are also in Germany where 19% of all large European enterprises are located. However, this does not mean that nothing is being done about security in these firms. Companies may have adopted security measures and initiatives that are not regularly reviewed, including technical measures and procedures involving employees (firewalls, new passwords, etc.).

With regard to technical measures, 61% of large enterprises **logged activities for analyses of security incidents** and 72% **stored data backups offsite**. The other very common and effective measure is to control and secure the access to the IT infrastructure. Coherently with the other indicators, 73% of large enterprises declare to use **strong password authentication** (i.e. min 8 characters, max 6 months, encrypted transmission and storage). 31% make use of **hardware tokens, e.g. smart cards**, for user identification and authentication. **Biometric methods** are still less diffused with around 10% of large enterprises using them at the beginning of 2010. Half of the companies that use strong authentication passwords or tokens/smart cards are also making use of **digital signatures** in some of the messages sent (39% of large enterprises). Finally, 21% of large enterprises use **secure protocols**, such as SSL or TLS, for reception of orders via internet.

For compliance with security measures and diffused vigilance, the involvement of employees has an important role to play in terms of the effective implementation of technological and procedural rules. This starts with making staff aware of their obligations regarding ICT security related issues. 81% of large enterprises are active on this front, to a large extent with relatively soft measures such as disseminating information on the Intranet or including security related norms in the contracts of employment. Compulsory training or presentations are relatively less common (40% of large enterprises). Often the approach adopted is a mix of these measures.

Figure 7: **Approaches adopted by enterprises to raise employees awareness, in % of large enterprises.**



EU27 without EE

Source: Eurostat Community Survey on ICT Usage and eCommerce in Enterprises

The lowest rates of awareness raising initiatives are observed in PL, LU, BG and HU, around 20 pp less than EU average.

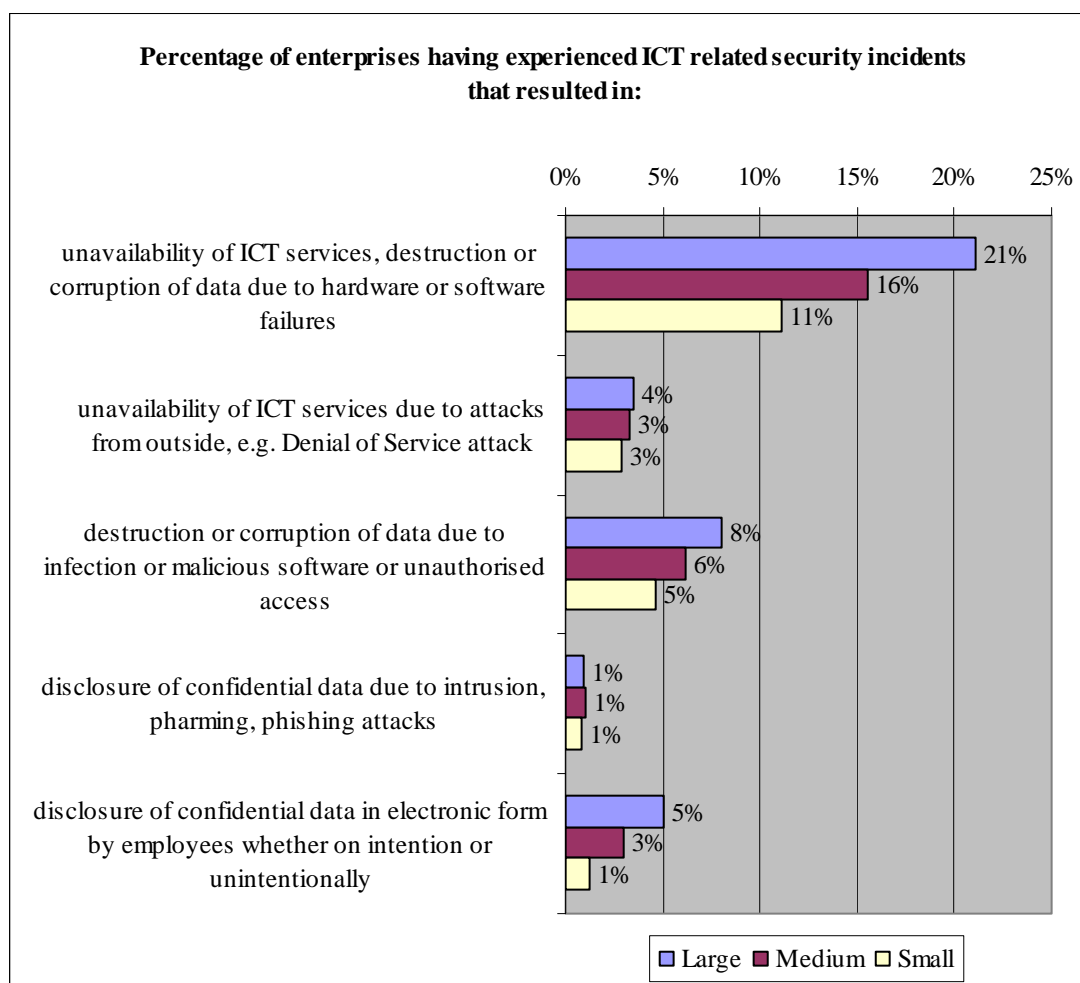
As such it can be concluded that large European enterprises are quite active in the security domain and a large majority of them are deploying the basic tools to protect the integrity, authenticity, availability and confidentiality of their data and IT systems. They are surely the main active consumers on the European network and security market, whose value has been estimated to reach between 10 and 15 billions of euros in 2010⁵.

6. ICT SECURITY INCIDENTS REPORTED BY ENTERPRISES

It is very difficult to judge if the investment of European companies in IT security (hardware, software and services) is effective or sufficient. The most frequently reported breaches in 2009 concern the destruction or corruption of data, due to internal hardware/software failure or, to a lesser extent, due to malicious software or unauthorised access (Figure 8).

⁵ IDC study

Figure 8: Security breaches experienced during 2009, by size of enterprises



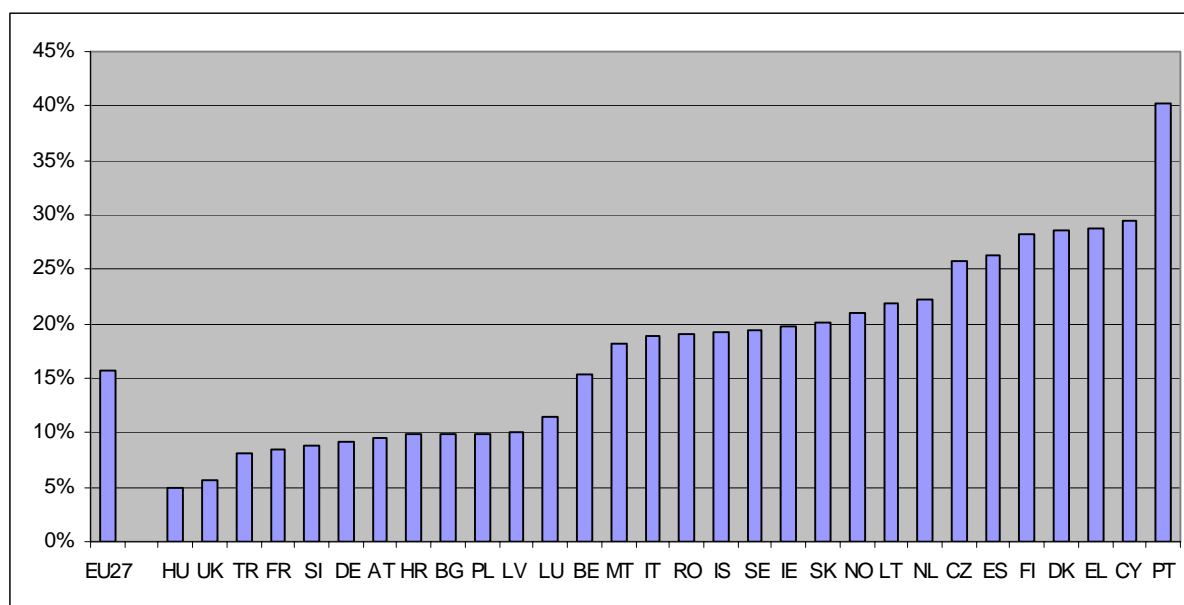
EU27 without EE

Source: Eurostat Community Survey on ICT Usage and eCommerce in Enterprises

Data in figure 8 should be interpreted with care. On the basis of observations by Internet Service Providers and network operators, security market experts consider that these types of incidents are reported much less frequently than they actually take place in reality. The higher incidence of breaches in large enterprises could be the result of the more rich and complex IT networks and services they manage relative to smaller enterprises, but also of their higher capacity to register and report about attacks and failures.

Country-level analysis confirms the existence of a mix of factors that make it so difficult to interpret victimisation indicators in this field (Figure 9). Countries with advanced levels of ICT use such as FI and DK show similar incidence rates to PT and EL, probably for reasons which go beyond this kind of analysis.

Figure 9: Enterprises having experienced any security incident during 2009, by country (%)



EU27 without EE

Source: Eurostat Community Survey on ICT Usage and eCommerce in Enterprises

7. THE SPECIFIC CASE OF SMES, DEPENDING ON EBUSINESS SOLUTIONS ADOPTED AND BY COUNTRY

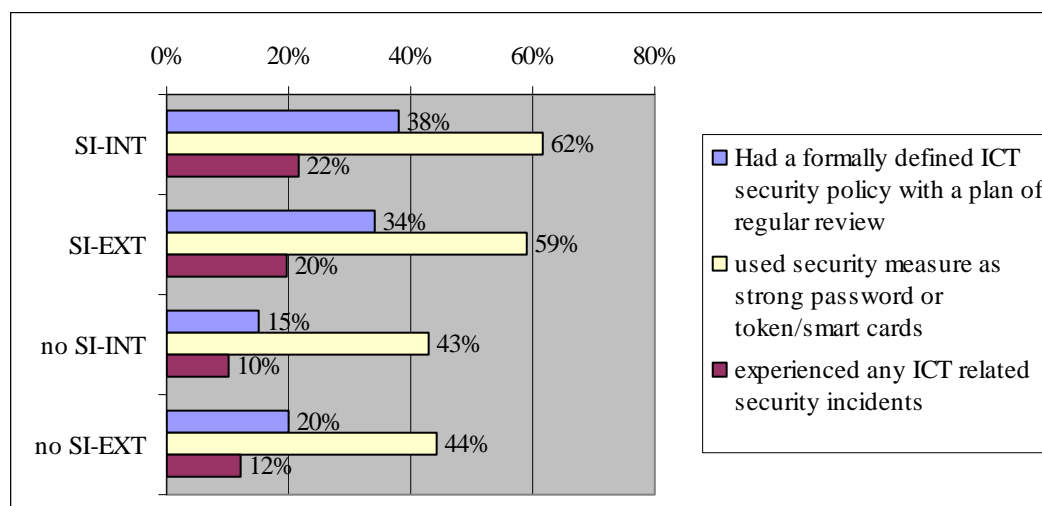
This chapter formulates a hypothesis related to the expected correlation between security investments and investments in collaborative data sharing technologies. The latter can be used for sharing information within the enterprise, or to exchange it with business partners. Two indices derived from the survey questionnaire allow the identification of companies with these characteristics, and thus to assess the intensity of that relation:

- SI-EXT is an index that identifies those enterprises that share electronically information suitable for automatic processing (as EDI, XML formats) with external business partners, suppliers or customers; 48% of all EU enterprises fall into this category;
- SI-INT is an index that identifies those enterprises that share electronically information within the enterprise, between different functions (through a common data warehouse or an ERP); 50% of all EU enterprises share this characteristic⁶.

⁶ The two indexes overlap, as 31% of all 10+ enterprises exploit eBusiness solutions that allow them to share information electronically both internally and externally with business partners. There are companies that use software only for automation and sharing internally (it is mostly the case of medium size enterprises), but also others using it only or mainly for the exchanges with external partners (often the case for small enterprises that doesn't require a sophisticated internal structure). There is a remaining group of 29% of all EU enterprises using none of these eBusiness tools, having computers and internet

The profiles presented in figure 10 relate to all 10+ enterprises, but due to the much higher number of small and medium enterprises compared to large ones in the sample, they can be interpreted as describing quite well the former patterns⁷. The comparison is carried out using three key indicators already presented in the previous paragraphs.

Figure 10: Security issues compared to the adoption of eBusiness solutions (% of enterprises)



Source: Eurostat Community Survey on ICT Usage and eCommerce in Enterprises

Formal ICT security policies/plans are adopted by more than a third of enterprises that have adopted structured eBusiness solutions. This represents half of the adoption rate of large enterprises, but twice the rate of those enterprises without intense sharing of information with internal functions or with business partners outside.

Security measures such as a strong password authentication (min 8 characters, max 6 months, encrypted transmission and storage) or via hardware tokens/smart cards are widely exploited also by enterprises without an eBusiness infrastructure (around 44%). These measures could be effectively justified to manage a simple website supporting eCommerce activities or also to protect little pieces of software for account or machinery control. These types of security measures were never the less more used by of large enterprises (77%).

Finally, as highlighted in the preceding paragraph, a much higher incidence of security breaches is observed in those enterprises that make higher use of ICT-based business solutions; twice as much as in the less equipped companies. Interesting to note is that in this case the gap with large enterprises is smaller (25% of them report security incidents, similar to the 20-22% of SME sharing information electronically).

connections, but for simpler usages as managing accounts, searching information on the web or managing a simple website.

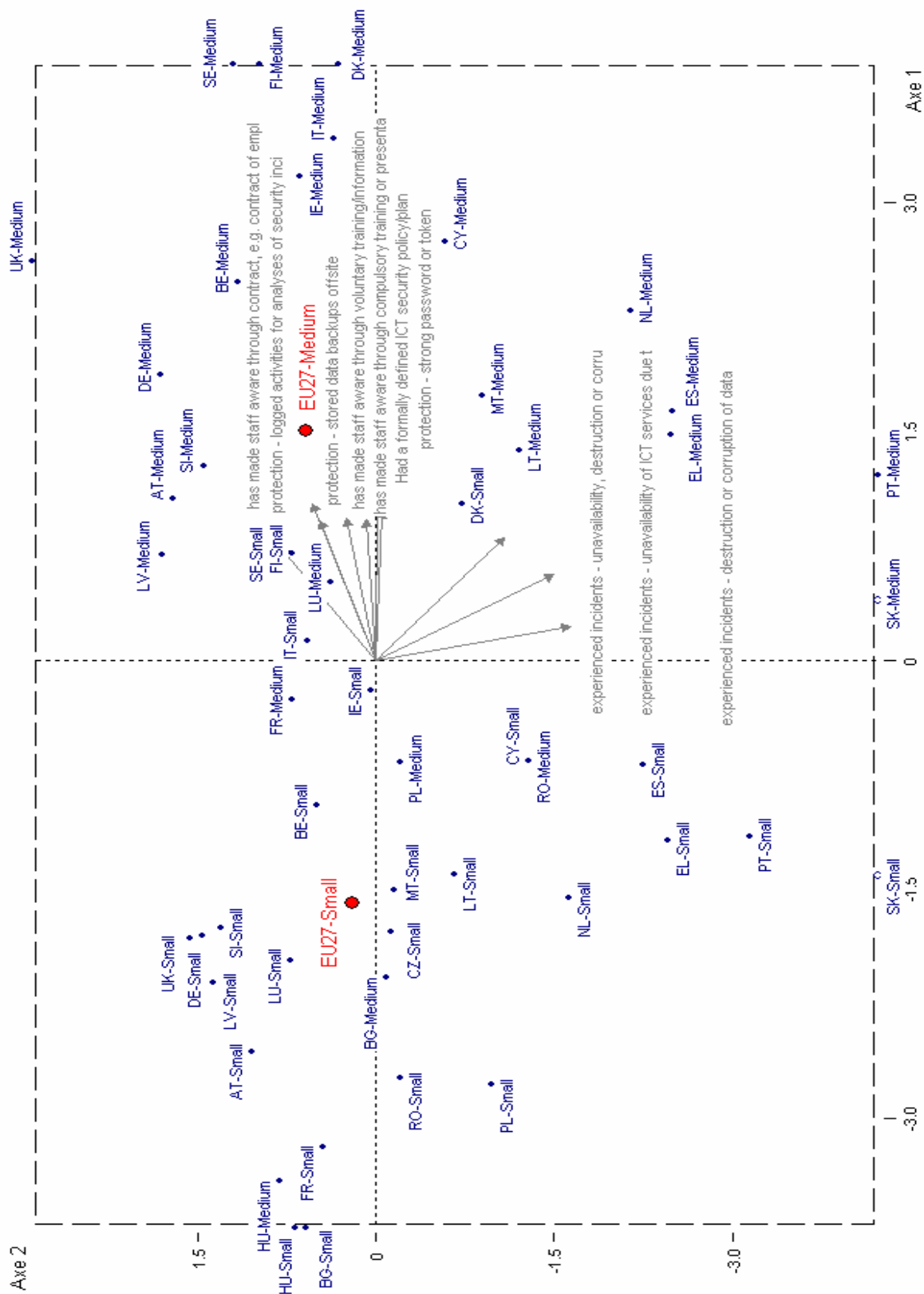
⁷ The survey refers to a universe of around 1.5 million enterprises with 10 persons employed or more, without the financial sector. More than 80% are small enterprises with 10 to 49 employees, 14% are medium with 50-249 employed persons, and the remaining less than 4% are large enterprises. The latter category employs anyway 47% of the corresponding workforce (medium 24% and small enterprises 29%).

A synthetic profile has been constructed separately for the small and for the medium size enterprises of each country. The profile includes the key variables concerning protection: having a specific policy/plan, initiatives for awareness raising of staff, logging of incidents, offsite backups, strong passwords and tokens; and three indicators concerning breaches: destruction/corruption of data due to incidents, due to infections/intrusion and unavailability of ICT services due to attacks from outside. Figure 11 illustrates the main similarities and differences between those country specific profiles⁸. The horizontal axe (axe 1) summarises the degree of protection and the vertical one (axe 2) the security breaches' variables. In particular:

- the top right hand quadrant refers to companies implementing a higher than average degree of protection and declaring having experienced security breaches less frequently than average; these are mostly medium sized enterprises;

⁸ It is the result of a principal component analysis of the correlation matrix between the mentioned 10 variables.

Figure 11: Security issues compared to the adoption of eBusiness solutions (% of enterprises)



Source: Eurostat Community Survey on ICT Usage and eCommerce in Enterprises

- the bottom left hand quadrant refers to companies implementing a lower than average degree of protection while declaring having experienced security breaches more frequently than average; these are mostly small size enterprises.

- the profiles of the medium sized enterprises of European countries are much more similar between them (they mostly lay on the right-hand side of the graph), than with the profiles of the small enterprises (left-hand side);

- The only exceptions are: medium companies in HU, BG, PL and RO are much more similar to EU average of small ones; and at the opposite, small enterprises from SE, FI and DK have a security profile similar to the one of medium enterprises;

- in the bottom left part are the medium size enterprises with the highest reported rate of incidents and attacks: SK, PT, EL, ES, NL. Also the small companies of these countries report high rate of breaches.

- country profiles in the top part of the graph present the lowest rates of reported victimisation: UK, DE, AT, LV, SI.

The analysis confirms also that strong correlations exist between the degree of adoption of security protection measures and the use of eBusiness solutions, mainly for the electronic/automated exchange of information within the enterprise (the index SI-INT has a correlation of 0.8 with the first horizontal axe).

8. SECTOR ANALYSIS

The economic sectors characterised by an important share of large enterprises are also those investing more in security plans, compulsory training of their staff and other protection measures⁹. Around 10% of large enterprises have introduced biometric methods for user identification (compared to an EU average of 3% of all enterprises). These efforts go together with the higher reporting of security incidents (almost the double than the average), both because these companies are best equipped to report about them and because they are more exposed to cyber crime and cyber attacks. This is the case for telecommunication, financial services, and other ICT sector enterprises.

Particularly concerned are also the enterprises within the content economic sector having publishing activities; motion picture, video & television programme production, sound recording & music publishing; programming & broadcasting. They are at the top for incidents involving the destruction-corruption of data by malicious software/intrusion, or the unavailability of ICT services due to attacks from outside, or for incidents due to hardware or software failures. But they are less frequently protecting themselves than the telecom or the financial services' enterprises.

⁹ More detailed information about the characteristics of the main economic sectors is available in the Eurostat publication Statistics in Focus n 7/2011: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-11-007/EN/KS-SF-11-007-EN.PDF

Quite active on the security protection front are also the enterprises of the professional, scientific and technical activities sector, travel agencies and tour operators, which are also intensive ICT users despite generally being small size companies. Their tools are less sophisticated than those used by large enterprises: strong passwords and backup. Security breaches are just above average.

The opposite profile of scarce investment on security measures concerns sectors traditionally consuming less ICT solutions, such as Construction, or less exposed/concerned by security risks, as those manufacture sectors dominated by small enterprises.

9. CONCLUSION

Security concerns are confirmed to be an important and diffused concern among internet users that affect their trust in the internet. If the fact that a lot of citizens refrain from exchanging personal information could be interpreted as a signal of growing maturity in terms of a more critical approach to the internet, the defection from eCommerce, eBanking and eGovernment services indicates the need for a reinforced effort to promote security.

The results also suggest the relevance of the mismatch between risks/concerns/protection and the inadequacy of skills. The level of concerns and the efforts to protect, by enterprises and citizens, seem not always appropriate to the risks. For individual users a problem of skills is certainly present. Market products, but also public policies, have a role to play to make protection tools and secure behaviours on the net more understandable so as to really empower all internet users. In any case, security is a challenge for both, the more and the less advanced users and countries.

The analysis has not been able to assess if the security of internet users is better or worse than some years ago, but the indicators presented could be re-used in the following years to track any change and evolution and to monitor possible impacts of the policy initiatives that will be adopted by all the concerned stakeholders.

10. ANNEX – METHODOLOGICAL NOTES AND REFERENCES

Background characteristics of the individuals

- the population interviewed in 2010 is a sample of individuals aged 16-74 years resident in the Member States of European Union.
- 71 % have used internet during last year
- **69 %** have used internet during last 3 months (**Internet users**)
- 65 % are regular internet users = at least weekly
- 53 % use internet daily

The questions about security issues have been proposed only to those 71% of all individuals having used the internet during last year (i.e. the last 12 months prior to the survey, in general the second quarter of 2010). The majority of them, 91%, is composed of regular users (at least weekly). 6% of them used internet irregularly during last 3 months and a 3% used it more than 3 months ago. For some rare items it could be relevant to check if these answers come from this minority or from the large majority of regular users, but this cannot be controlled in the database and require an ad hoc analysis of microdata, to be requested to Eurostat if the case.

- Where do internet users have accessed internet (last 3 months) ?
 - 92% have done it at **home** (and 38,5% only at home)
 - and 78% of retired and inactive accessed internet only at home
 - 41% have done at **work**, other than home (and 3% only at work)
 - but this go up to 60% of employees and self employed (“only at work” remain a rare case valid for 4% of working people)
 - 12% at place of **education**
 - this go up to 71% for students (only at place of education remain a rare case, for only 2% of students)
 - 23% in other **people's houses** (2% only in other people's houses)
 - 14% in **other** places (1% only in other places)
- Which devices do internet users used (last 3 months) ?
 - 39% use a mobile device: a mobile phone, a handheld (PDA) or a portable computer; with or without also a fixed device. Inside this group it is possible to distinguish:

- 20% use a mobile phone (11% without a laptop)
 - 11% use a mobile phone with 3G, and 11% a mobile phone via GPRS
- 27% use a portable computer (away from home or work) (18% without mobile phone)
 - 9% use mobile phone and laptop
- 4 % use a handheld computer such as a PDA

Pillar 4

Fast and ultra fast internet access

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1. POLICY CONTEXT: FROM FAST TO ULTRA FAST BROADBAND

Ensuring comprehensive availability and take-up of fast and ultra fast internet is one of the building blocks of the Digital Agenda for Europe (DAE). To enjoy sustainable economic and social benefits, it is of utmost importance that advanced broadband networks and applications are available to all European business and consumers. This is the reason why the Digital Agenda for Europe as well as Europe 2020, the European growth strategy for the next decade, committed to achieve ambitious high-speed targets. In addition to basic broadband networks being available to all EU citizens by 2013, by 2020 half of European households should subscribe to at least 100 Mbps, and 30 Mbps should be available to all Europeans.

These targets mark a difference with previous EU strategies for Information Society policies, such as *eEurope* and *i2010*, which focused on widespread availability and take-up of first-generation broadband, e.g. internet connections enabling at least 2 Mbps. Coverage of fixed broadband access as proxied by copper pair (DSL) coverage is nowadays close to 100% (95% at the end of 2010). By 2013, the whole of the EU population is expected to have access to some kind of commercially viable broadband service. Adoption of first generation broadband services has grown significantly in the last decade in all EU countries, with some countries already reaching saturation levels.

The focus of the Digital Agenda has therefore moved to ensuring a firm transition to a new generation of faster broadband networks (NGA) that enable the faster provision of bandwidth-hungry innovative services at better quality.

In addition to these quantitative targets, the DAE also defined a number of policy actions under pillar 4 (very fast internet). The timely implementation of these actions is crucial to the achievement of the broadband targets. In 2010 the European Commission adopted a "broadband package" made up of three complementary measures to facilitate the roll out and take up of broadband networks. This package comprises a Commission Recommendation on regulated access to Next Generation Access (NGA) networks that provides regulatory certainty to telecom operators, ensuring an appropriate balance between the need to encourage investment and the need to safeguard competition; a proposal for a Decision to establish a Radio Spectrum Policy Programme to ensure, inter alia, that spectrum is available for wireless broadband; and a Broadband Communication outlining how best to encourage public and private investment in high and ultra-high speed networks. The adoption of the package is just the starting point of the process. Member States, industry and other stakeholders now have a large responsibility in ensuring that there is a follow up on their part of the actions.

Nurturing the development of broadband networks and services requires a combination of regulatory and policy measures. The impressive rate of broadband adoption in Europe over the last years has been facilitated by the implementation of the EU regulatory framework that fostered competition and innovation by ensuring that competitive telecom companies had access, on fair and non-discriminate conditions, to the networks of the historic incumbent operators. Competition by alternative networks, especially by cable modem operators, has also been influential in achieving significant growth rates.

The current EU regulatory framework has brought benefits to European citizens in terms of innovative and increasingly affordable electronic communications services, including

broadband. Some traditional services such as voice telephony are maturing, while others such as mobile broadband and NGA are on the rise. These more recent data services bring about new opportunities and challenges.

This report analyses market developments in the main electronic communication market segments (broadband, mobile and fixed voice). It concludes with a brief overview of the telecom sector. The report is complemented by additional information on regulated market indicators.

Table 1: **Telecoms and broadband related actions in the Digital Agenda**

ID	Action	Progress	Pillar
18	Harmonisation of numbering resources	On track	1
19	Spectrum Policy Plan	On track	1
20	An investigation into the cost of non-Europe in telecommunication markets	On track	1
35	Guidance on implementation Telecoms rules on data privacy and personal data	On track	3
42	Adopt an EU broadband communication - common framework for actions	Completed	4
43	Funding for high-speed broadband	On track	4
44	European Spectrum Policy Programme	Completed	4
45	Foster the deployment of NGA networks - Recommendation on Next Generation Access networks	Completed	4
46	MS - Develop and make operational national broadband plans	On track	4
47	MS - Measures to facilitate broadband investment	On track	4
48	MS - Use fully the Structural and Rural Development Funds	On track	4
49	MS - Implement the European Spectrum Policy Programme	On track	4
101	Roaming	On track	1

2. FIXED BROADBAND

2.1 *Broadband coverage*

One of the DAE targets ensures access to basic broadband for all by 2013. The Digital Agenda is agnostic with regards to the technology used for achieving this objective. Wireless technologies are arguably better fitted to provide coverage in those areas where it is not economically viable to lay down wired infrastructure. Satellites already cover the whole geographic territory of the EU, but availability of retail commercial offers vary among Member States and the cost of the reception equipment can in some cases be still significant. Other fixed wireless technologies such as WiMax and WiFi contribute to extend coverage. Networks with increasingly higher capacity are another option. Around 90% of the EU population was covered by third generation mobile networks at the end of 2010. As with fixed networks though, less populated areas still remain underserved.

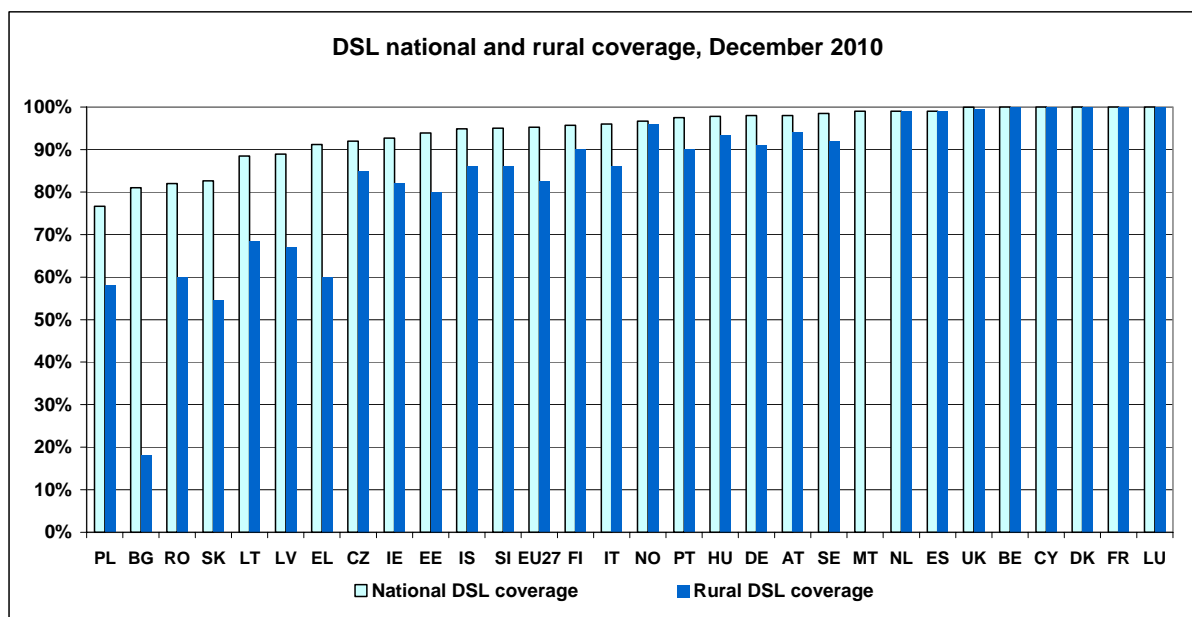
With regards to fixed broadband technologies, the footprint of DSL¹ has been used as a fair proxy to monitor progress in this area. At the end of 2010, DSL access was available to 95.3% of the EU population, up from 94.4% one year earlier. DSL coverage in rural areas on the other hand reached 82.5% of the rural population. This means that around 23.5 million EU citizens, of which 18 million living in rural areas, cannot yet connect to a fixed access broadband network. Only six member states still have DSL coverage below 90% of population (Figure 1). In Poland, Bulgaria and Slovakia rural coverage is still below 60%.

By way of comparison, in the United States the National Broadband Plan targets availability of broadband networks of at least actual 4 Mbps download and 1 Mbps upload to all US citizens. According to the US regulator (FCC), currently 4.2 million households have no broadband capability (2.7% of the total population) and another 2.8 million housing units are connected but only able to receive actual speeds below the 4 Mbps download target.²

¹ The term "DSL Coverage" refers to the percentage of the population that depends on local exchanges equipped with a DSLAM.

²Federal communications commission | The Broadband Availability Gap, <http://download.broadband.gov/plan/the-broadband-availability-gap-obi-technical-paper-no-1-chapter-2-broadband-availability.pdf>

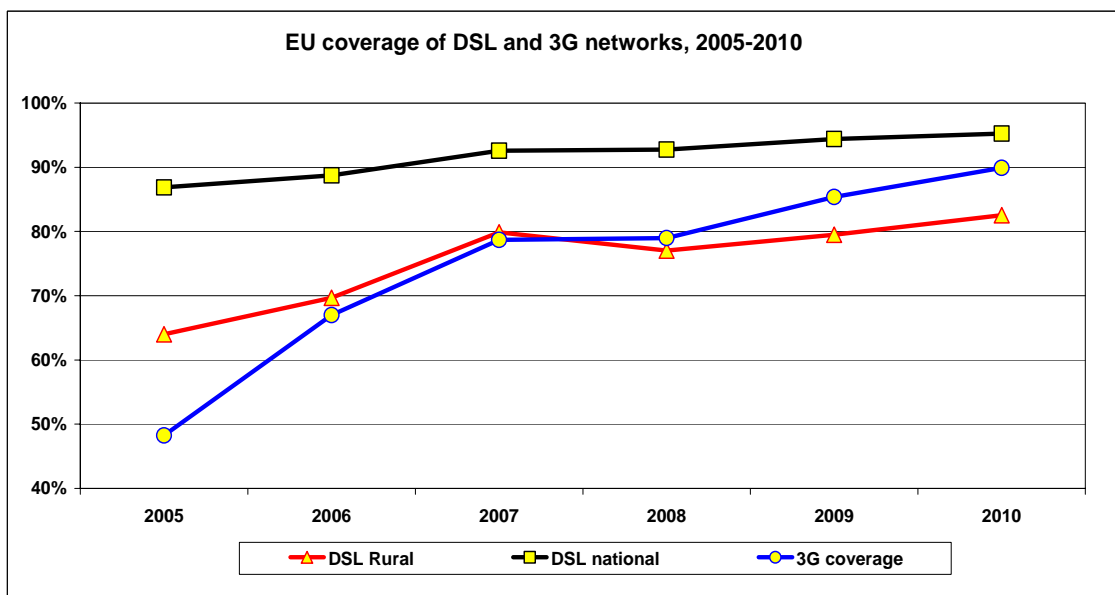
Figure 1: DSL national and rural coverage, December 2010, percentage of population



Source: Idate³

Trends in fixed and wireless coverage between 2005 and 2010 suggest that the 2013 target of broadband for all will be achieved, through a combination of fixed and wireless technologies (Figure 2). Data on satellite coverage are not available, but it is clear that far and less populated areas of Europe will need to rely on access through satellite.

Figure 2: EU coverage of fixed broadband and 3G networks



Source: Commission services based on IDATE

³ Broadband coverage in Europe, 2011 survey (forthcoming)

The European Commission in 2009 adopted the “Community Guidelines for the application of State aid rules in relation to rapid deployment of broadband networks”, which explain how public funds can be channeled for the deployment of basic broadband networks as well as NGA networks to areas where private operators do not invest. In light of the market, technological and regulatory developments since 2009, the Commission has launched a public consultation to obtain the view of stakeholders on their experience with the guidelines so far. The Commission will decide later on this basis to what extent a review of the Guidelines would be necessary.

The primary objective of these guidelines is to foster a wide and rapid roll-out of broadband networks while at the same time preserving the market dynamics and competition in a sector that is fully liberalised. The guidelines also specify that whenever state aid is granted to private operators, the aid must foster competition by requiring the beneficiary to provide wholesale access to the publicly funded network for third-party operators. In particular, the guidelines outline the distinction between competitive areas ("black" areas) where no state aid is necessary, and unprofitable or underserved areas ("white" and "gray" areas) in which state aid may be justified, if certain conditions are met. This distinction is then adapted to the situation of NGA networks by requiring funding authorities to take into account concrete investment plans by telecommunications operators to deploy such networks in the near future. A number of crucial safeguards (such as detailed mapping, open tender, open access obligation or technological neutrality, and claw-back mechanisms) are laid down in the guidelines in order to promote competition and avoid crowding out private investment.

In line with the guidelines, in 2010 the European Commission approved the use of over €1.8 billion public funds for broadband development through 20 decisions in, among others, Catalonia, Finland, and Bavaria⁴.

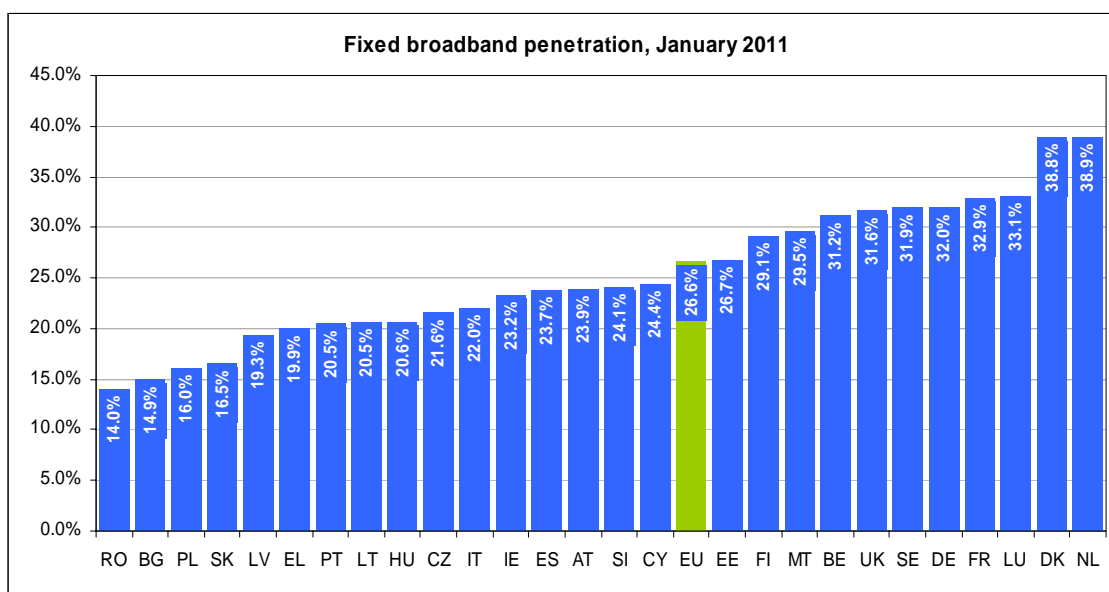
2.2 *The fixed broadband market in 2010*

With 133 million broadband fixed lines, the EU broadband market continued to grow in 2010 with some 8.8 million new lines (7.1% year-on-year growth) and still remains the largest in the world. At the end of 2010 there were 26.6 fixed broadband lines per 100 inhabitants in the EU (Figure 3), with eight countries reaching 30 lines or more per 100 inhabitants. China is very likely to overtake the EU as the largest broadband market in 2011, as this country is expected to reach 160 million lines in 2011⁵.

⁴ For more information about state aid use for broadband, see the Spring 2011 State Aid Scoreboard, forthcoming in the second half of June at <http://ec.europa.eu/competition/publications/>

⁵ Source: Informa. For a view of the growth of some BRICS markets, see "The ICTs landscape in BRICS countries. Brazil, India, China", JRC (2011) forthcoming."

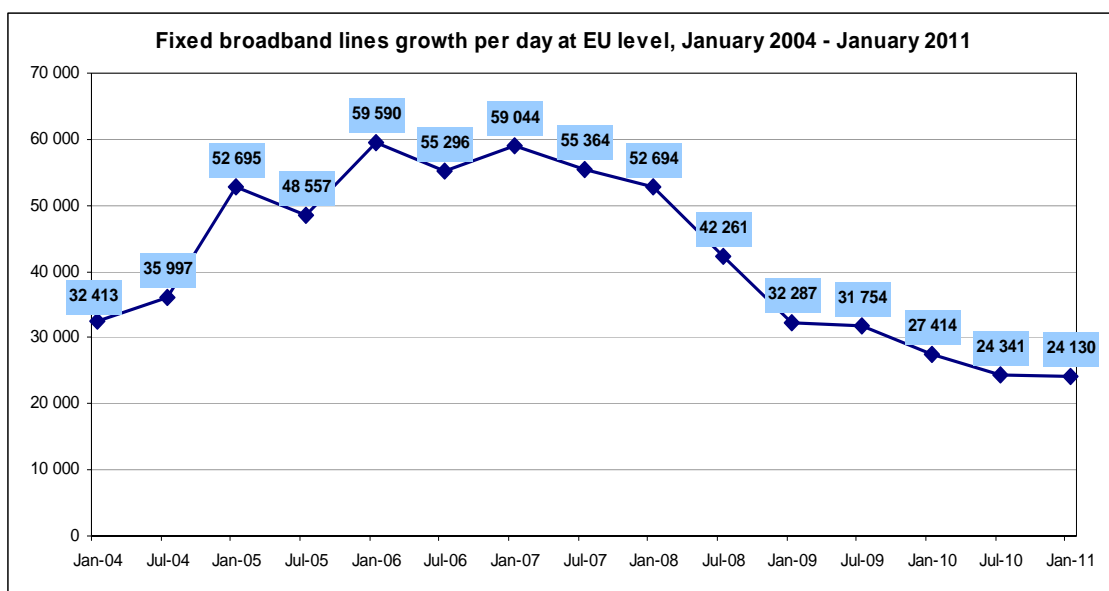
Figure 3: Fixed Broadband Penetration Rate, January 2011



Source: Communications Committee

Growth in the take up of fixed broadband marketing the EU however is declining. The penetration rate by population increased by 1.7 pp in 2010 and recorded the slowest growth rate since 2002. The number of net additions (24,130 lines per day) represents just a bit more than a third of the growth rates of 2006 and 2007 (Figure 4).

Figure 4: Growth of fixed broadband lines per day

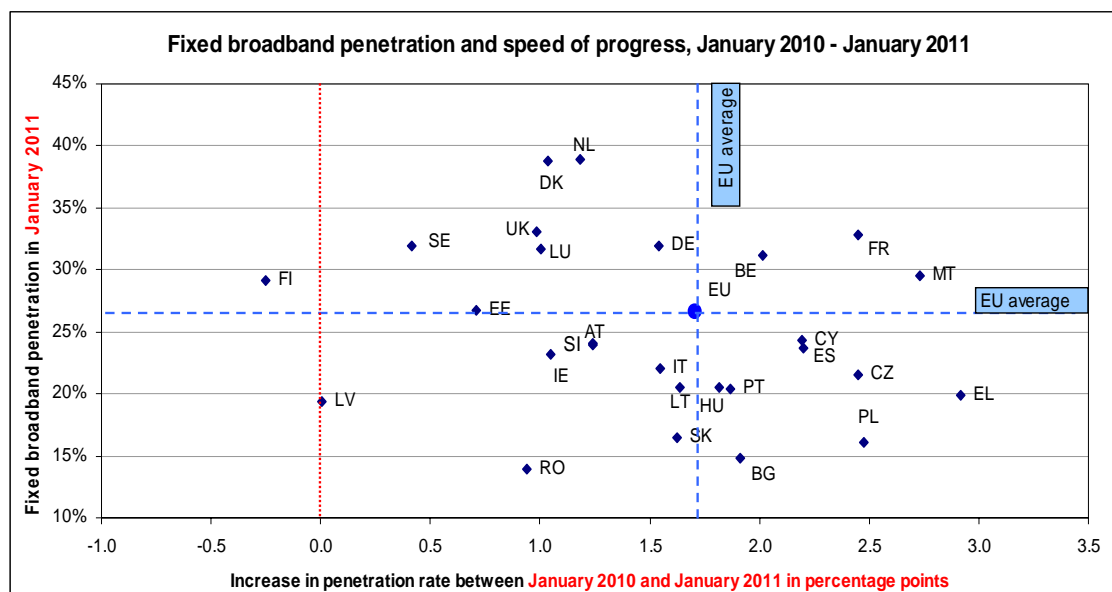


Source: Communications Committee

Many of the countries with the highest broadband penetration rates – the Netherlands, Denmark, Luxembourg, the UK and Sweden - experienced growth rates below EU average in 2010 (Figure 5). Finland experienced negative growth, possibly because users have shifted

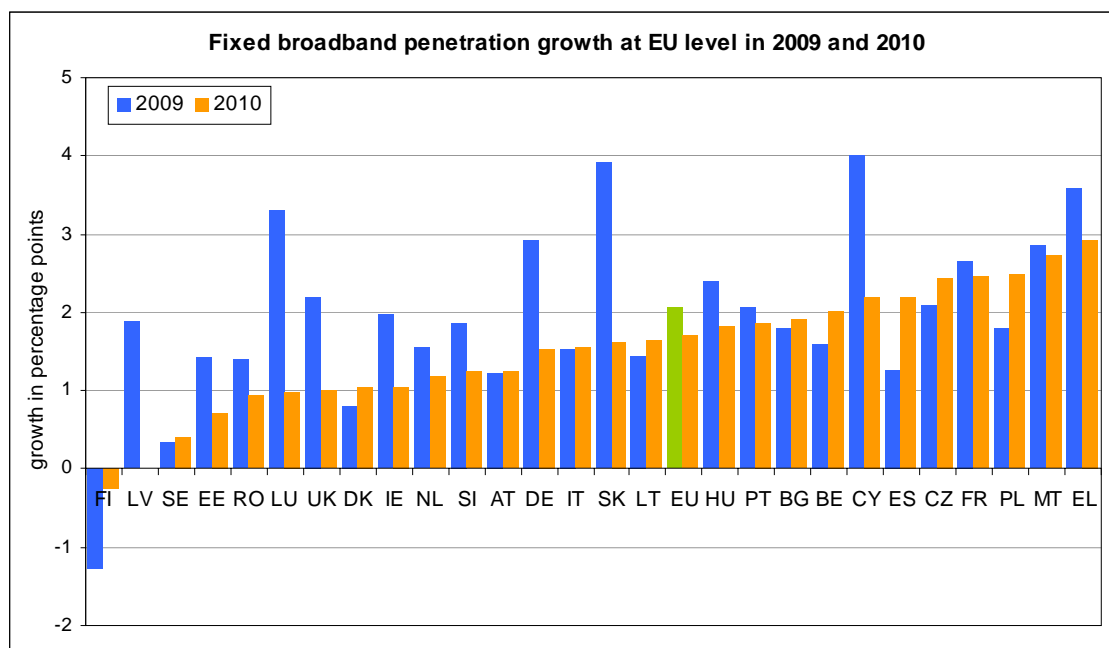
from fixed to mobile broadband access. All in all, however, these results are indicative of markets approaching maturity. Growth was also weak in another group of countries with penetration rates on or below EU average: Latvia recorded no growth despite going out of recession at the end of 2010, and the fixed broadband market increased by just one percentage point or less in Estonia, Romania, Ireland, Slovenia and Austria. Growth was near European average in Germany, Italy, Lithuania, Slovakia, Portugal, Hungary, Bulgaria and Belgium. Cyprus, Spain, France, the Czech Republic and Poland exceeded 2 percentage point growth, and only two countries, Greece and Malta, grew by almost 3 pp (Figures 5 and 6).

Figure 5: Fixed broadband penetration and speed of progress, 2009-2010



Source: Communications Committee

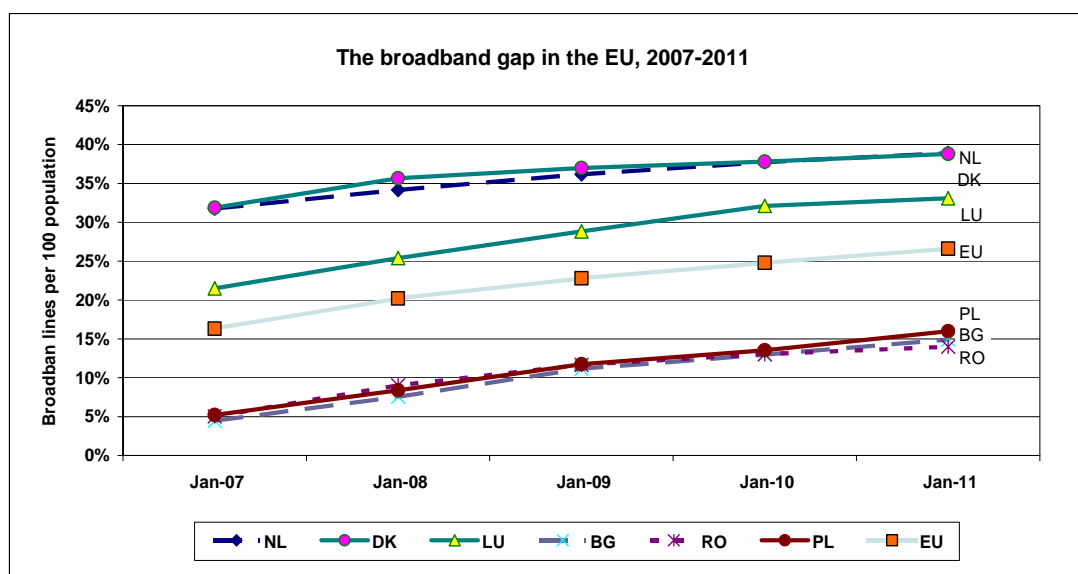
Figure 6: Growth of fixed broadband penetration in EU Member States, 2009-2010



Source: Communications Committee

The broadband gap, i.e. the difference between the countries with the highest and the lowest penetration rates in the European Union, continues to decrease but there are still considerable differences across countries. Romania, Bulgaria and Poland are still at the level of broadband adoption of the Netherlands or Denmark in July 2005. The broadband gap is being closed partially because most developed countries did not grow as much. Moreover, the growth rates of the less developed countries have considerably slowed in 2009 and 2010 (Figure 7), meaning that the catching-up process will take longer than expected.

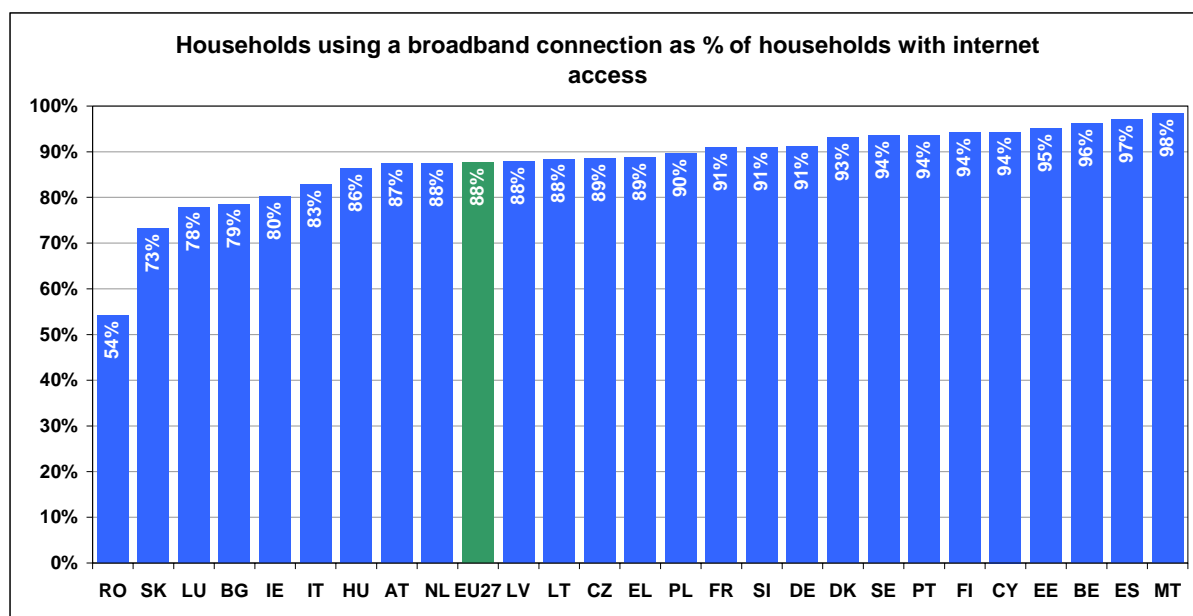
Figure 7: The broadband gap in the EU



Source: Communications Committee

Almost all internet connections in Europe are broadband (87.6% at EU level). This figure is however higher in other regions of the world. For instance in the US only 5% of internet connections used dial-up⁶, and this technology is not used anymore in Korea⁷. Romania and Slovakia are countries where the use of dial-up connections remains significant (Figure 8).

Figure 8: **Households connected to the internet with a broadband access, 2010**



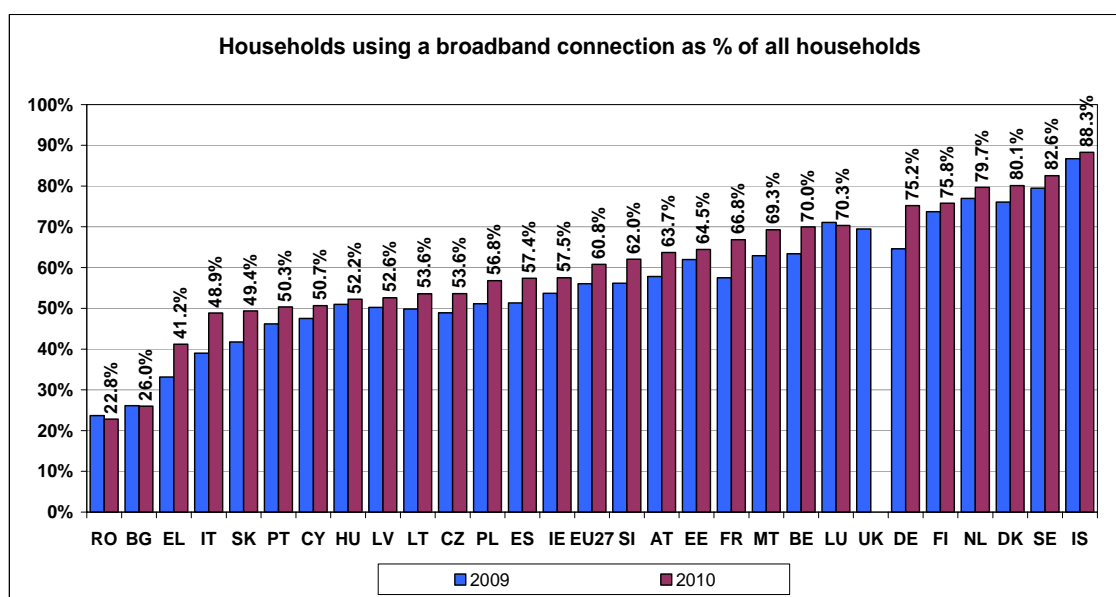
Source: Eurostat Community Survey on ICT Usage in Households and by Individuals. Data for the UK not available.

Yet between 20% and 30% of households in these advanced countries do not have any kind of broadband connection. There is therefore margin for growth. No need, lack of adequate skills, high subscription prices or unavailability of broadband are the main reasons for not using broadband. In the EU, on average, close to 40 % of households are not yet connected to broadband networks (Figure 9).

⁶ Home Broadband 2010. <http://pewinternet.org/Reports/2010/Home-Broadband-2010/Part-1/Little-change-in-home-broadband-in-2010.aspx>

⁷ "Survey on the Internet Usage", Korea Communications Commission, December 2010

Figure 9: Percentage of households using a broadband connection



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals. 2010 data for the UK not available.

Fixed-to-mobile substitution is also an important element behind the slowdown in the adoption of fixed broadband connections. It is no coincidence that many of the countries with the lowest numbers of fixed net additions in 2010 display at the same time the highest rates of mobile broadband penetration. This applies in particular to Finland, but also to Austria, Ireland and Italy. Sweden is a country with very high levels of both fixed and mobile access. It is difficult to ascertain to what extent wireless broadband access is used as the principal way to access the internet, or whether the two are perceived as complementary. In a few countries mobile technologies such as UMTS are considered fully substitutes of fixed broadband access, while in many other countries consumers choose mobile access as a complement to fixed.

The significant increase in the take-up of mobile broadband subscriptions over the last two years, with a significant impact on traffic in mobile networks, is driving some mobile operators to end flat-rate pricing schemes and to bill consumers according to the volume, something that has not yet happened in the fixed segment. This may therefore bring more and more consumers to consider mobile broadband as a complement to fixed or, alternatively, to use mobile broadband for a limited number of applications that do not require excessive data consumption (Table 2).

Table 2: **Broadband usage per type of device**

	Usage/month
Feature phone	1-30 MB
Smartphone	200-400 MB
Mobile broadband dongle	1 GB-1.5 GB
Home broadband	10 GB-15 GB

Source: Enders based on company reports

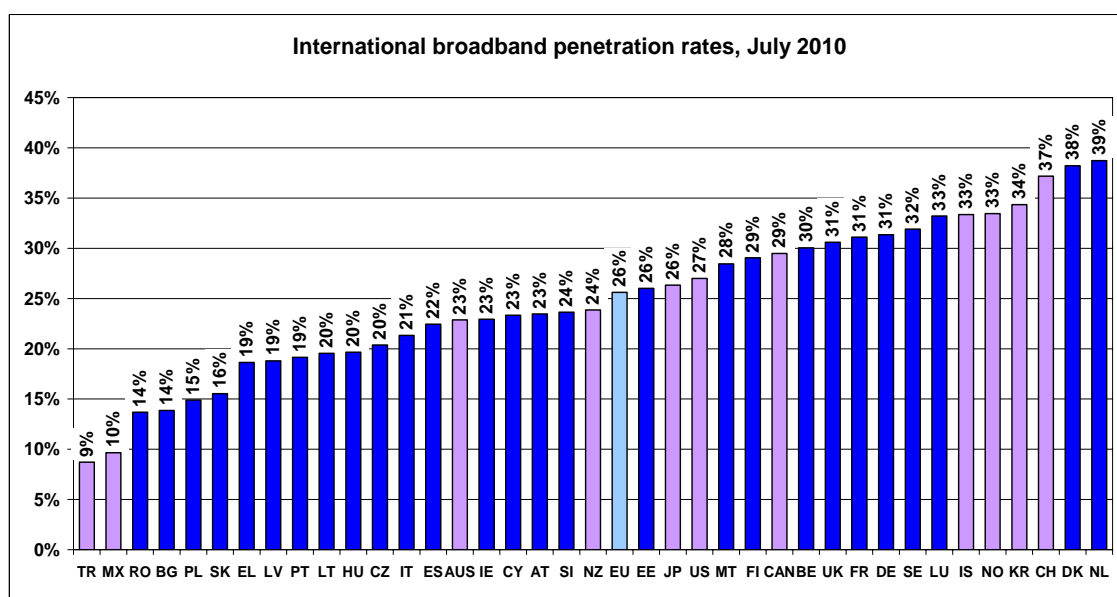
2.3 *An international comparison*

At international level the situation has not changed much compared to 2009 (Figure 10). The Netherlands and Denmark continue having the highest penetration rates, followed by Luxembourg and Sweden, along with a group of four non-EU countries (Switzerland, Korea, Norway and Iceland). The EU has narrowed the gap with the US (1.4 pp difference in July 2010 compared to 2.8 pp one year earlier and 3.4 pp in 2008⁸). According to market analysts, Brazil, Russia, India and China will account for the bulk of new fixed-broadband subscriptions over the next five years as growth continues to drop in developed markets⁹.

⁸ The annual growth in the fixed US broadband market was 4.4% (June 09-June 10), compared to a 7.5% growth in the EU. FCC's "Internet Access Services: Status as of June 30, 2010" at http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0321/DOC-305296A1.pdf

⁹ Informa, "Global fixed-broadband forecasts: BRIC nations to provide foundations of second stage of broadband growth", 6 January 2011

Figure 10: International broadband penetration rates, percentage of population

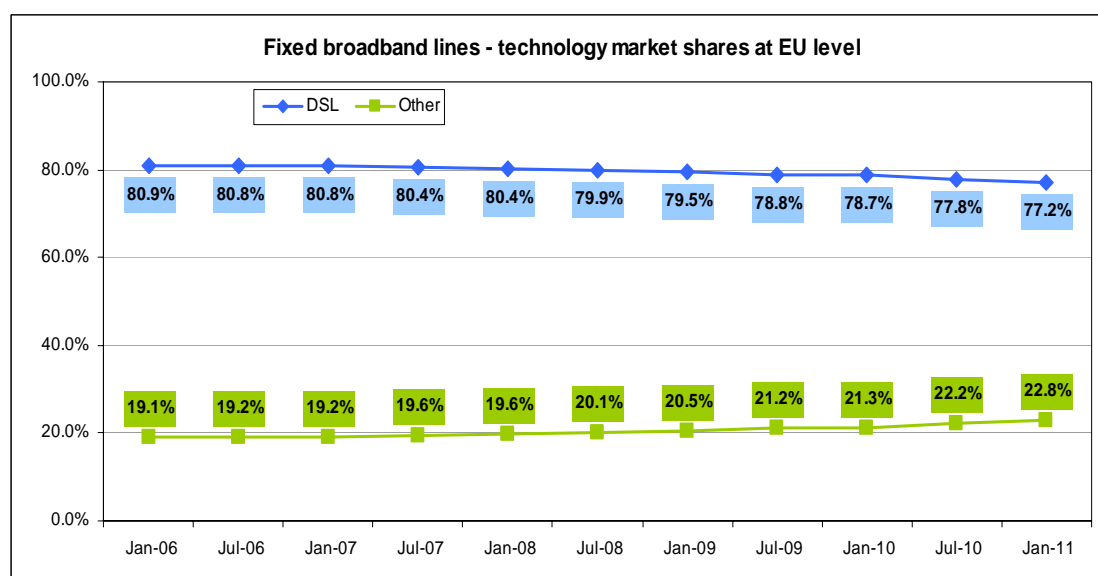


Source: Commission services based on COCOM and OECD figures

2.4 Broadband technologies and speeds

DSL continues to be the predominant technology in the EU broadband market, despite the slight decrease in its share, from of 80.9 % in January 2006 to 77.6% in January 2011. In 2010, 55 % of new lines were provided by means of xDSL technologies and 45% were connections using other types of technologies, while in 2009 these ratios were 71% and 29% respectively (Figure 11).

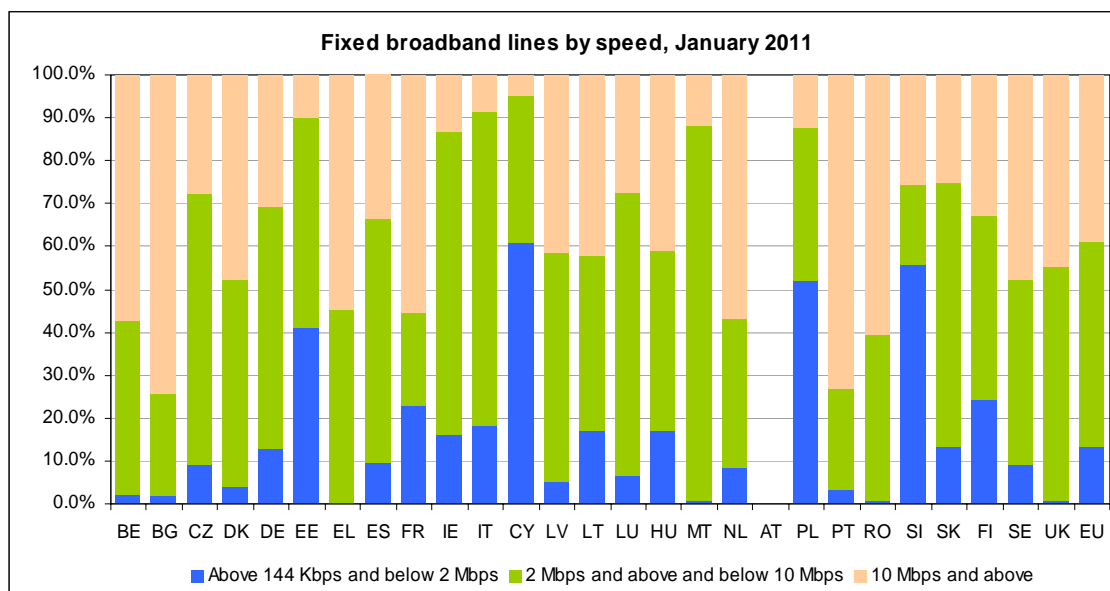
Figure 11: Fixed broadband lines in the EU by technology



Source: Communications Committee

The dominance of DSL technologies in the EU market means that current broadband speeds are still far from the targets set by the DAE. As of January 2011, on average 60% of fixed lines provide speeds of up to 10 Mbps (Figure 12).

Figure 12: Fixed broadband lines in the EU Member States by speed



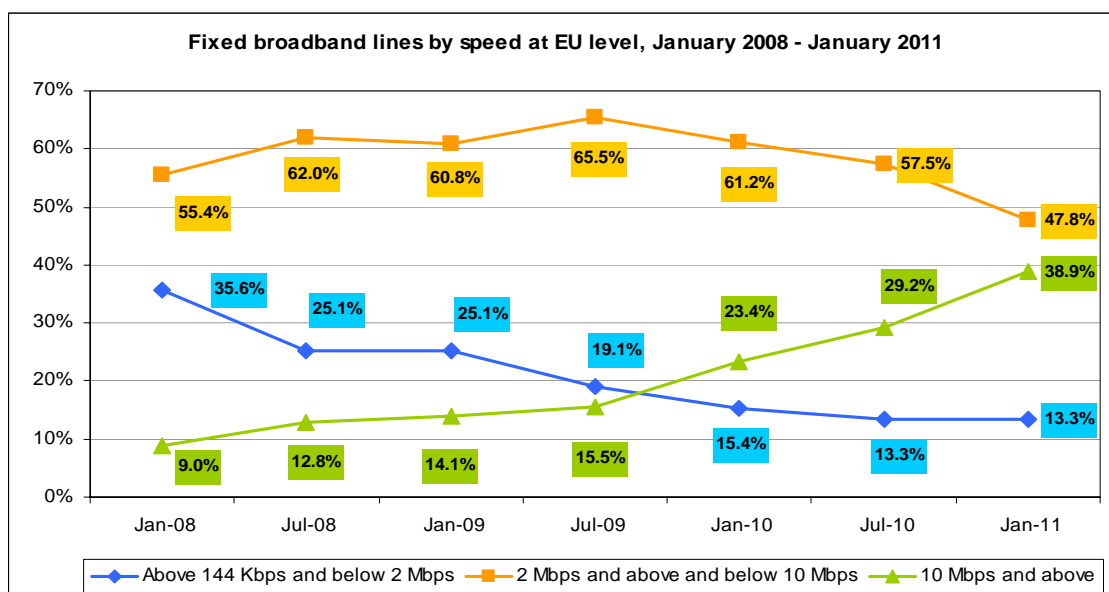
Source: Communications Committee - Data for Austria not available

In January 2011 around 86% of fixed broadband lines in the EU provide nominal speeds above 2 Mbps. Looking at higher speed rates, 40% of all lines provides speeds between 10 and up to 30 Mbps, which is a significant improvement compared to last year as these lines almost doubled.

More than 70% of fixed lines in Bulgaria and Portugal provide speeds above 10 Mbps. Romania, Belgium, the Netherlands, France and Greece follow with around 60% (Figure 12). In the case of Bulgaria and Romania the high proportion of high speed lines is driven by the availability of many brand new local networks built in the absence of legacy infrastructure. In Portugal, Belgium and the Netherlands the major driver is the competition between cable modem and DSL ex-incumbent operators. In all other countries with speeds around the EU average the situation is mixed, although there is a clear correlation between speeds and the degree of competition with alternative technologies.

The trend towards higher speeds that started in July 2009 has significantly accelerated in the second part of 2010, and the gain in 10+ Mbps has been equal to the loss in terms of 2-10 Mbps speed lines. Probably due to physical conditions (distance to the exchange or quality of the local access network), there still remains around 13% of lines providing very low speeds (144 kbps to 2 Mbps) since 2009 (Figure 13).

Figure 13: Fixed broadband lines by speeds, 2008-2011



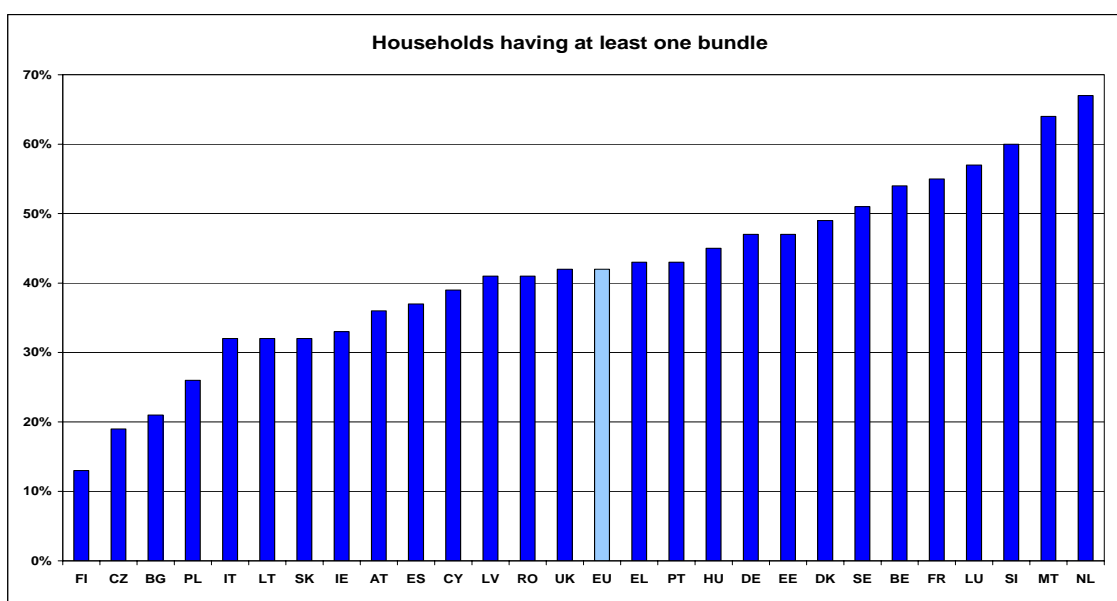
Source: Communications Committee

While there is a clear trend towards delivering higher speeds using first generation broadband technologies, only 5% of all fixed lines in January 2010 deliver speeds of 30 Mbps and above which can be qualified "next generation" access.

As of March 2010, it is estimated that 42% of households subscribed to bundled services (up from 29% three years ago). Bundled service packages are the prevailing way for consumers to get electronic communications services in the Netherlands, Malta, Slovenia, Luxembourg, France, Belgium and Sweden. 32% of Internet access services were provided by means of a bundled package in March 2010¹⁰, with a clear predominance of double play packages of broadband and fixed telephony, followed by triple play products which include television to services (Figure 14).

¹⁰ Eurobarometer, E-Communications Household Survey, May 2011 (forthcoming)

Figure 14: Percentage of households subscribing to bundled products



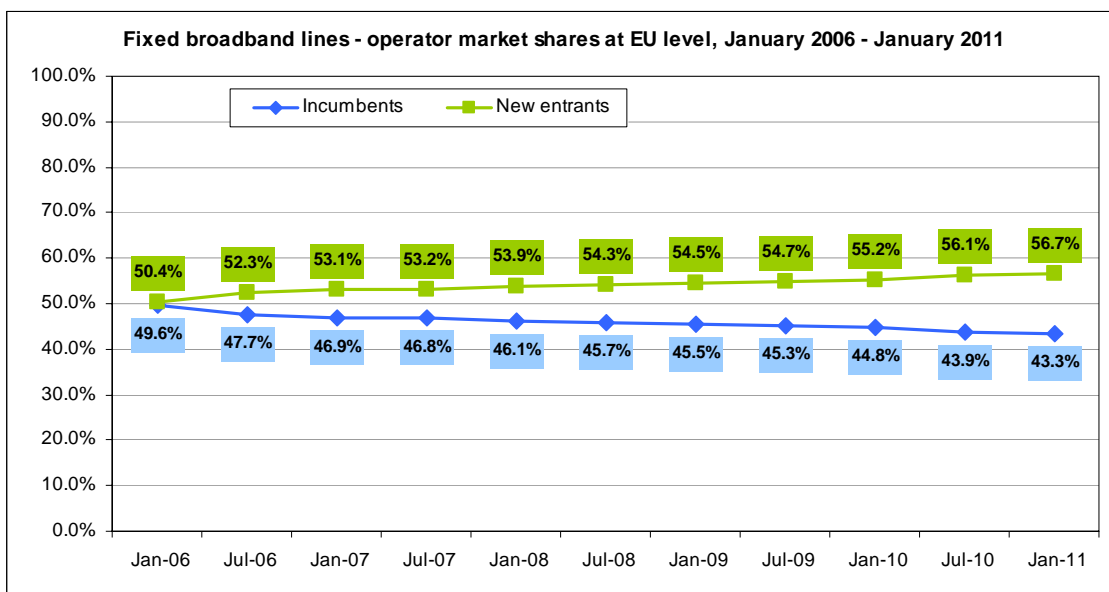
Source: Eurobarometer, E-Communications Household Survey, May 2011

2.5 Competition dynamics

The market share¹¹ of the incumbent fixed operators has been following a downward trend since July 2003. Nonetheless, this competitive trend slowed down between 2007 and 2009, when some incumbent operators managed to reduce losses and even regained some market positions. During these three years, incumbents just lost 2 pp of the market overall. In 2010 though competition accelerated again notably, and incumbent operators lost 1.6 pp of the fixed broadband market. As a result, new entrant broadband providers now hold almost 57% of the fixed broadband market (Figure 15).

¹¹Based on subscribers.

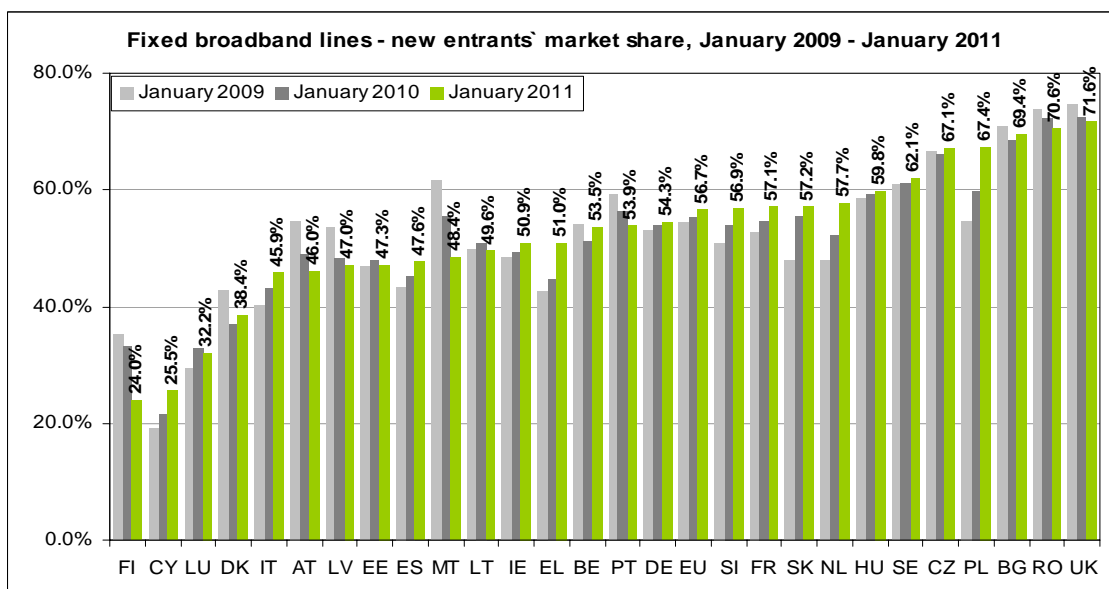
Figure 15: Percentage of broadband lines by operator



Source: Communications Committee

Incumbent operators in Finland (+9 pp), Malta (+7 pp) and Austria (+3 pp) are the main exceptions to the average EU trend. Although in 2010 incumbents in ten Member States regained parts of the market, these concentrated in small countries that do not have a strong impact on the EU average. In the UK the gains of the incumbent operator were much less significant than in 2009 (Figure 16).

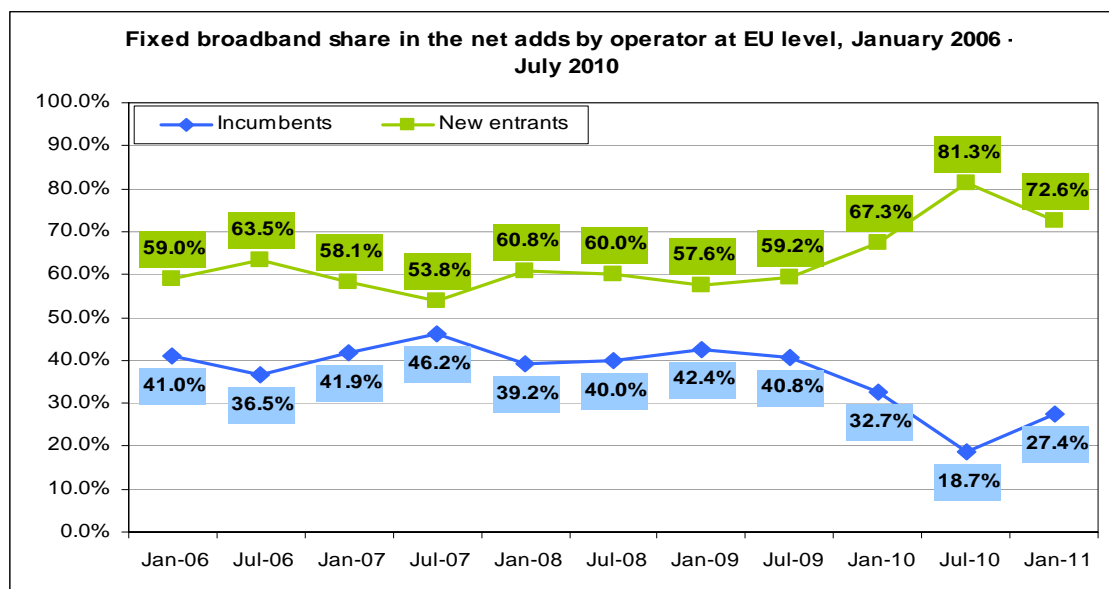
Figure 16: Fixed broadband lines – New entrant's market share, 2009-2011



Source: Communications Committee

The share of new lines sold by new entrants is the best indicator of this boost to competition: although market growth was limited, new entrants sold almost 80% of all the new fixed broadband lines during 2010, 17 pp more than in the previous year (Figure 17).

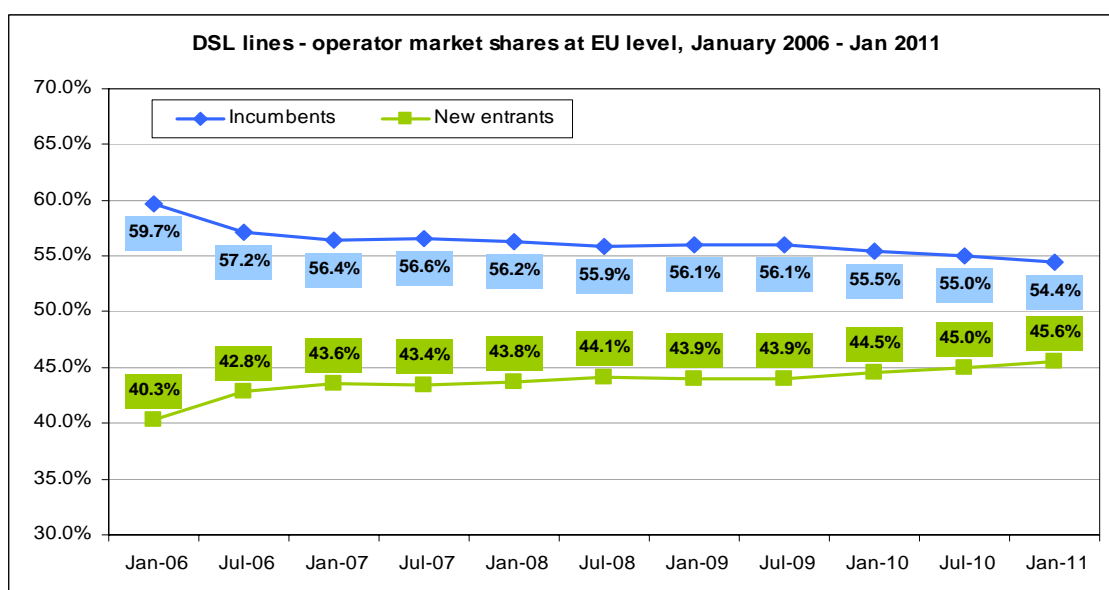
Figure 17: Fixed broadband net adds by operator in the EU



Source: Communications Committee

In the DSL market, incumbents have also lost more market share than in previous years with a net 1.1 points loss, keeping 54.4% of all DSL lines. This is also a major shift from the dynamics of the previous three years, during which unbundlers had managed to squeeze a gain of 0.9 pp only (Figure 18).

Figure 18: DSL lines – Market shares at EU level, 2006-2011

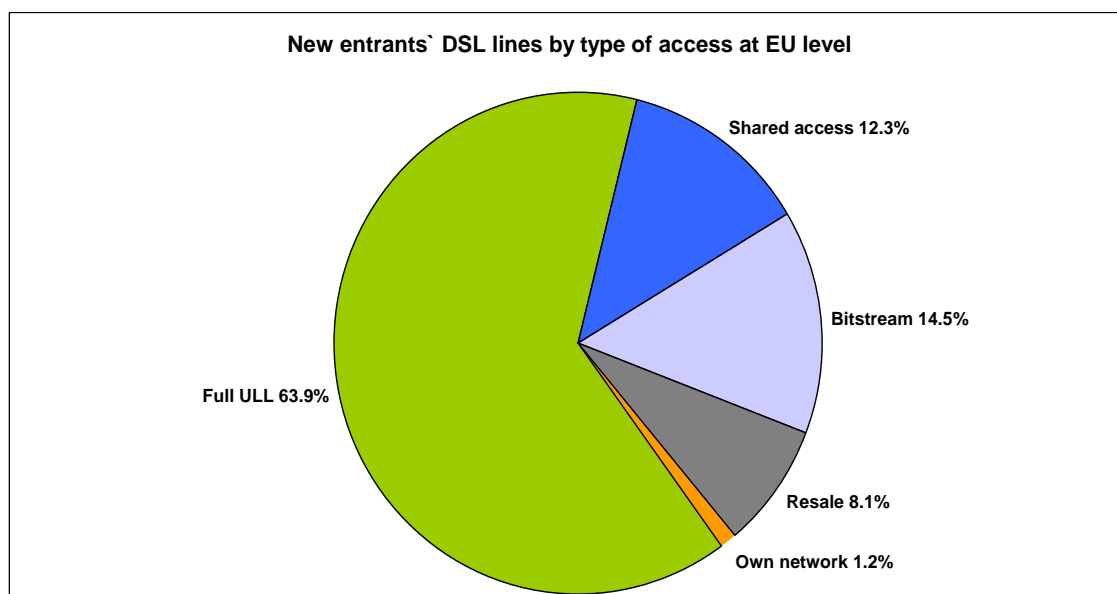


Source: Communications Committee

Local loop unbundling (fully unbundled lines and shared access) has consolidated as the main form of wholesale access for new entrants, with 76.2% of DSL lines, up from 73.7% in 2009.

New entrants are moving away not only from resale (-1.5%) and bitstream (-1.2), but also from shared access, which is the type of regulated access that experienced the most significant drop (-2.8) (Figure 19).

Figure 19: New entrants' DSL lines by type of access



Source: Communications Committee

Fully unbundled lines is the preferred way for new entrants to provide access in sixteen countries (Greece, Cyprus, Austria, Portugal, Finland, Germany, Estonia, Spain, France, Italy, Slovenia, Romania, Netherlands, Luxembourg, Denmark and the UK)). In Bulgaria, Malta, Slovakia, Lithuania, Hungary, Ireland and the Czech Republic bitstream dominates. Latvia and Belgium have a preference for resale.

2.6 *The slow move towards the next generation broadband access*

The EU broadband market has successfully grown over the last years (Table 3). A balanced combination of sector regulation and infrastructure competition has made this success story possible. In many European countries, especially in Western European countries, the explosion of the broadband market was facilitated by the availability of PSTN to a large proportion of the population, and operators invested in upgrading these networks to offer broadband access based on xDSL technologies. Sector regulation has triggered the entry of new market actors, mainly unbundlers, and promoted a competitive environment. In other countries where alternative infrastructures such as cable networks already existed, platform competition has been an important driver of growth. A third model of development has been that of a few countries where the footprint of the PSTN was limited and where new entrants invested on building a complete new network using more advanced technologies.

Table 3: Take-up of broadband by EU households

	2004	2005	2006	2007	2008	2009	2010
% of households with an internet connection	40.5%	48.4%	49.2%	54.1%	60.4%	65.2%	70.1%
Households with a broadband connection as % of households with internet at home	33.2%	47.6%	61.8%	76.8%	80.4%	86.0%	87.6%

Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Overall, the EU success has mainly built on the prior availability of PSTN and in some cases of cable modem networks. The level of investment relative to the average revenue per user and the high number of potential new customers made the business case apparent for fixed broadband providers. As a result, the EU broadband market is today the largest in the world. Broadband access has gradually become a mass product, with almost universal availability. In the fight to win and retain subscribers, operators have increasingly moved towards bundling other products to the broadband access. Prices have consistently gone down and performance has increased. 86% of fixed broadband lines in the EU are above 2 Mbps and as many as 40% of all lines provide speeds between 10 and up to 30 Mbps.

This success could, however, become a hindrance when it comes to implementing the Digital Agenda targets of 30 Mbps universal coverage and half of European households subscribing to at least 100 Mbps¹². The DAE targets are based on the availability of the so called "next generations access (NGA)" networks, which can deliver much faster speeds than legacy broadband. Contrary to the first generation of broadband services based on xDSL technologies, however, deployment of NGAs requires a much higher level of investment since new fixed infrastructure based on fibre needs to be built in¹³. Depending on the level of ambition and the way in which targets are interpreted, it is estimated that between €73 and €21 billion would need to be invested to meet the targets¹⁴.

In the current situation, with a relatively low number of web applications that require much faster speeds and, consequently, with few consumers willing to pay a premium for very high speeds, many operators are very cautious about the size and the pace of their investments in fixed NGAs. While the price for subscribing to this new access technology remains the first barrier for many potential users, a recent consumer survey in Europe and in the US suggested that around 40% of respondents were not aware of the advantages of ultra fast broadband access¹⁵, and of the estimated 22.3 million households passed with Fibre-To-The-Home

¹² In the US the *National Broadband Plan* also includes a target of at least 100 million U.S. homes having affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second by 2020. By 2015, 100 million U.S. homes should have affordable access to actual download speeds of 50 Mbps and actual upload speeds of 20 Mbps.

¹³ It appears that current xDSL broadband networks with commercially available technologies will hardly be able to offer the speeds of the DAE targets. This does not rule out the possibility of new technology developments, such as vectoring or line-bonding, but such developments would require an exam of the regulatory conditions under which operators grant other operators access to their local access broadband networks.

¹⁴ "Investigation of the Telecommunications Investment Needs in Europe for the Digital Agenda Broadband Targets", Study prepared for the European Investment Bank, March 2011

¹⁵ "Connected Consumer", Analysys Mason, November 2010

(FTTH) in Europe, only 3.9 million, i.e. 17% of the total, would subscribe to FTTH services¹⁶. What is more, the growth rate of homes passed in the second half of 2010 (23%) is not matched by the growth in effective FTTH take up (18%). Arguably this reluctance to subscribe to faster broadband speeds will lessen gradually as new services requiring higher speeds become available (entertainment services including HD video, 3D television and interactive gaming, multimedia communication, public online services, smart grids and M2M applications, HD user created content, etc¹⁷). Global Internet traffic is expected to increase more than fourfold by 2014, with video exceeding 91% of global consumer IP traffic by 2014¹⁸. Many of these applications do not only require faster download speeds but also higher upload speeds and a certain quality of service. Consumers are becoming aware of the importance of factors such as effective speeds, relative to advertised speeds¹⁹, latency or even volume caps imposed by operators in their offerings. Some operators also claim that the lack of certainty about the regulatory conditions on access obligations to these new networks disincentive some investment decisions. The Commission's Recommendation on Next Generation Access networks, adopted in September 2010, looks at providing guidance to national telecoms regulators on how they should regulate access to ultra-fast fibre networks, ensuring an appropriate balance between the need to encourage investment and the need to safeguard competition.

An international comparison on the take-up of lines based on fibre only (both fibre to the home and fibre to the building) reflects the extent of this problem: Compared to the US, Korea, Japan, China and even Russia, the EU has today almost the lowest number of FTTH lines and estimates indicate that growth in the adoption of this technology in the EU will increase at lower speeds than in other countries (Figure 20).

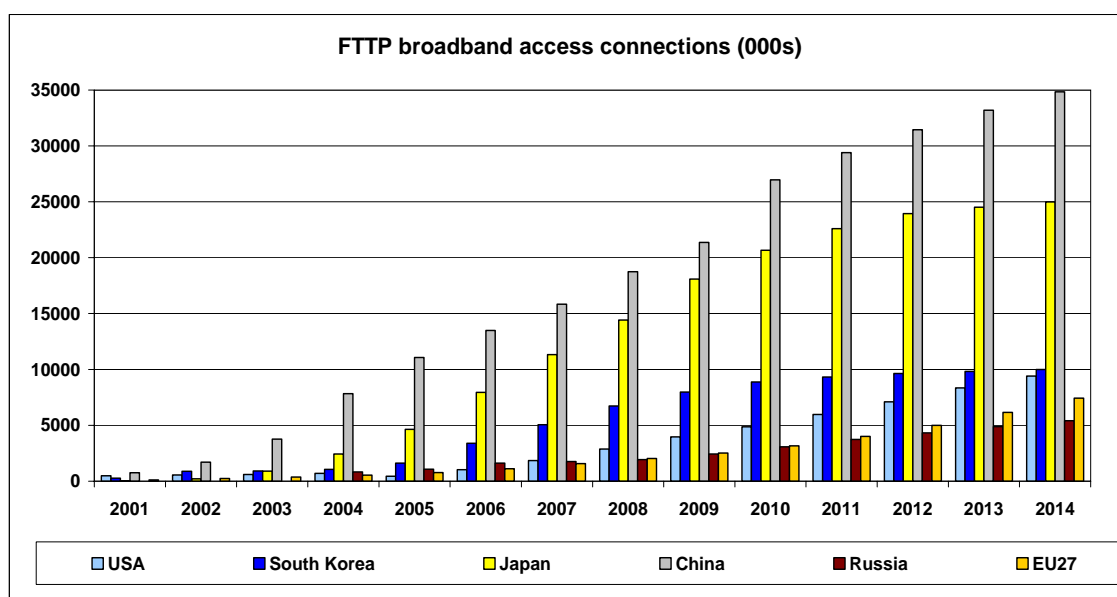
¹⁶ IDATE - Fiber to the Home Council, February 2011. Figures refer to EU27 countries + Norway, Iceland, Switzerland, Andorra, Ukraine, Croatia, Serbia and Turkey.

¹⁷ "A positive factor already documented in the JRC-IPTS study on videogames "Born digital/ Grown digital. Assessing the future competitiveness of the EU video games software industry" (2010), JRC Scientific and Technical Report, 24555 EN available online at <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=3759>"

¹⁸ Cisco® Visual Networking Index (VNI) Forecast, 2009-2014, http://newsroom.cisco.com/dlls/2010/prod_060210.html

¹⁹ In 2011 the European Commission has launched a study to measure and compare effective speeds and other parameters of broadband access in all EU Member States.

Figure 20: FTTH broadband access connections



Source: Screen Digest

Despite these gloomy forecasts at global level, there are signs that trends could evolve somehow in a more positive way due to several factors. First, as indicated earlier, there is a number of countries where the geographic footprint of PSTN networks is below 90% at national level and much lower in rural areas (between 40 and 70%), where the competitive constraint of xDSL lines over other technologies is not that strong. In some of these countries xDSL lines only account for between 30% and 40% of all broadband fixed lines and competition based on wholesale regulated products is almost inexistent or very weak. Competitors therefore use either existing alternative infrastructures such as cable modem, the coverage of which is above EU average, or simply invest in brand new networks based on fibre technologies. (Table 4).

Typical examples of this situation are Bulgaria, where 57% of broadband fixed lines use Fibre-To-The-Building (FTTB), and Romania, with similar levels of FTTB take up²⁰. These new networks bring fibre-based access to the premises and are capable of offering speeds in line with the DAE targets. This does not necessarily mean that only ultra-fast speeds are marketed, and it is not unusual to find FTTH products with speeds of 10 to 20 Mbps in these countries meant to attract new customers. In Latvia the incumbent should have rolled out FTTH networks to some 300,000 households in urban areas by the end of 2010 and also used VDSL architecture to upgrade networks in certain compactly populated rural areas. In the Czech Republic the incumbent has maintained a stable market share of 85.5% in the DSL segment, while WLL and cable providers are the main market players building FTTH networks (mostly as FTTB) as upgrades of their existing networks. In Slovenia growth of the fixed broadband market was primarily based on FTTH technologies and cable, which was the preferred technology for new connections in 2010 due to the upgrade of the cable operators' networks to DOCSIS 3.0

²⁰ Source: Commission services based on COCOM, "A world of Fiber" by Diffraction analysis, January 2011, and IDATE - IDATE - Fiber to the Home Council, February 2011

Table 4: Breakdown of fixed broadband lines by technologies

Country	DSL lines %	Cable modem %	Other %
RO	29%	14%	56%
BG	31%	13%	57%
LT	31%	7%	62%
CZ	38%	22%	40%
LV	40%	6%	54%
HU	40%	44%	17%
EE	44%	21%	35%
SK	44%	11%	46%
PL	51%	27%	22%
MT	52%	44%	4%
PT	53%	40%	7%
BE	54%	45%	1%
SE	55%	20%	25%
NL	57%	40%	3%
DK	58%	26%	16%
SI	58%	25%	17%
AT	69%	29%	2%
IE	71%	20%	10%
FI	71%	15%	13%
EU	77%	16%	7%
UK	79%	21%	0%
ES	80%	18%	2%
LU	84%	15%	1%
DE	88%	11%	1%
CY	91%	8%	1%
FR	93%	6%	1%
IT	98%	0%	2%
EL	100%	0%	0%

Source: Communications Committee

Where cable modem networks are used, operators are starting to upgrade these to DOCSIS 3.0 technologies that enhance transmission capacity and allow much higher speeds. In some of these countries the footprint of cable modem networks is above average, both at national level and, in some cases, in rural areas as well. These deployments may start exerting some degree of competitive pressure over incumbents, which are expected to react upgrading their own networks so as to offer higher speeds based on VDSL.

Such scenario is already a reality in countries where competition between cable modem and xDSL is effective. Incumbents and new entrants started upgrading their networks to sell VDSL and DOCSIS 3.0 products, initially with increases in retail prices and later offering speed upgrades maintaining the price level of the first generation access. Belgium, the Netherlands and Portugal are typical examples of this pattern of development: In Belgium the incumbent uses a fibre-to-the-curb (VDSL2) technology, which allegedly reaches 75% of population, while the cable companies are enabling their networks for EuroDocsis 3.0, which have allegedly been upgraded for 90%. In the Netherlands, as a consequence of the introduction of EuroDocsis 3.0 technology, the cable networks are able to make interesting offers with speeds of more than 100 Mbps. The fixed incumbent deploys VDSL and also fibre, by means of a joint venture. Overall the number of homes-passed in the Netherlands has tripled over the past three years (444,000 lines in the second quarter of 2010). In Portugal several offers of 100 Mbps, 200 Mbps and even 1 Gbps were launched in 2010, following FTTH deployments in limited areas by some alternative operators and the incumbent and the upgrade of the main cable operator's network to DOCSIS 3.0. Growth of VDSL and DOCSIS 3.0 lines in these countries has accelerated over the last years. According to an industry association, 24 operators in 18 countries now offer broadband speeds of 100 Mbps or above and 51% of EU households would be able to access speeds of at least 30 Mbps via cable networks by 2013.

A variant of this model occurs in a few countries that have been very active in rolling out FTTP networks in parallel to cable and DSL. This is particularly the case of Sweden, Denmark and Finland. In Sweden FTTH, with a 24.4% fixed broadband market share, has eventually replaced cable as the most important alternative fixed platform to DSL. In Denmark, electricity providers continue to invest in the roll-out of FTTH networks and focus on delivering 100 Mbps, with around 200,000 homes currently served with this service.

In the countries where xDSL is the dominant technology, former incumbent operators control the major part of the infrastructure and, with the exception of the UK, continue having a strong market position (between 40% and 50% of the fixed broadband market). These operators may leverage on dominance to maintain and even increase revenues with a gradual roll out of VDSL and, in the long term, FTTx products. But this should not occur to the detriment of unbundlers, which have incurred significant investments over the last years.

Large incumbents face the dilemma of carrying long run and costly fibre investments with yet low expected commercial outcomes, in a framework of political pressure from regional and national governments on the one hand to invest in fibre and shareholders' demand for short term returns on the other. Hence the ratio of expected effective take up of NGAs against planned roll out becomes a critical element for operators when deciding to engage on new network deployment. Obviously in those countries where a large proportion of the population has never used the internet and shows low propensity to become connected, it is very difficult to defend hefty investment plans. This partly explains the timid deployment of NGAs in some Member States, where operators only roll out fibre based networks in very specific

geographic areas where expected returns appear to be more secure. Sector NGA regulation will therefore be critical in ensuring a smooth transition to second generation broadband access.

2.7 *The political debate*

In the past few years the political debate in Europe has evolved around the desirability of an advanced, high-speed broadband infrastructure fit for the 21st century. Most of the investment needed is expected to come from the private sector. Nevertheless the market has been very cautious about the move, as costs of deployment are significantly higher than for legacy broadband.

Operators are searching for new and sustainable business models while trying to determine the speed and extent of their NGAs investments. While commercial players are expected to invest in more densely-populated urban areas, public authorities can support developments by subsidies in more rural areas and, most importantly, by considering cost-cutting measures. Given the high costs of civil engineering, the European broadband policy emphasises ways to facilitate investment and remove bureaucratic obstacles to achieve more with less. Possible cost-cutting measures include (i) mapping of the suitable infrastructure; (ii) making sure that civil engineering works involve potential investors and exploit synergies between all network infrastructures; (iii) clearing rights of ways, etc.

To maximise the policy impact, European Member States are expected to develop national plans focussing both on the cost-cutting measures above as well as on the use of Community funds (such as Regional and Rural Development funding) in disadvantaged areas. Finally, other important Digital Agenda policies are crucial to strengthen developments in digital skills and the digital single market, which states that demand must be in place to ensure a vibrant digital future for Europe.

With regards to State Aid for the deployment of broadband networks, after the adoption of the 2009 Broadband Guidelines, the Commission has issued a record number of decisions and has approved a record amount of pro-competitive state aid in this sector (over to €1.8 billion in 2010).

2.8 *Policy responses to the DAE targets*

The European Commission has taken active steps to clarify the regulatory environment as well as to propose concrete measures to stimulate deployment of high-speed broadband. It has adopted a comprehensive package comprising:

- A Commission Recommendation on Regulated Access to Next Generation Access (NGA)²¹ networks which sets out a common regulatory approach for access to new high-speed fibre networks. It requires national telecoms regulators to ensure an appropriate balance between the needs to encourage investment and to safeguard

²¹ C(2010) 6223

competition. This will provide increased regulatory clarity to all market players, which is necessary to stimulate investment in fast and ultra-fast broadband. The Telecommunications Framework Directive (2002/21/EC) requires Member States to ensure that their regulatory authorities take the "utmost account" of the Commission Recommendation, justifying any departure from it.

- A Commission proposal for a Decision by the European Parliament and Council to establish a five-year policy programme to promote efficient radio spectrum management²² and, in particular, ensuring that sufficient spectrum is made available by 2013 for wireless broadband (which will significantly contribute bringing fast broadband connections to people in remote areas and to make innovative services available across Europe). Efficient and competitive use of spectrum in the EU will also support innovation in other policy areas and sectors such as transport and the environment.
- A Broadband Communication²³ that sets out a coherent framework for meeting the Digital Agenda's broadband targets and, in particular, outlines how to best encourage public and private investment in fast and ultra-fast broadband networks. It calls on EU Member States to introduce operational broadband plans for high and ultra high speed networks with concrete implementing measures. It also provides guidance on how to cut investment costs and indicates how public authorities may support broadband investment, including making better use EU funds.
- These initiatives add to the 2009 Commission State aid Broadband Guidelines. The Guidelines provide a clear framework for government as well as for stakeholders as to how public authorities should design their State aid measures in the most pro-competitive way. The broadband Guidelines aim at achieving the coverage goals of the Digital Agenda in harmony with the goal of keeping broadband markets competitive, avoiding to crowd out private investments and to recreate positions of monopoly as a consequence of State intervention.

2.9 *NGA deployment in Member States – Current situation, investment and national plans*²⁴

In line with the DAE, many Member States have developed national broadband strategies setting ambitious targets in terms of broadband coverage and speeds.

National broadband strategies set out as a first target the covering of (mostly) 100 % of the population with basic broadband in the next years and the availability of much faster networks by 2015-2020. In some MS there is a significant gap between current take-up and coverage (both achieved and targeted coverage).

²² COM(2010) 471

²³ "European Broadband: investing in digitally driven growth", COM(2010) 472.

²⁴ Commission services based on "BEREC, *Next Generation Access – Collection of factual information and new issues of NGA roll-out*, February 2011" (http://www.erg.eu.int/doc/berec/bor_11_06.pdf), the European Broadband Portal (<http://www.broadband-europe.eu/Pages/StrategyDetail.aspx?ItemID=37>) information provided by NRAs and operators' announcements. Look at country chapters for further details.

The speed targets range from 2 Mbit/s in some countries up to 400 Mbit/s in the Netherlands. The majority of MS's target has a target bandwidth of 50-100 Mbit/s which goes beyond the 30 Mbit/s target set in the Digital Agenda.

Many countries focus on rural/underserved areas (e.g. in Austria, Denmark, Finland, France, Germany, Italy, Lithuania, Malta, Portugal, Romania, Spain, Sweden, United Kingdom).

The following is a non-exhaustive list of Member States' response to the DAE targets (Chart 21).

- In Belgium, the “Belgium – Digital heart of Europe 2010-2015: 30 action points” initiative contains very different elements, covering both infrastructure and e-services. One specific target looks at 90% of households connected to broadband by 2015. According to the Belgian plan, by mid 2009 more than 70% of the population was potentially covered by networks offerings 20 Mbps download speeds and this percentage should increase to 95%. The good average speed in Belgium seems to be the result of platform competition between the incumbent and the cable providers, which both have a national geographical coverage of almost 100%. They have based their strategy on an upgrade of technologies, VDSL for the incumbent, which allegedly reaches 75% of population and EuroDocsis 3.0 for the cable companies' networks, 90% of which have allegedly been upgraded.
- Bulgaria adopted its broadband strategy in 2009 and the Government has yet to present a detailed implementation programme. It plans to achieve 100% broadband coverage of 1 Mb/s by 2013. A governmental project for the development and operation of a broadband access network in less urbanised and rural areas has been launched, promoting open access for last-mile operators.
- The Czech Republic adopted in early 2011 a new broadband strategy called 'Digital Czech' that was prepared during 2010. The strategy sets out the following broadband targets: national coverage at minimum speeds of 2 Mbps (download), and in the cities at a minimum of 10 Mbps, by 2013; improving the quality of rural broadband connections to reach 50% of the average speed available in urban areas by 2015; and broadband at 30 Mbps to be available to at least 30% of subscribers in urban areas, also by 2015.
- In Denmark 77% of households could access 10 Mbit/s services by the end of 2009. In June 2010 the Danish government presented the "*Digital Roads to Growth*" initiative, which among 35 initiatives includes a target of 100 Mbit/s access to all households and enterprises by 2020. An intermediate objective included all households having access to a broadband connection of 0.5 Mbps by the end of 2010. Electricity companies continued investing in FTTH roll-out, with around 200 000 homes currently served with this service. The incumbent continues its VDSL strategy of upgrading its network in combination with the fibre network acquired with the take-over of a small fibre operator in 2010. However, according to the incumbent, VDSL networks were only able to provide speeds of 15 Mbps.
- In Germany, the “Deutschland Digital 2015” initiative refers to all aspects of information society, including the implementation and update of the 2009 "National Broadband Strategy". This strategy wants to ensure that all German households have

access to broadband Internet at speeds of at least 1 Mbps by the end of 2010 at the latest. It appears that just 98.6% coverage was reached at the end of 2010. The second target is to bring broadband access of or above 50 Mbps to 75% of the households by 2014. The strategy is based on four pillars: use of synergies in infrastructure roll-out, supporting spectrum policy, growth-oriented regulation, and financial support measures. A national duct support scheme with a budget of 600 million Euros aims at fostering the deployment of NGA networks. In 2010 40% of new broadband customers were connected over non-DSL lines mainly based on broadband cable, 255 000 households had active broadband lines based on FTTH/FTTB and 200,000 active lines were based on VDSL.

- The Estonian EstWin project foresees the provision of wholesale service and making 100 Mbit/s wideband internet accessible to every citizen of Estonia by 2015 through the construction of a country-wide broadband network. A non-profit organisation called Estonian Broadband Development Foundation was created in August 2009 by major operators and the government. The first sub-project was launched in August 2010.
- Following completion of the National Broadband Scheme, Ireland now has 99% coverage for the whole country. The service provides a minimum download speed of 1.6 Mbps and maximum of 6.8 Mbps and is available for 235,000 premises across every county in Ireland. Speeds will be increased to a maximum of 10 Mbps by October 2012. A new Rural Broadband Scheme to be launched shortly will ensure that the remaining 1% of the country will be covered. However the prospects for investment in NGN remain uncertain in Ireland although cross-industry discussions are progressing well and trials are being undertaken by the incumbent operator, which is planning to invest €20 million in a trial of ultra-high speed fibre-optic broadband services capable of data speeds of up to 150Mbps.
- In Greece the initial parameters of the national project for the creation of a nation-wide fibre optic network infrastructure were being revisited in order to render this project more economically viable and attractive to potential investors. Plans were also made for the exploitation of the existing optics metropolitan area networks present in 72 Greek cities aimed at ensuring the rollout of broadband networks in rural areas. The Greek incumbent initiated the deployment of its new optical access network (FTTC with the use of VDSL2 technology). The project was initially developed in a limited number of urban areas, and will progressively expand to cover other areas in order to provide end users with speeds up to 50 Mbps. Besides the mentioned plans, there is also a planned measure to bring broadband to rural areas using the funds made available by the European Economic Recovery Plan.
- In Spain the "Plan Avanza 2 – 2011-2015" strategy provides state aid for extending basic as well as high-speed broadband coverage. Draft legislation includes the definition of 1 Mbps as functional access to the Internet as part of the universal service as of 2011. But there have not yet been any major fibre deployments in the country. In August 2010, the incumbent launched new broadband offers based on FTTH with speeds of up to 50 Mbps in limited areas, and most cable operators are currently providing speeds of up to 100 Mbps.

- In France the “National Ultrafast Broadband Program” released in June 2010 does not lay down any goals in terms of speed, just coverage (70% of households in 2020 and 100% in 2025). It includes a call for expressions of investment intentions in order to collect investment intentions of operators to deploy ultrafast local loop networks in the next 5 years outside very high-density areas. This measure serves as a basis for granting financial support in the next step. The Government estimated that fibre may cover 80% of the territory, 15% will be covered by other technology than fibre and 5% by the modernisation of the copper network. FTTH deployment has started in about 100 out of the 148 municipalities that ARCEP defined as very densely populated areas. In the third quarter of 2010, almost one million households were eligible for FTTH offers. A new call for expressions of investment will be held every 2 years. An amount of € 2 billions is devoted to increase national coverage with high-speed networks.
- Italy is currently one of the largest FTTH markets in Europe, with more than 2.5 million ²⁵homes passed and 348,000 fibre subscribers at the end of December 2010. Both the incumbent and the alternative operators have announced investment plans: The “Fibre for Italy” project (with the participation of Fastweb, Vodafone and Wind in a co-investment partnership), aimed at reaching 20 million people in Italy’s 15 largest cities by 2015, and Telecom Italia’s plan to connect 138 cities with FTTH/B by 2018. The Italian NRA has established a NGN Committee to define guidelines for NGN. The Italian government has started the “Italia digitale” project. The two pillars of the Plan are the National Broadband Plan to bridge the digital divide and the Next Generation Access Networks Plan. The latter, in particular, aims at enabling at least 50 per cent of Italians to surf the Internet at a speed exceeding 100 mbps by 2020. The “Broadband in Rural Areas” plan envisages financing the extension of the fibre backhaul network to local exchanges areas located in rural areas as well as broadband wireless solutions for the most remote areas. The Commission approved a number of regional projects in 2010, including anti-digital divide initiatives in Lombardia and Trentino.
- In Cyprus a first draft of the digital strategy for the country was subjected to internal consultation in September 2010. The national broadband strategy, which forms part of this digital strategy for Cyprus, sets out broadband targets as outlined in the DAE. Geographical coverage and quality of service requirements will be included in the forthcoming spectrum auctions so as to facilitate access to internet of a speed of more than 2 Mbps for all citizens by 2013. Internet access of a speed of more than 30 Mbps by 2020 is expected to be met with the deployment of broadband access networks making use of fibre optics and other technologies (ex. wireless), and with the licensing of more spectrum for electronic communication services. The plan also envisions the use of satellite services to provide basic Internet connectivity of 1 Mbps for every 5 users to areas in Cyprus where broadband services were not available (‘white areas’ – 151 rural communities). The incumbent operator continued upgrading its copper network with a view to provide services through VDSL2 on a nationwide basis, which is expected to be finalised by the beginning of 2011. An alternative fixed operator is currently developing its own FTTH network.

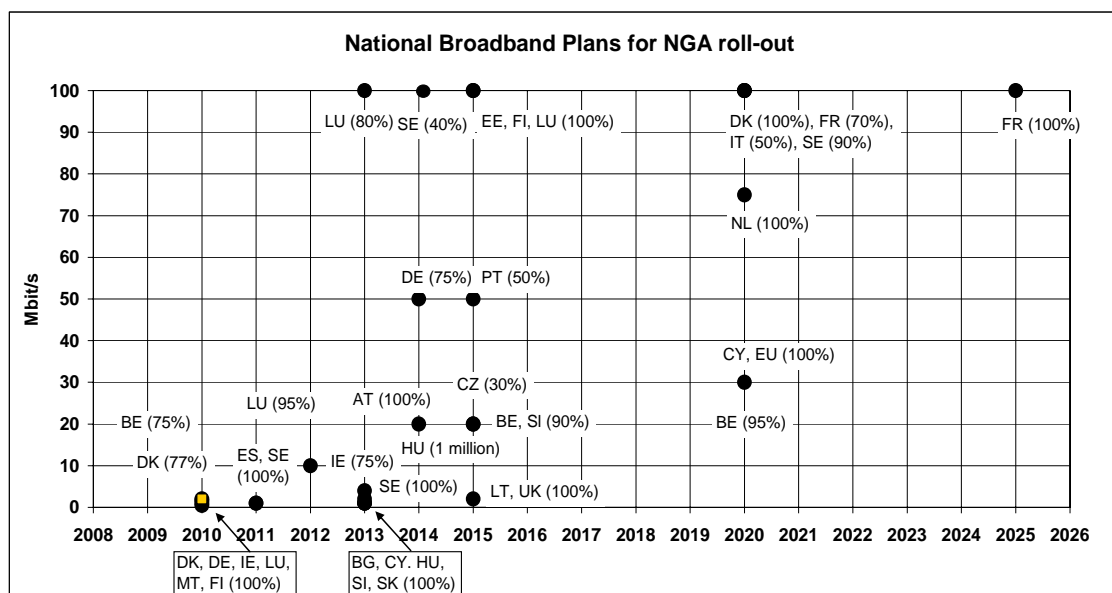
²⁵ FTTH Council

- Latvia has one of the highest shares of FTTH lines in the EU and the share of high speed lines (above 10 Mbps) doubled for the second consecutive year. The share of FTTH broadband lines jumped from 5.1% in January 2010 to 17.7% in January 2011. Latvian broadband operators continued to invest in upgrading their broadband networks. The incumbent reported having covered 300 000 households with FTTH networks by the end of 2010 and the alternative operators also worked on increasing broadband speeds. In August 2010, the Ministry of Transport submitted for approval to the Cabinet of Ministers draft “Guidelines for the electronic communications policy in 2011-2016”. These draft guidelines do not provide for specific broadband coverage targets but set the penetration targets (20% in 2012 and 25% in 2016 for fixed broadband and, respectively, 15% and 30% for mobile broadband). These draft guidelines have not yet been adopted.
- Lithuania is the European leader in FTTH penetration despite its lower than average broadband penetration rate. In June 2010, more than 20% of households were connected. As for take-up, penetration stood at close to 16%. A draft Lithuanian Information Society Development Strategy for 2010-2015 is under preparation, with one of its major targets being the provision of broadband access to 98% of Lithuanian inhabitants by 2015. Coverage of rural areas is the main challenge of the plan and the RAIN and RAIN-2 national projects look at stimulating the provision of fast broadband services in these areas. TEO LT was reported to have expanded the reach of its fibre to the home (FTTH) network to more than half of Lithuania's inhabitants.
- Luxembourg presented its national strategy for the development of NGNs in March 2010, aiming at increasing the speed of existing networks and the investment in NGNs so as to make Luxembourg the first "fibred" country in the EU, through a transition from VDSL to FTTH. A minimum speed of 2 Mbps downlink should be available for 100% of the population in 2010, 100 Mbps downlink by 2015, and 1 GBps by 2020. Intermediate coverage-related targets include 95% of the population with access to 25 Mbps downlink by 2011, 80% of the population with 100 Mbps downlink access in 2013 and 50% of the population with 1 GBps downlink access in 2015.
- The draft "Digital Hungary Programme" is closely linked to the European Digital Agenda, with basic and advanced broadband targets: 100% coverage of broadband connection of at least 4 Mbit/s by 2013 and 1 million with NGA access of at least 20 Mbit/s by 2014. According to information provided by the incumbent, as of December 2009, 545000 households can be reached via FTTB, although the market share of FTTH remained very low.
- Malta is currently in a transition phase with respect to its national broadband plan and no significant progress has been made on the move towards NGA networks. The previous policy plan ("Smart Island Strategy" – 2008-2010) aimed to achieve 100% broadband coverage at 2 Mbps by 2010, as well as 20% of households being connected to next generation networks. The government has now started to work on a new strategy outlining objectives for 2015. Despite some roll out of FTTC in certain areas, operators have not announced any investment plans or a timeframe yet in relation to FTTH. The Maltese NRA is considering extending the current scope of the universal service to include the provision of broadband connections permitting a minimum speed of 4 Mbps. The consultation was launched in the 3rd quarter 2010 and the NRA is currently reviewing the responses.

- In the Netherlands, the "Digital Agenda.nl" planned for May 2011 will cover the main aspects of the DAE. The Government has published a document which intends municipalities to identify their role in stimulating NGA roll-out and take-up. In most cases a facilitating role (e.g. opening streets) or a role for pooling demand is considered sufficient. In terms of actual coverage, broadband speeds are high in the Netherlands and it appears that cable companies are capable of providing very-high speed connections of more than 30 Mbps. Fibre is being rolled out by the fixed incumbent, by means of a joint venture, but also locally or regionally by smaller players and municipalities. Overall the number of homes-connected has tripled over the past three years (444 000 lines in Q2 2010).
- Austria foresees a target of providing every Austrian citizen with a broadband connection of at least 25 MBit/s by 2013. In December 2010 the Austrian Government presented the "Broadband Austria 2013" initiative, aimed at stimulating the rollout of broadband infrastructure in rural areas. A high-level competence centre for information and communication technologies for promoting the development, roll-out and usage of broadband technologies was established in 2010.
- Poland's broadband plans are currently based on the 2008 government's 'Strategy for the Development of the Information Society in Poland until 2013', which seeks to ensure general access to e-communications facilities. The strategy lacks specific broadband targets. A new comprehensive national broadband plan is expected in the first half of 2011.
- In Portugal more than 4 million households have access to high-speed broadband networks and the country aims for a 100% penetration of NGA. In 2009, the Government signed a protocol with four of the main operators and adopted new national legislation in order to boost investment in NGA. Five public tenders were launched for the deployment of NGA networks in rural areas, which are not served by private operators, including the outermost regions of the Açores and Madeira. The networks should provide a minimum download speed of 40 Mbps and cover at least 50% of the population in each area.
- Romania. No substantial progress has been achieved in relation to the project to develop fixed broadband infrastructure using EU rural development funds in accordance with the strategy adopted in 2009.
- The Slovenian Broadband strategy was adopted in July 2008 and defined quantitative broadband targets: Basic broadband coverage for 100% of Slovenian citizens by 2010, broadband coverage at minimum 2 Mbit/s for 98% population by 2012 and broadband coverage at 20 Mbit/s and availability of triple play for 90% population by 2015. Also a longer term objective was defined targeting the availability of FTTH or comparable broadband connections of greater capacity for 90% population by 2020.
- The Slovak national public broadband development project was revisited in 2010 with the principal outcome of shifting the focus to the financing of regional networks. Broadband access is defined at 2 Mbps downstream and 512 Kbps upstream. The new draft of the broadband strategy sets the national broadband target of full coverage by 2013 at 1 Mbps.

- The Finnish broadband strategy for 2009-2015 includes the extension of the scope of universal service to broadband connections of an average speed of 1 Mbps from 1 July 2010. By the end of 2015 the target is to have 100 Mbit/s broadband networks available for all. By the end of 2015 high-speed (trunk) networks should be within the reach of virtually everyone in a 2 km distance, according to demand. Commercial deployments are expected to ensure that 95 percent of the country is covered in this way, and public funds should be used to cover the remaining 130 000 households in rural areas
- Sweden saw an increase in fast broadband speeds in 2010 due to an extension of fibre networks. In November 2009, the Swedish Government published its Broadband Strategy, with a target of 90% of households and companies having access to at least 100 Mbps broadband by 2020 and an intermediate target of 40% of households by 2014. The Government also set an objective of providing a 1 Mbps connection for every citizen as of 2011, on the understanding that this speed constitutes functional Internet access.
- In the UK, BT plans to roll out fibre broadband covering two thirds of premises until 2015, through both VDSL and FTTH. Virgin Media has started to roll out DOCSIS 3.0 at 100 Mbps on their existing cable network to 12.7 million homes. On 6 December 2010, the Government launched a new broadband strategy entitled “Britain’s Superfast Broadband Future”, which aims to make sure the UK has the “best broadband network in Europe by 2015”. It also aims at ensuring that “virtually” all homes will have access to a minimum level of service of 2 Mbps by 2015.

Figure 21: Member States' broadband targets



Source: Commission services based on BEREC, OECD and national sources

3. THE MOBILE SECTOR

Developments in the mobile segment have mainly been driven by the rise in data traffic. Data traffic on mobile networks is already greater than voice and is expected to almost double year by year²⁶. The enormous increase in traffic is a result of four interrelated factors. First, the increasing penetration of smart phones and tablets (and also notebooks). By 2014, 83% of all Western European mobile connections will be 3G²⁷. Second, the fast evolution of the mobile applications market, which offers an increasingly wide range of attractive content optimised for mobile handsets. Mobile application store downloads are expected to grow by 117 % in 2011 reaching 17.7 billion downloads worldwide²⁸, with increasingly bandwidth-hungry applications driving up the average data consumption per user. Third, the mass market nature of the mobile market, with the evolution of devices and applications attracting large numbers of users. Fourth, mobile broadband is getting more and more popular for large screen use as well. Especially in countries with low fixed broadband penetration, mobile may be used as the main internet connection in a household.

The expected boom in demand for mobile data can only take place if mobile networks can manage the significant growth in traffic. In 2010, operators focused on improving their 3G and High Speed Packet Access (HSPA) networks, and prepared for the launch of LTE²⁹, the 4th mobile generation. As for 3G, European population coverage was 90% in 2010. Spectrum for LTE has already been auctioned in several countries including Sweden, Finland, Germany, Austria, the Netherlands, Denmark and Estonia, and 10 operators in the EU have already commercially launched 4G³⁰. LTE will bring effective speeds at user level comparable with current DSL products, thereby improving the competitive position of mobile broadband in relation to fixed offers. Nevertheless, the change-over to LTE will take time, as current devices can only operate on 3G or HSPA (or only on EDGE or GPRS) networks. This will trigger further investments in legacy networks too.

3.1 *Mobile subscriptions: Penetration is still on the increase*

There were 622 million active mobile subscriptions in the EU in October 2010, which corresponds to a population penetration rate of 124.2%. Number of subscriptions is still on the rise, though the growth rate has slowed down. The high penetration rate reveals that it is very common to use more than one mobile subscription or SIM card. In many cases, people have a business and a private subscription, or a voice and a data only subscription. Due to the still large differences in roaming and domestic calls, those people spending substantial time in two different countries may have subscriptions in both countries.

²⁶ Screen Digest: Mobile data traffic set for massive growth

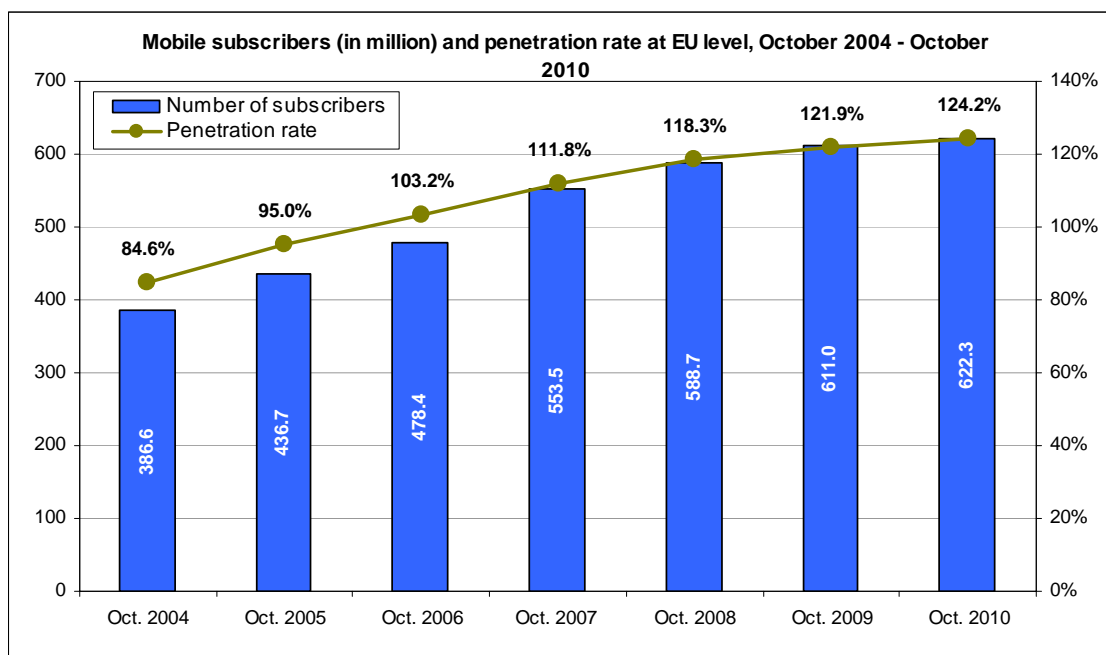
²⁷ Gartner: Market Trends: Worldwide, How Mobile SCPs can control the Mobile Data Explosion, 2011

²⁸ Gartner: Gartner Says Worldwide Mobile Application Store Revenue Forecast to Surpass \$15 Billion in 2011

²⁹ Long Term Evolution

³⁰ Source: GSM Association

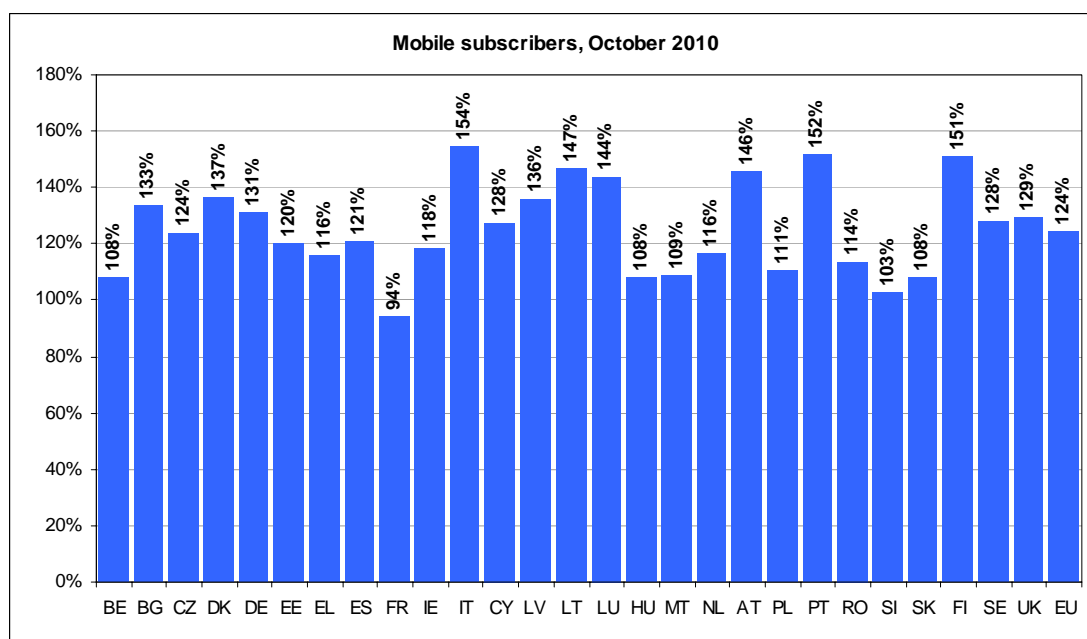
Figure 22: Mobile subscribers and penetration rate at EU level October 2004 – October 2010



Source: Commission services

There are large differences in penetration at the Member State level. Italy has the highest rate (154.5%), which is partly caused by the very high prepaid ratio. Penetration is also very high (above 140%) in Portugal, Finland, Lithuania, Austria and Luxembourg. France, being the only country below 100% penetration rate, is at the very bottom of the list, which is partly due to the very strong focus on postpaid (Figure 23).

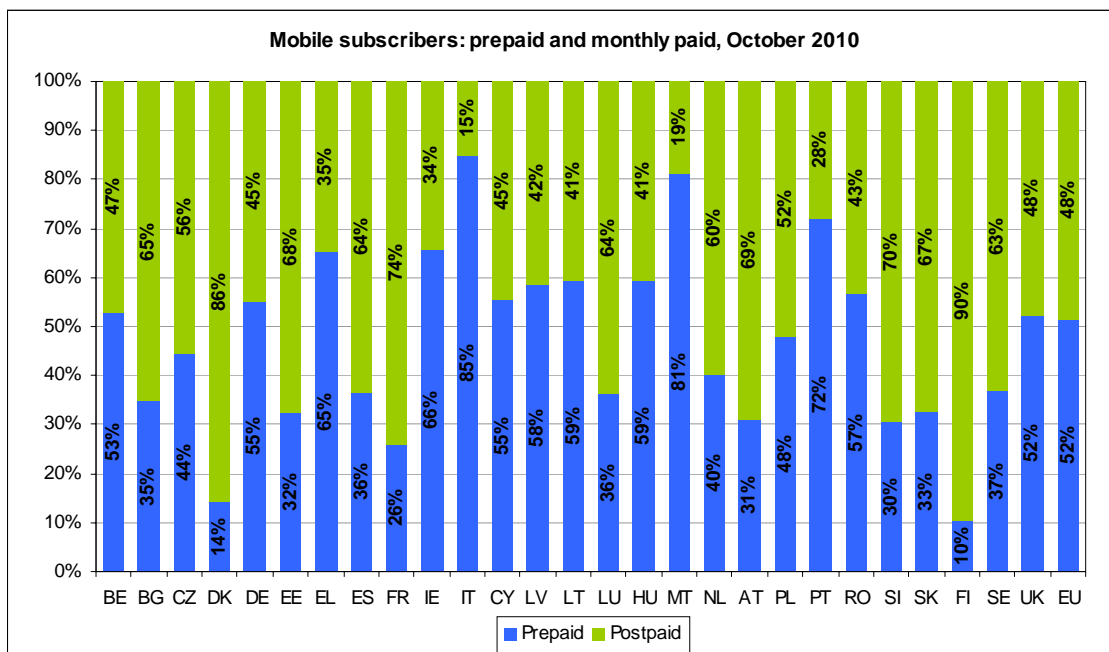
Figure 23: Mobile subscribers, October 2010



Source: Commission services

48.4% of European mobile subscriptions are postpaid, which is an increase of 3.7 pp compared to a year earlier. The ratios show large differences among the member states, which are mainly due to different operator strategies. The ratio of postpaid is generally higher in countries where the monthly paid customers are entitled to substantial subsidies on handsets, exclusive loyalty offers, and lower minute fees.

Figure 24: Mobile subscribers: prepaid and monthly paid, October 2010

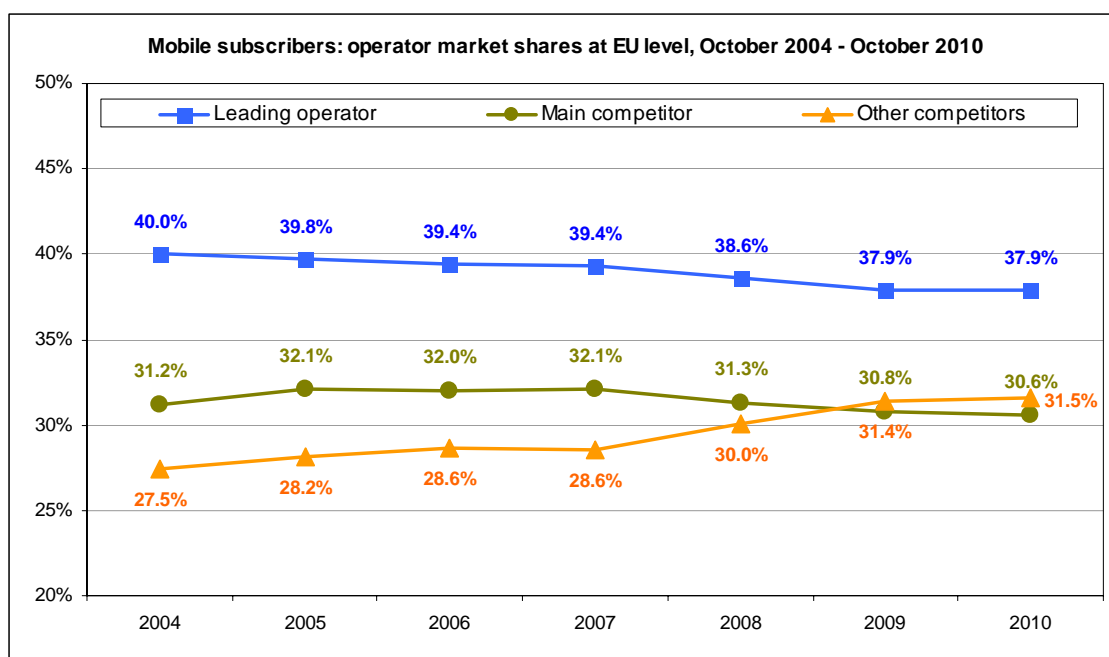


Source: Commission services

3.2 Competition: Market leaders are losing market share

Between 2007 and 2009, market leaders and main competitors (the second largest operator in a country) lost market share. This trend suggests that Mobile Virtual Network Operators were slightly gaining market share. Regulation has played an important role in strengthening competition in two ways. First, number portability eased very much the process of switching operators. Second, the lowering of termination rates has put small operators in a better position, as the price difference between on-net and off-net calls could be reduced. However, in 2010, market shares at EU level did not change, as the general strengthening of small operators was compensated by a merger in the UK market.

Figure 25: Operators' market shares at EU level, October 2004 – October 2010

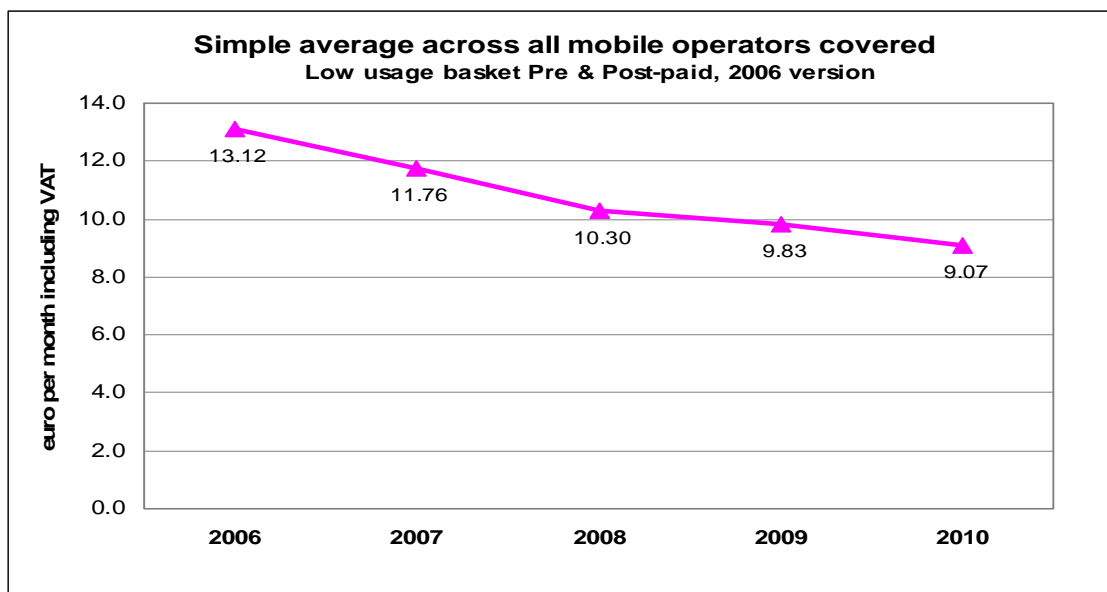


Source: Commission services

3.3 Pricing and Average Revenue Per User (ARPU): Prices are decreasing, ARPU dropped even more significantly

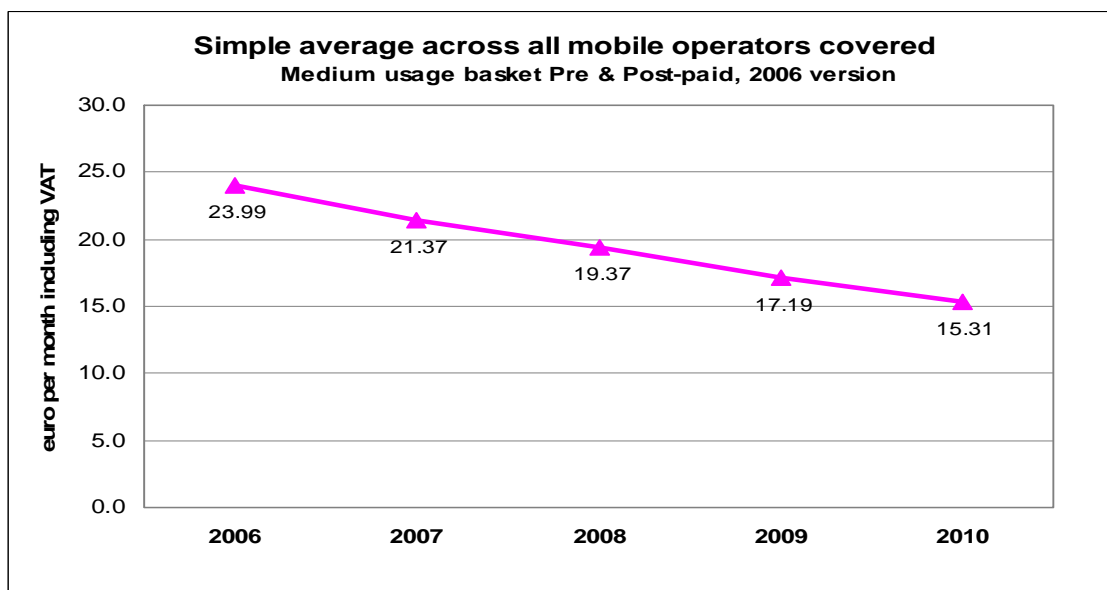
Mobile telephony prices, as measured by the OECD baskets methodology, have decreased for all consumer patterns (Figures 26a, b and c). While prices in the low usage basket have fallen by 7% in 2010, those in the medium and high usage basket have decreased by more than 10%.

Figure 26a: Mobile price development, low usage basket



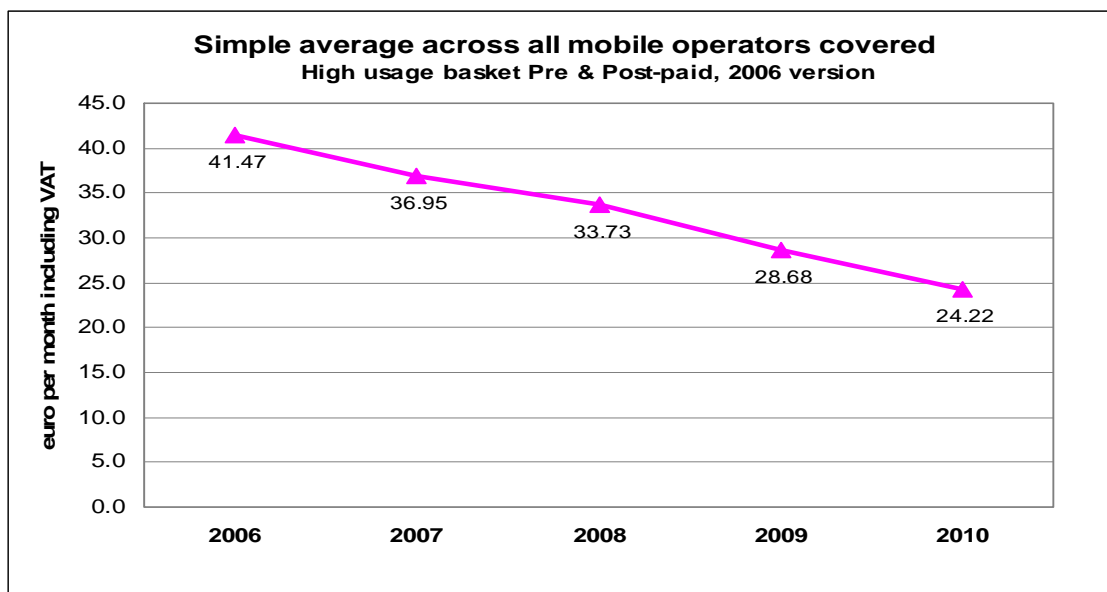
Source: Teligen

Figure 26b: Mobile price development, medium usage basket



Source: Teligen

Figure 26c: Mobile price development, high usage basket

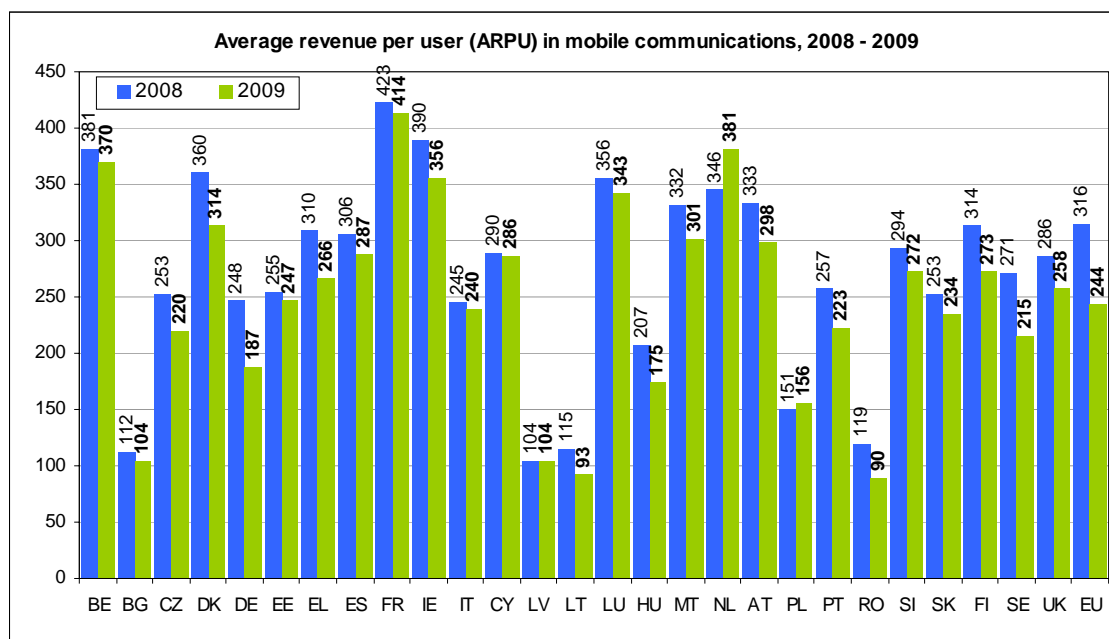


Source: Teligen

There are several reasons behind the price decrease. Competition has been increased as Virtual Mobile Network Operators emerged. Off-net and roaming retail charges were reduced due to regulation. As a result of lower switching costs (number portability), operators have to offer more loyalty discounts to retain valuable customers. In addition bundled offers, which may contain large discounts, are getting more and more popular too.

Average Revenue per User (ARPU) decreased more significantly than end-user prices. In fact, the reduction in prices is only one of the numerous reasons driving the development of ARPU. The market growth has slowed down and, in addition, the new customers generally experience lower consumption than the old ones. The reduction in wholesale prices (both roaming and domestic mobile termination rates) resulted in a large drop in wholesale revenues. Finally, the financial crisis made both consumers and enterprises more budget conscious.

Figure 27: Average revenue per user (ARPU) in mobile communications, 2008-2009

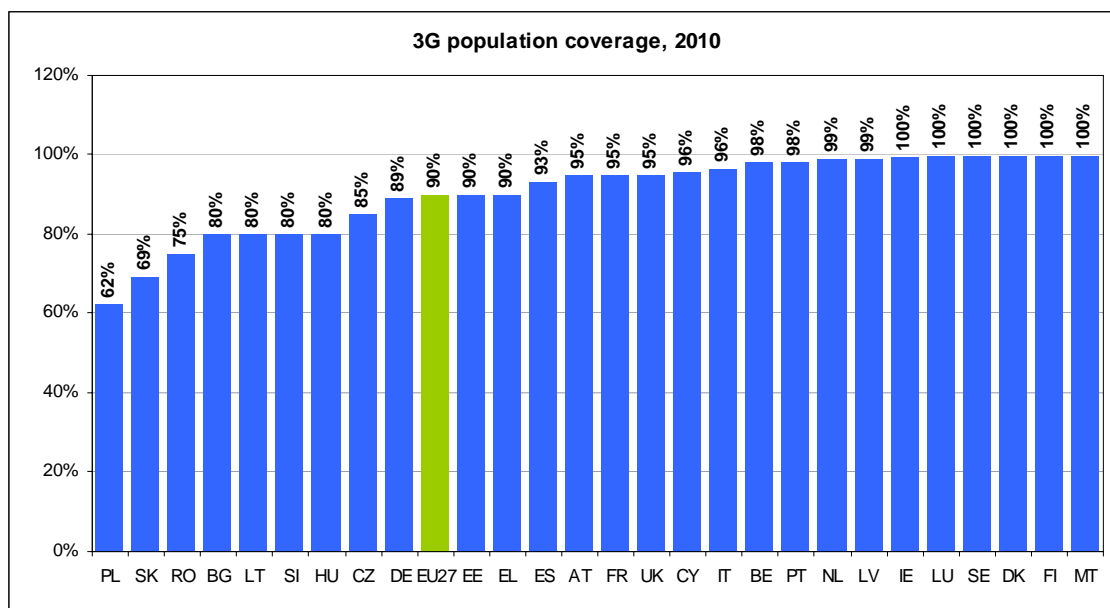


Source: Commission services

3.4 Mobile Broadband: Penetration of dedicated devices reached 7.2%

Mobile broadband is clearly the main source of revenue growth for mobile operators in the EU. On average, there was 90% population coverage of 3G in the EU in December 2010. Three member states (Malta, Finland and Denmark) have already reached full coverage. Coverage exceeded 95% in nine additional countries (SE, NL, BE, IT, IE, CY, PT, LU and LV). There are only two Member States (PL and SK), where 3G is not available to at least 70% of the population.

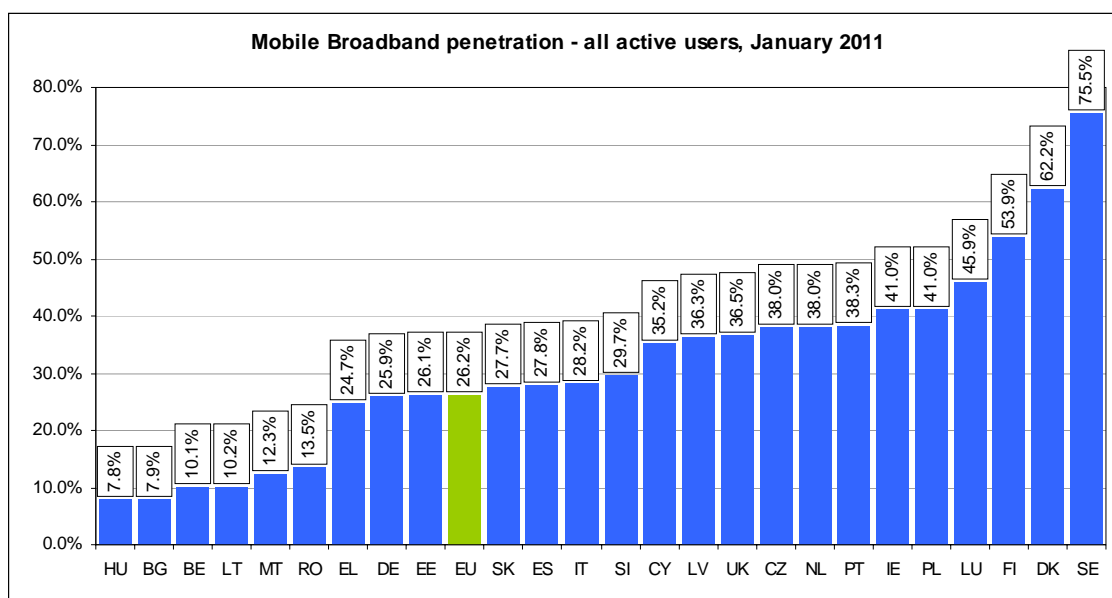
Figure 28: 3G population coverage



Source: Idate

Penetration of mobile broadband (use of any devices to access the internet through a mobile network) reached 26.2% of population in January 2011. Mobile broadband is most popular in the Nordic countries, where penetration is above 50%. At the same time, there are six Member States with a rate lower than 20%.

Figure 29: Mobile Broadband penetration – all active users

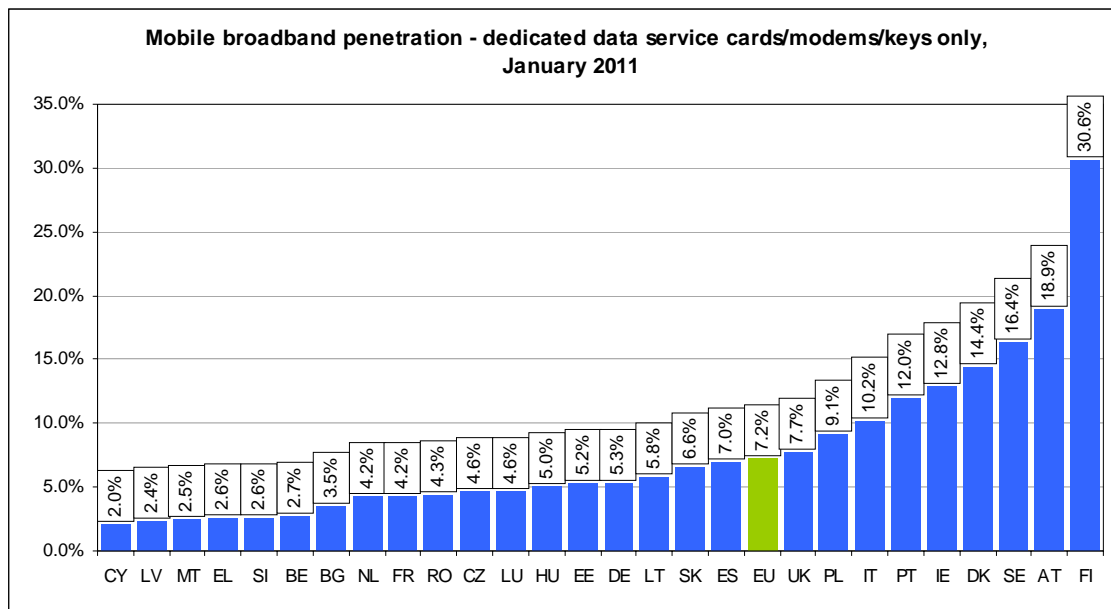


Source: Communications Committee

The penetration of mobile broadband as measured by dedicated data service cards/modems/keys was 7.2% (from 6.1% in July 2010 and 5.3% in January 2010). Take-up grew by 37% in 2010. Growth accelerated again in the second half of 2010 following a

slowdown in the first part of the year. Finland tops the league with a 30.6% penetration rate. In some Member States, like Austria, mobile broadband is considered a substitute product for basic broadband speed services.

Figure 30: Mobile Broadband penetration – dedicated data service cards/modems/keys only, January 2011



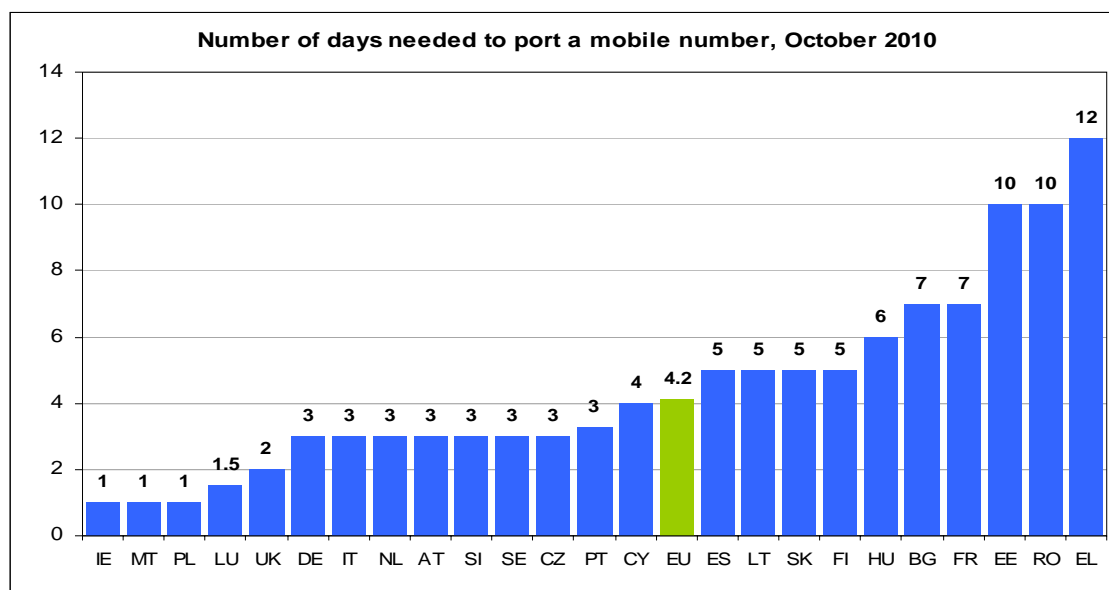
Source: Communications Committee

3.5 *The direct impact of regulation*

Mobile number portability

Mobile number portability is available in all Member States. In October 2010, it took 4.2 days in average to port a mobile number in the EU.

Figure 31: **Number Portability: Number of days needed to port a mobile number, October 2010**



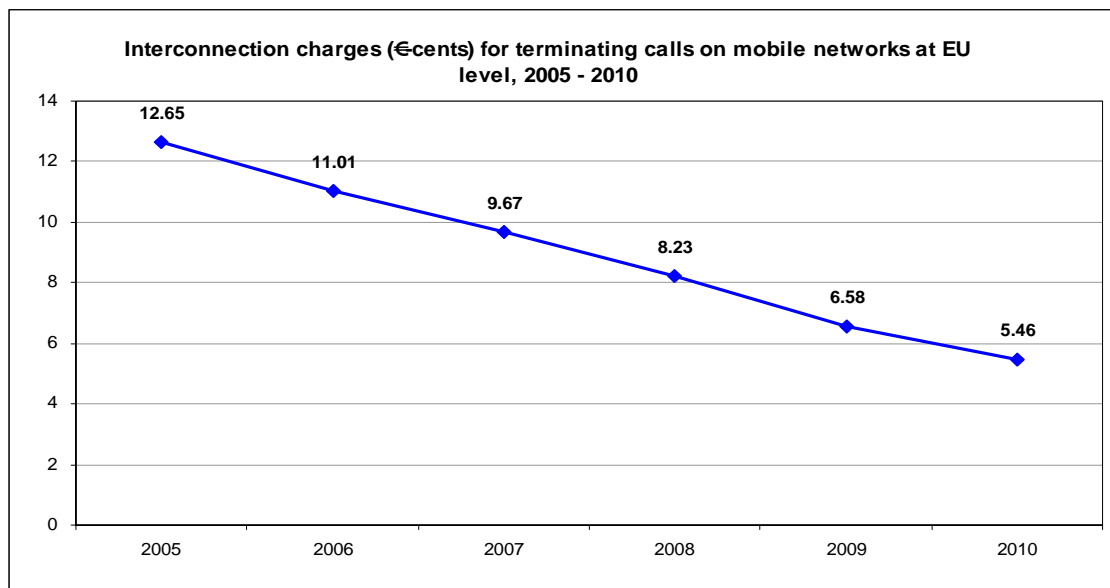
Source: Commission services

The wholesale cost of porting a number varies among the Member States. There is no charge in 11 Member States (BE, DE, EE, ES, FR, IT, LT, HU, PL, FI and UK), while the highest fee (21.5 EUR) is applied in CZ.

Mobile termination rates

Mobile termination rates have been going down since 2005. Since October 2005, there was a decrease of 57%.

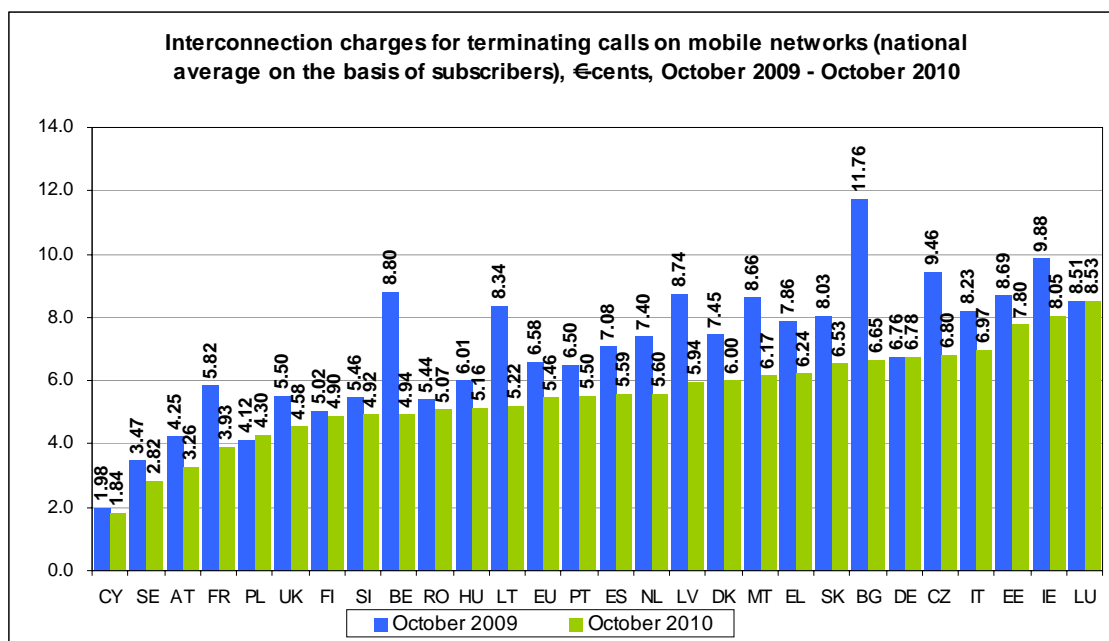
Figure 32: Average mobile termination rates at EU level



Source: Commission services

There are large differences among Member States, but the gap between the highest and lowest rates decreased to 6.69 €cents from 9.78 €cents. The largest reductions were made in Belgium, France, Latvia, Lithuania and Bulgaria.

Figure 33: Mobile termination rates by member states, October 2009-October 2010



Source: Commission services

4. THE FIXED VOICE SECTOR IN 2010

4.1 *The decline of the traditional fixed voice telephony market*

Technological changes and market developments continue driving the disappearance of fixed voice telephony in its traditional form. Fixed voice telephony is evolving towards voice over IP solutions, being substituted by mobile voice telephony and, finally, included as a commodity within fixed broadband offers. At the beginning of 2011 it is estimated that 27% of households in the EU had a mobile telephone access but no fixed telephone access, and that 63% of households had a broadband internet access, in many cases combined with one bundle offer.

As the market is being more and more driven by the Internet and web applications, the traditional fixed voice telephony service increasingly appears as a service from the past although yet used by less technologically advanced groups. Although still with importance, its share in the total revenues is declining fast. In 2010, the revenues from fixed voice telephony decreased by 6.7% but still represent 23%³¹ of the total revenues for the sector. Ten years ago this segment accounted for 45% of the sector. Therefore, this is the last year a separated analysis for the fixed voice telephone sector will be performed.

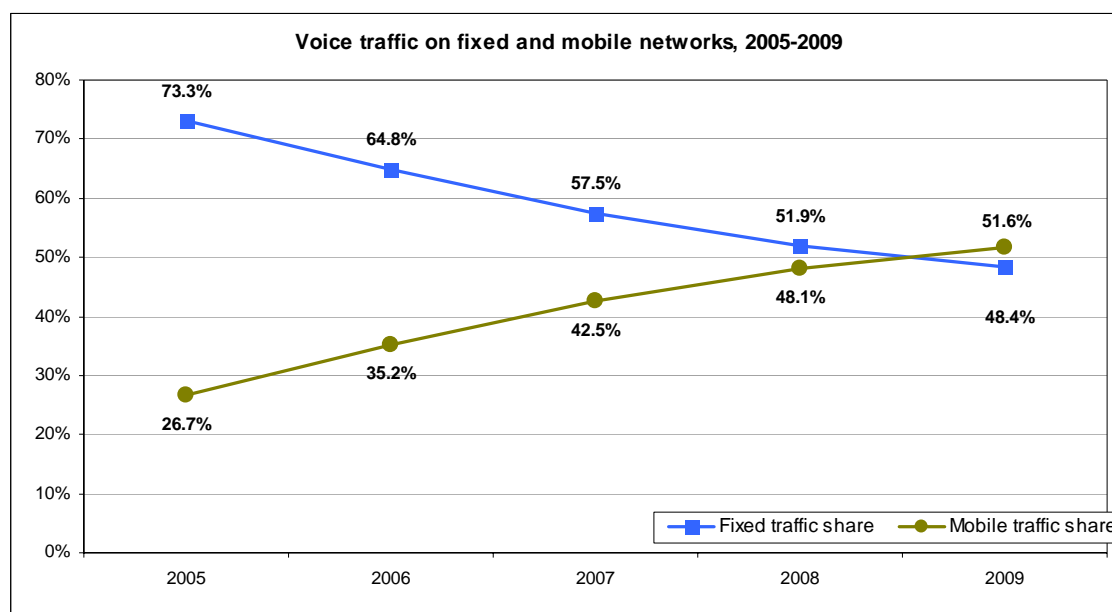
Prices of the calls outside bundled offers continue to slightly increase as the market for standalone telephony offers becomes increasingly concentrated (alternative operators move increasingly to bundled offers only).

4.2 *VoIP and convergence*

More and more subscribers substitute traditional fixed voice telephony with mobile voice or voice over IP services. Mobile voice traffic surpassed fixed voice traffic for the first time in 2009 with 52% of the total traffic. Only 9% of European households claim having a fixed telephone access but no mobile telephone access.

³¹ Source: EITO 2010

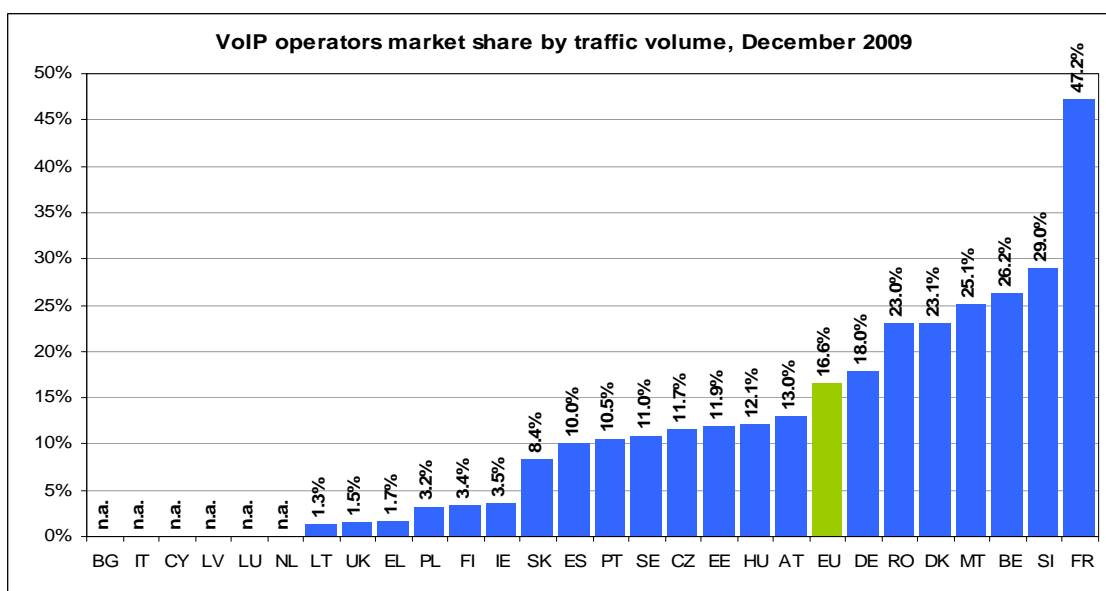
Figure 34: Voice traffic share of fixed and mobile networks



Source: Commission services

The market share of VoIP operators continues to increase as VoIP continues to replace traditional fixed voice telephony. The leading countries are France, Slovenia, Belgium and Malta. The market share of managed VoIP services represents 17% of the total fixed voice traffic (+12 pp).

Figure 35: Managed VoIP market share by volume

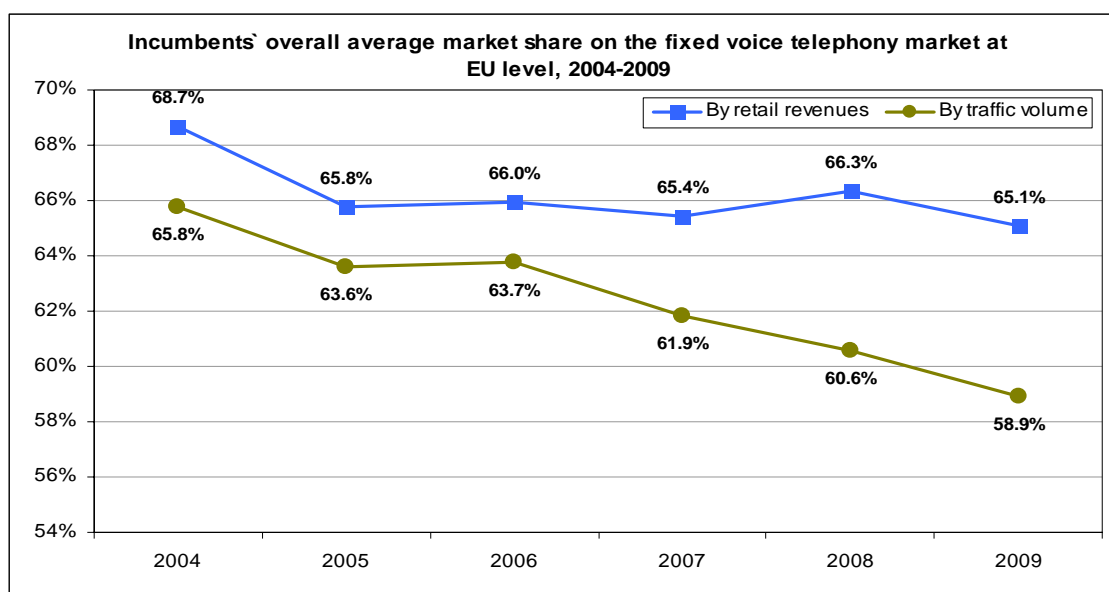


Source: Commission services

4.3 *The pattern of competition: fixed voice telephony market shares decreasing in terms of volume but not in terms of revenue*

The incumbent market share by revenues slightly decreased in EU-27 but has been stable in the past 5 years (between 66% and 65%). On the contrary the market share by traffic volume is constantly decreasing (from 64% to 59% in the same period of time) meaning that alternative operators are offering more minutes at lower prices or even for free under bundled products.

Figure 36: Average fixed voice telephony incumbent market share



Source: Commission services

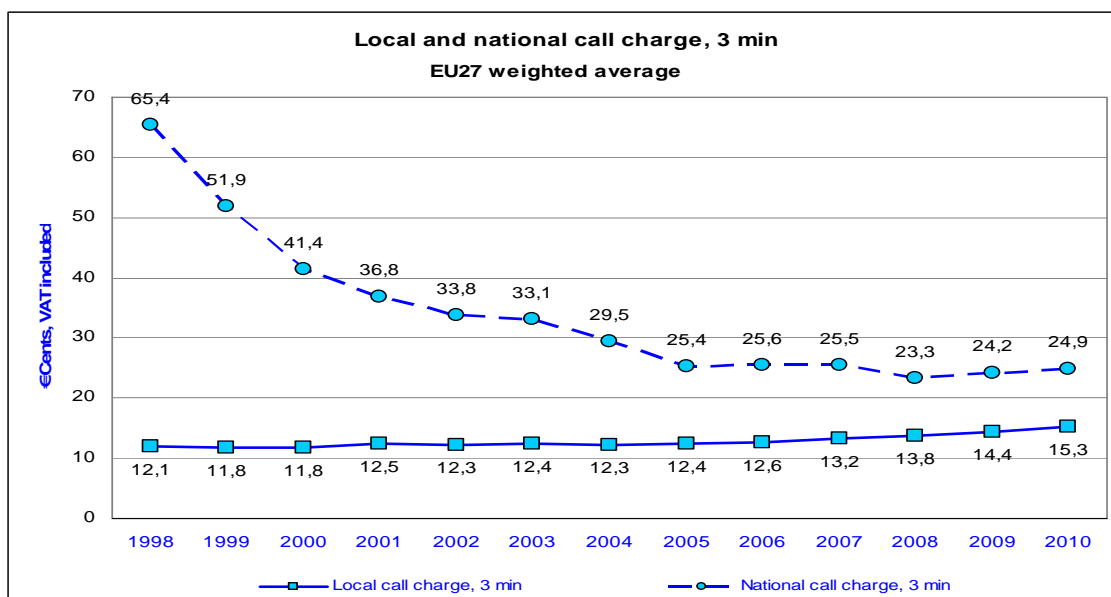
There are yet very uneven situations within the EU, and so while in the UK the market share of the incumbent was 49% in 2009, in Bulgaria it still represented 92%. Incumbent operators saw an increase of their market share both in Member States where they retain large parts of the market, such as Latvia and Luxembourg, as well as in other markets where alternative operators are strong (Denmark, the Netherlands, Austria, Portugal and Romania).

4.4 *Pricing in the fixed voice telephony sector: retail prices increase while wholesale prices continue to decrease*

The prices of standalone fixed voice telephony started to increase again in the EU. This trend started in 2008 for the national calls (and in 2004 or 2006 for the local calls depending on its duration). The reasons are again the lower competition in the fixed telephony segment with alternative operators moving to bundled offers with broadband where voice is included. Incumbent operators regaining market share are able to increase the prices for traditional voice telephony.

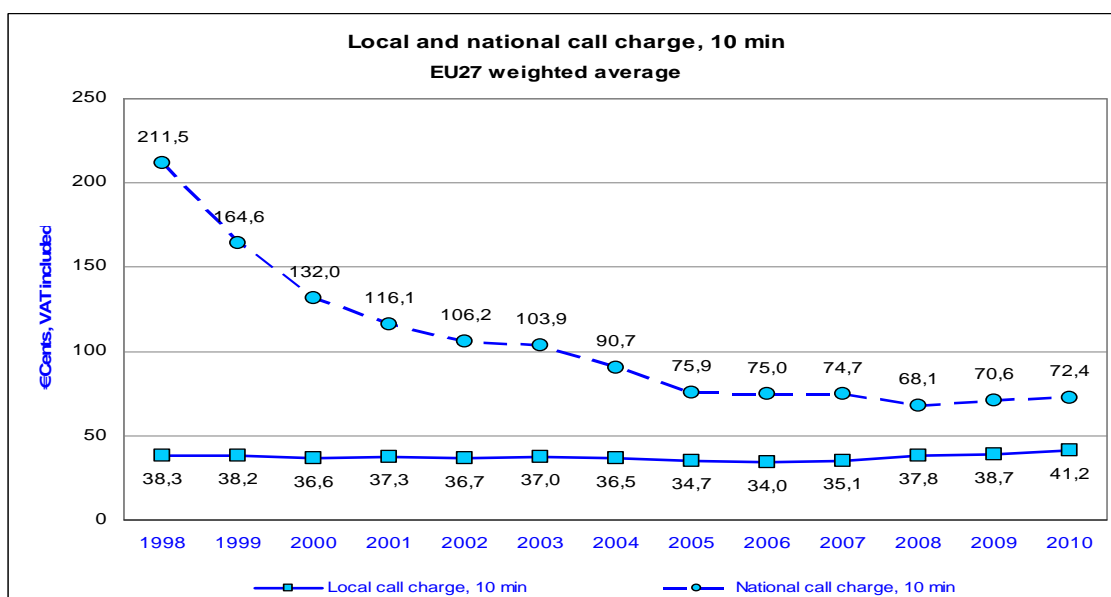
Prices for both 3-minute and 10-minute national calls have increased by 3% in 2010. In the case of the 3-minute and the 10-minute local calls, there has been a 6% increase.

Figure 37: Retail local and national call charge, 3 minute call



Source: Teligen

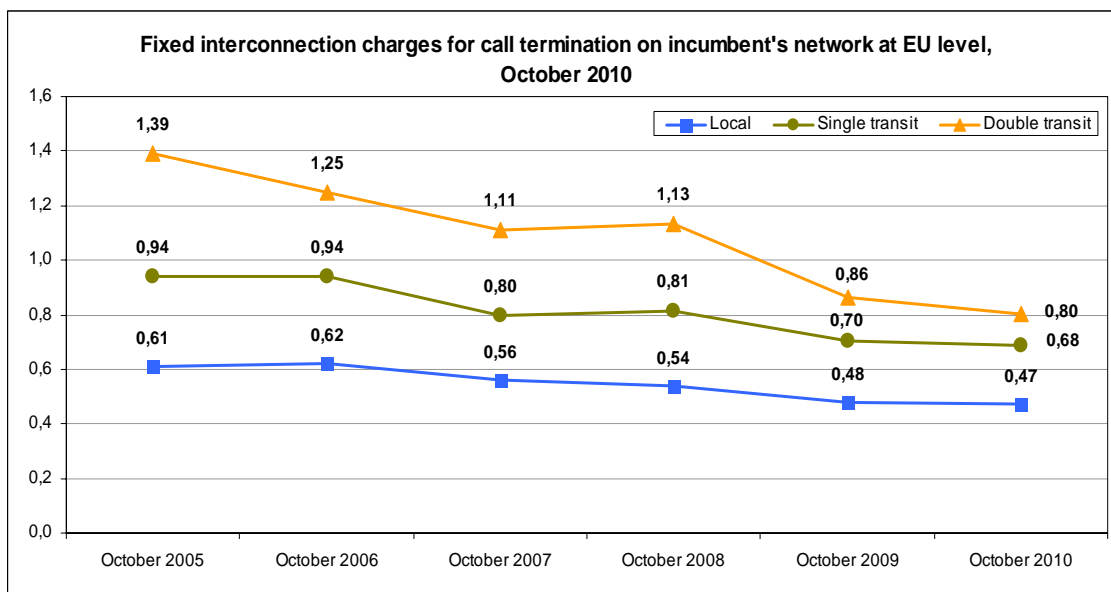
Figure 38: Retail local and national call charge, 10 minute call



Source: Teligen

EU average fixed incumbent interconnection rates continue their slight decline in accordance with regulatory measures like glide-paths. EU fixed interconnection rate went down between October 2009 and October 2010 by 2% at local level, by 3% at the single transit level and by 7.5% at the double transit level. The Member States with the lowest interconnection rates are Poland and the UK, while Finland has the highest rates.

Figure 39: Fixed incumbent interconnection charges EU average

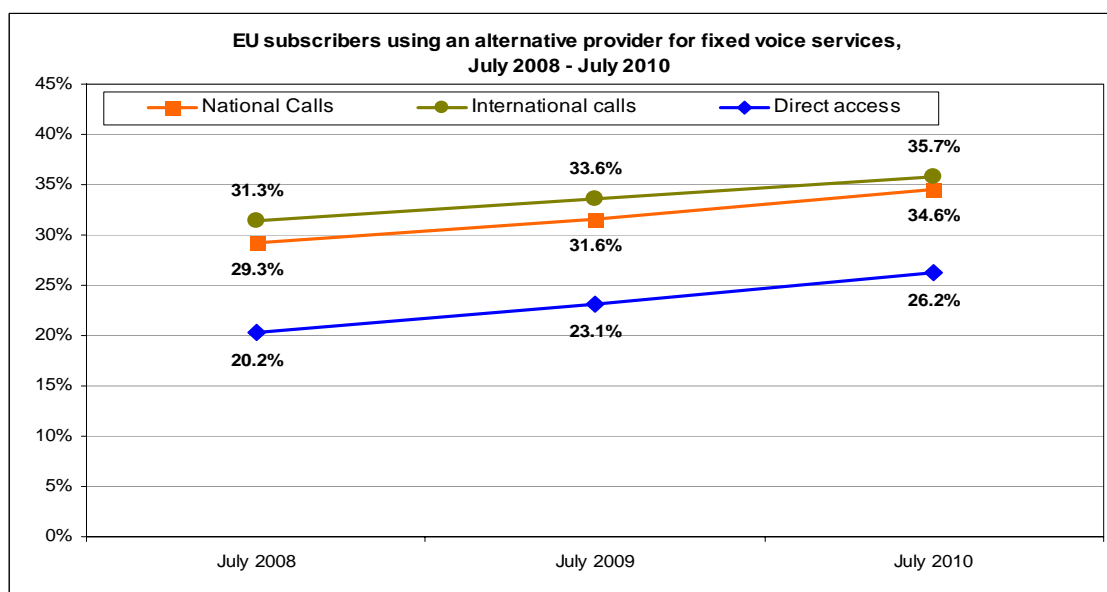


Source: Commission services

4.5 Choice of provider and number portability

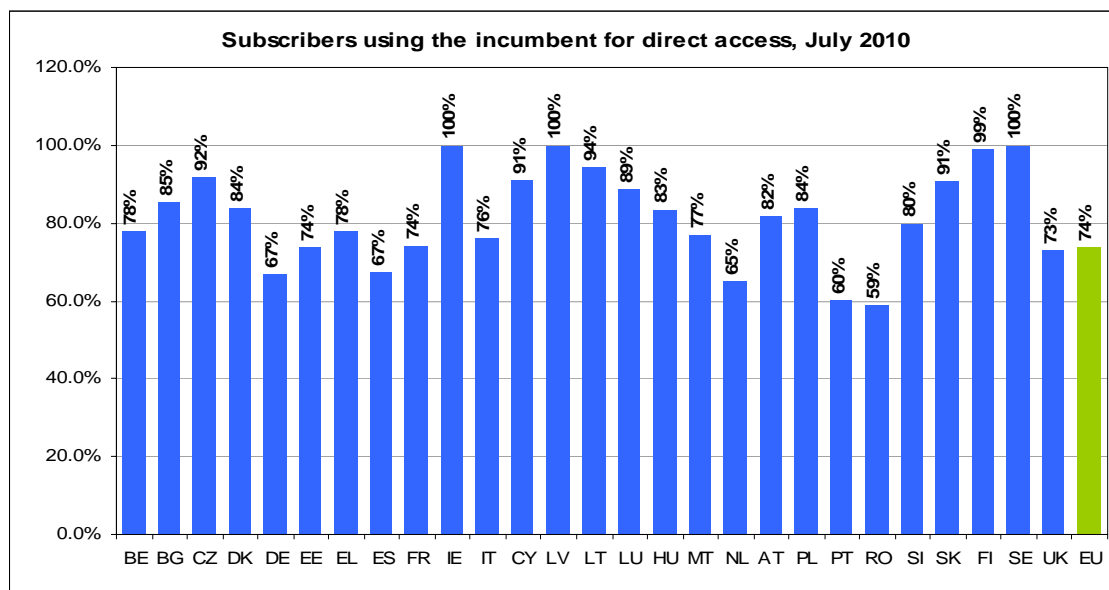
The provision of direct access by alternative operators only concerns 26% of the EU subscribers. Around 35% of them use an alternative provider for their international and national calls.

Figure 40: EU subscribers using an alternative provider for fixed voice services



Source: Commission services

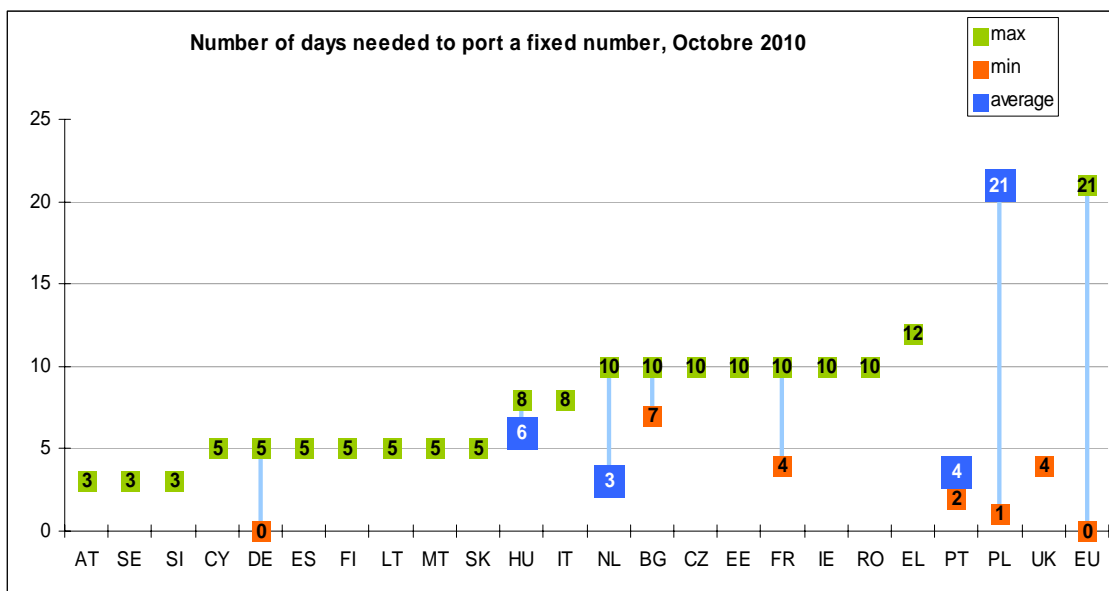
Figure 41: Subscribers using the incumbent for direct access, July 2010



Source: Commission services

A quick and clear procedure for fixed number portability process is necessary to ensure competition, since fixed telephony is included in triple and double play offers and can play a significant role regarding the switching of a broadband operator. Although for the majority of Member States the maximum time needed for porting fixed numbers is between 5 to 10 days, it can take as many as 21 days (in the case of Poland) for switching operator.

Figure 42: Number of days needed to port a fixed number, October 2010



Source: Commission services

5. STATE OF THE TELECOM SERVICES SECTOR IN EUROPE

2010 provided some recovery to the revenues³² of the European telecom operators after the 2009 large decline, the worst year of the economic crisis. Although operators are starting to come back to positive growth rates, the growth in revenues is not yet robust due to the effects of the structural adjustments in recent years (decreases of prices, end of organic growth and absence of brand new services).

For the short term objective of increasing profits, operators are focusing on cost-cutting and innovative pricing strategies to try to capture growth (for instance ending flat rates and introducing data caps for mobile broadband services). From this perspective, average profitability of operators increased, and a number of operators even displayed the highest profits in history, but this was driven rather by costs lowering strategies (largely due to the strategies focused in OPEX and CAPEX cuts) than by net increase in revenues.

For the long term issue of the growth disparity between traffic and revenues (which is critical for investment decisions), operators are investigating the possibility of innovative managed services, tiered pricing schemes and bilateral agreements with over-the-top internet platforms. Data revenues are expected to represent almost 30% of mobile revenues in Europe by 2014³³. Data is increasingly driven by the quick adoption of smartphones and similar devices. The relationship between platforms, devices and networks to extract value from this growth is at the core of this paradigm shift that will require additional CAPEX and increasing spectrum availability.

³² Based on EITO and the operators' financial statements.

³³ Source: Goldman Sachs March 2011

5.1 Revenues

Table 5: Telecom sector growth

	Growth rate (2008-2009)	Growth rate (2009-2010)	Share in e-communication services revenue (2010)
Fixed voice telephony and Internet access services	-3,9%	-2,6%	36%
Fixed voice telephony	-7,7%	-6,7%	23%
Internet access and services	4,4%	5,6%	13%
Mobile voice telephony and mobile data services	-1,7%	-0,9%	46%
Mobile voice telephony	-4,8%	-4,2%	34%
Mobile data services	9,4%	9,4%	12%
Business data services	-0,7%	-0,3%	7%
Pay TV	6,6%	6,8%	11%
Total Telecom services (carrier services)	-1,7%	-0,7%	100%

Source: EITO 2010

The overall growth of the telecom sector in Europe was -0.7% in 2010³⁴, a lower decrease than -1.7% in 2009. Revenues for the EU electronic communications sector were €332 billion in 2009³⁵ (€350 billion in 2008), accounting for half of the entire ICT sector. Revenues from voice (still 57% of the revenues for the EU telecom operators) experienced important declines (-6.7% in the case of fixed voice telephony and -4.2% in the case of mobile voice telephony) while revenues from data (still a 25% of the total for individuals and households, 7% for companies) are increasingly higher (+5.6% in the case of fixed internet access and +9.4% in the case of mobile data services). Although data is more important than voice in terms of traffic, fixed and mobile voice telephony still account for the most important share of the sector's revenues. This asymmetry is one of the main issues to address for the sustainability of future business models.

The decline in the relative size of the EU telecom sector over the past 3 years is partly driven by the European macroeconomic environment, but also by the structural adjustment of the

³⁴ EITO January 2011.

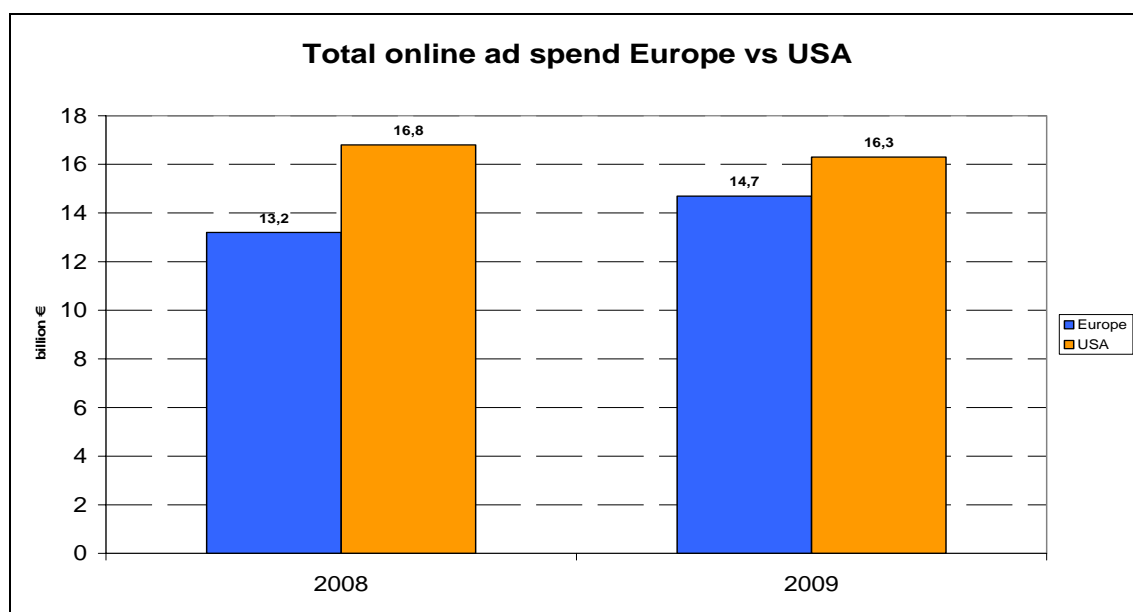
³⁵ Data from national regulatory authorities.

sector which faces lower ARPUs³⁶ in the main market segments. Main reasons are (i) organic growth in terms of new users coming to an end (in traditional markets like fixed and mobile telephony but also in legacy broadband), (ii) decreases in retail prices related to competition and technological developments, including voice over IP, but also due to the introduction of flat rates and bundles, and (iii) the absence of new sources of revenue growth. Most of the value from new services like mobile broadband is captured by companies outside the boundaries of the traditional electronic communication sector.

There seems to be a disconnection between the value and the positive externalities generated from the networks and the concrete incentives to invest in capacity from the operators. The evolution of the access revenues from access to the network is in sharp contrast with the increasing revenues coming from activities taking place within the network themselves that provide efficiencies for the whole economy (for instance e-commerce, search engines, or online advertising.).

In 2009, for example, the online advertising market kept growing and was the only segment of advertisement to do so. €14.7 billion were spent on online advertising in Europe in 2009³⁷. The share of the internet jumped to 20% of the total advertising market due to the decline of other advertising forms. Growth was lower in more mature national markets (like the UK). Search advertising (that had a 10.8% increase in 2009 in Europe) was again the leading advertising segment, followed by displays (down in most mature markets) and classified ads.

Figure 43: Total online ad spend Europe vs USA



Source: IAB Europe 2010

The mobile communications sector also continued to grow in terms of number of subscriptions, but there has been a slight decline in revenues in 2010³⁸. Despite the slightly larger customer base (2.6 pp growth in penetration), voice revenues have gone down by 4.2%.

³⁶ Average revenue per user: total revenues of the operator divided by the number of subscribers.

³⁷ AdEx 2009 European online advertising expenditure IAB Europe, September 2010

³⁸ Source: EITO

The growth in mobile data services could not compensate for the decline in voice and the total revenue of the mobile operators declined by 0.9 %. In 2010, voice revenues accounted for 74% of the total, which is 3 pp lower than a year ago. The growth in data revenues have been driven by mobile broadband internet.

Machine-to-Machine (M2M) communication is an important segment for the future to partly compensate for the decline in traditional voice and messaging services. Currently, there are 62 million connected objects worldwide, which are expected to grow to 2.1 billion by 2020, at an annual growth rate of 36%³⁹. Nevertheless, M2M subscriptions have significantly lower ARPU than those of traditional subscriptions. In addition, mobile operators are also looking at emerging markets, where there is still a high potential in traditional services, too.

Despite the revenue decline in voice services in Europe, the role of these services is still extremely crucial, since these are responsible for 74% of total revenues. As growth in number of subscriptions has slowed down, emphasis is also to be put on reducing customer churn on traditional services. However, the mobile sector is not performing very well on customer satisfaction based on The Consumer Markets Scoreboard⁴⁰, a survey monitoring the reported experiences and opinions of consumers in 50 consumer markets. According to the survey, the mobile sector has the 7th lowest overall score. Offers are not comparable enough, there is a low trust towards service providers and 19% experienced problems with the service (the fifth highest out of the 50 industries.)

5.2 *Investment and access to finance*

Operators keep on with cost-cutting strategies and lower investment intensities. The decrease in CAPEX⁴¹ in 2009 was remarkable: -12% in mobile and -3% in fixed equipment⁴². The intensity of investment as measured by the CAPEX/revenues ratio is declining but is estimated to remain around 11% in 2010⁴³ (a level similar to 2009 but much lower than in 2008, 14% and 2007, 15%).

³⁹ Analysys Mason: Mobile insight and the connected consumer.

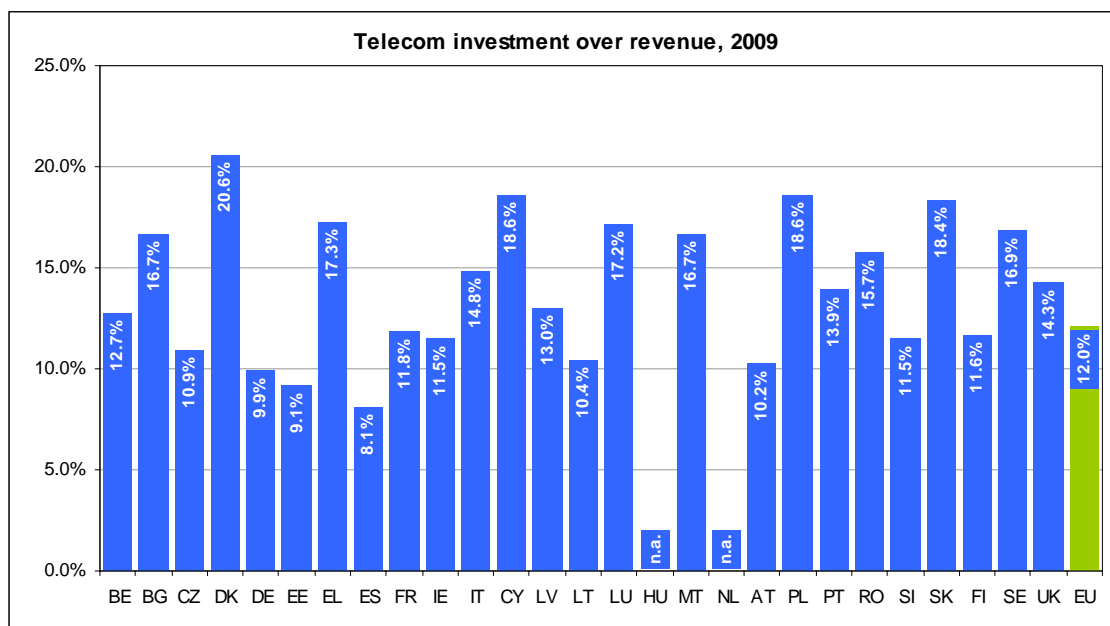
⁴⁰ http://ec.europa.eu/consumers/strategy/docs/4th_edition_scoreboard_en.pdf

⁴¹ Capital Expenditure.

⁴² EITO January 2011. No figures yet available for 2010.

⁴³ Source: Goldman Sachs 2011

Figure 44: Telecom investment over revenue



Source: Commission services

The weighted average EBITDA margin⁴⁴ for the 10 largest European operators⁴⁵ increased by 1.9 % in the first half of 2010 as compared with the first half of 2009. In general, financial margins in the sector have remained pretty stable.

In the case of mobile operators, the EBITDA over revenues ratio ceased to decline during the first two quarters of 2010. The EBITDA margin of the third and fourth mobile operator is lower than the ones of the first and the second in almost all Member States. This could lead to some consolidation.

Currently operators' profitability translates more into dividend pay-out than in investment. Moreover, in the current climate, operators find it more rewarding to buy assets in developing countries with a higher return on investment, rather than investing in Europe.

Regarding the access to finance, the operators do not seem to have any problem in general to access credit in 2010, although there is currently no a massive investment decision directed to fibre architectures. Markets consider cable nowadays as a better asset than legacy infrastructure, since they are easier to upgrade and, in the general view, face lower regulatory constraints than legacy networks. Finally, leading analysts consider operators with a mobile-only infrastructure not to be sustainable for the future. In that sense, mobile operators will have to buy fixed assets in order to compete in the quadruple play market.

⁴⁴ EBITDA over revenues.

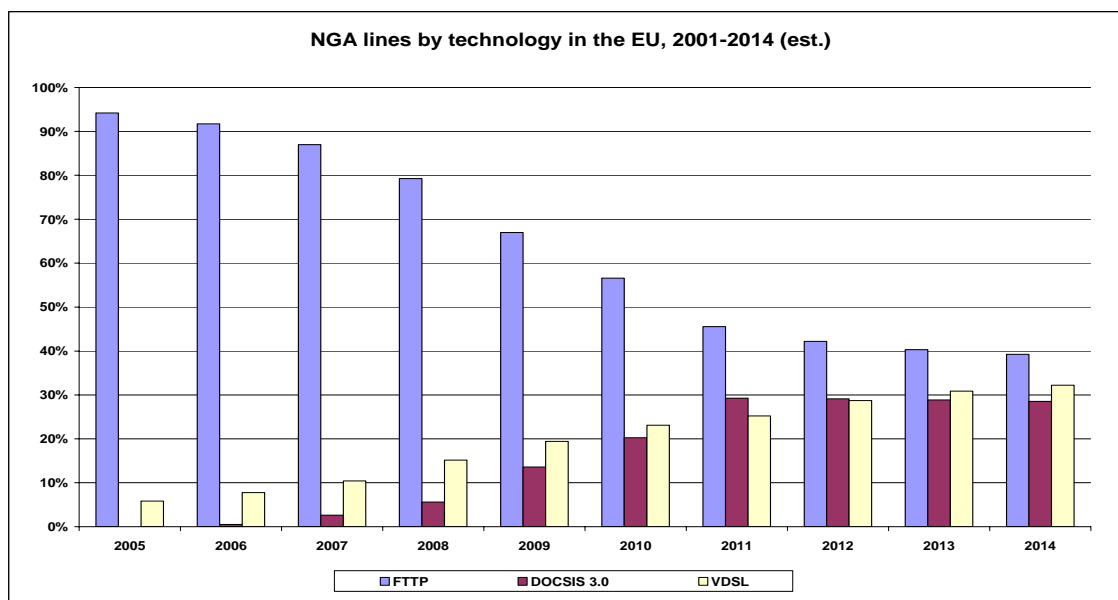
⁴⁵ Deutsche Telekom, Telefonica, Vodafone, Orange, Telecom Italia, BT, KPN, SFR, Telenor and Telia Sonera.

6. CONCLUSIONS

Ultra fast broadband network and applications are expected to have a significant impact in modern economies. The DAE has therefore set very specific targets in terms of availability and take up of NGA broadband. The DAE targets have come at a time when European economies start recovering from the worst economic crisis since the 1920s. While commercial operators are expected to take on most of these investments, public sector intervention will remain limited to the areas where returns on investment are not expected.

The broadband market continued to grow in 2010, despite the near saturation levels reached in a few Member States and the difficult economic situation of others. Competition has accelerated and broadband speeds have increased. But the deployment and take up of ultra fast broadband lines is still very low. However, the necessary pre-conditions seem now to be in place for ensuring a smooth but sustainable growth of the broadband market in line with the DAE targets. Competition between VDSL, DOCSIS 3.0 and FTTH providers is boosting the growth of ultra fast lines. Roll out of wireless 4G network should complement wired technologies in the achievement of these targets. The Commission has in parallel set a clear and predictable policy and regulatory framework that should promote the roll out and take up of next generation access lines. Investment is also currently held back as operators are looking for new business models to adapt to the new reality of increased data traffic and high capacity needs. In the light of these developments, it is not unlikely to expect much better results in the years ahead (Figure 45).

Figure 45: NGA lines by technology, 2001-2014



Source: Commission services based on Screen Digest

Pillar 5

The European ICT industry at the crossroad: economic crisis and innovation

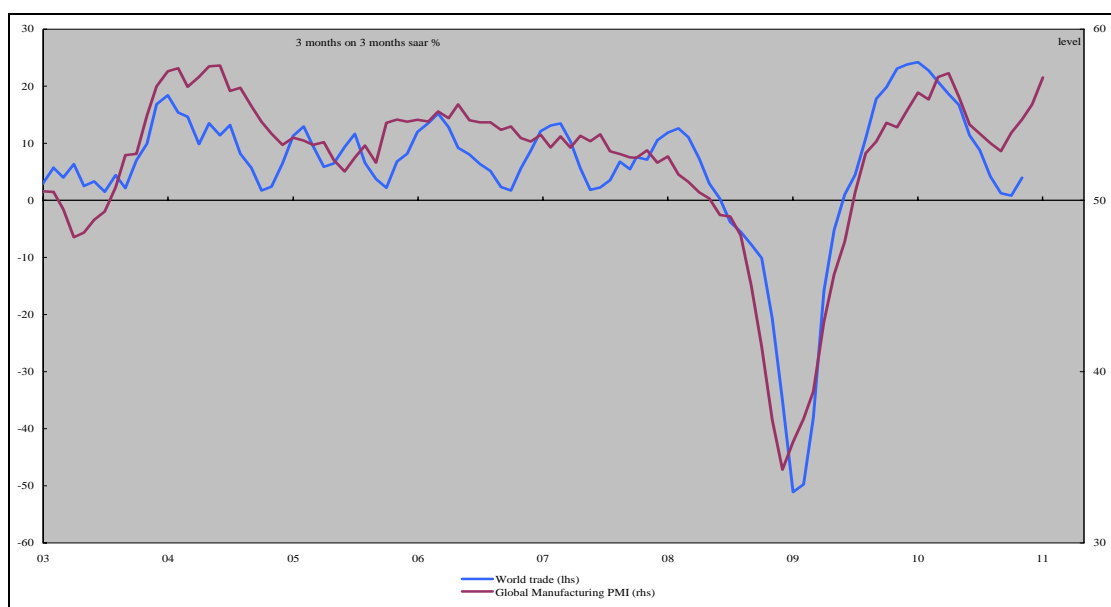
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1. INTRODUCTION

This report analyses the impact of the economic crisis and of innovation trends of R&D over the period 2007-2010¹ making use of companies' financial reporting.² The list of companies considered in the analysis is drawn from the EU Industrial R&D Investment Scoreboard.³

The period 2007 – 2010 has been chosen to assess the impact of the economic crisis on the ICT industry, 2007 being the pre-recession year of reference (Figure 1) and also because this is a period of intense ICT innovation. After the crisis, in 2010, the European ICT industry is back on a positive growth path.

Figure 1: World trade and global manufacturing purchasing managers index (PMI)



Source: European Commission

In September 2008, the bankruptcy of Lehman Brothers led to an unprecedented fall in confidence of both consumers and business, generating a wave of destocking, fall in production, trade and capital investment.⁴ The collapse of world trade has been unprecedented. During the first quarter of 2009, world exports in value terms were 31 percent

¹ The OECD IT Outlook 2010 uses a similar approach by analysing the performance of the top 250 ICT companies through 2009.

² Unless otherwise specified, the source of all charts are companies' financial reports. Values are converted into euro using the ECB exchange rates (quarterly or yearly average). For companies ending their fiscal year before September, quarterly results have been used to cover 2010 until December. Given these changes of the original data for the need of the analysis, readers should refer to the official earning releases of the companies.

³ European Commission (JRC/IPTS) http://iri.jrc.ec.europa.eu/research/scoreboard_2010.htm

⁴ DG ECFIN, Economic crisis in Europe: Causes, consequences and Responses, European economy 7/2009

lower than one year before and world imports 30 percent lower. Of course, the ICT industry did not escape the worst stage of the world economic crisis (Figure 2).

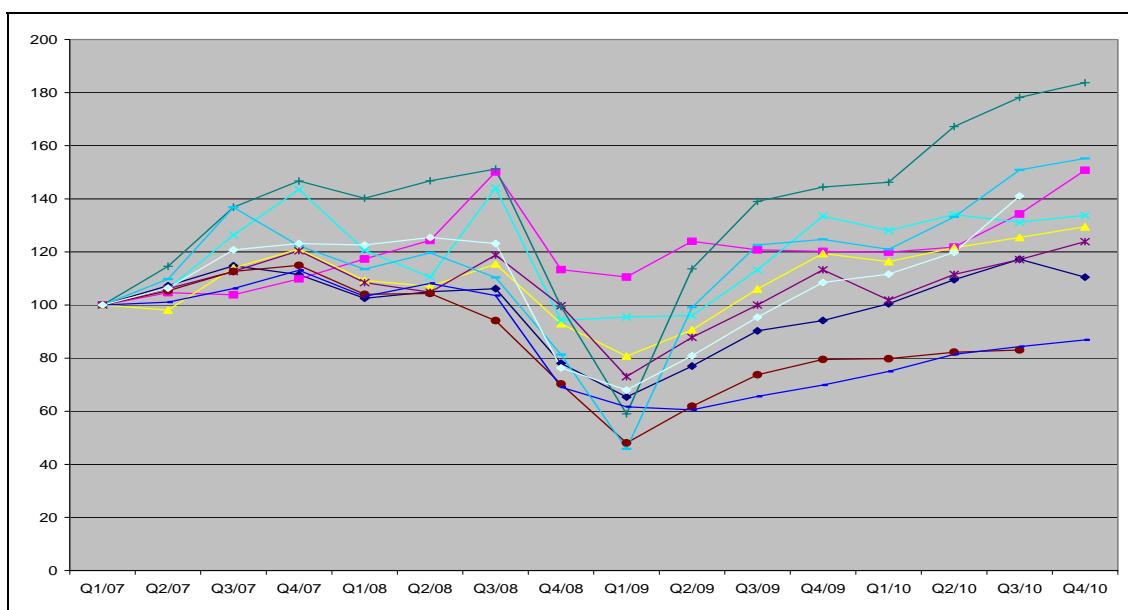
Figure 2: ICT World Exports (\$m at current prices)



Source: WTO Statistics Database

But the crisis was short lived. The worldwide semiconductor industry, which provides the core inputs for any other ICT business segment and which is as such a leading indicator of the global ICT market, illustrates the impact of the financial crisis during Q4/2008 and Q1/2009. Yet, after two quarters of negative growth, this industry started to recover (Figure 3).

Figure 3: World top 10 semiconductor quarterly net sales – Index Q1/2007=100



Source: Companies' financial releases

By the end of 2009 the semiconductor industry had nearly fully recovered (in terms of revenue and margins) and even several ICT businesses suffered in 2010 from a shortage of components (in particular the telecom equipment industry). According to the latest outlook by Gartner, Inc., worldwide semiconductor revenue is expected to exceed \$300 billion mark for the first time in its history.⁵

During the recession, the ICT industry was nevertheless sustained by a wave of innovations combining social networks, mobile Internet, cloud computing, and consumer electronics. Most of these innovations have to do with consumer entertainment rather than with productive investment. Thus, although the impact of the ICT sector on productivity growth is probably positive, efficiency gains in the wide economy due to increased take up of ICT by businesses are not clear cut.

2. THE EUROPEAN ICT INDUSTRY

The list of companies considered in the analysis is drawn from the EU Industrial R&D Investment Scoreboard. The 2010 EU Industrial R&D Investment Scoreboard⁶ cut-off date in collecting the data is May 2010. However, for most companies fiscal year ends in the second half of the year (typically September 31 and December 31). Therefore, in order to fully cover 2010 and the economic recovery, a sub-sample of 40 European ICT companies was selected on the basis of the Scoreboard list (Table 1). Given the high degree of industrial concentration, this sub-sample is representative in so far that it represents 85% of net sales recorded by the 2010 Scoreboard.⁷

Table 1: EU ICT sub-sample (in % of the 2010 Scoreboard sample)

Sector	Number of companies	R&D (€m)	Net sales (€m)
Telecom operators	8	4,583	298,245 (90%)
Internet	1	10	3,971 (95%)
Telecom equipment	3	10,112	76,296 (94%)
Semiconductors	5	3,180	14,222 (85%)
Computer hardware	3	108	1,804 (90%)
Electronic office	2	266	3561(100)

⁵ Gartner, December 9, 2010

⁶ European Commission (JRC/IPTS) http://iri.jrc.ec.europa.eu/research/scoreboard_2010.htm. The Scoreboard is part of the Industrial Research Monitoring Activity carried out jointly by the Joint Research Centre (JRC) and Research (DG RTD) Directorates-General of the European Commission

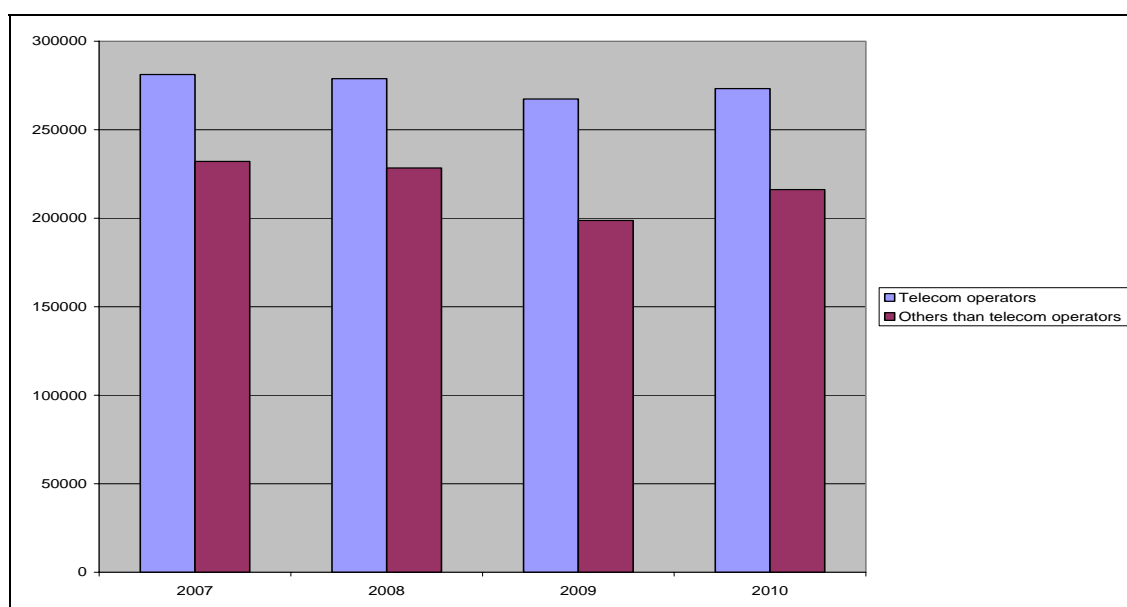
⁷ For additional information on growth and R&D investments of the major ICT companies worldwide, see the "2011 Report on ICT R&D in the European Union" and the report on "The Top World R&D-investing Companies from the ICT Sector: A Company-level Analysis" (2011), both available at: <http://is.jrc.ec.europa.eu/pages/ISG/PREDICT.html>

equipment			
Electronic equipment	10	892	14,957 (76%)
Software and computer services	15	3,504	42,860 (75%)
Leisure goods	1	1,714	23,189 (85%)

2.1. The European ICT industry: the global picture

Combined net sales of the EU top 40 ICT sample increased by 5% in 2010 compared to 2009, but are still 4.7% lower than in 2007 (Figure 4).

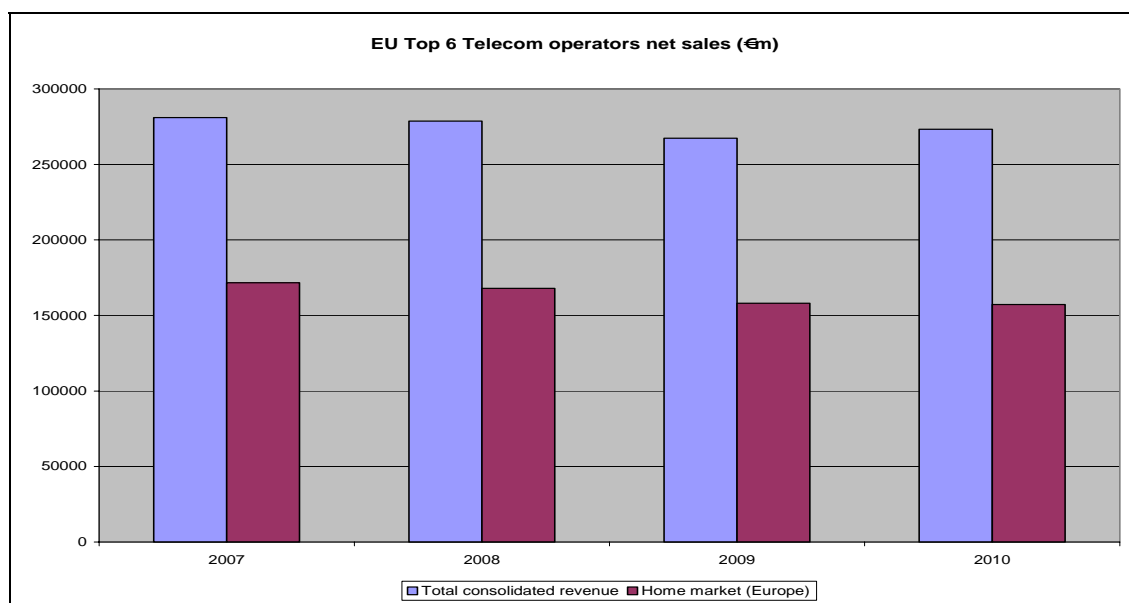
Figure 4: EU Top-40 companies' combined net sales (€bn)



In 2010, the European telecom operators (Top 6 companies) saw their combined net sales increased by 2% year on year and a decrease of 0.5% on the European market, reflecting a stagnant EU market and regulatory adjustments, the sample being exclusively composed of incumbents (Figure 5).⁸

⁸ See pillar 4 for further analysis of the telecom sector

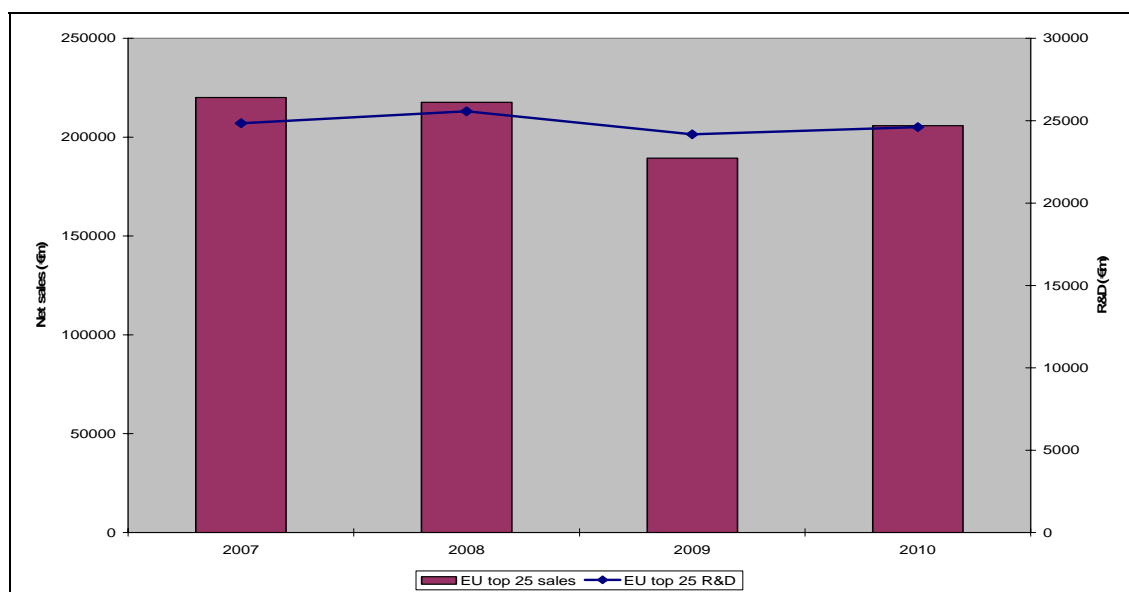
Figure 5: EU Top 6 telecom operators combined net sales (€m)



Net sales of companies other than telecom operators increased by 9% year-over-year, some of the growth represents a bounce back from the declines of 2009. Nevertheless, there is still a gap of 7% compared to 2007 (Figure 6).

R&D spending of the EU top-40 companies that reported R&D spending (25 companies)⁹ did not change significantly over the period. It increased by 2% in 2010 (year-on-year), at a level very close to 2007 (Figure 6).

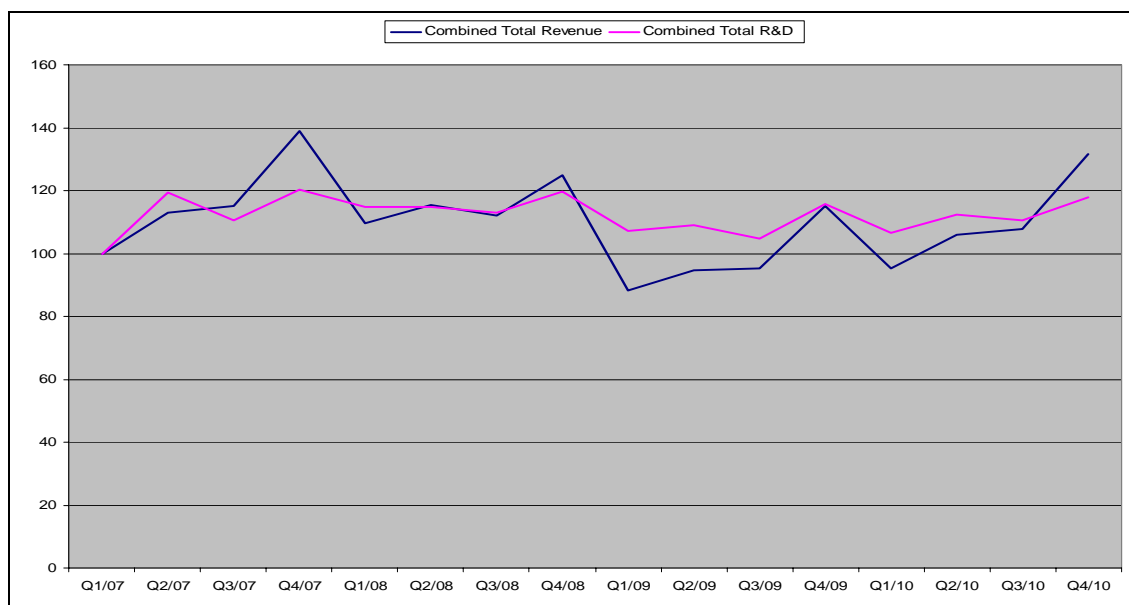
Figure 6: EU Top 25 combined net sales and R&D spending (€m)



⁹ Their unaudited FY 2010 does not report R&D spending.

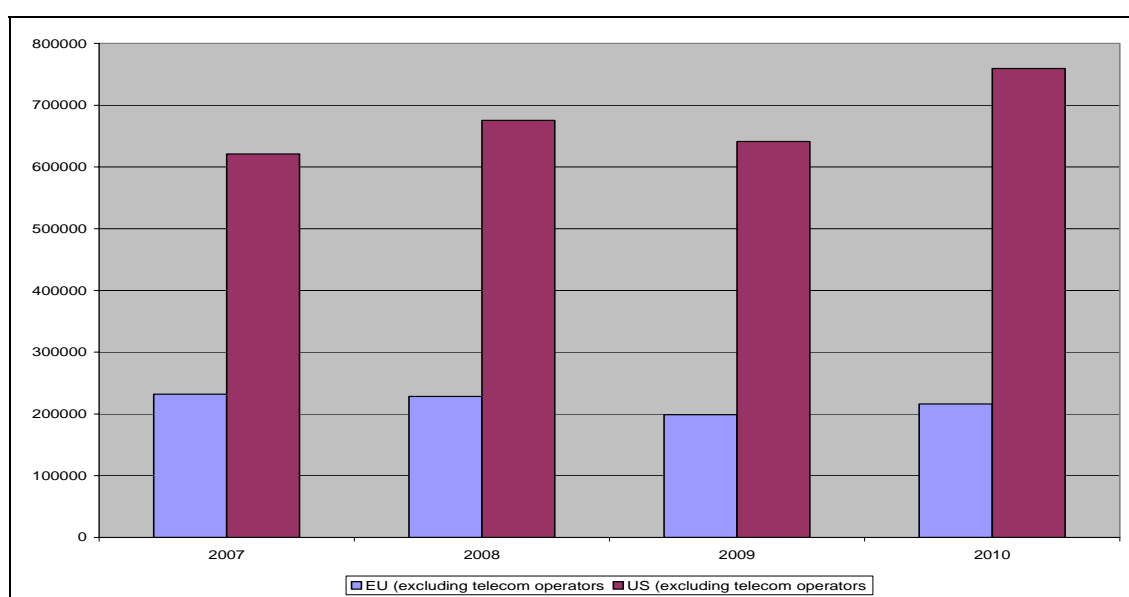
As a general rule, R&D spending is pro-cyclical since firms mainly rely on their cash flow to finance most R&D expenses. Nevertheless, looking at the EU top-10 biggest spenders on a quarterly basis, research expenses were less volatile than net sales throughout the crisis, meaning that the research effort was maintained as much as possible (Figure 7).

Figure 7: EU top 10 R&D spenders – Index Q1/2007=100



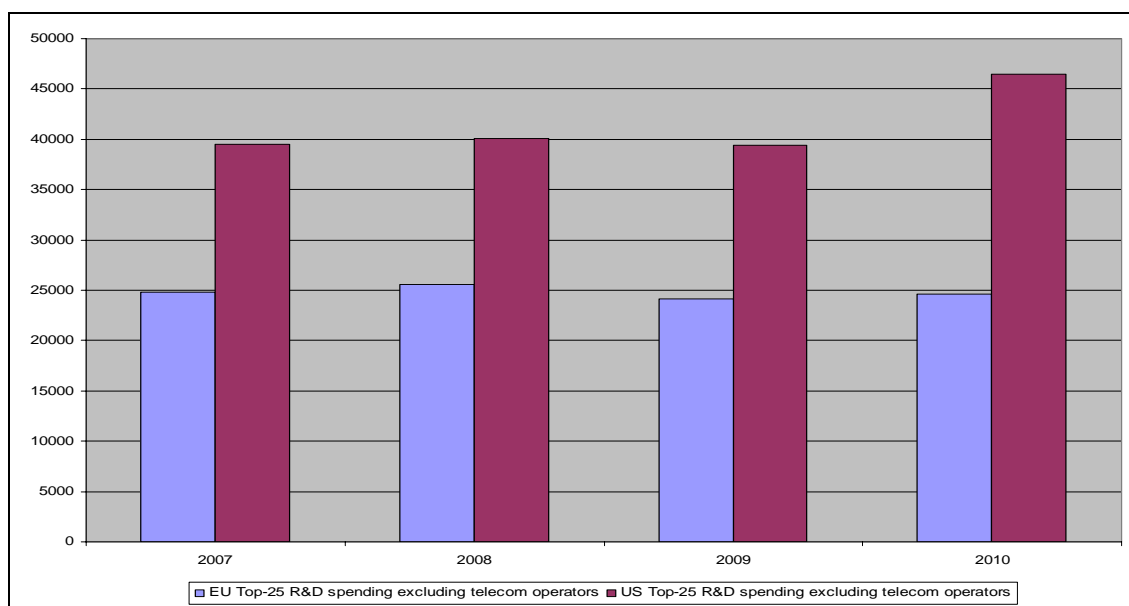
The European ICT industry, considered as a whole came out of the crisis and the sectoral analysis shows that this is true for most business segments. The US ICT industry, however, has achieved a lot more both in terms of net sales and R&D spending over the relevant period. The main factor explaining this is the 2007-2010 innovation wave. Total net sales of the Top-25 US ICT companies increased by 18 % between 2010 and 2009 and by 22% compared to the 2007 pre-recession level. These figures are compared with the EU top 40 list (figure 8).

Figure 8: Top US and EU companies' combined net sales (€m)



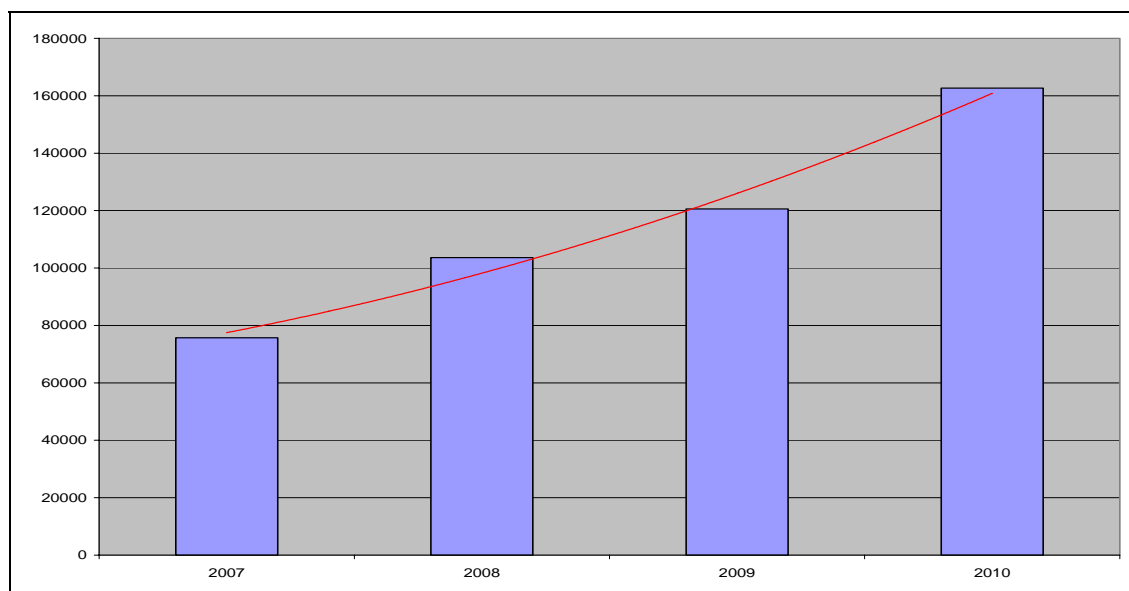
The combined R&D spending of the same list of US companies increased by 12% in 2010 compared to 2009 and by 14% compared to 2007 (figure 9).

Figure 9: Top US and EU ICT companies' R&D (€m)



Smartphones and electronic tablets, together with global Internet platforms, have been the main drivers of the US ICT industry growth during the 2007-2010 period. The combined revenue of the US top 6 companies delivering smartphones and Internet platform services increased by 114% between 2007 and 2010 and their R&D spending by 80% (Figure 10).

Figure 10: US Top 6 companies supplying smartphones and global Internet platforms net sales (\$m)



When excluding these companies from the sample, the US ICT industry's total revenue still increases by 15% between 2009 and 2010 and by 10% compared to 2007. The US ICT industry is also dominant in software and in cloud computing, partly reflecting the US

position in global Internet services, but also the strengthening of the software industry which re-merged hardware and software (one-stop shopping business model). For most companies belonging to the US sample, 2010 is the best fiscal year ever. US firms are also relatively more profitable than ICT companies from other regions (Table 2). While US companies take fifty percent of net profits, European companies' drive one quarter of the global ICT industry performances (sales, employment and profits), but more than sixty percent of the net debt.

Table 2: Share in the total of 250 IT companies (fiscal year 2009)

Region	Net sales	Employment	Net profit	Net debt
Asia-Pacific 98 companies	41%	48%	21%	19%
Americas 93 companies	34%	29%	48%	19%
Europe 51 companies	24%	23%	23%	63% ¹⁰

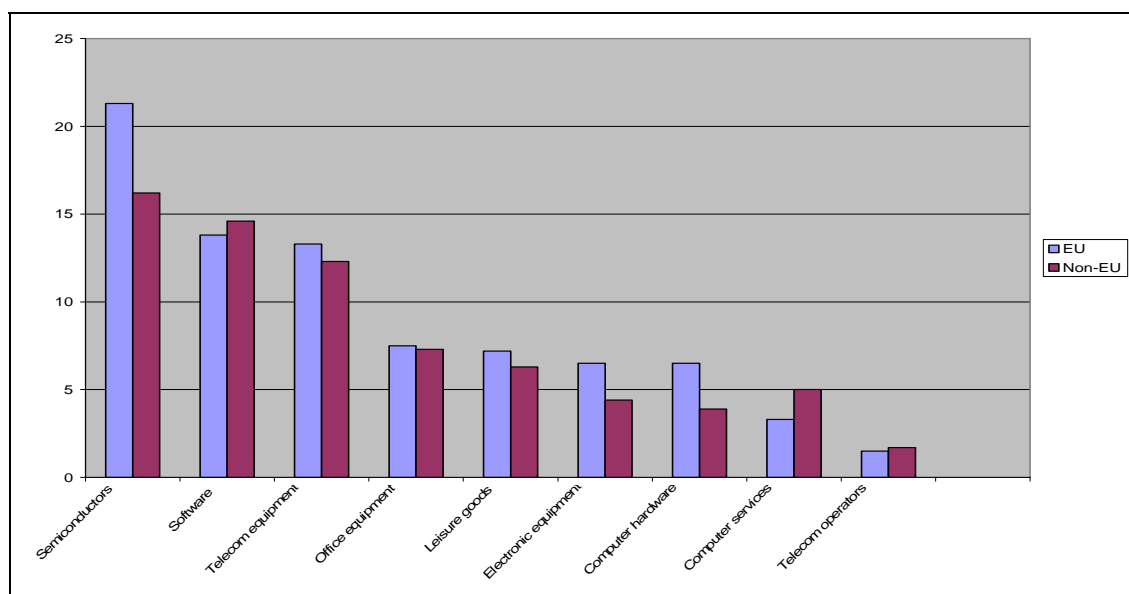
Source: OECD (2010), OECD Information Technology Outlook 2010, OECD Publishing

¹⁰ Mainly telecom operators

2.2. The sectoral analysis of the European ICT industry

As the sector samples of companies are far more homogenous, and R&D is industry/sector specific (Figure 11), the sectoral analysis of the ICT sector provides more insights into the trends and the performance of the individual segments.

Figure 11: R&D intensity (R&D spending in % net sales - 2010 Scoreboard sample)



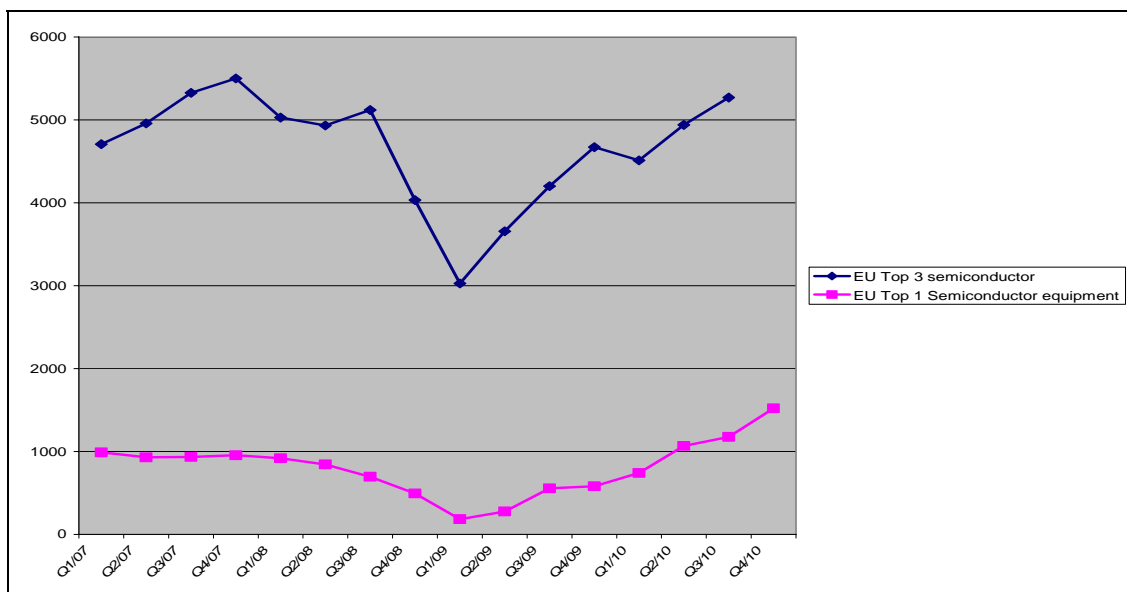
Source: European Commission – JRC/IPTS – 2010 EU Industrial R&D Investment Scoreboard

2.2.1. The semiconductor industry

Worldwide, in 2010, the semiconductor industry had recovered in terms of revenue and margins and capital expenditures are increasing. Firms are reshaping their product portfolio, specialising and favouring lighter asset strategies, in particular by relying on leading-edge foundries capacities.

The EU top 4 combined net sales and R&D spending is in line with the global chip market trend (Figure12).

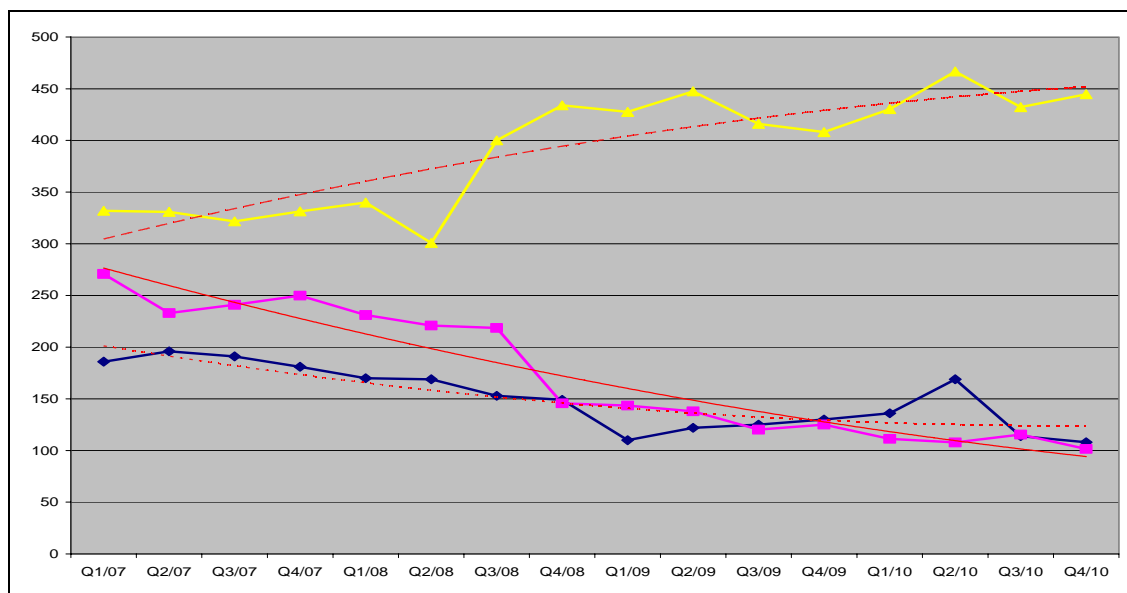
Figure 12: EU top 3 semiconductors and top 1 semiconductor equipment net sales (\$m)



The European semiconductor industry has a strong leadership in sensors and microsystems (used in buildings, cars, manufacturing processes) in security cards (used in healthcare, ID, banking), in high-power applications (grid), computerised machine tools, and in photovoltaic (LED). Most smartphones have several European semiconductors inside (e.g. motion-sensor types – accelerometers and gyroscopes) and run on a European low power chip design.

Cash restrictions, tougher technological and market competition induced two out of the three leading European IC companies to focus their production on their best performing products through divestitures, leaving only one European company in the world top 10 (with \$10 billion net sales). Of course, at firm level, these divestitures have a negative impact on R&D spending (Figure 13).

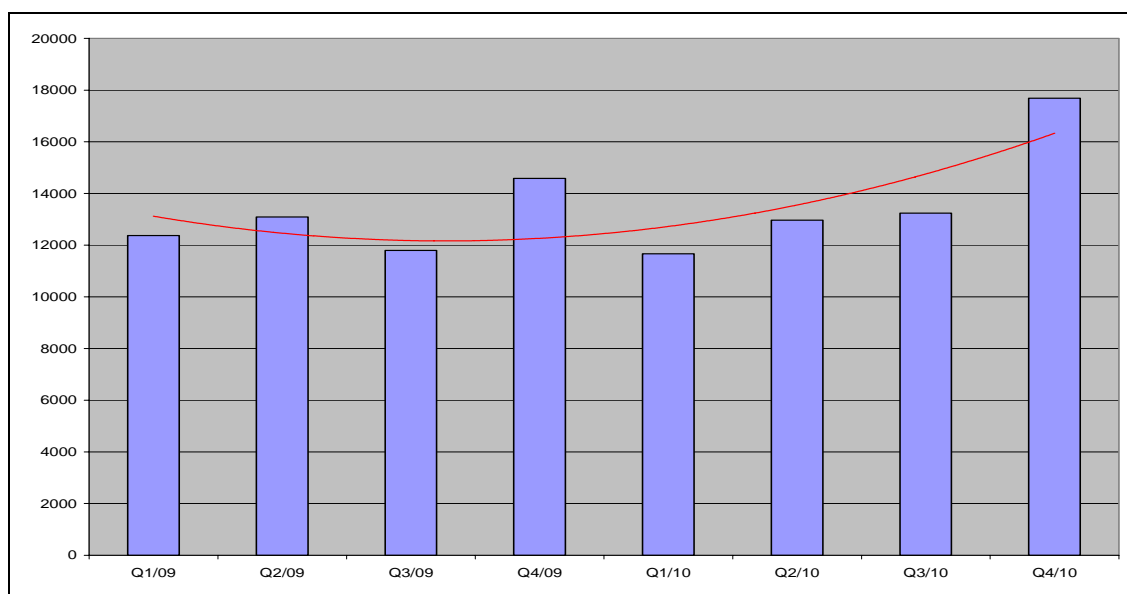
Figure 13: EU top 3 semiconductor companies R&D spending (€m)



2.2.2. The telecom equipment industry

Quarterly data shows that the telecom equipment segment is back on a positive growth trend (Figure 14).

Figure 14: Network business segment of the EU top 3 telecom equipment net sales (€m)



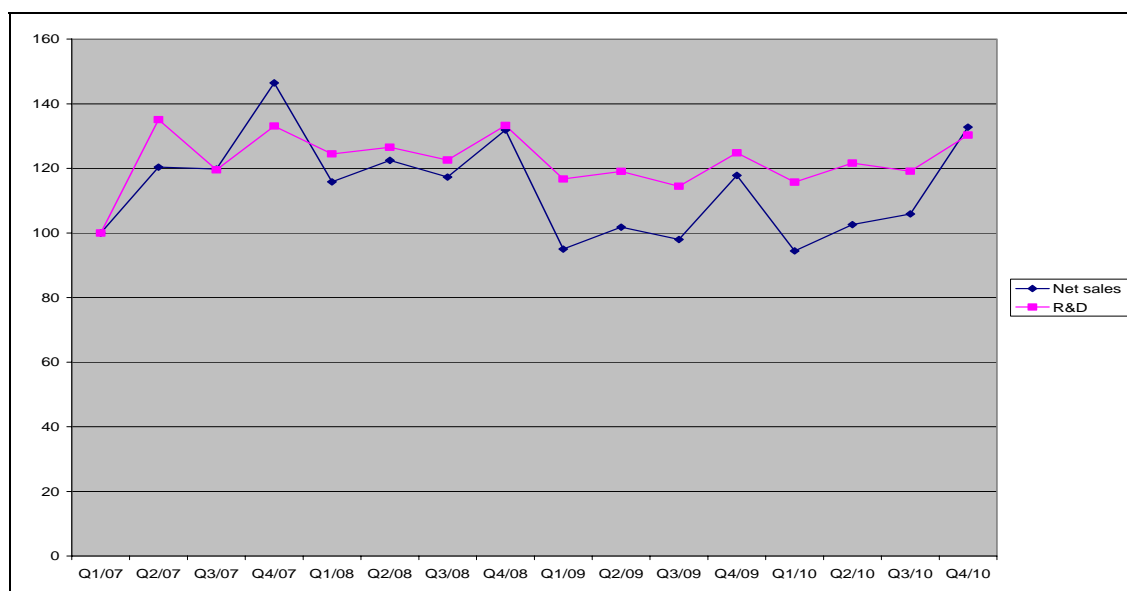
A business cycle time lag (telecom operators' capital expenditures), regulatory obstacles and uncertainties, and shortages in components hampered the recovery of the European telecom equipment industry. Q4/2010 shows a significant improvement. The European industry faces fierce competition from new entrants (mainly from China), but reinforced its global position through mergers and acquisitions (particularly on the US market).

The 2011 outlook is expected to be positively shaped by telecom operators' increased capital expenditures. 180 operators in 70 countries are currently investing in G4/LTE mobile

broadband networks. At least 64 LTE networks will be in commercial service by end 2012.¹¹ Gartner forecast worldwide telecom equipment spending to grow 9.1 percent in 2011.¹²

The EU Top-3 telecom equipment companies maintained their combined R&D spending, which represents 55% of the EU top 25 combined R&D spending, at a much more stable level than their combined revenues (Figure 15).

Figure 15: EU top 3 telecom equipment companies total net sales and total R&D – Index Q1/2007=100



2.2.3. Software and computer services industries

The software industry is extremely heterogeneous in terms of firm's size and activity. Alongside multinational companies supplying consulting services, IT outsourcing services, business and non-business application software, there are thousands of software and computer services companies being mostly active on a national or local scale.¹³

The "Truffle 100"¹⁴ ranks and analyses the top 100 European software companies. In 2009, all but 3 top 100 vendors have revenues below €1bn and 80% have revenues below €250m.

This is confirmed by our EU top 40 sample which counts 12 software (and IT services) companies, 10 having a turnover exceeding €1 billion and one exceeding €10 billion. Their combined revenue increased by 8.5% in 2010 (Figure 16).

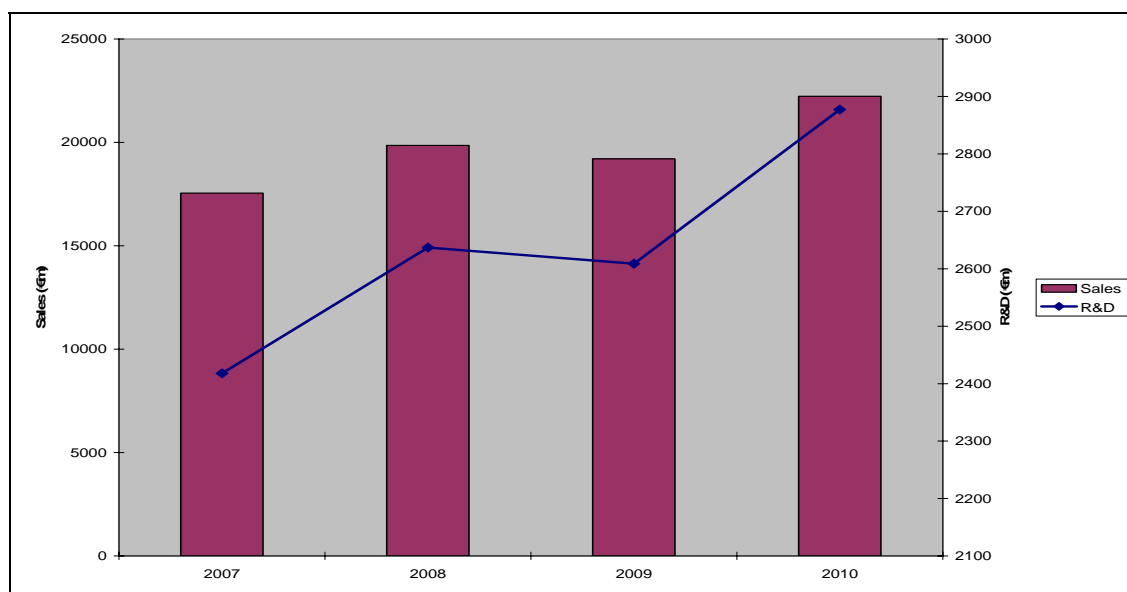
¹¹ GSA, January 12, 2011

¹² Gartner January 6, n 2011

¹³ Nevertheless Computer Services and Software reached 46% of ICT employment and 36% of value added in 2008

¹⁴ Database created by Truffle Capital, an independent venture capital firm investing in Europe

Figure 16: EU top 12 Software and IT Services companies sales and R&D (€m)



From this sample, only 8 companies reported R&D spending. In 2010, their combined R&D amounted to €2,877 billion (+10% year on year), with one company representing more than 50% of this amount (Figure 17)..

A major potential advantage of cloud computing for companies and public administrations is that they no longer need to install and maintain software and computing equipment of their own, nor manage data storage facilities in-house. Instead, they can enjoy remote access, through networks such as the Internet, to state-of-the-art software and data storage systems offered by specialist outside suppliers and so take advantage of much more affordable and efficient IT systems.¹⁵ The European software industry however is lagging way behind its US counterpart and "it is getting more and more difficult for their European counterparts to keep up with the challenges."¹⁶

3. BERD AND COMPANIES' R&D EXPENSES

Companies' R&D expenses, taken from their financial accounts, do not include information on the place where R&D is actually performed. These expenses are allocated to the country where these companies are registered. The approach adopted by the Scoreboard and this analysis are fundamentally different from that of statistical office, which gather data on R&D performed in the country, whatever the nationality of the company (BERD).¹⁷

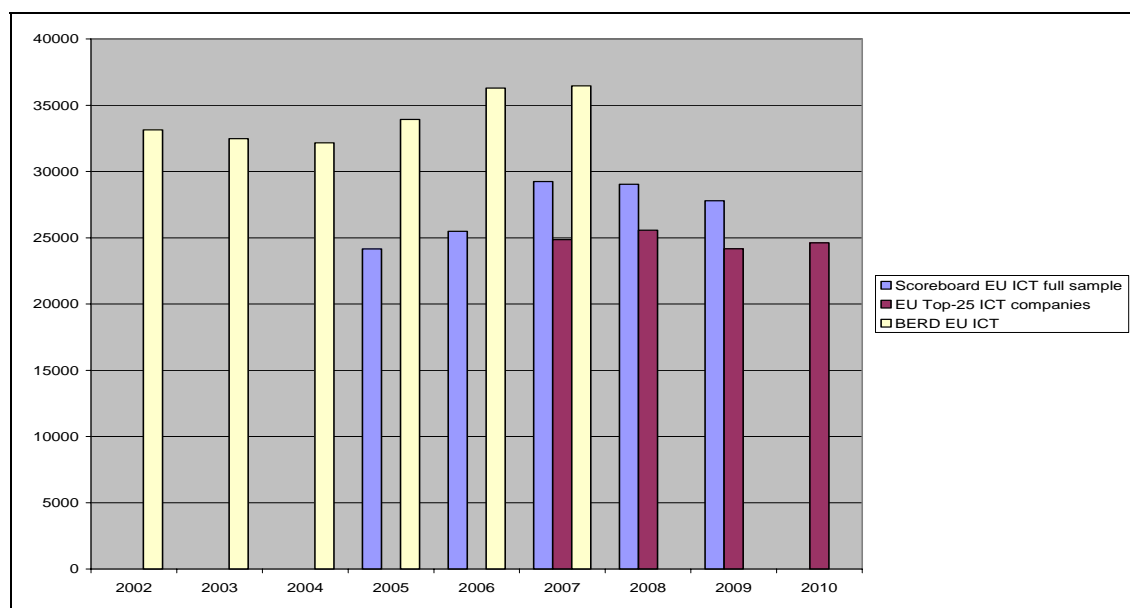
¹⁵ <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/11/128>

¹⁶ Bernard-Louis Roques, <http://www.truffle100.com/2010/interview.php>

¹⁷ A detailed analysis of the differences between BERD and firm's data (Scoreboard) is presented in the PREDICT reports (2009, 2010 and 2011 Annual Reports on R&D in ICT in the European Union. European Commission, JRC-IPTS, Available at <http://is.jrc.ec.europa.eu/pages/ISG/PREDICT.html>) and in: "Azagra Caro, J. M. and Grablowitz, A. (2008). "Data on Business R&D: Comparing BERD and the *Scoreboard*", Institute for Prospective Technological Studies, JRC Scientific and Technical Report, EUR 23364 EN, available online at: <ftp://ftp.jrc.es/pub/EURdoc/JRC44585.pdf>

At the time of writing this analysis, 2007 is the last year for which Eurostat has released BERD data by economic activity.¹⁸ Compared with the Scoreboard data, EU ICT BERD is significantly higher (Figure 17). EU ICT BERD covers all R&D expenditures performed in the ICT industry in the EU, including smaller firms and foreign affiliates of non-European firms. Given the ICT industry high concentration rate, R&D expenditures by foreign affiliates of non-EU firms in the EU accounts formost of the gap between the two approaches. It is also to be noted that the definition of R&D is also different in the two approaches; wider for BERD than according firm's accounting rules. In addition, not all firms report their R&D expenses in their financial releases.

Figure 17: EU ICT BERD and EU ICT companies' R&D expenses



Sources: JRC/IPTS – 2010 EU Industrial R&D Investment Scoreboard and the JRC/IPTS 2010 Report on R&D in ICT in the European Union

From an economic point of view, the gap between BERD and Scoreboard data reflects the globalisation of R&D and the relative success of a country to attract it. If it were possible to isolate all other factors, a higher BERD than Scoreboard data means a net inflow of R&D expenses.¹⁹

4. CONCLUSIONS

This analysis has taken a classic view of the ICT industry and its sectors. This is becoming less and less pertinent given the contribution of ICT to nearly all economic and social

¹⁸ ICT industry includes economic activities within NACE Rev. 1.1 codes 30 (manufacture of office machinery and computers), 32 (manufacture of radio, television and communication equipment), 33 (manufacture of medical, precision and optical instruments, watches and clocks), 64 (post and telecommunication services) and 72 (computer and related services)

¹⁹ Further analysis on this topic is available in the "2011 Report on ICT R&D in the European Union" and in a report on "Internationalisation of ICT R&D" (2011) available at: <http://is.jrc.ec.europa.eu/pages/ISG/PREDICT.html>

activities. Measuring the diffusion of ICT is still a difficult task given data constraints and a research topic.²⁰ An alternative perspective is offered by analysing the deployment of the key enabling technologies (KET's): Micro & nanoelectronics, advances materials, nanotechnology, biotechnology, photonics and advanced manufacturing systems. While not all are strictly speaking part of the ICT, all have a direct and close relationship with it.

From the KET's perspective, in terms of knowledge assets, Europe performs excellently and many non-EU experts rate the European R&D ecosystems (firm, research centre, universities) as the best in the world (Table 3).

Table 3: **KET's leading R&D actors**

	Micro and nanoelectronics	Photonics
Top R&D actors	Commissariat à l'énergie atomique (F)	Commissariat à l'énergie atomique (F)
	University of California (US)	Fraunhofer-Gesellschaft (D)
	IMEC (B)	MIT (US)
	Fraunhofer-Gesellschaft (D)	University of California (US)
	National Institute of Advanced Industrial Science and Technology (J)	US DoE
	Centre national de la recherche scientifique (F)	Centre national de la recherche scientifique (F)
	MIT (US)	National Institute of Advanced Industrial Science and Technology (J)
	Japan Science and Technology Agency	Japan Science and Technology Agency

Source: HLG KET mid-term meeting, February 2011

Europe has a technological leadership in sensors and microsystems (in buildings, car, manufacturing processes, machine tools), in security cards (healthcare, ID, payments), in high-power applications (grid), and in photovoltaic (LED). With two world leaders, Europe has a significant market share in medical equipment, which nowadays integrates the most advanced IT technologies, from chips to software. And Europe has a leading position in photovoltaic and silicon solar panels.

The issue is less about knowledge assets than growth opportunities, many of these final markets being still highly fragmented at EU level.

²⁰ ICTNET is a FP7 funded Support Action aimed at enhancing the coordination of the research in the economics of ICT - <http://www.ict-net.eu/>

5. ANNEX

The "EU Industrial R&D Investment Scoreboard" (the *Scoreboard*)²¹ The *Scoreboard* is part of the Industrial Research Monitoring Activity carried out jointly by the Joint Research Centre (JRC) and Research (DG RTD) Directorates-General of the European Commission. The database contains information on the 1000 EU companies and 1000 non-EU companies investing the largest sums in R&D in their latest reporting year.

The *Scoreboard* refers to all R&D financed by a particular company from its own funds, regardless of where that R&D activity is performed. BERD refers to all R&D activities performed by businesses within a particular sector and territory, regardless of the location of the business's headquarters, and regardless of the sources of finance.

Table 1 The 2010 Scoreboard – European ICT industry by sector²²

Sectors	Number of companies	Total R&D (€m) (Share in total ICT)	Total net sales (€m) (Share in total ICT)
Telecom operators	18	5,002 (18%)	328,000 (61%)
Internet	3	23 (0.08%)	4,151 (0.7%)
Telecom equipment	23	10,740 (38%)	80,920 (15%)
Semiconductors	20	3,538 (12.5%)	16,572 (3%)
Computer hardware	5	130 (0.5%)	2,015 (0.4%)
Electronic office equipment	2	266 (0.1%)	3,561 (0.6%)
Electronic equipment	37	1,271 (4.5%)	19,643 (3.6%)
Software	76	4,034 (14.5%)	29,301 (5.5%)
Computer services	21	916 (3.3%)	27,457 (5%)
Leisure goods ²³	10	1,992 (7.1%)	27,590 (5.1%)

²¹ European Commission (JRC/IPTS) http://iri.jrc.ec.europa.eu/research/scoreboard_2010.htm

²² http://iri.jrc.ec.europa.eu/research/scoreboard_2010.htm

²³ "Leisure goods" sector is not strictly ICT-related. It has in fact only one major ICT firm, Philips.

Total	215	27,912	539,912
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Source: European Commission – JRC/IPTS

The cut-off date of the 2010 *Scoreboard* is May 2010 and most companies have their fiscal year ended between September and December 31. Given the number of companies, the coverage of all 2010 annual reports implies the use of a sub-sample while keeping it representative comparatively to the *Scoreboard*.

Table 2 **Sub-sample (in % of the 2010 Scoreboard sample)**

Sector	Number of companies	Total R&D (€m)	Total net sales (€m)
Telecom operators	8 (BT, France Telecom, Telecom Italia, Telefonica, Deutsche Telekom, TeliaSonera, Vodafone)	4,583	298,245 (90%)
Internet	1 (Freenet)	10	3,971 (95%)
Telecom equipment	3 (Nokia, Alcatel-Lucent, Ericsson)	10,112	76,296 (94%)
Semiconductors	5 (STMicroelectronics, Infineon, NXP, ARM, ASML)	3,180	14,222 (85%)
Computer hardware	3 (Bull, Kontron, Axis)	108	1,804 (90%)
Electronic office equipment	2 (Océ, Neopost)	266	3561(100)
Electronic equipment	10 (Agfa-Gevaert, Thomson Technicolor, TomTom, Gemalto, Ingenico, Epcos, Barco, Sick, Zumtobel, Sensata Technologies)	892	14,957 (76%)
Software and computer services	15 (Indra Sistemas, Logica, Ubisoft, SAP, Dassault Systemes, Sage, Autonomy, Software AG, Cap Gemini, Wam Acquisition, Wincor Nixdorf, Sopra, Tieto, Amdocs,	3,504	42,860 (75%)

	Invensys)		
Leisure goods	1 (Philips)	1,714	23,189 (85%)
Total	47	24,321 (87%)	478,192 (88%)

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Digital Competence in the Digital Agenda

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1. INTRODUCTION

As ICT spreads throughout our societies, touching more and more parts of our lives, so digital competence has become essential for every individual. We are confronted with ICT from our youngest years when we are starting to learn in school and it supports life-long learning when we have left school. ICT has spread throughout the work place, so that the large majority of jobs now require some form of ICT skills. ICT also plays a larger and larger role in our private lives for leisure/entertainment, communication and social interaction, our health and well being, as well as with respect to our participation in society.

The importance of digital competence was recognised by the European Parliament and the European Council in 2006 in its recommendation on key competences for lifelong learning when it identified digital competence as one of eight key competences essential for all individuals in a knowledge-based society.

Furthermore, previous analysis has shown that lack of skills is an important reason for the digital divide i.e. for the large number of non-users in the EU, 30% in 2009. As such, one of the pillars of the Digital Agenda for Europe is devoted to digital literacy/competence, skills and inclusion, with a number of actions in this area. This chapter analyses recent developments in digital competence/literacy in Europe.

2. WHAT IS DIGITAL COMPETENCE?

In 2006 the European Parliament and the European Council published a recommendation on key competences for life long learning.¹ The recommendation provided a European Reference Framework on Key competences for Life long learning in which eight key competences were identified and defined. The Communication and reference framework had grown out of the need recognised and expressed at previous European Councils² for a European framework to define the basic skills to be provided through life long learning as a key measure in Europe's response to globalisation and the shift to a knowledge-based society.

Competences were defined as a combination of knowledge, skills and attitudes appropriate to the context. *Key competences* were those which all individuals needed for personal fulfilment and development, active citizenship, social inclusion and employment.

One of these eight key competences was *digital competence*.³ While all of the key competences were deemed equally important and inter-related, competence in the fundamental basic skills of language, literacy, numeracy and information and communication technologies were described as an essential foundation for learning.

Digital competence was defined as follows:

"Digital competence involves the confident and critical use of information Society technology (IST) for work, leisure, learning and communication. It is underpinned by

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:en:PDF>

² Starting with the Lisbon European Council (23-24 March 2000).

³ The others being: communication in a mother tongue, communication in a foreign language, mathematical competence and basic competences in science and technology, learning to learn, social and civic competences, sense of initiative and entrepreneurship and cultural awareness and expression.

basic skills in ICT: the use of computers to retrieve, access, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet."

Where essential knowledge skills and attitudes related to this competence were described in the following way:

"Digital competence requires a sound understanding and knowledge of the nature, role and opportunities of IST in everyday contexts: in personal and social life as well as at work. This includes main computer applications such as word processing, spreadsheets, databases, information storage and management, and an understanding of the opportunities and potential risks of the Internet and communication via electronic media (e-mail, network tools) for work, leisure, information sharing and collaborative networking, learning and research. Individuals should also understand how IST can support creativity and innovation, and be aware of issues around the validity and reliability of information available and of the legal and ethical principles involved in the interactive use of IST.

Skills needed include the ability to search, collect and process information and use it in a critical and systematic way, assessing relevance and distinguishing the real from the virtual while recognising the links. Individuals should have skills to use tools to produce, present and understand complex information and the ability to access, search and use internet-based services. Individuals should also be able use IST to support critical thinking, creativity, and innovation.

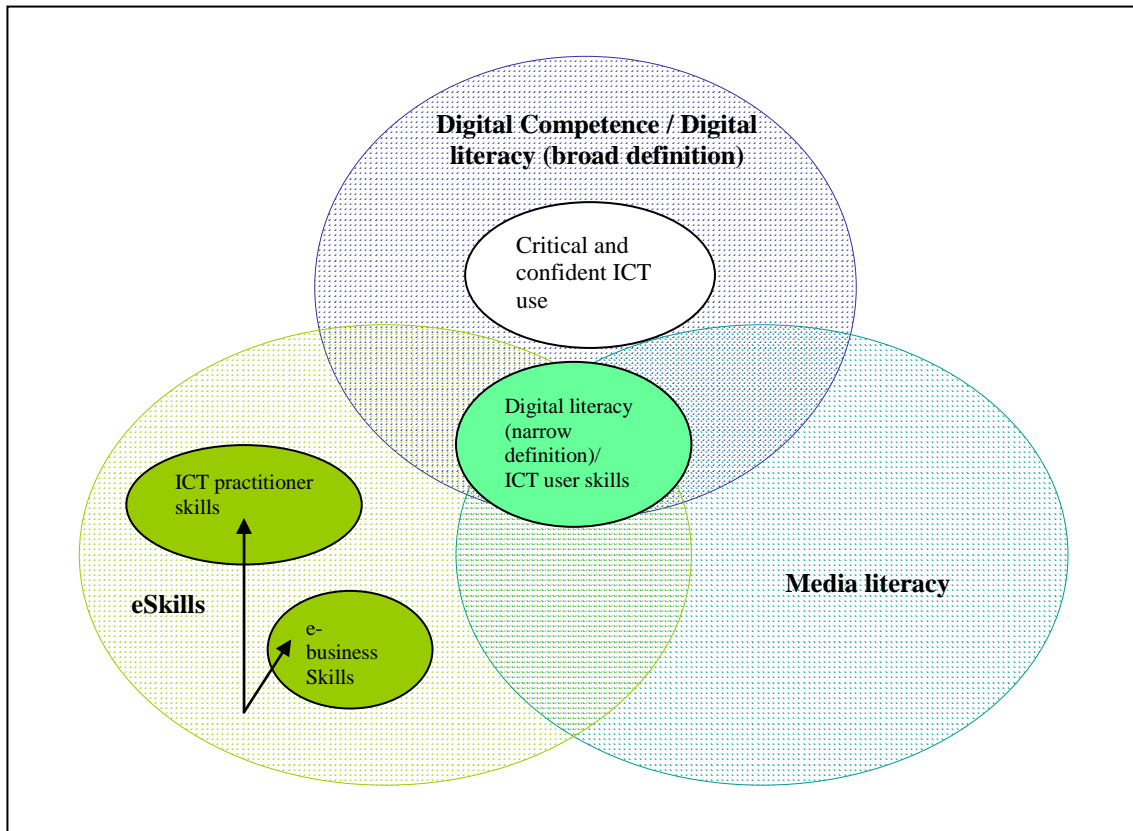
Use of IST requires a critical and reflective attitude towards available information and a responsible use of the interactive media. An interest in engaging in communities and networks for cultural, social and/or professional purposes also supports this competence."

From the above, it can be appreciated that digital competence is a very broad concept, including much more than basic skills in the use of ICT. It relates to other similar concepts such as digital literacy, eSkills and Media literacy (see Figure 1).⁴ In particular, digital competence can be considered as digital literacy in the broad sense. It encompasses the basic ICT user skills included under the term eSkills, as well as the digital part of Media Literacy. Whereas in the past analysis of skills focused on a more narrowly defined concept of digital literacy; here we take this broader approach.⁵

⁴ See the annex to this chapter for definitions of these concepts.

⁵ This process is aligned with JRC IPTS' work on detailing digital competence, for all levels of learners, see: <http://is.jrc.ec.europa.eu/pages/EAP/DIGCOMP.html>

Figure 1: Visual representation of concepts relating to digital competence, eSkills and media literacy



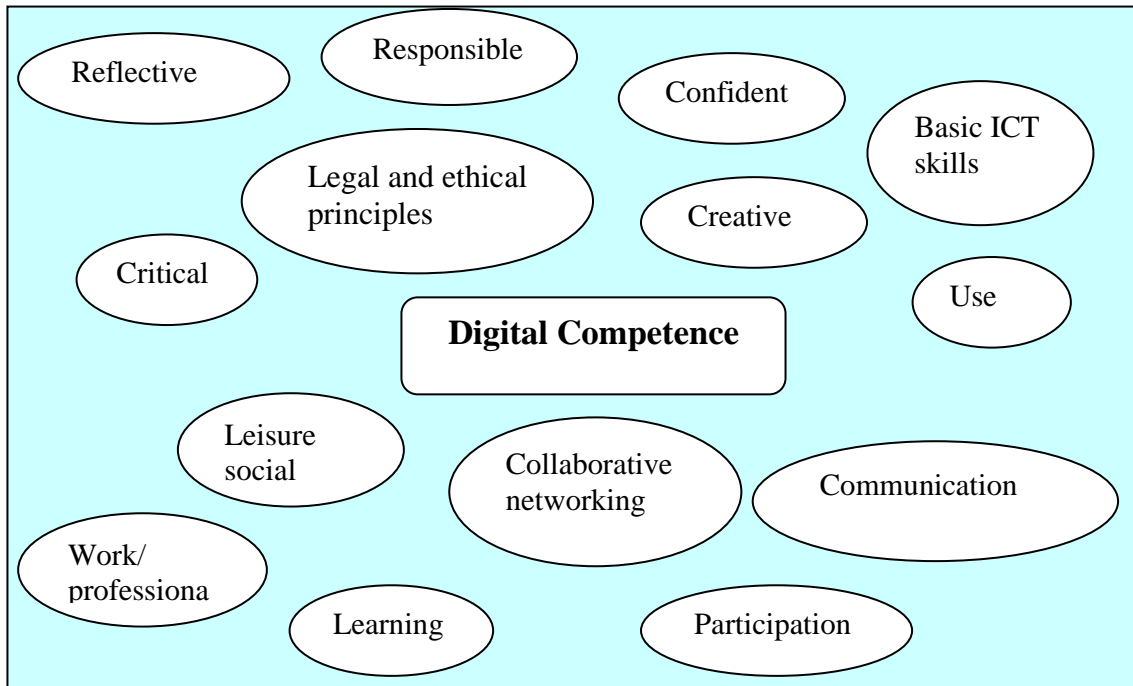
Source: Commission Services

3. WHAT DOES DIGITAL COMPETENCE COMPRISE?

From the definition outlined in section 2 of this chapter, the main aspects of digital competence can be discerned. These main aspects can be viewed in the below cloud diagram. These aspects are all related to the individual's competences. However, added to this there are environmental factors which contribute to them. In particular, access to ICT is essential for effective use of ICT. Therefore the analysis here also involves these environmental factors.

Based on the above, table 1 outlines a conceptual framework for digital competence structured along two main dimensions: Environmental factors and individual competence. Environmental factors relate to the availability of ICT and therefore access to it. These ICT include computers, the internet, smart phones, tablet PCs and other ICT devices allowing access to the internet. Individual competence includes (2) basic use/operational skills, (3) active application to aspects of life (or "advanced use") and (4) personal attitudes. Basic operational skills include basic computer and internet skills. "Active application to aspects of life" includes application to the areas work/professional life, learning (in a life-long learning context i.e. including formal compulsory education, but also informal and non-formal learning, outside of compulsory education), Communication, participation in society, leisure and collaborative networking. "Personal attitudes" includes critical and reflective use, responsible use, legal and ethical principles, confident use and creative use. This framework can be seen in table 1 below.

Figure 2: Cloud diagram of the main aspects relating to digital competence



Source: Commission services

Table 1: Conceptual framework for digital competence

Environmental factors:	(1) Access to ICT	<ul style="list-style-type: none"> • Computers • Internet • Smart phones • Tablet PCs • Etc.
Individual competence:	(2) Basic use/operational skills	<ul style="list-style-type: none"> • Basic computer use and skills • Basic internet use and skills
	(3) Active application to aspects of life (or "advanced use")	<ul style="list-style-type: none"> • Work/professional • Learning(LLL) • Communication • Participation in society • Leisure

(4) Personal attitudes

- Collaborative networking
- Critical/reflective use
- Responsible use
- legal and ethical principles
- Confident use
- Creative use

3.1. Access to ICT

In order for an individual to become digitally competent, he/she first has to have access to this ICT. Therefore access to digital technologies is a crucial environmental factor contributing to digital competence. In the past this access meant having access to a computer. However, rapid technological change in the ICT sector over the last few years has brought about a new wave of innovation in access technologies. So that we can no longer say that computers are the only or main access devices. In particular, the rise of the smart phone and more recently the large scale roll out of tablet PCs have once again revolutionised our connection to ICT, allowing more flexibility of use (anytime, anywhere), increasing its areas of application and making ICT more accessible to the general population. Also, other devices allow access to the internet, such as games consoles, PDAs and digital television. As such, a wider array of access devices should be taken into account when measuring access than purely computers. Furthermore, access to ICT obviously includes access to the internet. Therefore, access to broadband is also included in access to ICT.

3.2. Basic use/operational skills

The basis of digital competence is the acquisition of basic operational ICT skills. Basic operational skills refer to the basic skills needed in order to allow the functional use of ICT. Those skills therefore should include basic operational skills for computers and the internet. Some of these operational skills, in particular for computers, are outlined in the definition of digital competence. However, as discussed above they should also include the operational skills needed for other mainstream ICT devices such as for example smart phones, tablets and Wi-Fi. And, as other devices such as digital television with internet become more mainstream, in the future they will probably also include the operational skills needed for these such devices. It is a feature of ICTs that rapid technological development necessitates an ever changing skills basket and the need for life-long learning.

3.3. Active application to aspects of life or "advanced use"

Beyond the ability to perform basic operational ICT tasks, digital competence involves the use of ICT for a multitude of aspects of everyday life. The groups of areas identified in the Council definition of digital competence include: work/professional life, learning, communication, participation in society, leisure and collaborative networking. In essence, these should cover all aspects of (digital) life and in many ways can be thought of as more

advanced use of the internet than operational skills such as using a search engine or sending emails etc. as their primary function is not for the use of ICT but rather to use ICT for the achievement of personal, social and economic goals.

3.4. Personal attitudes

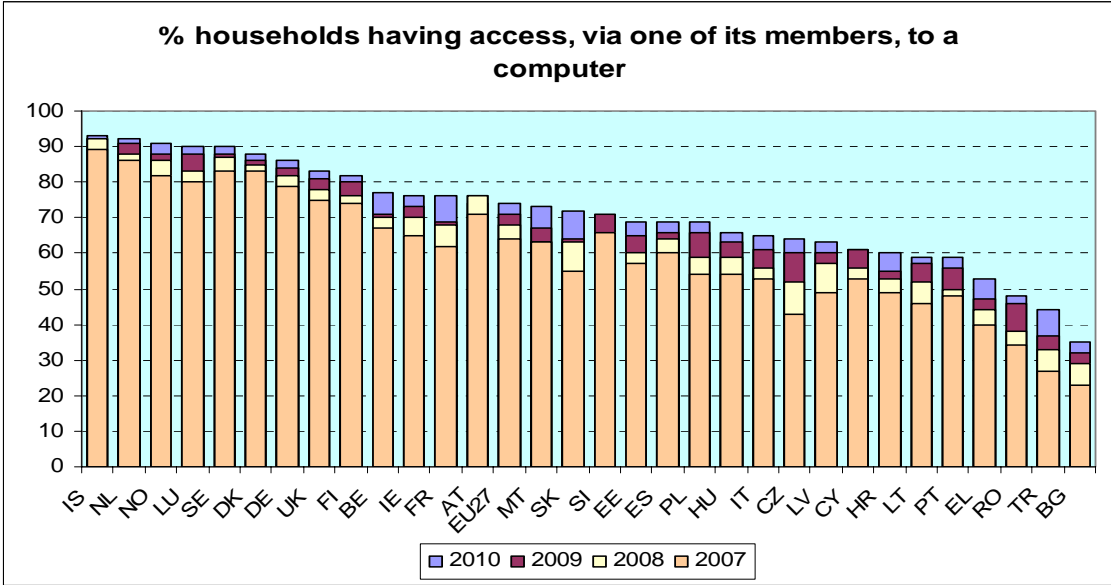
Personal attitudes refer to "how" individuals use ICT. In particular, a digitally competent individual should be critical and reflective in their use. In other words, they should be able to assess the credibility and reliability of the information they receive on the Internet, the sources they use and the individuals they encounter. They should be responsible users and should abide by the law and to other social norms of conduct. They should be confident and creative in their use.

4. RECENT EVIDENCE ON DIGITAL COMPETENCE IN EUROPE

4.1. Access to ICT

On average for the EU27 74% of households had **access to a computer at home** in 2010. This represents a 3pp. increase over 2009. Indeed household computer ownership continues to grow across the EU and other European countries, with all but Cyprus recording an increase since 2009.⁶ Rates of household computer ownership have increased to at or above 90% in the leading ICT countries (IS, NL, NO, LU and SE). At the other end of the scale Romania, Turkey and Bulgaria have less than 50% household access to a computer and Greece has a rate just above 50%.

Figure 3: % households having access, via one of its members, to a computer



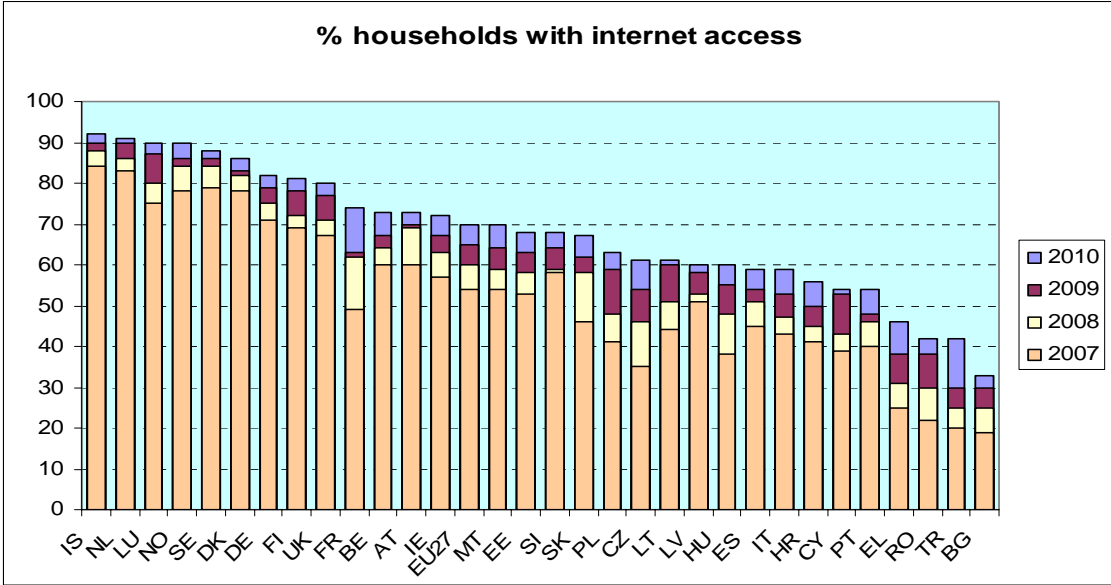
Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Rates of household **internet access** are similar to rates of computer access across European countries (with a correlation of 0.99) with 70% of EU households having access to the internet in 2010. As with computer access, the highest rates of internet access are observed in

⁶ 2010 data for Iceland are not available.

Iceland, the Netherlands, Norway, Luxemburg and Sweden (around 90%). The lowest rates are observed in Greece, Romania, Turkey and Bulgaria (all below 50%). As with computer access, household internet access is still showing positive growth, in some countries substantially so (TR, FR, EL, CZ).

Figure 4: % households with internet access



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

The most popular **device for internet access** remains the desktop or laptop computer with on average 68% of households in the EU accessing the internet in this way (up from 63% in 2009), mostly via broadband (61%). However, the importance of access via other devices is also increasing, especially for mobile phone access. On average 15% of EU households now access the internet via mobile phone, an increase of 4pp. over 2009. In some countries, rates have reached more than 30% (DK, NL, SL, SK and SE) and in Norway the rate has reached 45%. Furthermore, access via games consoles (7% in EU) and TV (4% in EU) is also on the rise. They are of particular importance in some of the most advanced ICT countries, showing that these countries not only have higher rates of access to the internet but also use a larger variety of devices for doing so.

Looking at households without access to the internet, the most important **reason for not having internet access** at home is lack of interest (40% of households with no internet access). The next most important factors are lack of skills (32%) and equipment (26%) and access (23%) costs. Lack of skills as a reason has increased in importance compared to 2008 (+8pp.) Only 15 % say they do not have access at home because they have it elsewhere. Another 12% say they do not want it (because of harmful content etc.), 6% say it is due to privacy and security concerns, 2% due to a physical disability and 20% state "other reasons". From a cross-country perspective, access and equipment costs are considered particularly important in BG, EE, LV, HU, RO, MK and TR. Access elsewhere is an important reason in Latvia. Furthermore, more than two thirds of households without internet access in DK, DE, ES, LT, LU, HU, PL, SI, SK, FI, SE, IS and HR still find no value in having internet access. An expressed lack of internet could relate to a number of things: lack of knowledge and skills, a genuine lack of interest, or lack of appropriate offer or not wanting to report financial reasons. Rates of households without internet access reporting that lack of skills is a reason

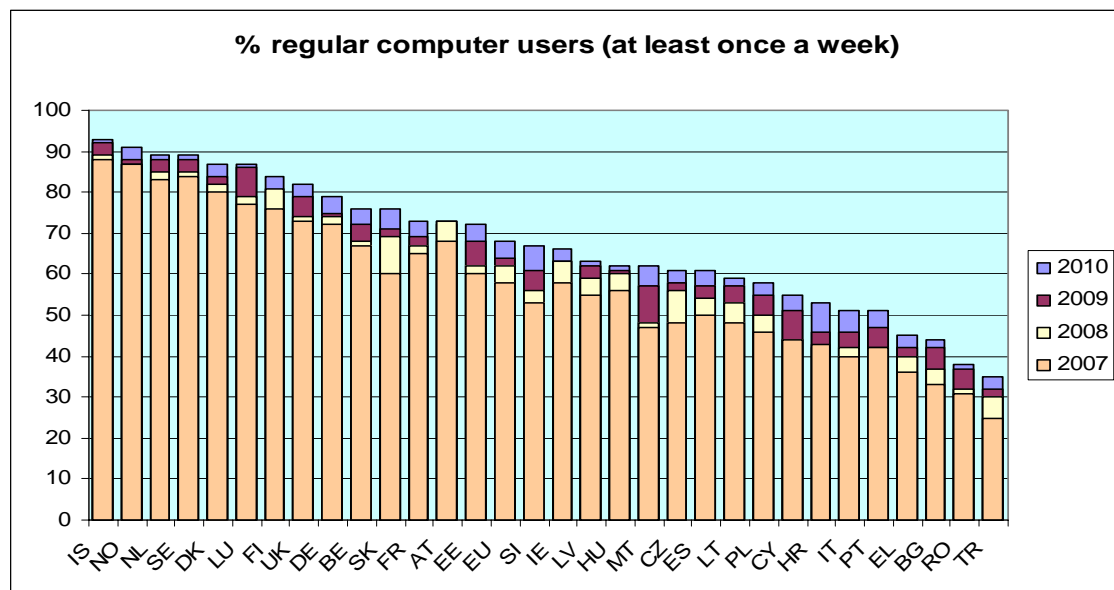
for no internet access at home are very high in a number of countries: CY (68%), EE (60%), MT and SI (both 58%) and PT (52%).

4.2. Basic use/operational skills

In terms of **computer use**, the latest data for 2010 show that on average 68% of individuals in the EU use a computer at least once a week, and most (57%) of them do so every day. The correlation between regular computer use and computer access (0.95) is very high, showing that the same country patterns observed below also hold for regular computer use: highest rates of use (above 80%) are found in the Nordic countries, the Netherlands, and also the UK; lowest rates are for Turkey, Romania, Bulgaria and Greece (45% or below).

Most progress in increasing rates has been made in a number of countries that have rates of computer use near to that of the EU average e.g. Slovenia, Slovakia, and Malta. Although, Croatia has witnessed the largest increase (+7pp.), and now has a rate of regular computer use of 53%, above those of Portugal and Italy. In particular, the low rates of increase in countries like Romania, Bulgaria, Turkey and Greece mean that they are increasingly being left behind by the others.

Figure 5: % regular computer users (at least once a week)

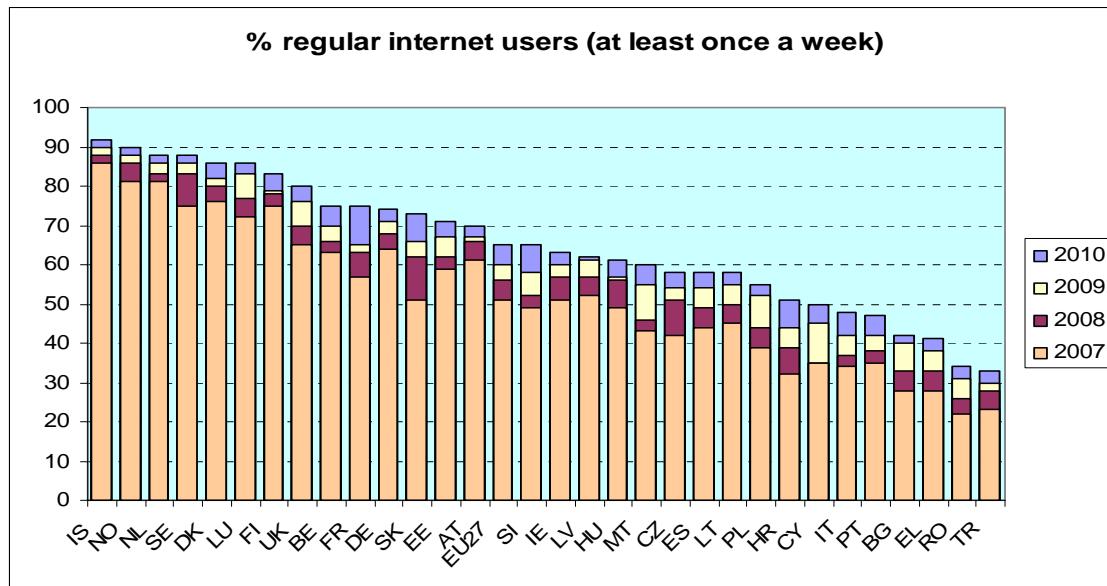


Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Data for 2010 show that, **regular use of the internet** has increased from 60% in 2009 to 65% for the EU27. This is a significant increase in regular users and means that the Digital Agenda target for reaching 75% of regular users in the EU by 2015 is well on track to being achieved. The pattern in regular internet use across countries is very similar to that for regular computer use with a correlation of 0.97 between the two indicators. The countries with the highest rates of regular internet use remain those with historically high rates, namely: Norway (90%), Sweden and the Netherlands (88% each), Denmark and Luxemburg (86% each) and the UK (80%). However, a number of previously average scorers on this indicator have made large improvements in regular internet use over the last year and are catching up with the leaders. These include, in particular, France (+10pp. to 75%), Slovakia and Slovenia (+7pp. to 73% and 65%, respectively) and Belgium (+5pp. to 75%). Other significant increases in rates

have been witnessed in Croatia (+7pp., non-EU), Italy (+6pp.), Cyprus (+5pp.) and Portugal (+5pp.), though still only record around 50% regular internet use. On the whole, the countries with the weakest performance are also those with the lowest rates i.e. Turkey (non-EU), Romania, Greece and Bulgaria. These countries are at increasing risk of being left behind.

Figure 6: % regular internet users



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Furthermore, rates of **non-use of the internet** have also decreased substantially over the last year. On average in the EU, the rate of non-users fell 4pp. to 26%. Again this represents a strong contribution to achieving the Digital Agenda target of halving the proportion of the population that has never used the internet by 2015 (to 15%) and means that this target is well on track to being achieved. Improvements were made in all countries analysed. Nevertheless, there remain a number of countries in Europe for which a substantial proportion of the population has still never used the internet. Over 50% of the population in Bulgaria, Greece, Romania and Turkey and more than 40% in Italy, Cyprus, Portugal and Croatia have never used the internet. By contrast, in the Nordic countries, the Netherlands and Luxemburg rates of non-users have fallen to between 5 and 11%.

In terms of **(basic) internet skills**⁷, data for 2010 show that the percentage of individuals having at least some level of skills (i.e. those with high, medium or low) has reached 72% in 2010 up from 60% in 2007. This represents a significant improvement in the internet skills of

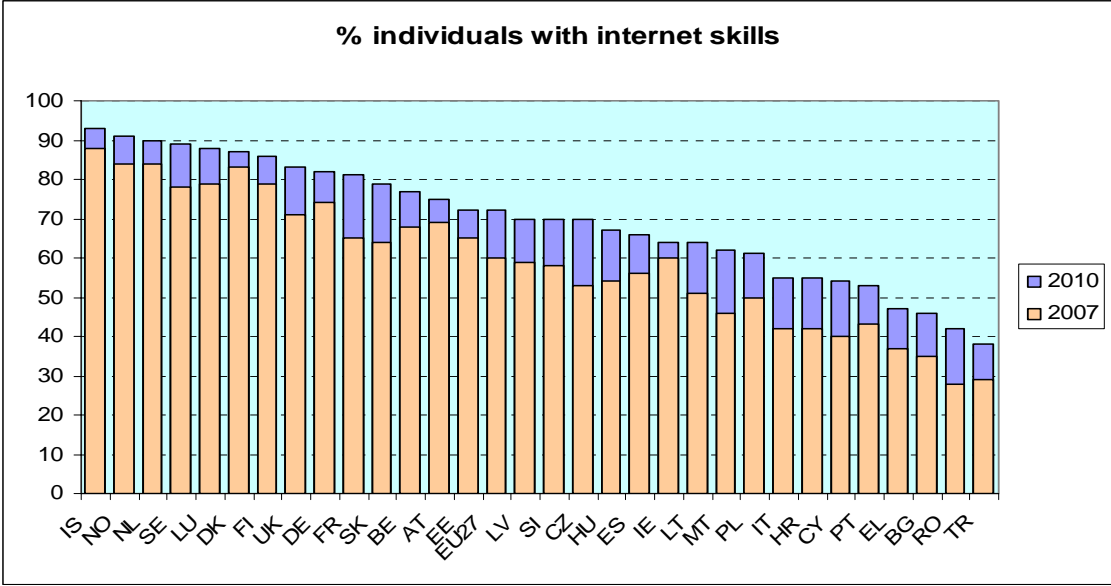
⁷ Each year the survey asks questions related to either 6 different internet or computer related skills. In 2010 it was internet skills, the previous time it was asked was in 2007. The skills included were the percentages of individuals who had:

- used a search engine to find information;
- send an email with attached files;
- posted messages to chat rooms, newsgroups, or an online discussion forum;
- used the internet to make a phone call;
- used peer-to-peer file sharing;
- and, created a web page.

Individuals who have performed 1 or 2 of these tasks are considered to be low skilled; those with 3-4 are medium skilled and those with 5-6 are high skilled.

the EU population over the last few years. Encouragingly, above average increases in skills can be observed in a number of countries that have previously been average or weak performers in terms of internet skills. The largest increases have occurred in the Czech Republic (+17pp. to 70%), France and Malta (+16pp. to 81% and 62%, respectively), Slovakia (+15pp. to 79%), Cyprus (+14pp. to 54%), and Hungary, Lithuania, Italy and Croatia (+13pp. to 67%, 64%, and 55% for the latter two). Nevertheless, the leaders remain the Netherland, the Nordic countries (FI, SE, DK, IS, NO), and Luxemburg. Indeed the cross-country correlation between regular internet use and (operational) skills is 0.99.

Figure 7: % individuals with internet skills

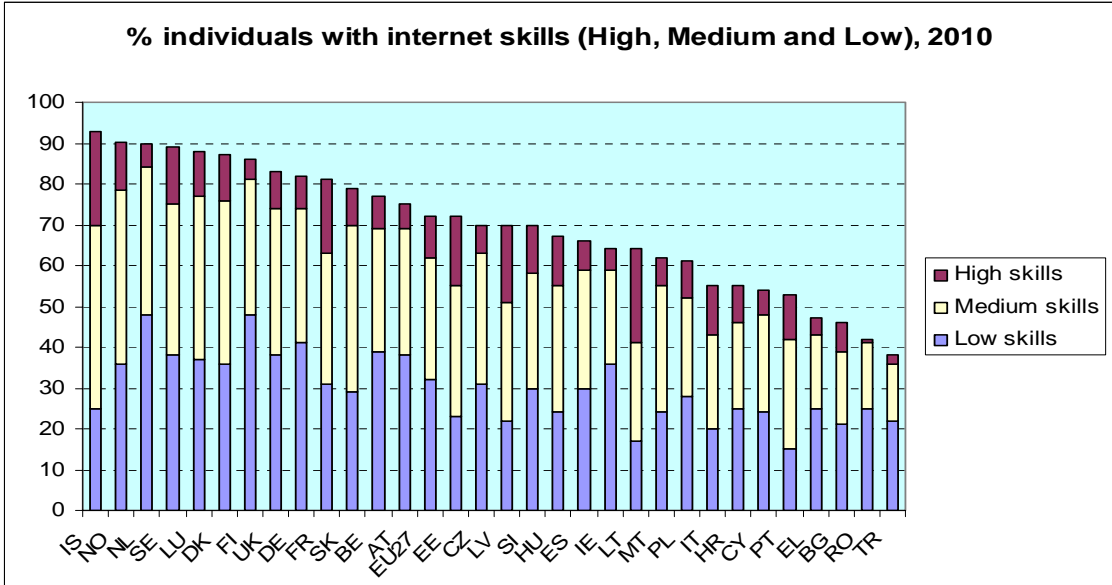


Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

While no data on **(basic) computer skills** are available for 2010, the historically strong correlation that exists between computer and internet skills allows us to infer a similar pattern in the distribution of computer skills throughout Europe.

Now looking at **different levels of internet skills**, it can be seen that for the EU27 32% have low level skills, 30% have medium level skills and 10% have high level skills. Among the Member States and other countries analysed. The percentages of individuals with only low level skills range from 15% in Portugal to 48% in the Netherlands and Finland (33 pp. range). Those with medium level skills range from 14% in Turkey to 45% in Island (31pp. range). And those with high level skills range from 1% in Romania to 23% in Lithuania (22pp. range). While rates of low and medium level skills to a large extent reflect the cross-country pattern of regular internet use (with correlations of 0.79 and 0.91), this is not the case for high level skills (correlation 0.37); countries with high access and basic use do not necessarily have the highest rates of high level skills. These are the countries: Lithuania, Latvia, Norway, Estonia, Sweden and France.

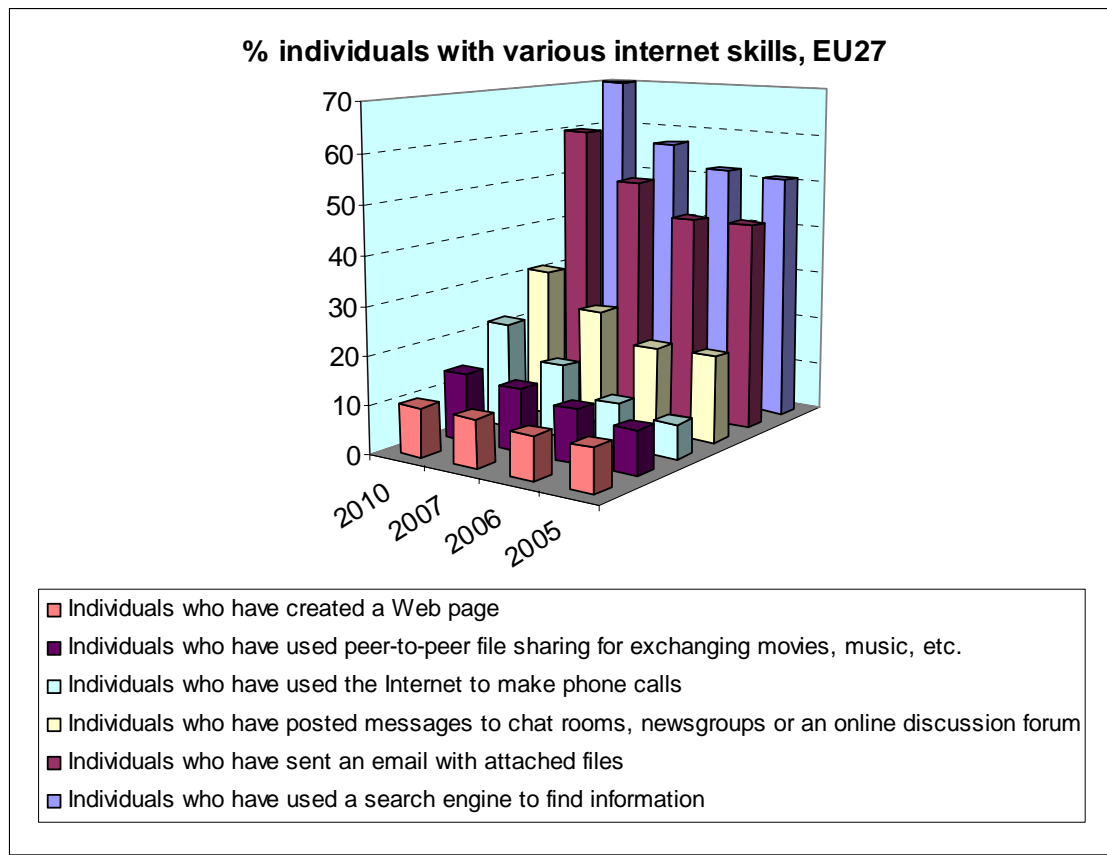
Figure 8: % individuals with different levels of internet skills, 2010



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

While this index calculates high, medium and low levels of internet skills depending on the number of listed activities carried out, it is also possible to determine levels of skill by looking at the percentages of individuals carried out each of the various activities, which themselves can be considered as varying in complexity and therefore requiring a varying level of skill. In particular, while using a search engine and sending an email with attached files can be considered as requiring relatively low levels of skill, posting a message to a chat site etc. might be considered slightly more complex and the remaining three even more so. This varying complexity is also reflected in the rates of use of these various activities. While 70% have used a search engine, 60% have sent an email with attached files, 31% have posted messages, 22% have used the internet to make phone calls, 14% have used peer-to-peer file sharing and only 10% have created a web page. Similarly, while the lower level skills have increased substantially over time, the increase in more complex tasks has been more gradual and in the case of creating a web page has remained stagnant.

Figure 9: % individuals with various internet skills



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

Summarising the main findings so far on computer and internet access, use and skills it can be said that while on average significant progress has been made in increasing rates of access, use and skills over the past year/past few years, the historically ICT advanced countries (largely encompassing the Nordic countries, the Netherlands, Luxemburg and the UK) remain the top and, with regard to access and use, most progress in catching up with them has been made in the middle ground. The countries at the bottom of the ranking, in terms of access and use, (in particular Turkey, Bulgaria, Romania and Greece) have made little progress and are being left behind by the others. In terms of skills, however, the weaker performers have made more substantial improvements. The same cross-country pattern is also exhibited by medium and low level skills, however, the countries with the highest levels of skills are more of a mixed bag. Important barriers to access and use remain lack of interest, lack of skills and access and equipment costs. Lack of skills is particularly important in a number of countries.

4.3. Active application to aspects of life or "advanced use"

This section looks at evidence for the areas work/professional life, learning, communication, participation, leisure and collaborative networking. Apart from the first area, it is mainly based on indicators on the use of the internet in the last three months for various purposes collected via the Eurostat survey of ICT use in Households and individuals.⁸

For the first area of **work/professional life**, statistics on % of employees with ICT user skills and ICT specialist skills is calculated on the basis on data collected through the European Labour Force survey.⁹

The latest data for 2010 show that 18.5% of employed persons in the EU27 have ICT user skills; 3.2% have specialist skills (the latter not being included under the concept of digital competence). These figures have changed little over time, which probably relates more to the way this indicator is measured than to the actual development in the ICT skills of the workforce.¹⁰ Despite its deficiencies, the indicator does allow us to get an idea of the pattern in skills in the workforce across countries. In particular, the highest rates of user skills within the workforce are found in Luxemburg (31%), Lithuania (25%), the UK (24%), Malta (23%), Denmark (23%), Sweden, Finland, Slovenia and Iceland (21%). The lowest rates are found in Turkey (9%), Romania (9%), Portugal (12%), Bulgaria and Greece (13%), Croatia (14%). Again, in most countries this rate has changed little over time. The proportion of ICT specialists ranges from less than 2% in Lithuania to around 5% in Finland, Sweden, Norway and the Czech Republic.

⁸ While the questions on skills analysed above usually do not stipulate a time period, but simply ask about accumulated experience and whether the individual has done any of the activities at any time of the past, skills, especially ICT skills, become quickly obsolete, therefore if one does not stipulate a time period it can not be determined whether the skill is actually still present. While three months is perhaps a shorter period than desirable, it nevertheless ensures the skill is actually present, being used and is strengthened by the evidence that most internet users go online every day, or at least every week.

⁹ The survey uses the OECD definitions of ICT user (basic + advanced) and specialist skills, as follows:
ICT specialists: they have the ability to develop, operate and maintain ICT systems. ICTs constitute the main part of their job – they develop and put in place the ICT tools for others.
Advanced users: competent users of advanced, often sector specific, software tools. ICTs are not their main job but a tool.

Basic users: competent users of generic tools (e.g. Word, Excel, Outlook, PowerPoint) needed for the information society, eGovernment and working life. Here too, ICTs are a tool, not the main job: OECD (2005), "New Perspectives on ICT Skills and Employment", OECD Digital Economy Papers, No. 96, OECD Publishing. <http://www.oecd-ilibrary.org/docserver/download/fulltext/5kz9hchrwc41.pdf?expires=1296469463&id=0000&acname=guest&checksum=324129B63568737AC7B713E3FDC52860>

The survey does not ask specific questions regarding individuals' ICT skills, but rather ICT skills are proxied by the percentage of persons employed within certain ISCO-88 job categories: <http://www.ilo.org/public/english/bureau/stat/isco/index.htm>

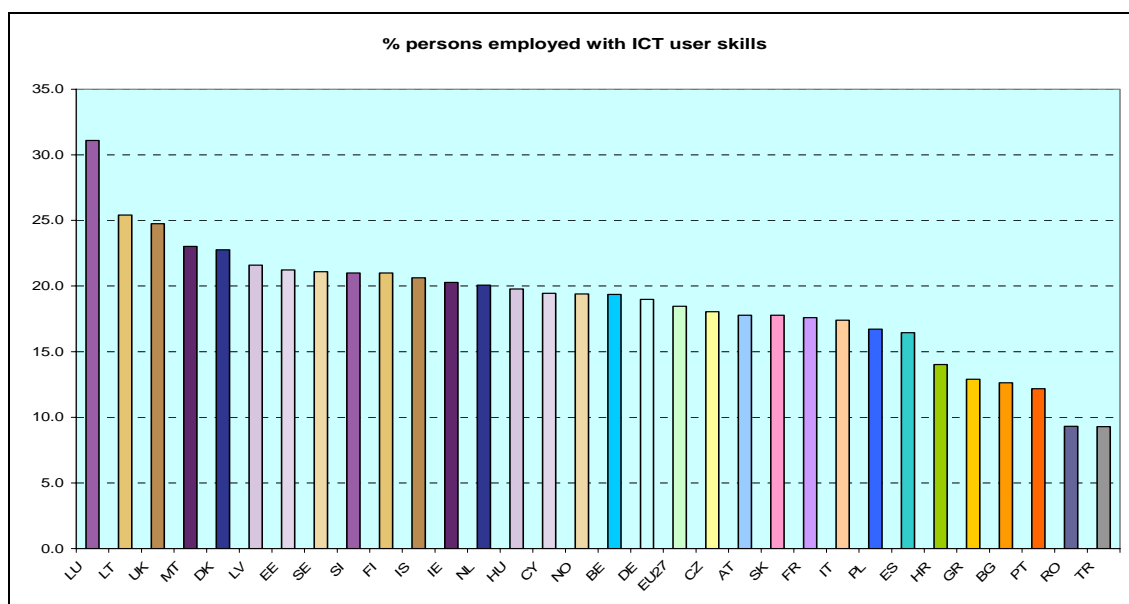
For ICT users the categories are: 121,122, 123,211, 212, 214, 241, 242, 243, 341, 342, 343, 411 and 412. For ICT specialists they are: 213, 312, 313 and 724.

As a result, these statistics do not strictly measure the ICT skills that individuals possess, but rather measure the skills that are used in employment. Therefore, in particular with regard to ICT user skills, these data are likely to underestimate the percentage of persons employed having ICT skills. In addition to this the ISCO-88 codes are from 1987 and thus do not take into account rapid changes in the working environment with regard to ICT. Recently, however, these codes were updated (ISCO-08) and they will come into use in the European Statistical System as of this year:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:292:0031:0047:EN:PDF>

¹⁰ See footnote 8.

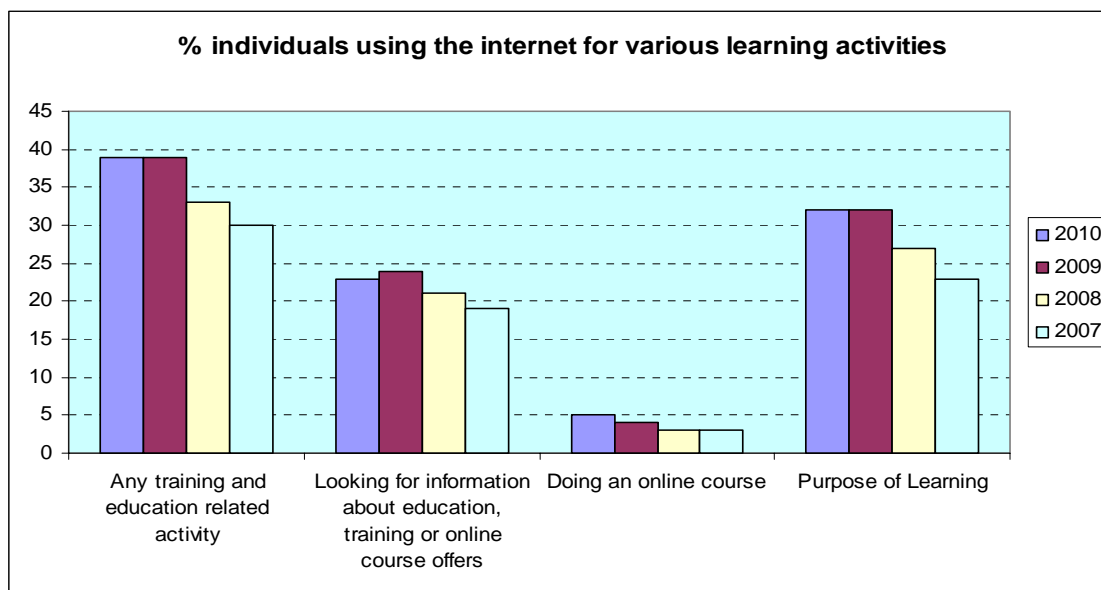
Figure 10: % persons employed with ICT user skills – 2010



Source: Eurostat European Labour Force Survey

Related to the area of **learning**, on average in the EU27 39% of individuals used the internet for any **training and education** related activity in 2010, the same as in 2009. In most countries, rates lie between 30 and 50% of individuals using the internet for this purpose. However, in Iceland, Luxemburg and Finland rates are at 70% or more. By contrast in Romania, Turkey and Bulgaria, they are below 20%. Looking at the specific items related to the above training and education indicator, 23% of individuals in the EU27 use the internet for **looking for information about education, training or online course offers**. Highest rates are found in Iceland (43%), Luxemburg and Denmark (40% each), but also in Spain (34%), Finland (33%), the Netherlands (32%), Malta (32%) and Norway (32%) rates are above 30%. The lowest rates are to be found in the Czech Republic (8%), Cyprus (9%) and Turkey (10%). In particular, the rate of individuals using the internet for this purpose has risen over the last year in Malta and Slovenia (+6pp. to 32% and 27%, respectively). **Doing an online course** remains an activity done by a minority (only 5% in the EU27). Although in Slovakia (32%) and Finland (14%, +1pp.) it is significantly more popular. Finally, the percentage of individuals in the EU using the internet **for the purpose of learning** lies at 32%. Rates are highest in Iceland (71%), Finland (67%), Luxemburg (65%), Norway (57%) and Denmark (56%) and lowest in Bulgaria (5%), Turkey (14%), Romania and Slovakia (17%, each).

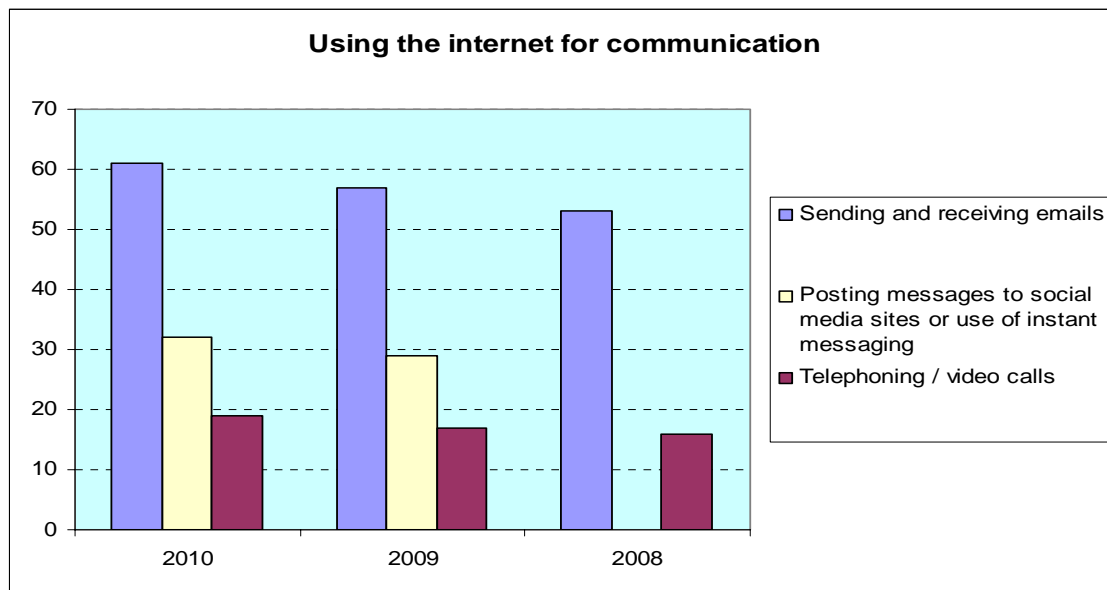
Figure 11: % individuals using the internet for training and education related activities



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

In terms of **communication**, sending and receiving emails, while always a popular activity continues to grow with the growth in internet users. According to 2010 data 61% of individuals use the internet for **sending and receiving emails**. The highest rates are to be found in the ICT advanced countries of Northern Europe: Iceland and the Netherlands (87% each), Norway (85%), Sweden (84%), Denmark (83%), and Finland (77%); as well as in Luxemburg (83%). In particular, France (+12pp. to 72%) and Slovakia (+9pp. to 70%) have exhibited large increases in email use in 2010. Lowest rates of use are in Turkey (27%), Romania (31%), Greece (32%), Bulgaria (35%), Croatia (40%), Cyprus (41%), Italy (43%) and Portugal (45%). In terms of **telephoning and video calls** over the internet, 19% of individuals in the EU27 did this in 2010, up from 17% in 2009. Interestingly, this activity is most popular in Slovakia (41%), Lithuania (39%), Latvia (35%), Estonia (34%), Iceland (33%) and Denmark (32%). It is least popular in Greece (10%), Spain and Portugal (13%), Italy, Slovenia and Croatia (14%) and Finland (15%). This shows a very different pattern of use to email and internet use generally. **Posting messages to chat sites, blogs, social networking sites, newsgroups, online discussion forum or use of instant messaging** increased from 29% in 2009 to 32% in 2010 for the EU27. This activity is most popular in Sweden (46%), Denmark (45%), Iceland (43%) and Finland (42%), but also in Poland (42%) and Lithuania (41%). Lowest rates are to be found in Romania (17%). Again this shows a very different cross-country pattern to general internet use and email.

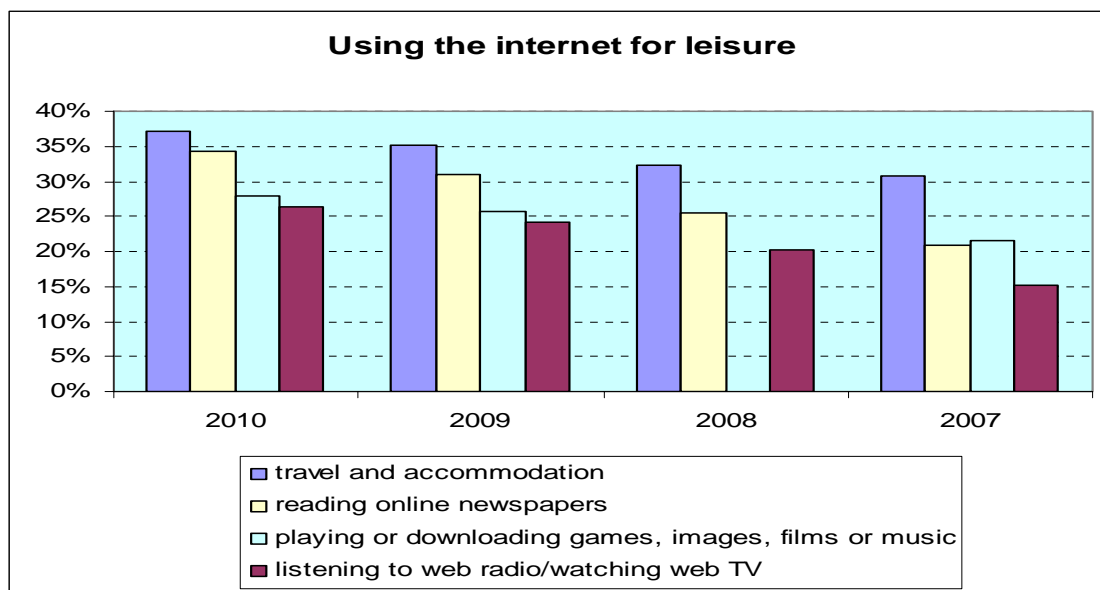
Figure 12: % individuals using the internet for various forms of communication



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

For the area **Leisure**, using the internet for **services related travel and accommodation** is the most popular of the leisure activities with 37% of EU citizens having used the internet for this purpose in 2010, up from 35% in 2009. In Denmark, Finland, Luxemburg rates are the highest at about 60%. At the other end of the scale the internet is used least for this purpose in Turkey (9%), Bulgaria (12%), Portugal (14%), Romania (16%) and Poland (17%). Next comes **reading online newspapers**, with 34% of individuals in the EU carrying out this activity in 2010, up from 31% in 2009. Of the EU and non-EU countries analysed, this activity is most popular in Norway (78%), Finland (74%), Estonia (66%), and Denmark (63%). It is least popular in Poland (17%), Bulgaria (20%), Ireland (21%), and France (21%). **Playing and downloading games, images, files or music** has reached 28% in the EU in 2010, up 2pp. from 2009. This activity is somewhat more popular in the advanced ICT countries of Northern Europe (IS, NO, FI and DK) as well as in Estonia, Luxembourg, Latvia and the Netherlands where rates are over 36%, and substantially less popular in Austria, Greece, Italy, Croatia and Turkey where they are below 20%. **Listening to web radio/watching web TV** is also an activity now performed by more than a quarter of the EU population (26% in 2010) and in some countries rates are above 50% (SE, NL, IS, NO). The lowest rates of use, around 15%, are recorded for Romania, Austria, Turkey and Italy.

Figure 13: % individuals using the internet for various leisure activities



Source: Eurostat Community Survey on ICT Usage in Households and by Individuals

For the last two aspects, **participation in society** and **collaborative networking**, there is currently no adequate data available. However, as of next year the household survey will include indicators of political participation online.

The data analysed in **this section has shown** that the most popular activities under each aspect exhibit cross-country patterns similar to diffusion rates for general internet use and email; However, some less diffused activities show quite a different pattern; with highest rates of use for certain activities, or highest rates of competence in these activities, being displayed in countries that are not necessarily the most advanced generally in terms of ICT. It has also highlighted the lack of appropriate data available for measuring certain aspects.

4.4. Personal attitudes

While we do not have direct measures of the personal attitudes required to be digitally competent, some can be proxied. In particular, responsible use is proxied by: "I use any kind of IT security software or tool (anti-virus, anti-spam, firewall, etc.) in order to protect my private computer and data". Confident use is proxied by online banking, as this activity requires both technical skill and trust, as well as buying goods and services online. Finally, creative use is proxied by data on the uploading self-created content and creation of web pages.

In the EU27, a majority of individuals use IT security software to protect themselves (60%), indicating a very high degree of **responsible use**. While rates are above 70 and 80% in some countries (NL, NO, IS, SE, FI, DK, UK, DE, FR and BE) in others (TR and RO) they are less than half the EU average (though still high relative to rates of internet users in those countries).

Internet banking is carried out by 36% of individuals in the EU, indicating that a majority of internet users in the EU are **confident users**. Highest rates are observed in the Nordic countries (NO, 83%; IS, 77%; FI, 76%; SE, 75%; DK; 71%), the Netherlands (77%) and

Estonia (65%). Lowest rates are observed in Bulgaria (2%), Romania (3%), former Yugoslav Republic of Macedonia (4%) and Turkey (6%). In particular, France saw a large increase in internet banking in between 2009 and 2010 (+11pp. to 53%), corresponding the large increase in regular internet use observed in this country over the last year. Similarly, 40% of individuals in the EU have ordered goods or services for private use in the previous 12 months. Highest rates are found in many of the Nordic countries (NO, 71%; DK, 67%; and SE, 65%) and the Netherlands and UK (both 67%). Lowest rates are in RO (4%), BG and TR (5%), LT (11%), EL (12%) and PT and IT (15%).

Finally, turning to **creative use**, 22% of individuals in the EU upload self-created content in 2010, showing that creative use by individuals is still only carried out by a minority (about 1/3) of internet users. Having said this, the figure has doubled in only two years. Highest rates of creative use are found in Island (41%), Latvia (39%), Denmark (37%), Luxemburg (35%), Hungary (34%) and the UK (32%). Relatively lower rates (around half the EU average or less) are observed for the Czech Republic (6%), Slovakia (9%), Greece (10%), Croatia, Poland and Turkey (11% each), and Malta and Bulgaria (12%). Furthermore, only 10% of individuals in the EU have created a web page. Highest rates are found in Iceland (34%), DK (23%), FI (19%), LU (18%), NL (17%), and SE and NO (16% each). Lowest rates are for TR and RO (1% each), CY (3%), BG, EL and IE (4% each), and CZ (6%).

Good proxies for **legal and ethical principles** and **critical/reflective attitude** are currently unavailable.

4.5. *eInclusion: the social inclusion perspective*

Thus far we have talked about digital competence from the cross-country perspective. However, the social inclusion aspect of digital competence is an important one. Many people belonging to disadvantaged social groups also tend to be disadvantaged in terms of their access to and use of the internet. While, ICT can offer such groups opportunities to help overcome their disadvantage, provided they have access to ICT and sufficient digital competence. As such the digital agenda has a target also for the use of the internet by disadvantaged people; namely to increase their regular use of the internet to 60% by 2015.

Data for 2010 show that the **regular internet use of the digitally disadvantaged**¹¹ has increased to 48%, from 42% in 2009. As such the above eInclusion target is well on the way to being achieved already after only one year. Furthermore, the improvement for this group is larger than that for the average population, showing that disadvantaged individuals are indeed catching up. Nevertheless, age and education still play a large role in determining internet use. While 90% of 16-24 year olds are regular internet users, only 46% of 55-64 year olds and 25% of those 65-74 fall into this category. Similarly, only 44% of the low educated, where as 90% of the high educated, use the internet regularly. Needless to say, rates of regular internet use by the low educated old (55-74) are extremely low (20%). While these are the main

¹¹ For the measurement of the Digital Agenda target, disadvantaged people include three main groups of individuals: those over 55 years of age, the low educated (ISCED 0-2), and those that are out of the labour market (the inactive, retired and unemployed). While other socially disadvantaged groups such as the disabled, those on low incomes, people living in thinly populated and women are also the target of eInclusion policy, these three groups constitute those which have been shown to be most disadvantaged in terms of their access and use of the internet and taking these three groups we are able to cover a large proportion of the eExcluded, as individuals often belong to more than one disadvantaged group.

determining factors, there are also important differences by employment status and population density. Also, other disadvantaged social groups such as those on low incomes, the disabled and those living in thinly populated regions are also affected.

Turning to the other aspects of digital competence, similar socio-economic patterns exist for **ICT access, basic use and operational skills** (in addition to regular internet use looked at above). Such differences also exist for the various internet activities included under "**active application to life**" or "**Advanced use**". Indeed these aspects were analysed in the 2010 digital competitiveness report and as such will not be analysed again in detail here. There it was found that, in addition to important divides related to age and education, while women exhibit similar rates of regular use and skills as men their level of skills tends to be low and medium – i.e. there is a significant gap in high level skills. Rather, we now turn to the analysis of "personal attitudes" by socio-economic group.¹²

As mentioned earlier, in the EU27 a majority of individuals used IT security software to protect themselves (60% in 2010), showing a high degree of **responsible use** (considering the group of internet users, the proportion is 84%). Interestingly, the youngest age group (16-24) are the most responsible with 79% doing so. By contrast only 43% of 55-64 year olds and 24% of 65-74 year olds do so. Similarly, there is a large education divide: the low educated are half as likely to protect themselves with IT security software than the high educated. Unsurprisingly, the low educated old are the least likely to protect themselves and are therefore putting themselves at a high level of risk and vulnerability. Regional differences and differences between the sexes are less marked.

There are also noticeable differences in **Creative use** of the internet by different social groups, in particular by age. 47% of those aged 16-24 upload self-created content. This falls to 10% for those aged 55-64 and to 5% for those aged 65-74. Education is also a factor, though differences are less (high educated 31%, low educated 16%). Finally, while employment status has an impact the main difference relates to students and economically inactive people. Students are more than twice as likely to upload creative content than employed or unemployed people. Also the inactive are less than half as likely to upload content than the employed/unemployed. These differences are mainly related to age. With regard to individuals who have created a web page, while 22% of those aged 16-24 have done so, the figure falls to 4% for those aged 55-64 and 1% for those aged 65-74. Again education also matters: while 17 % of the highly educated have created a web page, only 7% of the low educated have done so. Again, while employment status matters, with student exhibiting the highest rates and the inactive the lowest, as above this mainly relates to age. Other factors, such as gender, types of region et; also show differences, but they are less marked.

5. SUMMARY AND CONCLUSIONS

This chapter has looked at recent evidence on the digital competence, "...the confident and critical use of ICT for work, leisure, learning and communication", of the EU population.

The evidence shows that rates of **access to computers and the internet** have reached around 70%, and in some more advanced ICT countries they are up to 90% and still growing. Nevertheless, countries at the bottom of the access table have less than 50% access and risk

¹² Here we only look at responsible use and creative use as it is considered that the proxies for confident use are not reliable enough to allow for detailed analysis by socio-economic groups.

being left behind in the digital economy. Most access to the internet is via computers, though again in advanced countries access is also spreading to other devices such as mobile phones and games consoles as well. On the whole, interest in having an internet connection has risen substantially, though on average in the EU lack of interest is the biggest reason for not having an internet connection. This is followed by lack of skills. Lack of skills has marginally increased in importance since 2009 and in a number of countries it is by far the main reason. Access and equipment costs are still important in some countries.

In terms of basic use/operational skills, **regular use of the internet** has increased from 60% in 2009 to 65% in 2010 for the EU27. This means that the target set in the Digital Agenda for reaching 75% regular internet use by 2015 is well on track. There remain large difference in regular internet use of the most advanced and least advanced countries and little has changed at the extremes. However, some average performers have made substantial increases in the last year. A similar pattern can be seen for computer use, which is unsurprising given that most internet access occurs via a computer. Non-use of the internet has also decreased substantially over the last year. Non-use fell to 26% in 2010, from 30% in 2009. Again this represents a strong contribution to achieving the Digital Agenda target of halving the proportion of the population that has never used the internet by 2015 (to 15%). Nevertheless some countries still have over 50% of the population that have never used the internet.

72% of the EU population now has some level of **internet skills**, substantially up from 60% in 2007. Large increases were made in a number of countries, including some of those with the lowest rates of skills, showing that some catch-up is occurring. Even the more advanced countries have increased their rates of internet skills. On average, rates of low and medium level skills reflect patterns in regular internet use across countries. However, for higher level skills the pattern is more mixed.

Evidence on the digital competence aspects related to active application to life or "advanced use" show that, with regard to the area of **work**, 18.5% of employed persons have ICT user skills. Rates vary between 31% in Luxemburg to 9% in Turkey. In most countries this rate has changed little over time. Though there are measurement issues here. In terms of **learning**, using the internet for any education and training activity (39%) and in particular for the purpose of learning (32%) are popular activities. Looking for any information of education or training or course offers is less popular (23%) and doing a course online is still only performed by a small minority (5%).

With regard to **communication**, sending and receive emails is the most popular activity, with the highest rates observed in the ICT advanced countries of Northern Europe, as well as Luxemburg, though France and Slovakia have made substantial increases in the last year. Posting messages to social media sites or use of instant messaging is also becoming more popular, especially in a few countries (SE, DK, FI, LT, PL). Telephoning and making video calls is less. However, in the Baltic countries and Denmark it is significantly more popular than the average. The pattern across countries in the latter two indicators shows a very different one to general internet use and email, illustrating the importance of the multifaceted approach to measuring digital competence.

Use of the internet for **leisure** is popular in the EU; especially for using services related to travel and accommodation, but also for reading online newspapers as well as playing and downloading games, images, files or music. Even listening to web radio and watching web TV is becoming more popular. Highest rates of use for these various leisure activities tend to be in the ICT advanced countries of Northern Europe and Luxemburg.

In the final area of **personal attitudes**, it can be seen that in Europe levels of **responsible attitude** seem quite high, with the majority of individuals using IT security software to protect themselves online. Very high rates are seen in some advanced ICT countries. However, very low rates are apparent in countries like Romania and Turkey. A majority of internet users can be considered to be **confident users**, as proxied by the rates of use of online banking and buying online. The highest rates of confident users can be found in the Nordic countries, the Netherlands and Estonia. The lowest rates are observed in Bulgaria, Romania and Turkey. Finally, **creative use**, by individuals is still only carried out by a minority (about 1/3) of internet users. Highest rates of creative use are found in Latvia, Denmark, Luxemburg, Hungary and the UK; though, even here, rates are below 40% of the population.

Turning now to the issue of **eInclusion**, the 2010 data show that there remain strong socio-economic differences in access and use of computers and the internet, as well as for skills; for the most part along the lines of age, education and employment status. However, improvements are being made. In particular, in the last year, regular use of the internet by disadvantaged people increased to 48%, from 42% in 2009. As such, the Digital Agenda target for increasing the regular use of the internet by disadvantaged people to 60% by 2015 is well on track. Looking in more detail at the aspects of digital competence relating to "personal attitudes", it can be seen that, in particular, the young exhibit high levels of responsible attitude. Conversely, older cohorts show lower levels of responsible attitude. Finally, creative use shows a strongly declining age structure.

As such it can be seen that, there are still strong divides in digital use and competence in Europe both across countries and along socio-economic lines, though improvements are being made. In countries showing the lowest levels of digital competence, more needs to be done to bring individuals online. Rates of access and use are low and large proportions of their populations report lack of skills, costs and/or lack of interest as barriers to access. Those with higher rates of access and use also tend to score better on other indicators of digital competence. Though the picture is not uniform, for some aspects reflecting higher skills needs a different pattern can be observed. With regard to socio-economic divides the age and education divides remain dominant: the younger more educated are generally more digitally competent. Also, women generally have lower levels of operational ICT skills. In terms of personal attitudes necessary to be digitally competent, the young show the highest levels of responsible attitude. While they are also the most creative users of the internet, this is underdeveloped. These aspects in particular therefore deserve attention in the development of digital competence of young people. At the other end of the scale, levels of digital competence in the older/less-educated are extremely low and getting these people online remains a challenge that will need different strategies than for younger people.

Annex:

Definitions of Digital literacy, eSkills and Media literacy

Digital Literacy

In practical terms digital literacy is often taken as synonymous with basic operational ICT skills. However, in the academic literature it is taken more broadly. In particular, according to Prof. David Bawden¹³, the concept of digital literacy was introduced by Paul Glistner in his 1997 book of the same name.¹⁴ The definition he provided was: "*Digital literacy is the set of attitudes, understanding and skills to handle and communicate information and knowledge effectively, in a variety of media and formats.*" According to Bawden, Glistner's idea was broad and did not involve the enumeration of lists of particular skills, competences and attitudes but rather he explained the concept generally, as an ability to understand and use information from various digital sources, regarding it simply as literacy in the digital age.

eSkills

e-Skills is the term that has been adopted by the Commission to refer to ICT skills in the workforce and relates to the European Commission Communications "An Agenda for new skills and jobs: A European contribution towards full employment"¹⁵ and "E-Skills for the 21st century: Fostering Competitiveness, jobs and Growth"¹⁶. In its synthesis report of 2004, the European e-Skills Forum, building on the activities of the Career Space initiative, adopted a definition of the term *e-skills* covering three main categories:

- *ICT practitioner skills*: the capabilities required for researching, developing, designing, strategic planning, managing, producing, consulting, marketing, selling, integrating, installing, administering, maintaining, supporting and servicing ICT systems.
- *e-business skills*: the capabilities needed to exploit opportunities provided by ICT, notably the Internet; to ensure more efficient and effective performance of different types of organisations; to explore possibilities for new ways of conducting business/ administrative and organisational processes; and/ or to establish new businesses.
- *ICT user skills*: the capabilities required for the effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work. User skills cover the use of common software tools and of specialised tools supporting business functions within industry. At the general level, they cover "digital literacy".¹⁷

¹³ Source: http://www.scitopics.com/Digital_Literacy.html

¹⁴ Glistner, P. (1997), Digital literacy, New York NY: Wiley.

¹⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0682:FIN:EN:PDF>

¹⁶ http://ec.europa.eu/enterprise/sectors/ict/files/comm_pdf_com_2007_0496_f_en_acte_en.pdf

¹⁷ E-Skills for Europe: Towards 2010 and Beyond:

http://eskills.cedefop.europa.eu/download/synthesis_report_esf_2004.pdf

Thus, while *ICT practitioner skills* and *e-business skills* can be considered as more specialised ICT skills, ICT user skills are closer to the more general concept of digital literacy.

Media Literacy

The European Commission defines *Media literacy* in the following terms:

*"Media literacy relates to the ability to access the media, to understand and critically evaluate different aspects of the media and media context and to create communications in a variety of contexts."*¹⁸

*"Media literacy relates to all media, including television and film, radio and recorded music, print media, the internet and all other new digital communication technologies."*¹⁹

¹⁸ Commission Recommendation on Media Literacy in the digital environment for a more competitive audiovisual and content industry and an inclusive society (August 2009):

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:227:0009:0012:EN:PDF>

¹⁹ *Media Literacy Active citizenship in today's information society:*
http://ec.europa.eu/culture/media/literacy/docs/media_literacy_leaflet_en.pdf

Pillar 7:

ICT enabled benefits for EU society: eGovernment

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1. Introduction

The annual “EU eGovernment Benchmark Report”¹ has historically provided a measurement of progress in the deployment of eGovernment solutions across Europe through the indicator of **full online availability** of a basket of 20 basic services². The indicator measures what percentage of these basic services can be processed entirely online³ (i.e. without any need of further offline interactions). Although this indicator gives an incomplete picture of the development of eGovernment across the EU, it provides a general idea of its progress over time: in 2010 82% of services were fully available online compared with 69% in 2009 in the EU27+⁴ (84% in 2010 and 73% in 2009 for the EU27). Growth has quite kept the pace of previous years slowing just a bit since the approaching of business services toward a situation of full saturation, where half of the countries considered (i.e. 16 over the 32 composing the aggregate EU27+) have already reached 100 % availability. On the contrary, citizens’ services have displayed a growth larger than in the past years reaching 78% availability closer to the 89% availability shown by business services in EU27+ (81% and 89% respectively in EU27).

Currently, all the 20 basic services are fully available online in six countries (IE, IT, MT, AT, PT, SE) compared to three in 2009, and at least four fifths of the basic services are fully available online in 18 countries out of 32 countries considered.

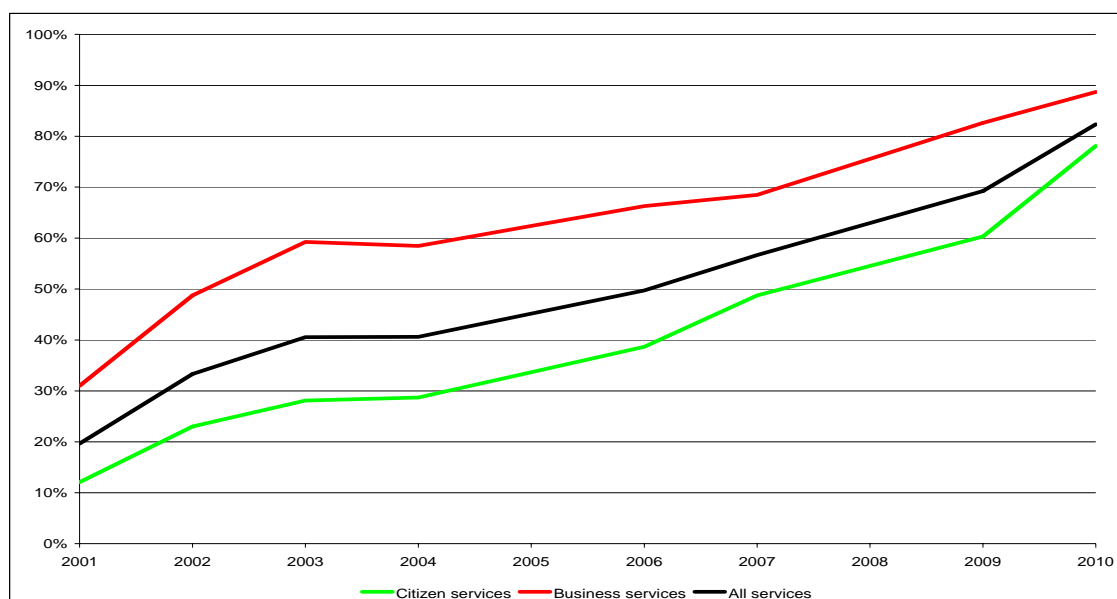
¹ See footnote 5

² ‘Basic’ refers to the 20 services (12 for citizens, 8 for businesses) used to benchmark the online availability of public services (full definition in the 9th eGovernment Benchmark Report, see previous footnote 1). These are: income taxes, job search, social security benefits, personal documents, car registration, building permissions, declaration to police, public libraries, certificates, enrolment in higher education, announcement of moving, health-related services (citizens), social contributions, corporate tax, VAT, company registration, statistical data, customs declaration, environment-related permits, public procurement (businesses).

³ It corresponds to level 4 and above on the sophistication indicator explained below (see footnote 6).

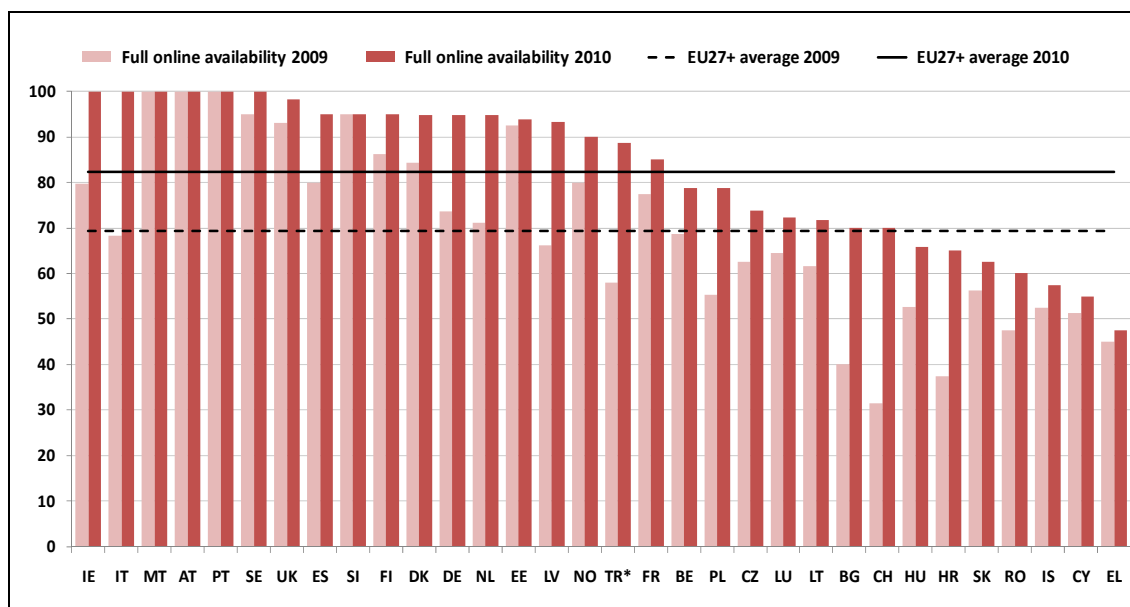
⁴ The EU27+ aggregate includes the EU27 Member States plus Iceland, Norway, Switzerland, Croatia and Turkey

Figure 1: Full online availability trend 2001-2010 timeline for EU27+



Source: CapGemini 'Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement', 2010⁵

Figure 2: Full Online availability ranking, 2009-2010 (in %)



Source: CapGemini 'Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement', 2010. * Turkey past data refer to 2007 instead of 2009

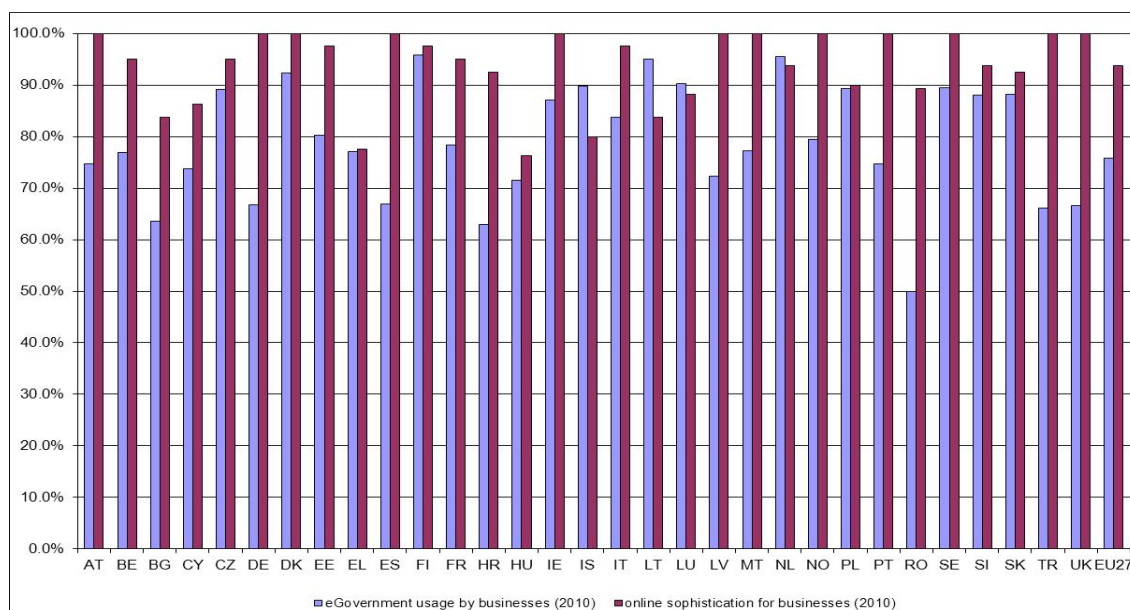
⁵ This publication constitutes the 9th edition of the European Commission's eGovernment Benchmark Report prepared by CapGemini and available at the following link:
http://ec.europa.eu/information_society/newsroom/cf/item_detail_dae.cfm?item_id=6537

2. eGovernment for businesses

The provision of eGovernment for businesses reached a very high level of sophistication⁶ in 2010 (94% in EU27+). One major driver for eGovernment for businesses is the Services Directive (2006/123/EC) that requires Member States to allow businesses to complete, through so-called "Points of Single Contact", all procedures and formalities relating to access to a service activity and to the exercise thereof. The implications of this in policy, collaboration, procedural, operational and technical terms are profound and have impact on all tiers of administration.

Some basic services like social contributions for employees, submission of data to statistical offices, custom declaration, VAT declaration and corporate tax declaration are available in all or nearly all the EU27+ countries. Reaching efficiency in these services often means reaching a higher compliance on declarations and payments which is in the interest of public administrations. Therefore, it is no surprise that these services are more developed than others. On the contrary, some services like company registration and the obtention of environment-related permits lag behind, notwithstanding their importance for a healthy business environment.

Figure 3: Supply vs. take-up -- businesses



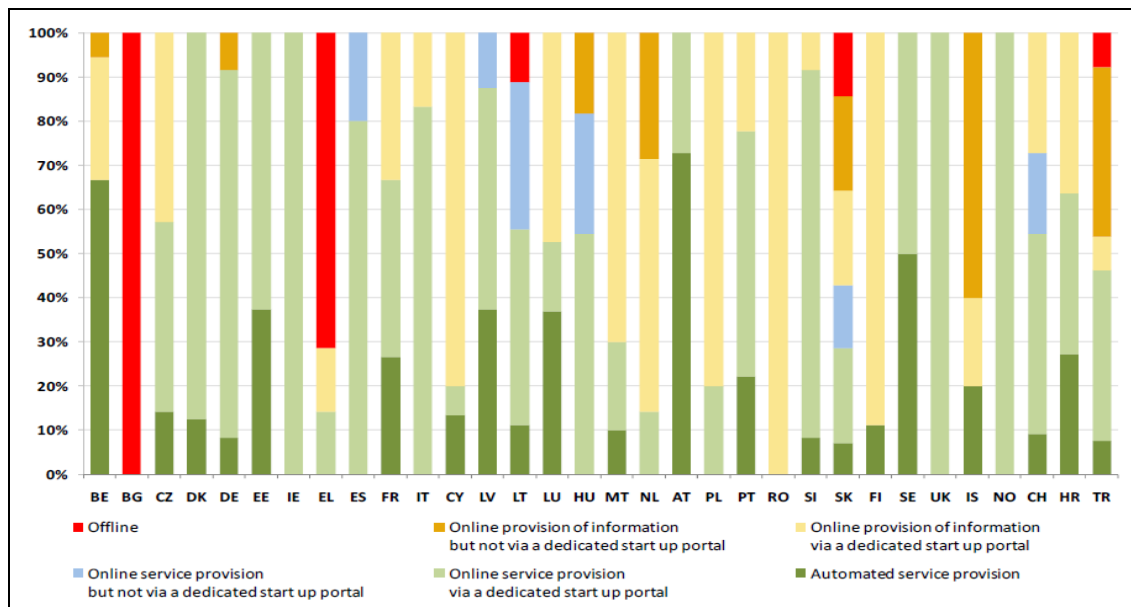
Source: CapGemini 'Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement', 2010 and Eurostat, Community Survey on ICT Usage and eCommerce in Enterprises, 2010.

The different degree of online availability (at the information stage or at the delivery stage) either through different websites or through a centralised portal of bureaucratic procedures necessary for starting up a company is shown in Figure 4. Most of the EU27+ countries are still distant from providing a centralized online access to all the services/procedures needed to start up a company, with only seven of them (AT, SE, EE, DK, UK, NO, IE) guaranteeing

⁶ Sophistication is an indicator that measures the degree of interaction possible between the citizen and the PA on the delivery of a given service. It consists of 5 possible levels: information about the service: one-way interaction (downloadable forms), two-way interaction (electronic forms), transaction (full-electronic case-handling), personalisation (pro-active, automated).

online provision of all the procedures through a single portal. However, many countries have shown good progress and 22 out of 32 provide the majority of procedures through a single web portal.

Figure 4: Starting up a company: percentage of procedures available online and/or through a web portal

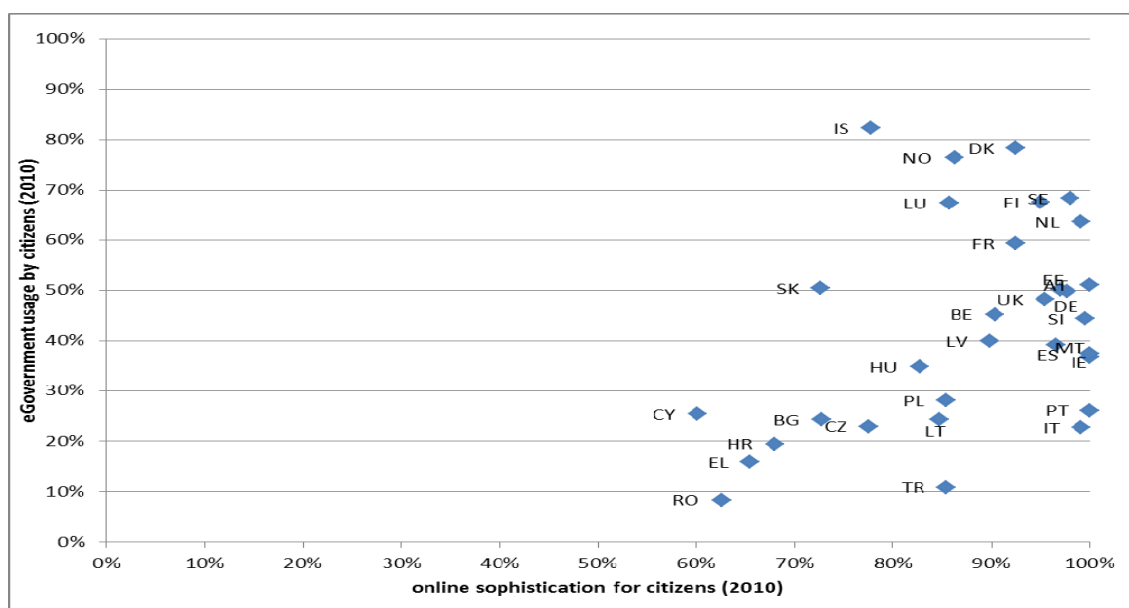


Source: CapGemini 'Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement', 2010

3. eGovernment for citizens

As previously mentioned, the supply of online public services for citizens has shown great progress in 2010, and this is reflected in a sophistication score of 87% compared to 78% in the previous year for the EU27+ (89% and 80% respectively for the EU27). However, take-up by citizens remains quite lower than that of businesses, and this reflects in great part the lower usage of Internet by citizens. In 2010 on average 41% of EU27 citizens have used the Internet for interaction with the public authorities, which meant an increase of 3 percentage points over the previous year, which, if current trends persist, could be quite on track for the European Digital Agenda target of 50% of eGovernment users by 2015. However, there is still a great dispersion in usage rates with the gap between the best performer (Iceland) and the worst performer being as large as 74 percentage points (Figure 5).

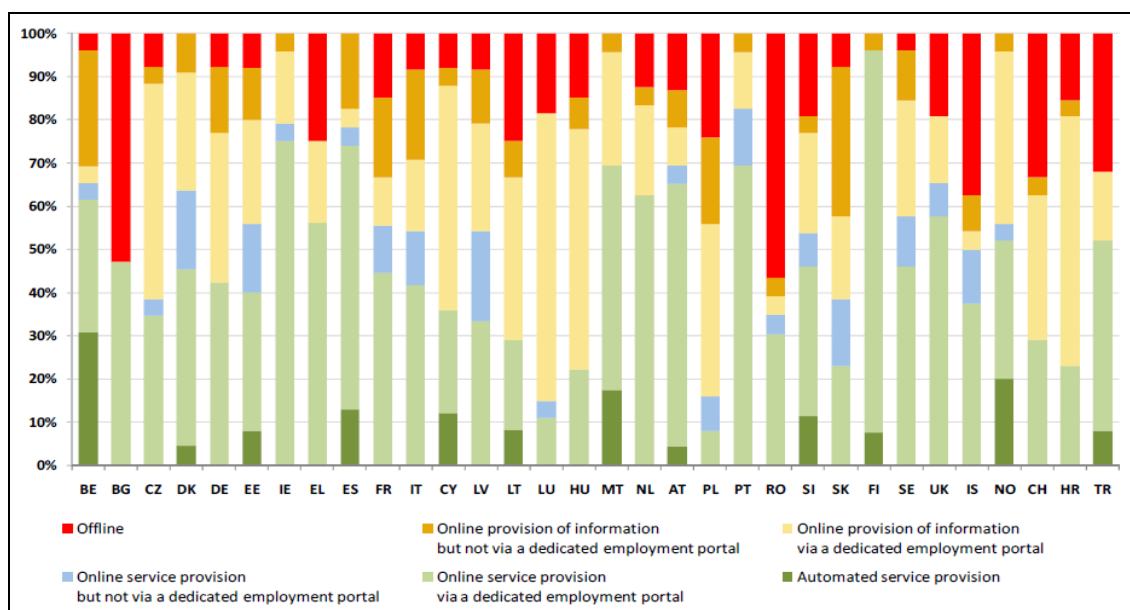
Figure 5: Supply vs. take-up – citizens



Source: CapGemini 'Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement', 2010 and Eurostat, Community Survey on ICT use in Households and by Individuals, 2010.

The usage is influenced not only by availability but also by usability of a service or of a set of services for a given purpose. In the current economic situation it could prove extremely helpful to the unemployed having easy online access to a series of services to sustain him/her during the unemployment period (e.g. registering for unemployment benefits or additional benefits) and getting him/her back to work (e.g. assistance in creating a CV, job search) without having to lose time and resources travelling from one public administration to the other. On average, EU public administrations still display a fragmented offer for the unemployed (Figure 6), with only one country (FI) providing almost all needed services through a centralized portal and other five countries providing more than two-thirds of them (IE, ES, MT, PT, AT).

Figure 6: **Loosing and finding a job – percentage of procedures available online and/or through a web portal**



Source: CapGemini 'Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement', 2010.

eGovernment is an online service that has a low frequency of use for citizens compared to other services accessible via Internet like eBanking and eCommerce: some citizens for example use it in an interactive way only once a year for their tax declaration, while other events that justify its use are even rarer (e.g. renewal of a passport). For that reason in the last three years Eurostat collected statistics on eGovernment usage both in the last 3 months (historical series) and in the last 12 months. In Table 1 these two statistics are shown for the EU27 aggregate as percentage of Internet users over the same period. The enlargement of the temporal window allows a better measure of the actual use of eGovernment by capturing a higher proportion of infrequent users. Indeed, while in the last 3 months only 46% of Internet users used eGovernment services, over the last full year its usage rose to 58% of Internet users. Contrary to the 3 month figure, the 12 months usage figures show a marked improvement over the years in the use of eGovernment, both in terms of basic activities like information search and in terms of more interactive uses like sending filled forms. A likely explanation is that the 3 months chosen for the survey probably do not fall in a period of bureaucratic obligations in many countries and therefore improvement in use goes mostly unperceived by that statistics. For these reasons, the 12 months statistics has a better performance measuring the actual usage of eGovernment than the 3 months statistics, and therefore it will be the only one maintained in the coming years.

Table 1: Use of Internet for various kinds of interaction with public authorities in the last 3/12 months as a % of Internet users

Values as % of people which used the Internet in the last 3 months	2008	2009	2010
I have used Internet, in the last 3 months, for obtaining information from public authorities web sites	41.3%	42.2%	40.7%
I have used Internet, in the last 3 months, for downloading official forms	25.8%	26.8%	25.9%
I have used Internet, in the last 3 months, for sending filled forms	19.0%	19.5%	19.3%
I have used Internet, in the last 3 months, for interaction with public authorities ⁷	45.8%	46.2%	45.8%
Values as % of people which used the Internet in the last 12 months	2008	2009	2010
I have used Internet, in the last 12 months, for obtaining information from public authorities web sites	49.9%	51.2%	52.5%
I have used Internet, in the last 12 months, for downloading official forms	34.4%	36.1%	37.4%
I have used Internet, in the last 12 months, for sending filled forms	25.3%	26.3%	29.4%
I have used Internet, in the last 12 months, for interaction with public authorities ⁸	54.0%	55.8%	57.9%

Source: Eurostat, Community Surveys on ICT use in Households and by Individuals.

4. Local dimension of eGovernment

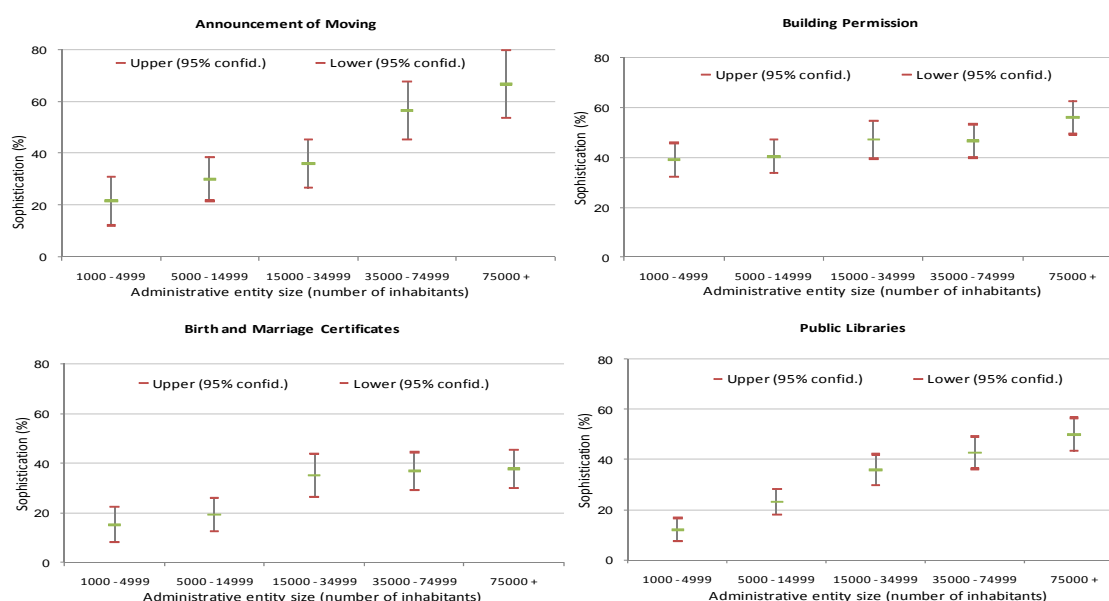
Some eGovernment services are provided predominantly at local level i.e. on the websites of local authorities (municipalities and the like), as a reflection, in the vast majority of cases, of a country administrative structure. The level of sophistication of the services most frequently provided at the local level across the EU, is clearly correlated with the size of the administrative entity (i.e. the resident population) providing the service (Figure 7).

A similar pattern of correlation can be observed on the usage side (Table 2): thinly populated areas display a substantially lower amount of eGovernment use with respect to central areas (8 pp. lower), even accounting for the lower Internet use (since the figure is in % of Internet users). These similar patterns in the supply and demand of eGovernment services according to population density do not necessarily mean causation in one sense rather than the other (if there were causation at all): they could signal a higher propensity, for people living in small communities, for face-to-face interaction with civil servants, with the administrations adjusting investment to the reduced demand. This way, however, there is a failure of public administrations to act in a pro-active way, amplifying the range of possible eServices available to the citizen and making a stronger case for Internet use.

⁷ This variable is a derived variable of the previous three variables: it scores positively when at least one of the former three scores positively. For that reason its value is not the sum of former three values.

⁸ See previous note

Figure 7: Mean score at NUTS level 4 and 5b by administrative entity size-category



Source: CapGemini 'Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement', 2010.

Table 2: Use of Internet for interaction with public authorities in the last 12 months as a % of Internet users

	2009	2010
living in densely populated areas	58.6%	60.7%
living in intermediate populated areas	54.2%	57.6%
living in thinly populated areas	51.3%	52.4%

Source: Eurostat, Community Survey on ICT use in Households and by Individuals.

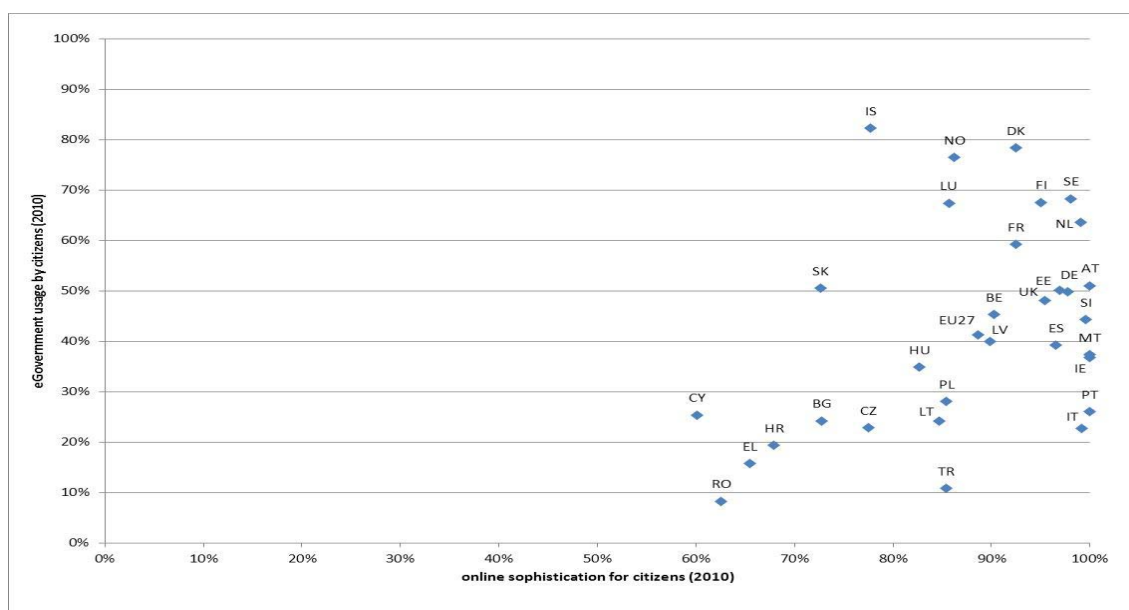
5. Electronic procurement

Public procurement provides an important economic opportunity for many European firms, with some of them obtaining the majority of their revenues from public tenders. A well-functioning public procurement system is therefore vital for the competitiveness of the ecosystem of many European firms and for the efficiency of public administrations. Accessing procurement notices or submitting tenders by electronic means could widely increase the number of potential participants to a tender and improve transparency across the market. This could favour the most competitive enterprises and, at the same time, be a source of cost savings for the public administration. Figure 8 gives a summary view of the status of eProcurement deployment in EU27+ countries in 2010. Two indicators are shown: the Visibility Benchmark that monitors the use of eProcurement solutions in a sample of 791 contracting authorities; and the Availability (pre-award) Benchmark, which monitors the degree of sophistication in terms of available services (i.e. eNotification, eSubmission,

eAward) and their sub-components over 67 eProcurement platforms. The top right corner of the chart could well represent the first target set in Manchester declaration in 2005: “by 2010 all public administrations across Europe will have the capability of carrying 100% of their procurement electronically”. The results show that the two indicators are generally quite correlated, and that there are mainly two clusters of countries: one with already some advanced eProcurement deployment and the other lagging somewhat behind. The first Manchester target has not been reached but a few countries are very close indeed. Similar conclusions were drawn by the ex-post evaluation of the 2004 EU Action Plan for e-procurement⁹.

However, progress towards the second Manchester target, relating to the effective use of electronic procurement¹⁰, is slower. The evaluation found that whilst technology is mature and successful e-procurement platforms are being established in many regions and Member States, use remains lower than expected. In 2010, high use was noted in countries such as Portugal and Lithuania who have introduced certain mandatory requirements for the use of electronic means; otherwise it was estimated that less than 5% of total procurement budget in the first mover Member States was being awarded electronically.

Figure 8: eProcurement Availability and Visibility Benchmark 2010



Source: CapGemini ‘Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement’, 2010.

⁹ Evaluation of the 2004 Action Plan for electronic procurement available at:

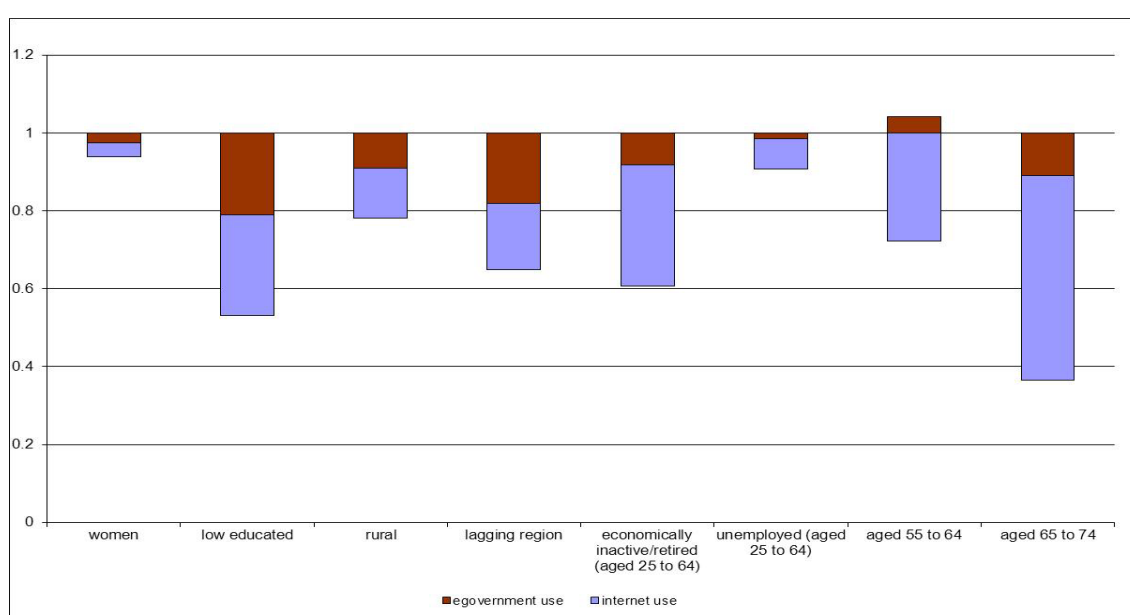
http://ec.europa.eu/internal_market/consultations/docs/2010/e-procurement/evaluation-report_en.pdf

¹⁰ The second Manchester target states that “By 2010 at least 50% of public procurement above the EU public procurement threshold will be carried out electronically”

6. Usage of eGovernment by different socio-economic groups

A disparity indicator for eGovernment use¹¹ (Figure 9) shows that once the different patterns of Internet use have been factored in, there is no clearly discernable ‘digital divide’ in eGovernment use among Internet users belonging to traditional groups at risk of exclusion. Indeed, the various groups have a usage only slightly below the population average, while the 55-64 age group shows even greater usage of eGovernment services than the average population. The main category at risk of exclusion from eGovernment usage (as well as from Internet use) is the low-educated. This could signal that people with a low education may lack the skills for the use of ‘advanced services’. The low usage of eGovernment for people in lagging regions could be explained by both a larger share of low educated people in these regions and by the lower availability of eGovernment solutions in these regions.

Figure 9: Disparity indicator for use of the Internet for eGovernment services in the last 12 months. Decomposition of Internet use effect and eGovernment use effect (2010, EU-27).



Source: Commission services on the basis of Eurostat, Community Survey on ICT use in Households and by Individuals, 2010.

7. Conclusions

The take-up of eGovernment in 2010 has reached 41 % of the EU population and, given the current trends, could be quite in accord with the target of the Digital Agenda of 50% of population using it by 2015. Furthermore, interactive use is on the rise with a rate of 21% (the Digital Agenda target is a 25% interactive usage rate by 2015)¹². Although a basic set of

¹¹ This eGovernment disparity indicator is calculated as the proportion of eGovernment users in various groups over the proportion of eGovernment users in the population. Therefore, a value of 1 would indicate that the group concerned had a usage pattern equal to that of the population at large, while values closer to zero would indicate significant disparities in use. The groups not using eGovernment are further split into two subgroups: people who do not use the Internet (and therefore do not use eGovernment services either) and Internet users who do not use eGovernment services.

¹² This interactive use mentioned in the text refers to the percentage of citizens returning filled in forms through the Internet. The Digital Agenda target requires that, at least more than half of eGovernment users should be returning filled in forms. Combining the target for eGovernment use (50% of the population) with that requirement makes for 25% of interactive use.

online public services is now widely available across the vast majority of EU countries, when looking at more advanced modes of service provision, like the combined provision of different services for a specific need (like starting a company or getting unemployed), the situation is less rosy, with many Member States still reasoning in terms of closed silos. The new eGovernment Action Plan includes as one of its pillars ‘User Empowerment’, which stresses the development of services built around user needs, with a high degree of personalisation and monitoring from the users, and seeking users’ collaboration and advice for their improvement. Therefore, public administrations should not be too complacent for the progress made so far and improve their organisational processes in order to meet these ambitious objectives. This way they will contribute to a much more interactive and conscious use of eGovernment services by EU citizens toward and possibly well over Digital Agenda targets, greatly reducing also current disparities based on education and location.



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COMMISSION STAFF WORKING PAPER

Digital Agenda Scoreboard

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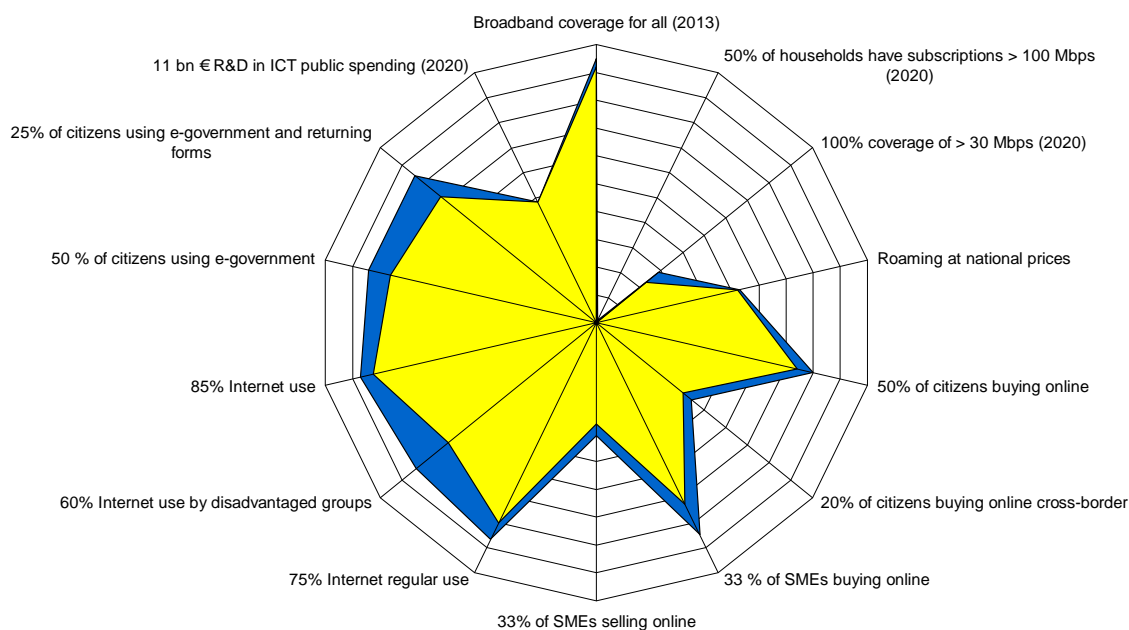
Digital Agenda Scoreboard

1. Key messages

In May 2010, the European Commission adopted the Digital Agenda for Europe¹ (DAE), a strategy to take advantage of the potential offered by the rapid progress of digital technologies. The DAE is part of the overall Europe2020 strategy for smart, sustainable and inclusive growth.

The Digital Agenda contains commitments to undertake 101 specific policy actions (78 actions to be taken by the Commission, including 31 legal proposals, and 23 actions proposed to the Member States) intended to stimulate a virtuous circle of investment in and usage of digital technologies. It identifies 13 key performance targets to show whether Europe is making progress in this area.

Chart 1: How the EU scores on the Digital Agenda targets



Yellow = 2010, blue = 2011. Labels refer to targets; outer line is 100% achievement; targets refer to 2015 unless otherwise stated; 20% reduction in energy use not included²

In order to chart the progress of both the announced policy actions and the key performance targets, the DAE calls for the publication of an annual scoreboard. This document is the first

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

² Work is currently ongoing to establish a baseline and identify the real contribution of digital technologies to reducing overall energy use.

scoreboard, reporting on the progress of the DAE actions — and only those — between May 2010 and May 2011. It is accompanied by a series of online publications looking in more detail at specific aspects of the Digital Agenda, such as eGovernment or online trust and security³. They can be found, together with a full overview of all 101 policy actions, on the scoreboard website: http://ec.europa.eu/information_society/digital-agenda/scoreboard/index_en.htm.

Regarding the policy actions, the Commission completed ten actions on schedule, plus one ahead of schedule. Six have been delayed, and are all now scheduled for 2011. In addition, preparatory work on actions planned for 2011 and 2012 has advanced adequately.

Progress in achieving the key performance targets has been promising but mixed. On the positive side, regular Internet usage has risen rapidly, including among disadvantaged groups, as has sporadic use, leaving fewer and fewer non-users. Citizens use eGovernment more and more, including interactively, and are rapidly taking to buying online, as are SMEs. Basic broadband is increasingly available even in the remotest corners. Finally, the market share of LED lighting is expanding swiftly. In all these areas, the targets will be met early if current trends persist.

On a couple of other targets progress is insufficient, albeit real. Citizens' uptake of cross-border eCommerce is barely growing. SMEs are only gradually starting to sell online. Access and subscriptions to very high-speed broadband remain concentrated in few places for the moment. Roaming prices have fallen, but only slowly. And public investment in R&D has not risen. In all these areas, the targets will not be met if current trends persist.

2. Involving stakeholders

From the outset, the Commission has strongly emphasised the governance of the Digital Agenda, in particular cooperation with Member States and engagement of stakeholders. Member States have been invited to join a High-Level Group to provide overall guidance to the Digital Agenda process as well as advice on specific policy actions and implementation measures. They have been actively supporting the Commission's work and ensuring coherence between EU actions and national activities.

Stakeholders such as consumer groups and industry representatives have been involved from the beginning. They have participated in various workshops and conferences and have developed a number of concrete ideas. Some of those will be taken up at the Digital Agenda Assembly, to be held in Brussels in June 2011 (http://ec.europa.eu/information_society/digital-agenda/daa/index_en.htm).

In 2010, the Commission launched an outreach initiative in Member States, called 'going local', which consisted in visiting all Member States for meetings and discussions with stakeholders. The objective of this initiative was to raise awareness of the Digital Agenda, to allow local stakeholders to express their opinions on the Commission's proposals, and to enhance the community of interest at national, regional and local level.

The 'going local' initiative mobilised close to 2000 stakeholders, and the feedback from participants was overwhelmingly positive. It also led to the translation of the DAE into local

³ The content of these online publications corresponds to what used to be published in the annual Telecom Implementation Reports and Digital Competitiveness Reports.

and regional integrated ICT strategies. Therefore, for the end of 2011, the Commission is planning another round of country visits, this time with a more thematic focus taking into account the situation in the Member State visited.

3. Key policy actions in the first year

The Digital Agenda is based on the concept of a virtuous circle, where infrastructure, innovative services and content complement each other. The 101 policy actions — structured in 7 pillars — are designed to remove obstacles that prevent this virtuous circle from becoming effective.

The present Scoreboard only addresses policy actions planned for the last twelve months in the Digital Agenda. A number of other initiatives complementing the Digital Agenda have been undertaken by the European Commission, but will not be addressed in this report.

A vibrant digital single market

The Internet is borderless, but online markets, both globally and in the EU, are still separated by multiple barriers affecting not only access to pan-European telecom services but also access to what could be global Internet services and content. These barriers — both legal and non-legal — lead to varying user experience and substantial costs for service providers.

The importance of taking action to realise the digital single market is also reflected in the Single Market Act action plan, adopted by the Commission on 13 April 2011⁴, which sees in the digital single market one of the twelve key levers through which the untapped potential of the single market can be unlocked to generate smart, sustainable and inclusive growth.

An extensive public consultation in 2010⁵ launched the evaluation of the impact of the existing eCommerce Directive, against the background that consumers and businesses alike have difficulties accessing online shops and services in other EU countries. Following the analysis of the results of the public consultation, a Communication will be issued in 2011 to clarify some of its provisions and present an action plan to tackle the remaining obstacles to the development of e-commerce in the Member States and cross-border.

EU data protection rules were subject to a public consultation in 2010⁶, resulting in a Communication on a comprehensive approach on personal data protection⁷. This was the beginning of a review of the Data Protection Directive⁸, which will culminate in 2011. The Commission has also reported recently on the evaluation of the Data Retention Directive⁹. Against this background, the Commission aims to modernise, where necessary, the relevant legal instruments to enhance trust and confidence of European consumers. The Commission also provided guidance¹⁰ to Member States on the implementation of Article 5(3) of the amended ePrivacy Directive¹¹, taking into account the growing importance of online behavioural advertising. Furthermore, the Commission services hosted two roundtables with

⁴ Available at http://ec.europa.eu/internal_market/smact/index_en.htm

⁵ Available at http://ec.europa.eu/internal_market/consultations/docs/2010/e-commerce/questionnaire_%20e-commerce_en.pdf.

⁶ Available at http://ec.europa.eu/justice/news/consulting_public/news_consulting_0006_en.htm

⁷ Available at http://ec.europa.eu/justice/news/consulting_public/0006/com_2010_609_en.pdf

⁸ Available at http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31995L0046&model=guichett

⁹ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:105:0054:0063:EN:PDF>

¹⁰ Available at http://circa.europa.eu/Public/irc/infso/cocom1/library?l=/public_documents_2010/cocom10-34_guidance/EN_1.0_&a=d

¹¹ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0011:0036:En:PDF>

stakeholders to discuss an EU level self-regulatory initiative proposed by the advertising and media industry.

On the content side, the proposal for a framework Directive on 'Collective Rights Management' was postponed due to the need to assess in depth all policy options which could bring benefits for European consumers, rights holders, collecting societies and service providers. The purpose of the framework Directive will be to enable the provision of competitive, innovative and consumer-friendly online music services across Europe.

The proposal for a Directive on Orphan Works was adopted by the Commission on 24 May 2011. The Directive sets out Europe-wide rules to enable further digitisation and dissemination of copyrighted works whose rightholders cannot be traced and, among other things, takes into account the report of the reflection group on digitisation set up by the European Commission (Comité de Sages), which was published in January 2011¹².

Likewise, the Green Paper on the opportunities and challenges of online distributions of audiovisual works and other creative content will be published in 2011. The Green Paper will invite discussion on further efforts to promote the availability of content across Europe, enabling producers and consumers to benefit from the opportunities offered by technological developments and changing consumer habits. It will allow stakeholders, particularly the producers, distributors and consumers of audiovisual content, to take position on the key elements affecting them.

Concerning payments, a proposal for a Regulation establishing technical requirements for credit transfers and direct debits in euro and amending Regulation (EC) No. 924/2009 was adopted by the Commission in December 2010¹³. The proposal sets EU-wide end-dates for the migration of legacy national credit transfers and direct debits to the recently created Single European Payments Area (SEPA) instruments. This will reduce the costs of payments, increase competition and make cross-border payments as easy as domestic ones.

The Commission adopted a Communication "Reaping the benefits of electronic invoicing for Europe" in December 2010¹⁴. The Communication identifies a set of tangible actions to make the uptake of electronic invoices in Europe easier so that e-invoicing can become the predominant method of invoicing by 2020.

May 2011 was the deadline for transposition by the Member States of the new regulatory telecommunication framework¹⁵ into national law.

Interoperability and standards

Interoperability between devices, applications, data repositories, services and networks is a key requisite for taking advantage of the benefits of digital technologies.

New standards are being created all the time, globally, and Europe's standard-setting framework must catch up with fast-moving technology markets if it is to remain relevant for the future. This will be addressed through specific provision for interoperability standards in

¹² Available at

http://ec.europa.eu/information_society/activities/digital_libraries/doc/refgroup/final_report_cds.pdf

¹³ COM (2010) 775, available at http://ec.europa.eu/internal_market/payments/sepa/ec_en.htm

¹⁴ COM (2010) 712, available at http://ec.europa.eu/internal_market/payments/einvoicing/index_en.htm

¹⁵ Available at http://ec.europa.eu/information_society/policy/ecomms/index_en.htm.

the European standardisation framework. Work on the proposal to reform European standardisation has taken longer than anticipated but is due to be adopted by the Commission in the first half of 2011. The reform aims to make European standardisation more transparent and improve competitiveness for European industry by reducing the time to market for innovative products.

In December 2010, the Commission adopted new 'Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal cooperation agreements'¹⁶, concerning standard setting in particular. For example, they clarify that the rules of standard-setting organisations can provide for advance disclosure of intellectual property rights to ensure better standard setting.

December 2010 also saw the adoption of the European Interoperability Framework¹⁷, which will help the development of interoperable cross-border public services.

December 2010 also saw the adoption of the Commission's Communication "Towards interoperability for European public services"¹⁸, including the European Interoperability Strategy and the European Interoperability Framework, which will both help to improve interoperability for cross-border public services.

Trust and security

ICT networks and end-user terminals remain vulnerable to a wide range of evolving threats. Attacks are becoming increasingly sophisticated and are often motivated by financial gain. As a result, half of Internet users have refrained from at least some major online activities due to security concerns.

In September 2010, the Commission adopted a proposal for a Regulation concerning the European Network and Information Security Agency (ENISA)¹⁹. The main objective of the proposal is to support the EU, Member States and stakeholders in preventing, detecting and responding better to network and information security problems.

At the same time, the Commission adopted a proposal for a Directive on attacks against information systems²⁰, aiming to strengthen the fight against cyber-crime by aligning Member States' criminal law systems and improving cooperation between judicial and other competent authorities.

The first pan-European exercise on network security incidents took place in November 2010. Experts from the participating European countries worked together to counter simulated attempts by hackers to paralyse websites and critical services.

In November 2010 the EU and the US agreed to establish a joint Working Group on Cyber-Security and Cyber-Crime. The Working Group will focus on four priority areas: cyber incident management; public-private partnerships; awareness raising; and cyber-crime.

¹⁶ Available at <http://eur-lex.europa.eu/JOHtml.do?uri=OJ%3AC%3A2011%3A011%3ASOM%3AEN%3AHTML>

¹⁷ Available at http://ec.europa.eu/isa/strategy/index_en.htm.

¹⁸ Available at http://ec.europa.eu/isa/strategy/doc/iop_communication_en.pdf

¹⁹ COM(2010) 521, available at

<http://www.coe.int/t/DGHL/STANDARDSETTING/T-CY/Proposal%20new%20regulation%20ENISA.pdf>.

²⁰ COM(2010) 517, available at

http://ec.europa.eu/home-affairs/policies/crime/crime_cybercrime_en.htm.

Fast and ultra-fast Internet access

The modern economy is a network-based knowledge economy with the Internet at its centre. In order to grow strongly and create jobs and prosperity in this economy, and to ensure citizens can access the content and services they want, Europe needs widely available and competitively priced fast and ultra-fast Internet access.

In September 2010, the Commission adopted a policy package comprising the following:

- A Commission Recommendation on Regulated Access to Next Generation Access (NGA) Networks²¹. It provides a common regulatory approach for access to new high-speed networks, balancing the need to encourage investment and the need to safeguard competition.
- A proposal for a first Radio Spectrum Policy Programme²². Among other things, the proposed programme calls for the 800 MHz band to be made available for terrestrial electronic communications services, including mobile broadband, by 2013 (possible derogations until 2015), which is a key condition for widespread growth of mobile broadband, including in rural areas.
- A Broadband Communication²³, which outlines how to best encourage public and private investment in fast and ultra-fast broadband networks, including national broadband targets and operational plans, with concrete implementing measures. It also provides guidance on how to facilitate investment by cutting investment costs and making better use of EU funds.

Research and innovation

Europe continues to under-invest in ICT research and development, investing much less than other industrialised economies²⁴. The latest figures indicate that investment by EU companies in ICT R&D did not increase from 2009 to 2010. Given that ICT represents a significant share of total added value in many European industries, the lack of investment in ICT R&D is a threat to the entire European manufacturing and service industry.

Since the launch of the DAE, the Commission has adopted work programmes for 2011/12 for its two R&D funding instruments in the field of ICT, i.e. the ICT part of the Seventh Framework Programme and the ICT Policy Support Programme.²⁵ It has also proposed a European Innovation Partnership (EIP) on Active and Healthy Ageing.²⁶ The EIP will mobilise Europe's expertise and resources in a coherent manner by generating the necessary

²¹ COM(2010) 572 available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF>.

²² COM(2010) 471 available at http://ec.europa.eu/information_society/policy/ecomm/radio_spectrum/documents/legislation/index_en.htm.

²³ COM(2010) 472, available at http://ec.europa.eu/information_society/activities/broadband/docs/bb_communication.pdf.

²⁴ "The 2010 report on R&D in ICT in the European Union", Joint Research Centre - Institute for Prospective Technological Studies, available at: <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=3239>

²⁵ Available at ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/ict-wp-2011-12_en.pdf and http://ec.europa.eu/information_society/activities/ict_psp/documents/ict_psp_wp2011_for_publication.pdf

²⁶ Endorsed by the European Council of 4 February 2011.

synergies between the EU and Member States. It will mobilise public funds through pre-commercial procurement for innovation and research.

The Commission is now preparing its proposals for both the next Multiannual Financial Framework and the next programme(s) for research and innovation, with the aim of simplifying procedures and increasing impacts. It published a Green Paper on research and innovation²⁷ in February 2011. The Green Paper outlined a common strategic framework combining the Framework Programme, the Competitiveness Innovation Programme, and the European Institute of Innovation and Technology (EIT).

Enhancing digital literacy, skills and inclusion

Despite the continuing progress of the Internet and ICT, a significant share of the population is still unable to take advantage of these opportunities, in particular people from disadvantaged groups such as the elderly or the disabled. The uptake rate among these groups stands at only 48%, fully 17 percentage points below the rate for the overall population. To achieve 'Every European Digital' by 2015, Europe needs to develop the ICT skills base of its population.

In December 2010, digital literacy and eSkills have been included among the priorities of the Agenda for New Skills and New Jobs²⁸. Concretely, this means that the Commission has committed itself to propose by 2012 an EU-wide approach and instruments to support Member States in the integration of ICT competences and digital literacy (e-skills) into core lifelong learning policies. Several actions are undertaken in the domain of education: identification of descriptors of digital competence; a policy handbook on digital competence; the development of indicators to measure the use of ICT in education; and large scale cross-national demonstrations on creative learning and innovative teaching. In addition, preparatory work on the multi-stakeholder sectoral council on ICT skills and employment is progressing in view of an establishment of such a Council before the end of 2012.

In September 2010, a Memorandum of Understanding (MoU)²⁹ was agreed on cross-border access to protected works for the benefit of people with a print disability. The aim of the MoU is to increase the production of special-format works and facilitate their distribution through trusted intermediaries across the EU.

ICT-enabled benefits for EU society

Given the pervasive nature of ICT, it is becoming a critical element in delivering a whole variety of policy objectives like supporting an ageing society, addressing climate change, etc. Governments must exploit its full potential to address societal problems more efficiently than in the past.

Regarding the contribution of smart grids to the decarbonisation of energy supplies, the Council of European Energy Regulators has submitted a report, 'ERGEG Guidelines of Good Practice on Regulatory Aspects of Smart Metering for Electricity and Gas'³⁰, as a basis for further work on the interoperability of smart grids in Europe.

²⁷ Available at http://ec.europa.eu/research/csfr/pdf/com_2011_0048_csf_green_paper_en.pdf#page=2.

²⁸ COM (2010) 682, available at <http://ec.europa.eu/social/main.jsp?langId=en&catId=958>

²⁹ Available at

http://ec.europa.eu/internal_market/copyright/docs/copyright-info/2010/20100914_mou_en.pdf.

³⁰ available at

In the first half of 2011, the Commission carried out a public consultation on the mutual recognition of eIdentification and eAuthentication, together with a consultation on revision of the eSignature Directive³¹. After analysis of the results, it will draw conclusions on how to establish a legal framework for the cross-border recognition and interoperability of secure eAuthentication systems.

The Ambient Assisting Living Joint Programme underwent an interim evaluation in December 2010³². The conclusions point to a need to reinforce the programme in future, in order to support projects developing ICT solutions for ageing well and to allow older people and persons with disabilities to live independently and actively in society. These results confirm the commitment made by the Commission in the Digital Agenda, and will contribute to the design of the EIP on Active and Healthy Ageing mentioned earlier.

From March to May 2011, the Commission carried out a public consultation on the new eHealth action plan³³ for the years 2012 to 2020³⁴. Among other things, the consultation addressed secure online access to medical health data, the deployment of telemedicine services, and the interoperability of patient records.

Preparatory work on the eProcurement action has started: a summary analysis of the responses to the 2010 Green Paper³⁵ will be published in June 2011. Work is also being undertaken to consider how eProcurement changes may feature within the wider revision of the EU's public procurement Directives, announced by the Single Market Act³⁶. Following the publication of these legislative proposals (scheduled for end 2011), the Commission will present a strategic Communication/White Paper on eProcurement identifying ways in which the EU can help Member States to fully exploit eProcurement's potential to simplify and improve public purchasing, how to accelerate the switch-over by providing the right mix of legislative incentives and tools, and how to allow companies from other Member States to participate in on-line procurement procedures. This Communication will complement the eGovernment action plan³⁷ adopted in December 2010³⁸.

The proposal for a Regulation setting out technical specifications for telematic applications for rail passenger services was adopted on 5 May 2011³⁹. Finally, the eCommission Action plan and the proposal for the deployment phase of the future European Air Traffic

http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/CUSTOMERS/Smart%20metering/CD/E10-RMF-29-05_GGP_SM_8-Feb-2011.pdf.

³¹ Available at

http://ec.europa.eu/information_society/policy/esignature/eu_legislation/revision/public_consultation/index_en.htm.

³² Available at

http://ec.europa.eu/information_society/activities/einclusion/docs/aal/interim_evaluation_report.pdf.

³³ Available at http://ec.europa.eu/information_society/activities/health/policy/index_en.htm.

³⁴ This is not a DAE action, but will have an impact on several actions relating to ICT and health in the Digital Agenda.

³⁵ Available at http://ec.europa.eu/internal_market/consultations/2010/e-procurement_en.htm

³⁶ See Key Action 12 of the Single Market Act, available at http://ec.europa.eu/internal_market/smact/index_en.htm

³⁷ Available at

http://ec.europa.eu/information_society/activities/egovernment/action_plan_2011_2015/index_en.htm

³⁸ This is not a DAE action, but it will impact on most eGovernment actions identified in the Digital Agenda

³⁹ Available at

http://ec.europa.eu/transport/rail/interoperability/interoperability/telematic_applications_en.htm

Management System (SESAR) are currently scheduled for adoption by the Commission in 2011.

International aspects of the Digital Agenda

Due to the strategic importance of the Internet, the actions under all seven pillars of the DAE have an inherent international dimension.

In December 2010, a decision was taken by the UN General Assembly to renew the mandate of the Internet Governance Forum (IGF) until 2015. A Working Group has been set up to discuss improvements to the IGF and will seek to coordinate Member States' positions.

In April 2010, the European Commission and the US Government, within the Transatlantic Economic Council (TEC), agreed on a set of ten fundamental principles for trade in information and communication technology services⁴⁰. The EU and the US, in cooperation with other countries, will promote these principles worldwide in order to support the global development of ICT networks and services and allow service providers to compete for contracts with local incumbents on an equal footing.

For a complete overview of the status of all actions, please see http://ec.europa.eu/information_society/digital-agenda/scoreboard/index_en.htm.

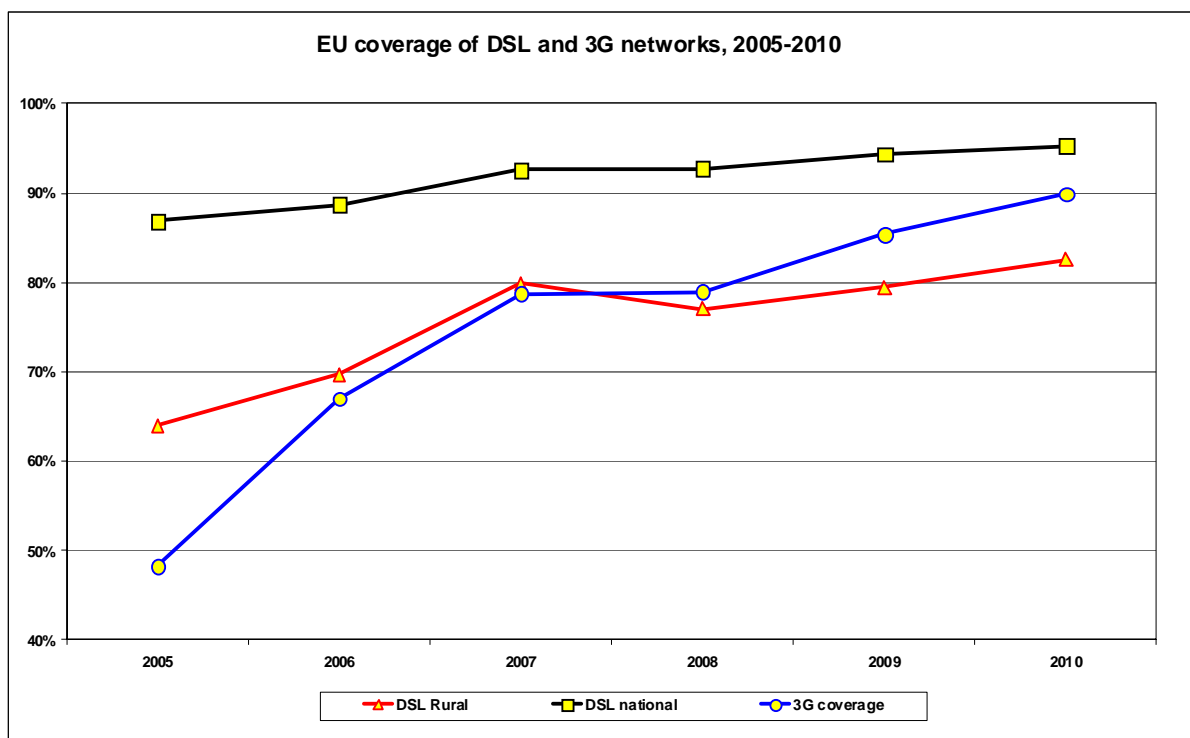
4. The key performance targets

Annex 2 of the Digital Agenda sets out the key performance indicators. This very limited set of indicators provides numerical evidence of the progress towards a selected group of headline targets. As such, they do not follow the seven pillar structure. This section presents the performance of the EU with respect to these targets.

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

Coverage of fixed broadband networks increased in 2010 by 1 percentage points to reach 95.3%, partly due to targeted state aid measures in several member states, and with significant improvements in Romania, Hungary, Cyprus and Austria. However, rural coverage still stands at only 82.4% of the rural population, despite a significant improvement to the 79.5% a year ago. Nevertheless, trends in fixed and wireless coverage between 2005 and 2010 indicate that the 2013 target is likely to be achieved, through a combination of fixed and wireless technologies, including satellite.

⁴⁰ Available at http://ec.europa.eu/information_society/activities/internationalrel/docs/eu-us-tradeprinciples.pdf.



Source: IDATE for European Commission

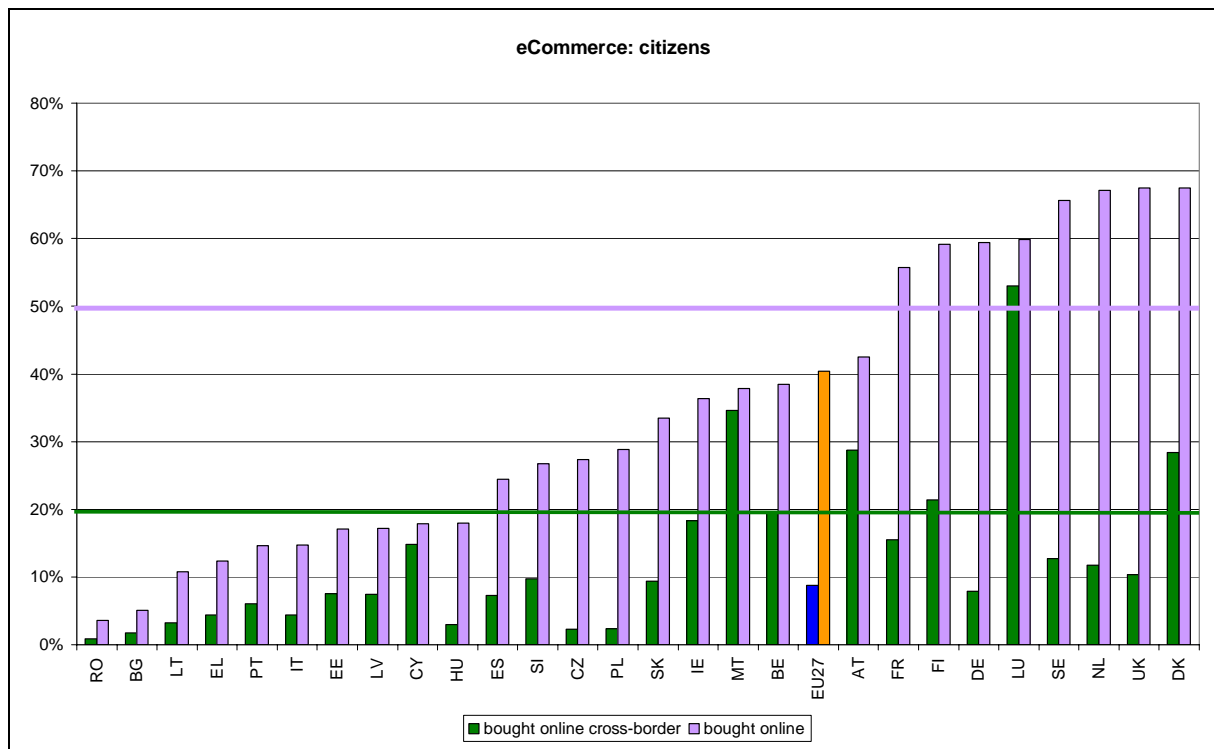
- **Key performance targets 1b and 1c:** the entire EU to be covered by broadband above 30 Mbps by 2020 and 50 % of the EU to subscribe to broadband above 100 Mbps by 2020

The broadband market continued to grow in 2010, despite reaching levels close to saturation in some Member States and the difficult economic situation in others. Competition has accelerated with new entrants gaining 1.6% of the market in one year. Broadband speeds have increased, with the share of subscriptions above 10 Mbps doubling over the last year to reach nearly 30%, while connections under 2 Mbps are on their way out.

The deployment and take-up of ultra-fast broadband is still low, and only 5% of all fixed lines deliver speeds of 30 Mbps and above, although 28.7% of households could have access to such speeds if they wanted to. Effective infrastructure competition is driving operators to upgrade their cable modem networks to DOCSIS 3.0 and DSL networks to VDSL. Along with FTTP providers, this move is gradually boosting the availability of ultra-fast networks. However, the sustainability of the current annual growth rate of almost 50% in Next Generation Access lines is not yet ensured.

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

There has been good progress towards achieving the target of 50% of the population using the Internet to purchase goods and services: the share rose from 37% to 40%. Even better, this increase does not merely reflect the rise in the number of Internet users: the share of Internet users engaging in eCommerce also increased from 54% to 57%. Eight Member States already meet the target. On current trends, this target could be reached before 2015.



Source Eurostat, Community survey on ICT usage in households and by individuals, 2010: 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

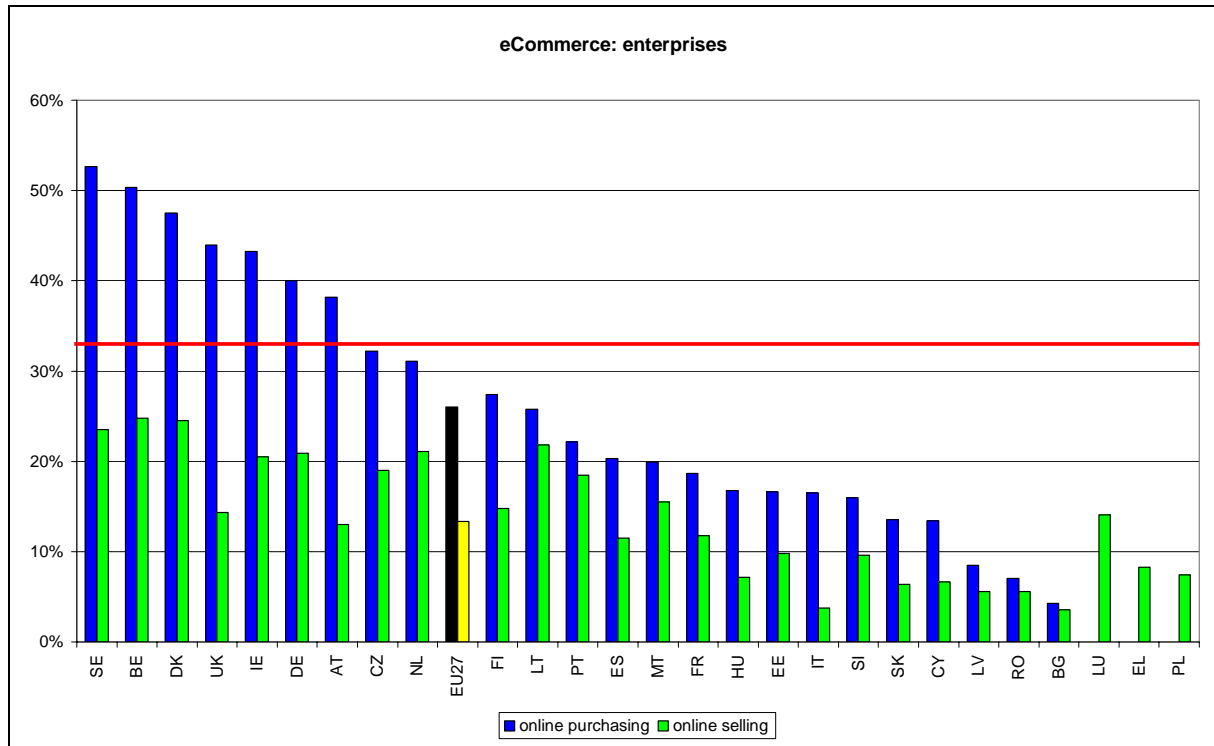
- **Key performance target 2b:** 20% of the population to buy online cross-border by 2015

The proportion of cross-border online purchasers advanced only slowly, from 8.1% to 8.8%. It should be borne in mind that the national numbers are skewed by the size of the country and the existence of common languages between different Member States. Typically, citizens of small countries show a higher propensity to shop across the border in a large neighbour with a similar language.

One reason why consumers are still reluctant to take up online cross-border shopping is that there is a widely held perception that they would face more difficulties in enforcing their rights in another EU country when things go wrong. Recent data⁴¹ showed that almost half (48%) of EU consumers were more confident when ordering goods or services via the Internet from sellers or providers in their own country than from those in other EU countries.

⁴¹ Eurobarometer ("Consumer attitudes towards cross-border trade and consumer protection", 2010), available at http://ec.europa.eu/public_opinion/flash/fl_299_sum_en.pdf

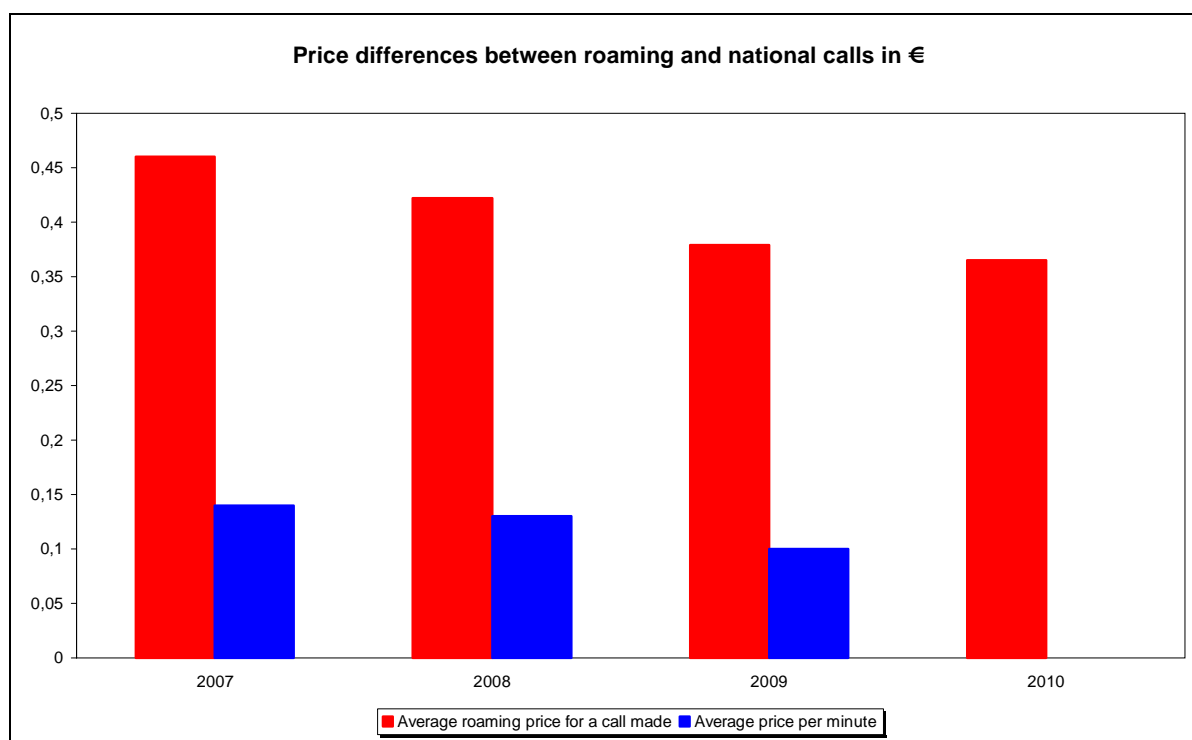
- **Key performance target 2c:** 33 % of SMEs to conduct online purchases/sales by 2015



Source: Eurostat, Community survey on ICT usage and eCommerce in enterprises. (Enterprises with 10-249 persons employed purchasing/selling more than 1% of their turnover online in 2009; horizontal line represents both targets); EU27 without Luxemburg

The use of computer networks by small and medium-sized enterprises for purchasing is growing rapidly, rising from 24 % in 2008 to 28 % in 2009. At this rate, the target will already be met in 2012, three years ahead of time. However, online sales by SMEs grew much more slowly, from 11 % to 12.9 %. Given also that the baseline was lower, this growth rate is quite insufficient to achieve the target. While seven Member States meet the online purchasing target, none are even close to the online sales target as yet.

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

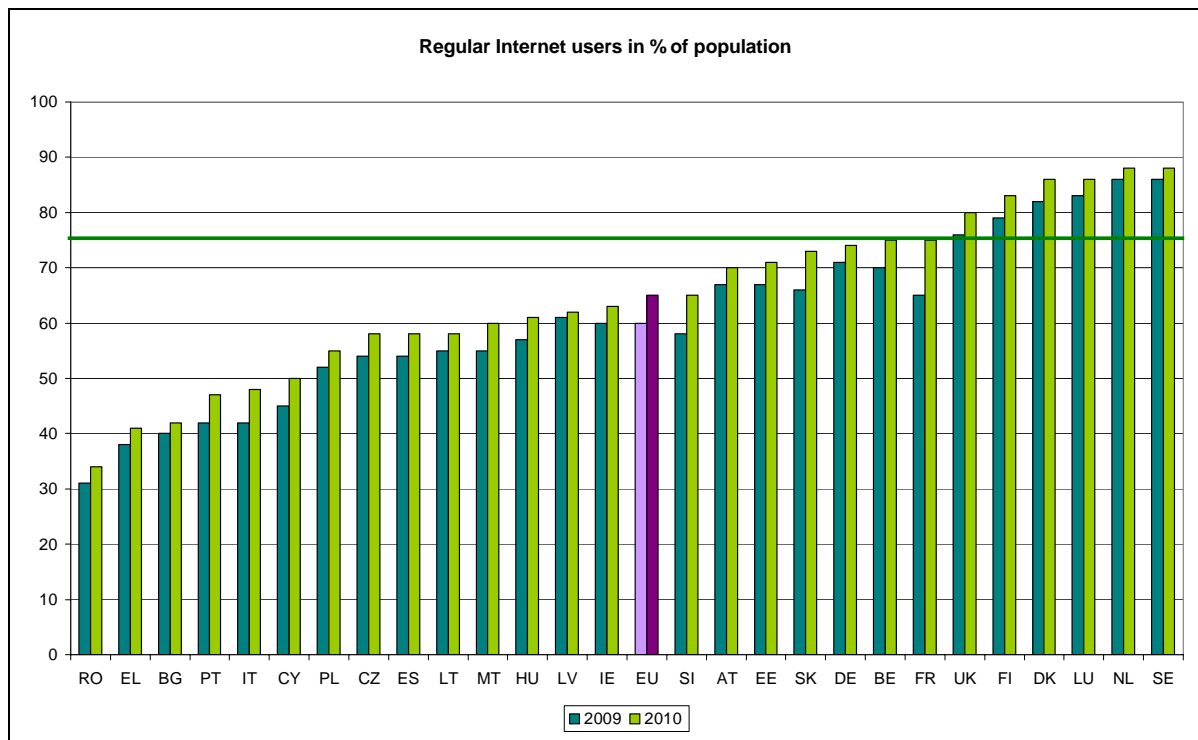


Source: Commission services based on BEREC

EU average prices for telecom services have continued to decline, both nationally and for roaming. While the difference has decreased only marginally in recent years, to 0.28 cents in 2009, this is mostly due to the decline in national call prices, which is in itself a positive development. Roaming prices declined by 1.5 cents in 2010, less than in previous years and clearly insufficient to close the gap with national calls in the foreseeable future. Moreover, this is mainly due to the effects of the regulation of wholesale and retail prices and not the result of emerging competition. Competition should therefore be further promoted in order to give consumers a rapid and easy choice of roaming services at, or close to, the relevant competitive domestic prices.

- **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 population that has never used the Internet from 30 % to 15 % by 2015

The proportion of the population regularly using the Internet increased by 5 percentage points (pp) in a single year, to 65 %. The biggest gains were recorded in France, with an increase of 10 pp, followed by Slovakia and Slovenia with 7 pp each. Conversely, the percentage of non-users has decreased from 30 % to 26 %, presenting roughly a mirror image. Romania, Bulgaria and Greece remain the only countries where there are fewer regular users than non-users.

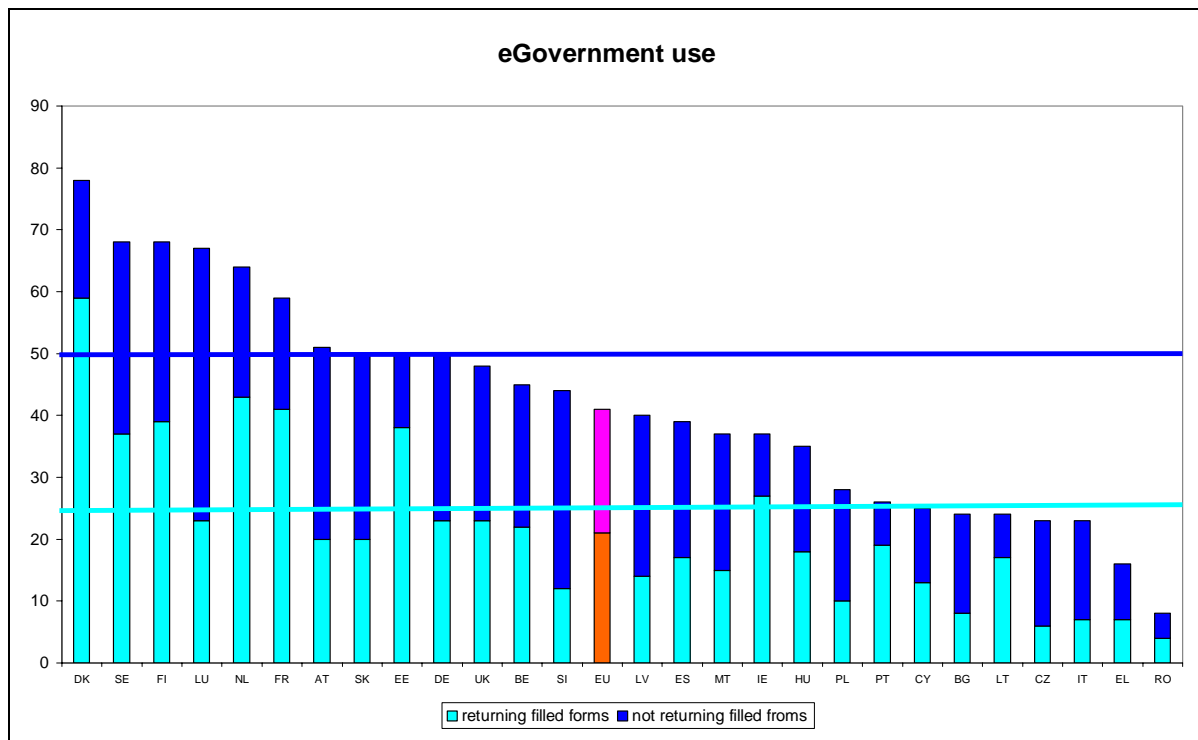


Source: Eurostat, Community survey on ICT usage in households and by individuals; 16-74 old persons using the Internet at least once a week; horizontal line represents targets

The signs are even more encouraging for disadvantaged groups: their usage rate has risen from 42% to 48%, indicating moreover a closing of the gap with the overall population. Continuing progress at the current rate would result in achieving all three targets well ahead of 2015.

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

The proportion of citizens using the Internet to interact with public authorities has risen by 3 points to 41% over the last year. Better yet, the share of eGovernment users filling in forms has also increased, to 50%. Eleven Member States already achieve the first target (up from five last year), and six already reach both. Continuing progress at the current rate would result in both targets being achieved well ahead of 2015.



Source: Eurostat, Community survey on ICT usage in households and by individuals, 2010; percentage of citizen between 16 and 74 using eGovernment services in the last 12 months; horizontal lines represent target

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

The list of services to be made available online has not yet been agreed by Member States. This target will be measured in future editions of the Scoreboard.

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

Public investment in ICT R&D did not increase in the last year⁴², compared to a required annual growth of 6% between 2007 and 2020 in order to reach the target.

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

Lighting devices and intelligent lighting systems based on solid-state lighting (SSL) such as light emitting diodes (LEDs and OLEDs) consume less energy (up to 80%) while offering better performance than traditional lightbulbs. Their increasing presence on the market will therefore significantly contribute to reducing energy consumption for lighting. Indeed, their market share (in value) of the EU market increased from 1.7% in 2009 to 6.2% in 2010. If, as expected, LEDs continue to rapidly gain market share, the energy savings target seems to be achievable, bearing in mind that the replacement of even about 50% of the current lighting stock by SSL would be sufficient to reduce energy use for lighting by more than 20% compared to today. However, the transition to energy-efficient solid-state lighting may create demand for new kinds of lighting installations (for example to light building facades), which may reduce energy savings.

⁴² Annual reports on ICT R&D in the European Union: European Commission, JRC-IPTS, 2010 and 2011, available at <http://is.jrc.ec.europa.eu/pages/ISG/PREDICT.html>

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5. The next steps

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. Additional data will be made available in the next few months and will be updated regularly.

The next twelve months will see three sets of actions. Firstly, those planned for 2011. Secondly, those put back from 2010. And thirdly, the follow-up on actions already launched (e.g. for the broadband package adopted in September 2010, the Commission will work with each Member State to develop national plans for the promotion of high-speed Internet access). For more details on the state of play with individual actions, please refer to http://ec.europa.eu/information_society/digital-agenda/scoreboard/index_en.htm.

Finally, the governance structures for the DAE have proven efficient and will continue to function. This applies to the High-Level Group, the stakeholder engagement arrangements, and the 'going local' initiatives.