



Broadband coverage in Europe in 2012

Mapping progress towards the coverage objectives of
the Digital Agenda

RESEARCH REPORT

A study prepared for the European Commission
DG Communications Networks, Content & Technology

*Digital
Agenda for
Europe*

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Broadband coverage in Europe in 2012

Research Report

for the SMART 2012/0035 Project

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Executive Summary

Motivation

The purpose of the Broadband Coverage in Europe in 2012 (BCE 2012) project was to support the objectives of the European Union's Digital Agenda. Two of the Agenda's key objectives are to provide:

- All European Union citizens with basic broadband coverage by 2013; and
- Broadband speeds of at least 30 megabits per second for all by 2020.

BCE 2012 was designed to measure progress towards this objective and identify where action would be needed to achieve it.

The project was commissioned by the Directorate General for Communications Networks, Content and Technology, DG Connect. Neelie Kroes, the Vice President of the European Commission responsible for the Digital Agenda for Europe, has pointed out that "accurate data is critical for delivering policy and regulation that enables broadband internet for all Europeans."

Methodology

With this need in view, DG Connect requested a study to be based on a survey of broadband network operators and National Regulatory Agencies (NRAs). The study was to cover all twenty-seven countries of the EU and also Norway, Iceland, Croatia and Switzerland¹. The main objective was to research the coverage of each of the nine main broadband technologies – meaning what proportion of households have access to services using each technology. The nine main broadband technologies were: DSL, VDSL, FTTP, standard cable, Docsis 3 cable, WiMAX, HSPA, LTE and satellite.

The study was also to estimate the overall coverage of "combinations" of technologies. Since the coverage areas of the different technologies would often overlap, this meant looking at the number of households passed by each different technology capable of delivering a chosen level of performance and estimating the total number of households being served by at least one of the technologies.

The three technology combinations chosen were:

- **Standard broadband**
 - Including the main technologies capable of providing basic broadband of at least 144kbps download speed for end-users, but excluding satellite broadband
 - Combining DSL (including VDSL), FTTP, WiMAX, standard cable (including Docsis 3 cable), HSPA and LTE, but excluding satellite broadband.
- **Standard fixed broadband**
 - Including the main fixed-line technologies capable of providing basic broadband of at least 144kbps download speed for end-users.

¹ *Glasfasernetz Schweiz* in Switzerland provided additional funding to include Switzerland within the study.

- Combining DSL (including VDSL), FTTP, WiMax and standard cable (including Docsis 3 cable).
- **Next Generation Access (NGA) broadband**
 - Including the technologies which are needed to meet the Digital Agenda’s 30Mbps objective.
 - Combining VDSL, FTTP and Docsis 3 cable.

To achieve an accurate estimate of technologies and combinations, Point Topic successfully proposed a study which would map technology coverage at the level of sub-national regions. The regions used follow the EU-sponsored scheme for “Nomenclature of Units for Territorial Statistics” (NUTS) and specifically the NUTS 3 level, which mostly corresponds to familiar administrative divisions such as counties, *départements*, or provinces. Working at regional level allows a far more reliable assessment of total coverage and the split between the more urban and the rural sectors in each country. The study also introduced a more sophisticated approach to defining rural households, which assessed the population density in every square kilometre across Europe.

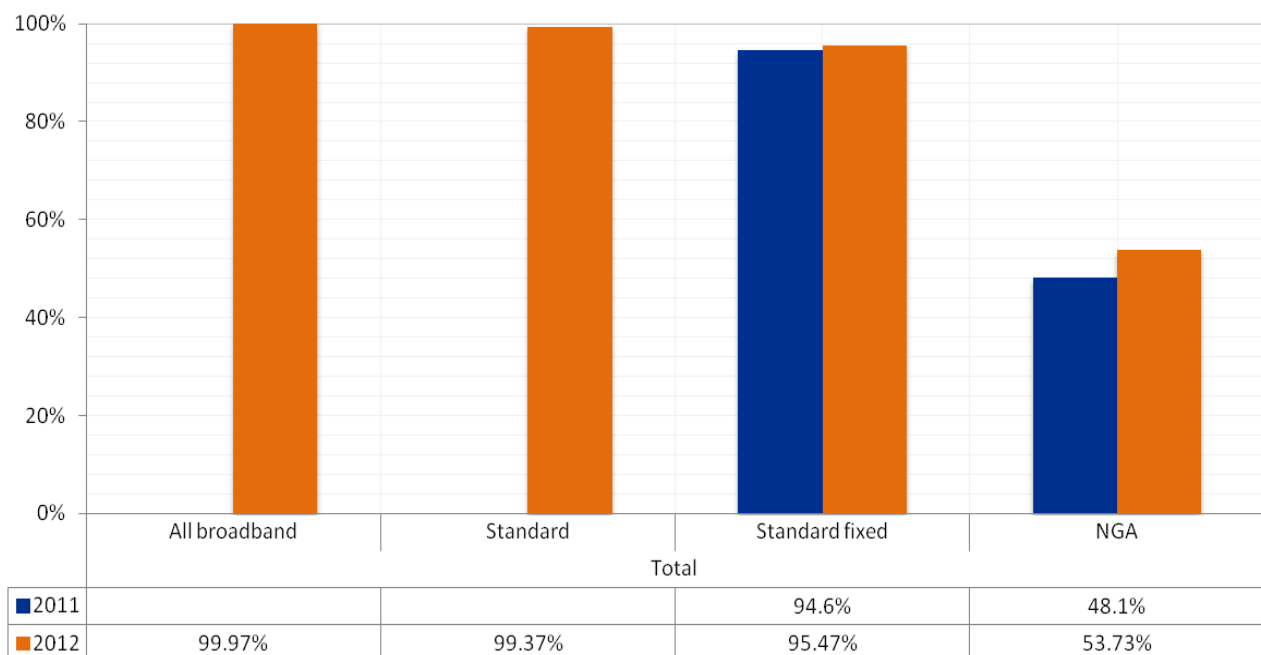
NRAs and operator respondents were asked to provide data at country level and at NUTS 3 level where possible. Thanks not least to the very valuable support of DG Connect, a high proportion did.

Point Topic would like to take this opportunity to thank DG Connect and all survey respondents for their support. Particular thanks are due to IDATE who, with the approval of the FTTH Council, also helped by providing their current country-level data on FTTP coverage.

EU-wide coverage by technology combination

At the end of 2012 nearly all households in the European Union could access broadband services through at least one of the nine listed broadband technologies.

EU27, total coverage by technology combination: end of year 2011 and 2012



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Broadband Coverage in Europe 2012

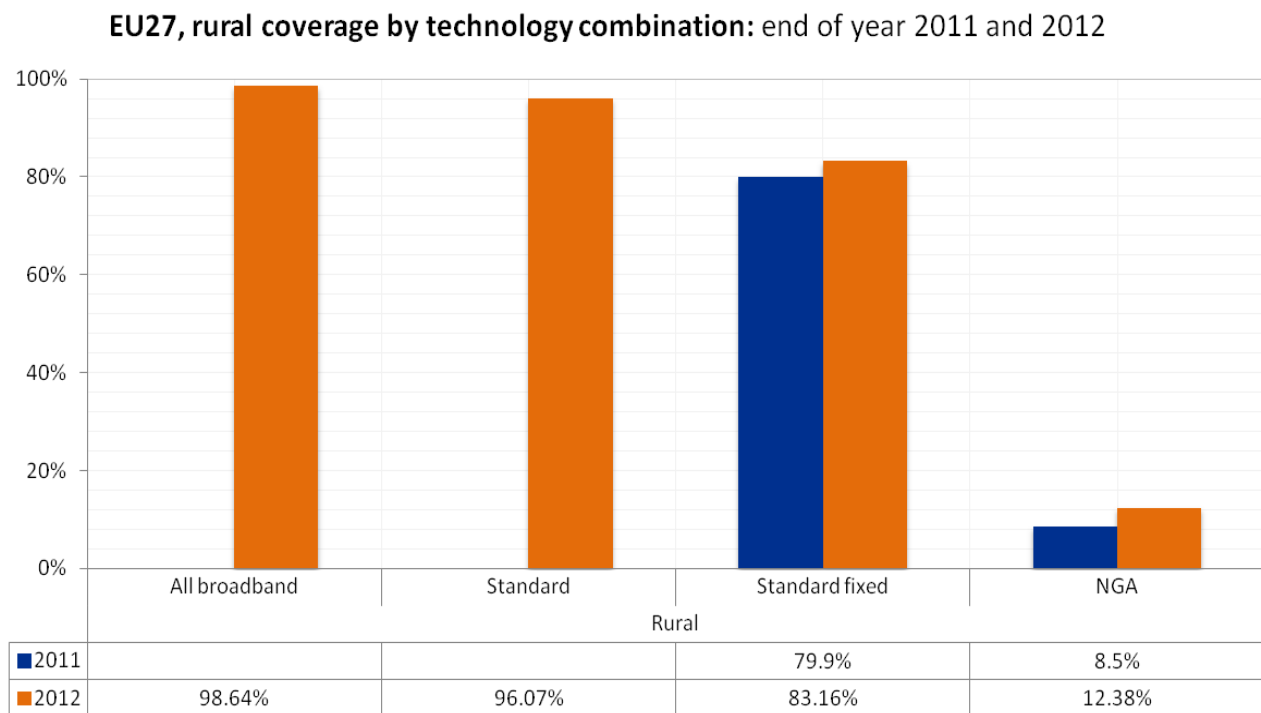
The few sets of households not served by broadband services were located in Iceland, Lithuania, Latvia and Estonia, where satellite broadband services were not available.

More than 99% of households could access standard broadband services through fixed or mobile services (HSPA or LTE), with over 95% able to access at least one fixed service.

At the end of 2012 the European Union was more than half-way towards its target of 30Mbps access for all by 2020. 54% of EU households, or 113 million, were already covered by NGA services at the end of 2012.

Point Topic's new approach to defining rurality identified 31 million rural households in the EU 27, or 15% of all households. Bringing NGA broadband services to these most rural areas remains the biggest challenge for broadband in the European Union.

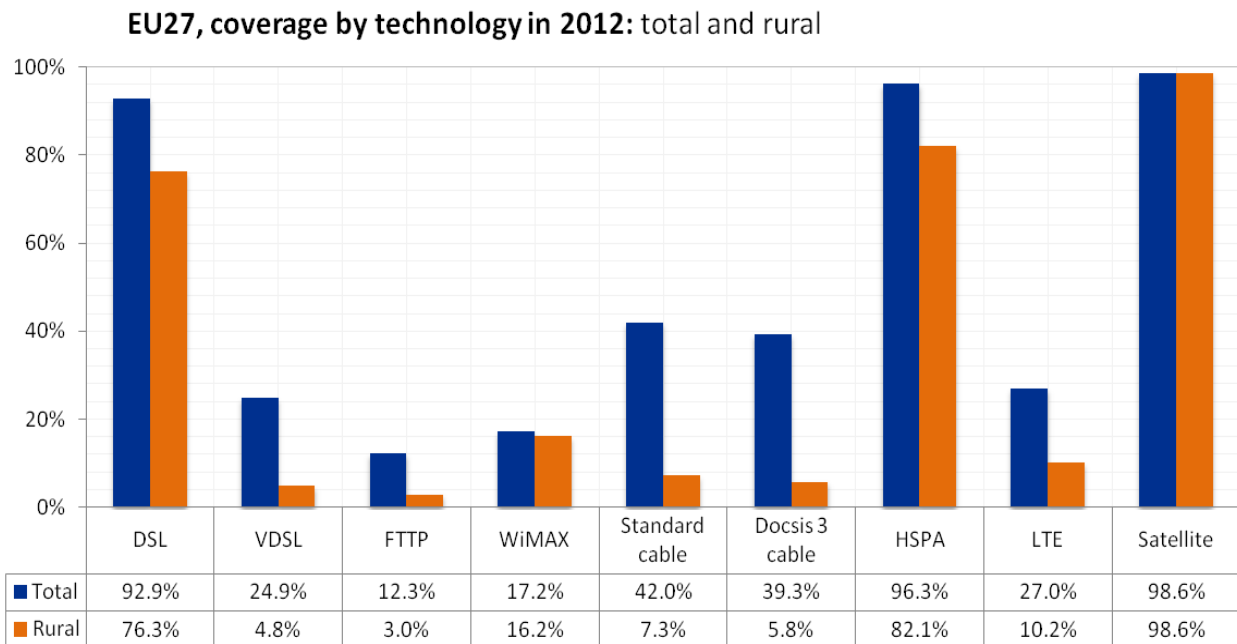
At the end of 2012, whilst rural households were relatively well served by standard broadband services only 12%, or 3.8 million, could receive NGA services. Improvements have been made, with coverage increasing by nearly 4% in 2012, but there is still a long way to go.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

EU-wide coverage by technology

Satellite was the most widespread broadband service in the European Union at the end of 2012. In terms of fixed broadband technologies, the research showed that DSL remained by far the most important fixed broadband technology in Europe. Coverage had grown slightly in 2012 and DSL covered 93% of EU households. Standard cable covered just over 42% of households, and WiMAX had 17% coverage. Out of the standard fixed broadband technologies and excluding the NGA technologies, WiMAX coverage grew most in 2012, reaching nearly 5.5 million new households.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Looking at the NGA technologies, Docsis 3 (also included in the standard cable figures) was the most important with nearly 40% coverage. VDSL (included in the DSL figures) was next at 25%, and FTTP was available to 12% of households. VDSL coverage grew by more than 5 percentage points in 2012, making it the fastest growing fixed broadband technology in that period.

As for mobile broadband, HSPA covered nearly all of the EU with 96% of households passed. LTE coverage grew rapidly in 2012, and the service was available to 27% of European Union households at end-2012.

Even more than for the market as a whole, DSL was the main provider of fixed broadband access in rural areas. WiMAX was next, contributing less than 16% gross coverage to rural areas.

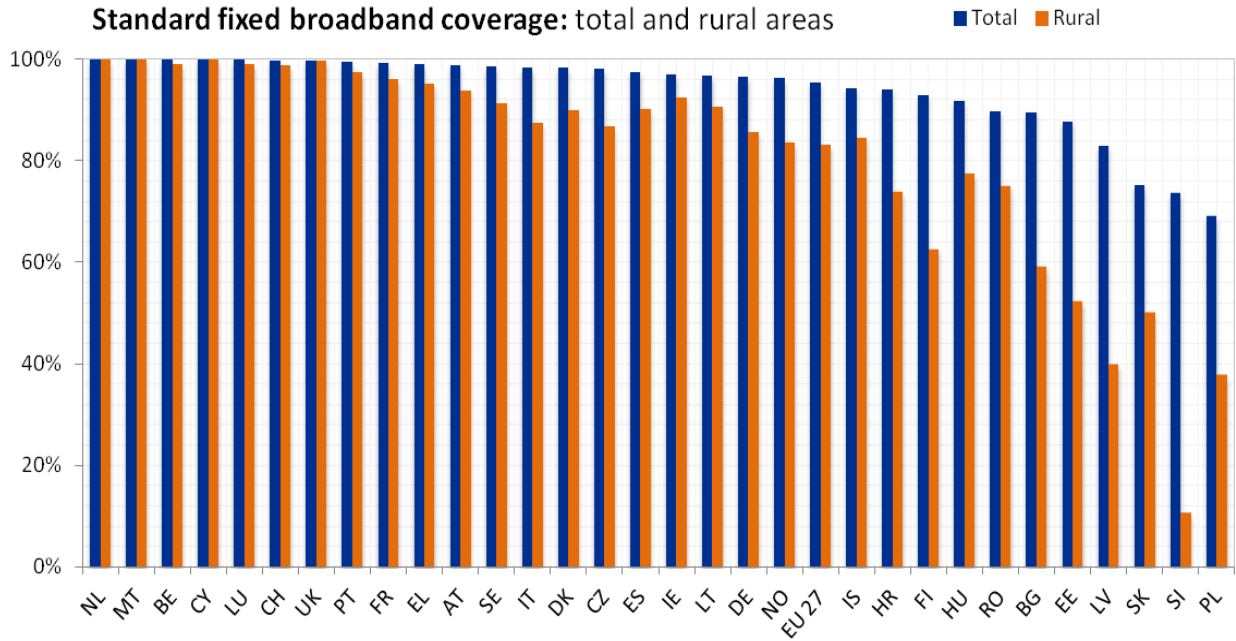
Docsis 3 cable was the biggest contributor to rural NGA coverage. With nearly 6% coverage it provided nearly two thirds of all NGA coverage in rural areas. VDSL contributed a further 5% to rural NGA coverage, and thanks to the existing twisted copper-pair telephone networks in most areas it has the potential to do much more.

Standard fixed broadband coverage by country

At the end of 2012, 95.5% of households in the European Union could access at least one fixed broadband service.

Ten member states were really close (>99%) to having full coverage at the end of 2012. Standard fixed broadband coverage is generally lower in Eastern Europe, especially Poland, Slovenia, Slovakia and Latvia. DSL is by far the biggest contributor to the standard fixed broadband contribution, and all but one of the countries that fell below the EU average had lower than average DSL coverage.

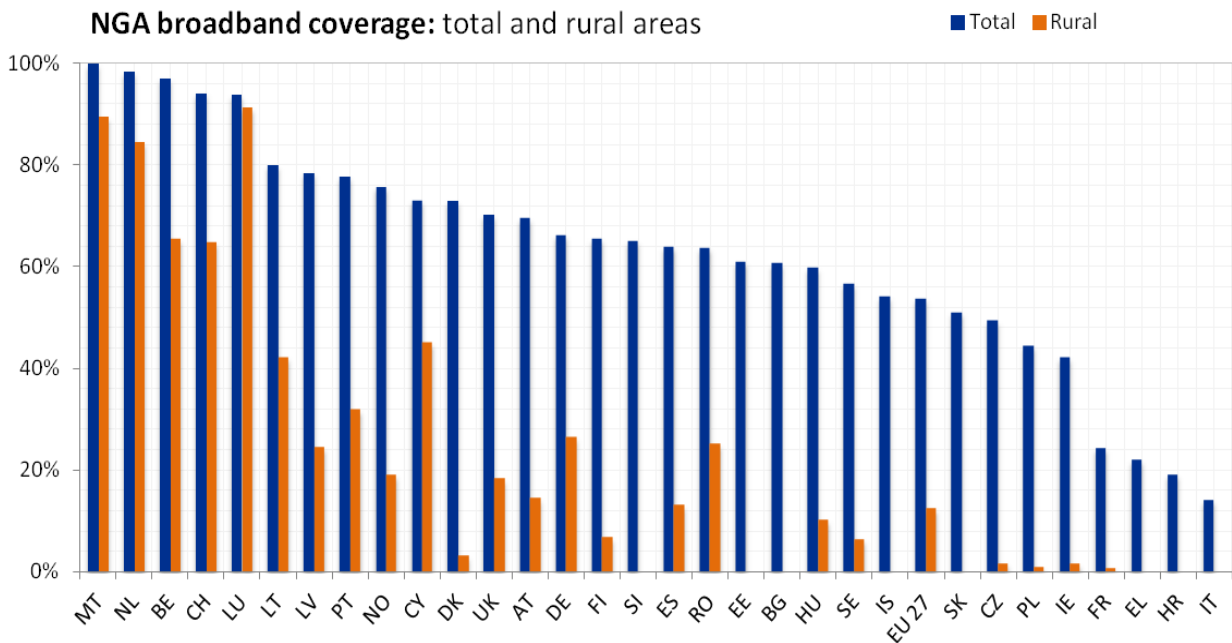
Rural standard fixed coverage was usually much lower than total coverage. The European Union average fell to 83.2% coverage for rural households. Coverage also fell off much more sharply in the less well served countries.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

NGA broadband coverage by country

The European Union as a whole was over half-way towards the 30Mbps goal at the end of 2012. Whilst it was generally the most urbanized countries with the highest NGA coverage, countries with above average coverage were found in all quarters of Europe, reflecting the effects of different development policies, infrastructure needs and technology choices.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Broadband Coverage in Europe 2012

Only 12.4% of rural households in the European Union had access to NGA services at the end of 2012. Eight countries were thought not to have any rural NGA coverage. Rural NGA coverage was highest in Luxembourg, Malta and the Netherlands.

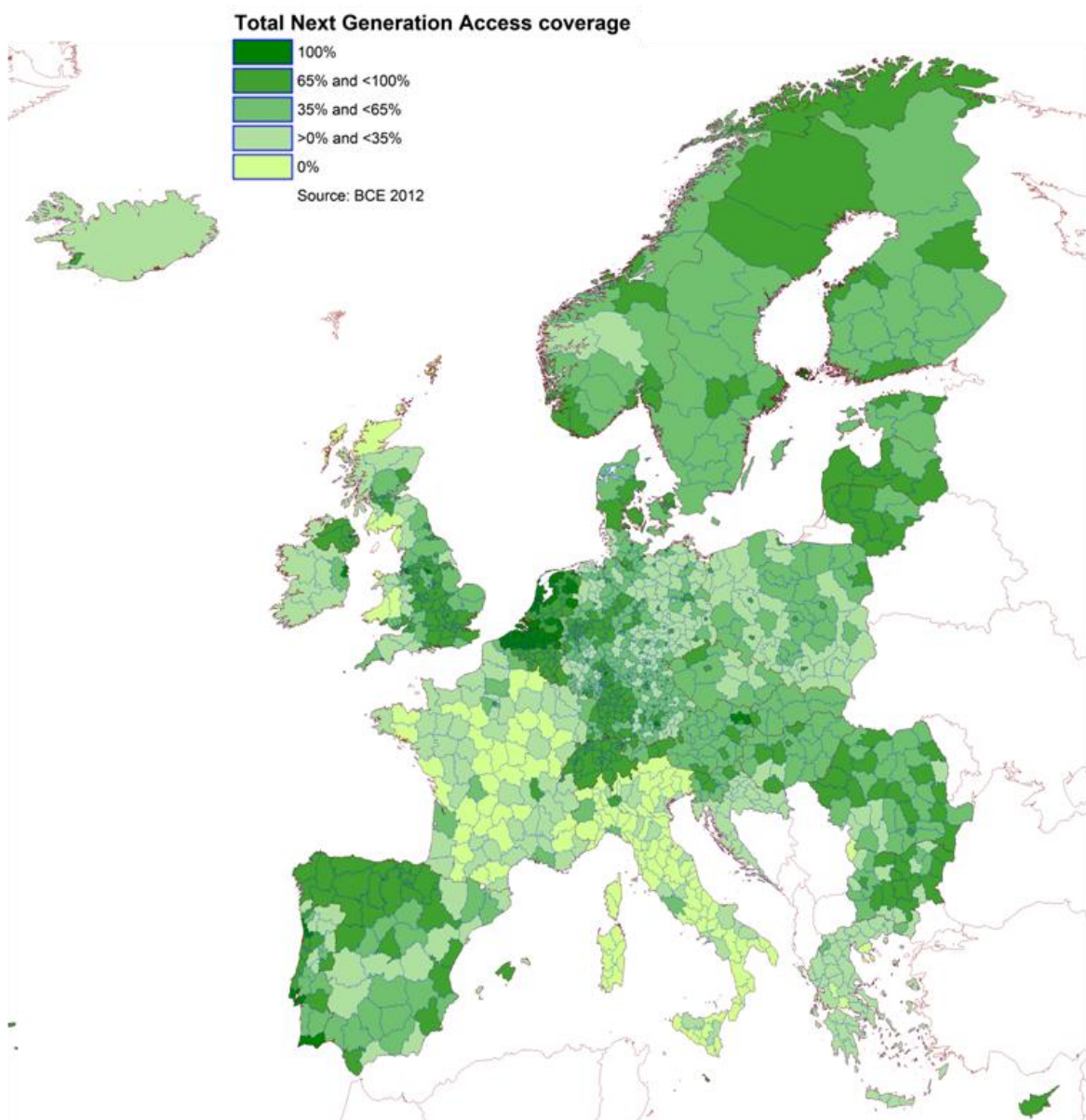
NGA coverage by sub-region

To establish the overlap between broadband technologies, Point Topic collected coverage data for every NUTS 3 area across Europe. In general, standard fixed broadband coverage was fairly consistent within a country. There can be significantly more variation in the coverage of NGA technologies, as shown in the map below.

In terms of NGA coverage, it was in the European Union's largest countries that we saw the biggest deficiencies. 80% of the NUTS 3 areas in Italy had no NGA coverage, and only 14% of all Italian households could access NGA services. In France, we estimated that there was no NGA coverage in thirty-eight of the one-hundred NUTS 3 areas at the end of 2012.

Eastern and Northern Europe continued to perform well in delivering NGA services to their residents. Cyprus, Latvia and Greece reported the greatest improvements in NGA coverage in 2012.

NGA coverage in the study countries



Conclusions

At the end of 2012, nearly all EU households had access to a standard broadband service. The European Commission can be pleased to be so close to meeting its target of delivering standard broadband to all by the end of 2013.

The challenge remains in delivering NGA broadband to all households by 2020, and particularly to rural households. Whilst results show an overall coverage increase of almost four percentage points in 2012, there is still a long way to go, particularly in some of the European Union's largest countries.

1. Introduction

1.1 Project Outline

Supporting the Digital Agenda

The purpose of the Broadband Coverage in Europe in 2012 (BCE 2012) project was to support the objectives of the European Union's Digital Agenda. Two of the Agenda's key objectives are to provide:

- All European Union citizens with basic broadband coverage by 2013; and
- Broadband speeds of at least 30 megabits per second by 2020.

BCE 2012 was designed to measure progress towards that objective and identify where action would be needed to achieve it.

With this aim in view DG Connect, the European Commission Directorate General for Communications Networks, Content and Technology, invited consultants to tender for a project to survey the coverage of all the main broadband technologies in September 2012.

The nine technologies for which coverage data was required were DSL, VDSL, FTTP, WiMAX, Standard Cable, Docsis 3 Cable, HSPA, LTE and satellite. Definitions for these technologies and other concepts used by the project are provided in the Appendices. The data required was for the period ending December 2012 and included all twenty-seven European Union countries plus Norway, Iceland, Croatia and Switzerland, the thirty-one "study countries". Note that *Glasfasernetz Schweiz* in Switzerland provided additional funding to include Switzerland within the study. Rural and national coverage of each technology was to be reported for each study country.

In addition DG Connect requested similar data for three "technology combinations", taking into account the overlaps of different technologies providing comparable performance for end-users. The combinations which are provided by the project are:

- **Standard broadband**
 - Including the main technologies capable of providing basic broadband of at least 144kbps download speed for end-users, but excluding satellite broadband
 - Combining DSL (including VDSL), FTTP, WiMax, standard cable (including Docsis 3 cable), HSPA and LTE, but excluding satellite broadband.
- **Standard fixed broadband**
 - Including the main fixed-line technologies capable of providing basic broadband of at least 144kbps download speed for end-users.
 - Combining DSL (including VDSL), FTTP, WiMax and standard cable (including Docsis 3 cable).
- **Next Generation Access (NGA) broadband**
 - Including the technologies which are needed to meet the Digital Agenda 30Mbps objective.

- Combining VDSL, FTTP and Docsis 3 cable.

Overlapping coverage

The combination measures were vital for the purposes of the project because they showed how far the EU, and associated countries, had progressed towards the objectives of universal coverage of basic broadband by 2013 and 30Mbps broadband by 2020. But their reliability depends on the use of a statistically sound means of measuring the overlap of different services.

Clearly, simply adding the coverage percentages of different technologies to reach a total coverage figure was not sufficient. Competing operators using different technologies will all tend to build their networks to serve the same or similar areas; in particular, they generally choose to invest in the more densely populated towns and suburbs rather than rolling out in country areas.

Rather, the only way to identify and measure overlapping and complementary coverage was to segment a country area by area and see which networks were present in each case. Point Topic was able to propose such a solution thanks to a previous experience, dating back to 2005. This included detailed mapping of broadband coverage firstly in the UK, and more recently in the whole EU 27 plus a number of associated countries. Point Topic then used the same approach to successfully map broadband coverage in Europe for the European Commission in its earlier study *Broadband Coverage in Europe in 2011*.

Mapping by sub-national regions

Point Topic's specific proposal was to collect coverage data for sub-national regions, more specifically those known as "NUTS 3" areas. NUTS stands for "National Units for Territorial Statistics" and provides an internationally comparable set of regions across the EU and associated countries. Thus the NUTS scheme supports the most consistent view available of Europe-wide issues such as broadband coverage with a ready-made statistical framework. NUTS 3 level areas in particular are mainly of 150,000 to 800,000 population, with 1,362 of them in all the thirty-one study countries. The study used the updated NUTS 3 areas defined in 2010.

In this way, Point Topic took the project a major step beyond DG Connect's original specification. As a result it provided a more accurate assessment of coverage at country level and a graphic picture of regional broadband coverage across the whole EU and other study countries. We hope that the broadband maps we have created will make an important contribution towards the successful development of policy in this area and the achievement of the Digital Agenda objectives.

Acknowledgements

Point Topic believes the project was successful, and if so, thanks are due to many groups and individuals who made that possible.

The general support of DG Connect, and of the project team in particular, was invaluable. They used and shared their Europe-wide contacts to ensure a good response to the survey of coverage, which was at the core of the project. Not least, Neelie Kroes, the Vice President of the European Commission responsible for the Digital Agenda, validated the project by pointing out that "accurate data is critical for delivering policy and regulation that enables broadband internet for all Europeans."

Respondents to the Survey also deserve our grateful thanks. Both operators and regulators tackled a demanding request for information with enthusiasm and care. We learnt a lot from our discussions with them and hope the results do justice to their contribution. The figures in our deliverables are not always exactly those our respondents provided due to several intricate factors, such as issues arising out of different definitions and statistical bases, for example. However, we always aimed to give priority to what respondents told us and to reflect this as faithfully as possible within the project's requirements for consistency and the overall framework.

Point Topic also wish to thank IDATE for generously providing access to key results from their research on FTTx coverage on behalf of the FTTH Council for Europe. IDATE's expertise is widely reflected in our results for FTTP.

1.2 Project methodology

Structure

The structure of the BCE 2012 project was simple and very similar to the earlier study, BCE 2011, also completed by Point Topic. DG Connect's specification for the project required that data collection should be based on a survey of NRAs and broadband network operators in the study countries. The project effectively began in November 2012 with a consultation period involving the regulators in each of the study countries. During this time we also developed the Survey Questionnaire and the supporting definitions and categories required for the project. In January 2013, once all these had been approved, the Survey was launched.

Point Topic also chose to complement the Survey with a parallel research programme designed to assess the validity of the survey results and fill any potential gaps. The final phase of the project involved integrating, checking and testing the results to produce the required unified picture of broadband coverage in Europe.

Project Survey

The Survey Questionnaire aimed to gather data on one basic question – “How many households have access to broadband?”, applied across three dimensions:

- **Technology** – for each of the broadband technologies surveyed
- **Geography** – for each country as a whole and each region within the country
- **Rurality** – for the rural areas in each country and each region compared with the corresponding country or region as a whole.

The coverage of satellite broadband in Europe was established separately through consultation with the major providers in Europe. For satellite broadband, we considered not only whether services were available, but also whether active distribution points existed within the country for consumers to purchase services.

The key definitions for technologies and their coverage are provided in the Appendices to this report.

In addition, the Survey included supplementary questions to establish the context of the data supplied in circumstances where the respondents were working with a wide range of definitions, reference dates and confidentiality issues.

In a few cases, more granular geographical coverage data was provided and aggregated by Point Topic to fit into the Survey structure.

Confidentiality

Confidentiality was an important issue for many respondents to the Survey. In many cases, the data provided, particularly at NUTS 3 level, was regarded as commercially sensitive.

To meet respondents' need for confidentiality the publication of the project's results is limited to country-level figures for single technologies, and technology combinations for NUTS 3 areas. The technology combinations (standard fixed coverage and NGA coverage) combine the coverage of multiple technologies so that the coverage of any one technology is usually obscured.

A further layer of data, coverage by NUTS 3 area for each technology surveyed, was provided to DG Connect who are holding it as commercially confidential.

Point Topic also asked all survey respondents to state the level of confidentiality they wished be applied to the data they provided. These ranged from allowing full use of the data to restricting its employment to the sole purposes of the survey and requiring its deletion upon the project's completion. Point Topic were pleased to meet respondents' confidentiality concerns and are grateful for the confidence placed in the company.

Parallel research

The parallel research programme was organised mainly on a country-by-country basis, but with overview tasks to bring together and support the country-level work where needed.

The programme relied on conventional techniques and published sources, including publications by NRAs and operators included in the survey. The members of the research team for BCE 2012 also produce Point Topic's Broadband Operators and Tariffs and Global Broadband Statistics services and are familiar with the type of data used for this project as well as the sources from which it is derived.

Besides NRA and operator data the research drew on existing published research for the Digital Agenda programme and Point Topic's own research services and projects, in particular the Broadband Coverage in Europe in 2011 study for DG Connect.

IDATE also generously provided access to key results from their research on FTTx coverage on behalf of the FTTH Council for Europe, specifically its table of country-level FTTx coverage and subscription numbers at year-end 2012. While they were sometimes superseded by some later data, such as survey responses from the NRAs, the IDATE figures were an essential input to the project's coverage estimates.

The key deliverable from the parallel research was initial estimates for the coverage of every technology in each of the study countries as a whole. This was backed up by extensive data and mapping from the major operators in each country, plus NRA reports and details of broadband strategies and plans.

Defining rural areas

For BCE 2012, Point Topic developed a new approach to classifying and defining rural areas. Using the Corine land cover database, Point Topic has created a database of the population and land type in every square kilometre across Europe. This database will be referred to as the European Kilometre Grid or EKG. Households in square kilometres with a population less than one hundred were classified as rural. Using this approach, Point Topic estimates that 15% of households in the study countries are rural.

This approach to defining rural areas presented many advantages for this study. Firstly, it provided a consistent definition for all thirty-one study countries. The public datasets which give estimates of the number of rural households in Europe do not cover all of the study countries, which would make comparisons between countries difficult.

More importantly, it offered a better model for identifying areas which are unlikely to receive broadband investment on a commercial basis. Using the EKG, Point Topic was able to identify high population density centres within otherwise rural areas. Considering the area as a whole, the average population density might suggest that a particular area is rural. However, those areas with a high population density are still likely to be good prospects for commercial investment in broadband infrastructure. The EKG was able to isolate and correctly identify these high-density areas, allowing Point Topic to focus only on the most rural households outside of those areas.

Data integration and modelling

The final major task of the study was to merge the data from both the survey and the parallel research to produce the actual coverage estimate outputs from the project.

This work was done for every technology individually, in each country. In the best cases respondents provided figures for total and rural coverage in each NUTS 3 area. At the other extreme, data was supplied for total coverage by technology at national level only. The parallel research programme was tasked to provide a best efforts estimate of total coverage as a minimum. Even in these cases the coverage totals were often supported by “presence” data, showing in which NUTS 3 areas the technology was available. In many cases where detailed survey data was not available, results from the earlier study BCE 2011 were used as a basis for estimating regional coverage.

Where necessary the total and rural coverage for each NUTS 3 area was estimated from national coverage and presence data using simple models. The models relied on simple assumptions, for example that investment in technologies like VDSL, cable and FTTP would strongly favour urban over rural areas.

Most cases were in-between those two extremes. For example, data on NUTS 3 rural coverage was often unavailable when total coverage data was provided. Here modeling assumptions were used to estimate rural coverage. Another difficulty was posed by the varying definitions of rurality used by different respondents and aligning the data supplied into a single consistent dataset for the whole of Europe.

Taking account of all the above, the project succeeded in providing a complete set of estimates for the total and rural coverage of all nine technologies considered and for all 1,362 NUTS 3 areas in the thirty-one study countries.

Estimating coverage for technology combinations

The individual technology estimates were used to produce estimates of the total coverage provided in combination by technologies with similar performance characteristics. The particular examples chosen were standard broadband coverage (combining DSL, FTTP, WiMAX, Standard Cable, HSPA and LTE), standard fixed broadband coverage (combining DSL, FTTP, WiMAX and Standard Cable), and Next Generation Access coverage (combining VDSL, FTTP and Docsis 3 Cable).

The project used a standardised approach to make these combination estimates. This was required both to produce the technology combinations and where we had data from multiple operators providing the same technology in an area.

The default formula to estimate combination coverage was to combine the averages of:

- The minimum possible coverage; equal to the coverage of the most widespread technology or operator in the area
- The maximum possible coverage; equal to the sum of the coverage of all the technologies or operators being considered, or to 100%, whichever was the greater.

The default formula was applied in the great majority of cases but altered in a few countries where some technologies were judged to complement each other, rather than overlapping. In these cases the minimum coverage was taken as equal to the sum of the complementary technologies, if this was greater than the most widely available single technology.

Note that the estimates for combination coverage at national level were obtained by summing the estimates for the NUTS 3 areas in the country and not by applying this formula only at country level. This provides a more accurate view at a higher confidence degree than simply using the country-level average.

Three countries were able to provide their own estimates for the overlap of different technology combinations using their own, more granular geographical databases of broadband coverage. This data was used where it was available.

Restating the data for year-end 2011

In some cases, new data was supplied that provided a more accurate assessment of coverage at the end of 2011. If new and reliable data was provided, this was used to update the figures published in the project Broadband Coverage in Europe in 2011.

A full list of all restatements made to the 2011 dataset is provided within the appendices.

Finalisation

Once the NUTS 3 and country-level datasets had been completed they were passed on to DG Connect for review and, where necessary, amended over several cycles. The final draft datasets were then sent to the NRAs of all the countries involved for their comments, leading to the final changes before publication.

Finally, the finished datasets were published within the Digital Agenda's Scoreboard and used to prepare this research report.

1.3 Project deliverables

1.3.1 Summary of deliverables

The deliverables provided by the BCE 2012 project were as follows.

Published deliverables:

- Research Report (this document)
- Country-level dataset: coverage by technology
- NUTS 3-level dataset: coverage by technology combination and HSPA

Additional deliverables for internal use by DG Connect:

- Methodology Report
- NUTS 3-level dataset: coverage by technology

1.3.2 Research Report

Introduction

This provides an overview of the objectives, methodology and deliverables of the Broadband Coverage in Europe in 2012 (BCE 2012) project.

The Project Outline explains DG Connect's objectives in commissioning the project as a contribution towards achieving the targets of the Digital Agenda programme, and Point Topic's proposed approach. It summarises the project plan and the invaluable support provided by the NRAs and broadband operators of all types in the study countries.

The Methodology section describes the overall structure of the project and the key issues involved. It covers the Survey, which was the main basis of the project, Point Topic's approach to confidentiality, the Parallel Research programme, and the techniques used to integrate data from different sources and provide the complete set of research results required.

Finally this section provides a guide to the content and availability of the deliverables.

Europe Overview

This reviews the EU 27 and the study country results as a whole. The first part is concerned with Europe-wide coverage as shown by the technology combinations and the total and rural coverage of individual technologies. It also shows how these results map onto the NUTS 3 geography of Europe for both Standard Fixed and NGA Coverage in all households and in rural households.

The second part compares the country-level figures for the standard, NGA and mobile technologies and for the total and rural estimates. It includes a series of bar charts showing the country coverage values for each technology and combination in rank order. The bar charts include values for both the EU 27 and for the study countries as a whole. The final section provides a set of data tables for all the coverage values and Europe-wide demographics.

Country Profiles

This section comprises results profiles for each of the thirty-one study countries. Each profile includes bar charts of the technology combination, total and rural coverage for each technology;

maps showing standard fixed and NGA coverage for each NUTS 3 area; demographic and coverage data tables and brief discussion of the data results and mapping.

Country-level dataset

This dataset comprises basic demographics and coverage values for all nine technologies and combinations, both total and rural, for all thirty-one study countries plus the EU 27 and all countries as a whole.

NUTS 3-level dataset

This dataset provides figures for each NUTS 3 area in all the the estimated total and rural coverage for the standard, standard fixed and NGA combinations.

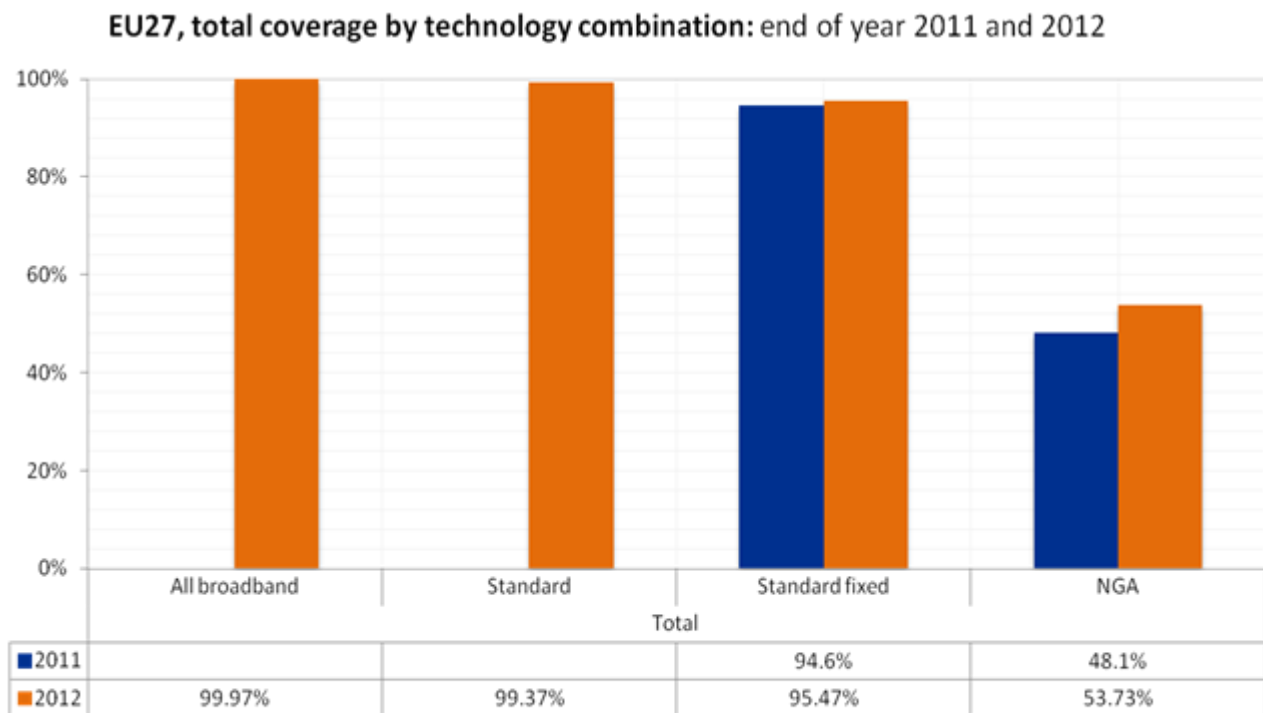
2 European overview

2.1 Europe-wide coverage

2.1.1 Coverage by technology combinations

The central task of the Broadband Coverage in Europe in 2012 (BCE 2012) project was to estimate the availability of broadband services across all the countries of the European Union and Norway, Iceland, Croatia and Switzerland. The study looked at the coverage of the nine main broadband technologies and the coverage of different technology combinations, capable of delivering standard or high-speed services.

The results show that at the end of 2012 nearly all 210 million households in the EU had access to at least one of the main broadband technologies. The European Commission had almost completely achieved its target of delivering basic broadband to all European Union citizens by 2013.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

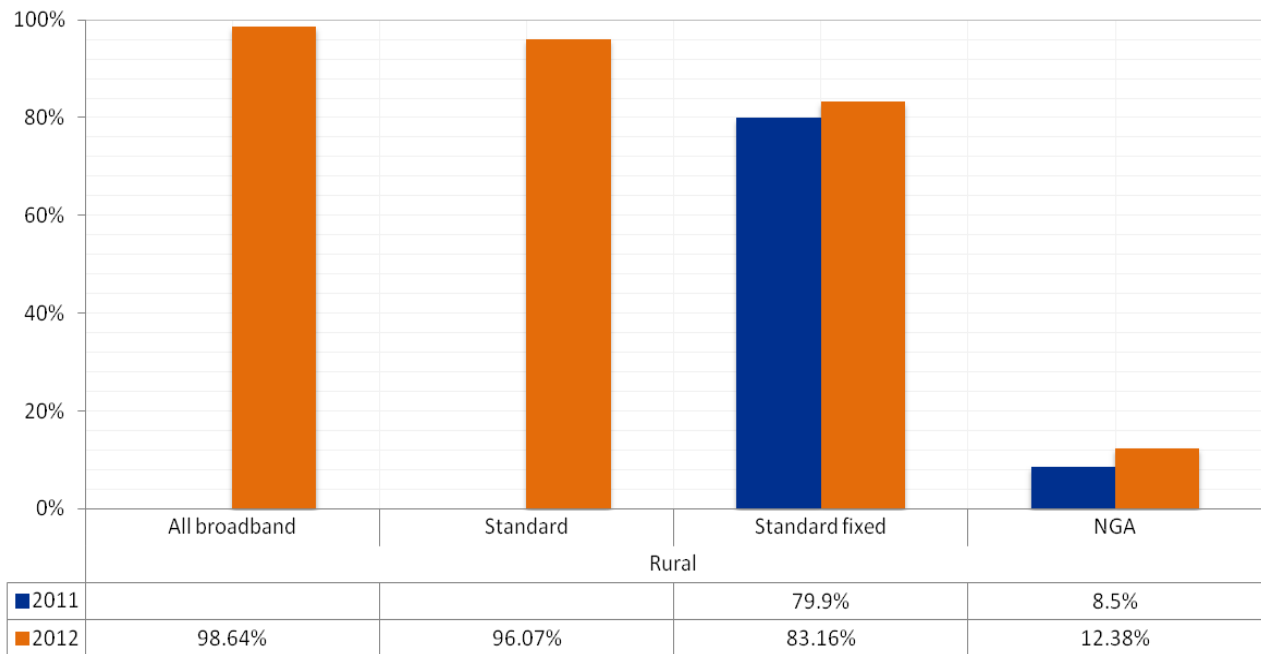
Over 99% of households were able to access standard broadband services through fixed or mobile technologies. This meant that less than 1% of households could only access standard broadband services through satellite broadband. More than 95% of households could access at least one fixed standard broadband service, implying that 4% could only access mobile broadband services.

Nearly 54% of EU households – 113 million – already had “Next Generation Access” services available to them, capable of delivering 30Mbps or more. NGA coverage increased by nearly six percentage points in 2012, with around 12 million more households gaining access to services.

Broadband Coverage in Europe 2012

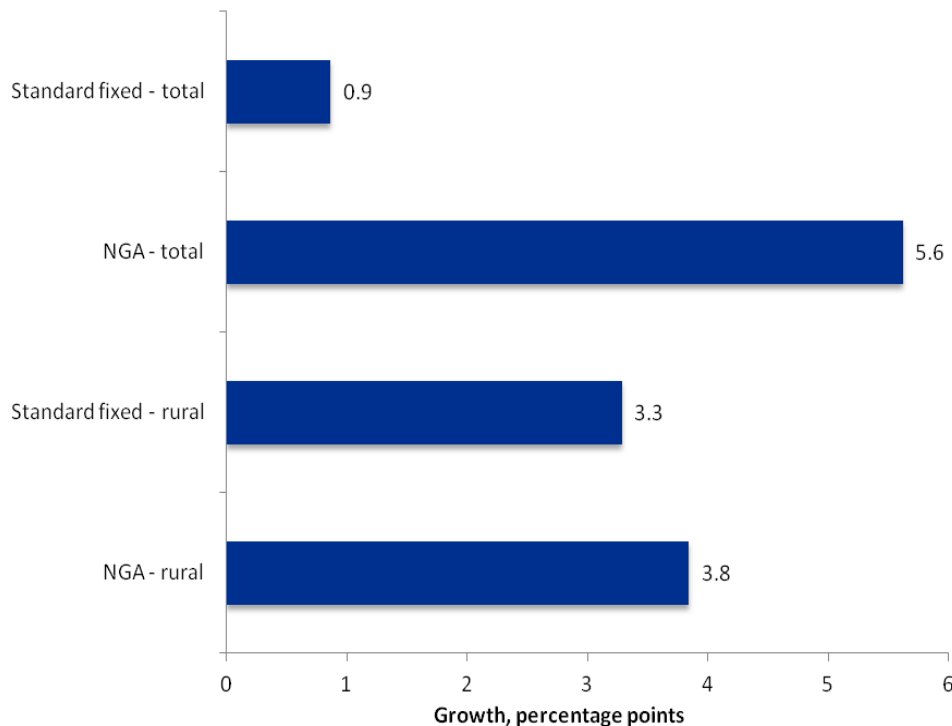
Point Topic's new approach to defining rural households identified 31 million rural households in the EU 27, which represented 15% of all households. Bringing NGA broadband services to these most rural households remains the biggest challenge for broadband in Europe. At the end of 2012, whilst rural households were relatively well served by standard broadband services, only 12% or 3.8 million had access to NGA services. Improvements have been made, with coverage increasing by nearly four percentage points in 2012, but there is still a long way to go.

EU27, rural coverage by technology combination: end of year 2011 and 2012

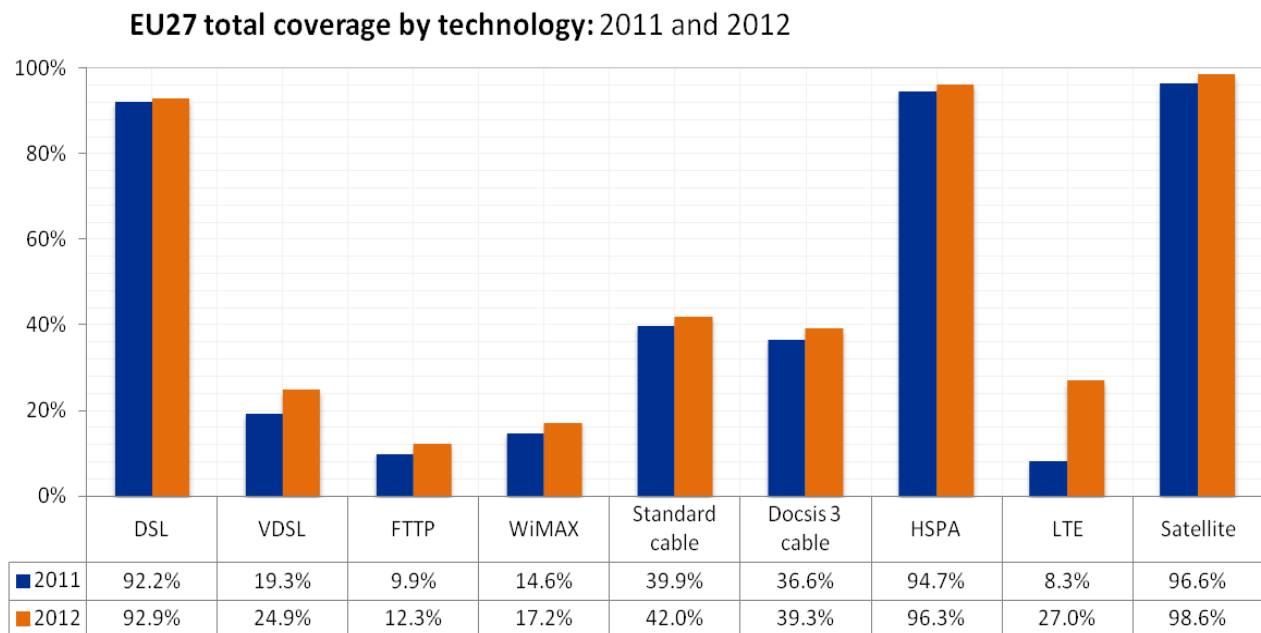


Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Coverage by combination: growth in 2012, EU27



2.1.2 Total coverage by technology



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Satellite was the most widespread broadband service in the European Union at the end of 2012. The new KA-band satellites were able to offer two-way broadband services of 2Mbps and above to nearly 99% of European households. These satellite broadband services were not available to households in Estonia, Latvia, Lithuania and Norway at the end of 2012.

In terms of fixed broadband technologies, the research showed that DSL was by far the most important service in the EU. Coverage grew slightly in 2012 and by the end of the year DSL covered nearly 93% of households. Standard cable covered over 42% of households, and WiMAX had 17% coverage. Out of the standard fixed broadband technologies, WiMAX coverage grew most in 2012, reaching around 5.5 million new households.

Combining the coverage of all these networks and also taking account of FTTP, the research showed that about 96% of the households in the EU had access to at least a basic fixed broadband service at the end of 2012.

Looking at NGA technologies, Docsis 3 was most important with nearly 40% coverage. VDSL was next at 25% and then FTTP which was available to 12% of households in the EU. VDSL coverage grew by more than five percentage points in 2012, making it the fastest-growing fixed broadband technology. Note that Docsis 3 was also included in the standard cable figures, and VDSL was also included in the DSL figures.

Combining the net contribution of these services gave a total NGA coverage of above 53%. This implied that VDSL and FTTP only added 13% net coverage to Docsis 3, due to an overlap between the technologies.

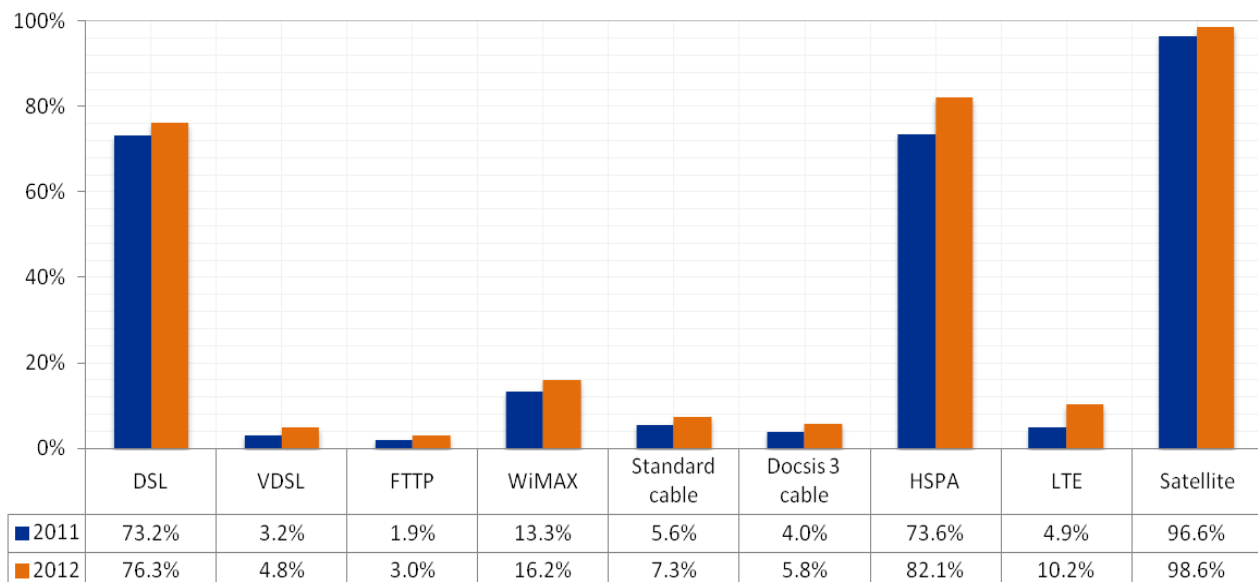
As for mobile broadband, HSPA covered nearly all of the European Union or more than 96% of households. LTE coverage grew rapidly in 2012, and the service is now available to 27% of EU households.

2.1.3 Rural coverage by technology

Besides researching the total coverage of broadband technologies the BCE 2012 project was also tasked to provide data on the coverage of rural areas in the European Union. Using its European Kilometre Grid, Point Topic estimated that 15% of households within the study countries are rural. Because of the financial barriers to supplying broadband in areas of low population density, the rural parts of Europe are expected to present the most difficulty for achieving both the basic broadband and the 30Mbps Digital Agenda objective.

The situation at the end of 2012 reflected those difficulties. Standard fixed broadband coverage in rural areas was 83% against more than 95% for the EU 27 as a whole. The headline gap for NGA was much greater, with 12% coverage in rural areas against 54% in the EU 27 as a whole.

EU27 rural coverage by technology: 2011 and 2012



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Even more than for the market as a whole, DSL was the main provider of fixed broadband access in rural areas. It provided 76% of rural coverage overall, meaning that the other standard fixed technologies only contributed a further 7% of coverage.

WiMAX was next, contributing around 16% gross coverage to rural areas. Cable made a smaller gross coverage contribution than WiMAX, at 7%. Given that cable networks need high population densities to achieve an economic return it is unsurprising that the figure is so low.

However, Docsis 3 cable was the biggest contributor to rural NGA coverage. With nearly 6% coverage it provided nearly two thirds of all NGA coverage in rural areas.

VDSL contributed another 5% to rural NGA coverage, and thanks to the existing twisted-copper-pair telephone networks in most areas it has the potential to do much more.

FTTP made the smallest contribution to rural NGA with 3% coverage, as would be expected from its economics. This total may be understated slightly because of the incidence of very small FTTP projects which fell below the size required for inclusion in the BCE 2012 research.

One positive factor for NGA coverage in rural areas was that where networks did exist they were much more likely to be complementary than in the market as a whole. Rural VDSL, FTTP and Docsis 3 together had a gross coverage of 14.6% and Point Topic estimated their net coverage at 13.3%, which was 91% efficient in terms of avoiding overlaps.

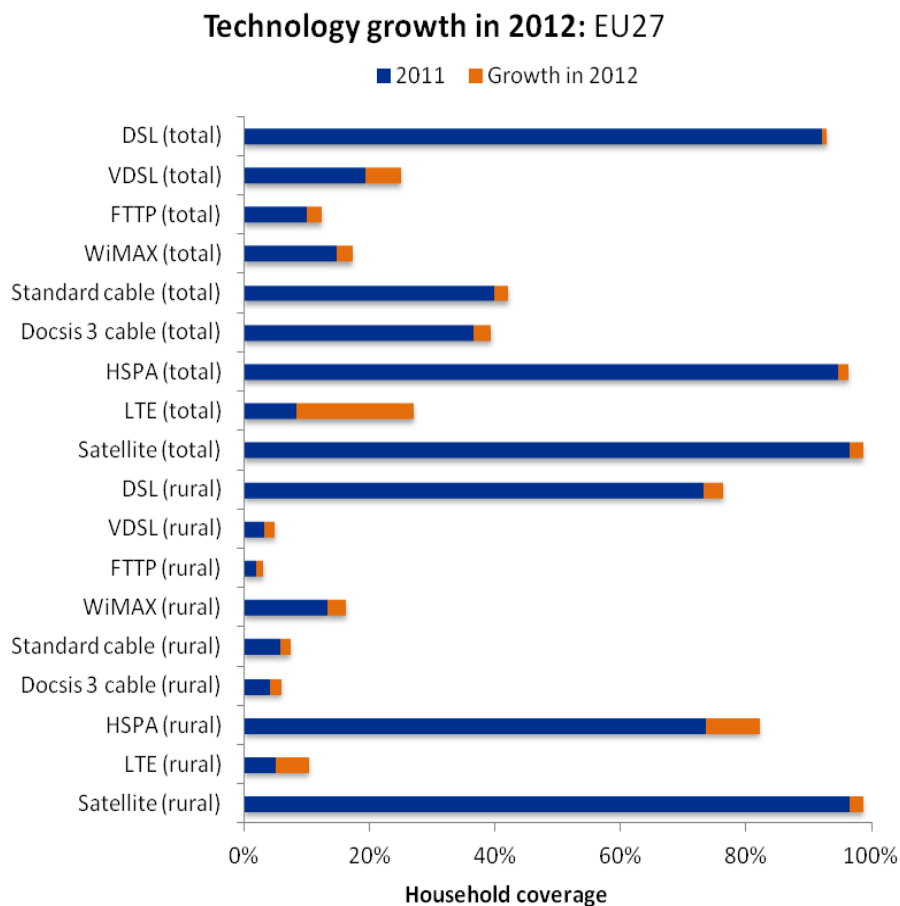
HSPA covered nearly as many rural households as all standard fixed broadband services, with 82% coverage compared with 83% for the standard fixed combination. Combined, the rural coverage of fixed-line and mobile services was 91%, implying that HSPA was the only service available to 9% of rural households at the end of 2012.

LTE covered over 10% of rural households. Sweden provided the highest rural LTE coverage in the European Union, followed by Germany. In Portugal and Estonia LTE also covered more than 30% of rural households. Across the rest of Europe, LTE was still to make any real impact on coverage in rural areas.

Satellite achieved the same percentage coverage in rural areas as for whole countries; its capabilities are better suited to rural demand.

2.1.4 Coverage growth in 2012

We tracked the growth in technology coverage by comparing the results of BCE 2011 and BCE 2012.



LTE was the fastest growing technology in 2012. By the end of 2012 LTE services were available to 39 million new households. In terms of total coverage, VDSL was the second fastest growing technology with nearly 12 million households in the EU 27 gaining access to services in 2012.

The fastest growing technology in rural areas was HSPA. HSPA covered 95% of all households at the end of 2011. Whilst it only grew by 1.6 percentage points in 2012, all growth was in rural areas.

Satellite coverage grew by 2.1 percentage points in 2012, with services also becoming available in Sweden.

2.2 Total coverage by NUTS 3 areas

The maps in this section show how standard fixed and NGA broadband coverage was distributed across Europe.

As far as standard fixed broadband is concerned, the map reveals a continent where coverage at the end of 2012 was virtually complete in the Western countries, but which still had some way to go in a number of regions of Eastern and Central Europe.

Ten of the study countries had standard fixed coverage greater than 99% and only seven had a standard fixed coverage below 90%, of which all seven countries were in Eastern Europe. Malta, the Netherlands and Belgium had the densest populations and had close to 100% standard fixed broadband coverage. Cyprus, Malta and Luxembourg also benefited from having the smallest land areas in the study.

In terms of NGA coverage, we saw significantly more variation in coverage within a country. It was in Europe's largest countries that we saw the biggest deficiencies. 80% of the NUTS 3 areas in Italy had no NGA coverage, and overall only 14% of households could access NGA services. In France, we estimated that there was no NGA coverage in thirty-eight of the one-hundred NUTS 3 areas at the end of 2012. Eastern Europe continued to perform well in delivering NGA services to its residents.

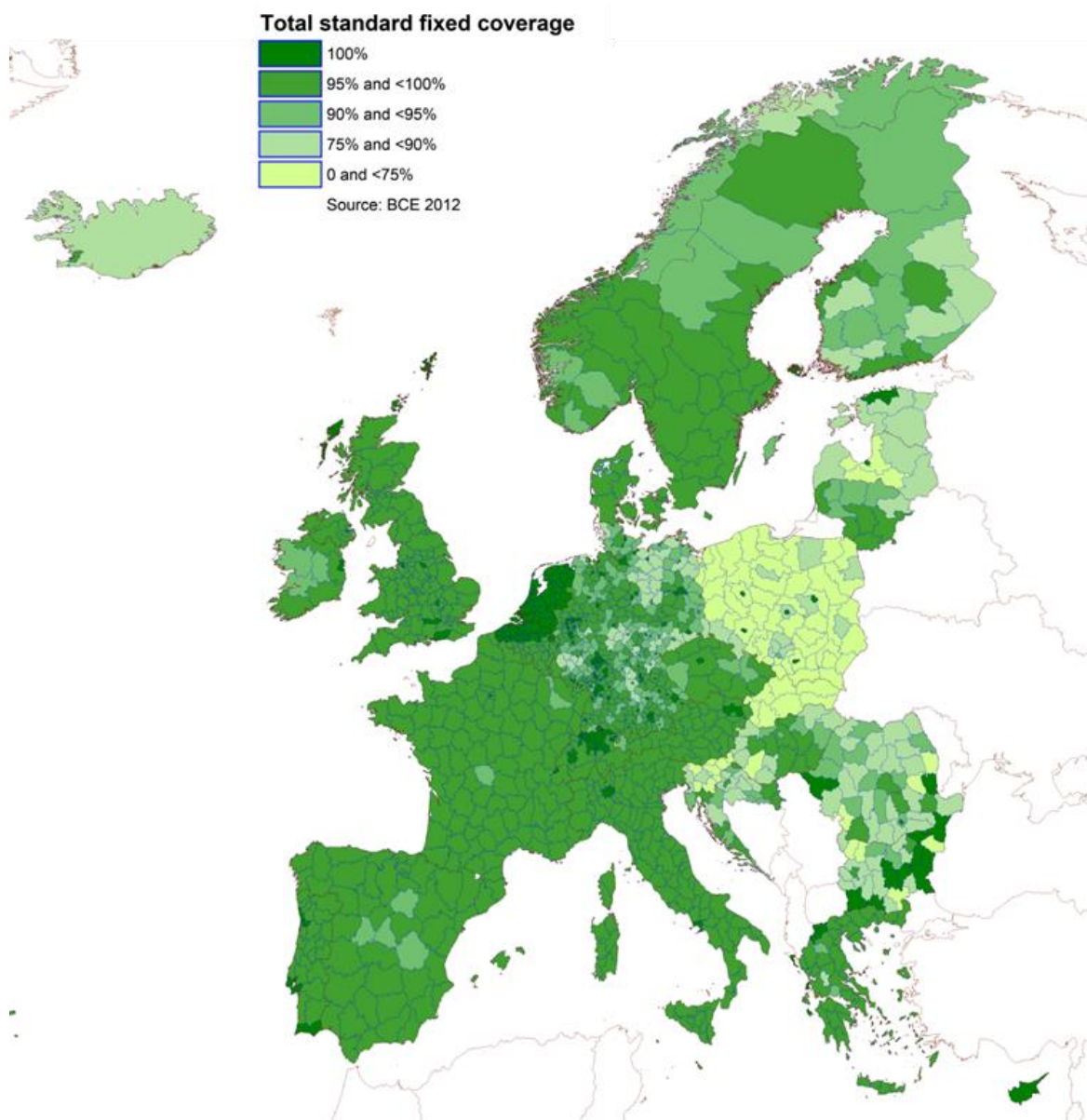
2.3 Rural coverage by NUTS 3 areas

The maps in this section show how standard fixed and NGA broadband coverage was distributed across rural households in Europe.

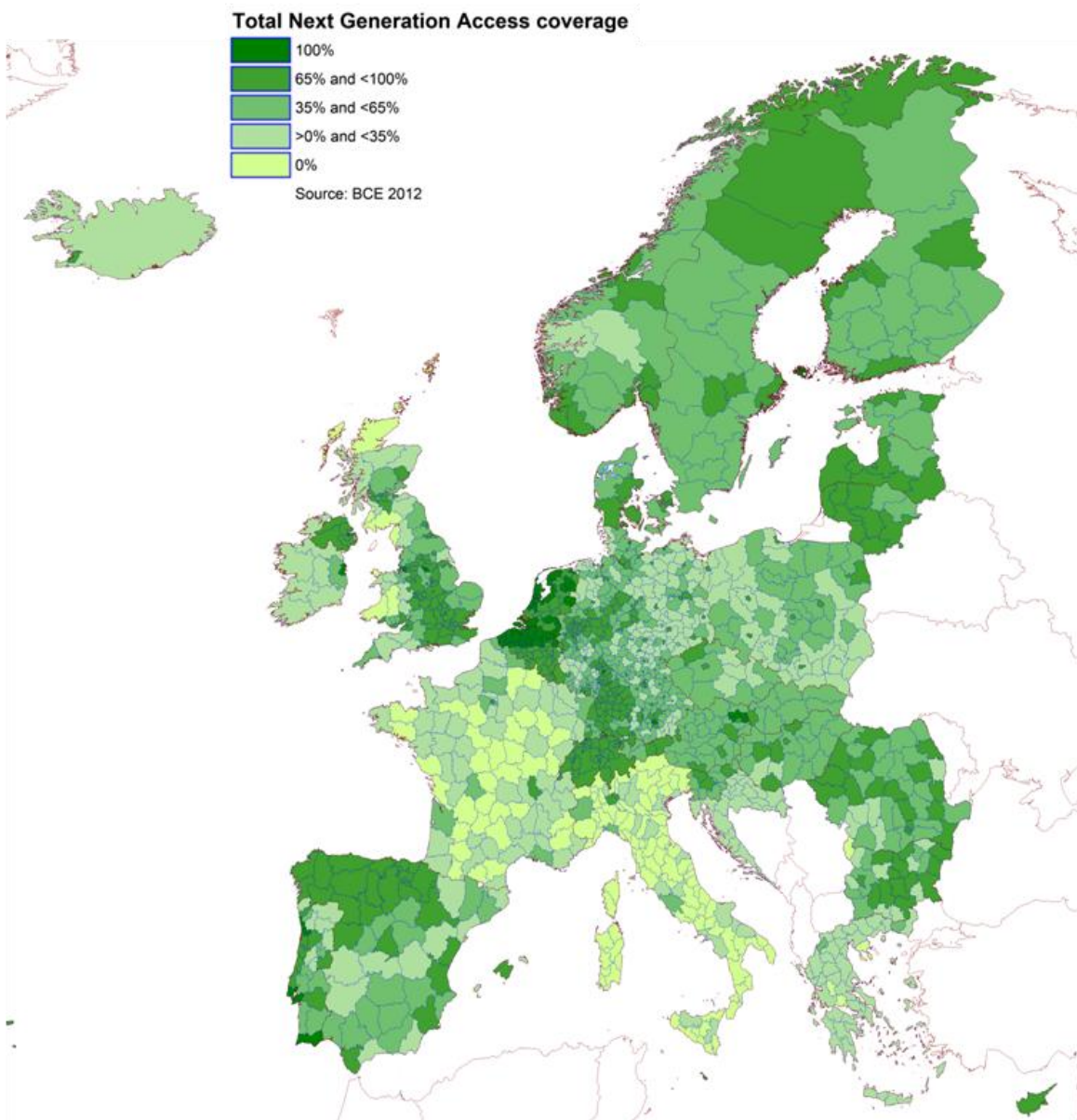
For standard fixed services, there were pronounced deficiencies in coverage in Eastern and Northern Europe. In terms of NGA services, we estimated that there was no rural NGA coverage in eight of the study countries. The most developed countries were Luxembourg, Malta and the Netherlands. Italy, one of the largest countries in Europe, had no rural NGA coverage, whilst France had less than 1% coverage.

We could see the impact of state investment in NGA broadband services in Northern Ireland, where nearly all rural households could access NGA services.

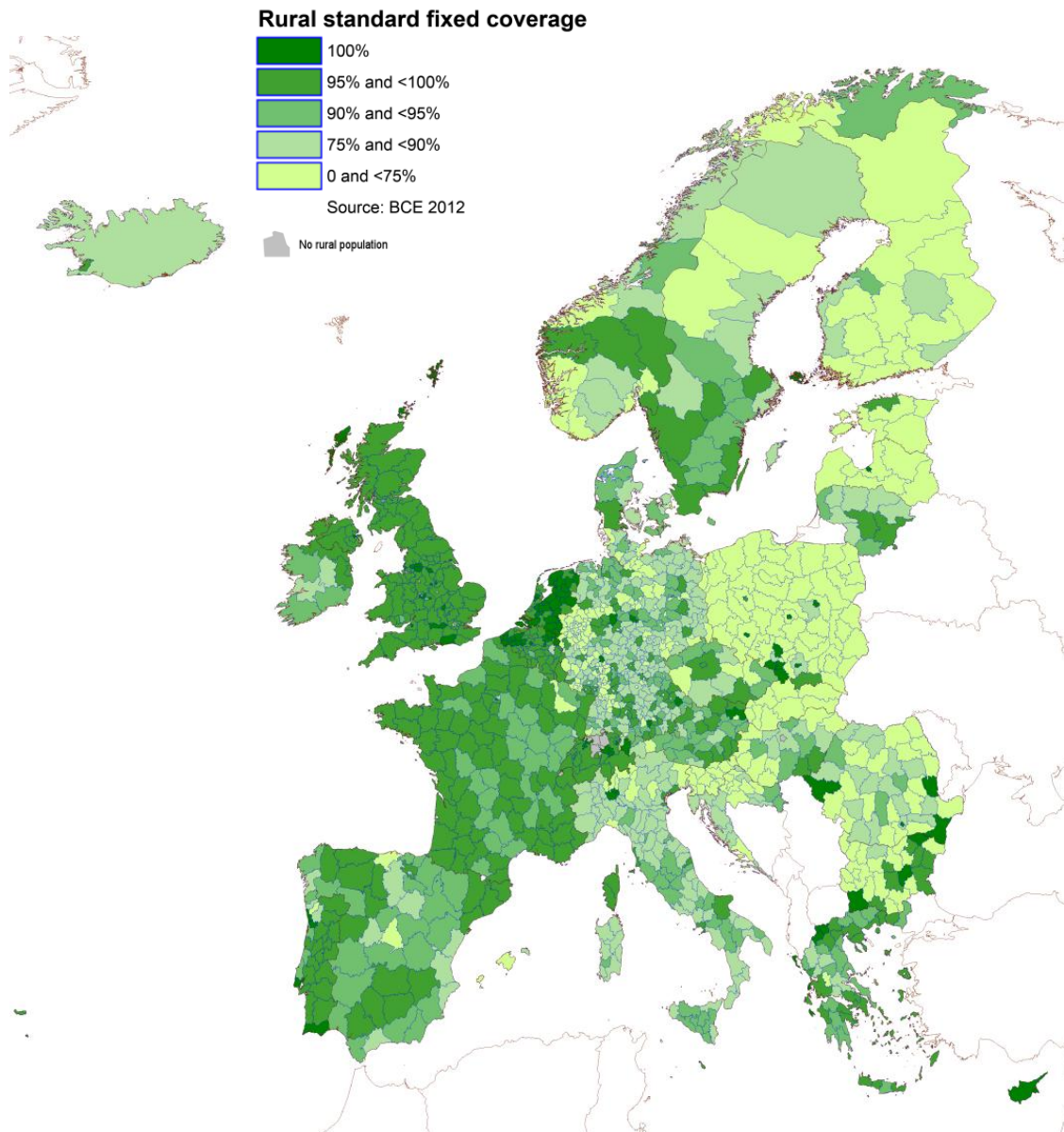
Map 2.01 Standard fixed broadband coverage in the study countries



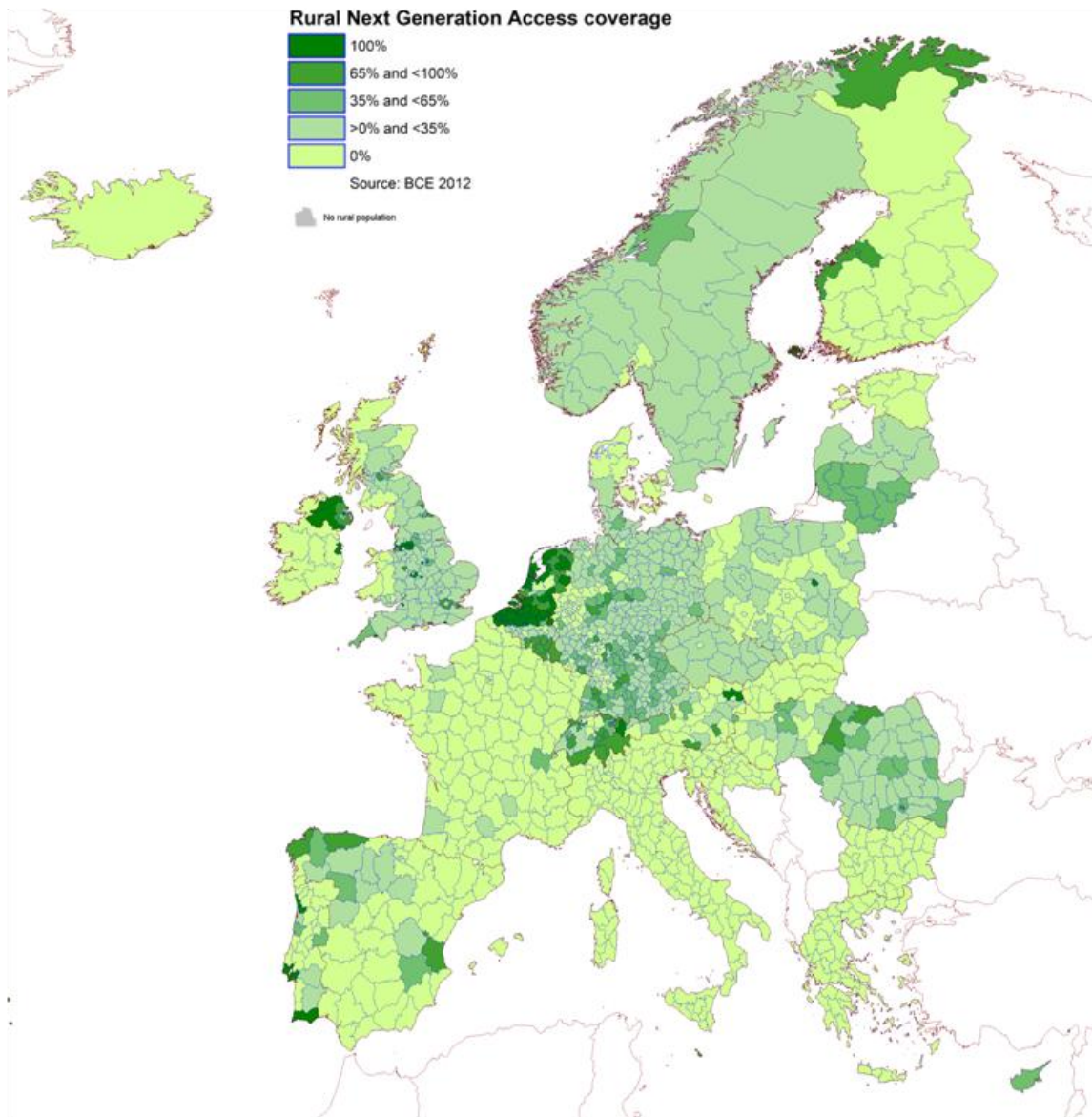
Map 2.02 NGA coverage areas in the study countries



Map 2.03 Standard fixed coverage of rural households in the study countries



Map 2.04 NGA coverage of rural households in the study countries



Coverage data for NUTS 3 areas outside mainland Europe

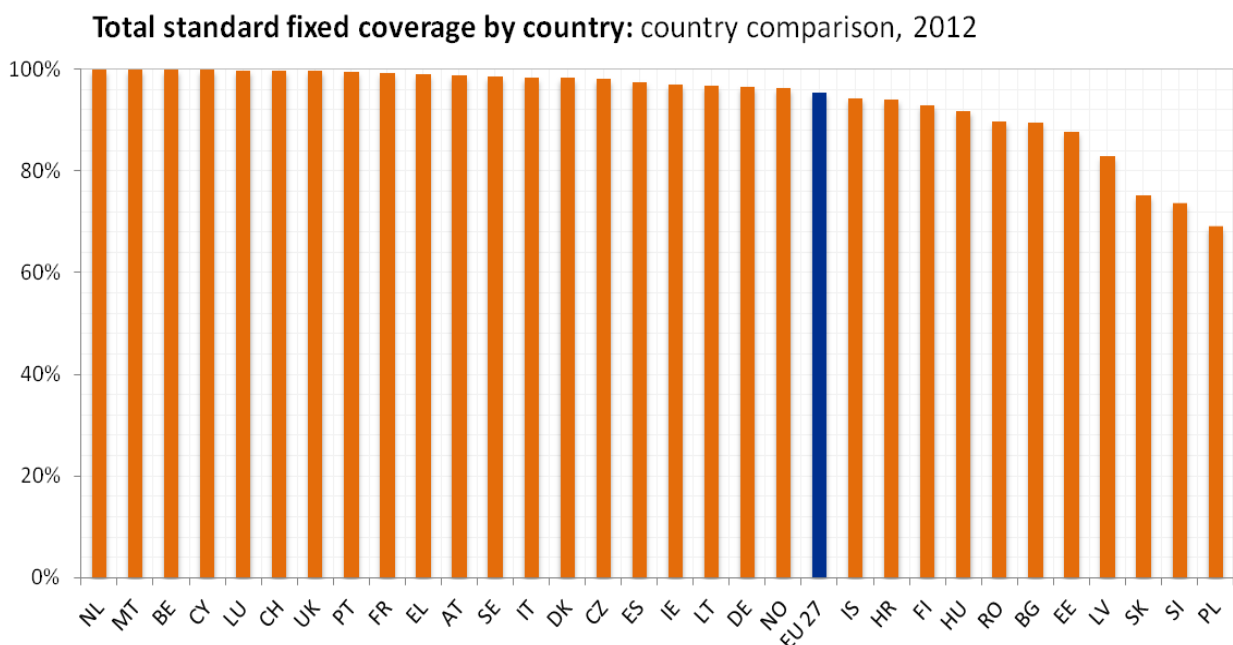
Country	NUTS code	NUTS area name	Standard fixed coverage	NGA coverage
France	FR910	Guadeloupe	97.3%	7.7%
France	FR920	Martinique	98.4%	0.0%
France	FR930	Guyane	98.9%	0.0%
France	FR940	Réunion	99.2%	0.0%
Portugal	PT200	Açores	99.5%	95.9%
Portugal	PT300	Madeira	99.5%	84.8%
Spain	ES630	Ceuta	97.2%	13.7%
Spain	ES640	Melilla	97.7%	2.8%
Spain	ES703	El Hierro	63.8%	4.2%
Spain	ES704	Fuerteventura	94.7%	9.7%
Spain	ES705	Gran Canaria	95.7%	61.6%
Spain	ES706	La Gomera	91.1%	17.2%
Spain	ES707	La Palma	95.4%	9.3%
Spain	ES708	Lanzarote	96.3%	36.5%
Spain	ES709	Tenerife	95.7%	51.4%

2.4 Country comparisons of total coverage

2.4.1 Standard fixed technologies

2.4.1.1 Total standard fixed coverage combination

The standard fixed coverage combination was meant to give an indication of the extent to which households in each country or region can access fixed broadband service capable of providing at least 2Mbps downstream speed. The four technologies taken into account to calculate the combination were DSL (which includes VDSL), Standard Cable (which includes Docsis 3 cable), FTTP and WiMAX. This section looks at the contribution of DSL, Standard Cable and WiMAX in particular. FTTP is generally classified as an NGA technology, so it is considered more fully in the next section, but it can add significant extra standard coverage, particularly in countries where DSL coverage is limited.



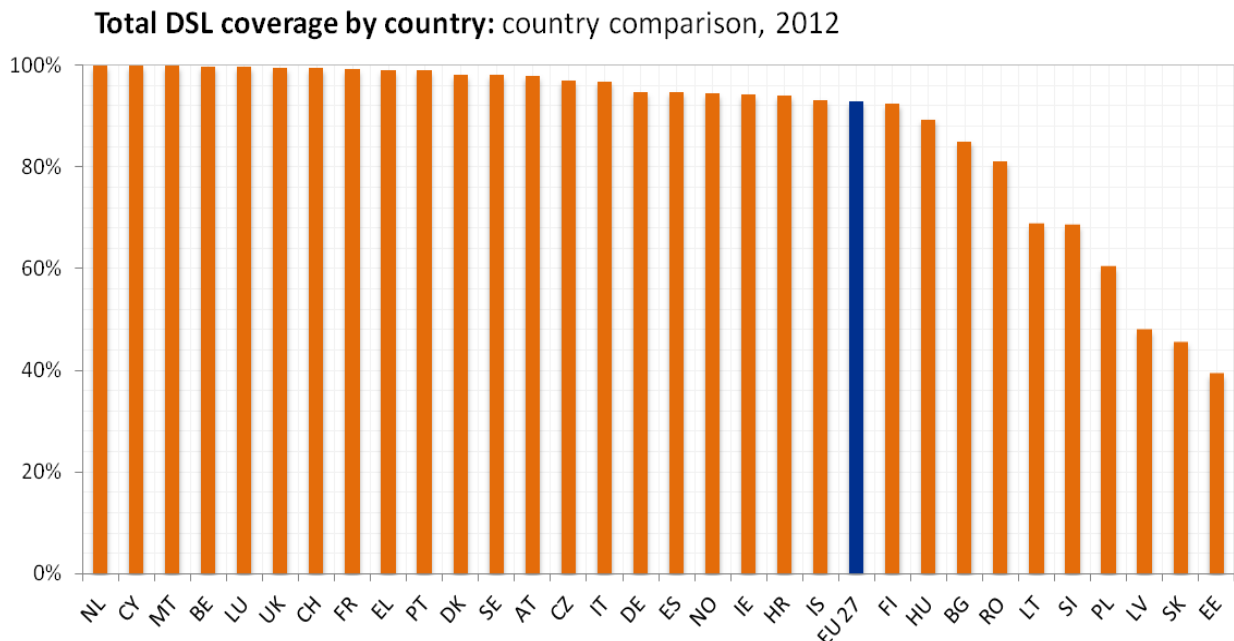
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

As the chart shows, twenty of the thirty-one study countries had a total standard fixed coverage above the European Union average of 95.5%. All the countries below the EU average were in Eastern Europe except for Iceland, which was narrowly behind the average, and Finland. On the other hand, ten countries showed fixed broadband services being available to more than 99% of households.

2.4.1.2 DSL coverage

DSL, as pictured in the chart below, was by far the biggest contributor to the standard fixed broadband combination. All but one (Iceland) of the countries which fell below the European Union average for standard fixed coverage had lower than average DSL coverage.

The distribution of DSL coverage reflects the pattern of past investment in the telephone network. Where a universal service obligation (USO) to provide telephone service has been implemented using fixed-line twisted copper-pair infrastructure then the availability of DSL has naturally followed. Where USO implementation is yet incomplete or has been carried out by alternative means, such as wireless telephony, then DSL coverage can be limited even now.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

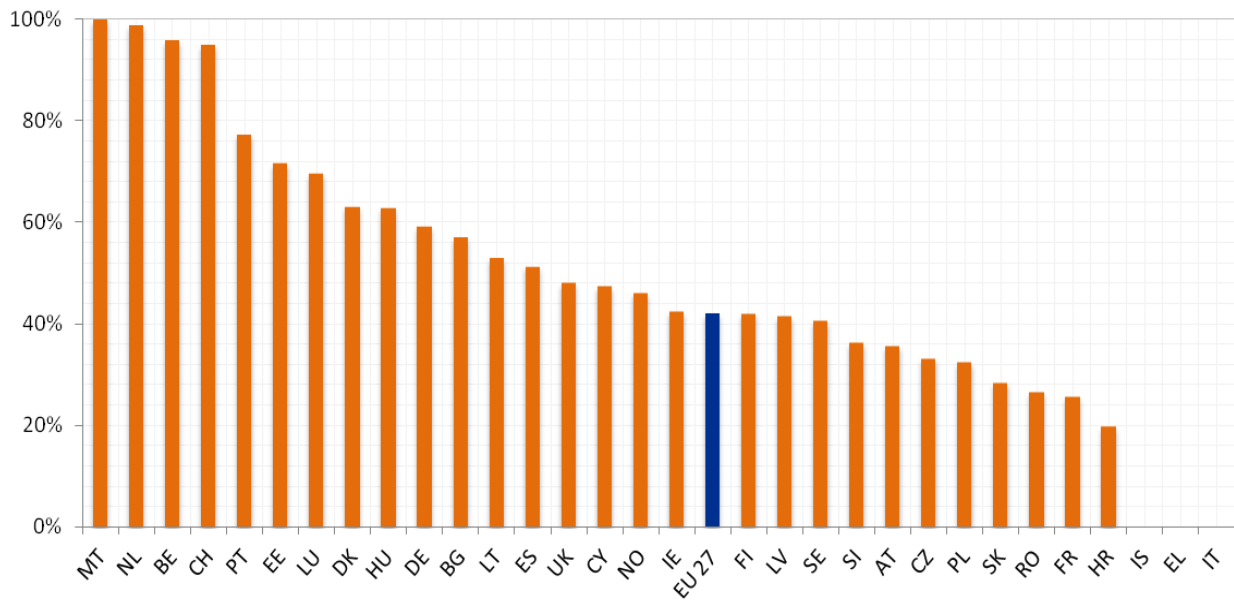
In Latvia, new DSL connections are not installed in households where fibre infrastructure is available. Such households were therefore not counted as having DSL coverage. In Slovakia, Poland and France, the data provided for household coverage of DSL from the regulators did not precisely match the survey definition. More details are provided within the country-specific sections of this report.

2.4.1.3 Standard cable coverage

After DSL cable networks were the next most widespread component of standard fixed broadband coverage, although they added relatively little extra coverage. This is because they are still overwhelmingly concentrated in relatively densely-populated urban and semi-urban areas and generally overlapped by DSL. The three most urbanised countries – Malta, the Netherlands and Belgium – had a cable coverage exceeding 95%. Switzerland also had coverage greater than 95%, which is surprising given that it is a relatively rural country. No other country had more than 78% coverage, and three had no cable networks providing broadband services at all. Cable coverage in the European Union as a whole was 42%.

Docsis 3 services over the cable networks made a very important contribution to the availability of NGA in the EU, as detailed in the next section.

Total standard cable coverage by country: country comparison, 2012

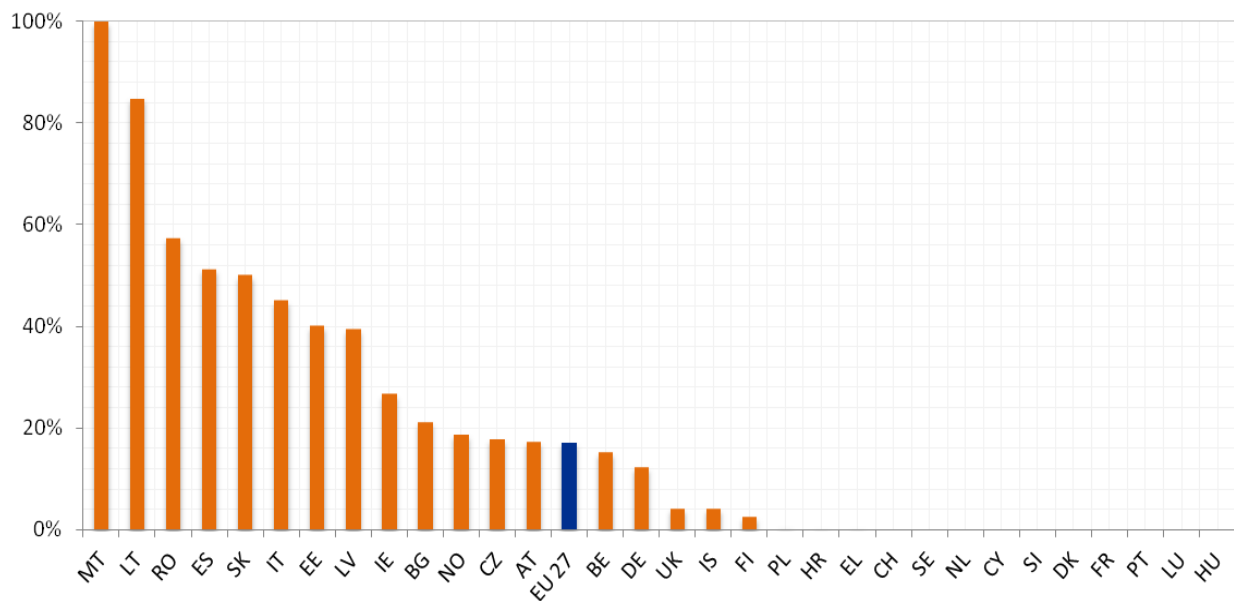


Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

2.4.1.4 WiMAX coverage

The coverage of WiMAX is very difficult to assess accurately. One fundamental reason for this is that WiMAX signals can often be received over a very large area, at least in principle, so operators may claim much greater coverage than they are realistically marketing to or supporting. The industry is also highly fragmented. Repeated experience has shown that the actual customer numbers achieved by fixed wireless operators are small and so it generally attracts only smaller operators with limited ambitions. On the other hand, market entry is relatively easy and cheap so this also suits smaller players. Also, many more plans and projects are announced than actually come to

Total WiMAX coverage by country: country comparison, 2012



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

fruition and survive.

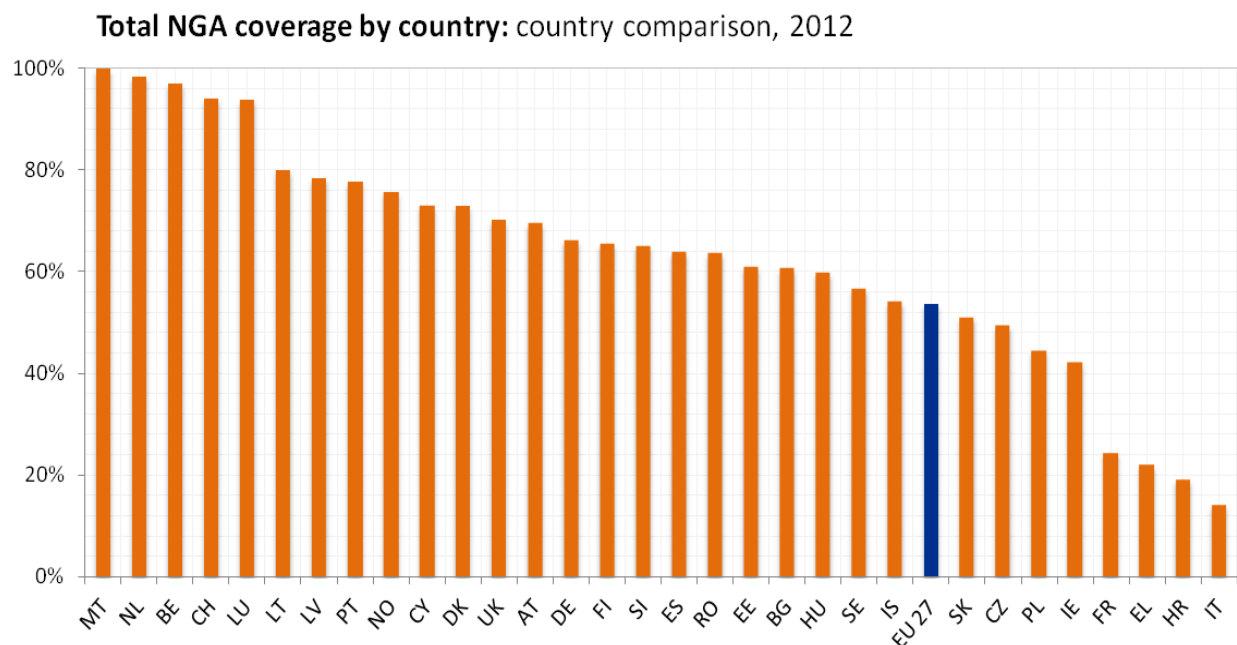
Still, WiMAX did play an important role in some countries, filling in gaps or providing a competitive alternative to the bigger networks. For example, Lithuania, Romania, Slovakia, Estonia and Latvia all had more than 35% coverage, which helped to offset the low coverage provided by DSL services.

WiMAX did add some coverage to standard fixed coverage where other networks were limited but it was not a major factor.

In ten countries the project found no active WiMAX services available at all. This now includes Denmark where the single provider of the technology went bankrupt in 2012, leaving the country without any WiMAX coverage.

2.4.2 NGA technologies

2.4.2.1 Total NGA Coverage combination



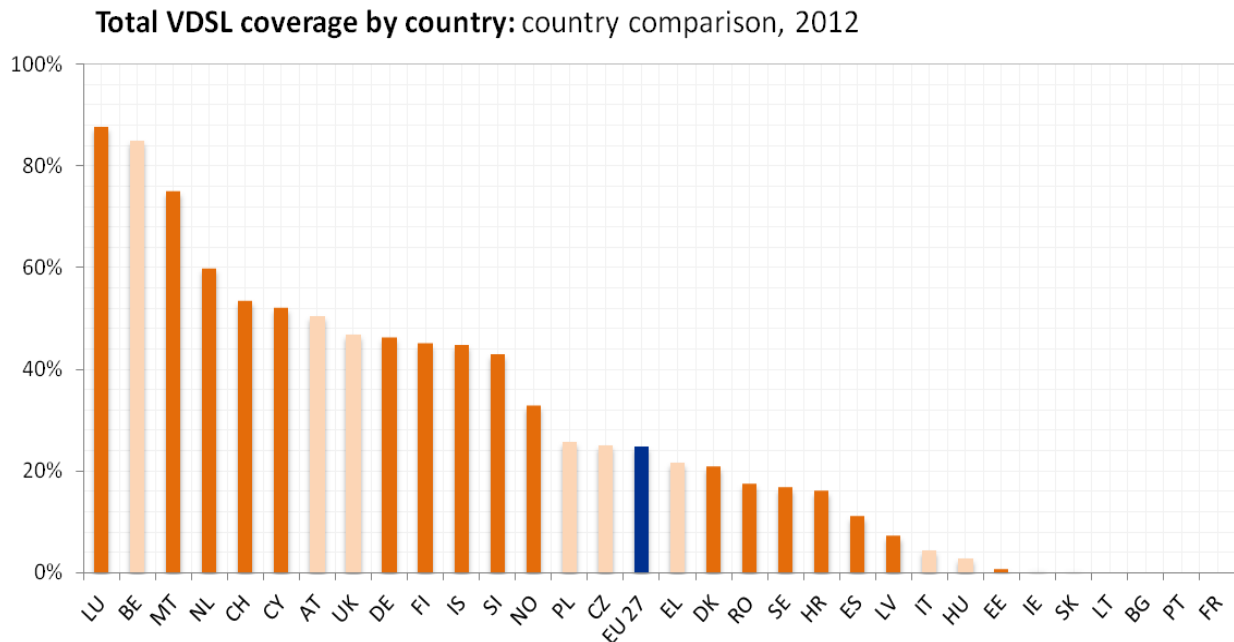
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The NGA coverage combination was intended to show how far advanced the European Union is towards achieving the Digital Agenda objective of access to 30Mbps broadband for all by 2020. It combined the coverage of the three main fixed-line Next Generation Access technologies: VDSL, Docsis 3 Cable and FTTP. All three are capable of delivering the target of 30Mbps downstream, although VDSL will fall short of that capability where a premises is too far from the serving VDSL node.

As the chart shows, the EU as a whole was over half-way towards the 30Mbps goal at the end of 2012. The BCE 2012 project found 53.7% net coverage by fixed-line NGA services, after taking account of the overlaps between different services. Again, it was the most urbanised countries which had the highest NGA coverage but otherwise the pattern of high or low coverage was quite

mixed. Countries with above average NGA coverage were found in all quarters of Europe, reflecting the effects of different development policies, infrastructure needs and technology choices.

2.4.2.2 VDSL coverage



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

VDSL was the fastest-growing NGA technology in Europe, with coverage ahead of FTTP but still behind Docsis 3. Twelve countries had over 40% coverage, well ahead of the European Union average of 25%. No VDSL coverage was reported for Bulgaria, Lithuania, Portugal or France. A further six countries had limited implementations covering less than 10% of households.

Note that not all countries provided VDSL coverage data corresponding to the survey definition. The qualification for coverage used in the survey is:

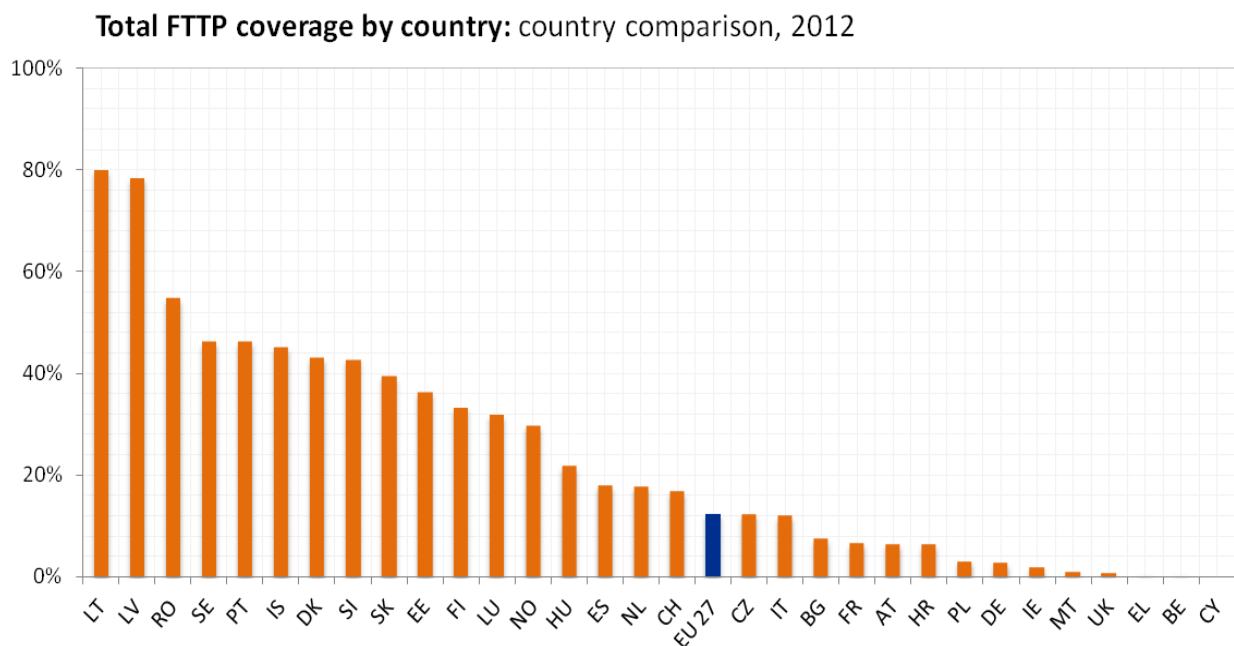
Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

The countries indicated with lighter shading did not provide data matching to this definition. In Belgium and the UK, survey data was provided for VDSL including all VDSL coverage, not restricted to coverage delivering high-speed services. In Austria, Poland, the Czech Republic, Greece, Italy and Hungary, we were not able to confirm whether the survey definition had been met.

In Belgium this had no impact on the NGA coverage combination value reported – high-speed VDSL data was supplied for the combination calculation. But in the other countries mentioned, we expect that overall NGA coverage will be too high. However, since Docsis 3 is the main contributor to NGA coverage we assume the impact will remain minimal.

2.4.2.3 FTTP coverage

FTTP coverage was largest in Eastern Europe, where the immediate need is greatest – because of the limitations of other networks – and the residential building stock is most favourable. A large proportion of housing in these countries consists of flats in system-built blocks, typically forty per block. It is often economically attractive to run optical fibre to a single block, or even a group of them, and then distribute broadband service over local networks provided by VDSL, Ethernet or even FTTH technology. (In-building VDSL distribution is not generally included in the definition of VDSL coverage for this project.)



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

In Lithuania and Latvia nearly 80% of households were covered by FTTP. Most of the other Eastern European countries were above the European Union average of 12.3% as well. The five Nordic countries had also made a heavy commitment to fibre, all at more than twice the EU average. Portugal, Luxembourg, Spain, the Netherlands and Switzerland also posted higher than average FTTP coverage at the end of 2012.

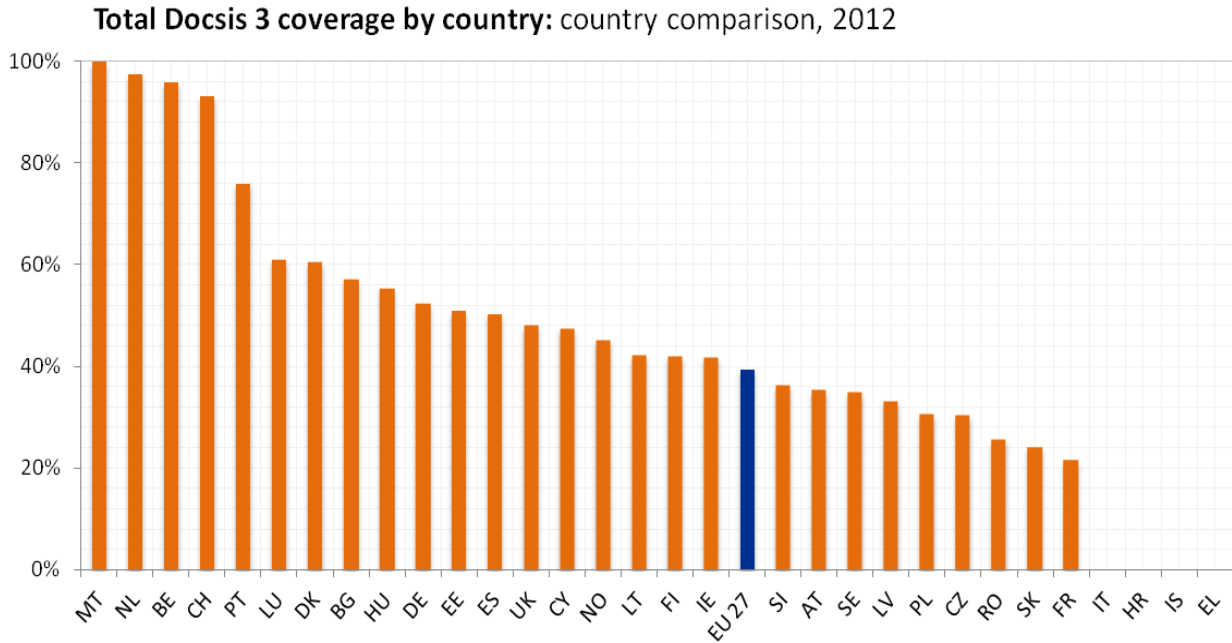
At the other end of the scale, there was no reported FTTP coverage in Cyprus and seven more countries had less than 5% of households covered.

2.4.2.4 Docsis 3 coverage

The European Union’s cable networks have mostly proved able to upgrade quite quickly to Docsis 3 with download speeds of at least 30Mbps evolving towards 100Mbps and above. Across the EU 27 as a whole over 93% of cable network coverage was Docsis 3 at the end of 2012. Seven countries reported a complete upgrade and a further nine over 95%, with the others ranging from 71% to 95%.

The proportion will certainly increase over the next few years but some areas will not be suitable for upgrading. At least one cable operator has closed network segments which it is unable to upgrade.

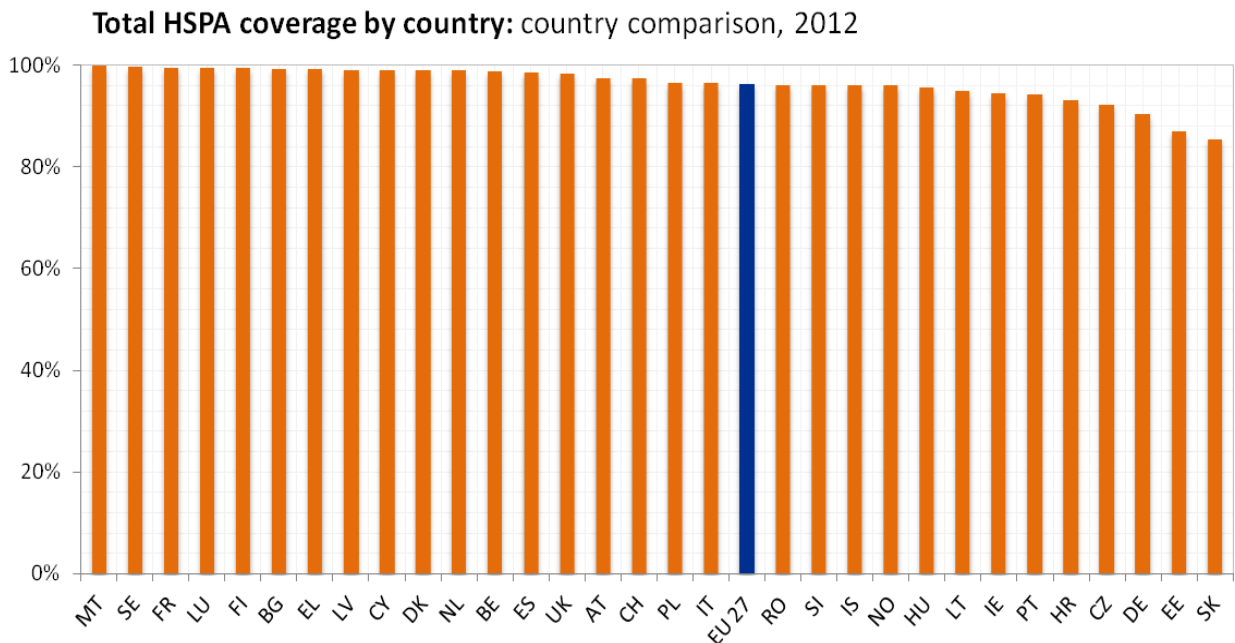
Countries which were below the average of 93% upgraded were spread throughout Europe and throughout the range of cable network coverage, except for the highest coverage countries where the cable networks were completely Docsis 3. Only Croatia was reporting no upgrade of its cable network to Docsis 3.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

2.4.3 Mobile broadband technologies

2.4.3.1 HSPA coverage



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

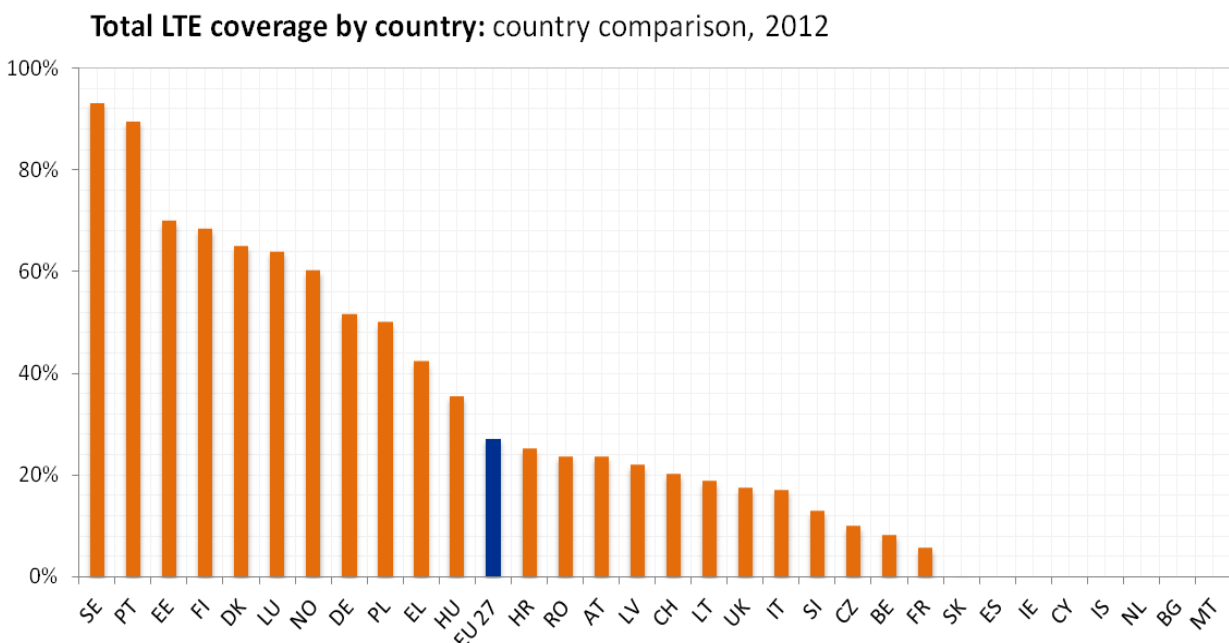
HSPA has achieved a high degree of coverage across the EU in a relatively short time. Eighteen countries were above the European Union average of 96.3% and none were below 85%. However, this represents the mobile operators' own reported coverage areas in most cases, which use varying standards as far as actual performance is concerned. Where more rigorous standards were applied, such as providing at least 1Mbps download speed, coverage areas were found to be lower. As most users will know, actual performance can be intermittent even well inside expected coverage areas.

One issue with HSPA performance is whether coverage should be measured indoors or outdoors. Point Topic set the default definition of coverage for the project as being for outdoors performance. This is to reflect the situation where HSPA is being offered as a direct substitute for fixed-line broadband to meet the Digital Agenda targets. In this case it is reasonable to assume that households could cover the cost of an external aerial without making HSPA uncompetitive as a broadband solution.

LTE coverage

LTE coverage increased rapidly in 2012, with coverage growing by 18 percentage points. With the exception of Iceland, all the Nordic countries were ahead of the EU average for LTE deployment. Sweden led with over 90% household coverage, with Portugal close behind.

Averaged across the European Union, LTE coverage was 27.0% and seven of the study countries had no commercial LTE service at the end of 2012 (Slovakia then had less than 1% coverage). Many were undertaking working trials and had already granted licences for LTE spectrum. Coverage is again expected to increase rapidly during 2013.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

2.4.4 Satellite

All but four of the thirty-one countries surveyed had Ka-band satellite coverage and distribution for consumer broadband services. The four exceptions are Estonia, Iceland, Latvia and Lithuania.

The project defined coverage as being 100%, in both urban and rural areas, in any country where service was available from at least one KA-band satellite service provider and as 0% otherwise. On this basis, twenty-seven countries have 100% coverage and four 0%. This gave an EU coverage average of 98.6% for both urban and rural areas.

In every country with satellite coverage Point Topic also identified commercial distribution points, meaning that services are available to the consumer.

Although broadband satellites can “see” virtually every household in the area covered by each beam footprint, the total data bandwidth which any single beam can provide is limited. This means that the number of users who can be supported by a single beam is limited by the average bandwidth used by each user in peak hours. The maximum number of users per beam depends on many factors and changes with time, but is often quoted as about 200,000. As a result, a satellite beam will not necessarily have the capacity to serve all the unconnected premises it covers.

Note that satellite coverage was not separately researched for the overseas administrative areas of the Study Countries which have them (France, Portugal and Spain). These areas were assumed to enjoy the same satellite coverage as the rest of the country concerned.

2.5 Country comparisons of rural coverage

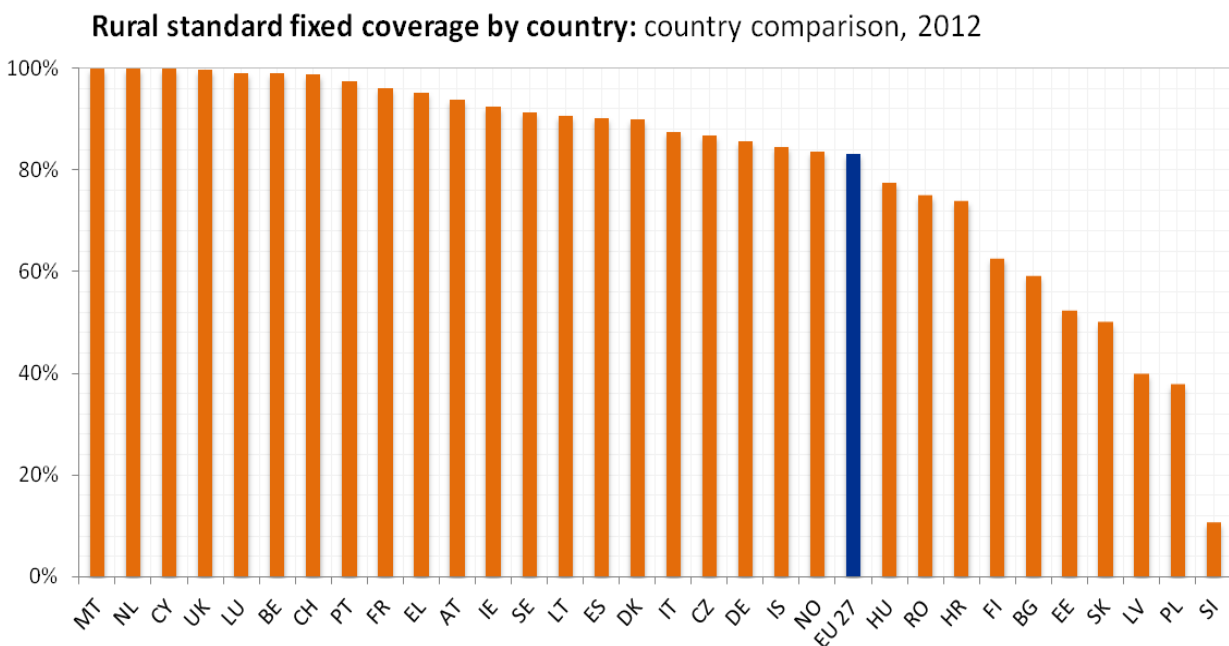
2.5.1 Standard fixed technologies

2.5.1.1 Rural standard fixed coverage

Rural standard fixed coverage was usually much lower than total coverage. The European Union average for total coverage was 95.5%, which fell to 83.2% for the rural equivalent. Coverage also fell off much more sharply in the less well served countries. Twenty-one countries had rural fixed broadband coverage above the EU average, but this then ranged down to as low as 11%.

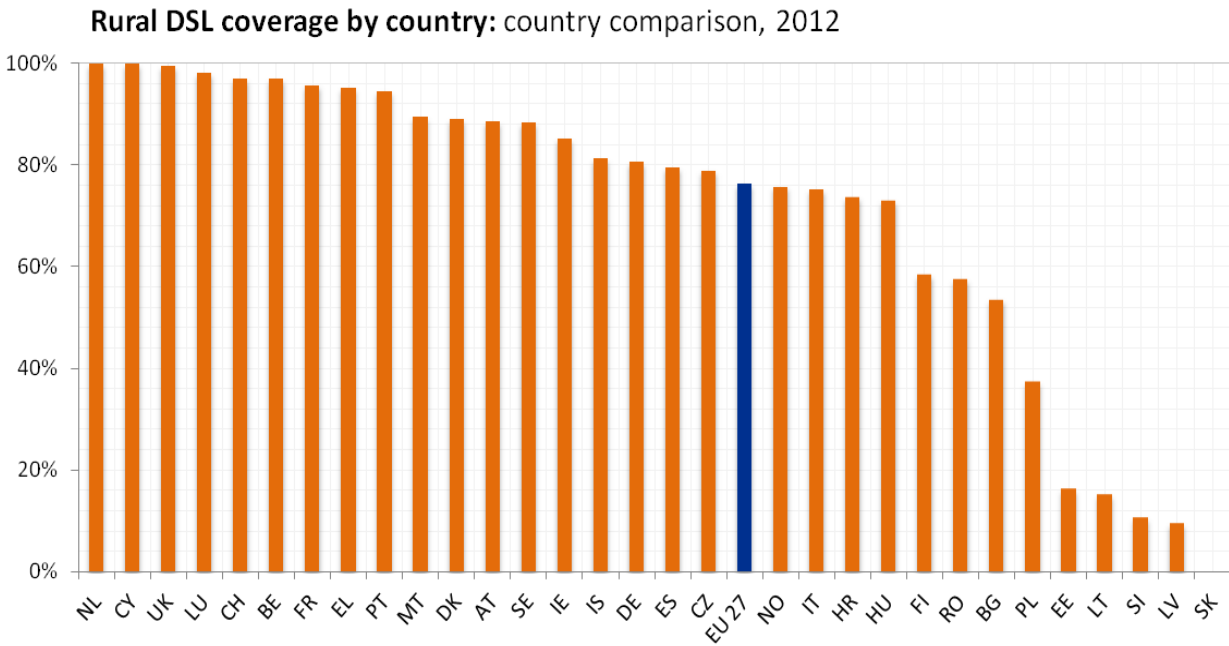
All of the countries below the EU average for rural fixed broadband coverage were in Eastern Europe, and also Finland.

On many occasions, real data on the coverage of rural households was not available from the regulator or the operators. In such cases we estimated rural coverage, assuming that the coverage of a technology within an area will only reach the rural parts if the urban or non-rural parts are 100% covered. Where real data, reported by NRAs or operators, was available, it sometimes showed that rural areas did have some coverage, typically just a few percent, even where non-rural areas were not fully covered. Thus our estimates in the areas without actual data will sometimes understate rural coverage slightly. This means that the implied coverage in non-rural areas is overstated by the equivalent amount so that the figure for total coverage is not affected.



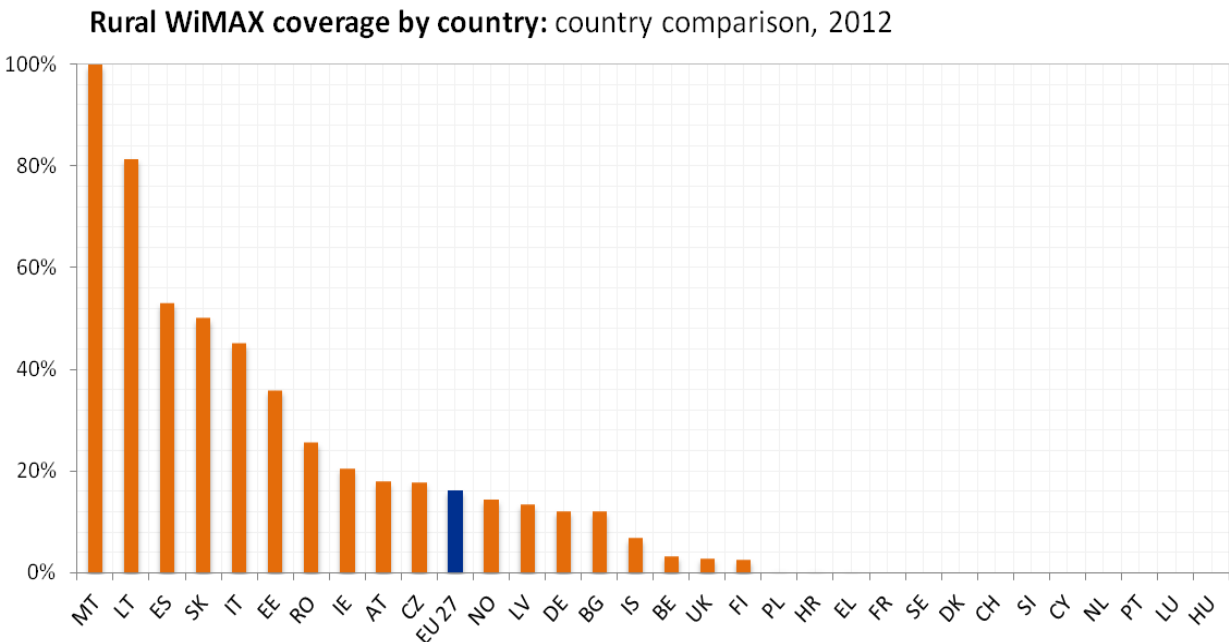
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

2.5.1.2 Rural DSL, Standard Cable and WiMAX coverage



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

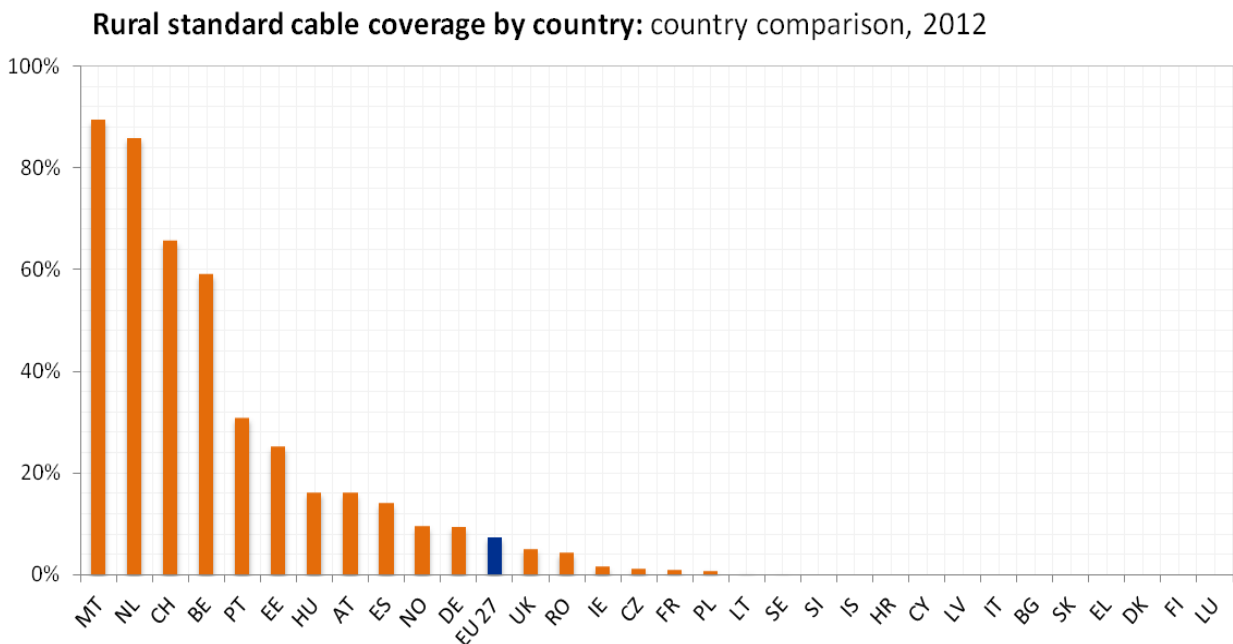
DSL was the biggest contributor to rural broadband coverage overall, just as it was for total coverage. But the total contribution was not so large – averaging 76% for rural areas rather than 93% in total – and the range between countries was much greater. In Slovakia we estimated that there was no coverage of rural households, although this was not supported by survey data. In four other countries DSL covered less than 20% of the rural households. In Lithuania, WiMAX played a bigger contribution in delivering standard broadband to rural areas.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Rural WiMAX coverage followed a very similar pattern to total WiMAX coverage, and the percentage difference was less than for other technologies. This is because WiMAX is assumed to cover urban and rural areas equally where it is available. Even so, overall average rural coverage was quite low at 16.2%, and ten countries were found not to have any rural WiMAX coverage.

Note that rural networks providing broadband using earlier fixed wireless technologies were available in many of these and the other study countries but were not included in the survey because of their limited coverage and bandwidth capability.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The cable networks made a lower contribution to rural coverage than WiMAX with a EU average of 7.3%. This was mainly in countries with extensive and old-established cable networks, many rolled out when the business case was not so rigorously calculated as it would be today. On the whole the countries with newer cable networks had at most only a few percent coverage of rural areas.

Twelve of the study countries were shown as having no rural coverage by cable, and a further eight had 5% or less. Of the twelve, three had no broadband cable services in any case, but in the other cases the cable networks were entirely confined to the urban areas.

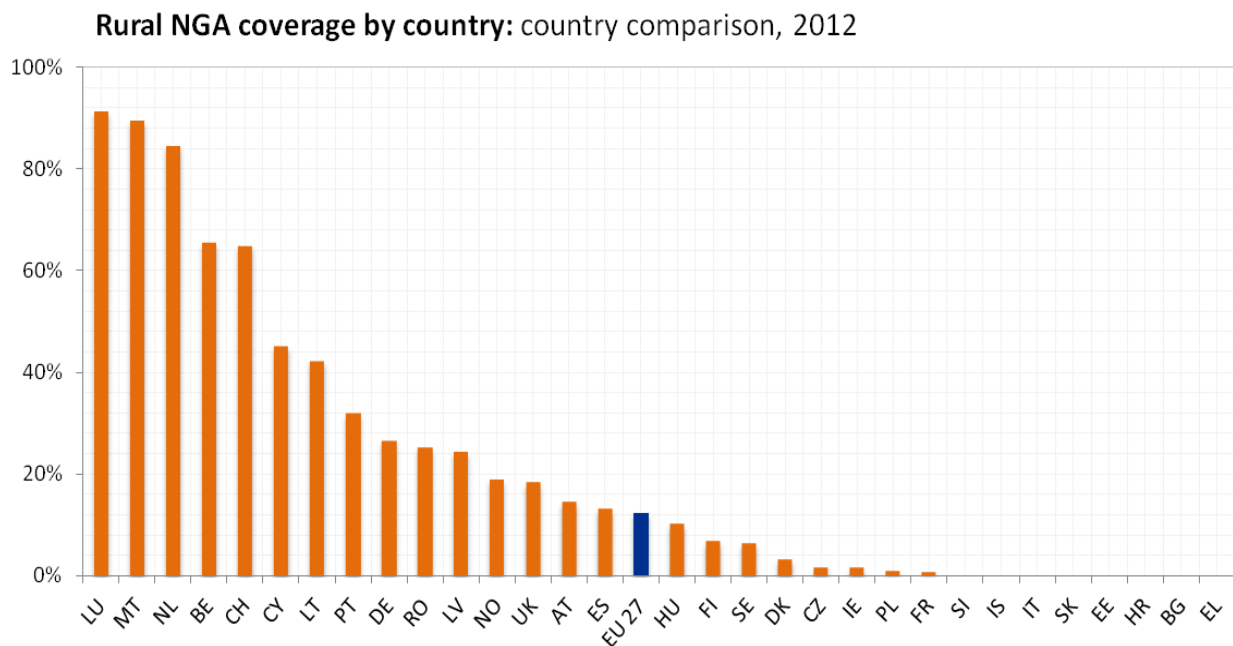
2.5.2 NGA technologies

2.5.2.1 Rural NGA coverage

As would be expected, the gap between total and rural NGA coverage was even greater than the gap for standard coverage. Total NGA coverage in the European Union was 53.4% - but only 12.4% of the most rural households had coverage. This reflects the basic economics of broadband where more densely populated areas have a strong advantage.

Luxembourg, Malta and the Netherlands all covered more than 85% of their rural households with NGA services. Belgium and Switzerland then had around 65% coverage each. In Luxembourg VDSL contributed most to rural coverage. In the other high-ranking countries rural NGA coverage was delivered by the extensive Docsis 3 networks. Eight countries were thought not to have any rural NGA coverage.

Historical circumstances, national policy and the availability of different technologies have created a very varied picture as far as NGA coverage in more marginal areas is concerned.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

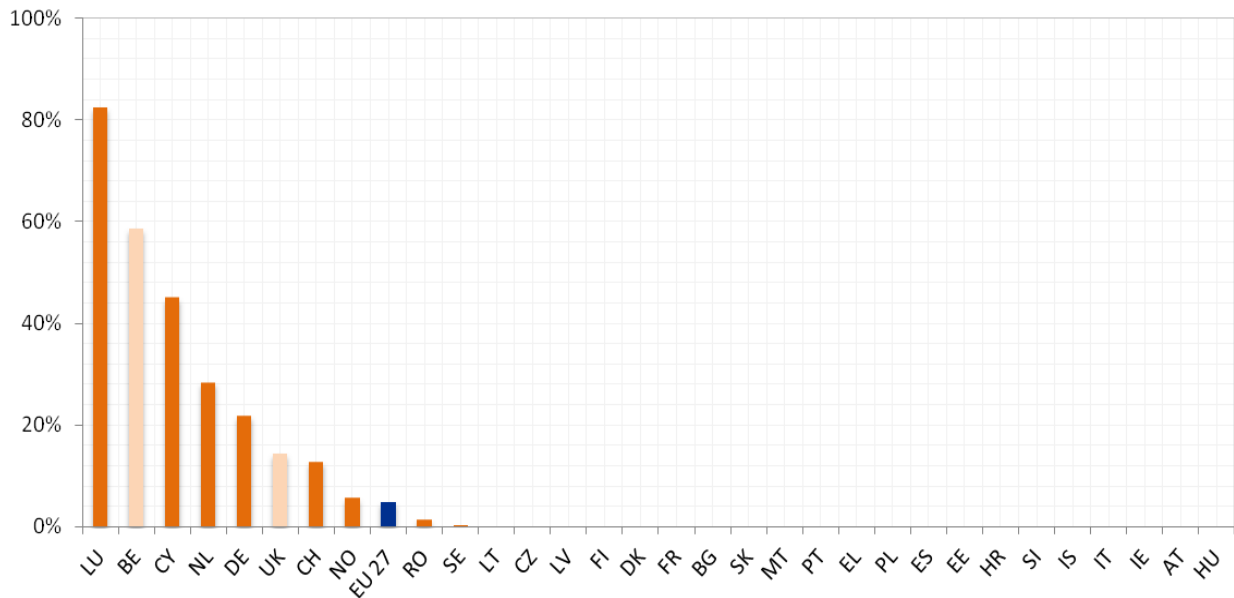
2.5.2.2 Rural VDSL, FTTP and Docsis 3 coverage

Docsis 3 contributed most NGA coverage to rural areas, with 5.8% of households covered. This was closely followed by VDSL with 4.8% coverage and FTTP with 3% coverage of the EU's rural households.

Twenty-one countries had no rural VDSL coverage, but it was the dominant rural NGA technology in Luxembourg, Cyprus, Germany and the UK. Thirteen countries had no rural FTTP coverage, but it was the lead technology for rural NGA coverage in countries such as Latvia, Lithuania and Romania.

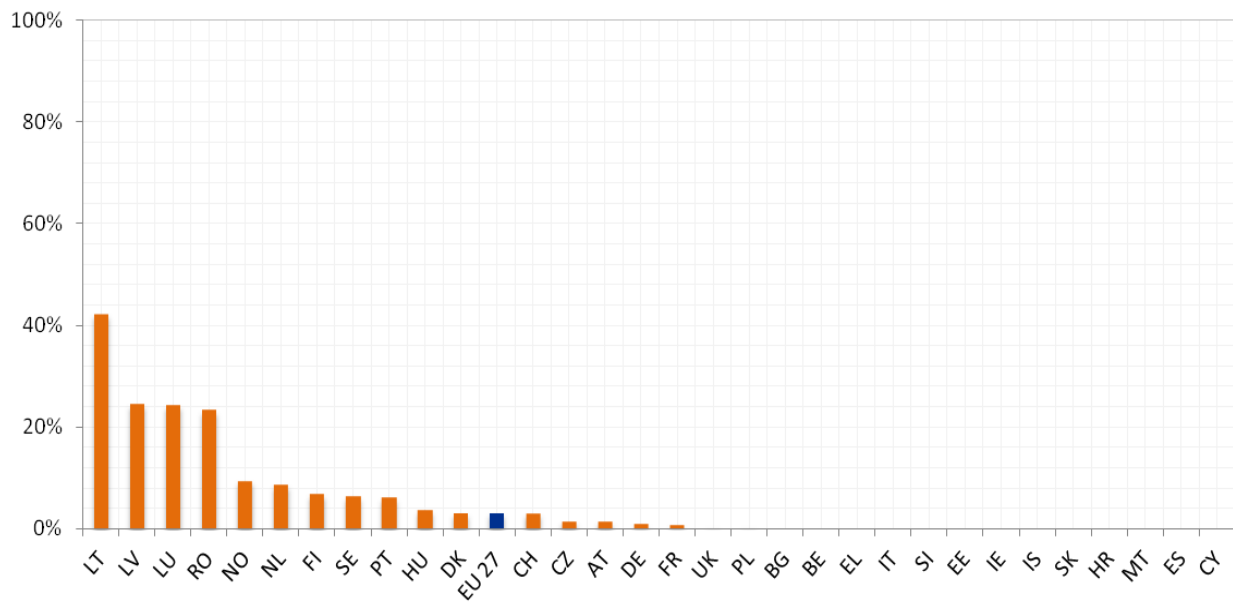
Docsis 3 was the lead technology for covering rural households in ten countries including Malta, the Netherlands, Belgium and Switzerland. Fifteen countries had no rural Docsis 3 coverage.

Rural VDSL coverage by country: country comparison, 2012

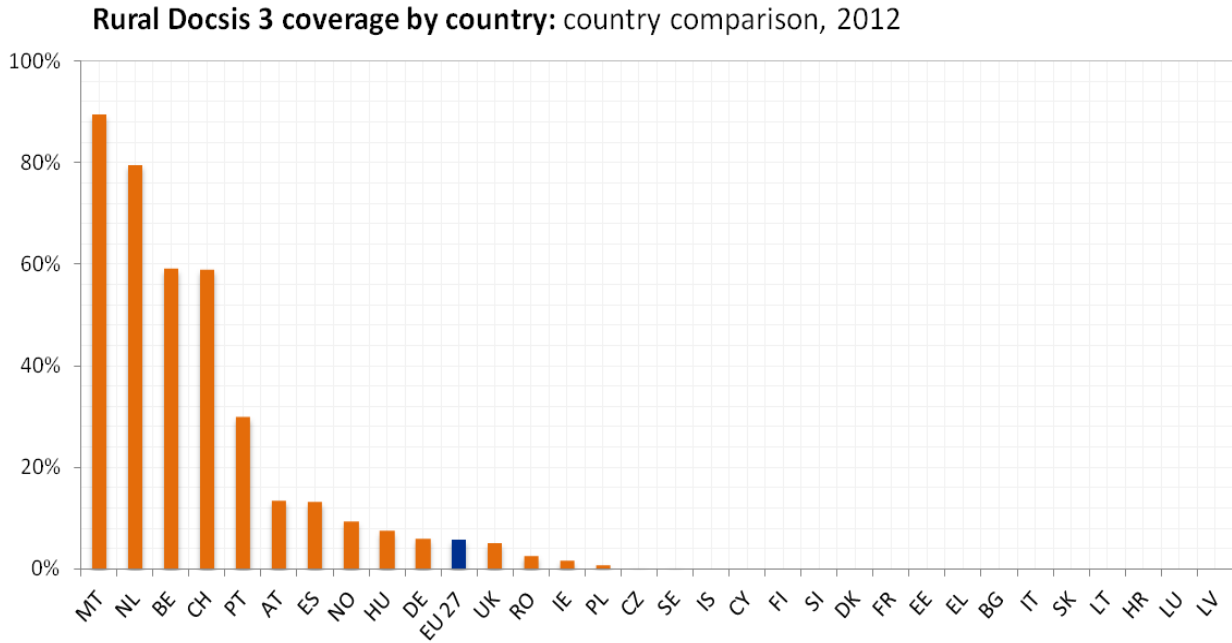


Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Rural FTTP coverage by country: country comparison, 2012



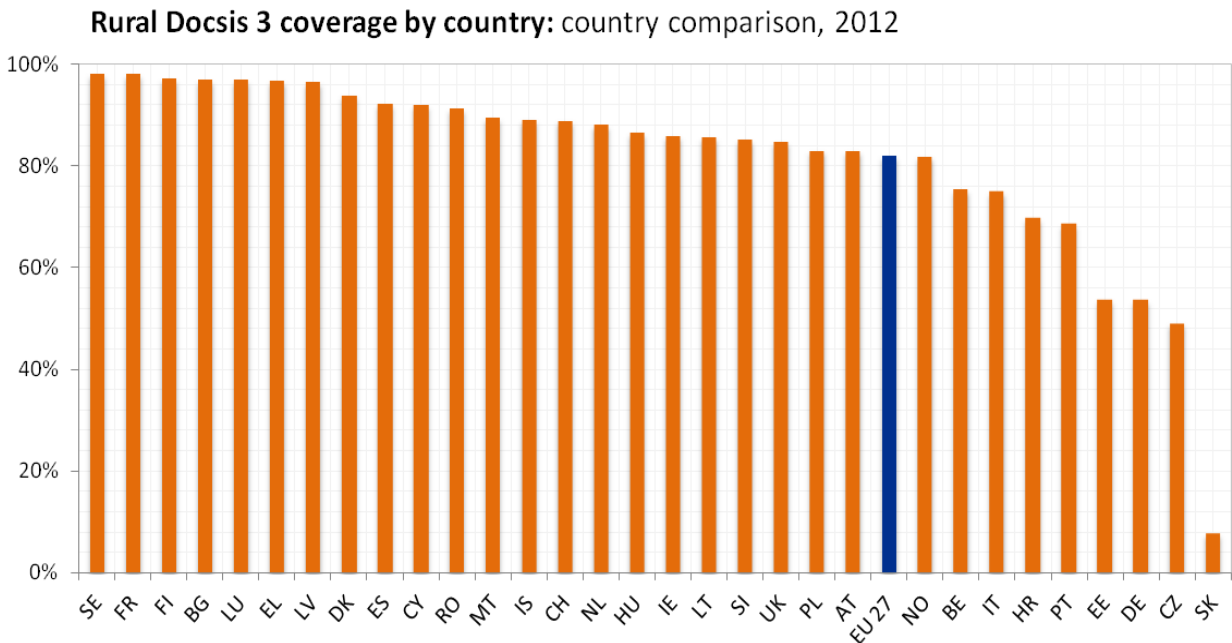
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

2.5.3 Mobile broadband technologies

2.5.3.1 Rural HSPA coverage



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Leaving aside satellite services, HSPA provided the most extensive broadband coverage in rural areas, ahead of DSL with 82% against 76%. HSPA almost provided the same amount of coverage in rural areas as all the standard fixed broadband technologies.

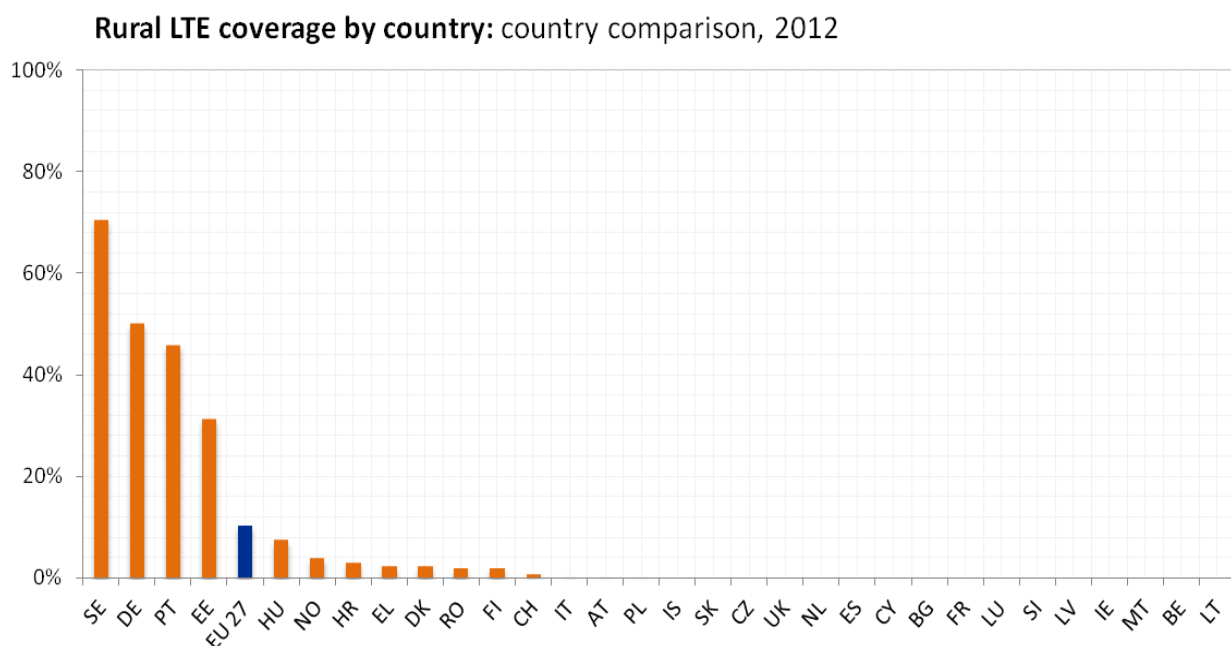
On the other hand there was little information on the actual broadband performance delivered by HSPA services in the more marginal areas. One clue was provided by the surprisingly low coverage quoted by Germany. In this case coverage was defined by the ability to receive a download speed of at least 1Mbps and was quoted at only 53.6%, well below that of most other country. No doubt the coverage quoted in other countries would be considerably lower if it was subjected to the same stringent test.

2.5.3.2 Rural LTE coverage

The wide coverage of HSPA contrasted totally with the current availability of LTE, the newest technology arrival. At the end of 2012, four countries had significant LTE coverage – Sweden, Germany, Portugal and Estonia, while sixteen countries had no rural LTE coverage.

Sweden, Portugal and Estonia all had very developed LTE networks which extended into rural areas due to their size.

Germany had also leapt ahead by giving priority to rural areas in rolling out LTE services resulting in coverage averaging 50% claimed by LTE operators in Germany. This suggests a powerful way of filling the gap the German regulator has identified in LTE coverage and performance.



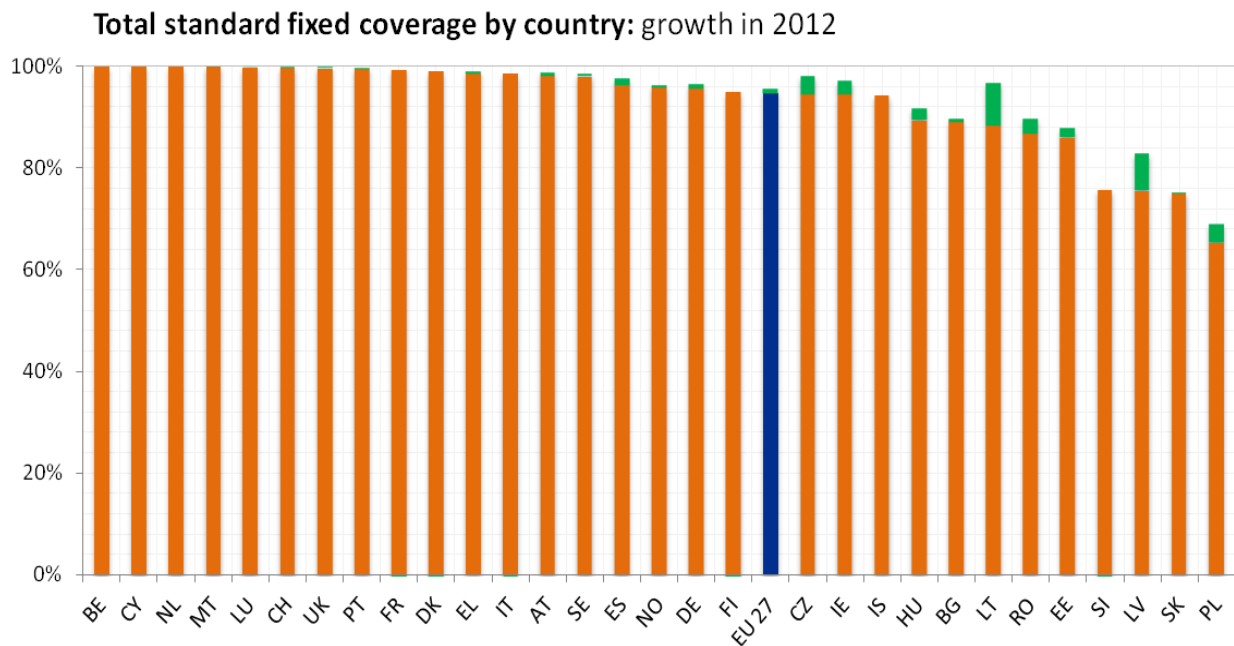
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

2.6 Country growth in 2012

2.6.1 Total standard fixed coverage

Overall total standard fixed broadband coverage increased by under one percentage point in 2012.

The countries which saw the biggest increase in standard fixed coverage in the year were Lithuania and Latvia. In Lithuania, this was due to the expansion of its WiMAX and FTTP networks. In Latvia, WiMAX, FTTP and standard cable coverage had all increased within the year.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

In some countries standard fixed coverage actually decreased during 2012. In some cases, this is simply because the broadband networks did not grow at the same rate as the population. In Denmark, the reason for the slight decline is that the main provider of WiMAX stopped providing services in 2012. In Finland, Slovenia and Latvia, DSL was actually serving fewer households as it was being replaced by other technologies, in particular FTTP. In Latvia the growth of other technologies off-set the decline in DSL coverage.

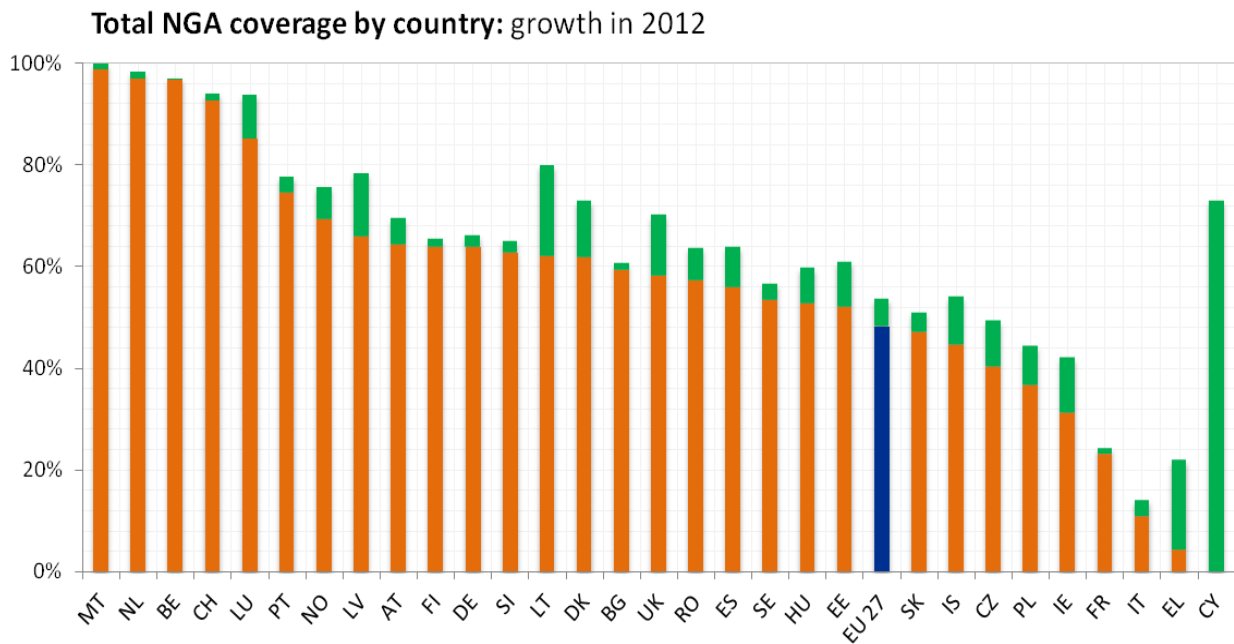
On the whole, most markets were approaching saturation of standard fixed broadband services – there is little room for growth. The countries experiencing the biggest growth were all behind the European Union average for standard fixed broadband coverage.

2.6.2 Total NGA coverage

There was significantly greater expansion of the NGA networks in Europe, but again in markets that had greater headroom for growth.

Not having reported NGA coverage at the end of 2011, Cyprus had one of the best NGA networks in the EU at the end of 2012, offering VDSL and Docsis 3 services to its citizens. The growth of FTTP in Latvia and Lithuania added significantly to their NGA coverage.

In the EU's largest countries, the expansion of the VDSL networks in the UK has had the biggest impact on NGA coverage. Italy also introduced VDSL services in 2012 which delivered some growth.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

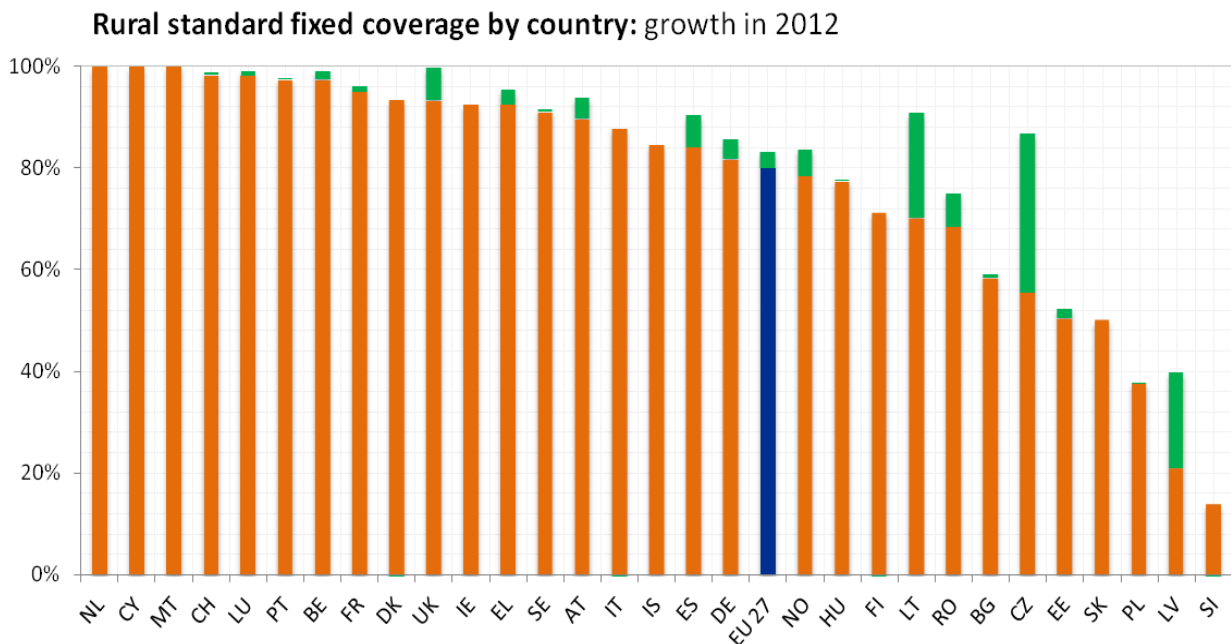
Overall nearly 12 million new households were able to access high-speed broadband services in 2012.

2.6.3 Rural standard fixed coverage

Standard fixed broadband coverage of rural households increased by more than three percentage points in 2012, meaning that over one million of Europe's most rural households were able to access services.

The biggest growth was reported in the Czech Republic, Latvia and Lithuania. In the Czech Republic, the DSL network expanded into more rural areas. In Latvia and Lithuania, their FTTP and WiMAX networks reached more rural households.

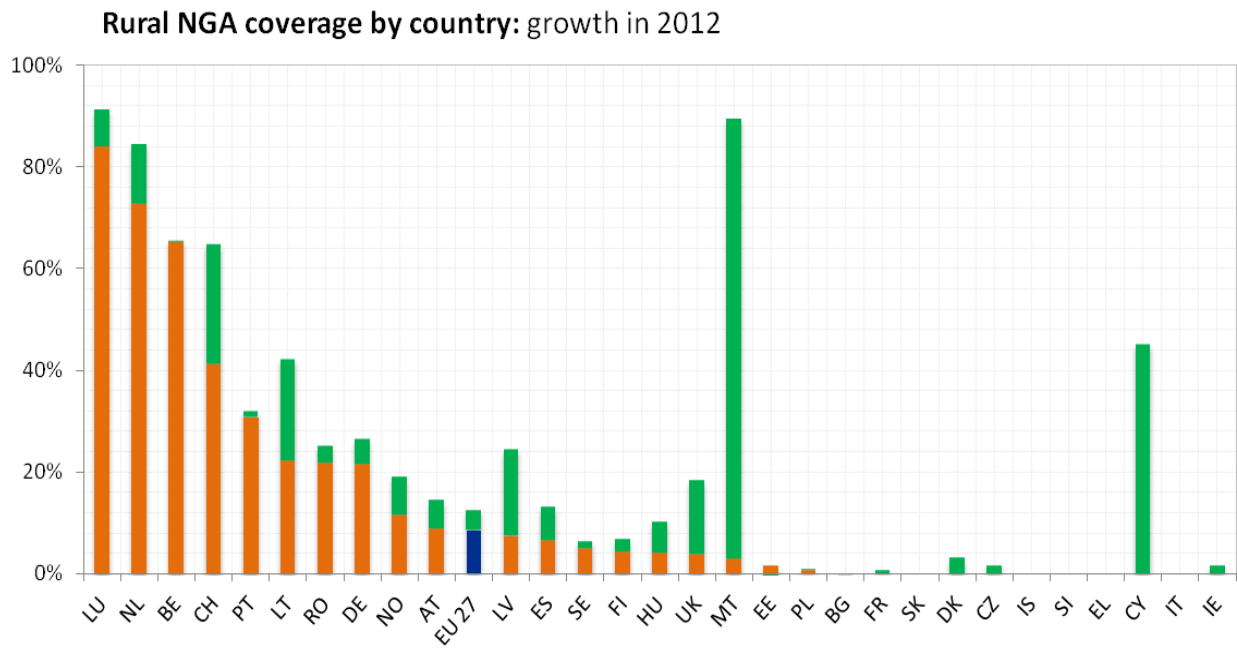
In general, as most urban areas had close to total standard fixed broadband coverage, any expansion of the major fixed networks – DSL and cable – had a relatively large impact on the coverage of the most rural households.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

2.6.4 Rural NGA coverage

The upgrade of the cable network in Malta to Docsis 3 means that most rural households can now access NGA services. In Cyprus, the expansion of the VDSL network has focused mainly on rural households, with plans for FTTP expansion in urban areas. Switzerland has now caught up with the Netherlands for rural NGA coverage, mostly due to the expansion of its Docsis 3 cable networks.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

In total, 1.2 million rural households in the European Union gained access to NGA services in 2012.

2.7 European data tables

Demographics

Country list	NUTS 3 areas	Persons per household	Land area (sq km)	Population	Population density	Total Households	Rural Households	Rural %
EU 27	1,294	2.372	8,419,265	499,566,363	59.336	209,768,235	31,079,983	14.8%

Total coverage

Country list	DSL	VDSL	FTTP	WiMAX	Standard cable	Docsis 3 cable	HSPA	LTE	Satellite	Standard Coverage	Standard Fixed Coverage	NGA Coverage
EU 27	92.9%	24.9%	12.3%	17.2%	42.0%	39.3%	96.3%	27.0%	98.6%	99.4%	95.5%	53.7%

Rural coverage

Country list	DSL	VDSL	FTTP	WiMAX	Standard cable	Docsis 3 cable	HSPA	LTE	Satellite	Standard Coverage	Standard Fixed Coverage	NGA Coverage
EU 27	76.3%	4.8%	3.0%	16.2%	7.3%	5.8%	82.1%	10.2%	98.6%	96.1%	83.2%	12.4%

Total coverage by technology for each country – 2012

Country	DSL	VDSL	FTTP	WiMAX	Standard Cable	Docsis 3 cable	HSPA	LTE	Satellite
Austria	98.0%	50.5%	6.3%	17.2%	35.6%	35.3%	97.6%	23.5%	100.0%
Belgium	99.8%	85.0%	0.3%	15.1%	95.9%	95.9%	98.7%	8.1%	100.0%
Bulgaria	85.1%	0.0%	7.3%	21.1%	57.1%	57.1%	99.4%	0.0%	100.0%
Croatia	94.1%	15.9%	6.2%	0.0%	19.6%	0.0%	93.1%	25.0%	100.0%
Cyprus	>99.95%	52.0%	0.0%	0.0%	47.4%	47.4%	99.0%	0.0%	100.0%
Czech Republic	97.0%	25.0%	12.2%	17.7%	33.1%	30.2%	92.3%	9.9%	100.0%
Denmark	98.2%	20.7%	43.0%	0.0%	63.1%	60.5%	99.0%	65.0%	100.0%
Estonia	39.3%	0.6%	36.2%	40.0%	71.6%	51.0%	87.0%	70.0%	0.0%
Finland	92.5%	45.0%	33.3%	2.4%	42.0%	42.0%	99.5%	68.5%	100.0%
France	99.3%	0.0%	6.5%	0.0%	25.5%	21.4%	99.7%	5.5%	100.0%
Germany	94.8%	46.3%	2.6%	12.2%	59.1%	52.3%	90.4%	51.7%	100.0%
Greece	99.1%	21.7%	0.4%	0.0%	0.0%	0.0%	99.4%	42.4%	100.0%
Hungary	89.4%	2.8%	21.6%	0.0%	62.9%	55.3%	95.7%	35.5%	100.0%
Iceland	93.2%	44.7%	45.1%	4.0%	0.0%	0.0%	96.0%	0.0%	0.0%
Ireland	94.3%	0.5%	1.7%	26.6%	42.4%	41.8%	94.6%	0.0%	100.0%
Italy	96.9%	4.5%	11.8%	45.0%	0.0%	0.0%	96.5%	17.0%	100.0%
Latvia	47.9%	7.1%	78.5%	39.4%	41.4%	33.1%	99.0%	21.8%	0.0%
Lithuania	68.8%	0.0%	80.0%	84.9%	53.0%	42.2%	95.1%	18.7%	0.0%
Luxembourg	99.8%	87.7%	31.8%	0.0%	69.6%	61.0%	99.6%	64.0%	100.0%
Malta	99.9%	75.0%	0.9%	99.9%	99.9%	99.9%	99.9%	0.0%	100.0%
Netherlands	>99.95%	59.9%	17.7%	0.0%	98.8%	97.5%	99.0%	0.0%	100.0%
Norway	94.5%	32.7%	29.6%	18.6%	46.1%	45.1%	96.0%	60.2%	100.0%
Poland	60.5%	25.7%	2.9%	0.3%	32.4%	30.5%	96.5%	50.0%	100.0%
Portugal	99.0%	0.0%	46.1%	0.0%	77.4%	76.0%	94.4%	89.7%	100.0%
Romania	81.1%	17.4%	54.7%	57.4%	26.4%	25.5%	96.2%	23.6%	100.0%
Slovakia	45.6%	0.3%	39.4%	50.0%	28.3%	24.0%	85.5%	0.2%	100.0%
Slovenia	68.6%	42.9%	42.7%	0.0%	36.2%	36.2%	96.2%	12.8%	100.0%
Spain	94.8%	10.9%	17.9%	51.3%	51.3%	50.3%	98.6%	0.0%	100.0%
Sweden	98.0%	16.6%	46.2%	0.0%	40.6%	34.7%	99.7%	93.3%	100.0%
Switzerland	99.4%	53.4%	16.7%	0.0%	95.0%	93.1%	97.4%	20.2%	100.0%
UK	99.6%	46.9%	0.7%	4.1%	48.0%	48.0%	98.4%	17.3%	100.0%
EU 27	92.9%	24.9%	12.3%	17.2%	42.0%	39.3%	96.3%	27.0%	98.6%
Study Countries	93.0%	25.4%	12.5%	16.8%	42.8%	40.0%	96.3%	27.2%	98.6%

Coverage by technology combination for each country – 2012

Country	Total Standard	Total Standard Fixed	Total NGA	Rural Standard	Rural Standard Fixed	Rural NGA
Austria	99.6%	98.9%	69.5%	97.0%	93.8%	14.4%
Belgium	>99.95%	>99.95%	97.1%	99.4%	99.1%	65.4%
Bulgaria	99.8%	89.6%	60.7%	99.0%	59.2%	0.0%
Croatia	97.5%	94.1%	19.1%	88.8%	73.9%	0.0%
Cyprus	>99.95%	>99.95%	73.1%	>99.95%	>99.95%	45.0%
Czech Republic	98.3%	98.1%	49.3%	88.0%	86.8%	1.5%
Denmark	99.7%	98.3%	72.9%	98.2%	89.9%	3.0%
Estonia	96.4%	87.8%	61.0%	84.8%	52.2%	0.0%
Finland	99.8%	93.1%	65.5%	98.6%	62.6%	6.6%
France	99.9%	99.3%	24.2%	99.3%	96.1%	0.6%
Germany	99.8%	96.6%	66.2%	98.5%	85.6%	26.4%
Greece	99.8%	99.1%	21.9%	98.9%	95.3%	0.0%
Hungary	98.0%	91.8%	59.7%	93.7%	77.5%	10.1%
Iceland	98.2%	94.4%	54.1%	95.0%	84.6%	0.0%
Ireland	97.8%	97.1%	42.1%	94.4%	92.5%	1.4%
Italy	98.9%	98.4%	14.0%	91.1%	87.5%	0.0%
Latvia	99.5%	82.9%	78.5%	98.3%	39.8%	24.4%
Lithuania	97.8%	96.8%	80.0%	93.5%	90.7%	42.2%
Luxembourg	99.9%	99.9%	93.8%	99.1%	99.1%	91.3%
Malta	>99.95%	>99.95%	99.9%	>99.95%	>99.95%	89.5%
Netherlands	>99.95%	>99.95%	98.4%	>99.95%	>99.95%	84.5%
Norway	98.1%	96.3%	75.7%	91.4%	83.7%	19.0%
Poland	98.4%	69.1%	44.5%	92.3%	37.7%	0.7%
Portugal	99.7%	99.6%	77.8%	98.4%	97.5%	31.8%
Romania	98.3%	89.8%	63.7%	96.1%	74.9%	25.0%
Slovakia	92.8%	75.2%	51.1%	53.8%	50.0%	0.0%
Slovenia	97.6%	73.6%	65.1%	90.5%	10.5%	0.0%
Spain	99.4%	97.6%	63.9%	96.6%	90.3%	13.0%
Sweden	99.8%	98.5%	56.6%	99.1%	91.4%	6.3%
Switzerland	99.9%	99.8%	94.2%	99.0%	98.8%	64.8%
United Kingdom	>99.95%	99.8%	70.3%	99.9%	99.8%	18.2%
EU 27	99.4%	95.5%	53.7%	96.1%	83.2%	12.4%
Study Countries	99.4%	95.5%	54.3%	96.0%	83.3%	13.2%

Rural coverage by technology for each country – 2012

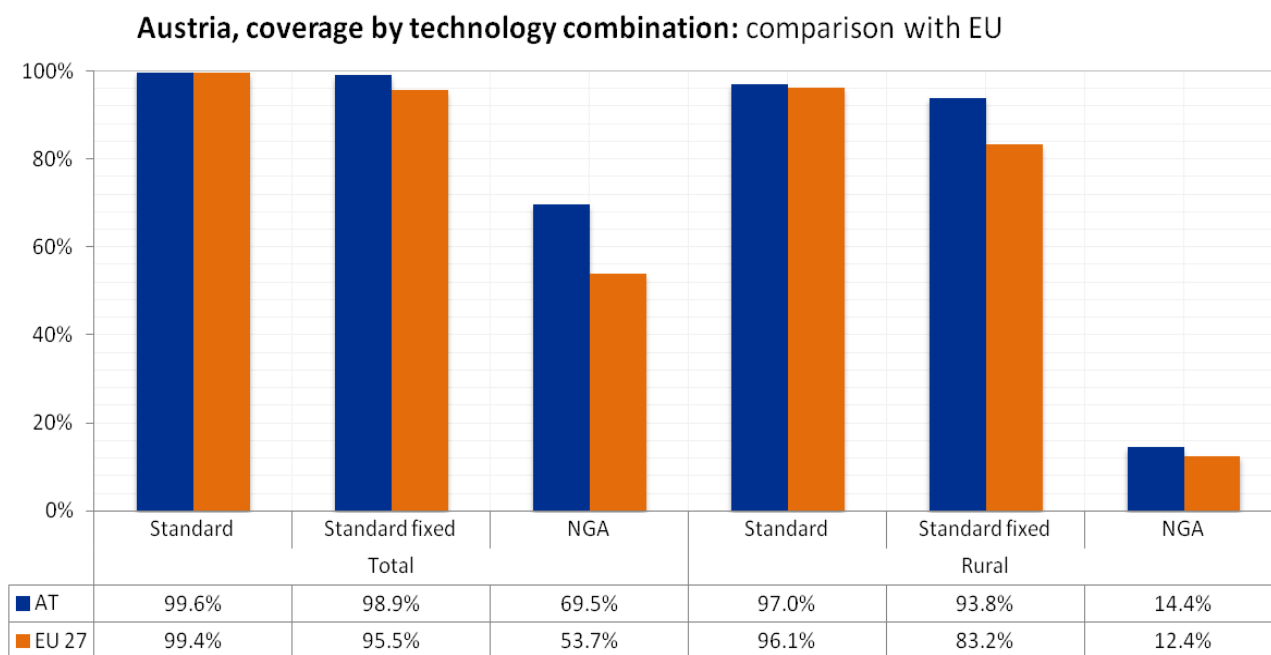
Country	DSL	VDSL	FTTP	WiMAX	Standard cable	Docsis 3 cable	HSPA	LTE	Satellite
Austria	88.7%	0.0%	1.2%	17.8%	15.9%	13.4%	83.0%	0.2%	100.0%
Belgium	97.0%	58.6%	0.0%	3.2%	59.1%	59.1%	75.4%	0.0%	100.0%
Bulgaria	53.5%	0.0%	0.0%	11.9%	0.0%	0.0%	97.0%	0.0%	100.0%
Croatia	73.8%	0.0%	0.0%	0.3%	0.0%	0.0%	69.7%	2.9%	100.0%
Cyprus	> 99.95%	45.0%	0.0%	0.0%	0.0%	0.0%	92.0%	0.0%	100.0%
Czech Republic	78.9%	0.0%	1.3%	17.7%	1.1%	0.2%	49.0%	0.0%	100.0%
Denmark	89.0%	0.0%	3.0%	0.0%	0.0%	0.0%	94.0%	2.2%	100.0%
Estonia	16.2%	0.0%	0.0%	35.9%	25.1%	0.0%	53.6%	31.2%	0.0%
Finland	58.5%	0.0%	6.6%	2.4%	0.0%	0.0%	97.2%	1.9%	100.0%
France	95.8%	0.0%	0.6%	0.0%	0.7%	0.0%	98.1%	0.0%	100.0%
Germany	80.6%	21.8%	0.7%	12.0%	9.3%	5.9%	53.6%	50.0%	100.0%
Greece	95.3%	0.0%	0.0%	0.2%	0.0%	0.0%	96.8%	2.3%	100.0%
Hungary	73.1%	0.0%	3.5%	0.0%	16.1%	7.3%	86.5%	7.3%	100.0%
Iceland	81.3%	0.0%	0.0%	6.6%	0.0%	0.0%	89.1%	0.0%	0.0%
Ireland	85.3%	0.0%	0.0%	20.4%	1.4%	1.4%	86.0%	0.0%	100.0%
Italy	75.3%	0.0%	0.0%	45.0%	0.0%	0.0%	74.9%	0.3%	100.0%
Latvia	9.4%	0.0%	24.4%	13.3%	0.0%	0.0%	96.5%	0.0%	0.0%
Lithuania	15.1%	0.0%	42.2%	81.4%	0.3%	0.0%	85.7%	0.0%	0.0%
Luxembourg	98.1%	82.5%	24.2%	0.0%	0.0%	0.0%	96.9%	0.0%	100.0%
Malta	89.5%	0.0%	0.0%	99.9%	89.5%	89.5%	89.5%	0.0%	100.0%
Netherlands	> 99.95%	28.4%	8.5%	0.0%	86.0%	79.7%	88.1%	0.0%	100.0%
Norway	75.8%	5.5%	9.3%	14.3%	9.4%	9.2%	81.9%	3.7%	100.0%
Poland	37.3%	0.0%	0.0%	0.3%	0.7%	0.7%	83.1%	0.2%	100.0%
Portugal	94.6%	0.0%	6.0%	0.0%	30.8%	29.8%	68.6%	45.8%	100.0%
Romania	57.6%	1.3%	23.2%	25.5%	4.2%	2.5%	91.3%	1.9%	100.0%
Slovakia	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	7.7%	0.0%	100.0%
Slovenia	10.5%	0.0%	0.0%	0.0%	0.0%	0.0%	85.2%	0.0%	100.0%
Spain	79.6%	0.0%	0.0%	53.0%	14.0%	13.0%	92.3%	0.0%	100.0%
Sweden	88.4%	0.2%	6.2%	0.0%	0.1%	0.1%	98.2%	70.6%	100.0%
Switzerland	97.0%	12.7%	2.9%	0.0%	65.7%	58.9%	88.9%	0.5%	100.0%
UK	99.6%	14.3%	0.1%	2.7%	5.0%	5.0%	84.8%	0.0%	100.0%
EU 27	76.3%	4.8%	3.0%	16.2%	7.3%	5.8%	82.1%	10.2%	98.6%
Study Countries	76.6%	4.9%	3.0%	15.7%	8.2%	6.7%	82.1%	9.9%	98.6%

3 Coverage by country

3.01 Austria

3.01.1 National coverage by broadband technology

Austria remained ahead of European averages for standard, standard fixed and NGA broadband coverage, both in total and in rural areas.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Standard fixed broadband coverage was dominated by DSL coverage. At the end of 2012, Austria reported 98% coverage of households with DSL but was behind the EU average for standard cable coverage.

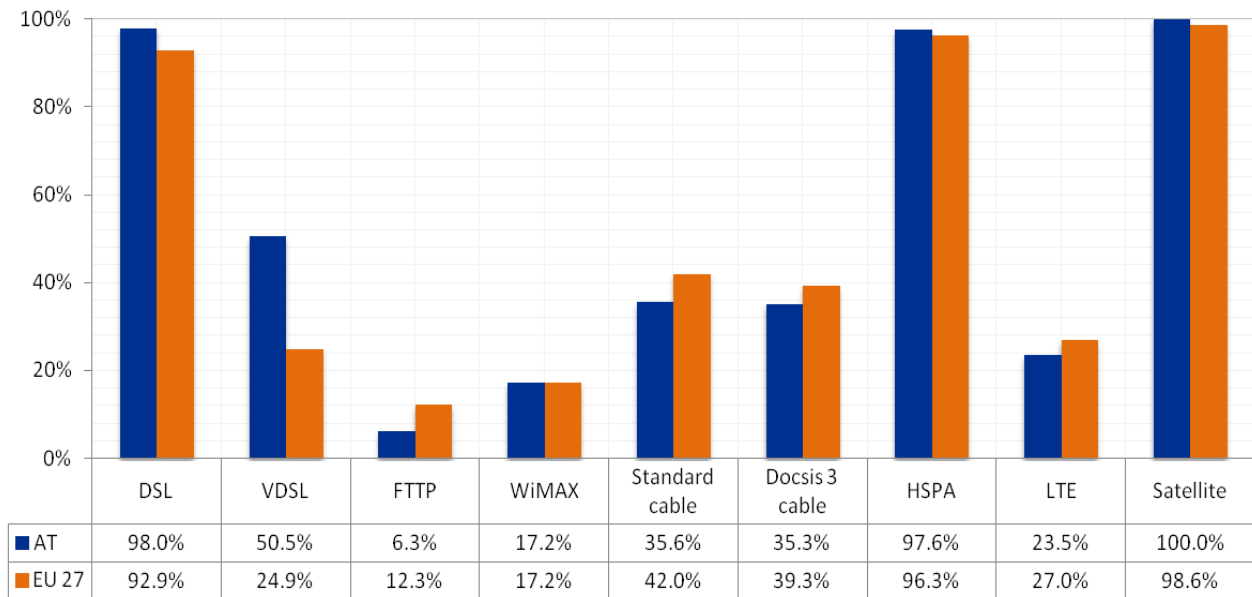
Austria gains its NGA advantage with higher than average VDSL coverage. At the end of 2012 more than 50% of households could access VDSL services, although note that this was not restricted to households that could access speeds greater than 25Mbps. This offset the comparatively low deployment of FTTP.

DSL was the key fixed-broadband service for bringing standard broadband to rural areas, although coverage of cable at rural households was more than twice the European average, and WiMAX also made a significant contribution. VDSL and FTTP services were still mostly absent in rural areas. Whilst it has been indicated that there is some VDSL coverage in rural areas, we were able to find no evidence of the precise locations from the survey or supporting research. Docsis 3 was therefore the key technology bringing NGA services to rural households.

Overall NGA coverage grew by over five percentage points in 2012, and by nearly 6p.p. in rural areas. VDSL coverage grew by 4p.p. in the year and made the biggest contribution to the increase.

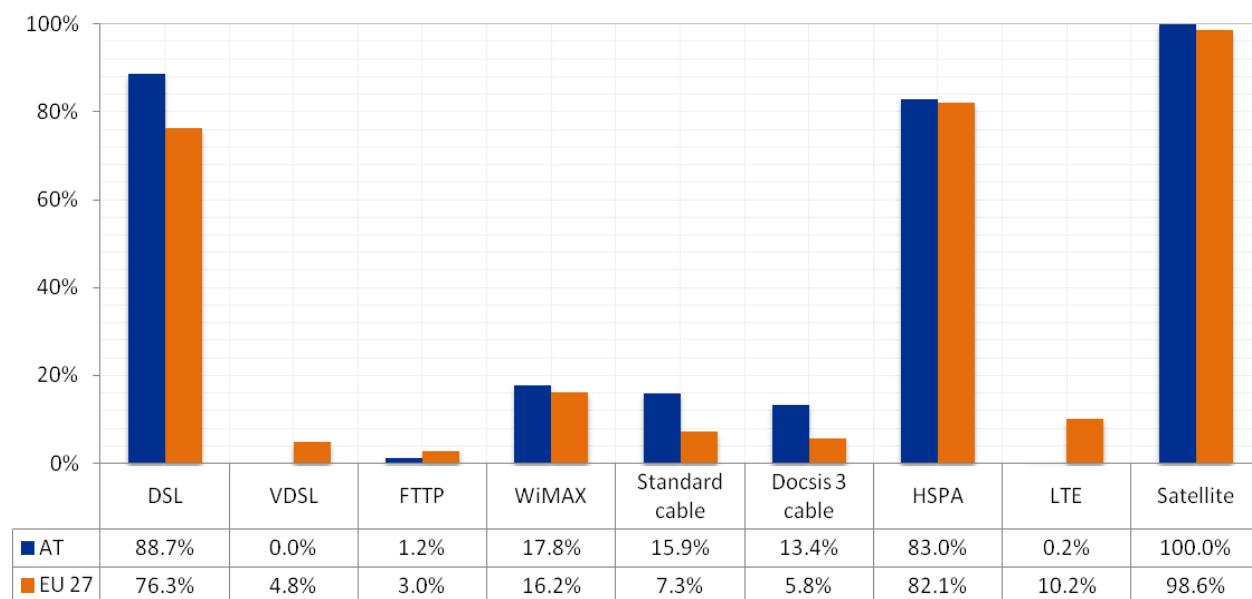
Broadband Coverage in Europe 2012

Austria, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

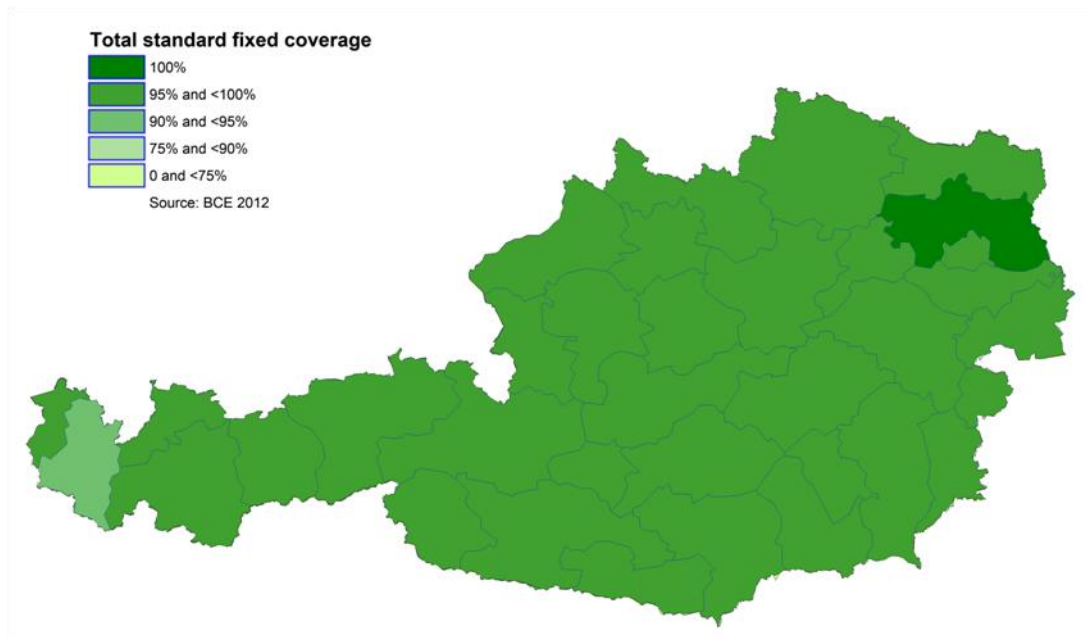
Austria, rural coverage by technology in 2012: comparison with EU



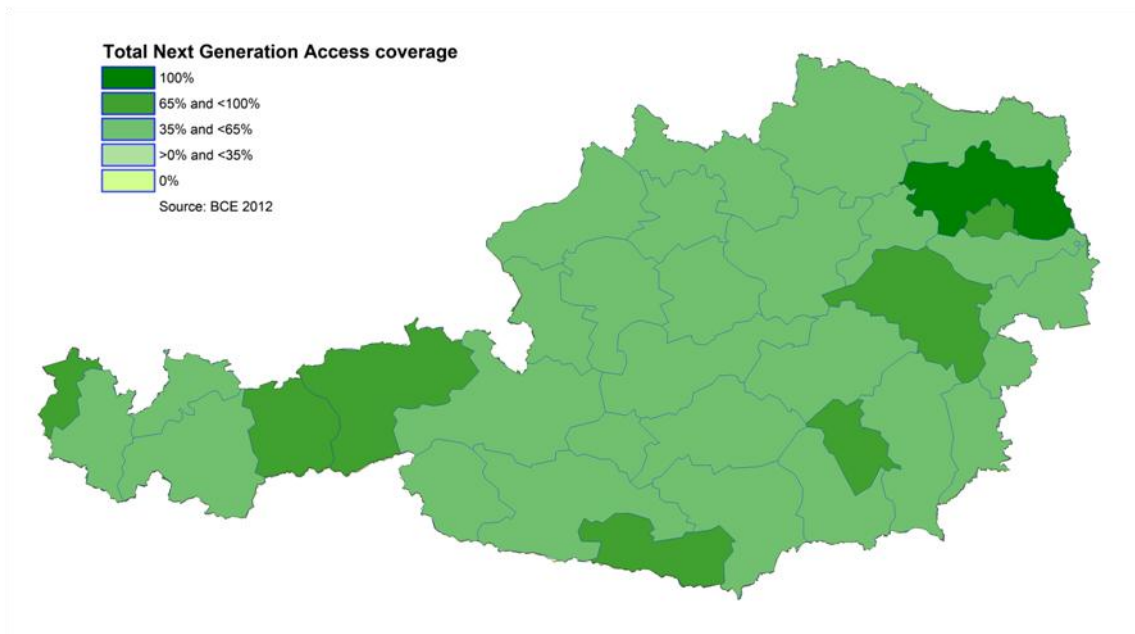
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.01.2 Regional coverage by broadband technology

Austria standard fixed broadband coverage



Austria Next Generation Access coverage



Most areas in Austria were thought to have greater than 95% coverage of standard fixed broadband services by the end of 2012. More precise data on the location of the cable networks in Austria has changed the NGA profile of the country slightly, with greater coverage in the west as well as the east of the country. The surrounding areas of Vienna enjoyed the highest standard and NGA broadband coverage.

3.01.3 Data tables for Austria

Statistic	National
Population	8,404,252
Persons per household	2.3
Rural proportion	14.3%

Technology	AT - 2012		AT - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	98.0%	88.7%	97.0%	84.7%	92.9%	76.3%
VDSL	50.5%	0.0%	46.5%	0.0%	24.9%	4.8%
FTTP	6.3%	1.2%	5.3%	0.0%	12.3%	3.0%
WiMAX	17.2%	17.8%	17.2%	17.7%	17.2%	16.2%
Standard cable	35.6%	15.9%	34.8%	11.1%	42.0%	7.3%
Docsis 3 cable	35.3%	13.4%	34.8%	8.7%	39.3%	5.8%
HSPA	97.6%	83.0%	97.5%	82.9%	96.3%	82.1%
LTE	23.5%	0.2%	18.8%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.6%	97.0%			99.4%	96.1%
Standard fixed	98.9%	93.8%	98.2%	89.6%	95.5%	83.2%
NGA	69.5%	14.4%	64.4%	8.7%	53.7%	12.4%

3.01.4 Notes on data and coverage estimates**VDSL:**

The survey definition for VDSL coverage is:

Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

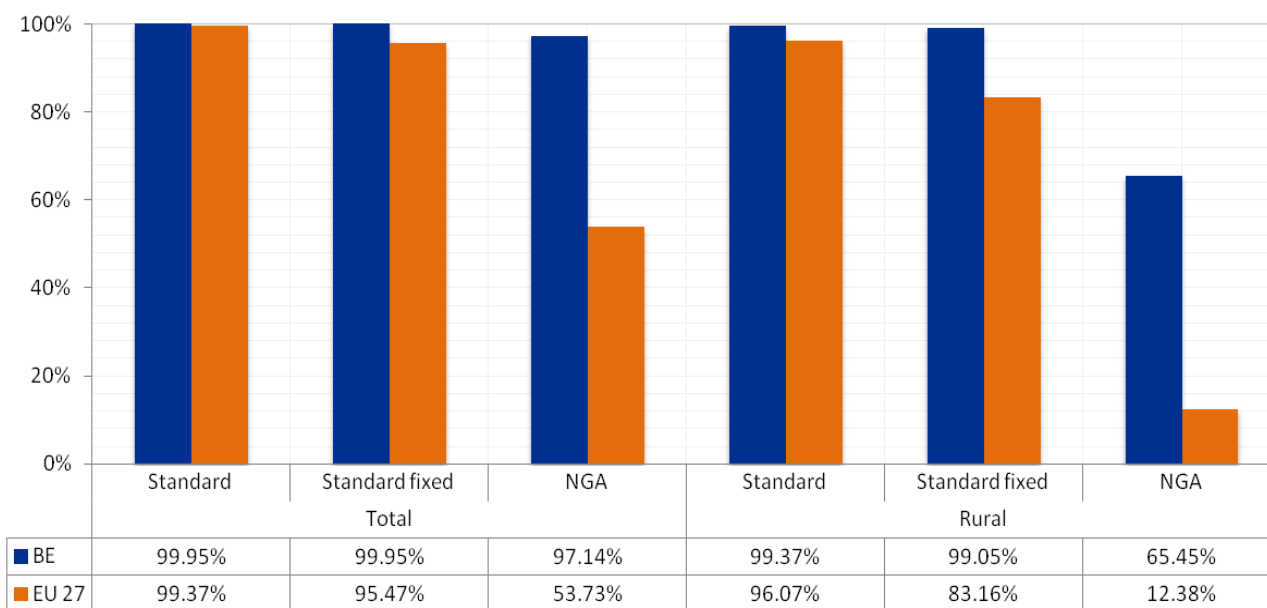
In Austria, the data for VDSL coverage was taken from a report published by the incumbent operator. We were not able to confirm the definition for coverage used in the report, and so we assume that it includes all coverage and is not restricted to superfast coverage.

3.02 Belgium

3.02.1 National coverage by broadband technology

Belgium was one of the most advanced countries in the EU for NGA coverage, ranking third out of all the study countries with 97.1% households covered in 2012. This was well ahead of the EU average for NGA coverage in total and in rural areas. We estimated that nearly all households could access standard and standard fixed services, with over 99% of households able to access DSL broadband services.

Belgium, coverage by technology combination: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Belgium owed its extensive NGA coverage to Docsis 3 cable, which alone covered over 95% of households. VDSL services were also extensive, with 85% of households able to access VDSL services. Note that the reported figure includes all households served by VDSL and is not restricted to those who receive high-speed services. FTTP only covered a small number of households in Belgium. Belgium should have little trouble meeting the Digital Agenda target to deliver high-speed broadband services to all citizens by the end of 2020.

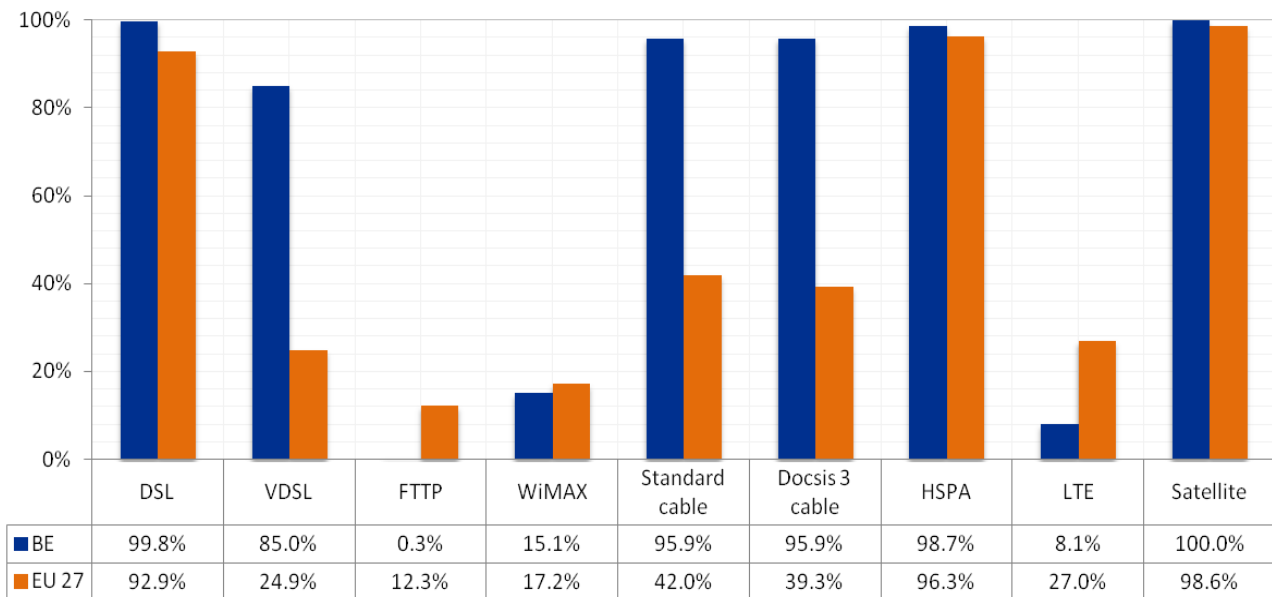
LTE services were launched in Belgium in 2012 and covered over 8% of households by the end of the year. This was one of the few areas in which Belgium fell behind the rest of Europe.

VDSL coverage grew by four percentage points in 2012. Other than the launch of LTE services, this was the biggest shift in coverage in Belgium in 2012.

Clear distinctions in coverage could be observed between the North and South of the country. Whilst both standard and NGA technologies were accessible to the whole of Flanders, southern regions were found to be slightly but consistently under-served. This is due to differences in cable provision across the country.

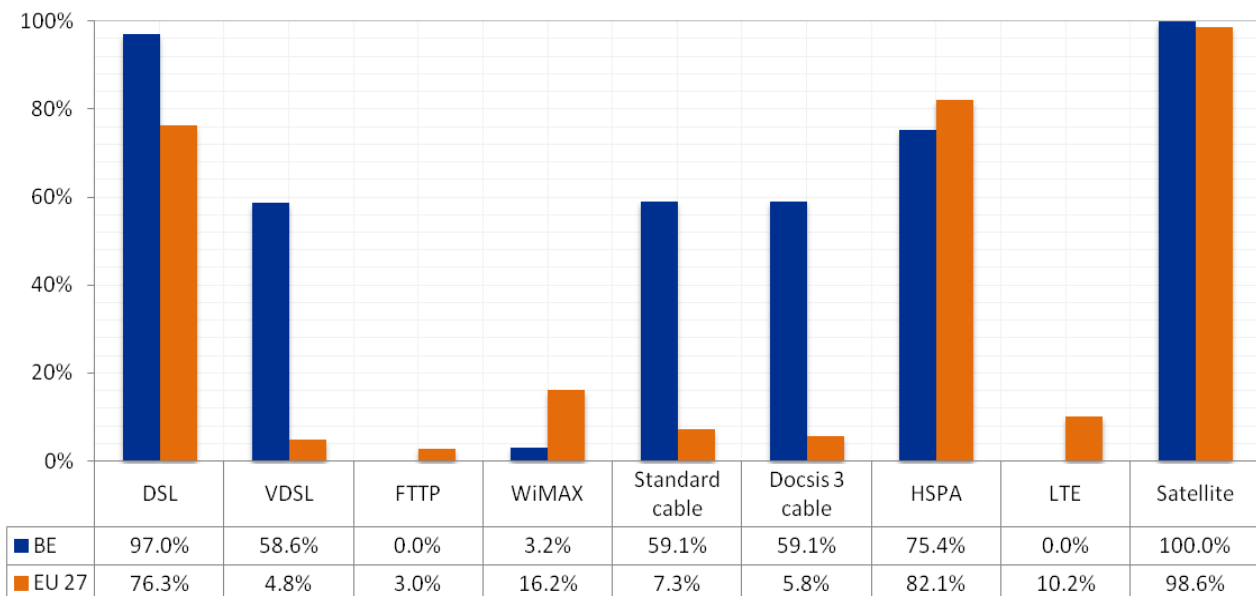
Broadband Coverage in Europe 2012

Belgium, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

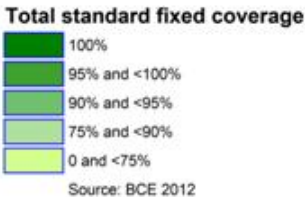
Belgium, rural coverage by technology in 2012: comparison with EU



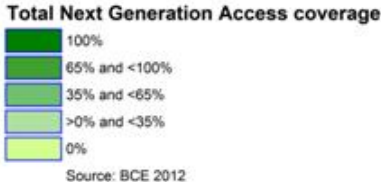
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.02.2 Regional coverage by broadband technology

Belgium standard fixed broadband coverage



Belgium Next Generation Access coverage



3.02.3 Data tables for Belgium

Statistic	National
Population	10,949,718
Persons per household	2.4
Rural proportion	4.6%

Technology	BE - 2012		BE – 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.8%	97.0%	99.8%	97.0%	92.9%	76.3%
VDSL	85.0%	58.6%	81.0%	55.9%	24.9%	4.8%
FTTP	0.3%	0.0%	0.2%	0.0%	12.3%	3.0%
WiMAX	15.1%	3.2%	14.7%	3.1%	17.2%	16.2%
Standard cable	95.9%	59.1%	95.9%	58.9%	42.0%	7.3%
Docsis 3 cable	95.9%	59.1%	95.9%	58.9%	39.3%	5.8%
HSPA	98.7%	75.4%	98.7%	75.4%	96.3%	82.1%
LTE	8.1%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	>99.95%	99.4%			99.4%	96.1%
Standard fixed	>99.95%	99.1%	>99.95%	97.3%	95.5%	83.2%
NGA	97.1%	65.4%	96.8%	65.4%	53.7%	12.4%

3.02.4 Notes on data and coverage estimates

VDSL:

The survey definition for VDSL coverage is:

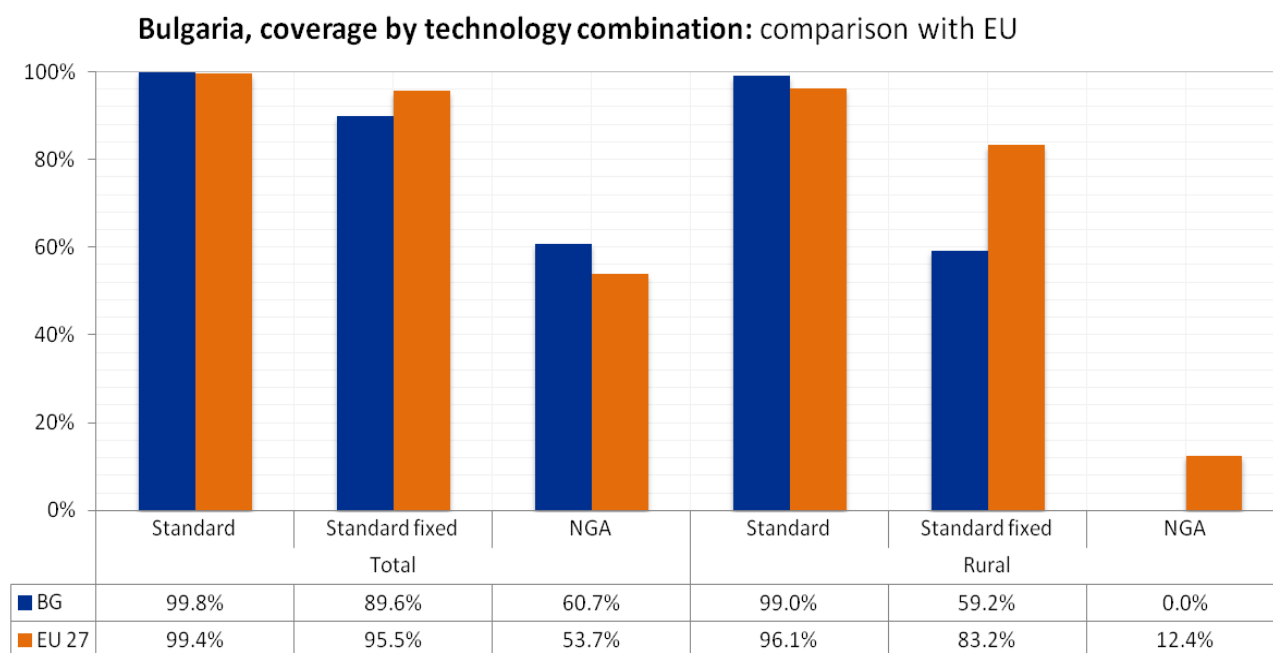
Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

In Belgium we were provided with two datasets for VDSL coverage. The first reported the overall coverage of VDSL with no restriction on the speed delivered. This data was used to report the overall coverage of VDSL in Belgium. The second dataset restricted coverage to meet the survey definition. This data was provided under NDA and could not be published. However, it was used to calculate the overall NGA coverage reported for Belgium. In this way, Belgium is accurately described as the third ranking country in terms of NGA coverage in the European Union in 2012.

3.03 Bulgaria

3.03.1 National coverage by broadband technology

Bulgaria was behind the EU averages for standard fixed broadband coverage in total and in rural areas. Whilst it was ahead of the EU average for total NGA coverage, we estimated that there was no coverage in rural areas at the end of 2012.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The pattern in overall coverage can be explained by the technology profile in Bulgaria. In 2012 DSL covered 85% of households. Whilst this is extensive, it falls behind the average of 93% coverage in the European Union. As DSL is usually the primary technology for delivering standard fixed broadband coverage, this explains why Bulgaria falls behind the EU average for this measure.

No VDSL coverage was reported for Bulgaria in 2012. FTTP covered just over 7% of households, which is modest compared to the average coverage in the European Union and particularly compared to other Eastern European countries. The key technology providing NGA services to households in Bulgaria was Docsis 3.

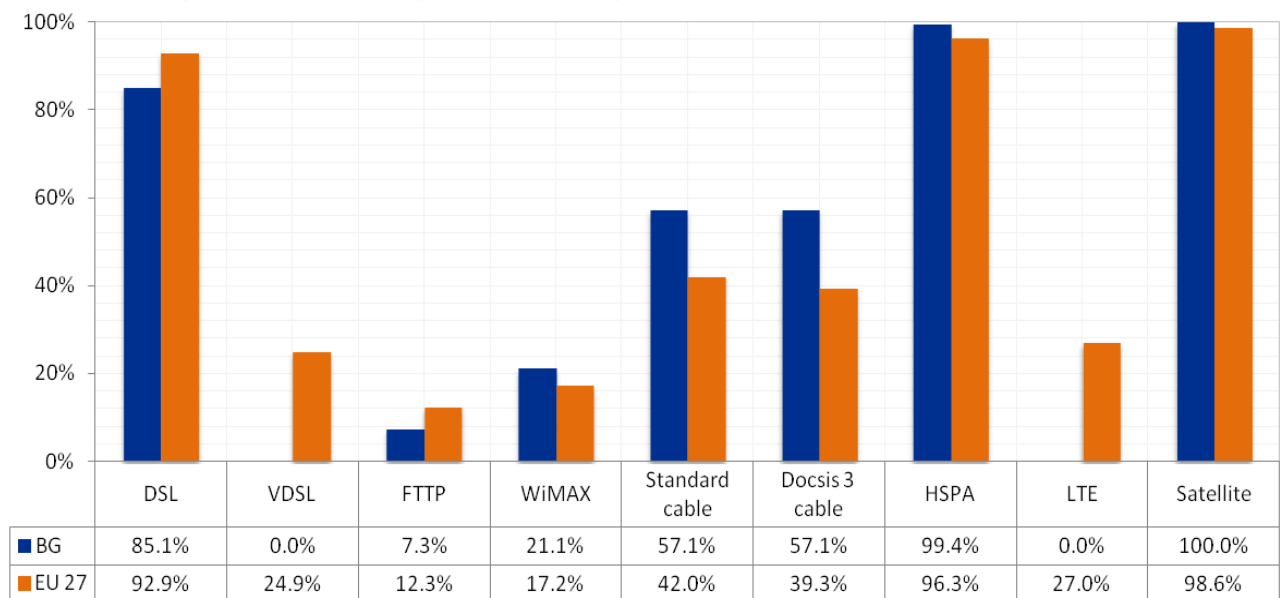
The low coverage for FTTP in Bulgaria may seem surprising when compared to other published sources for broadband coverage. For the purposes of this study, what can sometimes be described as FTTP was classified as Docsis 3 cable. There is an unspecified amount of FTTLA architecture within one operator's network, which we believe primarily uses Docsis 3 technology. FTTLA, with fibre being brought close to the end-user and sometimes into apartment blocks, would be correctly classified as FTTB but we currently have no evidence of how widespread the technology is. Considering that when estimating total NGA coverage it makes no difference whether the connection is Docsis 3 or FTTB, we opted for classifying the whole network as Docsis 3 rather than making an uncertain estimate that a proportion was FTTB.

Broadband Coverage in Europe 2012

20% of households in Bulgaria were thought to be rural at the end of 2012. Given that the Docsis 3 network covered under 60% of households, it is our assessment that this was likely to result in no rural coverage.

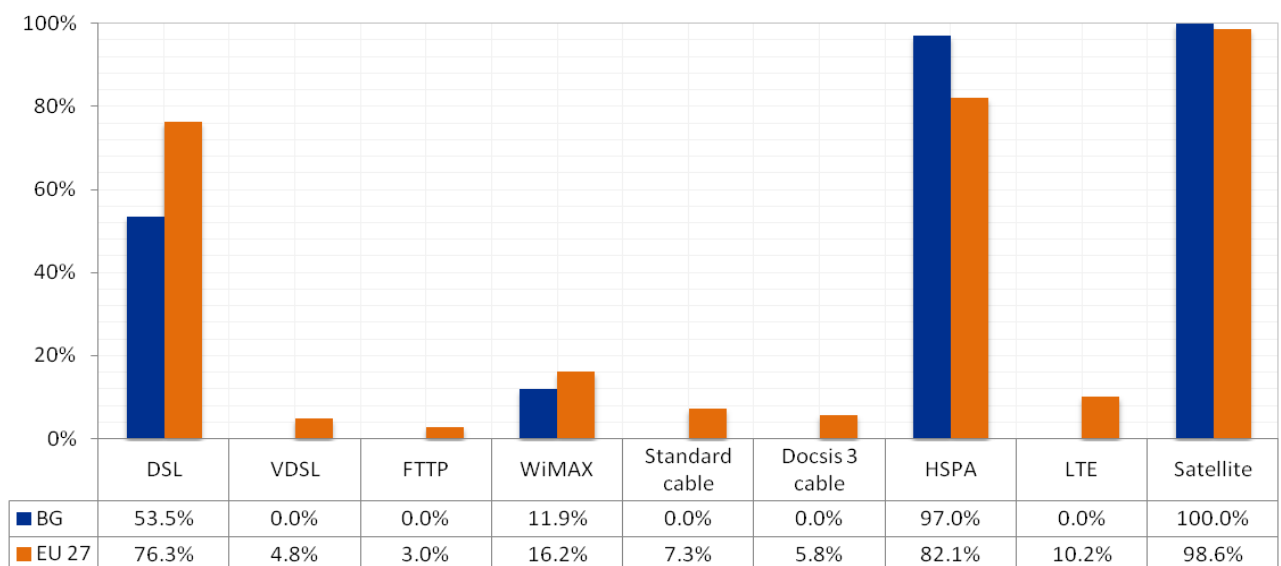
Overall broadband growth progressed slowly in 2012. WiMAX coverage grew with an additional 126 thousand households covered in 2012. No other technology grew by more than two percentage points.

Bulgaria, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Bulgaria, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

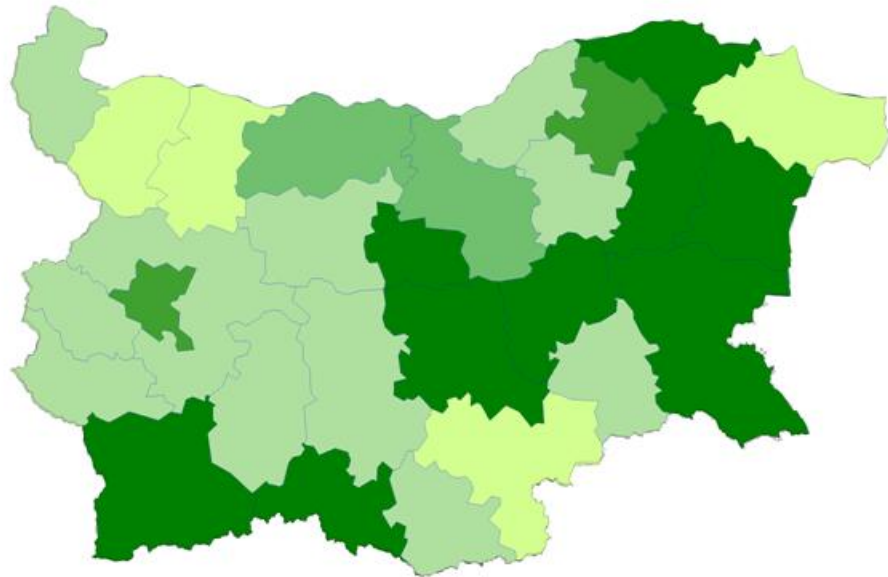
3.03.2 Regional coverage by broadband technology

Bulgaria standard fixed broadband coverage

Total standard fixed coverage



Source: BCE 2012

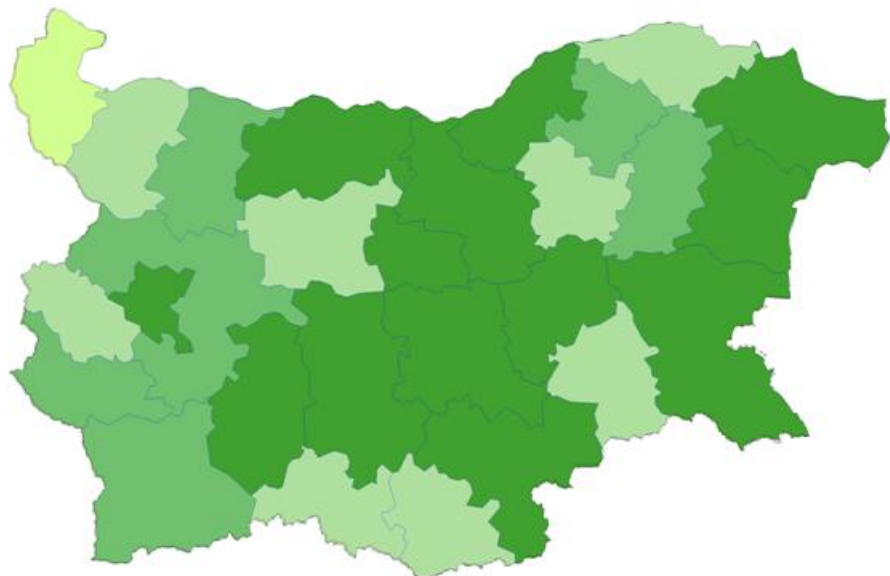


Bulgaria Next Generation Access coverage

Total Next Generation Access coverage



Source: BCE 2012



Bulgaria had variable broadband coverage with a different pattern from that familiar in Western Europe. The areas which led in standard fixed coverage did not necessarily lead for NGA coverage.

Broadband Coverage in Europe 2012

Sofia, the capital, for example, was behind the leading areas for standard coverage, but first in the country for NGA coverage.

Tourist areas such as the coastal provinces were among those with 100% standard fixed broadband coverage. Most provinces had between 80% and 94%. Those in North-West Bulgaria are the lowest, starting below 50% and reaching around 70%.

Most of the NUTS 3 areas in the country had over 50% coverage but the most rural areas all had less than 10% of their households covered.

3.03.3 Data tables for Bulgaria

Statistic	National
Population	7,364,570
Persons per household	2.5
Rural proportion	19.6%

Technology	BG - 2012		BG - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	85.1%	53.5%	84.8%	53.7%	92.9%	76.3%
VDSL	0.0%	0.0%	0.0%	0.0%	24.9%	4.8%
FTTP	7.3%	0.0%	5.6%	0.1%	12.3%	3.0%
WiMAX	21.1%	11.9%	16.9%	9.4%	17.2%	16.2%
Standard cable	57.1%	0.0%	56.2%	0.0%	42.0%	7.3%
Docsis 3 cable	57.1%	0.0%	56.2%	0.0%	39.3%	5.8%
HSPA	99.4%	97.0%	98.0%	90.1%	96.3%	82.1%
LTE	0.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.8%	99.0%			99.4%	96.1%
Standard fixed	89.6%	59.2%	89.1%	58.3%	95.5%	83.2%
NGA	60.7%	0.0%	59.3%	0.1%	53.7%	12.4%

3.03.4 Notes on data and coverage estimates

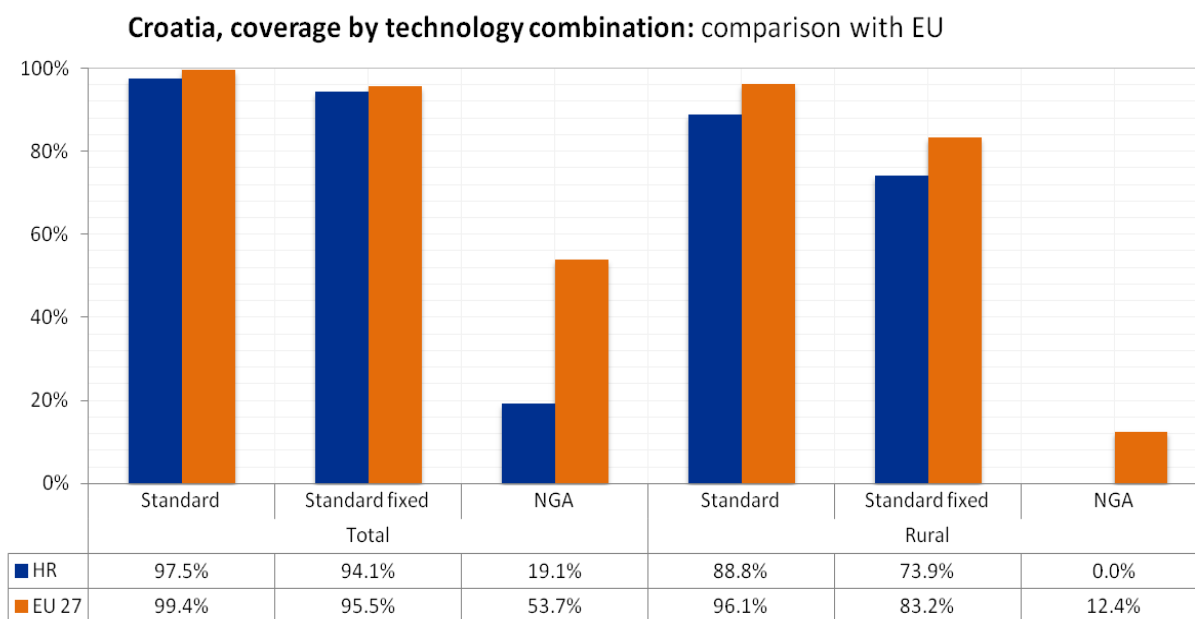
FTTP vs Docsis 3:

As noted in the commentary, where it was not possible to distinguish between FTTLA and Docsis 3 technology within one network, the whole network was assumed to be Docsis 3 – rather than making an ill-informed judgement on the FTTB percentage. This does not affect the overall NGA coverage reported.

3.04 Croatia

3.04.1 National coverage by broadband technology

Croatia was new to the Broadband Coverage in Europe study. The data showed that it was slightly behind the European Union averages for standard and standard fixed broadband coverage, and quite far behind the average for NGA coverage. We estimated that less than 0.01% of rural households could access NGA services at the end of 2012.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

A key reason for the low NGA coverage was that none of the cable network had been upgraded to Docsis 3 at the end of 2012. Since Docsis 3 is typically a key component of NGA coverage, it is therefore not surprising that Croatia falls behind the EU average. VDSL contributed nearly 16% to NGA coverage and FTTP just over 6% - implying that only half of the FTTP network overlapped with the VDSL network.

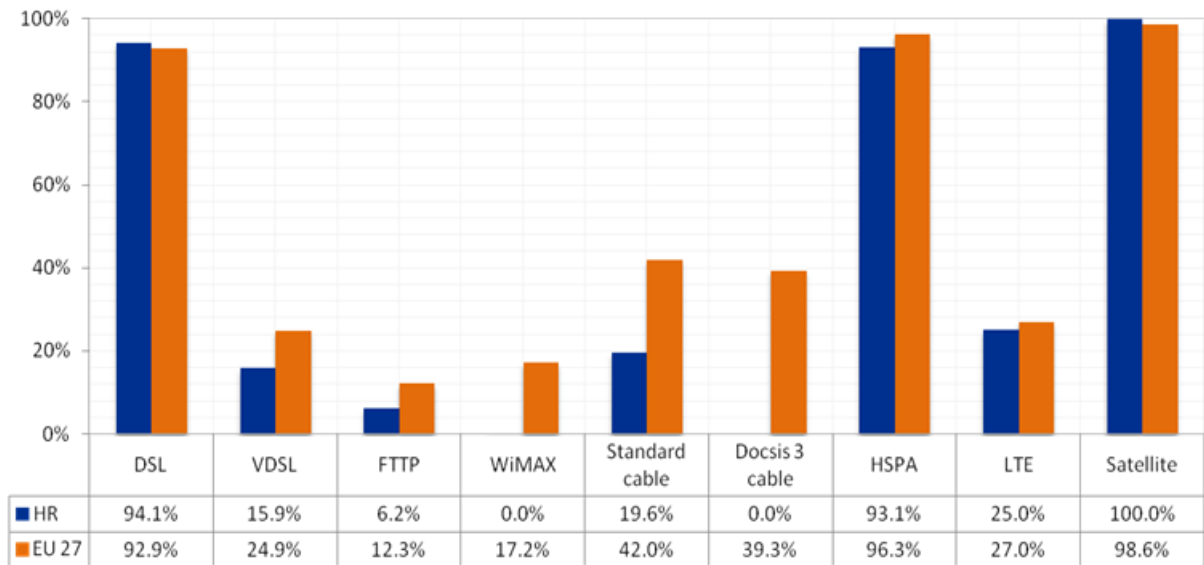
Whilst a very small amount of rural FTTP coverage was reported, overall this was less than 0.01% of all rural households.

As well as Docsis 3, no WiMAX networks were reported in Croatia. Coverage of most technologies fell behind the EU average for coverage, with the exception of DSL which was slightly ahead of the average.

Croatia's capital Zagreb had the highest standard fixed broadband coverage and NGA coverage. Beyond this, it was areas in the west, south and east of Croatia which enjoyed the highest standard fixed broadband coverage. No region in Croatia had NGA coverage over 35%.

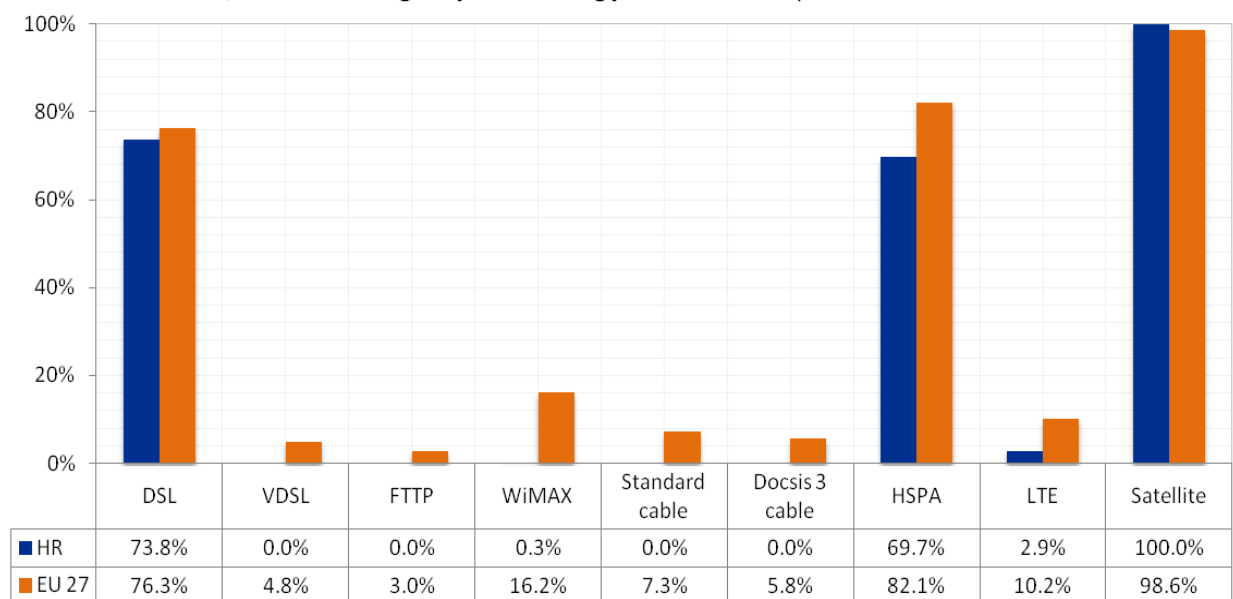
Broadband Coverage in Europe 2012

Croatia, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Croatia, rural coverage by technology in 2012: comparison with EU

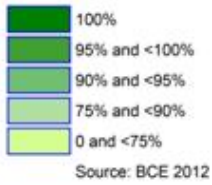


Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.04.2 Regional coverage by broadband technology

Croatia standard fixed broadband coverage

Total standard fixed coverage



Croatia Next Generation Access coverage

Total Next Generation Access coverage



3.04.3 Data tables for Croatia

Statistic	National
Population	4,284,889
Persons per household	2.8
Rural proportion	22.4%

Technology	HR - 2012		HR - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	94.1%	73.8%			92.9%	76.3%
VDSL	15.9%	0.0%			24.9%	4.8%
FTTP	6.2%	0.0%			12.3%	3.0%
WiMAX	0.0%	0.3%			17.2%	16.2%
Standard cable	19.6%	0.0%			42.0%	7.3%
Docsis 3 cable	0.0%	0.0%			39.3%	5.8%
HSPA	93.1%	69.7%			96.3%	82.1%
LTE	25.0%	2.9%			27.0%	10.2%
Satellite	100.0%	100.0%			98.6%	98.6%
Standard	97.5%	88.8%			99.4%	96.1%
Standard fixed	94.1%	73.9%			95.5%	83.2%
NGA	19.1%	0.0%			53.7%	12.4%

3.04.4 Notes on data and coverage estimates

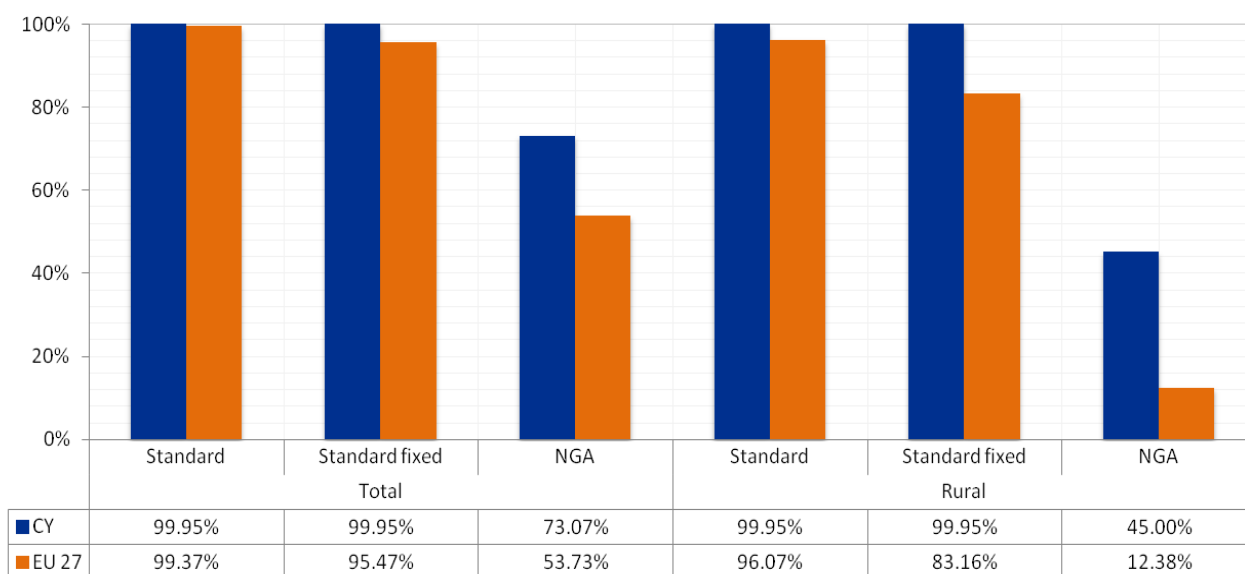
None.

3.05 Cyprus

3.05.1 National coverage by broadband technology

Cyprus was one of the smallest countries within the study and enjoyed almost complete standard and standard fixed broadband coverage. Whilst NGA was reported as absent at the end of 2011, at the end of 2012 73% of households were covered by high-speed services.

Cyprus, coverage by technology combination: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

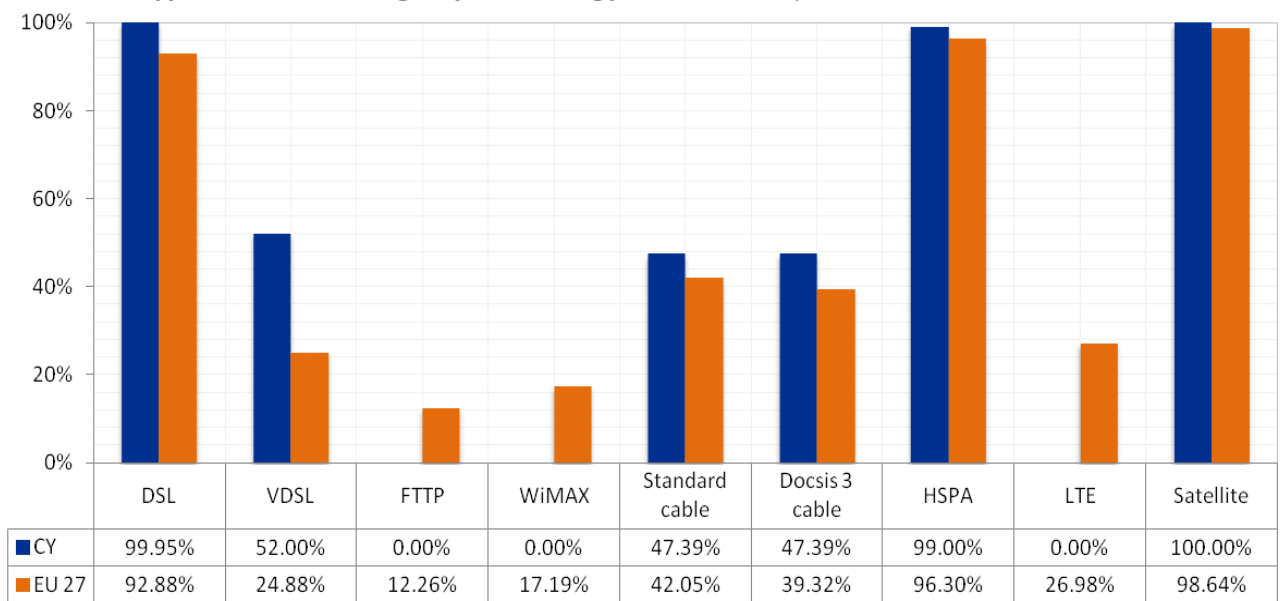
FTTP and WiMAX were both still absent in Cyprus at the end of 2012, whilst VDSL and Docsis 3 had become available. At the end of 2011, cable services were only offered providing speeds of up to 20Mbps. For the purposes of this study, this was not classified as an NGA service and so not classified as Docsis 3. However, at the end of 2012 high-speed services were available across the whole cable network.

VDSL expanded with unusually high coverage of rural households. Cyprus already had nearly 100% coverage of DSL. VDSL cards and other relevant equipment to support higher speeds were mostly added to DSLAM's in rural areas: the plan was then to invest in fibre in the urban areas. However these plans have been delayed due to uncertainty in regulation and demand. The economic situation in Cyprus then complicated the issue further.

Cyprus enjoyed full coverage from satellite broadband, and nearly complete DSL and HSPA coverage. At the end of 2012, LTE services had not yet been launched in Cyprus.

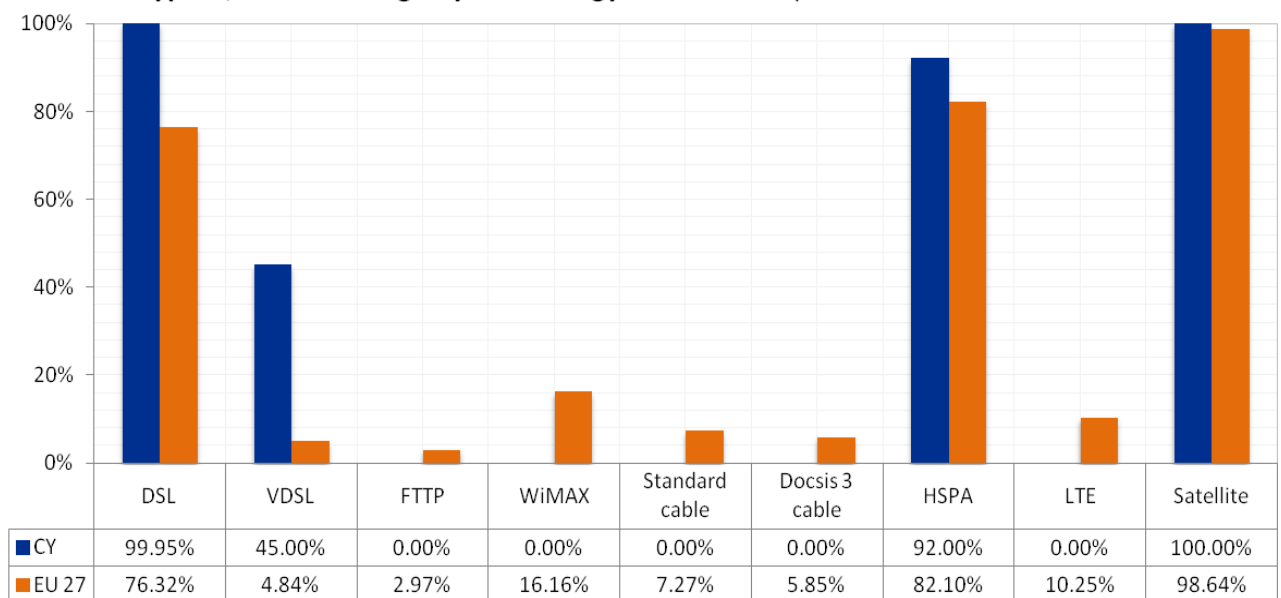
Broadband Coverage in Europe 2012

Cyprus, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

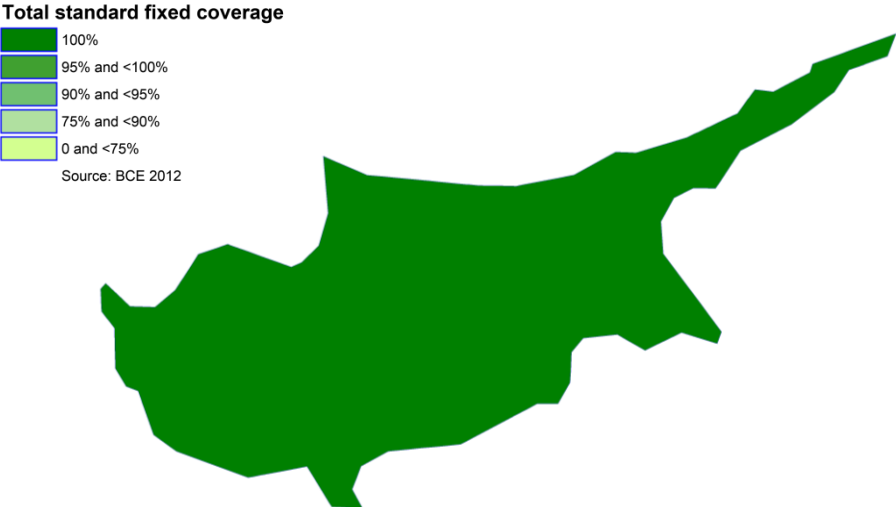
Cyprus, rural coverage by technology in 2012: comparison with EU



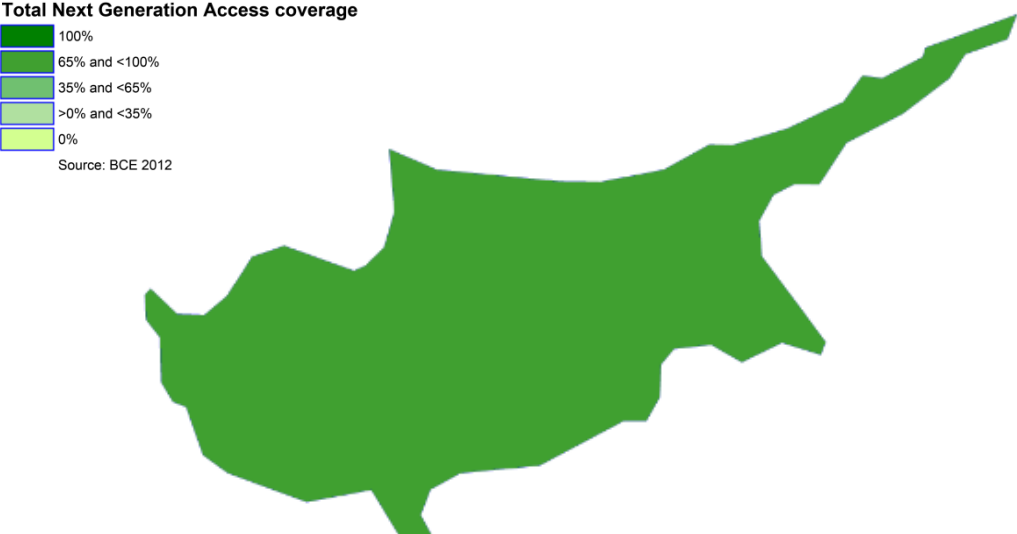
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.05.2 Regional coverage by broadband technology

Cyprus standard fixed broadband coverage



Cyprus Next Generation Access coverage



3.05.3 Data tables for Cyprus

Statistic	National
Population	839,751
Persons per household	2.8
Rural proportion	12.5%

Technology	CY - 2012		CY - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	>99.95%	>99.95%	>99.95%	>99.95%	92.9%	76.3%
VDSL	52.0%	45.0%	0.0%	0.0%	24.9%	4.8%
FTTP	0.0%	0.0%	0.0%	0.0%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	47.4%	0.0%	45.9%	0.0%	42.0%	7.3%
Docsis 3 cable	47.4%	0.0%	0.0%	0.0%	39.3%	5.8%
HSPA	99.0%	92.0%	99.0%	92.0%	96.3%	82.1%
LTE	0.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	>99.95%	>99.95%			99.4%	96.1%
Standard fixed	>99.95%	>99.95%	>99.95%	>99.95%	95.5%	83.2%
NGA	73.1%	45.0%	0.0%	0.0%	53.7%	12.4%

3.05.4 Notes on data and coverage estimates

VDSL:

The survey definition for VDSL coverage is:

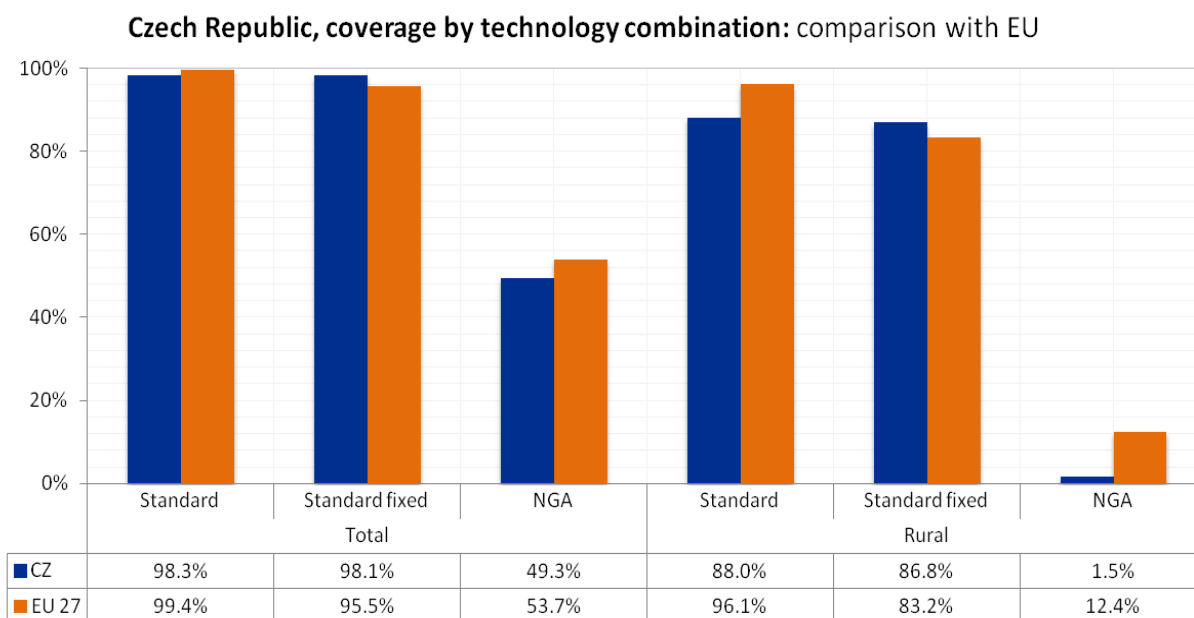
Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

In Cyprus, the data provided considers a range of 1,200 metres.

3.06 Czech Republic

3.06.1 National coverage by broadband technology

Whilst the Czech Republic is slightly ahead of the European Union average for standard fixed broadband coverage, it remains behind the average for overall standard coverage and NGA coverage.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The technology profile provides the background to these results. DSL coverage in the Czech Republic was higher than average in 2012, with 97% of households covered by services. DSL dominated the results for standard fixed broadband, which is consequentially higher than the EU average.

Whilst FTTP and VDSL coverage were very close to the average for the European Union, a less extensive cable network means that the Czech Republic fell behind in terms of NGA coverage. Only FTTP was found to provide any significant coverage in rural areas, covering just 1.3% of rural households. This resulted in the much lower than average results for rural NGA coverage.

Looking at all technologies, the Czech Republic had one of the lowest figures for rural HSPA coverage, pulling down the standard coverage for mobile and fixed-line technologies to 88%.

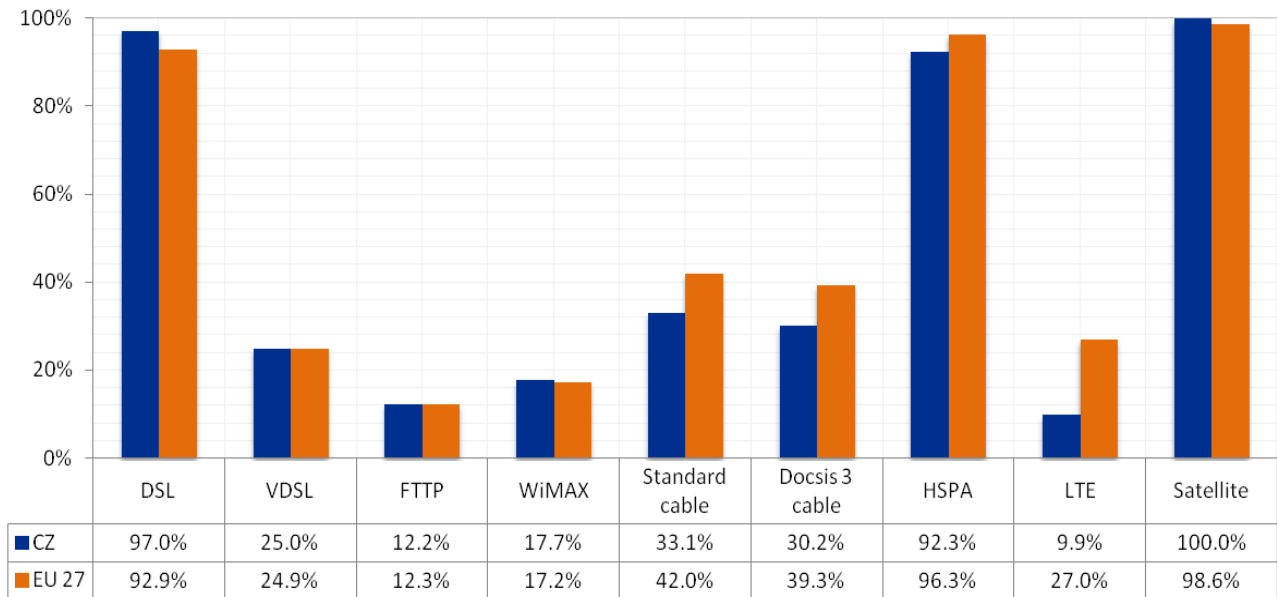
Notable improvements were recorded in 2012, with the coverage of VDSL growing from just under 10% to 25%. This in turn had a positive impact on overall NGA coverage, which grew by 9p.p. in the year.

LTE services were launched in 2012 and these covered nearly 10% of households by the end of the year. The whole of the Czech Republic was covered by satellite broadband services.

The capital Prague enjoyed the highest coverage of both standard fixed broadband and NGA services. Coverage of standard fixed broadband was over 90% in every region. Coverage of NGA broadband was high in the regions around Prague and particularly in the north-west, as well as in the south and south-east around Brno and Ostrava.

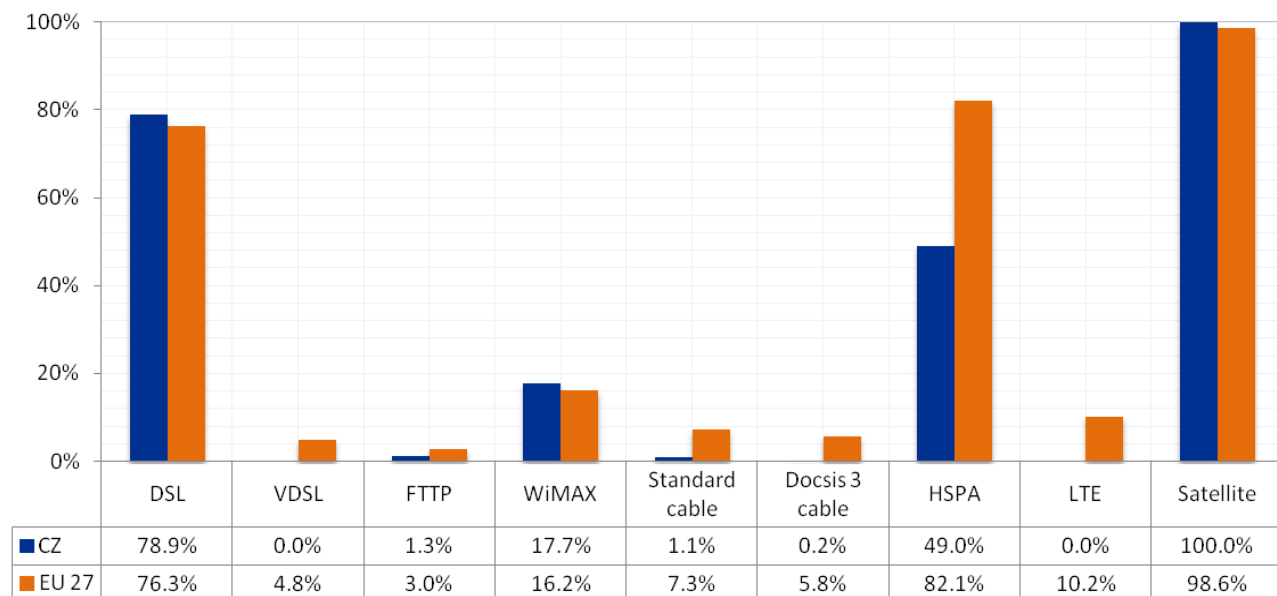
Broadband Coverage in Europe 2012

Czech Republic, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Czech Republic, rural coverage by technology in 2012: comparison with EU

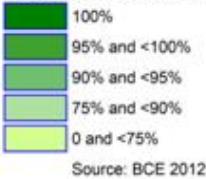


Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.06.2 Regional coverage by broadband technology

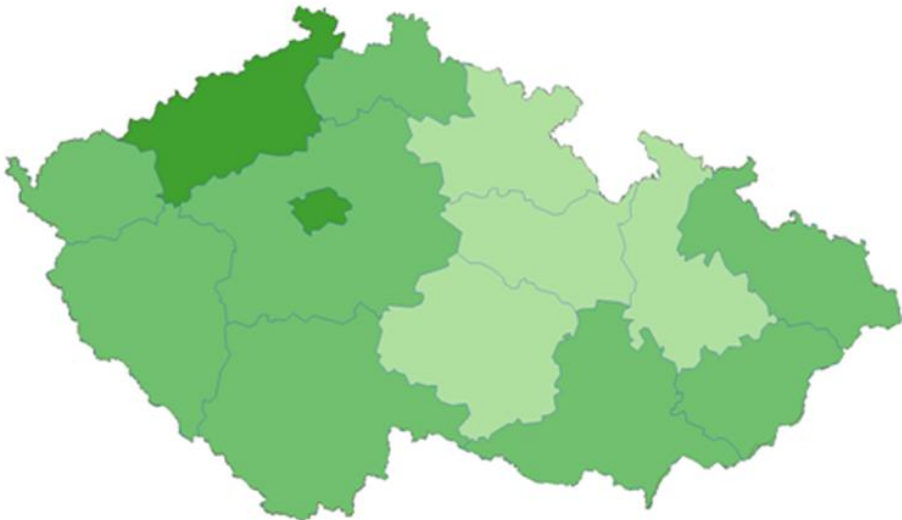
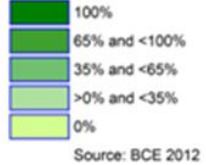
Czech Republic standard fixed broadband coverage

Total standard fixed coverage



Czech Republic Next Generation Access coverage

Total Next Generation Access coverage



3.06.3 Data tables for the Czech Republic

Statistic	National
Population	10,532,770
Persons per household	2.4
Rural proportion	14.2%

Technology	CZ - 2012		CZ - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	97.0%	78.9%	92.0%	45.5%	92.9%	76.3%
VDSL	25.0%	0.0%	9.6%	0.0%	24.9%	4.8%
FTTP	12.2%	1.3%	11.3%	0.0%	12.3%	3.0%
WiMAX	17.7%	17.7%	17.7%	17.7%	17.2%	16.2%
Standard cable	33.1%	1.1%	32.8%	0.0%	42.0%	7.3%
Docsis 3 cable	30.2%	0.2%	29.3%	0.0%	39.3%	5.8%
HSPA	92.3%	49.0%	90.0%	35.6%	96.3%	82.1%
LTE	9.9%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	98.3%	88.0%			99.4%	96.1%
Standard fixed	98.1%	86.8%	94.5%	55.5%	95.5%	83.2%
NGA	49.3%	1.5%	40.3%	0.0%	53.7%	12.4%

3.06.4 Notes on data and coverage estimates:

VDSL:

The survey definition for VDSL coverage is:

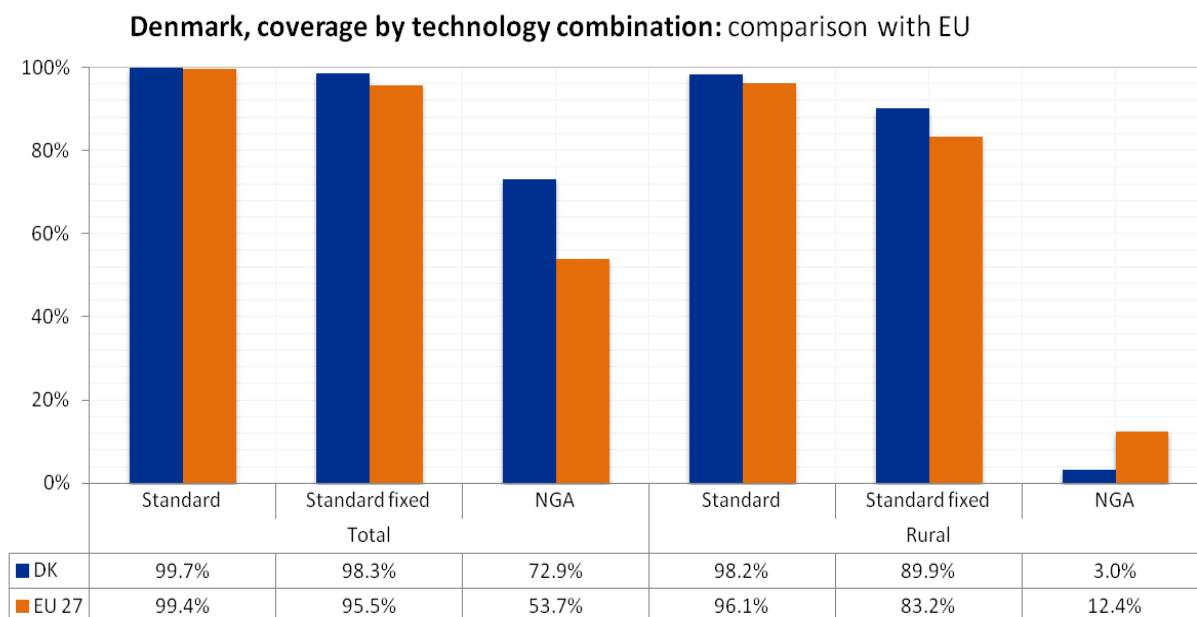
Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

In the Czech Republic, we were not able to confirm the definition for coverage used in the report, and so we assume that it includes all coverage and is not restricted to superfast coverage.

3.07 Denmark

3.07.1 National coverage by broadband technology

Denmark was ahead of the European Union average for most measures of standard and NGA broadband coverage, but fell behind when it came to serving its rural households with high-speed services. Using the new study definition for rurality means that there were significantly fewer rural households reported in Denmark in 2012, and these hardest-to-reach areas were judged to be unserved by NGA services.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The HSPA network in Denmark covered nearly the whole country, and DSL covered more than 98% of households. This drove the high-ranking for both standard and standard fixed broadband coverage.

At the end of 2012 Denmark no longer had the highest LTE coverage in the European Union, as reported at the end of 2011. Sweden, Portugal, Estonia and Finland have all rolled out more extensive LTE networks, with Denmark now ranked fifth with 65% coverage.

Denmark had particularly high FTTP coverage, with 43% of households served compared to the EU average of 12%. Coverage grew by nearly 6p.p. in 2012. All five of the Nordic countries have invested significant amounts in FTTP, along with many countries in Eastern Europe. However, the FTTP network only provided very limited coverage in rural areas by the end of 2012.

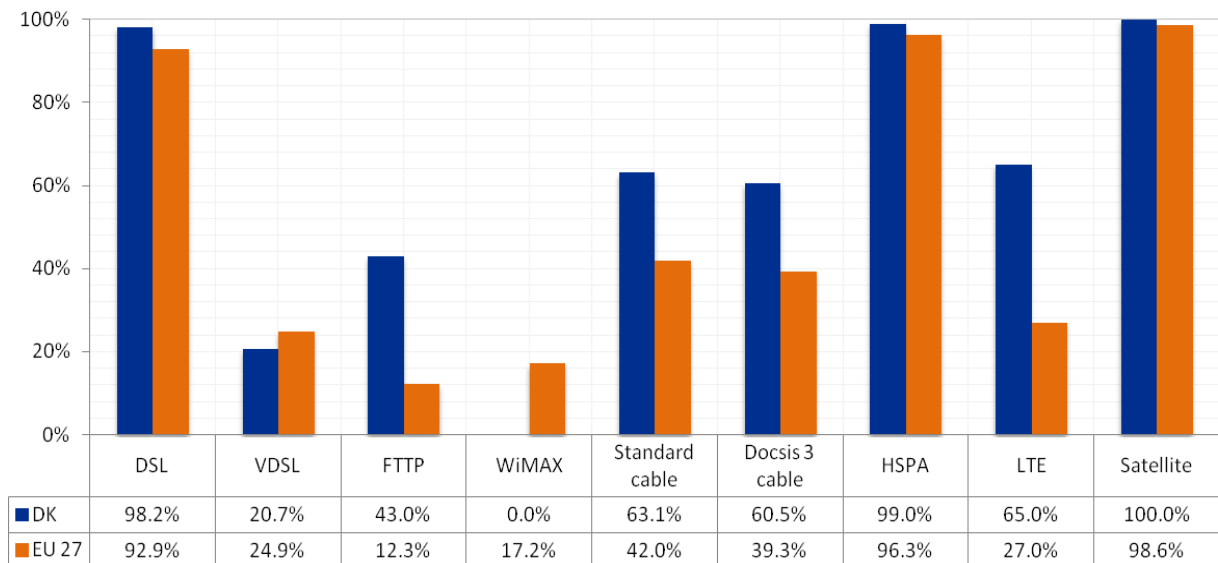
Whilst Denmark is one of the top ranking countries for cable coverage, these networks still did not seem to extend into the rural areas in 2012. LTE was also found to provide only limited coverage for these households. The major WiMAX provider in Denmark, which covered 8% of households at the end of 2011, went bankrupt during the year.

Denmark had uniformly high standard fixed broadband coverage, with all areas enjoying coverage above 97%. NGA coverage was also fairly evenly distributed. All regions had over 60% coverage, with the only exception of the eastern island of Bornholm with 37% coverage. This is the picture of a

Broadband Coverage in Europe 2012

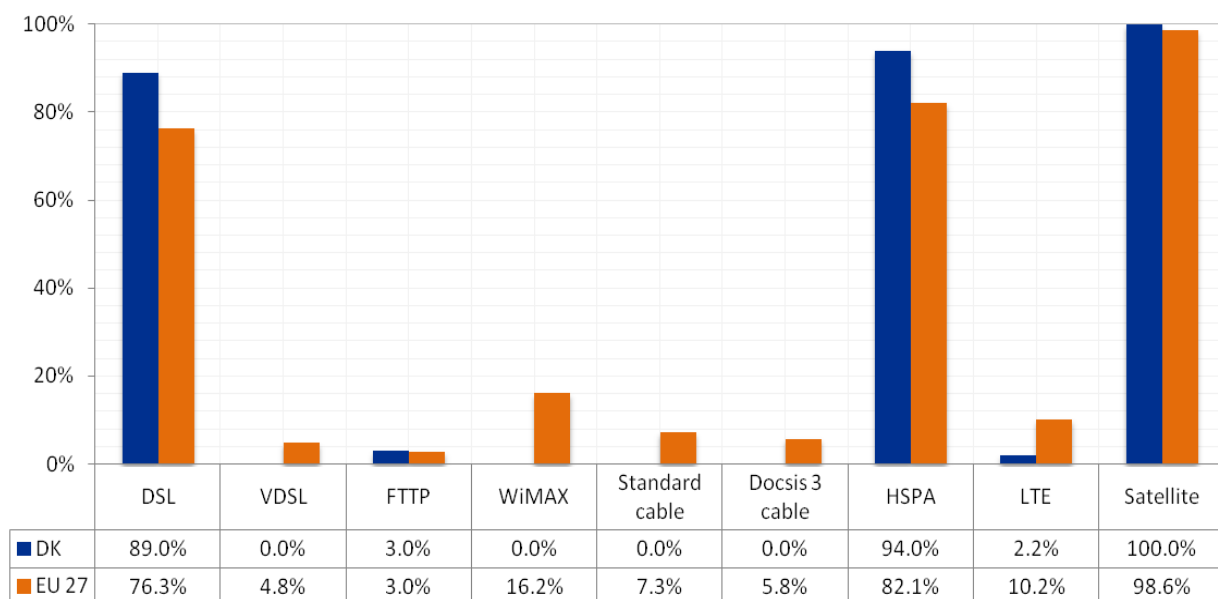
country which offers a wide range of services with good coverage, rather than having a leading position in any particular service.

Denmark, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

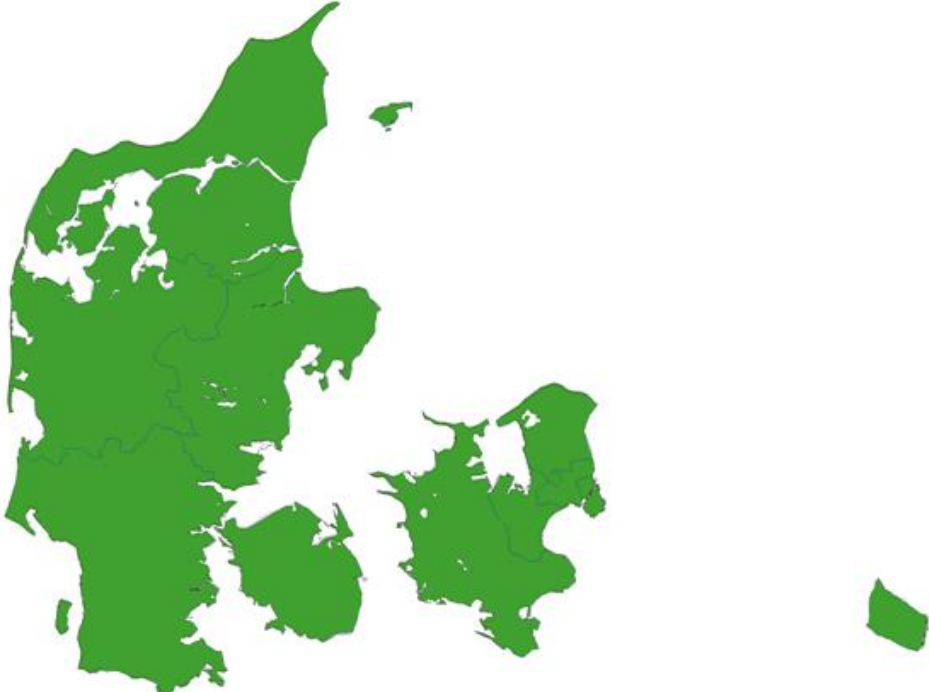
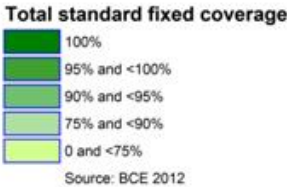
Denmark, rural coverage by technology in 2012: comparison with EU



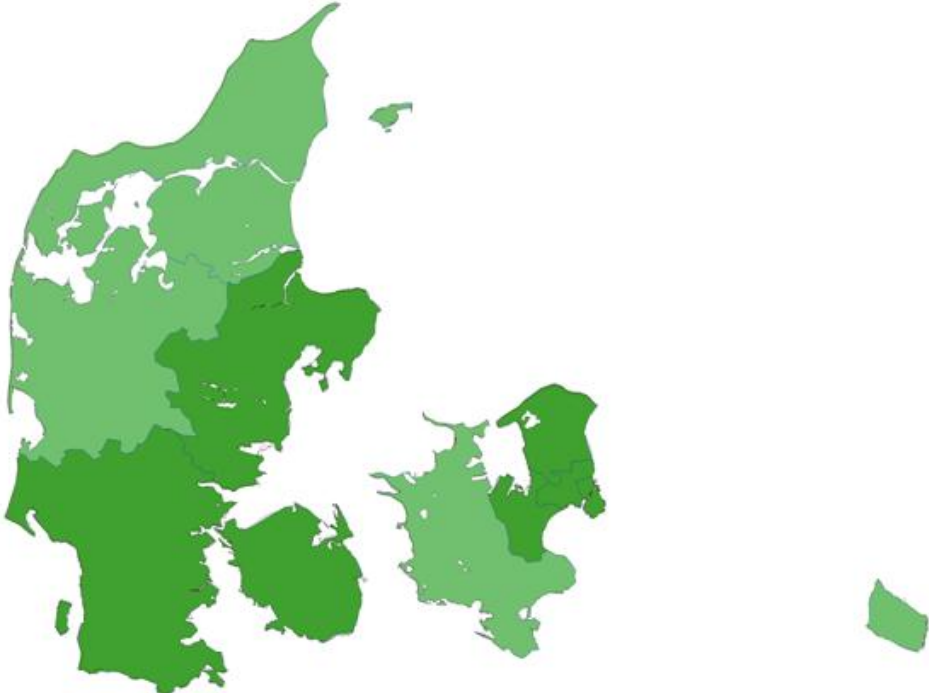
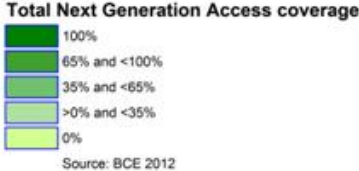
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.07.2 Regional coverage by broadband technology

Denmark standard fixed broadband coverage



Denmark Next Generation Access coverage



3.07.3 Data tables for Denmark

Statistic	National
Population	5,560,628
Persons per household	2.1
Rural proportion	16.6%

Technology	DK - 2012		DK - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	98.2%	89.0%	98.1%	88.8%	92.9%	76.3%
VDSL	20.7%	0.0%	19.9%	0.0%	24.9%	4.8%
FTTP	43.0%	3.0%	37.2%	0.0%	12.3%	3.0%
WiMAX	0.0%	0.0%	8.0%	9.6%	17.2%	16.2%
Standard cable	63.1%	0.0%	62.6%	0.0%	42.0%	7.3%
Docsis 3 cable	60.5%	0.0%	54.4%	0.0%	39.3%	5.8%
HSPA	99.0%	94.0%	98.1%	89.3%	96.3%	82.1%
LTE	65.0%	2.2%	54.1%	0.8%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.7%	98.2%			99.4%	96.1%
Standard fixed	98.3%	89.9%	99.0%	93.3%	95.5%	83.2%
NGA	72.9%	3.0%	61.9%	0.0%	53.7%	12.4%

3.07.4 Notes on data and coverage estimates:

Date:

Data provided reflects coverage at the end of June 2012, rather than the end of 2012.

Docsis 3:

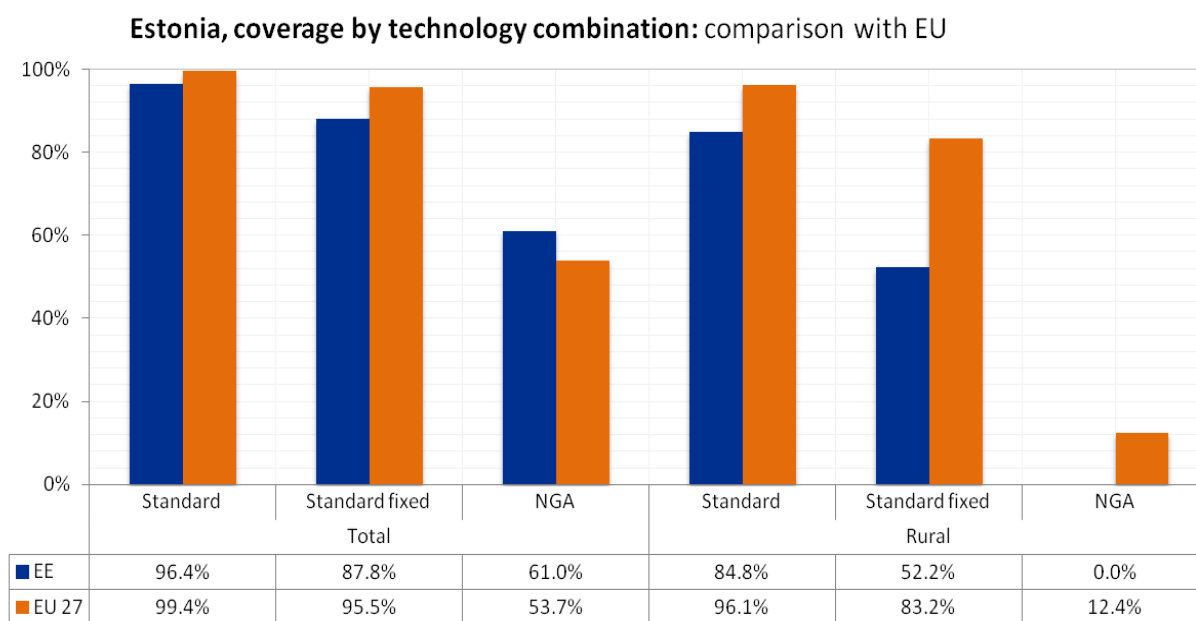
The coverage of Docsis 3 cable is provided as the coverage of cable with 50+ Mbps downstream. The data therefore deviates from the survey definition of services capable of delivering 30+ Mbps downstream.

3.08 Estonia

3.08.1 National coverage by broadband technology

We made significant revisions to the coverage profile for Estonia in 2012 in light of new data. Estonia presents a very interesting case study for broadband coverage which is common in Eastern Europe and very different to the typical picture for Western Europe.

Estonia was behind the European Union average for standard and standard fixed broadband coverage, but slightly ahead for total NGA coverage. None of its rural households had access to NGA services at the end of 2012.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The technology profile presents some interesting findings. Estonia reported the lowest coverage of DSL in any of the study countries at 39.3%. This coverage is much lower than the value published in 2011, which was 90% – we now estimate that coverage at the end of 2011 was 38.5%.

The higher number reported last year corresponded to the total number of copper pairs in Estonia. But not every single copper pair was automatically DSL-ready in 2012. Many were still only able to deliver telephony services, since the quality of copper pairs in the network in Estonia can fluctuate significantly. Therefore the total number of DSL lines remains significantly smaller than the total number of copper pairs. The figures provided for DSL represent the potential number of DSL lines in Estonia.

Given the very low coverage of DSL, it is surprising then that Estonia did not also report the lowest standard fixed broadband coverage in the study. The country's cable network is extensive, with more than 70% of households covered at the end of the year and ranked sixth overall in the whole study. Estonia is also ranked seventh overall for WiMAX coverage, with an estimated 40% of households covered in 2012. It also ranks above the EU average for FTTP coverage, which is also considered in the standard fixed coverage combination. There was only a slight overlap between DSL and FTTP technologies, which was taken into account when calculating the overall technology coverage.

Broadband Coverage in Europe 2012

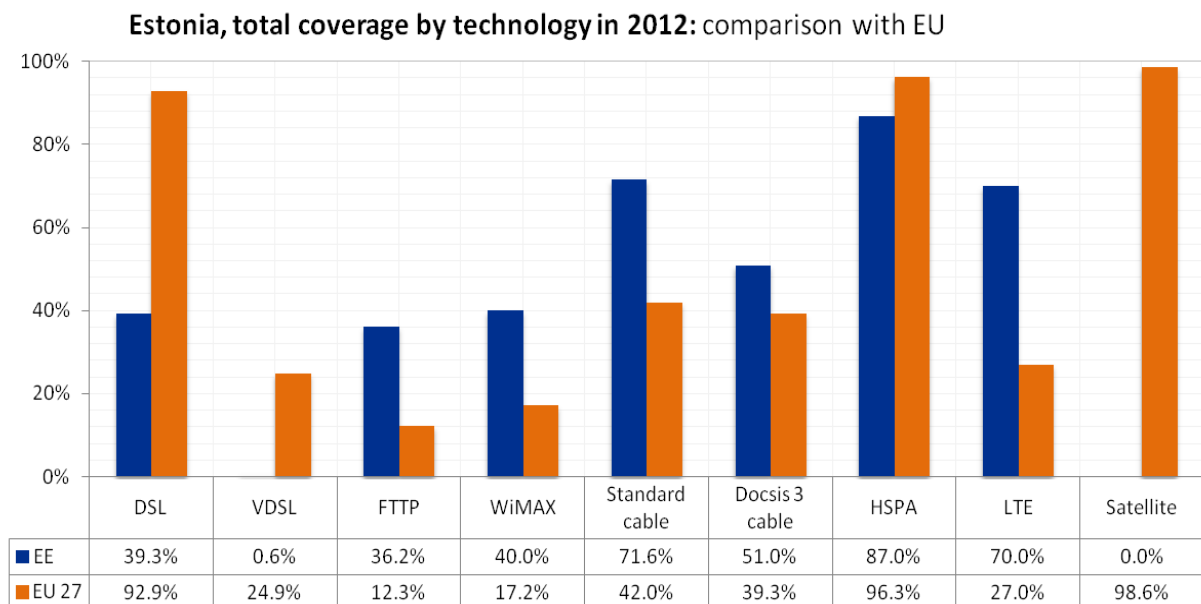
Overall Estonia almost made up for its undersupplied DSL network by providing a competent range of other services.

Looking at its NGA technologies, just over 70% of the cable network had been upgraded to Docsis 3 (compared to an EU average of 90%). The combination of Docsis 3 and FTTP delivered over 60% NGA coverage across the country. Typically in Estonia, when operators upgrade the network, they choose to upgrade to FTTP rather than VDSL – VDSL is therefore mostly absent. It was estimated that NGA coverage did not extend to the most rural households in Estonia in 2012.

Estonia also falls behind the EU average for HSPA coverage in 2012, reporting only 87% coverage. As is the case in some other countries reporting lower than average coverage, we believe that this is a result of Estonia applying more rigorous standards for what actually constitutes coverage – in this case excluding coverage which delivers under 58 dBµV/m signal strength.

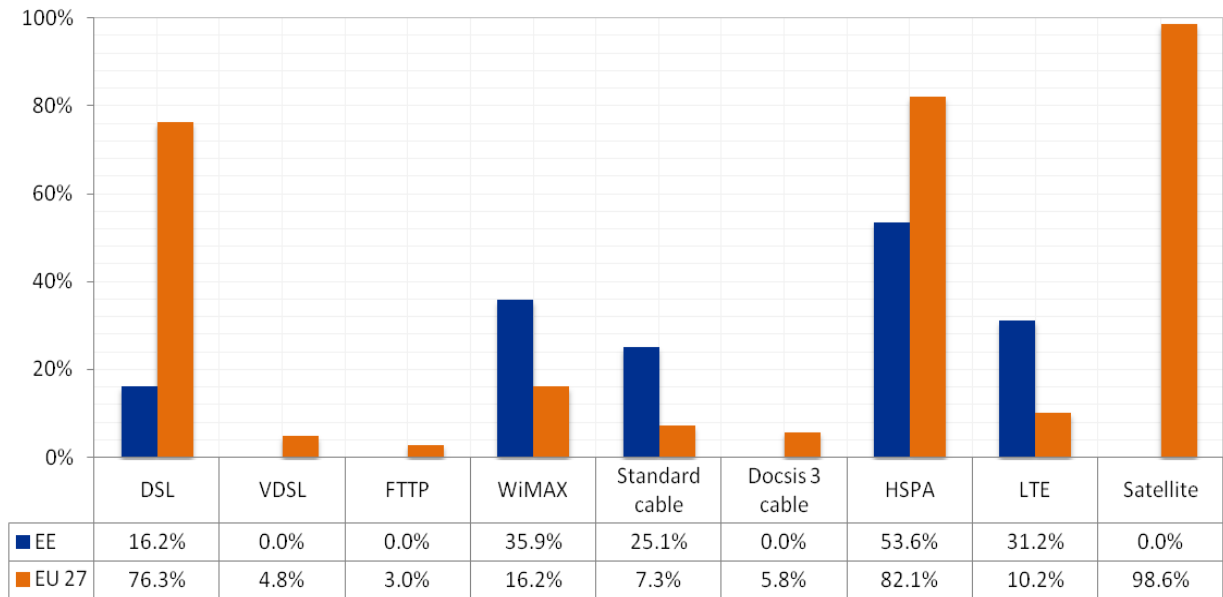
In terms of LTE, Estonia presents one of the most advanced networks in the study, reporting 70% coverage in 2012 and ranking third overall within the study.

Estonia is one of the four study countries with no reported satellite broadband services. Whilst we believe that the country does have some satellite coverage, there were no distributors for satellite services in Estonia in 2012 – meaning that it was not commercially available to its citizens.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

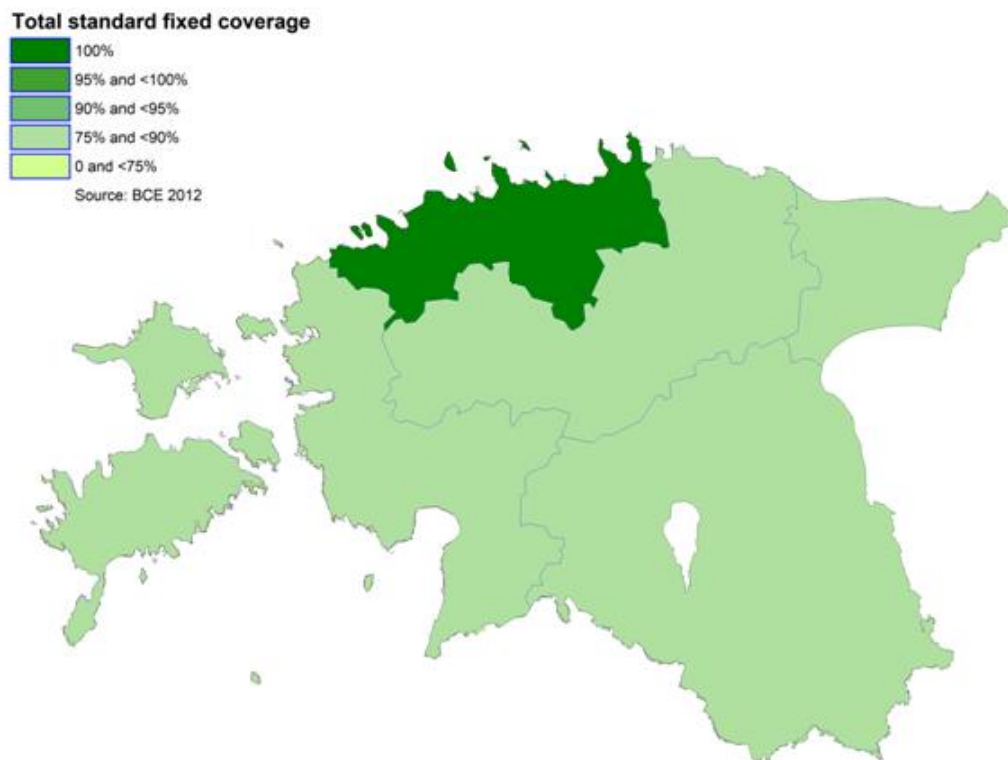
Estonia, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

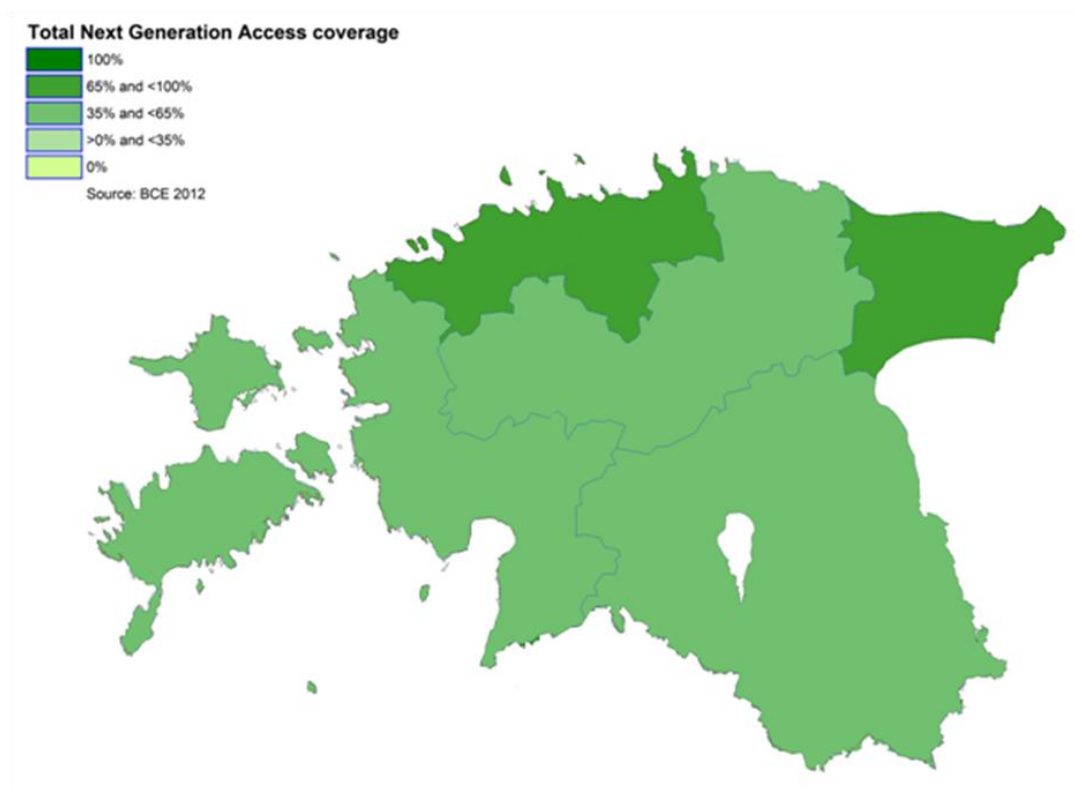
3.08.2 Regional coverage by broadband technology

Estonia standard fixed broadband coverage



Põhja-Eesti, situated on the northern coast of Estonia and including its capital Tallinn, was the only region in Estonia to report 100% standard fixed broadband coverage. All other regions had coverage between 75% and 85%.

Estonia Next Generation Access coverage



In terms of NGA coverage, again the capital region reported the highest coverage. The north-eastern industrial region of Kirde-Eesti reported 65% NGA coverage. The more rural areas of Estonia then reported between 35 and 45% coverage.

3.08.3 Data tables for Estonia

Statistic	National
Population	1,340,194
Persons per household	2.3
Rural proportion	22.5%

Technology	EE - 2012		EE - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	39.3%	16.2%	38.5%	16.1%	92.9%	76.3%
VDSL	0.6%	0.0%	2.4%	1.4%	24.9%	4.8%
FTTP	36.2%	0.0%	30.7%	0.0%	12.3%	3.0%

Broadband Coverage in Europe 2012

WiMAX	40.0%	35.9%	40.0%	35.9%	17.2%	16.2%
Standard cable	71.6%	25.1%	71.5%	13.7%	42.0%	7.3%
Docsis 3 cable	51.0%	0.0%	37.0%	0.0%	39.3%	5.8%
HSPA	87.0%	53.6%	87.0%	53.6%	96.3%	82.1%
LTE	70.0%	31.2%	70.0%	31.0%	27.0%	10.2%
Satellite	0.0%	0.0%	0.0%	0.0%	98.6%	98.6%
Standard	96.4%	84.8%			99.4%	96.1%
Standard fixed	87.8%	52.2%	86.0%	50.4%	95.5%	83.2%
NGA	61.0%	0.0%	52.1%	1.4%	53.7%	12.4%

3.08.4 Notes on data and coverage estimates:

Notes on technology definitions:

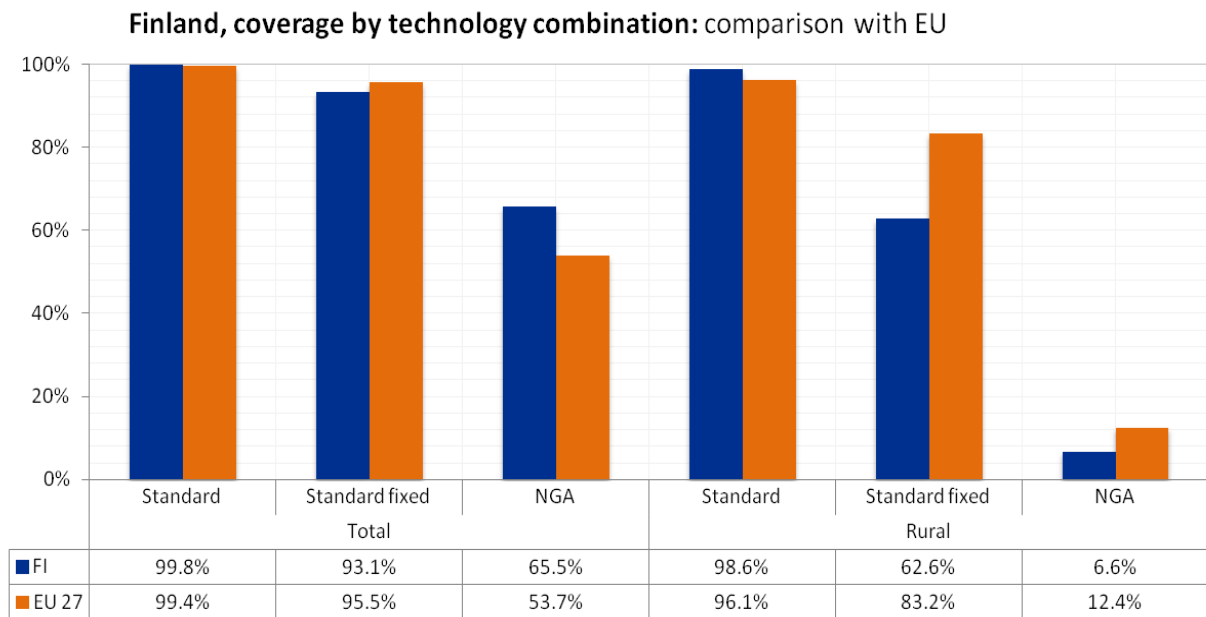
HSPA coverage report only includes areas covered by a signal strength greater than 58 dB μ V/m, which is considered sufficient to deliver access to data connections.

3.09 Finland

3.09.1 National coverage by broadband technology

Coverage data for Finland was also updated significantly since we last reported for end-2011. The VDSL network in Finland was much more extensive than previously thought, but its cable and WiMAX coverage was lower.

Overall, Finland was ahead of the European Union average for NGA coverage but behind for standard fixed coverage and NGA coverage of rural households.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

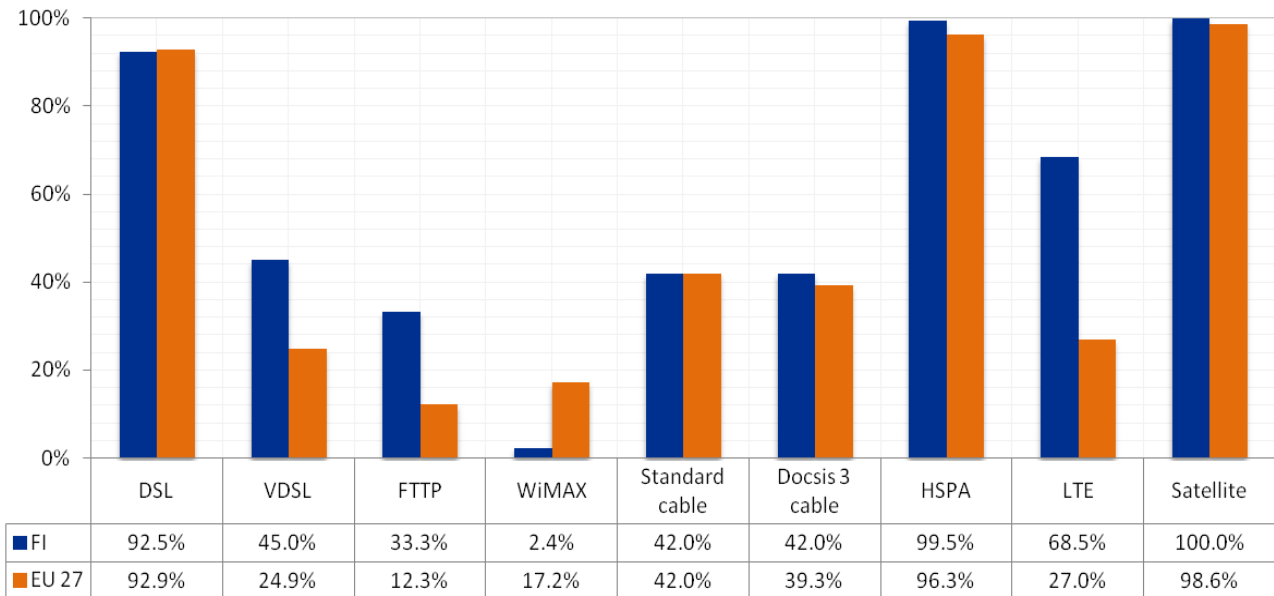
DSL and cable coverage in Finland were comparable to the average in the EU in 2012, at 92.5% and 42.0% respectively. FTTP covered a third of all households, placing Finland well ahead of the average coverage levels. But these networks mostly overlap, and overall coverage of standard fixed services was only 93.1%. WiMAX only contributed a small amount to coverage, and not enough to fill the gap.

Finland benefits from offering a wide range of NGA services offering good coverage, rather than having a leading position with any particular service. Finland’s VDSL network was found to be extensive and it ranks tenth overall for coverage. Coupled with the heavy commitment to fibre in Finland and reasonable Docsis 3 coverage, its NGA coverage is higher than the EU average. Due to overlap between the networks, we estimate that 65% of households in Finland could access an NGA service at the end of 2012. Finland also has the fourth most extensive LTE service in the study, with nearly 70% of households able to access services in the same period. These results are particularly impressive given that Finland has one of the lowest population densities in the study.

Using the new study definition for rurality means that there were significantly fewer rural households reported in Finland for 2012. HSPA was the key technology for delivering services to these rural households, covering more than 97% by the end of 2012 with FTTP also playing its part. However, the apparent lack of DSL coverage in the most rural areas means that Finland falls well behind the EU average for standard fixed coverage in rural areas in 2012.

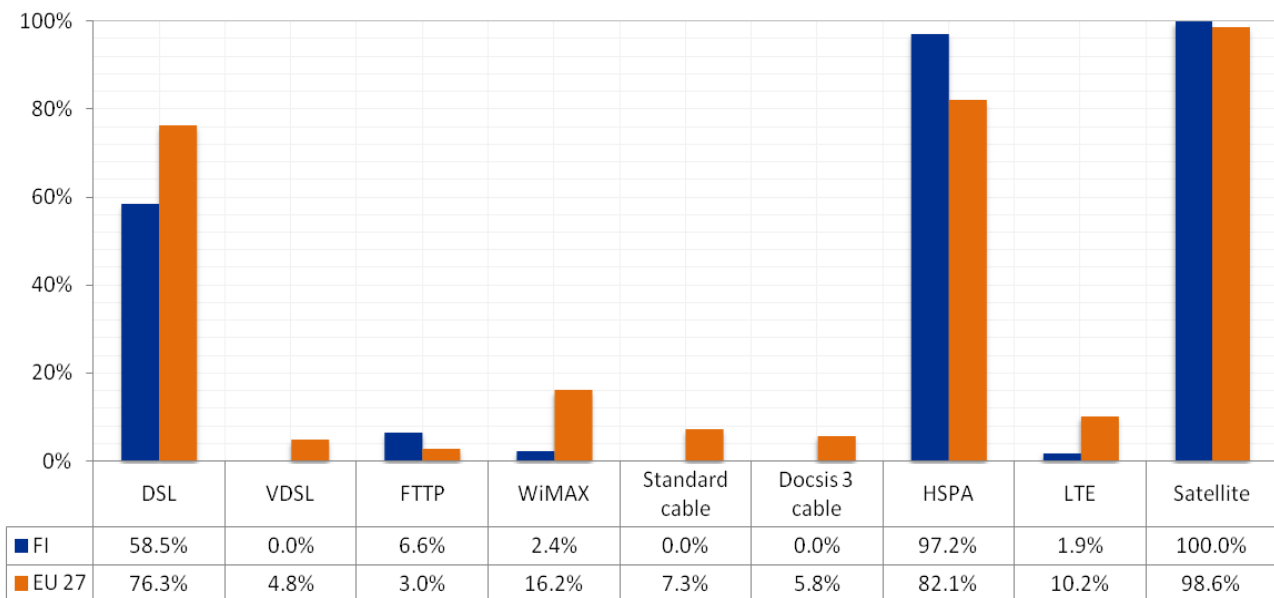
Broadband Coverage in Europe 2012

Finland, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

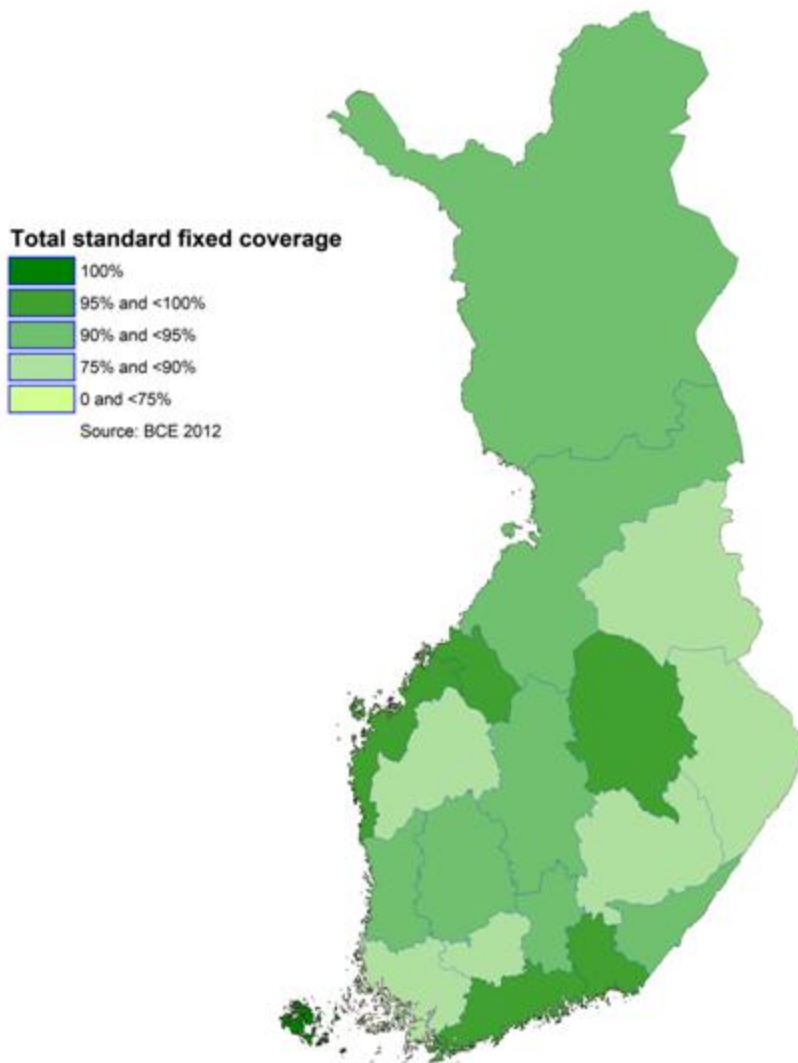
Finland, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.09.2 Regional coverage by broadband technology

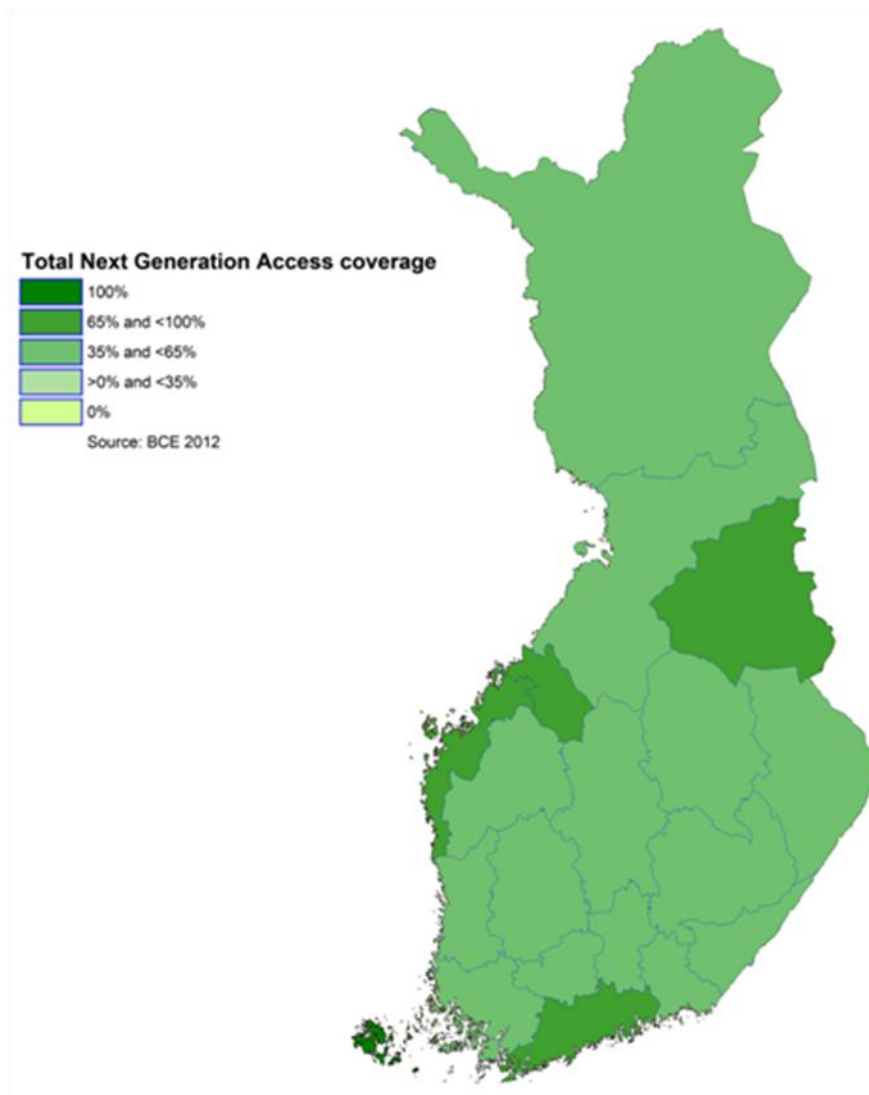
Finland standard fixed broadband coverage



New data has shown that the coverage of standard fixed broadband services is not as uniform as we believed.

Virtually all households in the Åland islands were covered by standard fixed and NGA broadband at the end of 2012. This is due to extensive fibre coverage reported for this area. Beyond this, Ostrobothnia and Central Ostrobothnia on the western coast offered high levels of standard fixed and NGA broadband.

Finland Next Generation Access coverage



3.09.3 Data tables for Finland

Statistic	National
Population	5,514,549
Persons per household	2.1
Rural proportion	18.1%

Broadband Coverage in Europe 2012

Technology	FI - 2012		FI - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	92.5%	58.5%	94.5%	69.6%	92.9%	76.3%
VDSL	45.0%	0.0%	46.0%	0.0%	24.9%	4.8%
FTTP	33.3%	6.6%	31.0%	0.0%	12.3%	3.0%
WiMAX	2.4%	2.4%	3.0%	3.0%	17.2%	16.2%
Standard cable	42.0%	0.0%	41.6%	0.0%	42.0%	7.3%
Docsis 3 cable	42.0%	0.0%	41.6%	0.0%	39.3%	5.8%
HSPA	99.5%	97.2%	98.7%	97.2%	96.3%	82.1%
LTE	68.5%	1.9%	24.5%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.8%	98.6%			99.4%	96.1%
Standard fixed	93.1%	62.6%	95.0%	71.2%	95.5%	83.2%
NGA	65.5%	6.6%	63.9%	4.2%	53.7%	12.4%

3.09.4 Notes on data and coverage estimates:

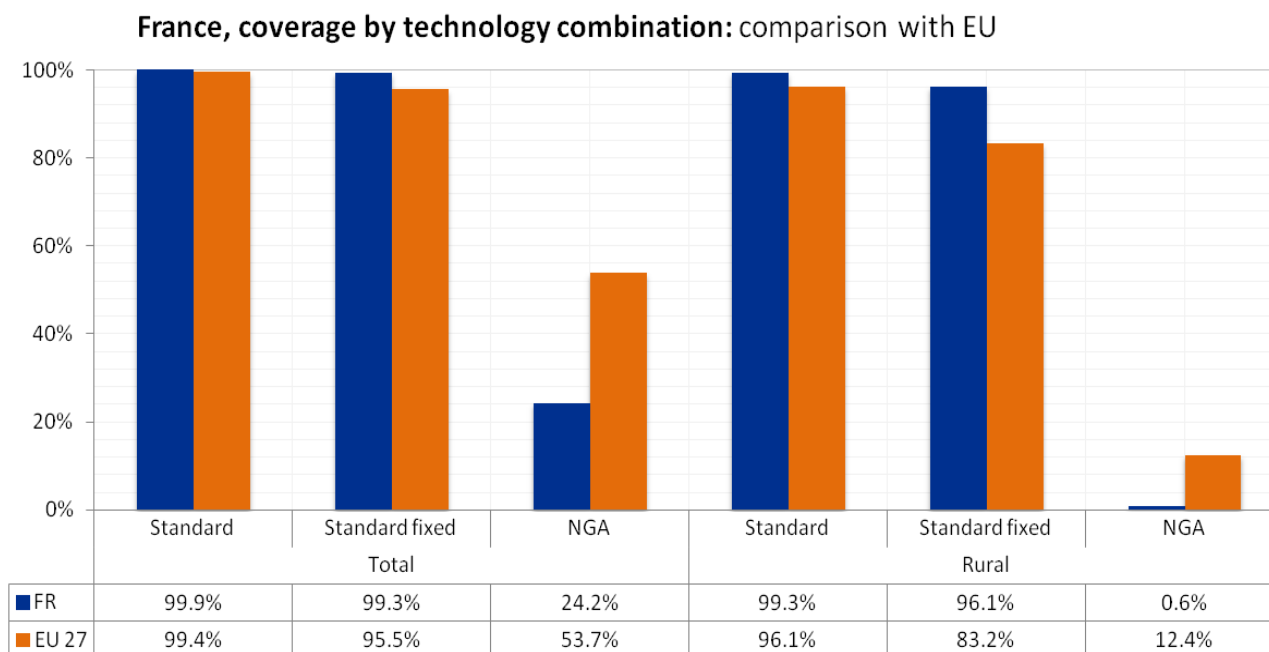
None.

3.10 France

3.10.1 National coverage by broadband technology

The results presented for France need careful interpretation and the notes on the source for the data give more background on the data that has been provided.

France was ahead of the European Union average for standard and standard fixed broadband measures, particularly in rural areas. But it was some way behind for NGA services – with 24.2% of households covered it was in the bottom four countries for the study overall.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The data assumes that DSL services were available to nearly all households and most rural households at the end of 2012. The coverage reported here is not an exact interpretation of households passed by DSL services, and it is important to note the caveats within the notes at the end of this chapter.

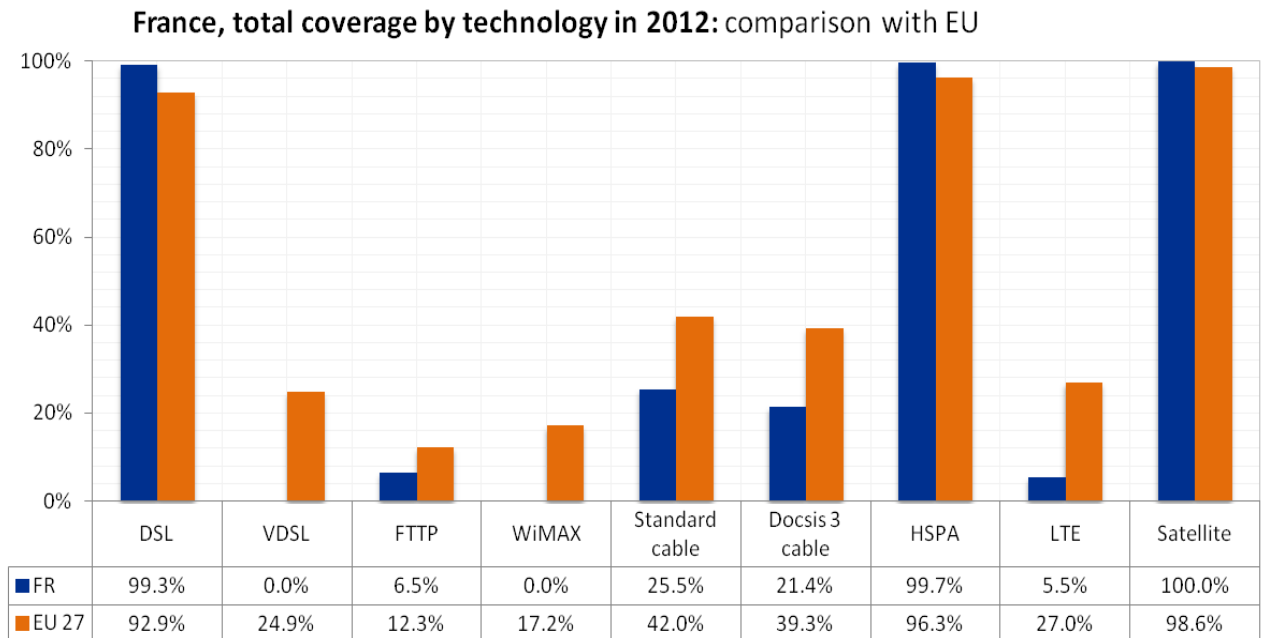
HSPA services were also found to be available to nearly all households – and so the combination of HSPA coverage and our estimate for DSL coverage results in higher than average coverage for standard and standard fixed broadband services.

By the end of 2012 France had no VDSL services and lower than average cable coverage. The best estimate available is that Docsis 3 was available through more than 80% of the cable network, providing around 20% coverage overall. Note that this is an estimate and precise data is not available. FTTP was then available to approximately 6.5% of households (again, please refer to the notes for the precise interpretation of this figure).

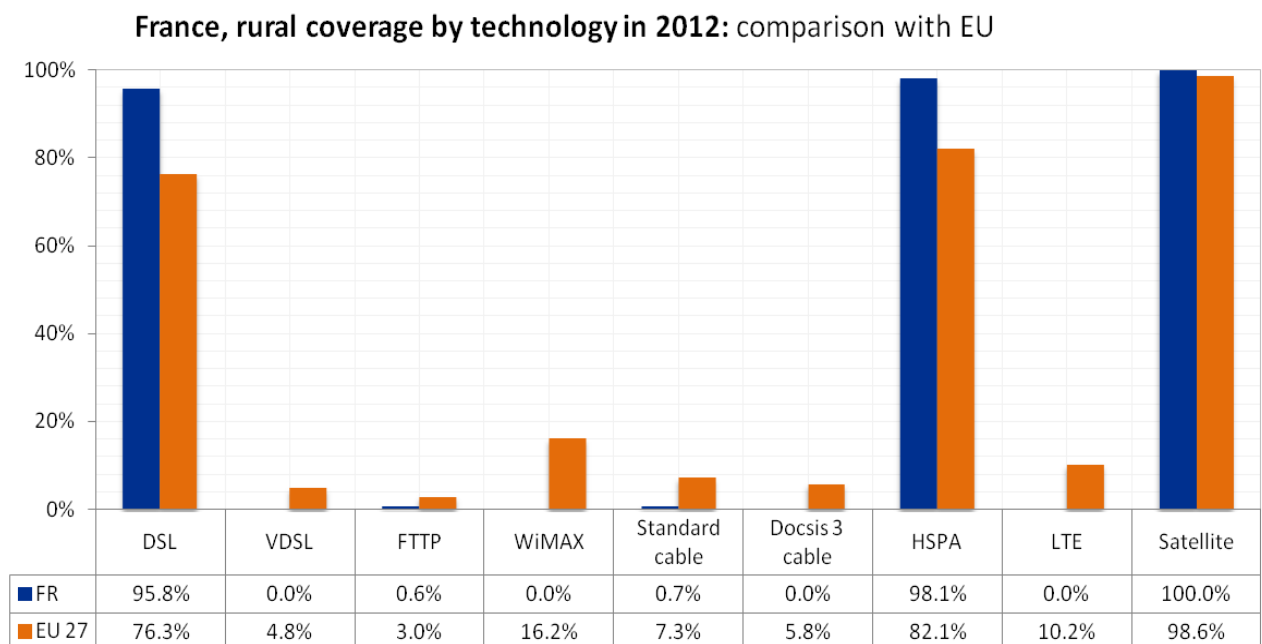
The net result is that overall NGA coverage in France is low compared to the rest of the EU. As one of the EU’s largest countries, this has a big impact on the results presented for the EU 27 as a whole.

Broadband Coverage in Europe 2012

Whilst DSL was believed to cover most of France's rural areas at the end of 2012, NGA provision was limited – we estimate that less than 1% of the 5 million rural households in France could access NGA services in the same period.



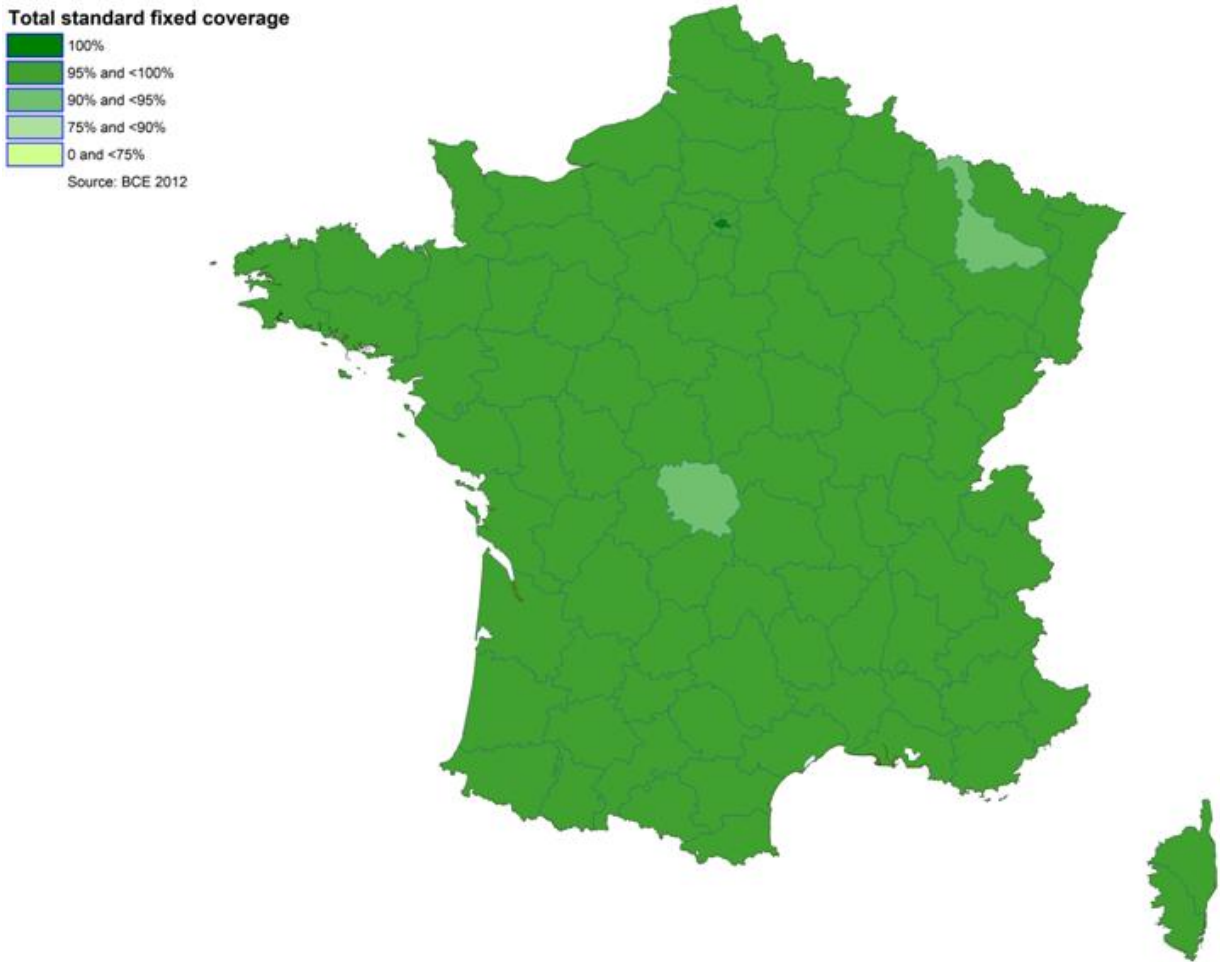
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

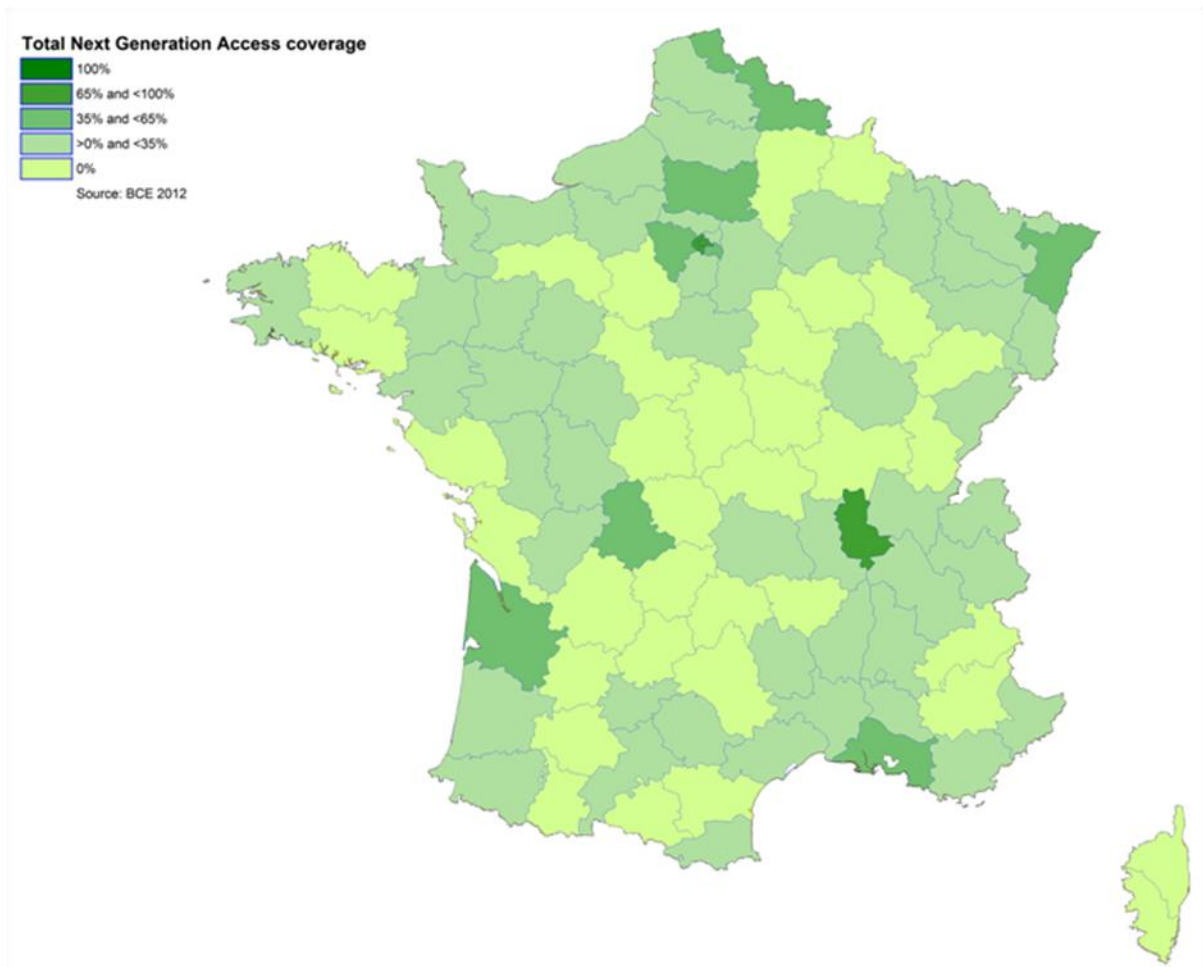
3.10.2 Regional coverage by broadband technology

France standard fixed broadband coverage



Standard fixed broadband coverage was uniform across France. Paris and its suburbs reached 100% in 2012, while the rest of mainland France had 95% coverage or higher, as did the overseas departements. The only exceptions were Creuse, a rugged and rural departement in the heart of the country, and Meurthe-et-Moselle. Both areas reported just under 95% standard fixed broadband coverage as a result of lower DSL coverage.

France NGA broadband coverage



NGA in France forms a complicated patchwork. Paris and its closest suburbs enjoyed 100% coverage, but forty-two départements had no NGA coverage recorded at all, including three outside mainland France. In general, it is the most urban areas across France which were reporting the highest NGA coverage.

Coverage data for NUTS 3 areas outside mainland France

Country	NUTS code	NUTS area name	Standard fixed coverage	NGA coverage
France	FR910	Guadeloupe	97.3%	7.7%
France	FR920	Martinique	98.4%	0.0%
France	FR930	Guyane	98.9%	0.0%
France	FR940	Réunion	99.2%	0.0%

3.10.3 Data tables for France

Statistic	National
Population	64,711,657
Persons per household	2.3
Rural proportion	17.5%

Technology	FR - 2012		FR - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.3%	95.8%	99.1%	95.0%	92.9%	76.3%
VDSL	0.0%	0.0%	0.0%	0.0%	24.9%	4.8%
FTTP	6.5%	0.6%	3.8%	0.0%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	25.5%	0.7%	23.7%	0.0%	42.0%	7.3%
Docsis 3 cable	21.4%	0.0%	21.1%	0.0%	39.3%	5.8%
HSPA	99.7%	98.1%	97.0%	82.9%	96.3%	82.1%
LTE	5.5%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.9%	99.3%			99.4%	96.1%
Standard fixed	99.3%	96.1%	99.4%	95.0%	95.5%	83.2%
NGA	24.2%	0.6%	23.2%	0.0%	53.7%	12.4%

Notes on data and coverage estimates:

FTTP

Data provided for FTTH considered the total number of homes passed by services. This is not the same as the number of households passed, which is the metric used within this report. However we assumed that the same proportion of homes and households were covered by FTTP services.

The low coverage for FTTP may seem surprising when compared to other published sources for coverage in France. For the purposes of this study, what can sometimes be described as FTTP has been classified as Docsis 3 cable. This is due to an unspecified amount of FTTLA architecture within one operator's network, which we believe primarily uses Docsis 3 technology. FTTLA, with fibre being brought close to the end-user and sometimes into apartment blocks, would be correctly classified as FTTB but we currently have no evidence on how widespread the technology is. Considering that when estimating total NGA coverage it makes no difference whether the connection is Docsis 3 or FTTB we opted for classifying the whole network as Docsis 3 rather than making an uncertain estimate that a proportion is FTTB.

Broadband Coverage in Europe 2012

DSL

We have assumed that 99.3% of households could access DSL services by the end of 2012. The percentage is based on the ratio of DSL copper lines to the global number of copper lines. We were advised that applying this ratio to estimate household coverage would result in an inaccurate figure, but we did not have any more precise data available to us.

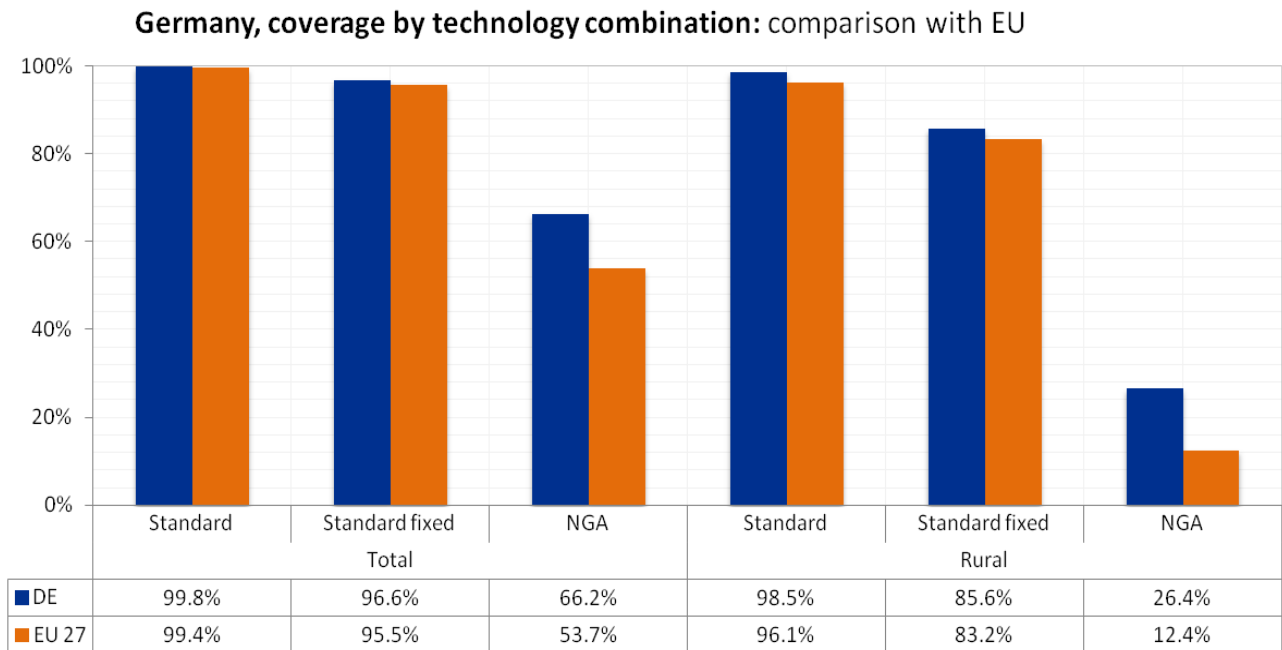
Cable

It was not possible to gain precise figures for the coverage of Docsis 3 in France. The figure reported is therefore an estimate.

3.11 Germany

3.11.1 National coverage by broadband technology

Germany was ahead of the European Union averages for all measures of standard and NGA broadband coverage. In particular, it had extensive NGA coverage among rural households. Note that we have updated the figures published for Germany at the end of 2011, using new data which aligns precisely to the coverage definitions used within the study.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

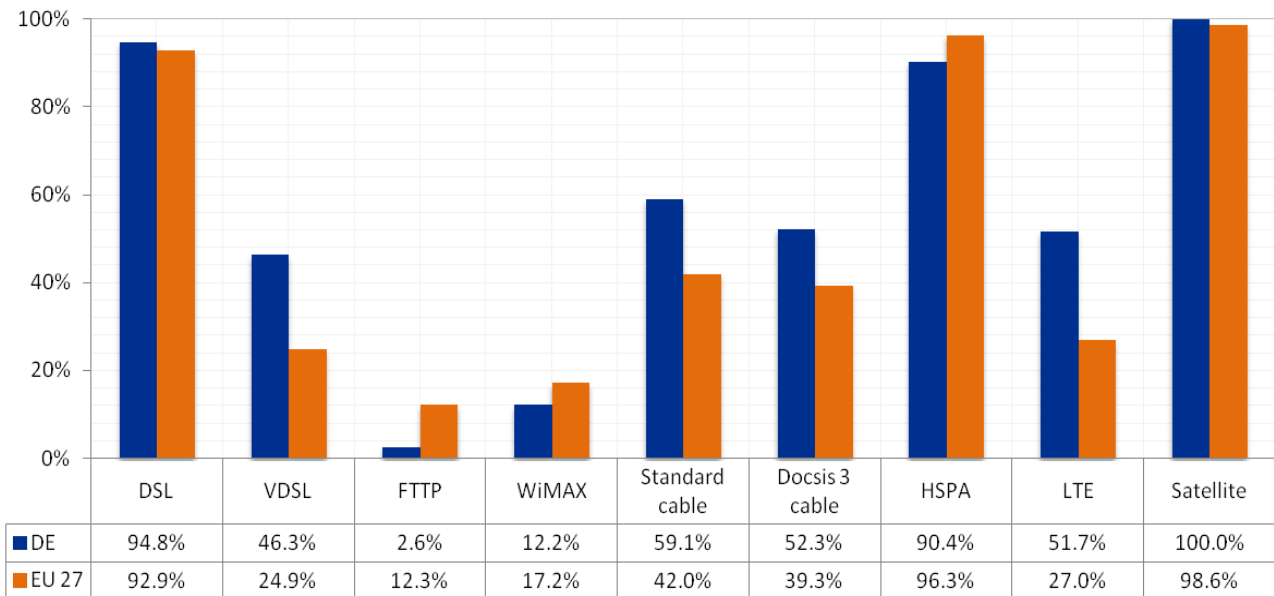
Germany enjoyed extensive VDSL and Docsis 3 cable coverage, although little was invested in FTTP in 2012. Together, these high-speed networks covered two thirds of all German households at the end of the year.

VDSL coverage in rural areas was found to be exceptionally high, and Germany ranks fourth in the EU (excluding Belgium, where the data is not restricted to high-speed services). Overall NGA services were available to nearly 2 million rural households in Germany. This represents more than half of all rural NGA coverage within the European Union.

HSPA coverage, in total and in rural areas, fell behind the European Union averages. But LTE coverage is high, particularly in the rural areas, and coverage grew by 30 percentage points in 2012. Licensees in Germany are mandated to give priority to rural areas in building their LTE networks and the impact of this is clear. Only Sweden provided greater coverage of rural households in 2012, with LTE services.

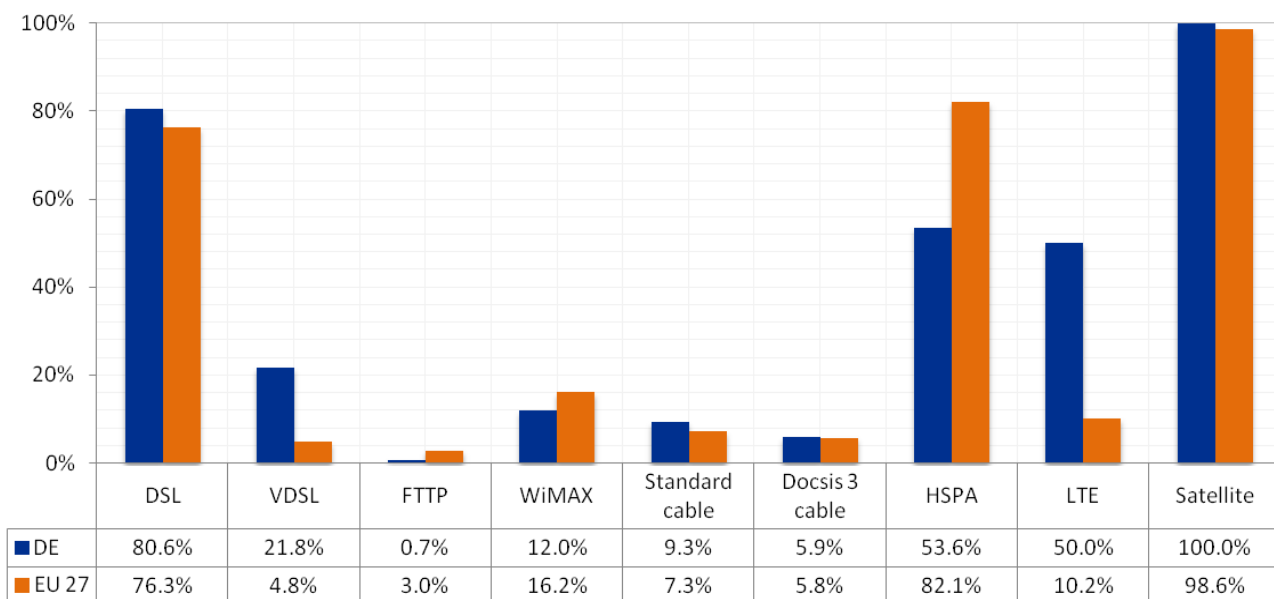
Apart from LTE, VDSL and Docsis 3 cable also grew significantly in 2012, with both networks increasing their coverage by approximately 6p.p..

Germany, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

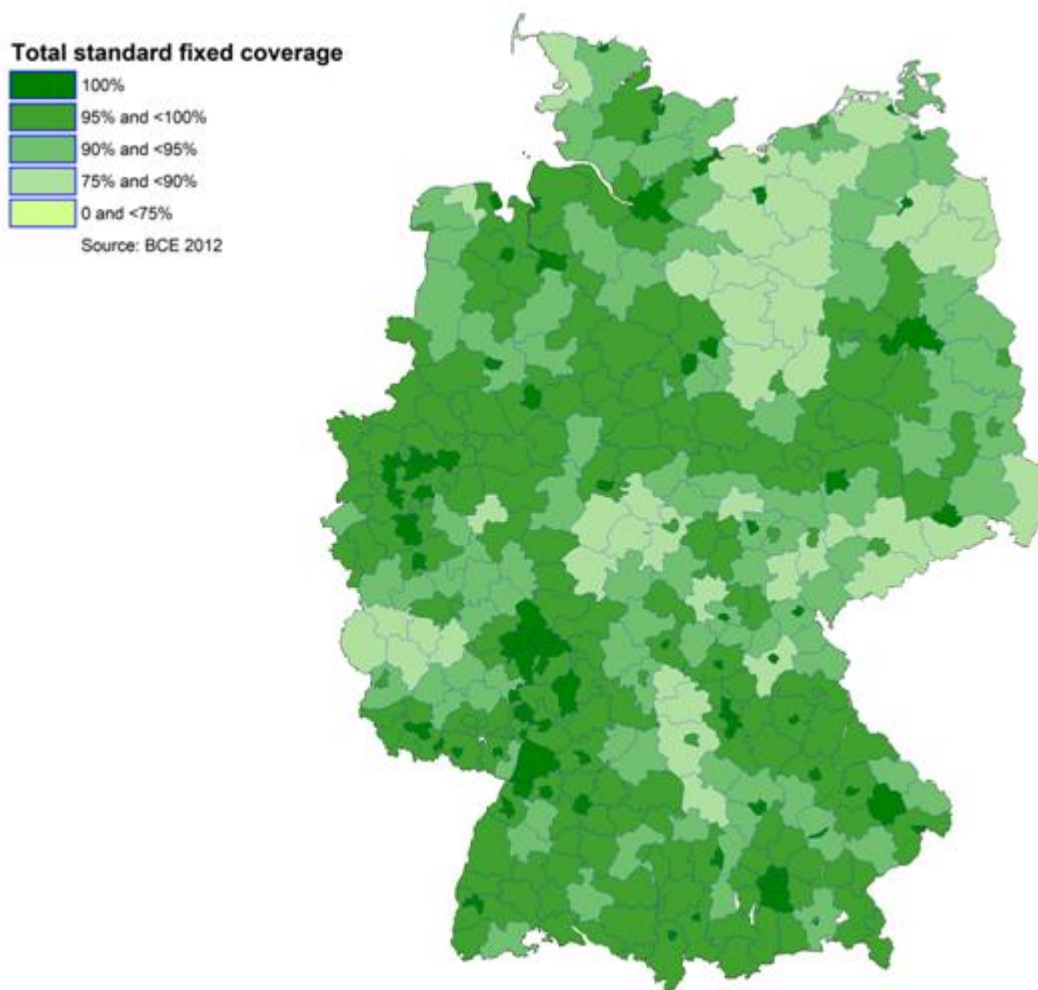
Germany, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.11.2 Regional coverage by broadband technology

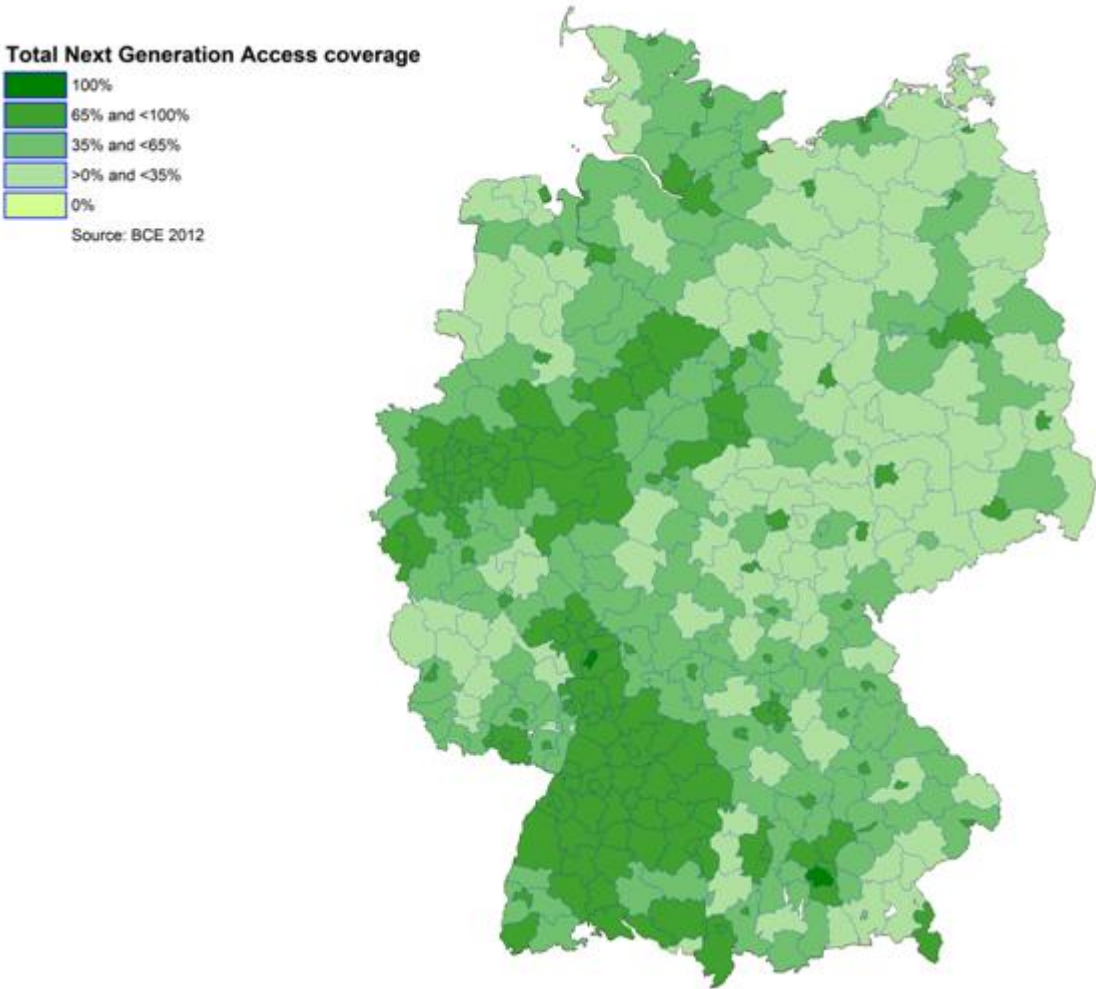
Germany standard fixed broadband coverage



Standard fixed broadband coverage across Germany is variable. In general it is the most urban cities which have the highest fixed broadband coverage. The counties with the lowest coverage are generally in the former East Germany, but others are in the more rural areas of West German provinces.

In general the areas that have the highest standard fixed broadband coverage also have the higher NGA coverage. Many areas in the south-west of the country, all the way down to the Rhine valley, had at least 65% NGA coverage. No area was found to be without NGA coverage, although many areas in the former East Germany had lower than average coverage for NGA.

Germany Next Generation Access coverage



3.11.3 Data tables for Germany

Statistic	National
Population	81,027,876
Persons per household	2.0
Rural proportion	10.5%

Technology	DE - 2012		DE - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	94.8%	80.6%	93.8%	76.8%	92.9%	76.3%
VDSL	46.3%	21.8%	40.6%	13.1%	24.9%	4.8%
FTTP	2.6%	0.7%	2.4%	0.4%	12.3%	3.0%
WiMAX	12.2%	12.0%	11.5%	10.8%	17.2%	16.2%
Standard cable	59.1%	9.3%	55.1%	7.2%	42.0%	7.3%
Docsis 3 cable	52.3%	5.9%	45.9%	3.5%	39.3%	5.8%
HSPA	90.4%	53.6%	88.5%	49.0%	96.3%	82.1%
LTE	51.7%	50.0%	21.5%	33.3%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.8%	98.5%	99.3%	95.4%	99.4%	96.1%
Standard fixed	96.6%	85.6%	95.7%	81.7%	95.5%	83.2%
NGA	66.2%	26.4%	63.8%	21.5%	53.7%	12.4%

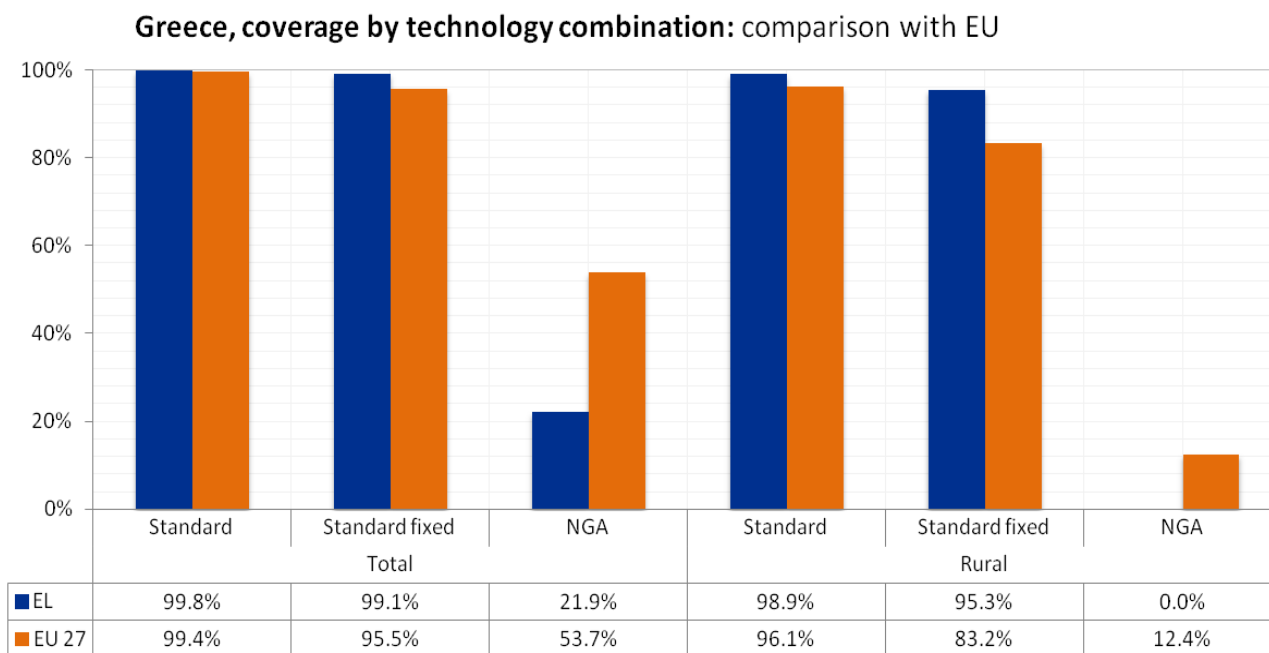
3.11.4 Notes on data and coverage estimates:

None.

3.12 Greece

3.12.1 National coverage by broadband technology

Greece remained ahead of the EU averages for standard broadband coverage, both in total and in rural areas. In 2012 most of the standard broadband coverage for Greece was based on DSL coverage, defined by whether premises are within the service area of an exchange enabled for DSL.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The country saw a significant increase in NGA coverage in 2012, with VDSL being rolled out from the Central Office in a number of major cities and urban areas through Greece. The calculation for coverage includes households that can be served from either the street cabinet or from the Central Office. By the end of the year rural areas had not yet benefited from the roll-out of VDSL services.

Greece still had no cable network, and without the benefit of Docsis 3 coverage the country is likely to remain behind the European Union average for NGA coverage. FTTP services proved to have so far only been deployed on a small scale.

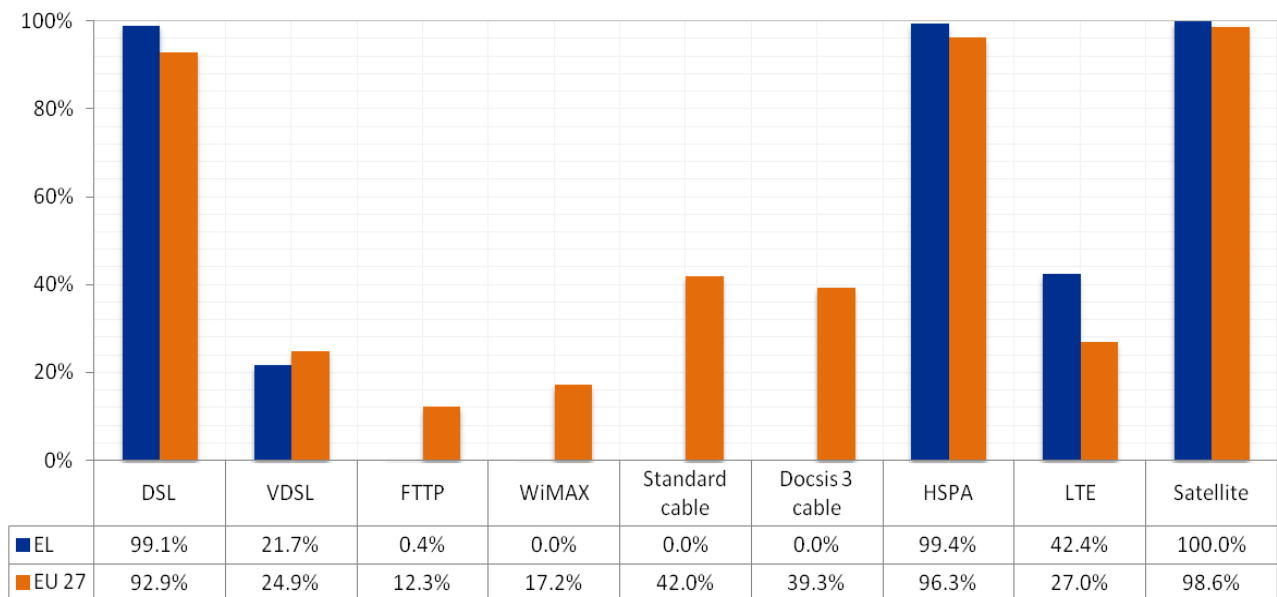
LTE services were also launched in 2012, and the country already had impressive coverage of services, mostly concentrated in urban areas. While DSL and HSPA both provided standard coverage to rural areas, we estimate that at the end of 2012 none of the most rural households in Greece could access NGA services.

Standard fixed broadband coverage was fairly uniform across Greece. Only one province had less than 90% coverage – Evrytania, in central Greece.

The roll-out of VDSL was fairly uniform across Greece and its islands, and only three provinces had no coverage at the end of 2012 – Evrytania, Fokida and Chalkidiki. Coverage across the other provinces ranged from 7% to 44%.

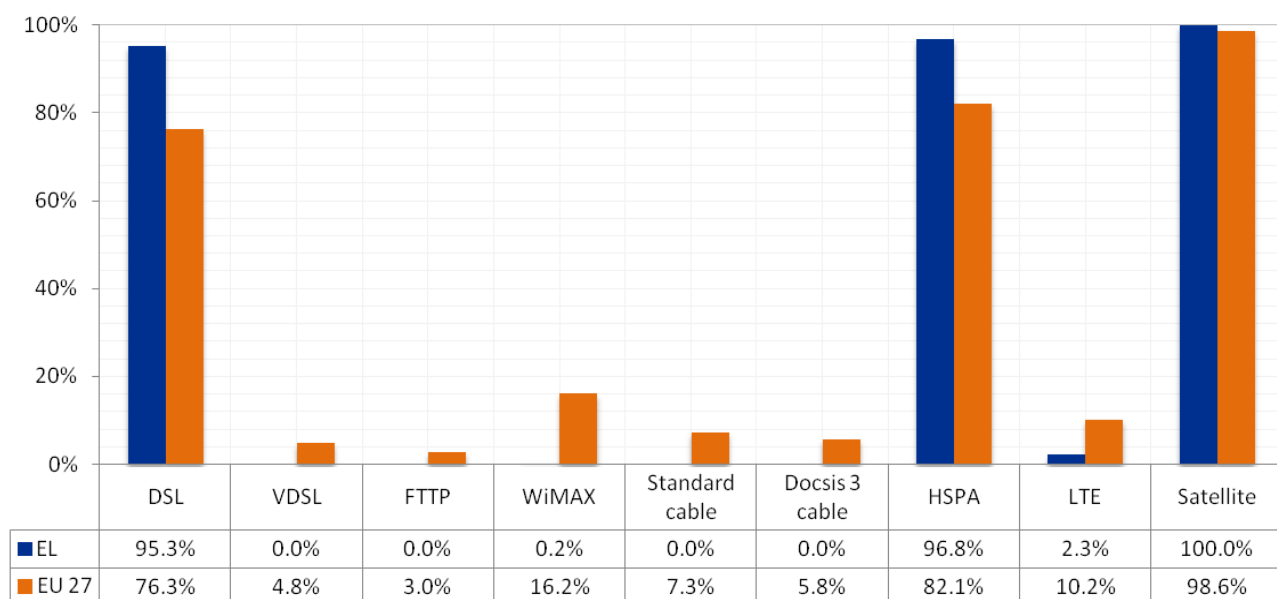
Broadband Coverage in Europe 2012

Greece, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Greece, rural coverage by technology in 2012: comparison with EU



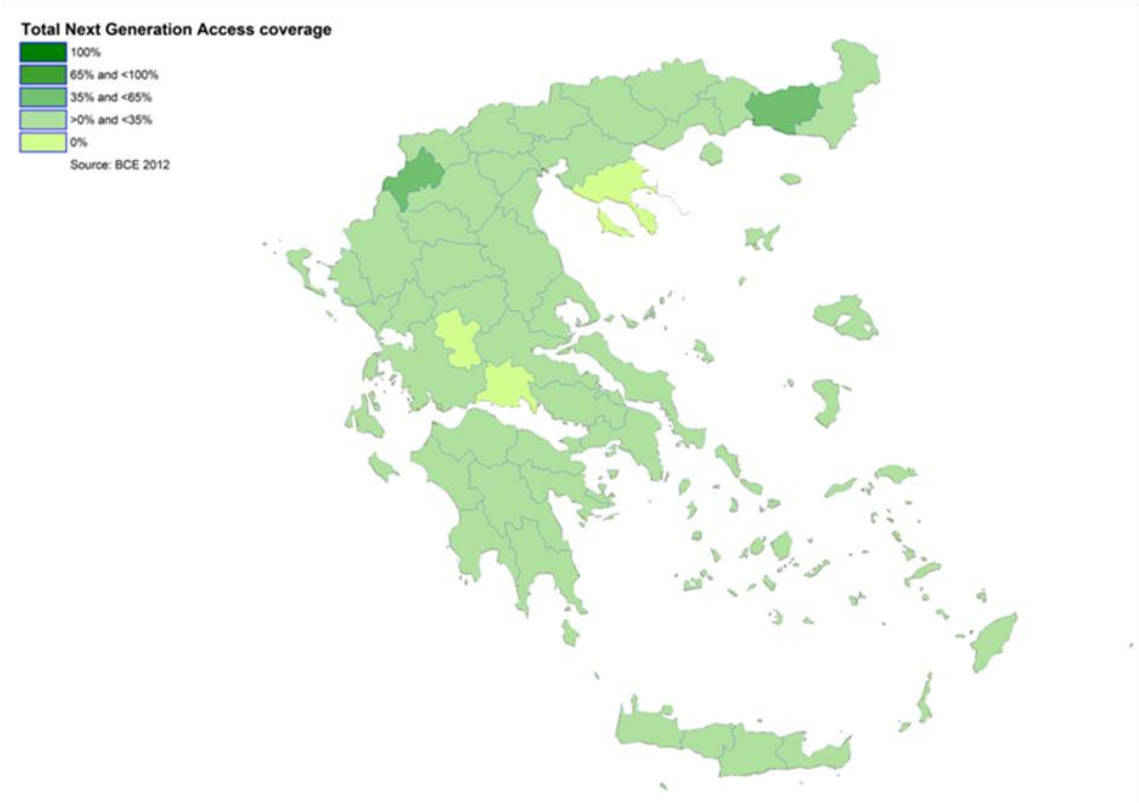
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.12.2 Regional coverage by broadband technology

Greece standard fixed broadband coverage



Greece Next Generation Access coverage



3.12.3 Data tables for Greece

Statistic	National
Population	11,309,885
Persons per household	2.4
Rural proportion	19.9%

Technology	EL - 2012		EL - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.1%	95.3%	98.5%	92.3%	92.9%	76.3%
VDSL	21.7%	0.0%	4.2%	0.0%	24.9%	4.8%
FTTP	0.4%	0.0%	0.0%	0.0%	12.3%	3.0%
WiMAX	0.0%	0.2%	0.0%	0.1%	17.2%	16.2%
Standard cable	0.0%	0.0%	0.0%	0.0%	42.0%	7.3%
Docsis 3 cable	0.0%	0.0%	0.0%	0.0%	39.3%	5.8%
HSPA	99.4%	96.8%	99.4%	96.8%	96.3%	82.1%
LTE	42.4%	2.3%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.8%	98.9%			99.4%	96.1%
Standard fixed	99.1%	95.3%	98.5%	92.4%	95.5%	83.2%
NGA	21.9%	0.0%	4.2%	0.0%	53.7%	12.4%

3.12.4 Notes on data and coverage estimates:

DSL and VDSL:

Data provided reflected actual lines with DSL service capability, not households passed exactly.

In order to estimate households passed from the data provided Point Topic assumed that the percentage of actual lines enabled for DSL is the same as the percentage of households enabled for DSL. Whilst this approach is expected to give a good approximation on a nationwide level, we recognise that at the NUTS 3 level this could give a slight overestimation. In some NUTS 3 areas the number of access lines is lower than the number of households, whilst in some urban areas it can be considerably higher.

VDSL:

The survey definition for VDSL coverage is:

Broadband Coverage in Europe 2012

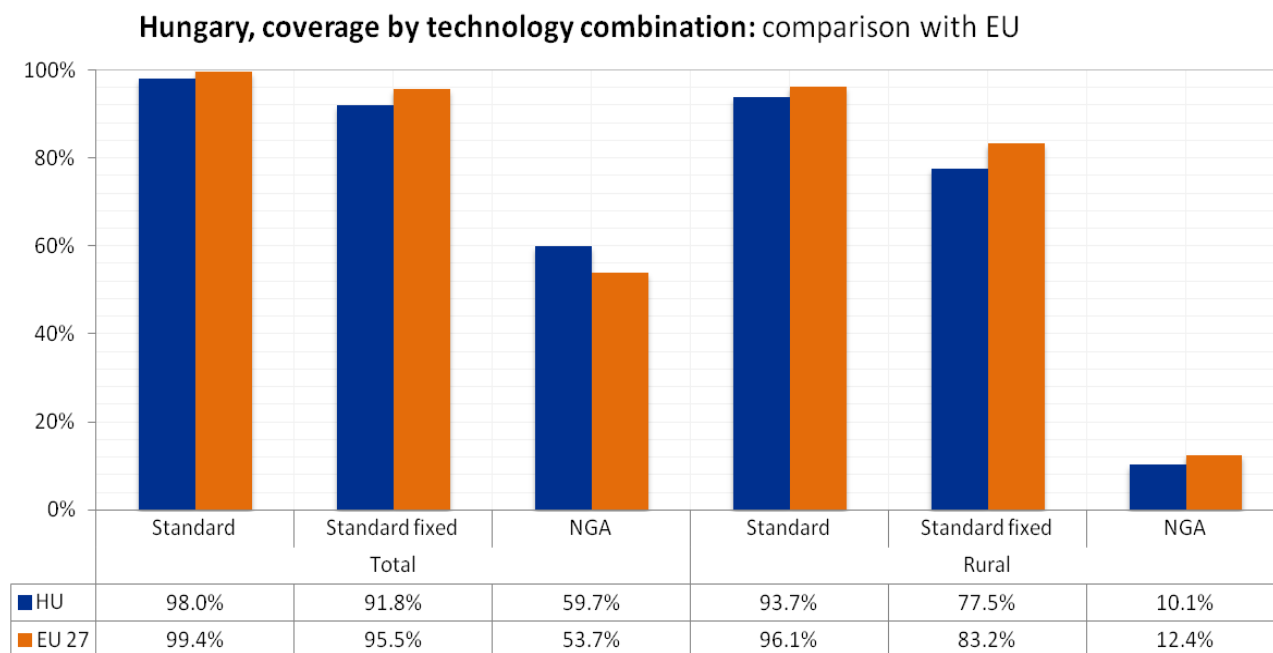
Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

According to the design of the network in Greece, the maximum cable length between VDSL cabinets and the Central Office is 800m. Data was provided for all coverage, but this will mostly be for higher-speed services.

3.13 Hungary

3.13.1 National coverage by broadband technology

Hungary was behind all of the EU averages for coverage of standard and NGA services, except for total NGA, where it was ahead of the average.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

This is explained by the technology profile in Hungary. Both HSPA and DSL fell slightly behind the EU average for coverage both in total and in rural areas. As the main components of standard and standard fixed broadband coverage, respectively, this results in Hungary falling behind the rest of the EU for standard coverage measures.

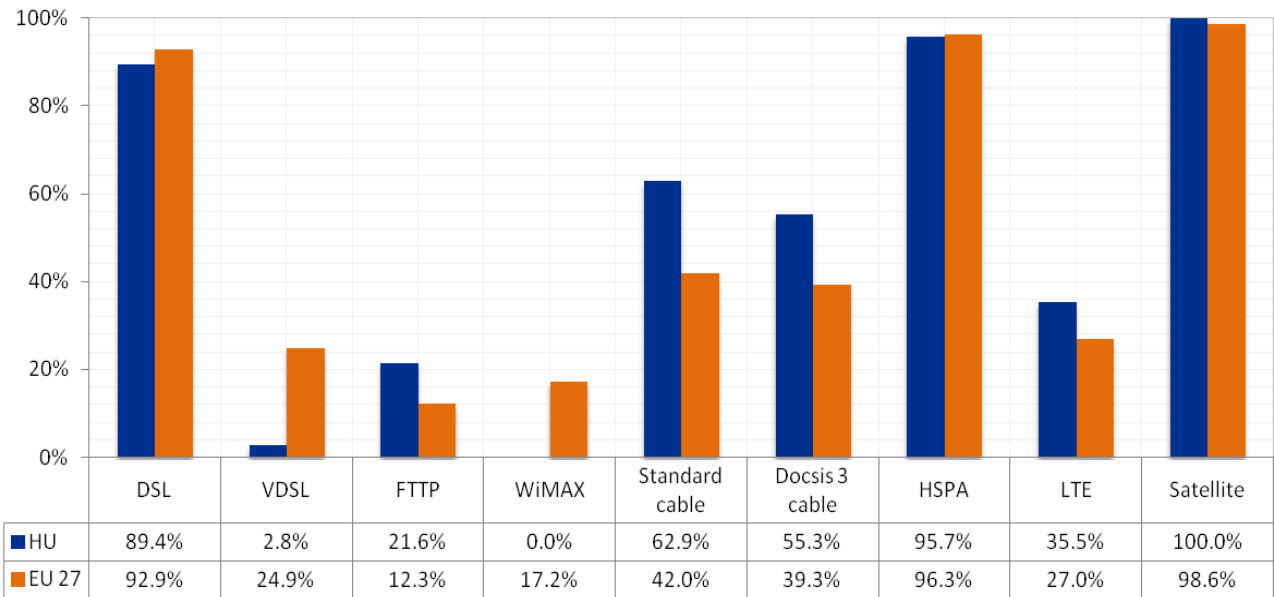
Hungary gains its broadband advantage through extensive coverage of Docsis 3 (55%) and FTTP (22%). We found no evidence that the VDSL network had grown in 2012, and it still covered under 3% of households by the end of the year. These networks combined to give an overall NGA coverage of just under 60%, implying strong overlap between the cable and FTTP networks. Docsis 3 and FTTP showed to also provide some coverage for rural households.

LTE services were launched in 2012 and covered more than a third of households at the end of the year, which included limited coverage of rural households. Also in 2012, more of the cable network was upgraded to Docsis 3 and FTTP coverage grew by more than 4p.p..

Standard fixed broadband coverage is not distributed uniformly across Hungary; its north-eastern and western borders had the lowest coverage. NGA coverage was more uniform, but this is mainly because of the cable networks, which are uniformly distributed across the country. In contrast, over 50% of Hungary's FTTP was found to be concentrated in the capital city of Budapest, which has nearly two thirds coverage of FTTP.

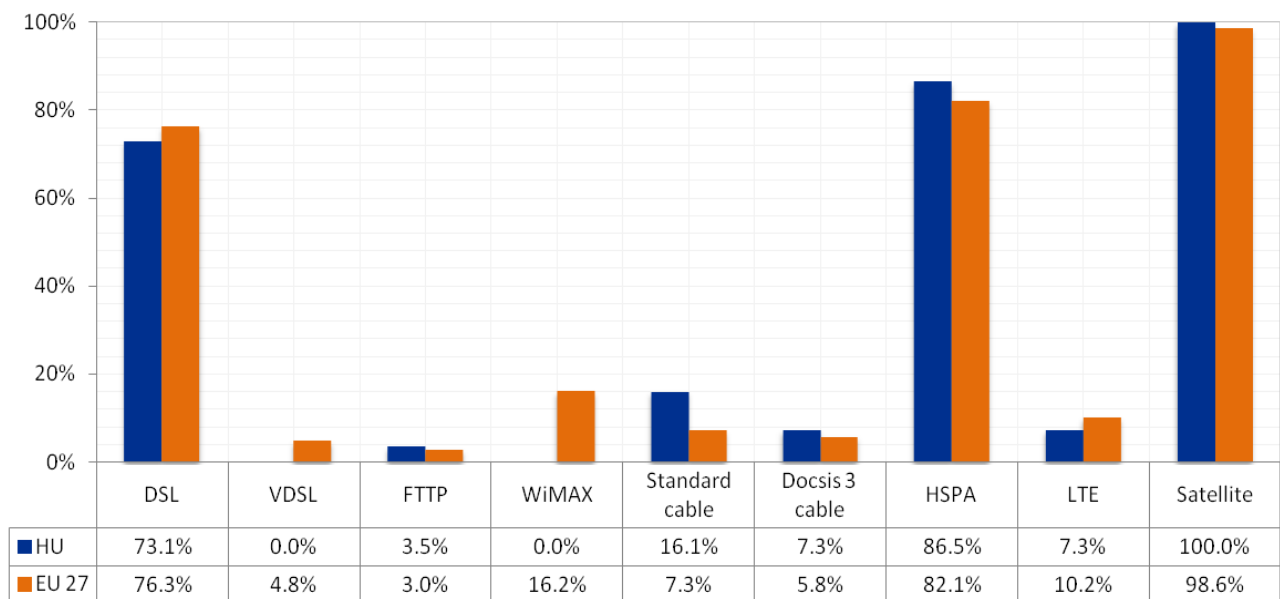
Broadband Coverage in Europe 2012

Hungary, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

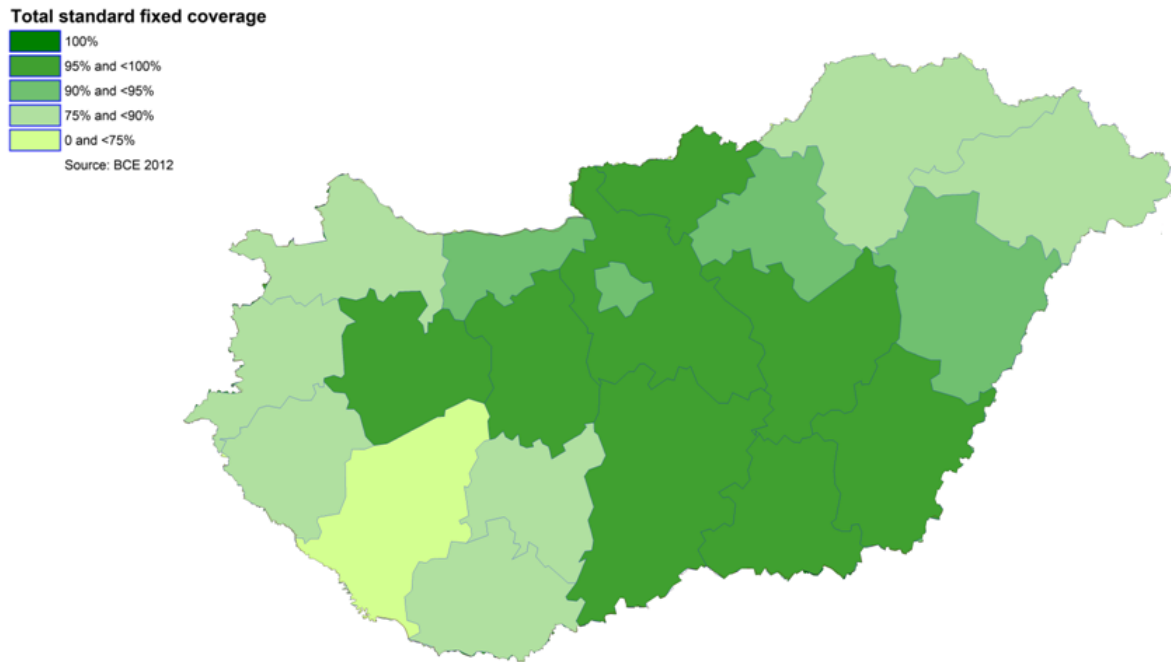
Hungary, rural coverage by technology in 2012: comparison with EU



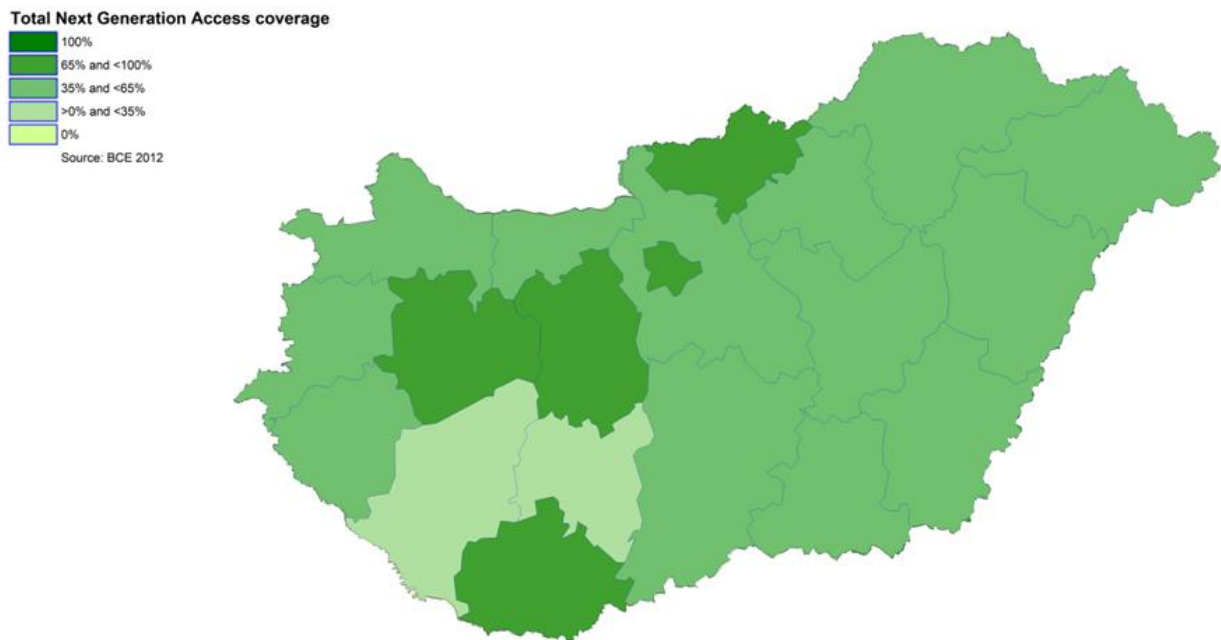
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.13.2 Regional coverage by broadband technology

Hungary standard fixed broadband coverage



Hungary Next Generation Access coverage



3.13.3 Data tables for Hungary

Statistic	National
Population	9,985,722
Persons per household	2.6
Rural proportion	32.1%

Technology	HU - 2012		HU - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	89.4%	73.1%	89.4%	73.1%	92.9%	76.3%
VDSL	2.8%	0.0%	2.8%	0.0%	24.9%	4.8%
FTTP	21.6%	3.5%	17.1%	3.4%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	62.9%	16.1%	62.0%	14.4%	42.0%	7.3%
Docsis 3 cable	55.3%	7.3%	47.3%	3.9%	39.3%	5.8%
HSPA	95.7%	86.5%	91.3%	73.9%	96.3%	82.1%
LTE	35.5%	7.3%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	98.0%	93.7%			99.4%	96.1%
Standard fixed	91.8%	77.5%	89.4%	77.4%	95.5%	83.2%
NGA	59.7%	10.1%	52.8%	3.9%	53.7%	12.4%

3.13.4 Notes on data and coverage estimates:

VDSL:

The survey definition for VDSL coverage is:

Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

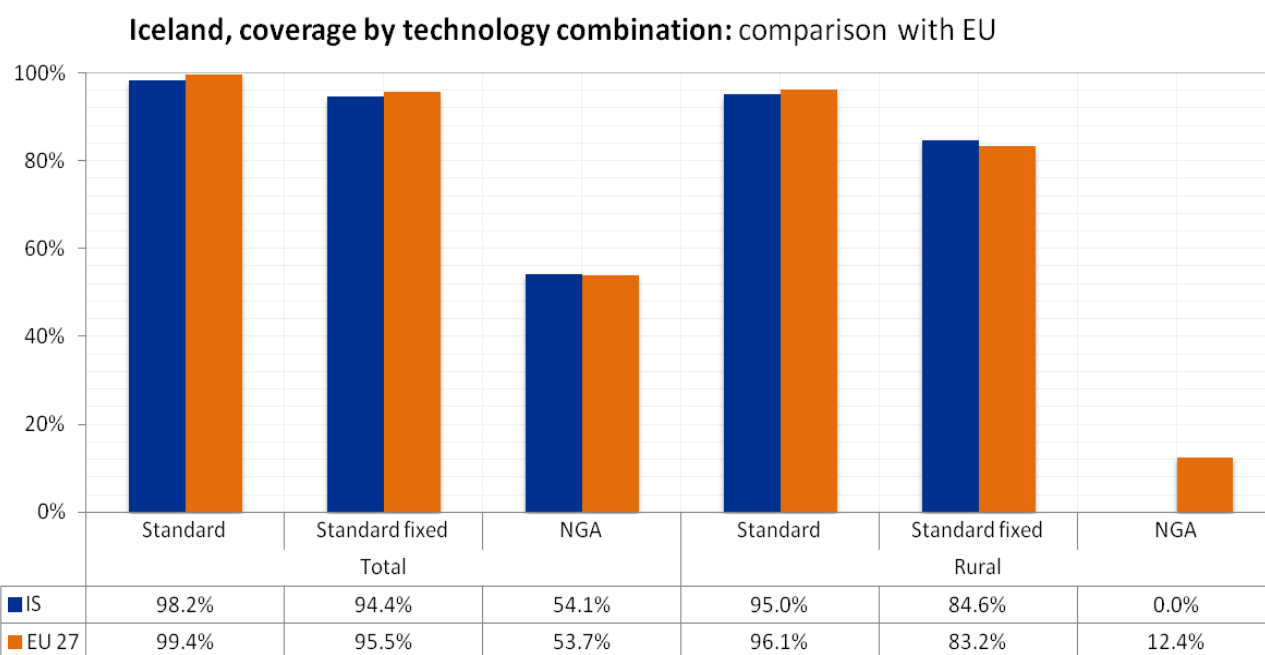
In Hungary, we were not able to confirm the definition for coverage used in the report, and so we assume that it includes all coverage and is not restricted to superfast coverage.

3.14 Iceland

3.14.1 National coverage by broadband technology

Iceland mostly matched the European Union averages for standard and NGA broadband coverage measures, although at the end of 2012 it had no NGA services available to its rural households.

Few rural areas can be as hard to reach as those of Iceland. The country has a population density of 3.1 people per km sq, with the majority of the population in Reykjavik and other towns. Iceland therefore faces unique challenges in reaching its whole population with broadband and particularly high-speed broadband.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

At the end of 2012, Iceland had no cable network. Its DSL and HSPA coverage matched the European average overall, and exceeded their average in rural areas.

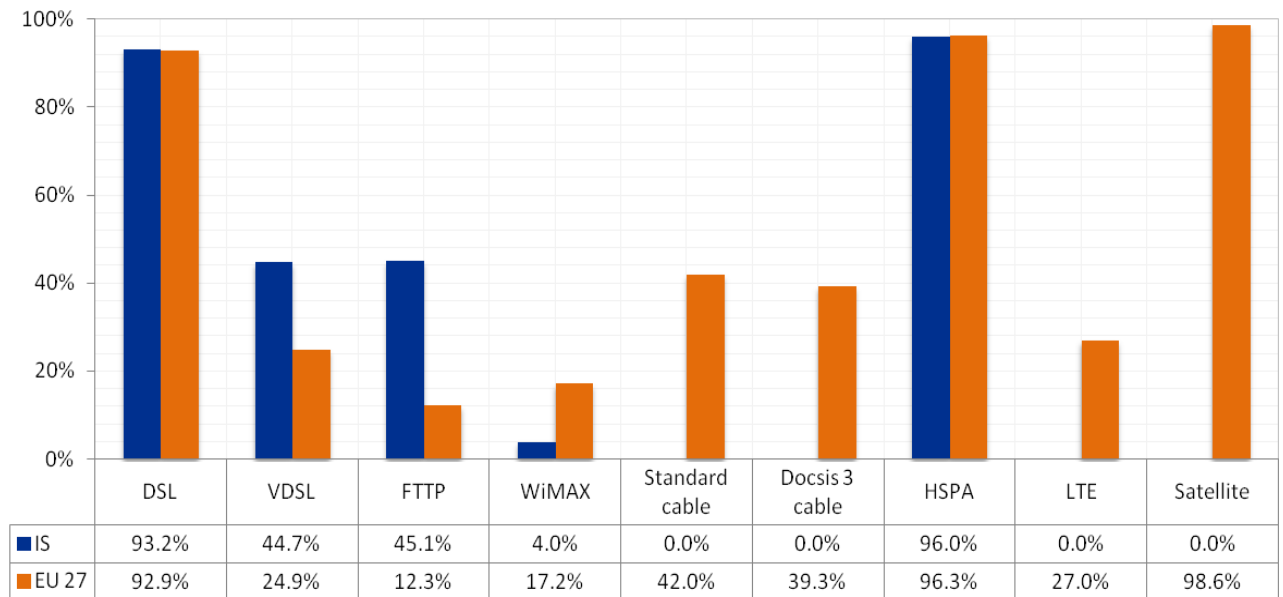
The VDSL and FTTP networks in Iceland are advanced, with both networks covering around 45% of households in 2012. But these networks mostly overlap, and the overall NGA coverage in Iceland was just over 54%. Iceland had no LTE services at the end of 2012, and it is one of only four countries in the study without commercially available satellite broadband services.

Both VDSL and FTTP coverage grew significantly in 2012. VDSL coverage grew by nearly 25 percentage points, whilst FTTP coverage grew by 7p.p.. In total, however, NGA coverage grew by only 10p.p. - the networks were extended in areas that already had NGA coverage.

There was no NGA coverage in rural areas in Iceland at the end of 2012. The country consists of two NUTS 3 areas – one comprising the capital city Reykjavik, and the other the rest of the country. The capital predictably had higher coverage of both standard fixed and NGA broadband given the extreme rural nature of the rest of the country – by far the most thinly populated area covered by the study.

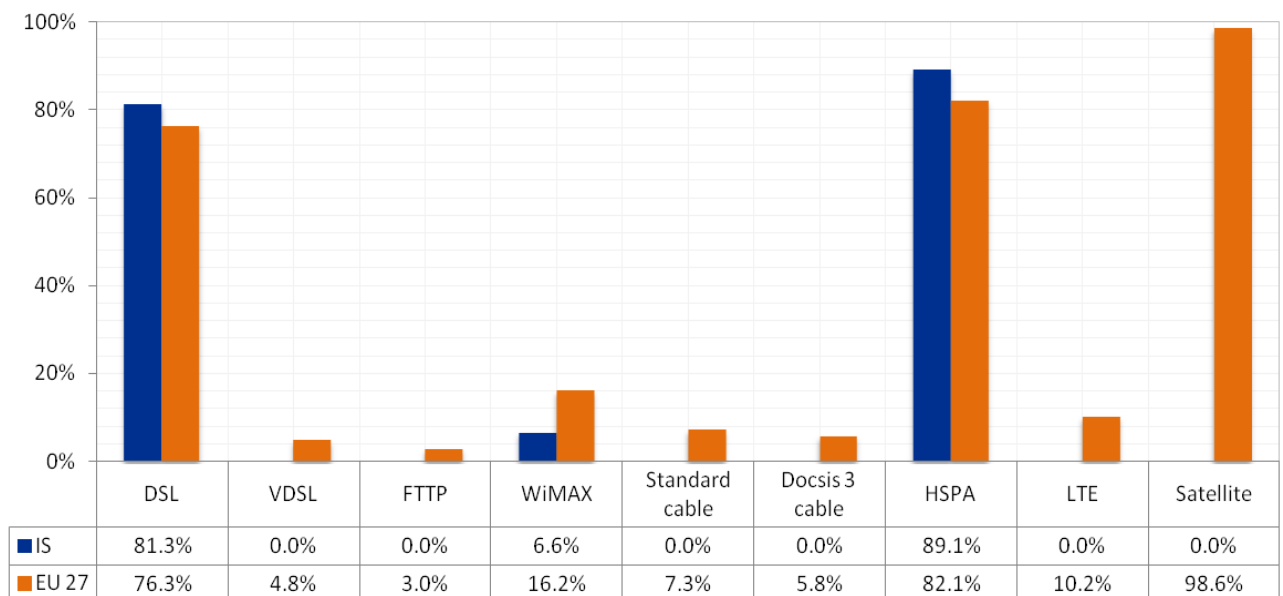
Broadband Coverage in Europe 2012

Iceland, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

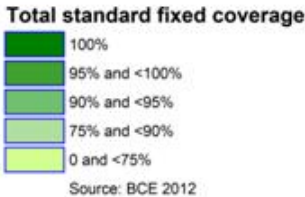
Iceland, rural coverage by technology in 2012: comparison with EU



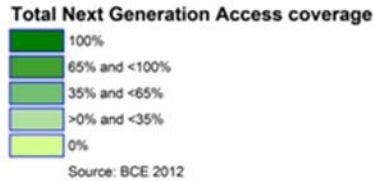
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.14.2 Regional coverage by broadband technology

Iceland standard fixed broadband coverage



Iceland Next Generation Access coverage



3.14.3 Data tables for Iceland

Statistic	National
Population	318,452
Persons per household	2.5
Rural proportion	36.3%

Technology	IS - 2012		IS - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	93.2%	81.3%	93.2%	81.3%	92.9%	76.3%
VDSL	44.7%	0.0%	22.4%	0.0%	24.9%	4.8%
FTTP	45.1%	0.0%	38.3%	0.0%	12.3%	3.0%
WiMAX	4.0%	6.6%	4.0%	6.6%	17.2%	16.2%
Standard cable	0.0%	0.0%	0.0%	0.0%	42.0%	7.3%
Docsis 3 cable	0.0%	0.0%	0.0%	0.0%	39.3%	5.8%
HSPA	96.0%	89.1%	96.0%	89.1%	96.3%	82.1%
LTE	0.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	0.0%	0.0%	0.0%	0.0%	98.6%	98.6%
Standard	98.2%	95.0%			99.4%	96.1%
Standard fixed	94.4%	84.6%	94.4%	84.6%	95.5%	83.2%
NGA	54.1%	0.0%	44.6%	0.0%	53.7%	12.4%

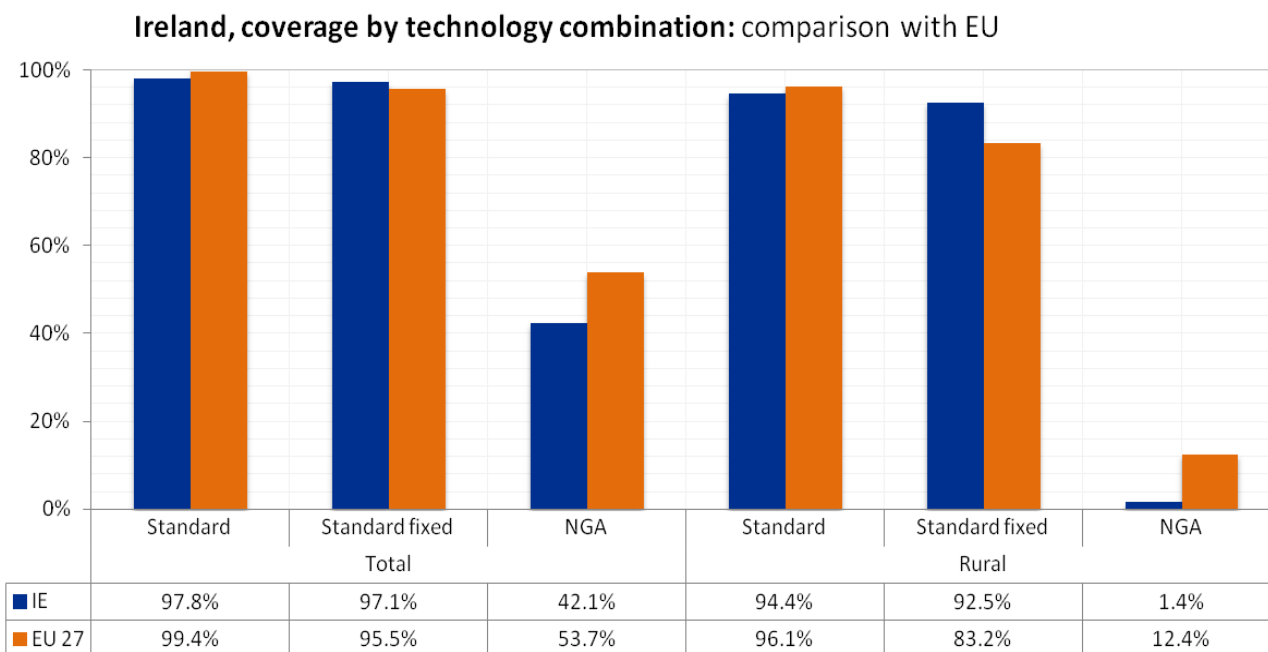
3.14.4 Notes on data and coverage estimates:

None.

3.15 Ireland

3.15.1 National coverage by broadband technology

Ireland was ahead of the European Union coverage averages for standard fixed broadband, but behind in terms of both overall standard and NGA broadband coverage.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

DSL coverage in Ireland was ahead of the European Union average in 2012, and resulting in Ireland posting higher than average coverage for standard fixed broadband services. Coverage of its cable network also matched the EU average, and most of the network had already been upgraded to Docsis 3. But Docsis 3 was the only significant service for delivering NGA to households in Ireland. At the end of 2012, less than 2% of households could access FTTP services and only small-scale trials of VDSL had been rolled-out.

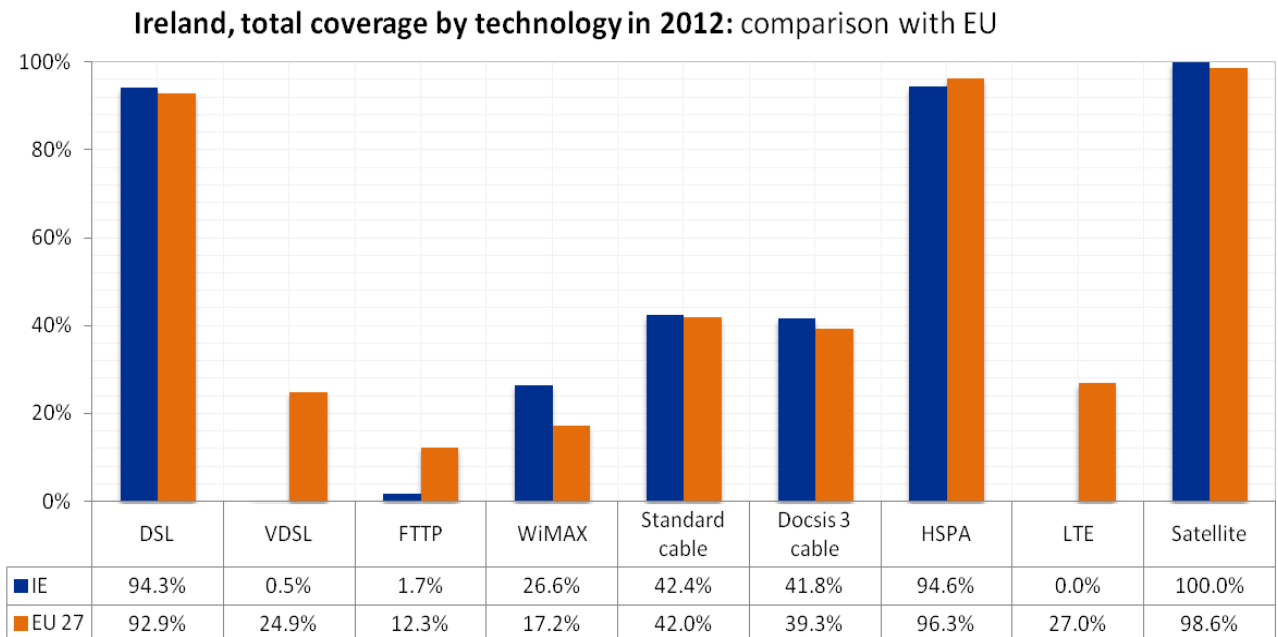
As a result, Ireland fell behind the European Union average for NGA coverage in 2012, particularly in rural areas. Cable networks typically favour urban areas, and Docsis 3 was thought to cover less than 2% of the most rural households in Ireland. Without significant VDSL or FTTP coverage, Ireland is being left behind the rest of the EU. DSL and WiMAX both contribute to standard fixed broadband coverage in rural areas.

The only technology to have grown significantly in 2012 was Docsis 3 cable. A large proportion of the network was upgraded during the year and 98% of the network provided high-speed services at the time of the Survey – compared with under 80% at the end of 2011. Ireland had not rolled out commercial LTE services by the end of 2012.

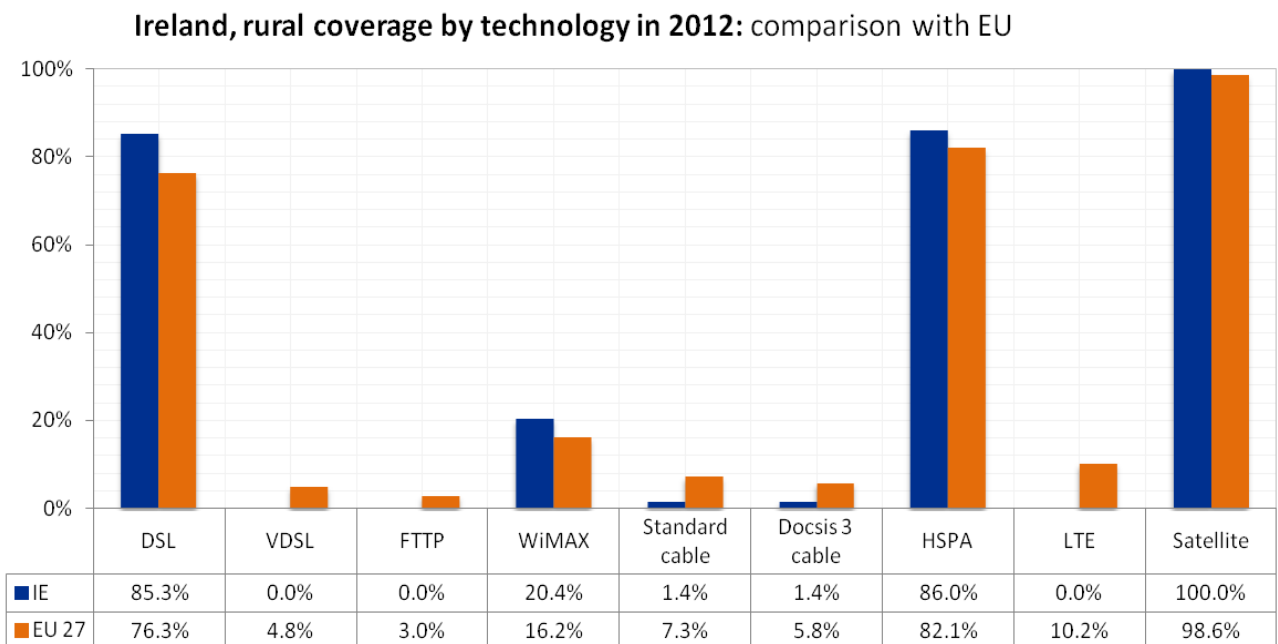
Nearly all households in Dublin could access standard and NGA broadband services. The roll-out of Docsis 3 most increased coverage in Dublin and the Mid-East region. NGA coverage was lowest in the more rural areas of Ireland, with coverage under 20% in the West and Border regions. The western

Broadband Coverage in Europe 2012

and midland regions of Ireland had the lowest coverage of standard broadband services, although coverage was still close to 95%.



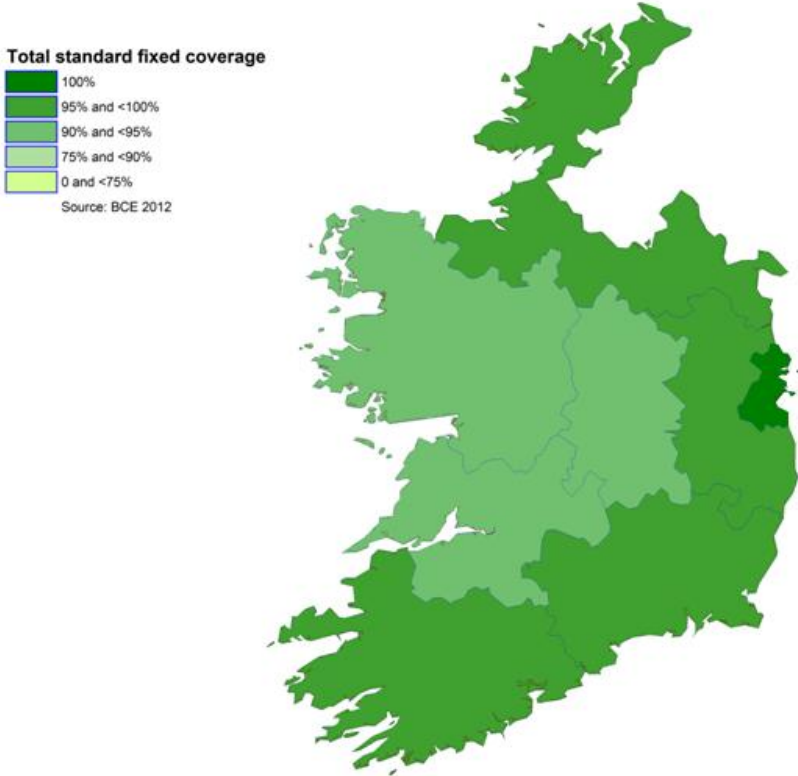
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission



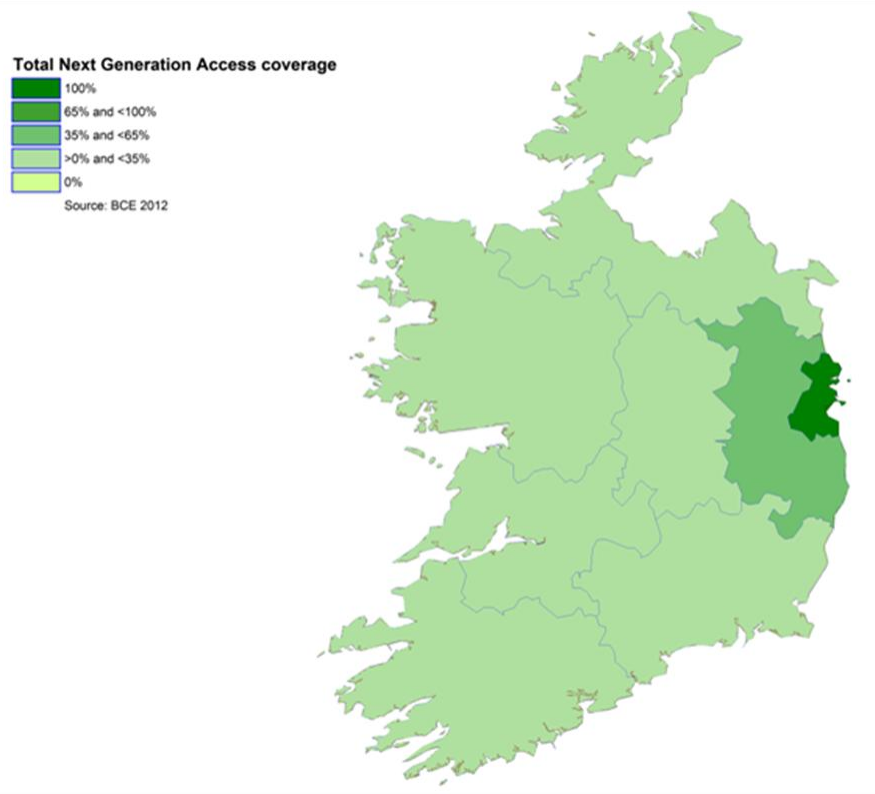
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.15.2 Regional coverage by broadband technology

Ireland standard fixed broadband coverage



Ireland Next Generation Access coverage



3.15.3 Data tables for Ireland

Statistic	National
Population	4,576,087
Persons per household	2.6
Rural proportion	38.7%

Technology	IE - 2012		IE - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	94.3%	85.3%	94.3%	85.3%	92.9%	76.3%
VDSL	0.5%	0.0%	0.5%	0.0%	24.9%	4.8%
FTTP	1.7%	0.0%	1.7%	0.0%	12.3%	3.0%
WiMAX	26.6%	20.4%	26.6%	20.4%	17.2%	16.2%
Standard cable	42.4%	1.4%	38.4%	1.4%	42.0%	7.3%
Docsis 3 cable	41.8%	1.4%	30.1%	0.0%	39.3%	5.8%
HSPA	94.6%	86.0%	94.6%	86.0%	96.3%	82.1%
LTE	0.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	97.8%	94.4%			99.4%	96.1%
Standard fixed	97.1%	92.5%	94.5%	92.5%	95.5%	83.2%
NGA	42.1%	1.4%	31.2%	0.0%	53.7%	12.4%

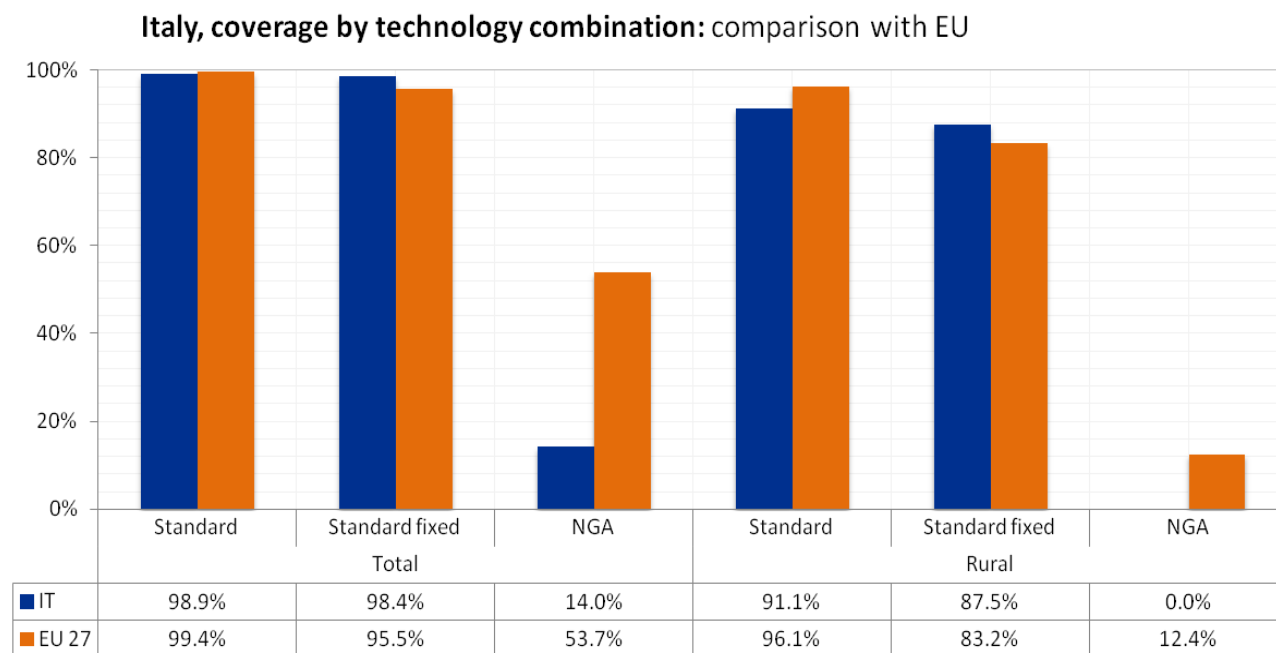
3.15.4 Notes on data and coverage estimates:

None.

3.16 Italy

3.16.1 National coverage by broadband technology

Whilst Italy was ahead of the EU averages for standard fixed broadband coverage, its NGA networks were quite far behind. In fact, the country had the lowest reported NGA coverage in any of the study countries for 2012, and no reported coverage of rural households.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

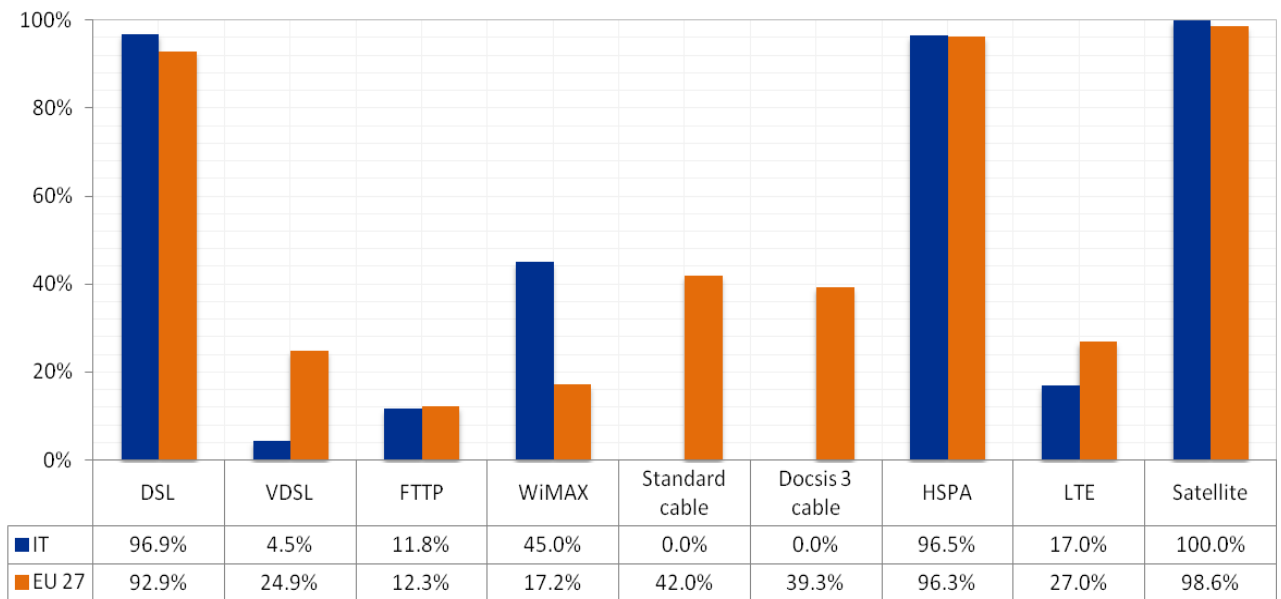
The reasons for this pattern are clear from the technology profile. In 2012, Italy had above average DSL coverage (97%) and its HSPA coverage was comparable to the average within the European Union (96%). It also had one of the most expansive WiMAX networks in the study, which contributes significantly to coverage in rural areas.

In 2012 Italy launched its VDSL network, which covered nearly 5% of all households by the end of the year. But the country still had no cable, and hence no Docsis 3. Whilst Italy developed one of Europe's first major FTTP services, other countries in the EU now have much more developed networks. Overall FTTP remained the main option for NGA services in Italy, but only 14% of households could receive such services in 2012, leaving nearly 21 million households with no access to services, and providing no coverage to the most rural areas.

LTE services also launched in 2012 and covered nearly 10% of Italian households by the end of the year.

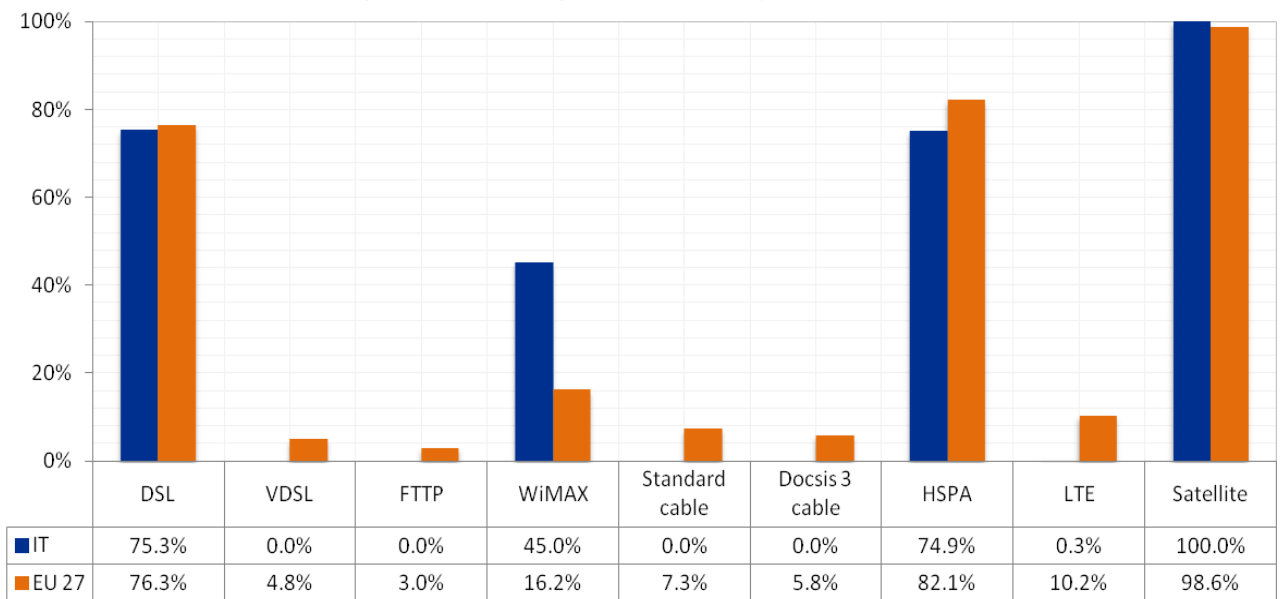
Broadband Coverage in Europe 2012

Italy, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Italy, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.16.2 Regional coverage by broadband technology

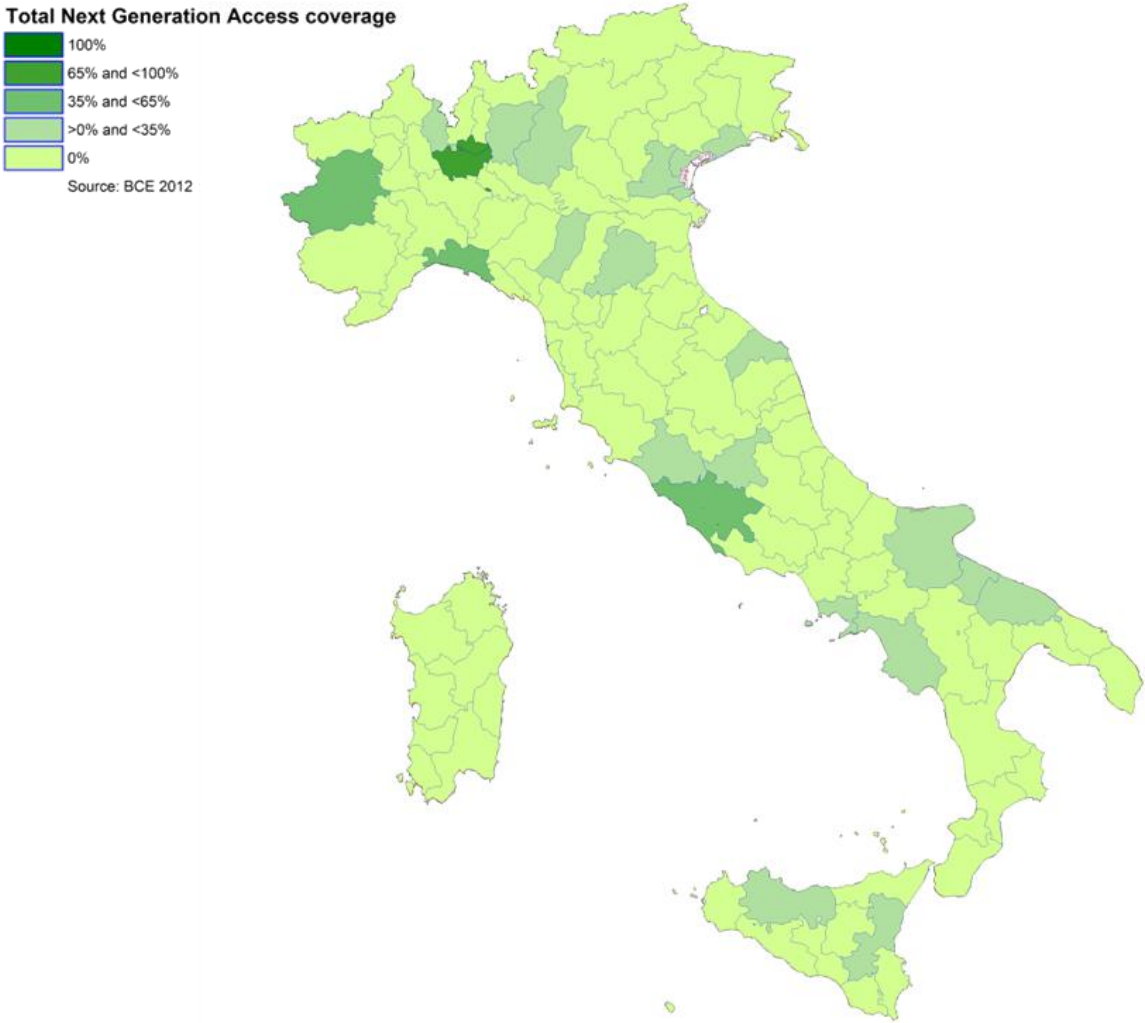
Italy standard fixed broadband coverage



In 2012 Italy had high and, as far as current data goes, fairly uniform standard broadband coverage. The two most densely populated regions, Milan and Naples, had 100% coverage, while the rest of the country had over 95%.

Italy's NGA coverage mainly reflects the roll-out of its pioneering FTTP network. Milan, where it started, had over 88% coverage in 2012. VDSL services only recently launched in Rome, Torino and Naples, areas which also have quite extensive FTTP services. But ninety out of Italy's one-hundred and ten NUTS areas had no coverage whatsoever by the end of 2012.

Italy Next Generation Access coverage



3.16.3 Data tables for Italy

Statistic	National
Population	58,364,545
Persons per household	2.4
Rural proportion	12.7%

Technology	IT - 2012		IT - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	96.9%	75.3%	97.0%	75.9%	92.9%	76.3%
VDSL	4.5%	0.0%	0.0%	0.0%	24.9%	4.8%
FTTP	11.8%	0.0%	10.7%	0.0%	12.3%	3.0%
WiMAX	45.0%	45.0%	30.0%	30.0%	17.2%	16.2%
Standard cable	0.0%	0.0%	0.0%	0.0%	42.0%	7.3%
Docsis 3 cable	0.0%	0.0%	0.0%	0.0%	39.3%	5.8%
HSPA	96.5%	74.9%	95.5%	68.9%	96.3%	82.1%
LTE	17.0%	0.3%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	98.9%	91.1%			99.4%	96.1%
Standard fixed	98.4%	87.5%	98.5%	87.9%	95.5%	83.2%
NGA	14.0%	0.0%	10.7%	0.0%	53.7%	12.4%

3.16.4 Notes on data and coverage estimates:**VDSL:**

The survey definition for VDSL coverage is:

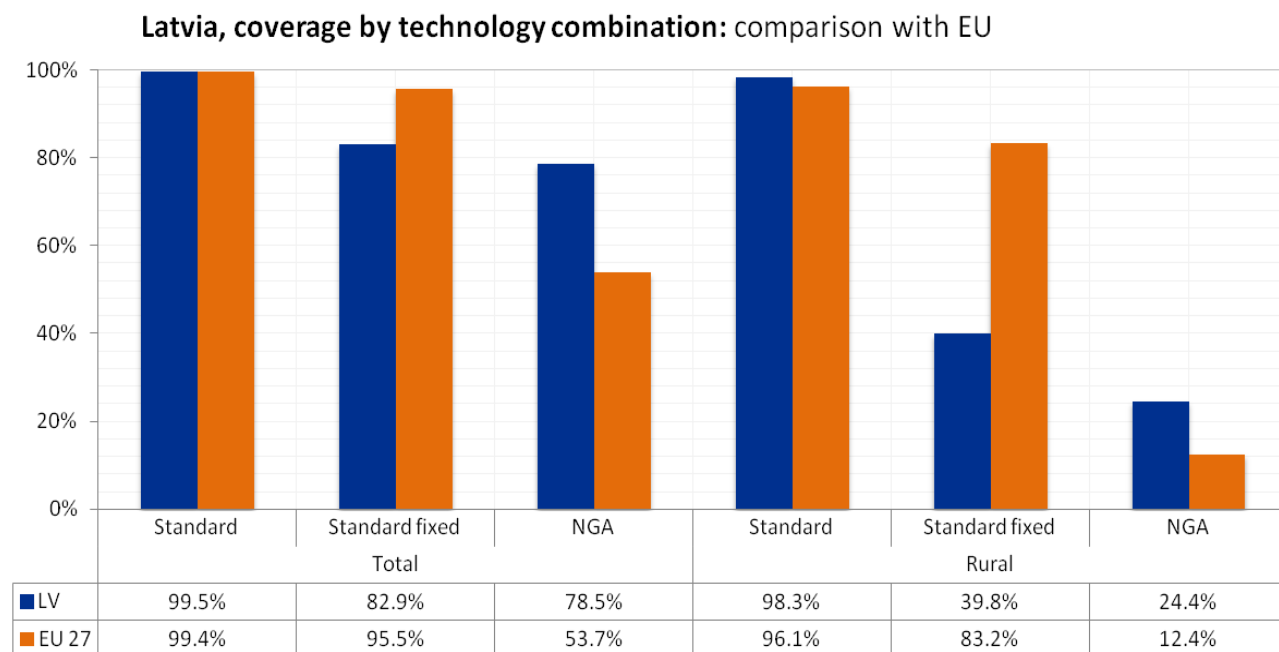
Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

In Italy, we were not able to confirm the definition for coverage used in the report, and so we assume that it includes all coverage and is not restricted to superfast coverage.

3.17 Latvia

3.17.1 National coverage by broadband technology

Whilst Latvia lagged behind the rest of the European Union for standard fixed broadband coverage, it was well ahead for NGA coverage. Much new information on coverage in Latvia was provided since we reported in 2011, and Latvia presents an interesting case study for broadband deployment in eastern Europe.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Latvia had one of the least extensive DSL networks in the EU in 2012, with under 50% coverage reported and ranking third from bottom in a list of all the study countries. But it had an extensive WiMAX network and the second largest FTTP network in the European Union, as well as a competent cable network. FTTP coverage grew by more than 17 percentage points in the year, whilst DSL coverage dropped by nearly 5p.p..

The reason for this is simple. In general, new DSL connections are not installed in households where fibre infrastructure is available. These households are therefore not counted in the DSL coverage totals.

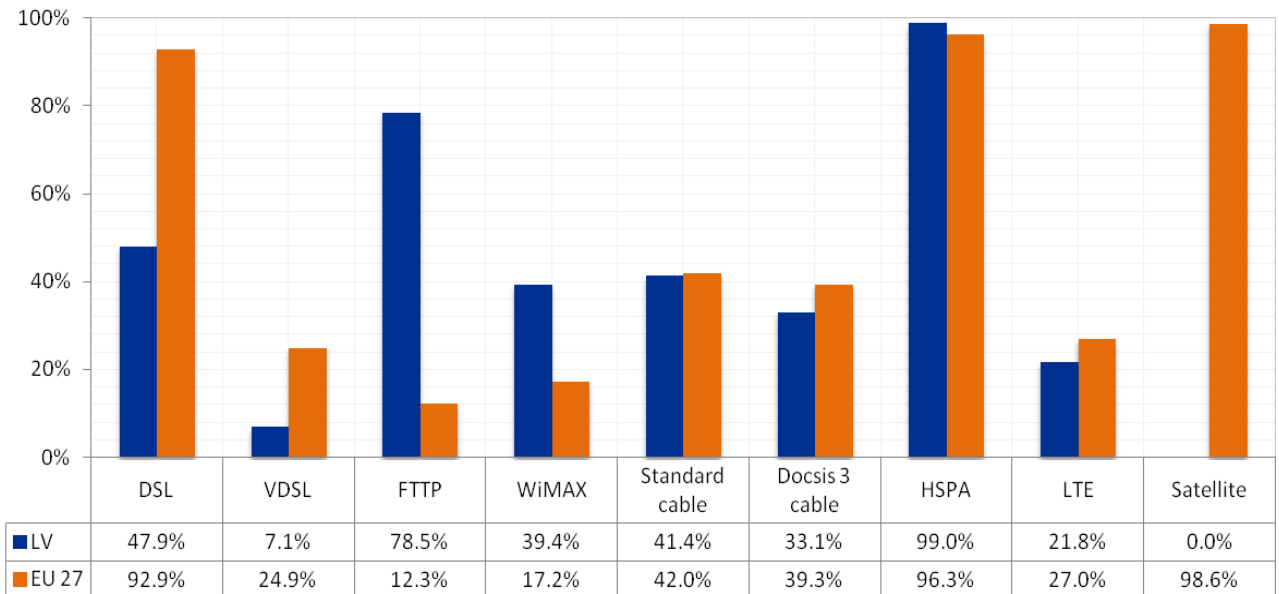
Docsis 3 services were available in Latvia, but the network entirely overlaps with the FTTP network and overall NGA coverage was 78.5% at the end of 2012. This makes Latvia one of the top ranking countries for NGA coverage, but it still lags behind in terms of standard fixed broadband.

Significant improvements were made to the coverage of most technologies in 2012. We have already mentioned the large expansion of the FTTP networks. The cable network also grew by around 8p.p. as did WiMAX coverage. LTE coverage increased by nearly 20p.p. and VDSL grew by more than 5p.p.. But Latvia needs to focus on bringing basic broadband to all its citizens, rather than extending its NGA coverage in areas that can already access high-speed services. It is one of the four study

Broadband Coverage in Europe 2012

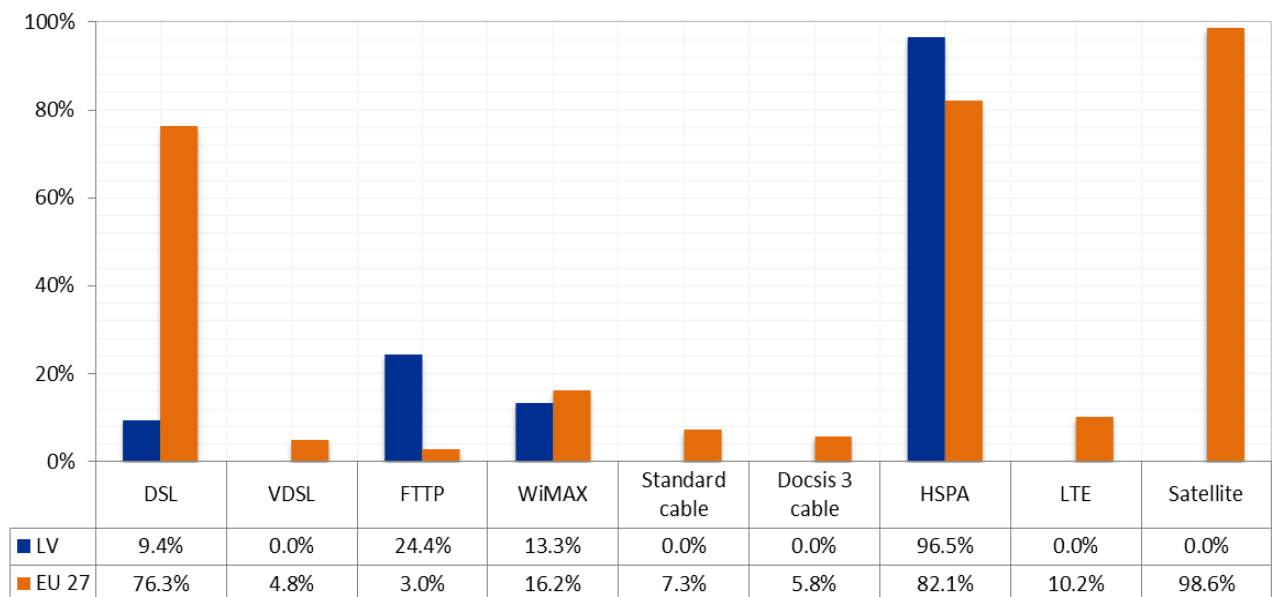
countries with no satellite broadband availability – so this will not fill the gap for standard fixed broadband coverage left by DSL.

Latvia, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

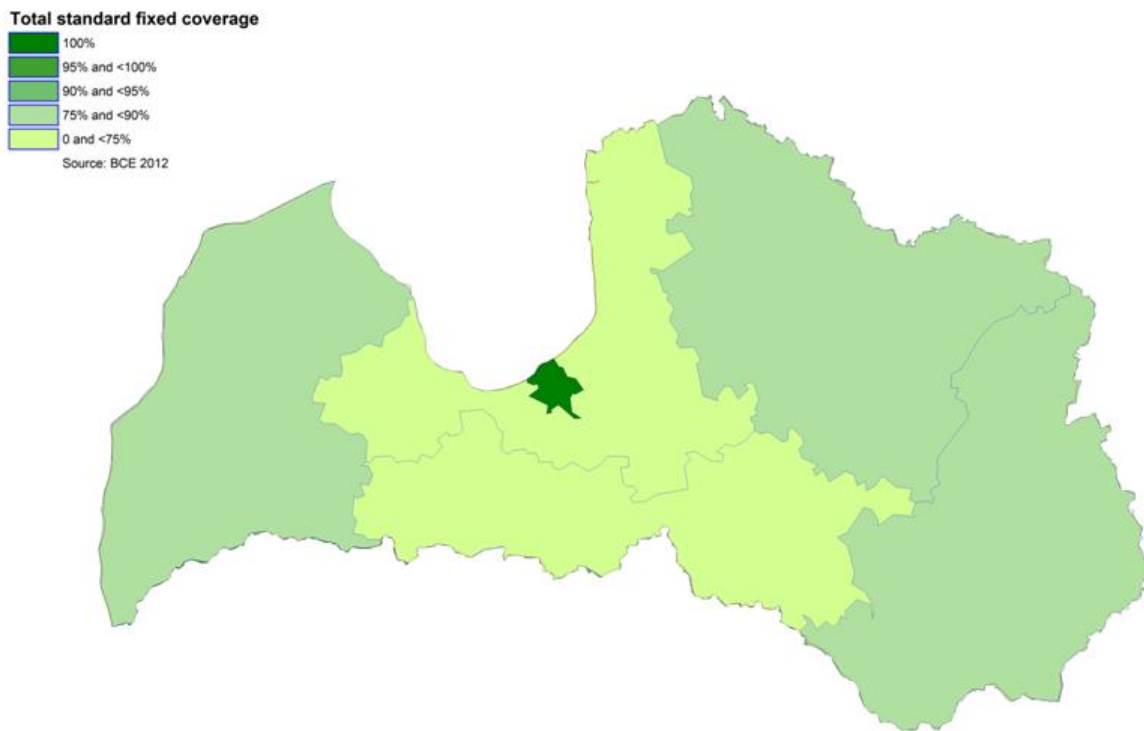
Latvia, rural coverage by technology in 2012: comparison with EU



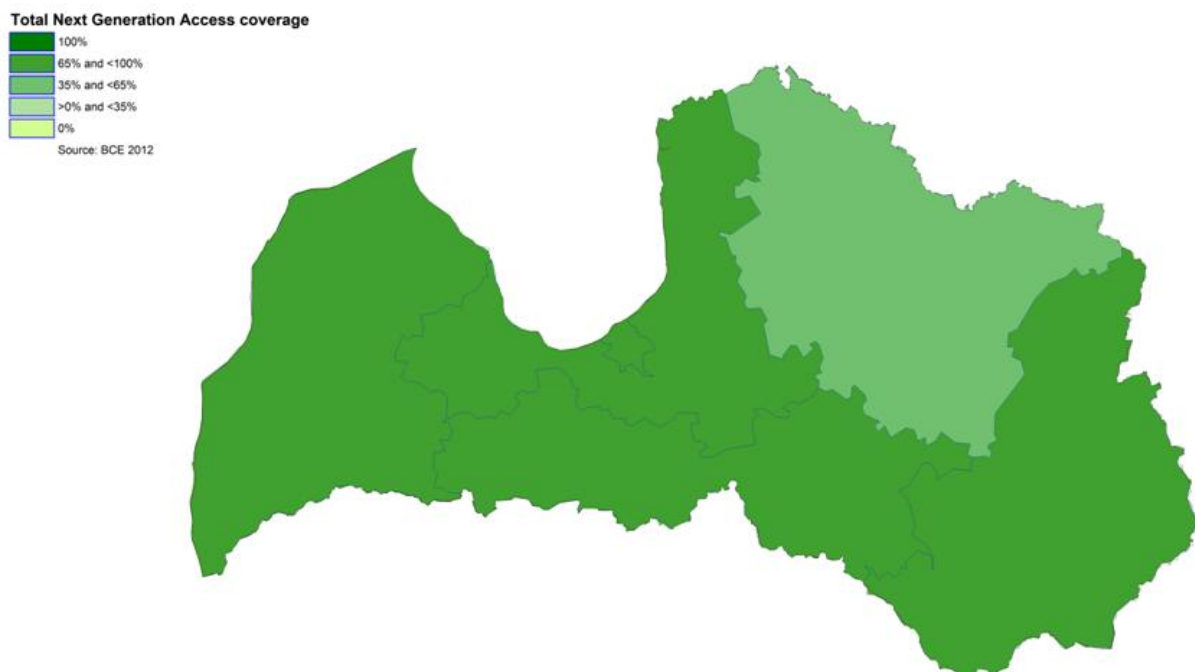
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.17.2 Regional coverage by broadband technology

Latvia standard fixed broadband coverage



Latvia Next Generation Access coverage



Latvia's capital Riga had total coverage of standard fixed broadband services, but other areas only had between 70 and 80% coverage by the end of 2012. Most households in Riga could also access NGA services. It is the most rural areas that still had the lowest coverage, although all areas are comparatively well served.

3.17.3 Data tables for Latvia

Statistic	National
Population	2,229,641
Persons per household	2.6
Rural proportion	28.5%

Technology	LV - 2012		LV - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	47.9%	9.4%	52.9%	12.2%	92.9%	76.3%
VDSL	7.1%	0.0%	1.6%	0.0%	24.9%	4.8%
FTTP	78.5%	24.4%	60.8%	7.4%	12.3%	3.0%
WiMAX	39.4%	13.3%	31.6%	1.2%	17.2%	16.2%
Standard cable	41.4%	0.0%	33.1%	0.0%	42.0%	7.3%
Docsis 3 cable	33.1%	0.0%	26.5%	0.0%	39.3%	5.8%
HSPA	99.0%	96.5%	99.0%	96.5%	96.3%	82.1%
LTE	21.8%	0.0%	2.4%	0.0%	27.0%	10.2%
Satellite	0.0%	0.0%	0.0%	0.0%	98.6%	98.6%
Standard	99.5%	98.3%			99.4%	96.1%
Standard fixed	82.9%	39.8%	75.5%	20.8%	95.5%	83.2%
NGA	78.5%	24.4%	66.0%	7.4%	53.7%	12.4%

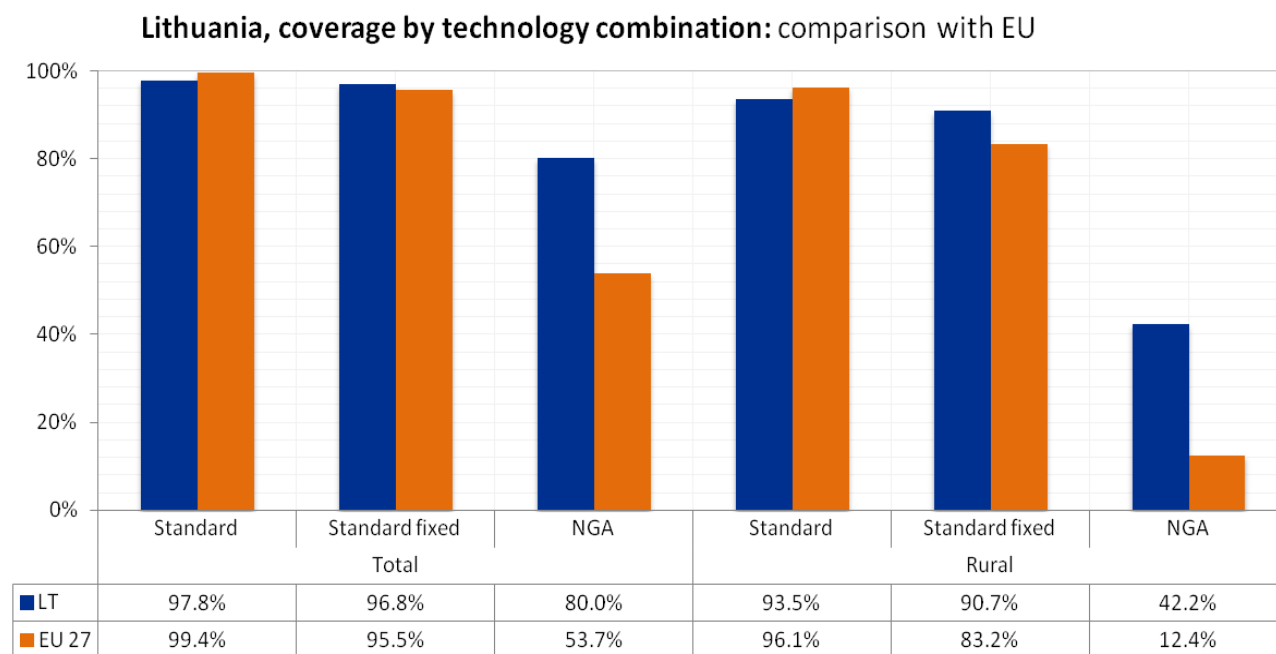
3.17.4 Notes on data and coverage estimates**VDSL**

A household has VDSL coverage if it can receive a VDSL connection delivering a downstream speed of 20 Mbps. Note that this threshold is lower than the survey definition. This has no impact on the NGA coverage reported for Latvia.

3.18 Lithuania

3.18.1 National coverage by broadband technology

Lithuania was an EU leader for NGA services, and compared to its neighbours it also delivered a good level of basic service to all its citizens.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Lithuania had one of the least developed DSL networks in the European Union, but the country instead focused on providing services through other channels. Lithuania had the second largest WiMAX network in the study, with services reaching nearly 85% of households by the end of 2012. WiMAX was the key service for delivering standard broadband services to rural households, along with HSPA.

Lithuania had the most extensive FTTP network in the EU, reaching at least 80% of households. Other estimates suggest that coverage could be as high as 94%, but we suggest that this could be too optimistic. There is a great deal of overlap between the various FTTH/B networks. Also coverage was mainly limited to serving apartment blocks, which in 2012 were housing nearly 60% of the population according to Eurostat. We also believe that it is unlikely that FTTH/B coverage could have extended very far with the 34% of the population living in low-density rural areas.

53% of households could also access cable services, and nearly 80% of the network had been upgraded to Docsis 3. We believe that the Docsis 3 network overlaps entirely with the FTTP network in Lithuania, which means that overall NGA coverage was 80%.

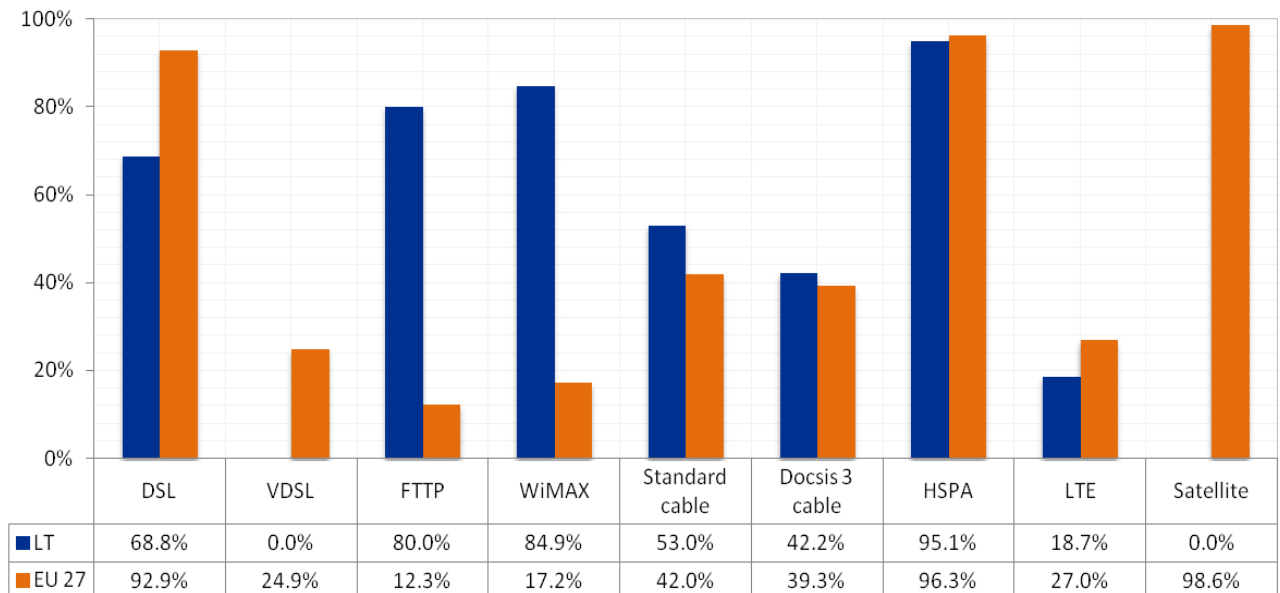
Both WiMAX coverage and FTTP coverage grew by a significant amount in 2012, with around 25p.p. and 20p.p. growth respectively. LTE grew by more than 6p.p. and was serving around 20% of all households by the end of the year.

The most rural area of Utenos had the lowest coverage of both standard fixed and NGA broadband services. It is one of the most rural areas in the study, with 72% of households in areas with less than

Broadband Coverage in Europe 2012

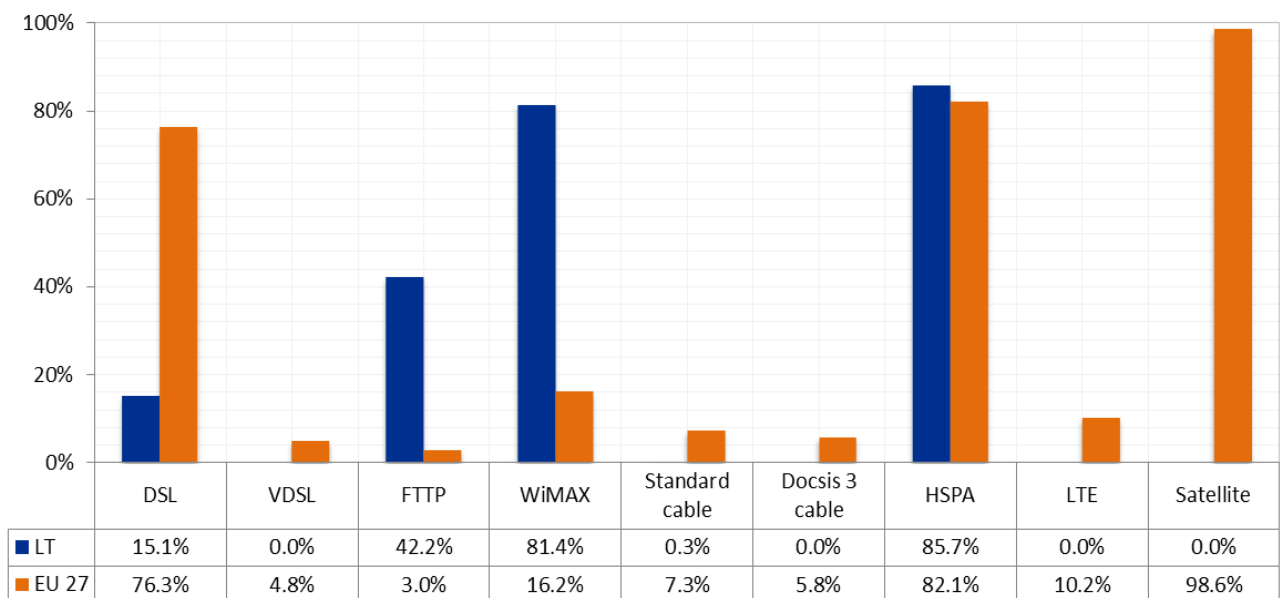
100 people per kilometre. Whilst NGA coverage in Lithuania is very advanced, it will still be a challenge to reach its most rural households with NGA services. Lithuania is also one of the four study countries in which satellite broadband services were still not commercially available in 2012.

Lithuania, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

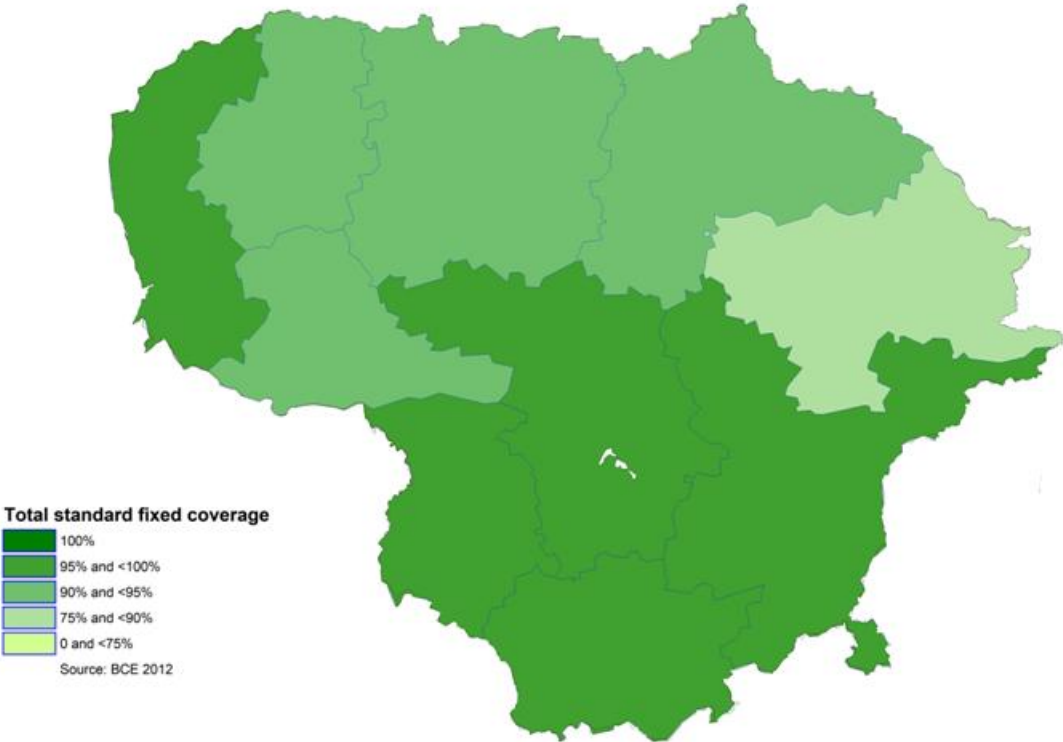
Lithuania, rural coverage by technology in 2012: comparison with EU



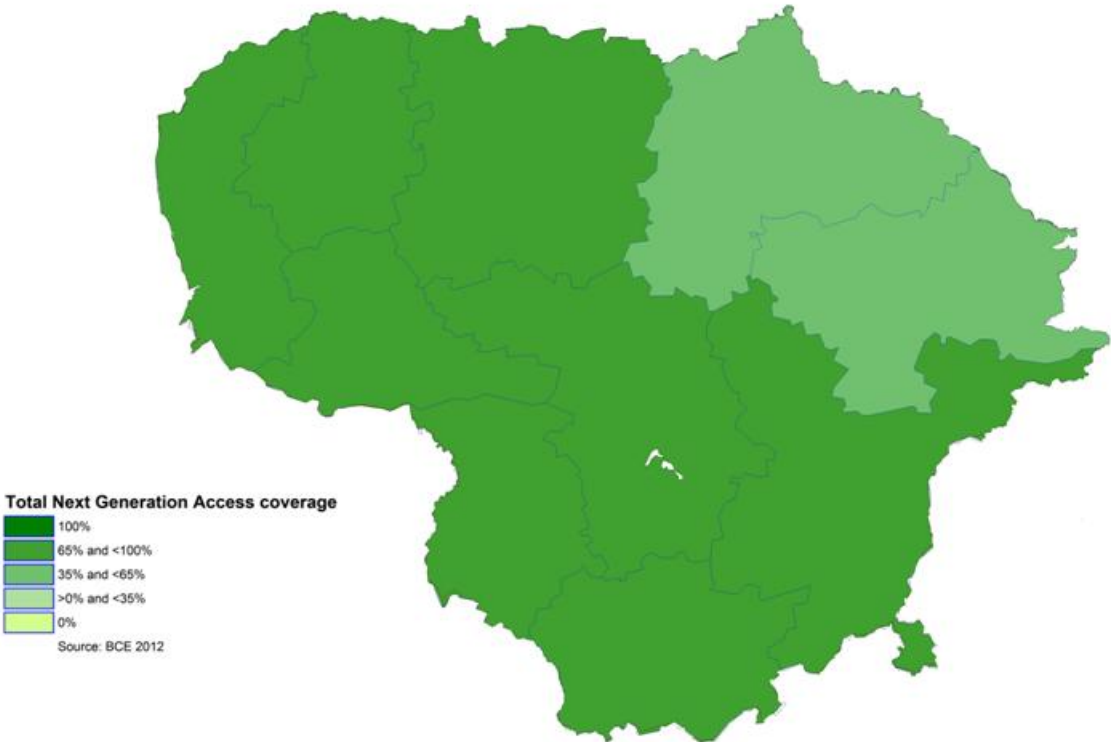
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.18.2 Regional coverage by broadband technology

Lithuania standard fixed broadband coverage



Lithuania Next Generation Access coverage



3.18.3 Data tables for Lithuania

Statistic	National
Population	3,244,601
Persons per household	2.3
Rural proportion	34.6%

Technology	LT - 2012		LT - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	68.8%	15.1%	68.5%	14.8%	92.9%	76.3%
VDSL	0.0%	0.0%	0.0%	0.0%	24.9%	4.8%
FTTP	80.0%	42.2%	59.4%	22.1%	12.3%	3.0%
WiMAX	84.9%	81.4%	60.0%	60.0%	17.2%	16.2%
Standard cable	53.0%	0.3%	52.8%	0.3%	42.0%	7.3%
Docsis 3 cable	42.2%	0.0%	41.7%	0.0%	39.3%	5.8%
HSPA	95.1%	85.7%	95.0%	85.6%	96.3%	82.1%
LTE	18.7%	0.0%	12.1%	0.0%	27.0%	10.2%
Satellite	0.0%	0.0%	0.0%	0.0%	98.6%	98.6%
Standard	97.8%	93.5%			99.4%	96.1%
Standard fixed	96.8%	90.7%	88.4%	70.1%	95.5%	83.2%
NGA	80.0%	42.2%	62.2%	22.1%	53.7%	12.4%

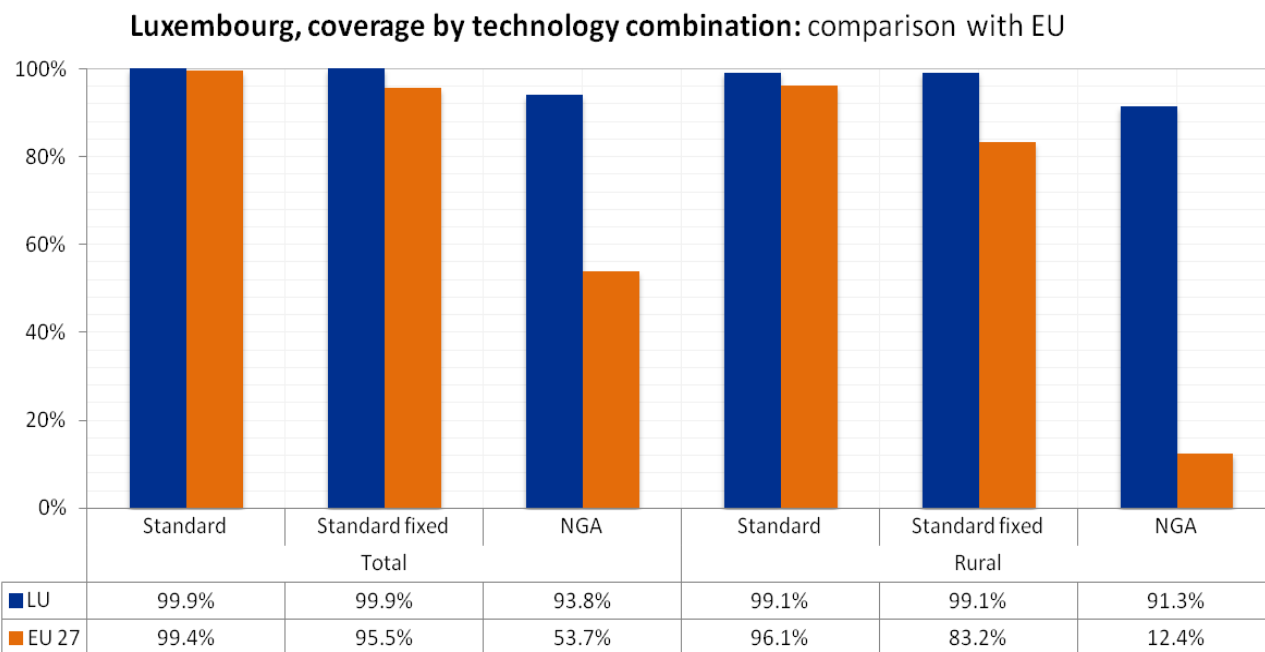
3.18.4 Notes on data and coverage estimates:

None.

3.19 Luxembourg

3.19.1 National coverage by broadband technology

Luxembourg was ahead of the European Union averages for all broadband coverage measures and was one of the top five highest ranking countries for all measures. For rural NGA coverage, it ranked top out of all the study countries.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

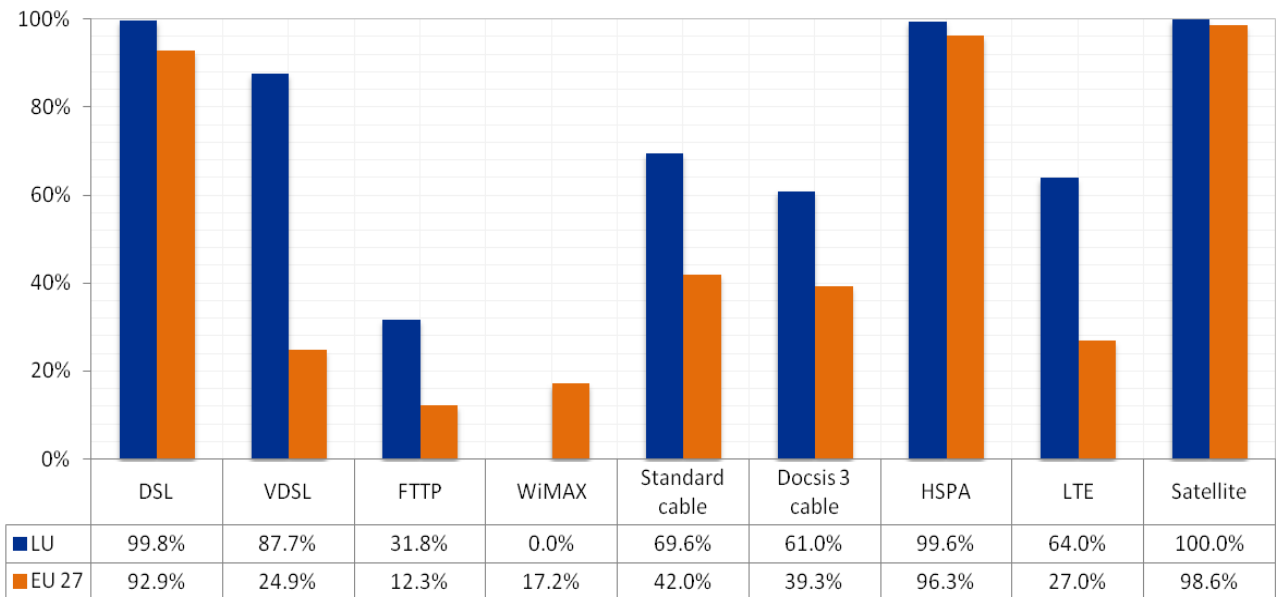
Luxembourg’s strength in NGA coverage was based on having the most extensive VDSL network in the EU. Nearly 90% of households could access VDSL services at the end of 2012, with services available to more than 80% of rural households.

As well as VDSL, Luxembourg also ranks higher than most of the other study countries for its cable, DSL, HSPA and LTE coverage. LTE only launched in 2012, was already available to almost two thirds of the households in Luxembourg by the end of the year. There was no WiMAX network in Luxembourg at the end of 2012.

Luxembourg is one of the smallest countries in the study, both in terms of land area and population. In 2012 13% of its population was living in its often rugged and forested rural areas, but even these areas were well served by the extensive VDSL network and nearly all households can access basic broadband services.

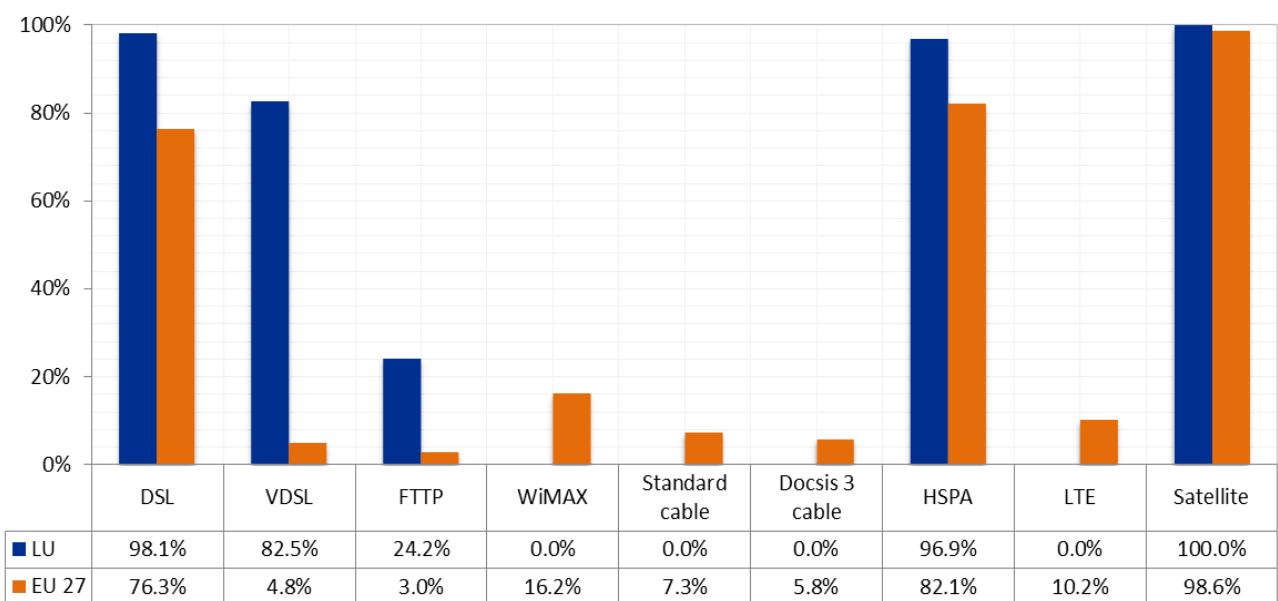
Broadband Coverage in Europe 2012

Luxembourg, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

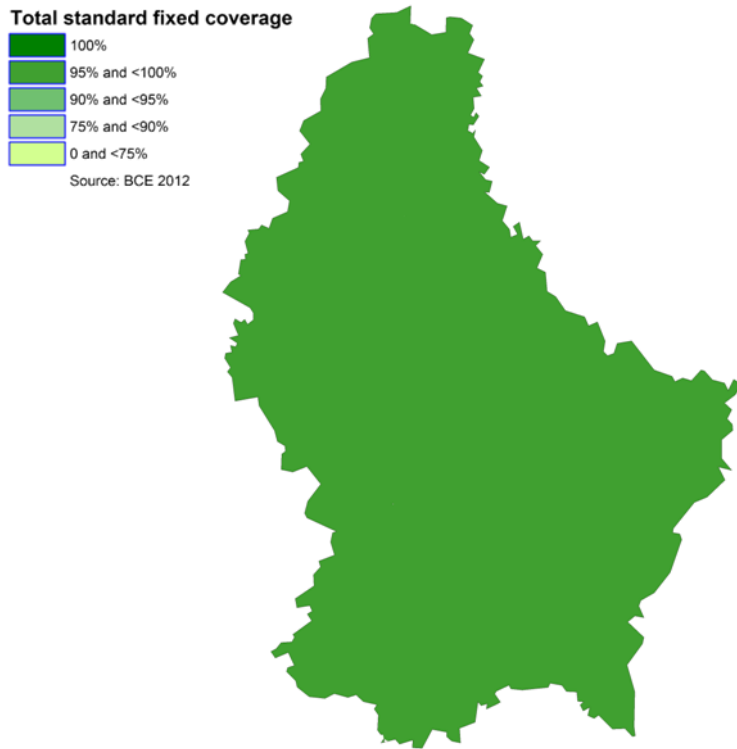
Luxembourg, rural coverage by technology in 2012: comparison with EU



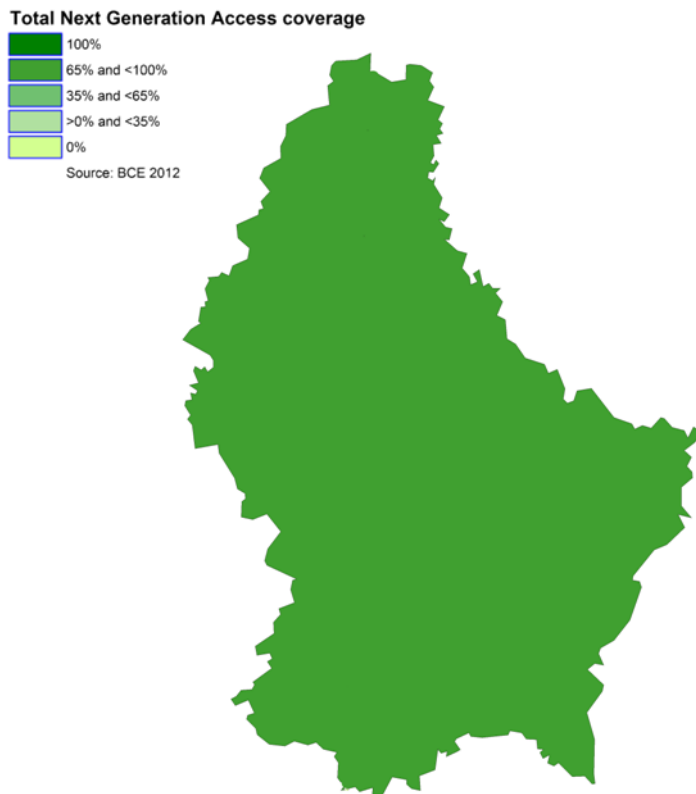
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.19.2 Regional coverage by broadband technology

Luxembourg standard fixed broadband coverage



Luxembourg Next Generation Access coverage



3.19.3 Data tables for Luxembourg

Statistic	National
Population	524,853
Persons per household	2.4
Rural proportion	13.1%

Technology	LU - 2012		LU - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.8%	98.1%	99.8%	98.1%	92.9%	76.3%
VDSL	87.7%	82.5%	80.0%	75.3%	24.9%	4.8%
FTTP	31.8%	24.2%	23.1%	17.6%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	69.6%	0.0%	63.5%	0.0%	42.0%	7.3%
Docsis 3 cable	61.0%	0.0%	52.0%	0.0%	39.3%	5.8%
HSPA	99.6%	96.9%	99.6%	96.9%	96.3%	82.1%
LTE	64.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.9%	99.1%			99.4%	96.1%
Standard fixed	99.9%	99.1%	99.8%	98.1%	95.5%	83.2%
NGA	93.8%	91.3%	85.2%	84.1%	53.7%	12.4%

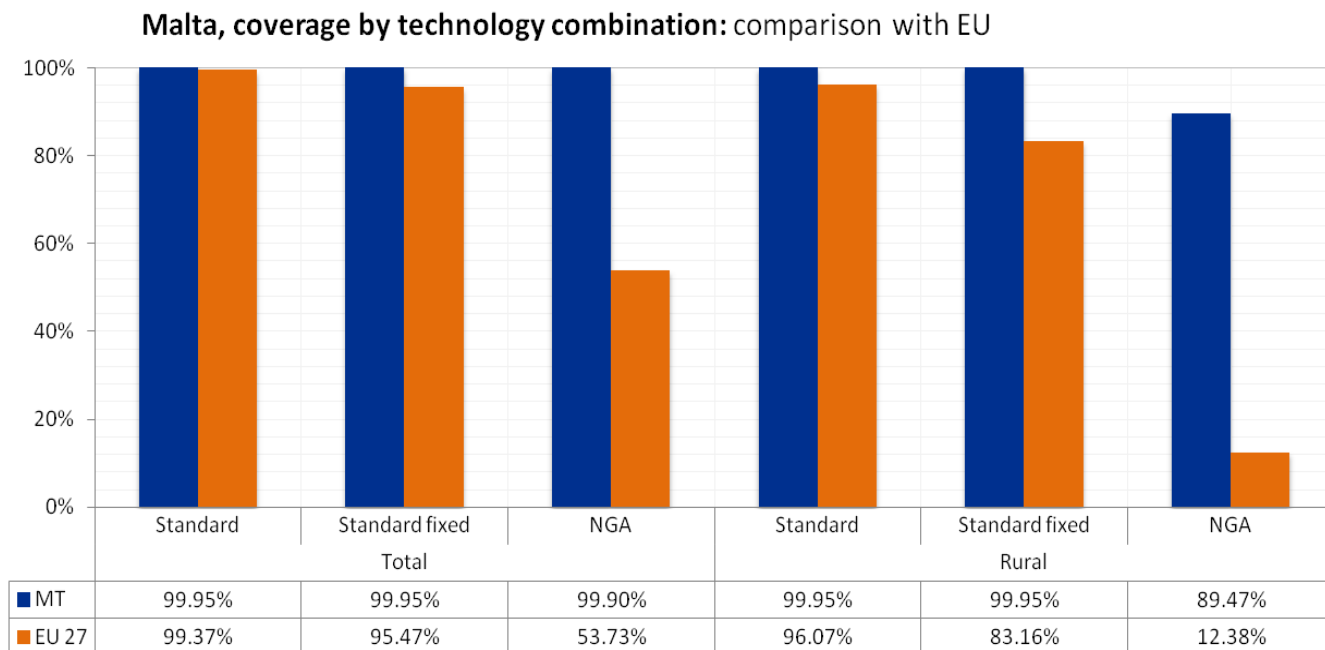
3.19.4 Notes on data and coverage estimates:

None.

3.20 Malta

3.20.1 National coverage by broadband technology

Malta was by far the smallest in land area and most densely populated study country. Using the new study definition for rural households, only 1% of households in Malta were located in areas with fewer than 100 people per kilometre.



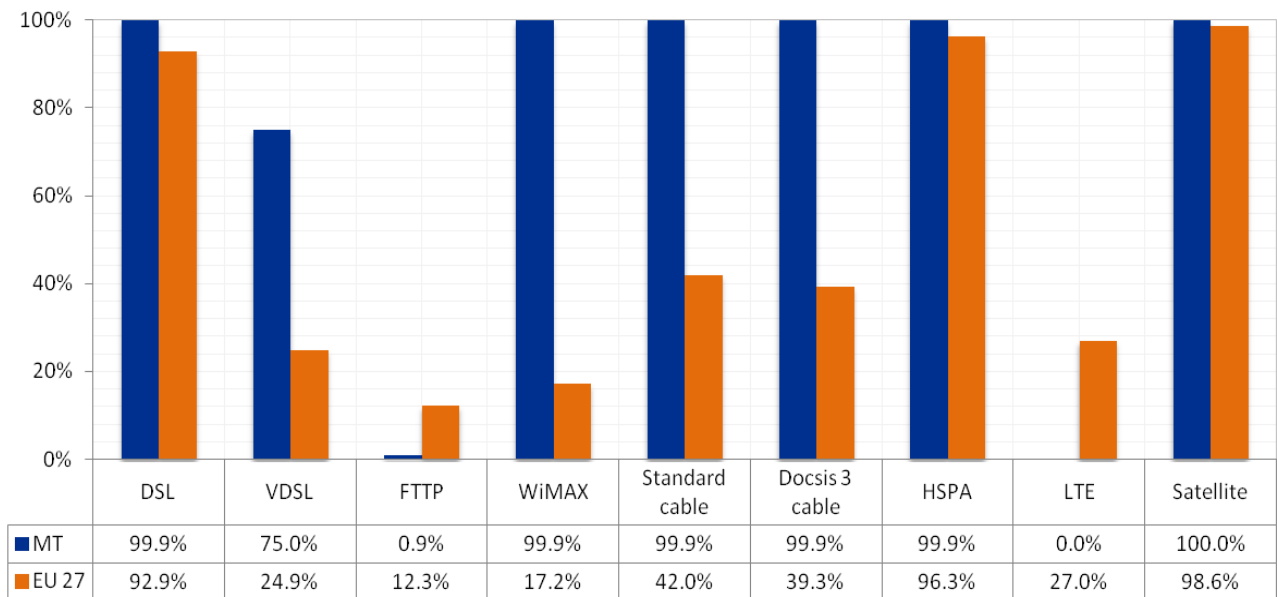
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

In terms of technology coverage, DSL, cable, WiMAX, HSPA and satellite all covered nearly all households in Malta in 2012. At the end of the year, Malta had not yet launched LTE services and only had a very limited FTTP network. But since the cable network is all upgraded to Docsis 3, nearly all premises could access NGA services. VDSL was available to 75% of households.

Precisely identifying coverage at the 1% of households defined as rural was not possible. However we estimate that these will include the final remaining households not served by NGA services in Malta.

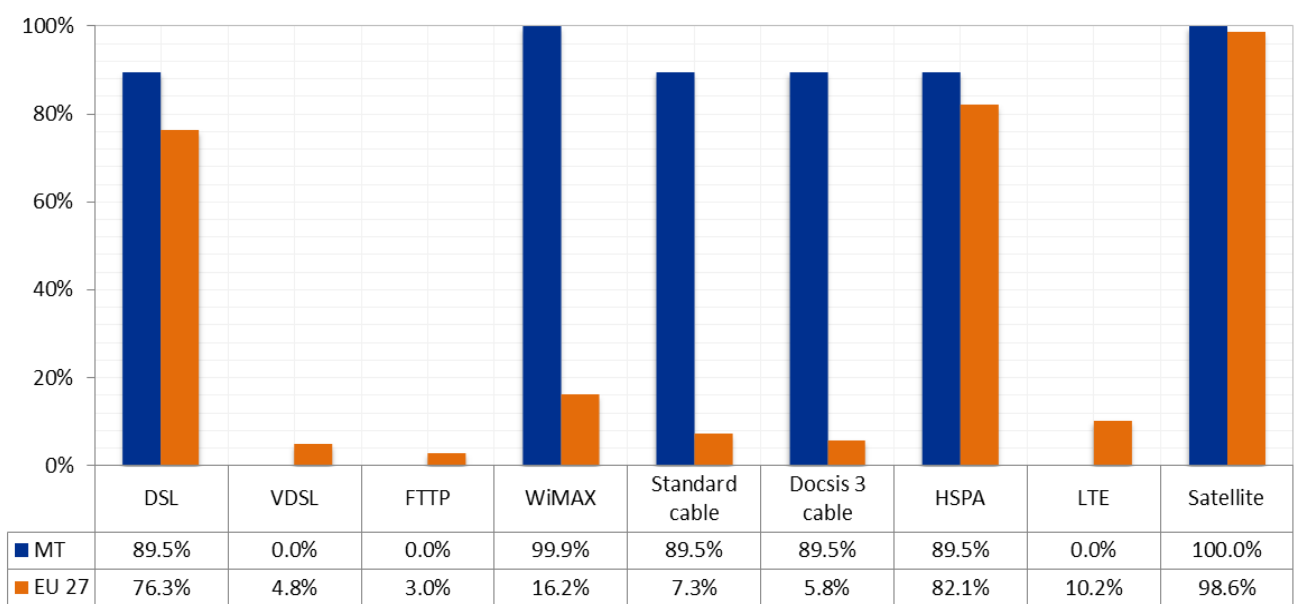
Broadband Coverage in Europe 2012

Malta, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

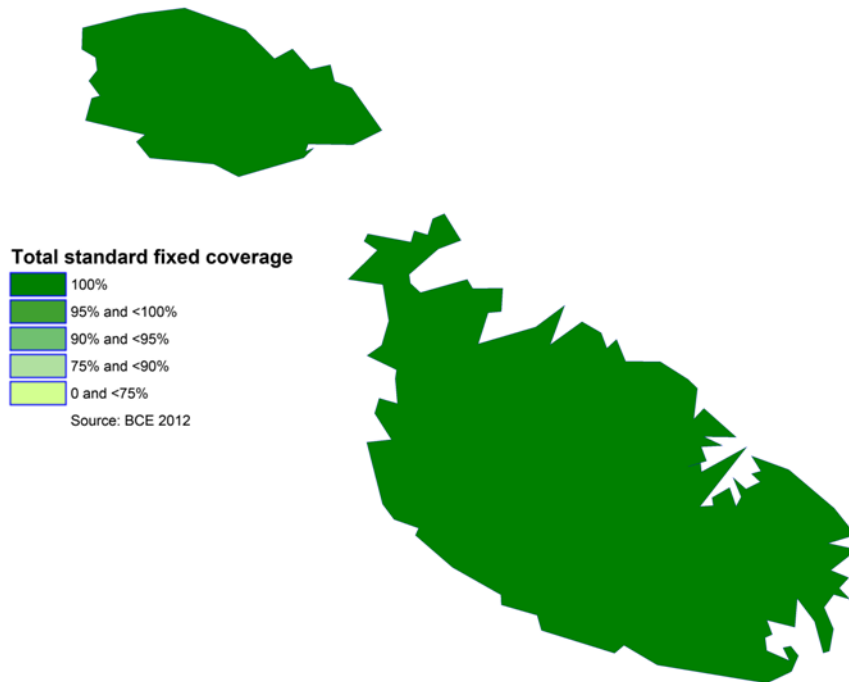
Malta, rural coverage by technology in 2012: comparison with EU



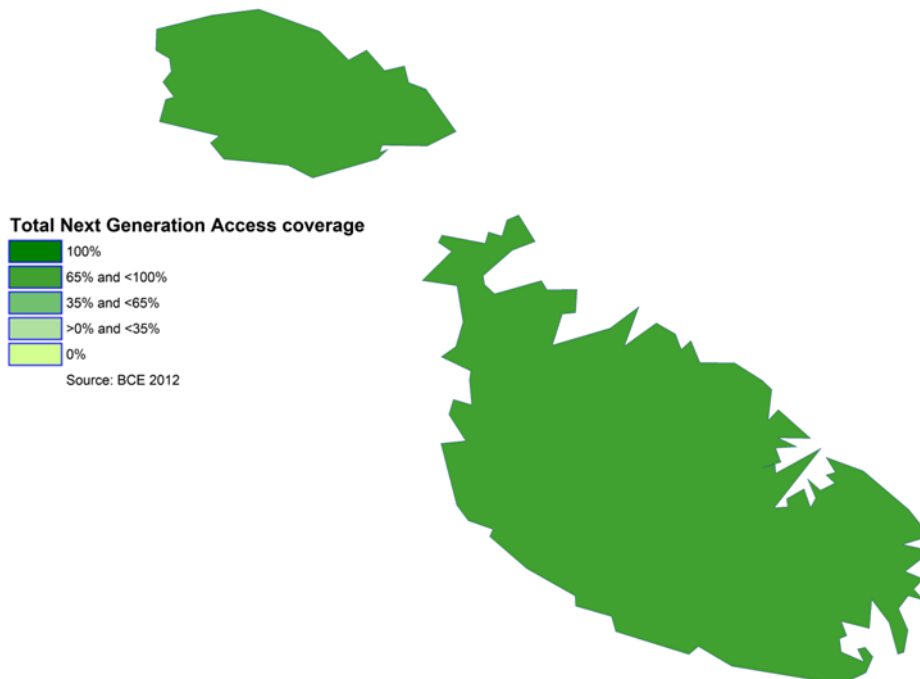
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.20.2 Regional coverage by broadband technology

Malta standard fixed broadband coverage



Malta Next Generation Access coverage



3.20.3 Data tables for Malta

Statistic	National
Population	417,520
Persons per household	2.9
Rural proportion	0.9%

Technology	MT - 2012		MT - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.9%	89.5%	99.0%	6.9%	92.9%	76.3%
VDSL	75.0%	0.0%	75.0%	0.0%	24.9%	4.8%
FTTP	0.9%	0.0%	0.0%	0.0%	12.3%	3.0%
WiMAX	99.9%	99.9%	99.9%	99.9%	17.2%	16.2%
Standard cable	99.9%	89.5%	98.5%	2.9%	42.0%	7.3%
Docsis 3 cable	99.9%	89.5%	98.5%	2.9%	39.3%	5.8%
HSPA	99.9%	89.5%	99.0%	6.9%	96.3%	82.1%
LTE	0.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	>99.95%	>99.95%			99.4%	96.1%
Standard fixed	>99.95%	>99.95%	99.9%	99.9%	95.5%	83.2%
NGA	99.9%	89.5%	98.8%	2.9%	53.7%	12.4%

3.20.4 Notes on data and coverage estimates:

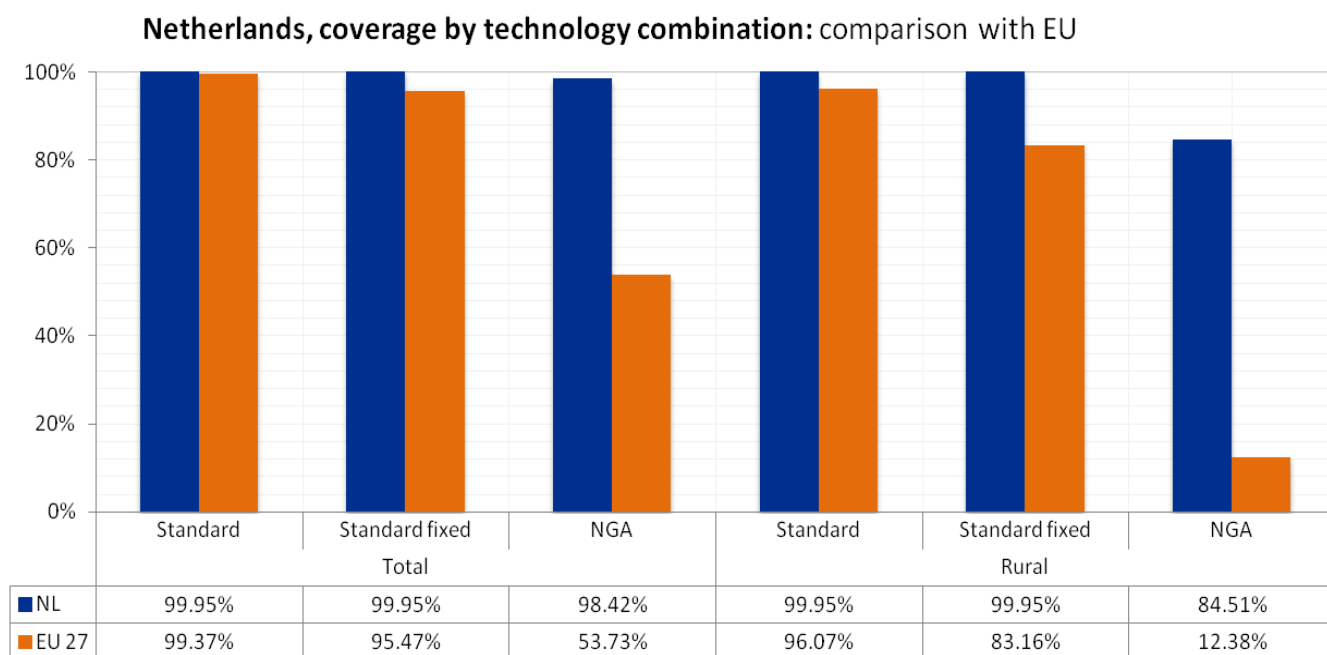
None.

3.21 Netherlands

3.21.1 National coverage by broadband technology

The published results for the Netherlands for end-2011 suggested that all households were covered by VDSL services. Since this report was published, we have received new data which shows that the VDSL network is not as extensive as first thought.

However this only causes a small shift in the overall NGA coverage. The Netherlands still had one of the most advanced NGA networks in the EU, second only after Malta, and nearly all households could access standard fixed broadband services.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

It is estimated that 60% of households in the Netherlands were able to receive high-speed services through VDSL connections by the end of 2012. Only Luxembourg and Malta had more extensive networks at the same period. However, over 97% of Dutch households were able to access NGA services through the cable network. As a result, the Netherlands was one of the most advanced countries in the European Union for high-speed broadband access.

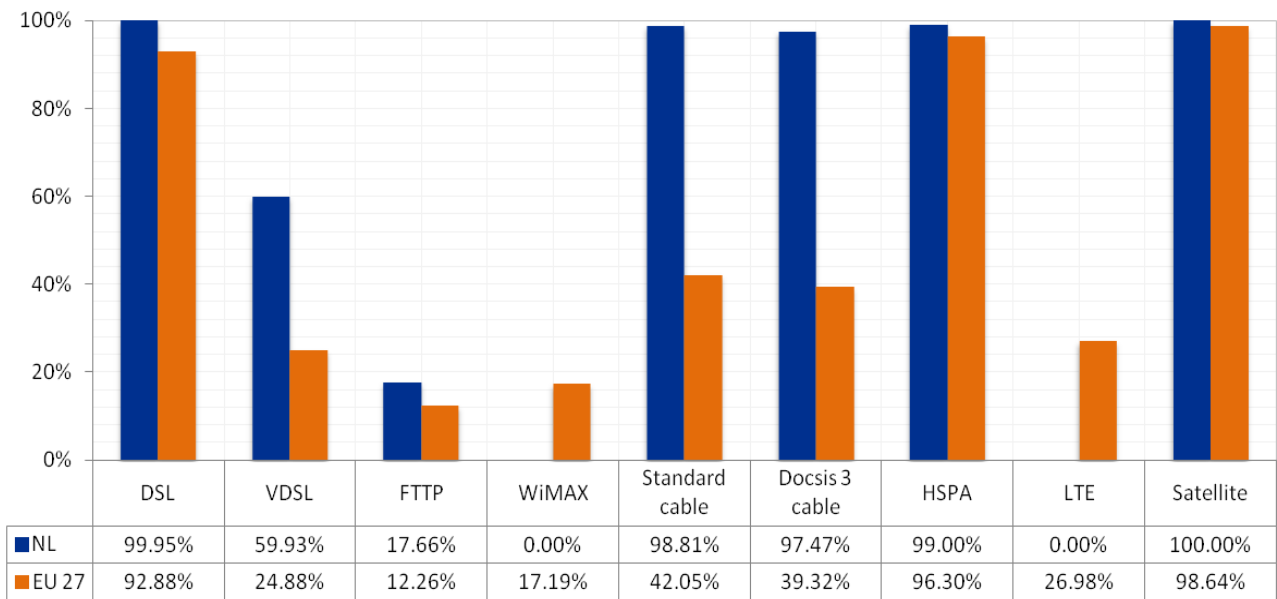
Comparatively the FTTP network in the Netherlands is less advanced. Coverage grew by 5 percentage points in 2012, but this is much more modest than the 13p.p. growth of the VDSL network. Even so, the Netherlands is recognised as the home of some world-leading fibre-city projects. Over 80% of households in the region of Zuidwest-Overijssel could access FTTP services in 2012.

At the end of 2012 the Netherlands had not yet launched LTE services. This is the only area in which the country falls behind the rest of the European Union.

Twenty-six of the forty regions in the Netherlands had complete NGA coverage, with all regions enjoying higher than 85% coverage.

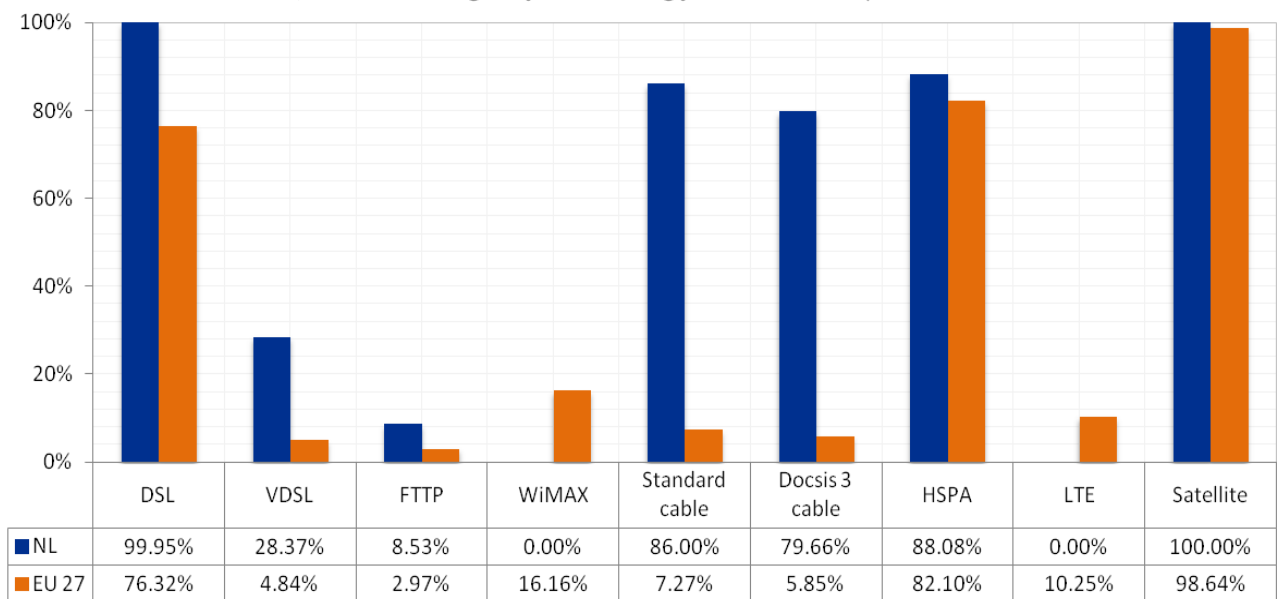
Broadband Coverage in Europe 2012

Netherlands, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Netherlands, rural coverage by technology in 2012: comparison with EU



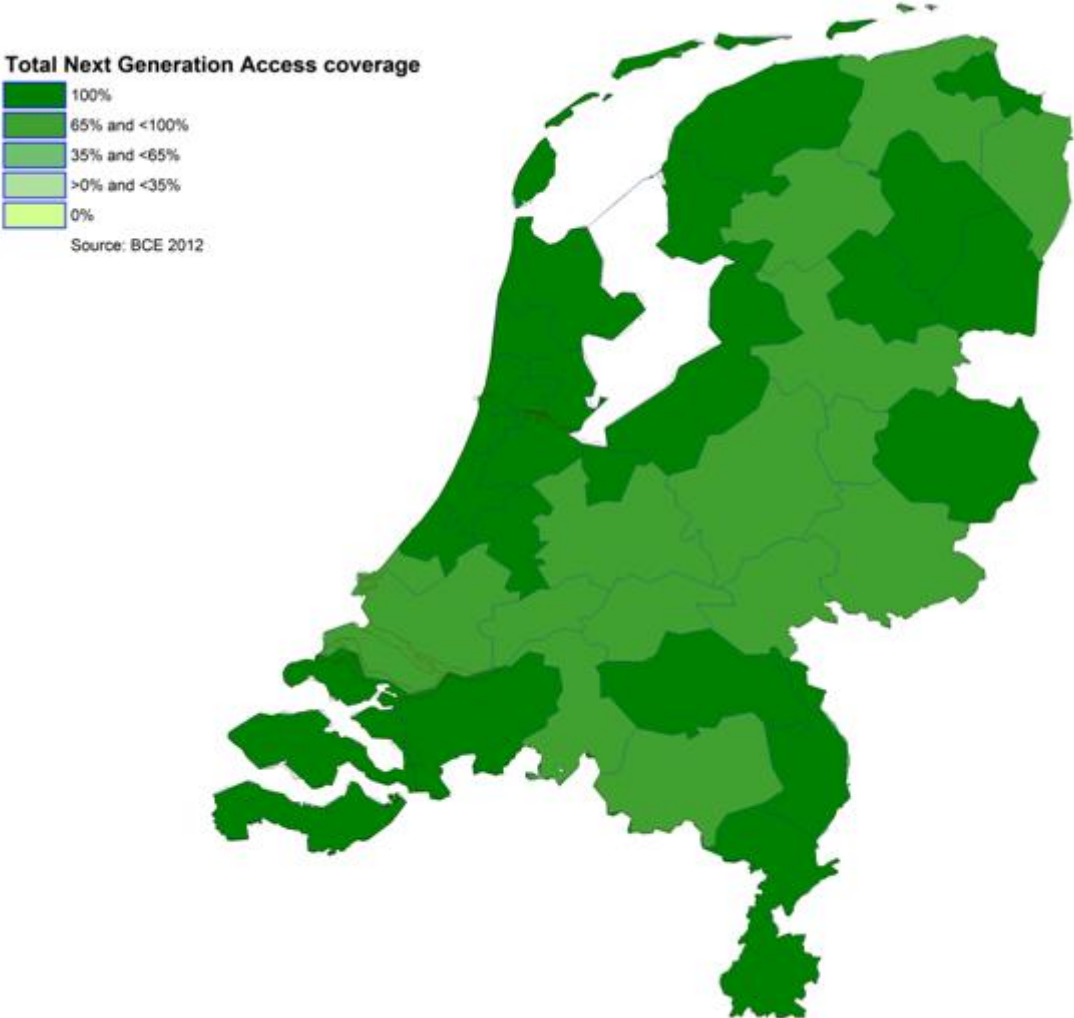
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.21.2 Regional coverage by broadband technology

Netherlands standard fixed broadband coverage



Netherlands Next Generation Access coverage



3.21.3 Data tables for Netherlands

Statistic	National
Population	16,642,442
Persons per household	2.2
Rural proportion	8.2%

Technology	NL - 2012		NL - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	>99.95%	>99.95%	>99.95%	>99.95%	92.9%	76.3%
VDSL	59.9%	28.4%	47.3%	27.8%	24.9%	4.8%
FTTP	17.7%	8.5%	12.8%	8.5%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	98.8%	86.0%	98.5%	82.9%	42.0%	7.3%
Docsis 3 cable	97.5%	79.7%	96.8%	65.5%	39.3%	5.8%
HSPA	99.0%	88.1%	99.0%	88.4%	96.3%	82.1%
LTE	0.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	>99.95%	>99.95%			99.4%	96.1%
Standard fixed	>99.95%	>99.95%	>99.95%	>99.95%	95.5%	83.2%
NGA	98.4%	84.5%	97.1%	72.9%	53.7%	12.4%

3.21.4 Notes on data and coverage estimates

VDSL:

Reported threshold is 30Mb+, provided on VDSL or VDSL bonding technology on existing double copper pairs.

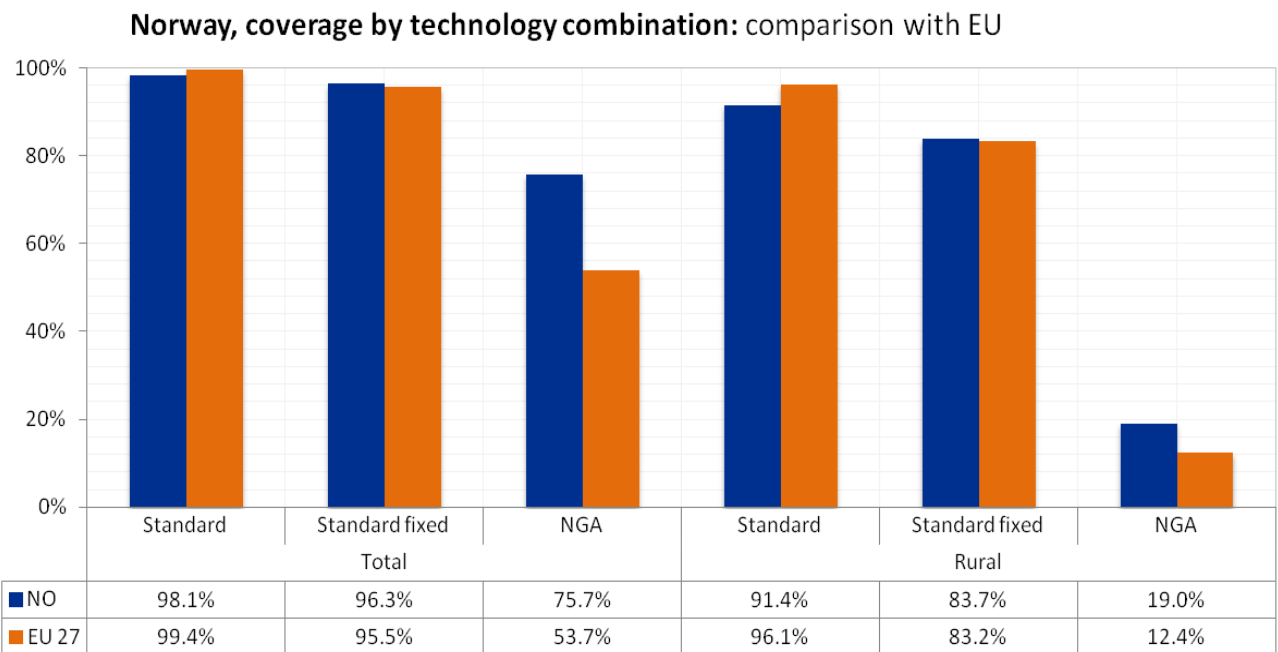
Rural households:

The data provided did not match the survey definition for rural coverage, calculated using the kilometre grid. However, given the high overall coverage of cable this would not be expected to affect the overall standard and NGA figures reported.

3.22 Norway

3.22.1 National coverage by broadband technology

Norway faces significant challenges as far as delivering broadband services is concerned. Besides a difficult terrain, it has a relatively high rural population and low population density. However, Norway has invested significant money to create a broadband infrastructure which compares well with the rest of the EU and in 2012 the country proved to exceed expectations for NGA coverage.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

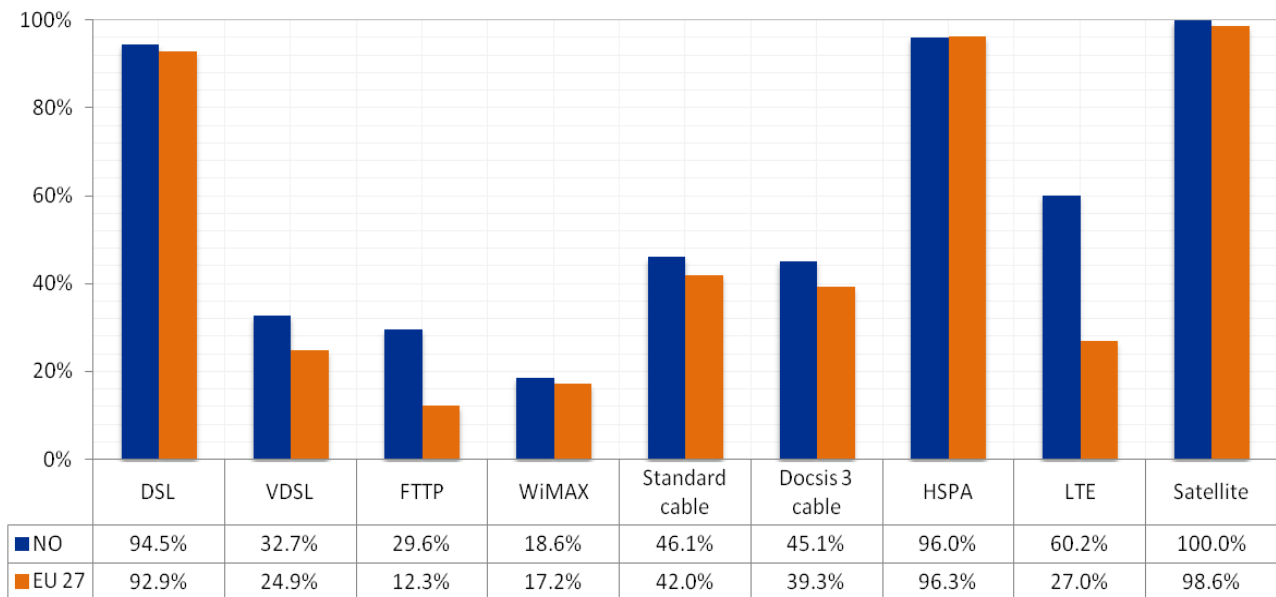
For each of the nine broadband technologies considered, Norway either matched or beat the coverage average within the European Union in 2012, providing good coverage of a range of services without leading with any one particular service.

Coverage from the NGA technologies is mostly complementary. In 2012 Docsis 3 cable was the most wide-spread NGA service and covered 45% of Norwegian households. FTTP and VDSL then added an extra 30% NGA coverage to Norway, bringing its total coverage to over 75%. NGA services did not neglect rural households, of which nearly 20% were able to access services at the end of 2012. FTTP coverage of rural households was most consistent across the country – VDSL and Docsis 3 cable were only available to rural households in some regions of Norway.

All technologies posted some coverage growth in 2012, and LTE coverage grew by nearly 35p.p..

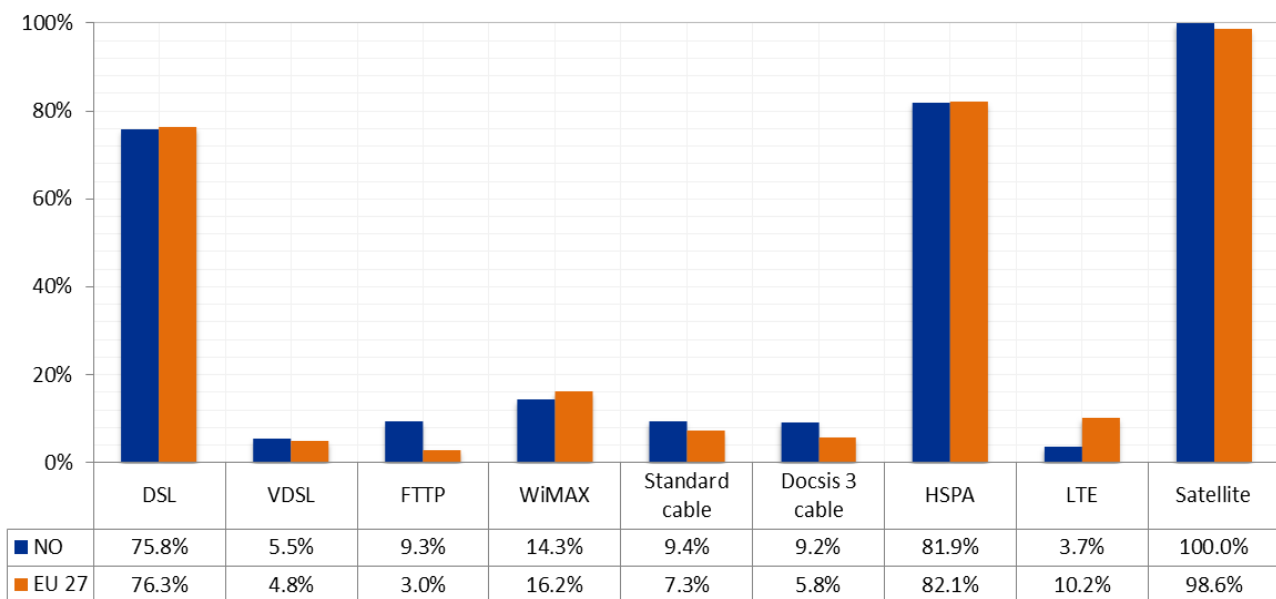
Broadband Coverage in Europe 2012

Norway, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

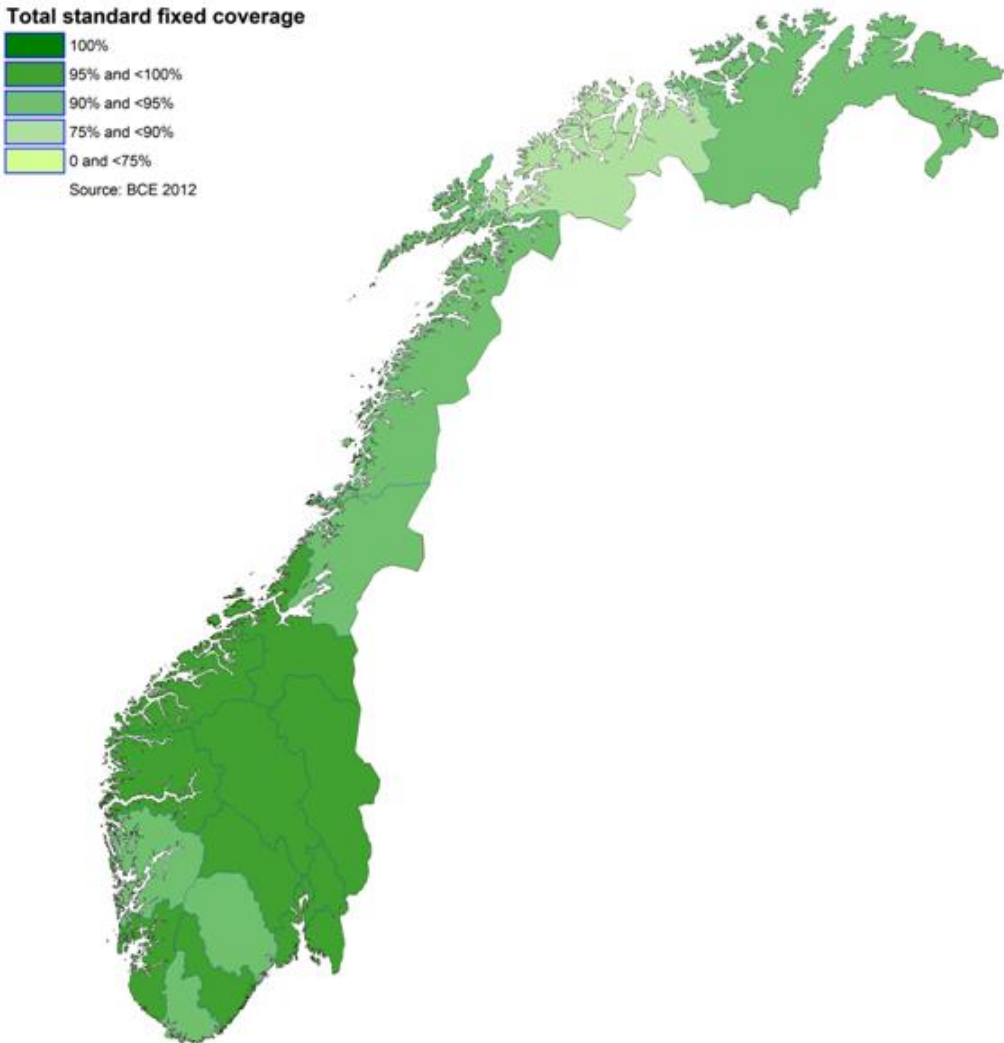
Norway, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.22.2 Regional coverage by broadband technology

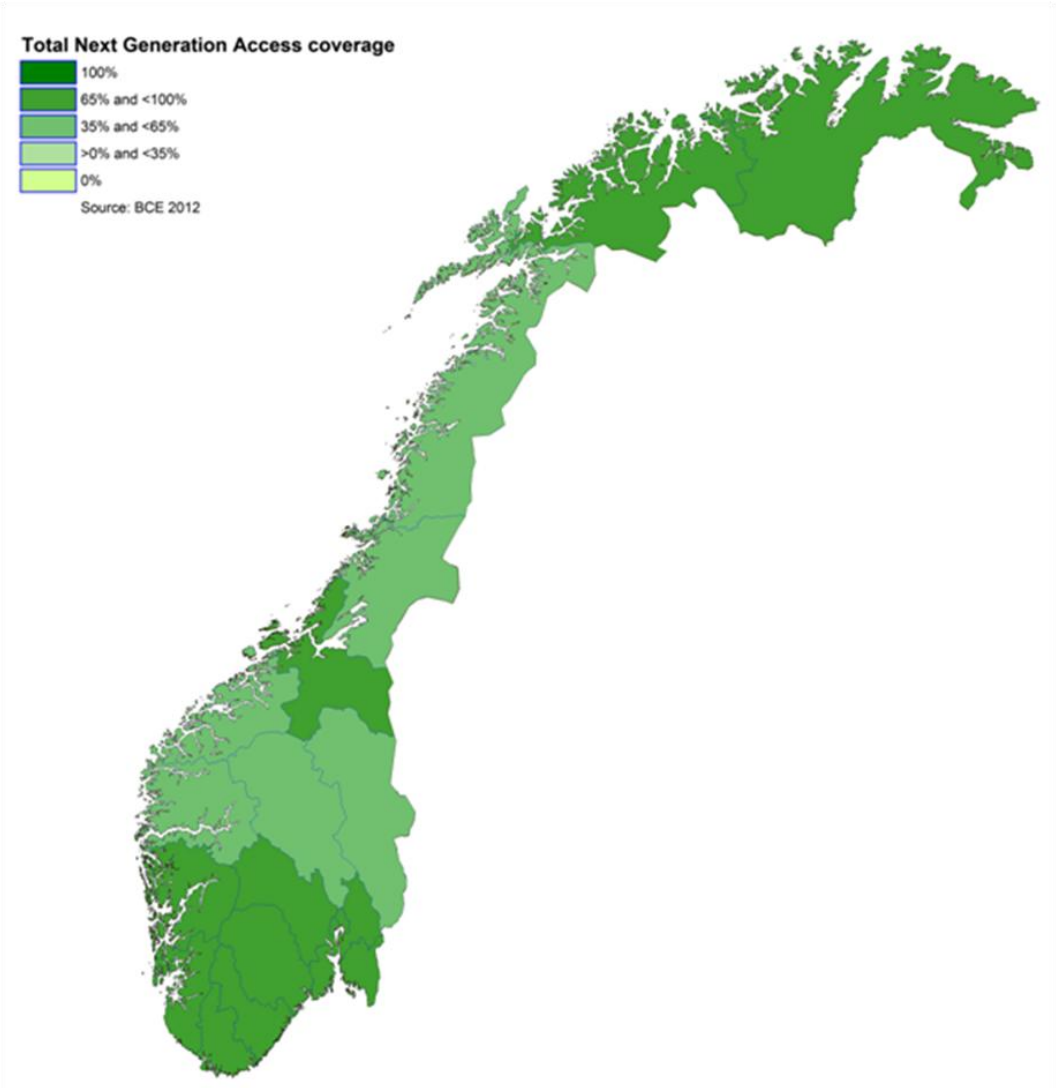
Norway standard fixed broadband coverage



Standard fixed-line broadband coverage was above 90% in every province in Norway, except in the northern region of Troms where it fell just below 90%.

NGA coverage was highest in Oslo at over 92%. The regions which generally had the lowest NGA coverage were also the most rural – such as Nord-Trøndelag, Hedmark, Sogn og Fjordane and Oppland – although this was not always the case. Finnmark, one of the most rural provinces, had nearly 80% NGA coverage.

Norway Next Generation Access coverage



3.22.3 Data tables for Norway

Statistic	National
Population	4,920,305
Persons per household	2.1
Rural proportion	21.8%

Technology	NO - 2012		NO - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	94.5%	75.8%	93.7%	72.1%	92.9%	76.3%
VDSL	32.7%	5.5%	26.8%	2.2%	24.9%	4.8%
FTTP	29.6%	9.3%	24.9%	5.0%	12.3%	3.0%
WiMAX	18.6%	14.3%	10.0%	10.0%	17.2%	16.2%
Standard cable	46.1%	9.4%	45.9%	8.2%	42.0%	7.3%
Docsis 3 cable	45.1%	9.2%	43.7%	7.4%	39.3%	5.8%
HSPA	96.0%	81.9%	91.9%	63.6%	96.3%	82.1%
LTE	60.2%	3.7%	25.9%	3.6%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	98.1%	91.4%			99.4%	96.1%
Standard fixed	96.3%	83.7%	95.9%	78.4%	95.5%	83.2%
NGA	75.7%	19.0%	69.4%	20.5%	53.7%	12.4%

3.22.4 Notes on data and coverage estimates:**Mobile – HSPA and LTE:**

All households within an area with an outdoor signal strength better than 104dBm are defined as covered.

DSL:

Only households having a minimum of 640kbps download speed have been included. This is a higher than the 144kbps threshold defined by the survey.

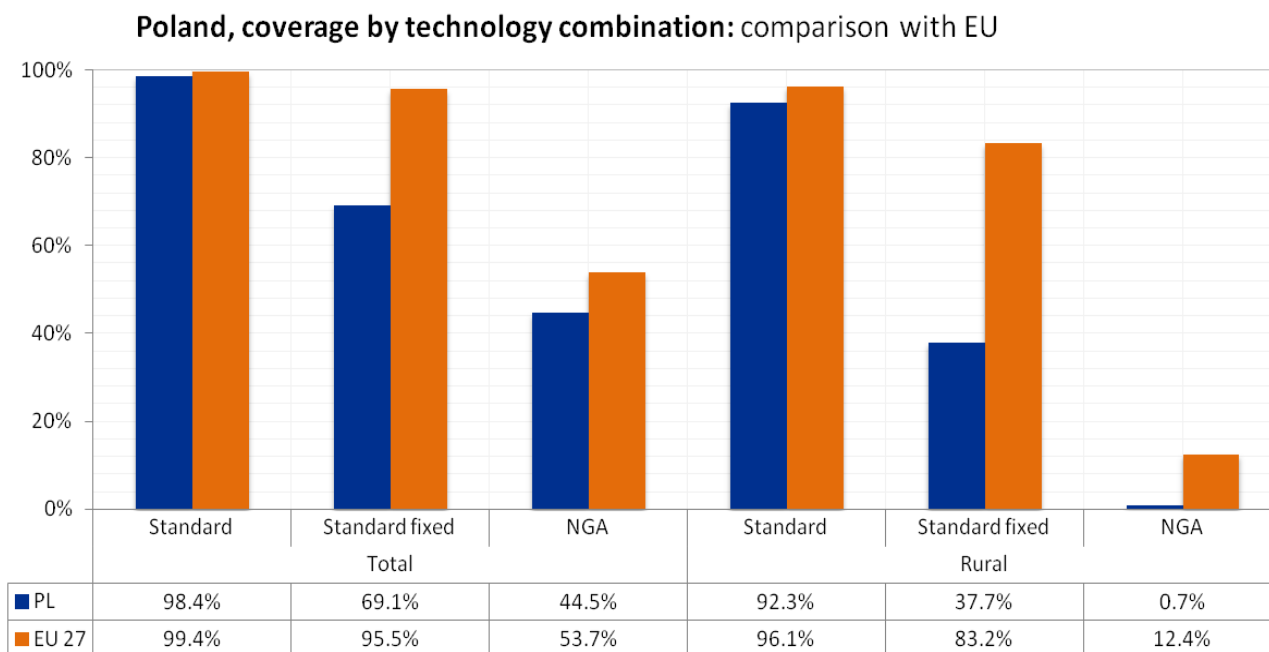
Date:

Coverage data was collected at 30 June 2012 and has been adjusted to estimate coverage at the end of 2012.

3.23 Poland

3.23.1 National coverage by broadband technology

At the end of 2012, Poland was behind the European Union averages for all the technology combination measures. Its standard fixed broadband coverage was the lowest in the study, and rural standard fixed coverage was second lowest after Slovenia.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The technology profile for Poland shows that DSL is responsible for the shortfall in standard fixed broadband coverage. Just over 60% of households were estimated to be able to access DSL services at the end of 2012. Standard cable coverage was reasonable at over 32%, but this network mostly overlaps with the DSL network and cable added only 9% to standard fixed-line coverage. Unlike elsewhere in Eastern Europe, Poland’s WiMAX and FTTP networks are limited and do not help to fill the coverage gap.

On the other hand, the roll-out of VDSL increased rapidly in 2012 and over 40% of the network had been upgraded by the end of the year. These services complemented the deployment of Docsis 3 and overall NGA services were available to nearly 45% of households. But there was very little coverage of the most rural households in Poland, and we estimate that less than 1% of households were able to access NGA services at the end of 2012.

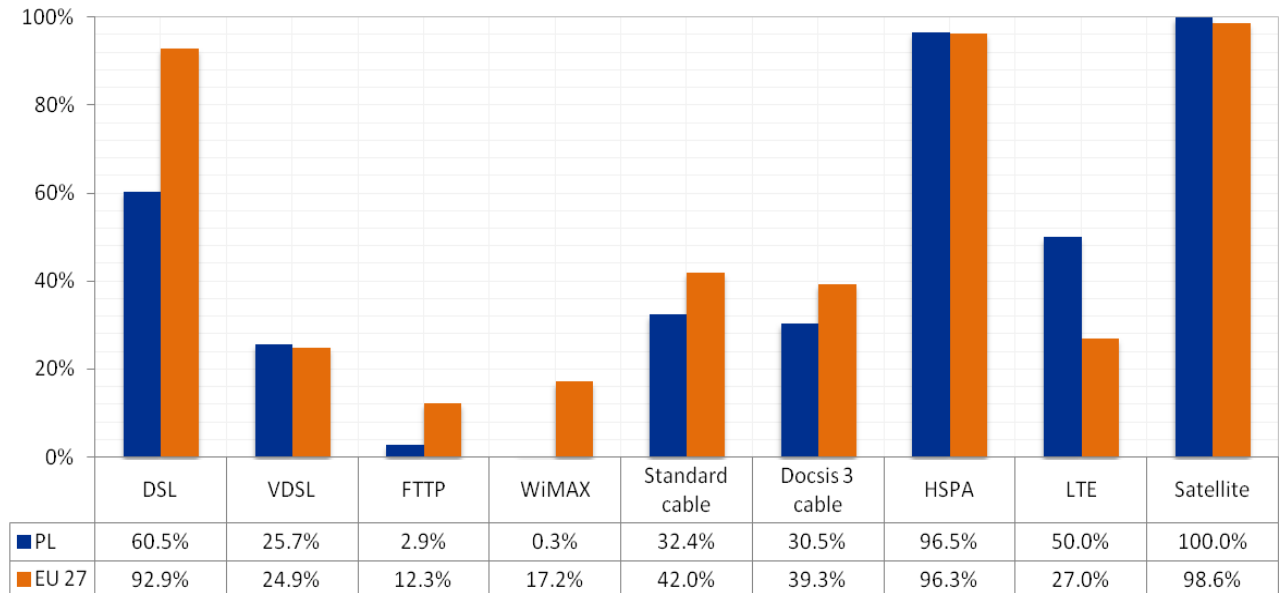
Poland’s LTE network doubled in size in 2012 and could provide services to half of all Polish households by the end of the year.

Standard fixed broadband coverage was nearly completed in some of Poland’s most urban cities, including Warsaw, Poznan, Kraków and Łódz. Outside of these areas and in most of Poland, coverage fell beneath 75%. In the country’s most rural region, Sandomiersko-jędrzejowski, we reported the lowest standard fixed broadband coverage of any area in the study. Indeed, many of Poland’s NUTS 3 areas have the lowest coverage levels reported within the whole study.

Broadband Coverage in Europe 2012

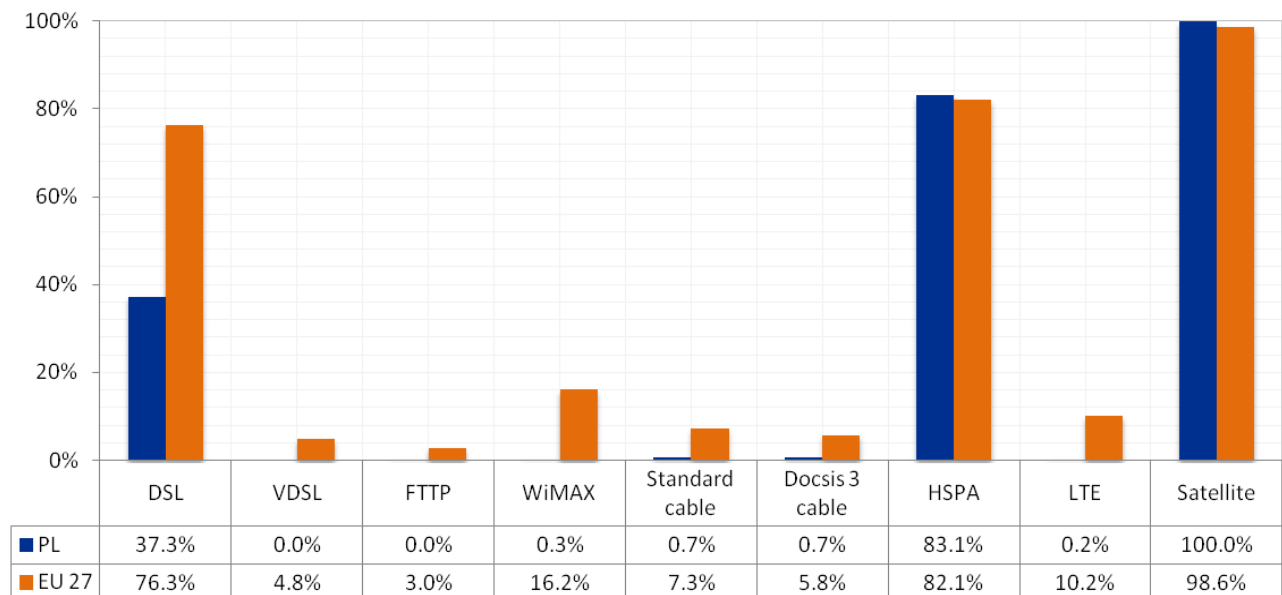
NGA services also favour the most urban centres, and in general the areas with the highest standard fixed broadband coverage also had the highest NGA coverage. This makes sense in a country where most NGA services are delivered through the telephone and cable networks and the FTTP networks are limited.

Poland, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Poland, rural coverage by technology in 2012: comparison with EU

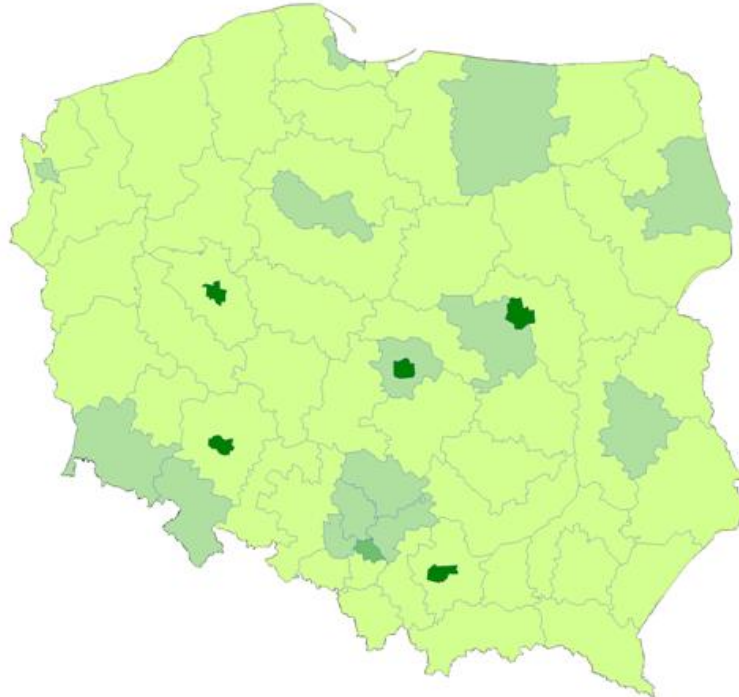
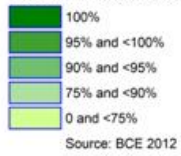


Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.23.2 Regional coverage by broadband technology

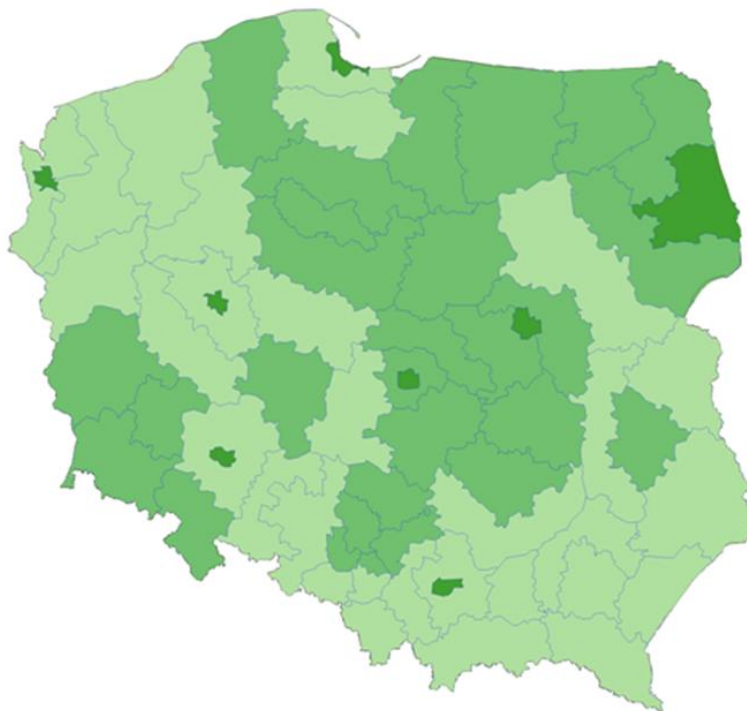
Poland standard fixed broadband coverage

Total standard fixed coverage



Poland Next Generation Access coverage

Total Next Generation Access coverage



3.23.3 Data tables for Poland

Statistic	National
Population	38,200,037
Persons per household	2.8
Rural proportion	20.7%

Technology	PL - 2012		PL - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	60.5%	37.3%	60.4%	37.0%	92.9%	76.3%
VDSL	25.7%	0.0%	11.7%	0.0%	24.9%	4.8%
FTTP	2.9%	0.0%	2.2%	0.0%	12.3%	3.0%
WiMAX	0.3%	0.3%	0.3%	0.3%	17.2%	16.2%
Standard cable	32.4%	0.7%	30.2%	0.6%	42.0%	7.3%
Docsis 3 cable	30.5%	0.7%	30.2%	0.6%	39.3%	5.8%
HSPA	96.5%	83.1%	90.0%	51.9%	96.3%	82.1%
LTE	50.0%	0.2%	25.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	98.4%	92.3%			99.4%	96.1%
Standard fixed	69.1%	37.7%	65.4%	37.5%	95.5%	83.2%
NGA	44.5%	0.7%	36.8%	0.6%	53.7%	12.4%

Notes on data and coverage estimates:

Coverage definitions:

Data supplied for DSL and WiMAX are based on “single-family homes and flats in apartment buildings” rather than households.

VDSL:

It has been commented that the data concerning VDSL could represent just single-family homes and flats in apartment buildings with active VDSL service, not including single-family homes and flats in apartment buildings which are in range of VDSL.

The survey definition for VDSL coverage is:

Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

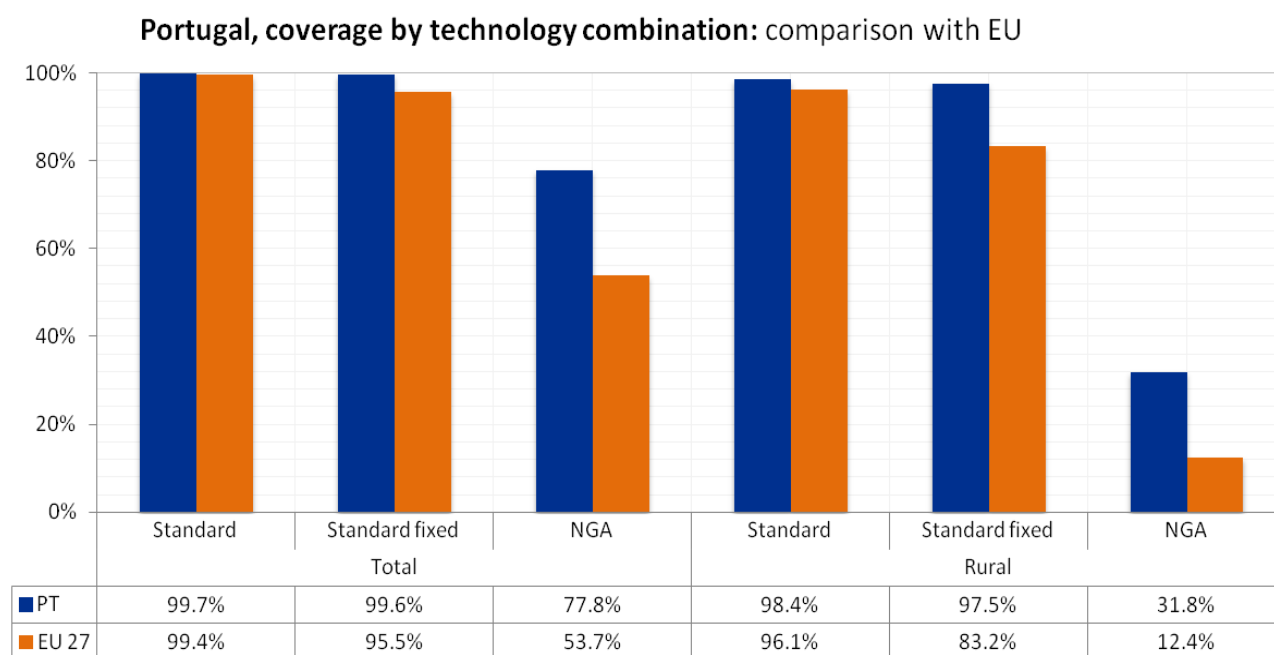
Broadband Coverage in Europe 2012

In Poland, we were not able to confirm the definition for coverage used in the report, and so we assume that it includes all coverage and is not restricted to superfast coverage.

3.24 Portugal

3.24.1 National coverage by broadband technology

Portugal has made major investments in broadband coverage, particularly for next generation access. As a result, despite being a relatively poor country, it was well ahead of the European Union averages for the coverage of standard fixed and NGA services and was a top ten country for all combination measures.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

In 2012 DSL coverage in Portugal remained at 99%, using the definition of coverage as ‘being within the service area of a DSL-enabled exchange’. Given that the Portuguese exchange network is quite thinly spread in rural areas, a performance based definition would reduce the coverage figure.

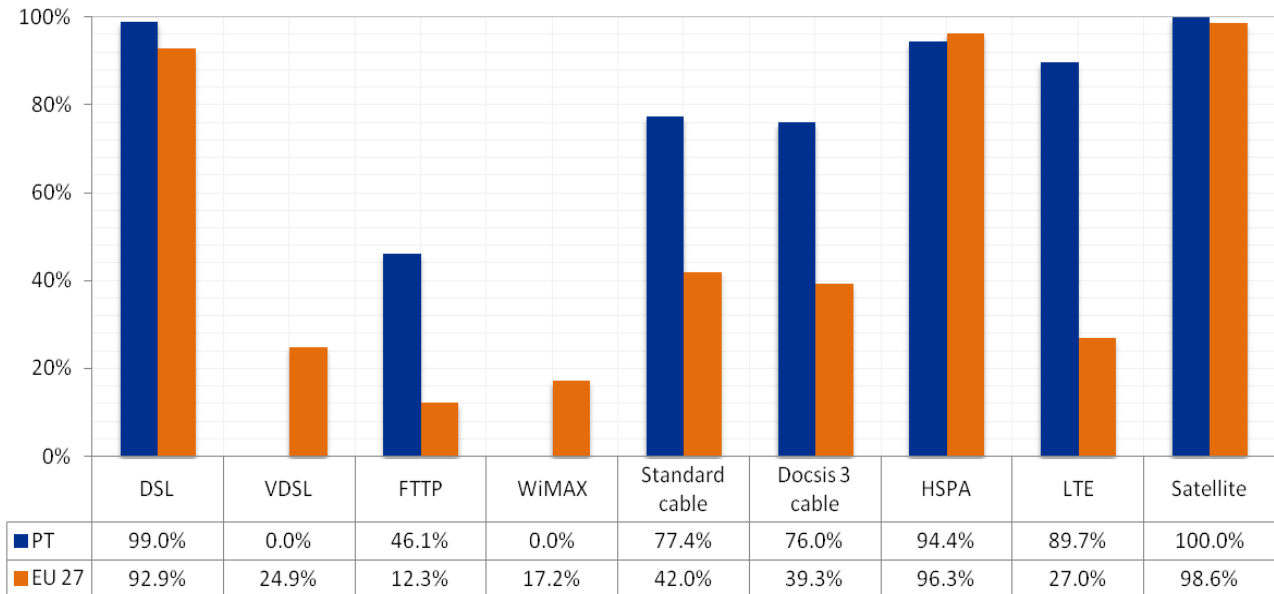
Portugal has an extensive cable network and ranks fifth in the study for both standard cable and Docsis 3 coverage. At the end of 2012 most of the network had been upgraded to Docsis 3, which covered 76% of households. As well as offering extensive Docsis 3 coverage, FTTP covered more than 45% of households in Portugal, making it the most extensive FTTP network in Western Europe. However these networks mostly overlap and FTTP adds very little additional NGA coverage to the Docsis 3 network. Rural areas were also found to benefit from Docsis 3 NGA coverage.

Portugal has one of the largest LTE networks in the study, second only to Sweden with nearly 90% of households covered by the end of 2012. This is remarkable given that services had only launched earlier in the year.

VDSL was not pursued in Portugal, with priority being given instead to FTTP. Also the country had no WiMAX network at the end of 2012.

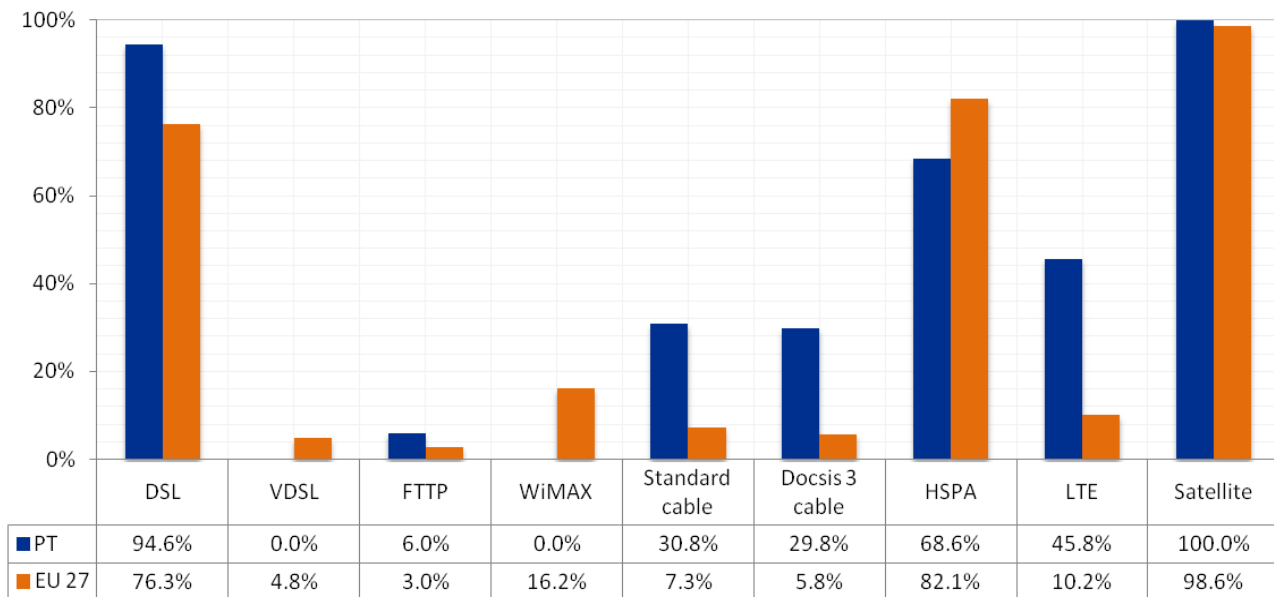
Broadband Coverage in Europe 2012

Portugal, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

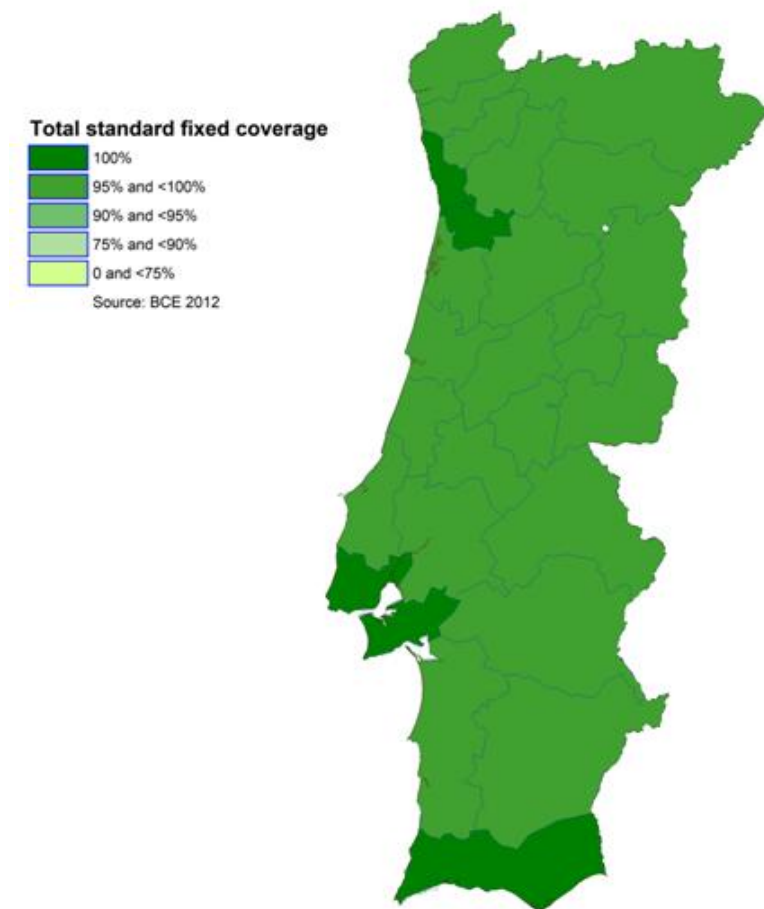
Portugal, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.24.2 Regional coverage by broadband technology

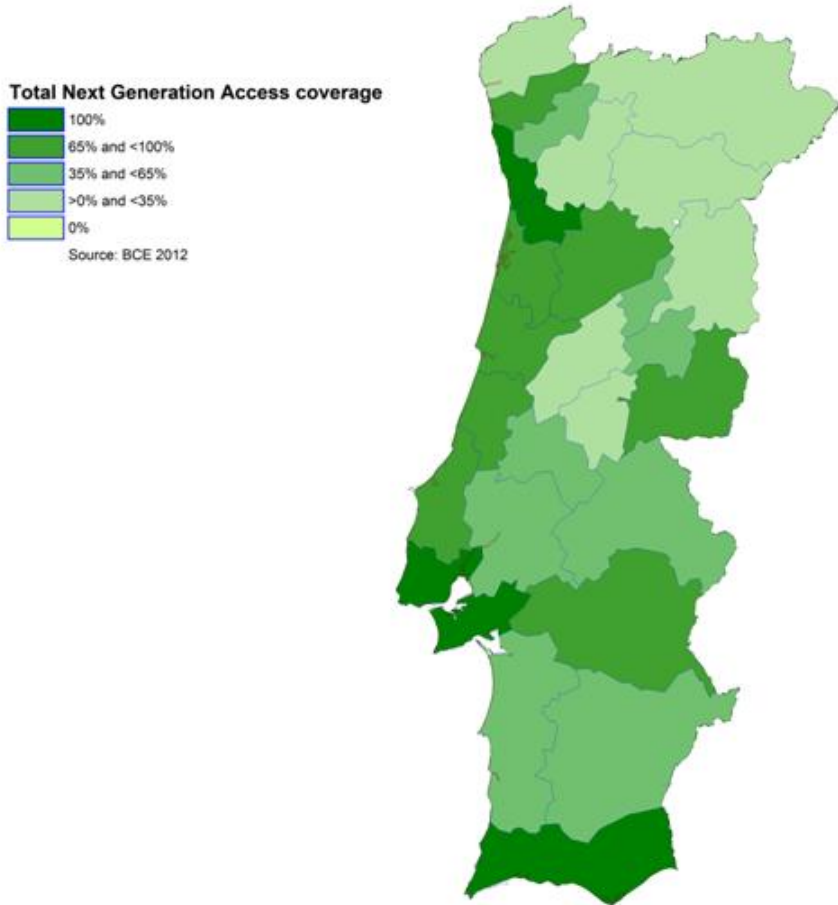
Portugal standard fixed broadband coverage



Portugal had at least 99% standard broadband coverage across all its NUTS 3 areas in 2012. Lisbon and Oporto along with their surrounding areas, as well as the southern province of the Algarve, all enjoyed total coverage.

The coverage of NGA was more varied. The five provinces indicated above had complete coverage. Three coastal provinces, and also the overseas regions of Madeira and the Azores, had between 81 and 95% NGA coverage. It is the northern and north-eastern regions which had the lowest coverage. These do not correspond to the most rural areas of the country.

Portugal Next Generation Access coverage



Coverage areas of Portugal outside mainland Europe:

Country	NUTS code	NUTS area name	Standard fixed coverage	NGA coverage
Portugal	PT200	Açores	99.5%	95.9%
Portugal	PT300	Madeira	99.5%	84.8%

3.24.3 Data tables for Portugal

Statistic	National
Population	10,562,178
Persons per household	2.6
Rural proportion	17.7%

Technology	PT - 2012		PT - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.0%	94.6%	99.0%	94.6%	92.9%	76.3%
VDSL	0.0%	0.0%	0.0%	0.0%	24.9%	4.8%
FTTP	46.1%	6.0%	41.2%	5.1%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	77.4%	30.8%	75.9%	30.1%	42.0%	7.3%
Docsis 3 cable	76.0%	29.8%	73.7%	29.1%	39.3%	5.8%
HSPA	94.4%	68.6%	92.2%	61.1%	96.3%	82.1%
LTE	89.7%	45.8%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.7%	98.4%			99.4%	96.1%
Standard fixed	99.6%	97.5%	99.5%	97.4%	95.5%	83.2%
NGA	77.8%	31.8%	74.5%	30.7%	53.7%	12.4%

3.24.4 Notes on data and coverage estimates:

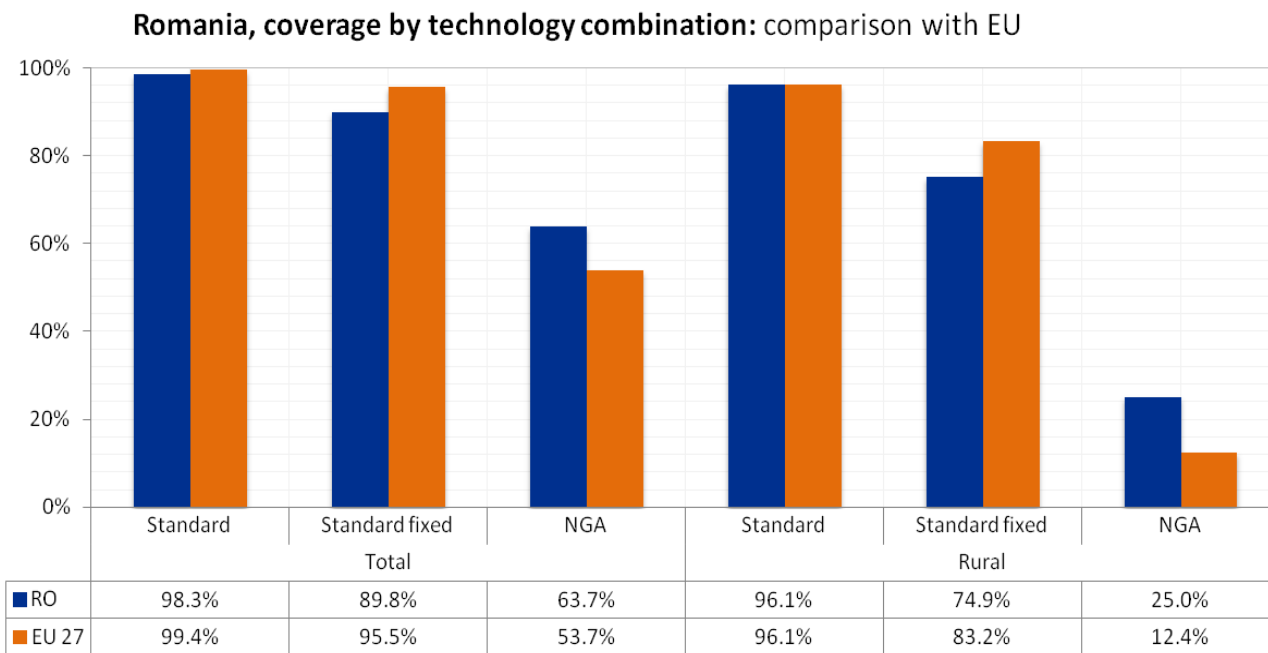
None.

3.25 Romania

3.24.1 National coverage by broadband technology

There have been significant restatements of the data published for broadband coverage at end-2011.

As is typical in Eastern Europe, Romania fell behind the EU average for standard fixed broadband coverage, but was ahead for NGA coverage.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Romania is slightly behind or matches the European Union average for standard coverage. Its HSPA coverage was close to the EU average. But because Romania only had a limited DSL network, it fell behind the EU average for standard fixed coverage – despite having the third largest WiMAX network in the study, and the third largest FTTP network. DSL coverage grew by more than 6 percentage points in 2012; FTTP and WiMAX grew by more than 7p.p..

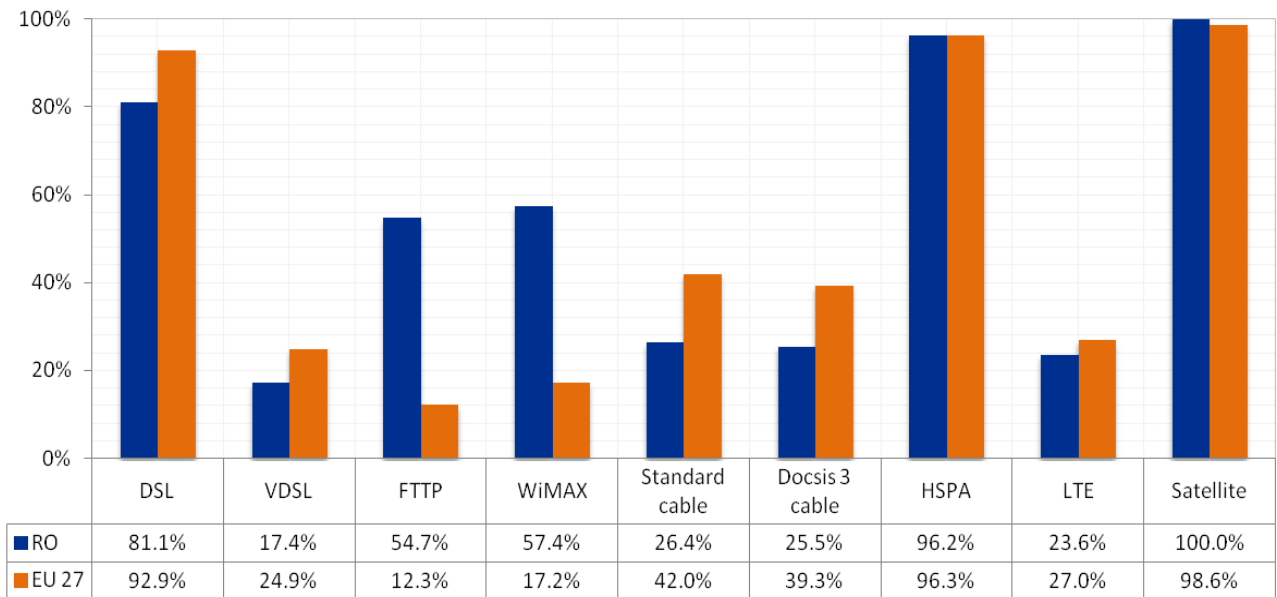
In 2012 Romania had reasonable Docsis 3 and VDSL coverage to support the delivery of NGA services. In particular, FTTP played a big role in bringing NGA services to rural areas of Romania. LTE services were introduced in 2012 and by the end of the year covered over 23% of Romanian households.

Romania’s capital Bucharest and three other regions had complete standard fixed broadband coverage. The pattern of coverage across the rest of the country is difficult to interpret – it seemed to follow no clear geographical pattern and coverage was not highest in the most urban areas.

NGA coverage was again highest in Bucharest. Typically it is the areas with the highest standard fixed broadband coverage which also had the highest NGA coverage, but it is difficult to establish a trend within the data patterns.

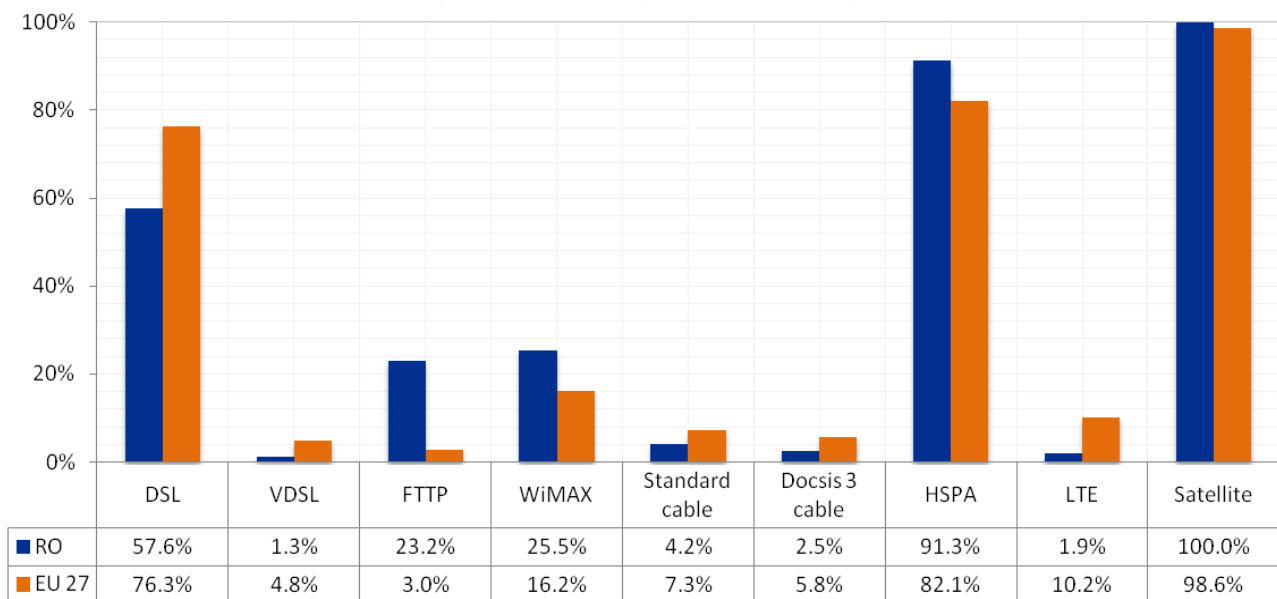
Broadband Coverage in Europe 2012

Romania, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

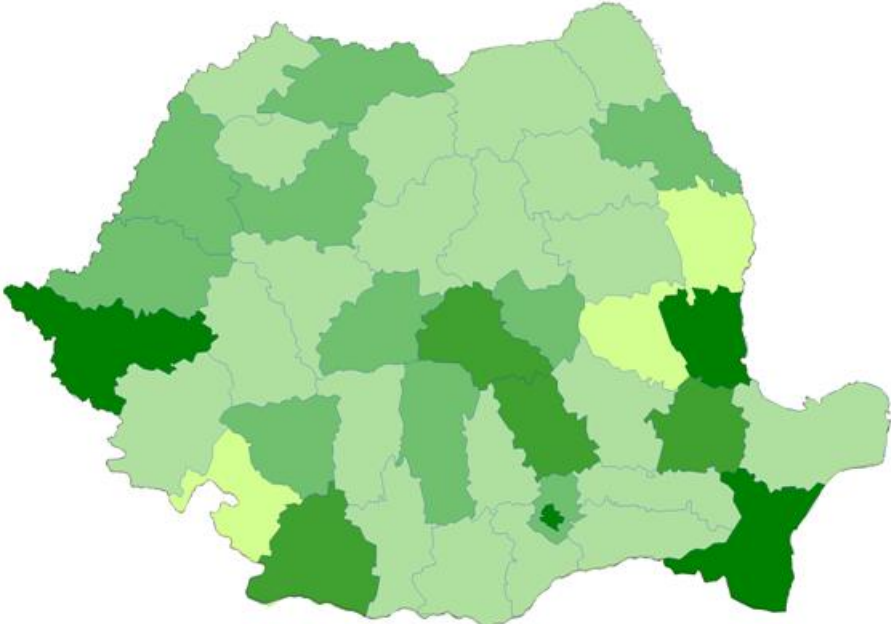
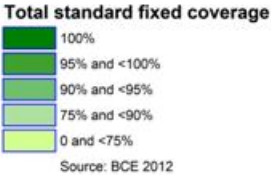
Romania, rural coverage by technology in 2012: comparison with EU



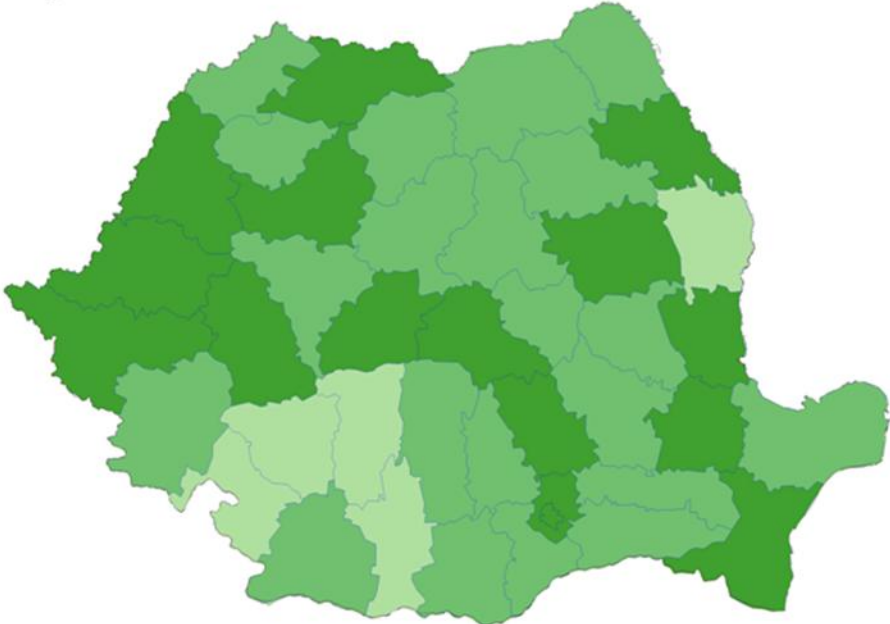
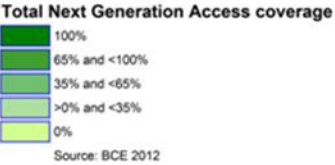
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.25.2 Regional coverage by broadband technology

Romania standard fixed broadband coverage



Romania Next Generation Access coverage



3.25.3 Data tables for Romania

Statistic	National
Population	21,413,815
Persons per household	3.0
Rural proportion	20.9%

Technology	RO - 2012		RO - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	81.1%	57.6%	74.6%	50.6%	92.9%	76.3%
VDSL	17.4%	1.3%	17.4%	1.3%	24.9%	4.8%
FTTP	54.7%	23.2%	47.5%	20.0%	12.3%	3.0%
WiMAX	57.4%	25.5%	50.0%	20.0%	17.2%	16.2%
Standard cable	26.4%	4.2%	23.8%	4.0%	42.0%	7.3%
Docsis 3 cable	25.5%	2.5%	22.9%	2.0%	39.3%	5.8%
HSPA	96.2%	91.3%	95.9%	90.0%	96.3%	82.1%
LTE	23.6%	1.9%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	98.3%	96.1%			99.4%	96.1%
Standard fixed	89.8%	74.9%	86.8%	68.4%	95.5%	83.2%
NGA	63.7%	25.0%	57.4%	21.6%	53.7%	12.4%

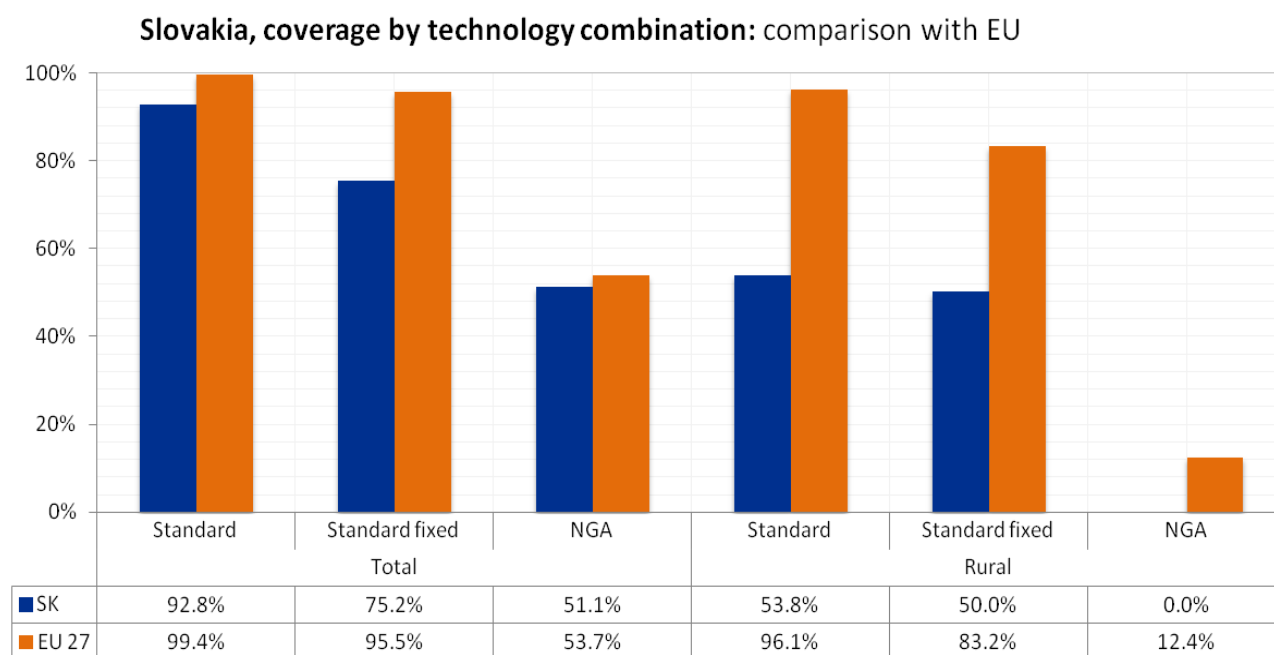
3.25.4 Notes on data and coverage estimates:

None.

3.26 Slovakia

3.26.1 National coverage by broadband technology

Slovakia fell behind the European Union average for all measures of standard and NGA coverage. Whilst it is typical for the more eastern countries in the study to have lower than average standard fixed broadband coverage, most make up for this with very extensive NGA coverage. However in Slovakia even NGA coverage fell slightly behind the EU average.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

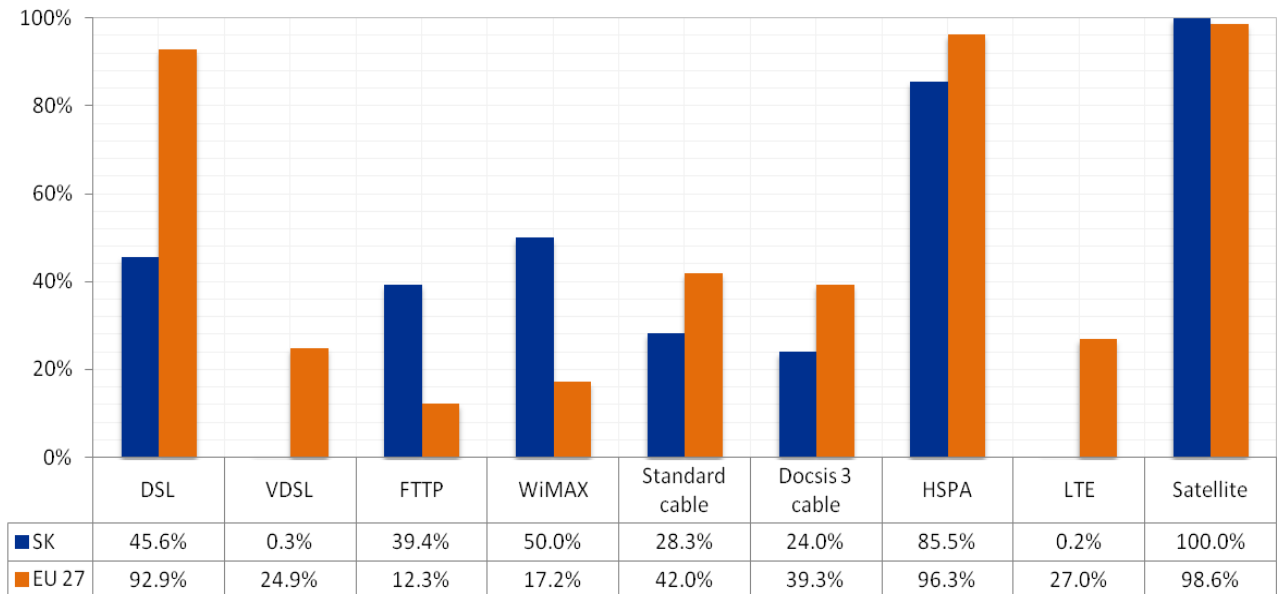
As the technology profile shows, standard fixed broadband coverage was limited in Slovakia because the DSL network only covered 46% of households and no rural households. HSPA was also comparatively limited, particularly in rural areas. WiMAX filled some of the coverage gap left by DSL and HSPA, particularly in rural areas, and FTTP provided nearly 40% coverage in urban areas. But overall, Slovakia fell behind the EU averages for all standard coverage measures.

FTTP solutions in Slovakia typically involve fibre backhaul from distribution nodes in large system-built apartment blocks. By the end of 2012 there were none of these apartment blocks in rural areas. There is a cable network in Slovakia, but this only contributed 24% coverage of Docsis 3 services and no coverage in rural areas. Overall we estimate that none of the most rural households in Slovakia could access NGA services and only half could access basic fixed-line broadband services in 2012. Slovakia is covered by satellite broadband, which at least means that its whole population could access at least one basic broadband service.

Slovakia’s cable network grew by over 6p.p. in 2012, but mostly in areas that could already access standard fixed broadband services – overall standard fixed coverage did not grow by much in the year. The extension of the Docsis 3 network did make a positive impact on NGA coverage in Slovakia, which grew by nearly 4p.p. in the year. At the end of 2012 there were only small scale LTE and VDSL deployments.

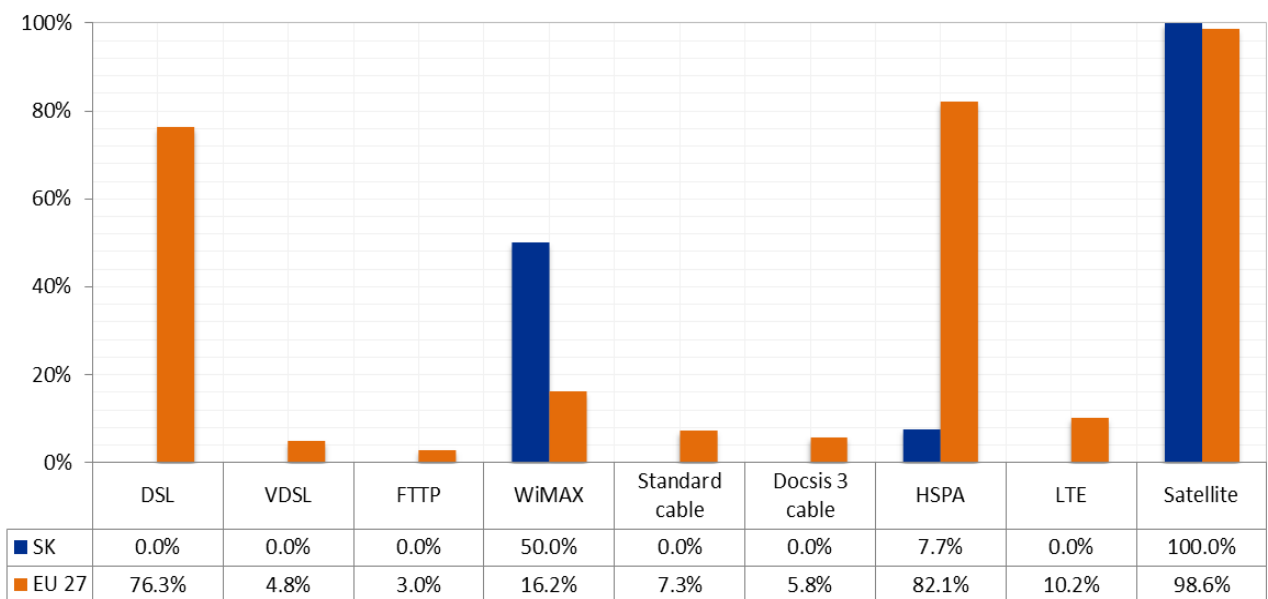
Broadband Coverage in Europe 2012

Slovakia, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

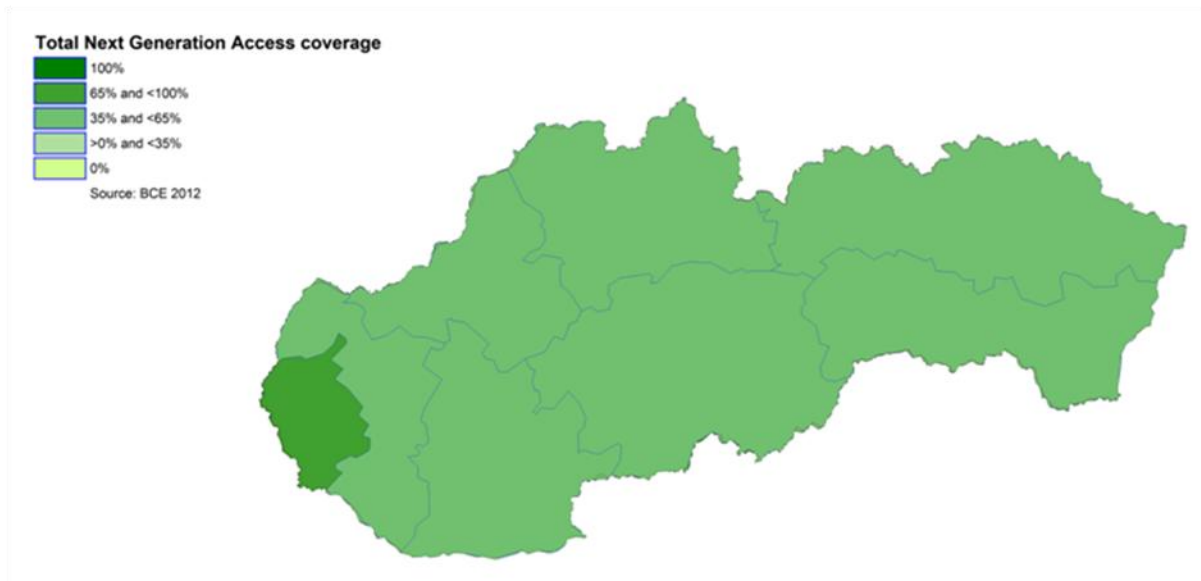
Slovakia, rural coverage by technology in 2012: comparison with EU



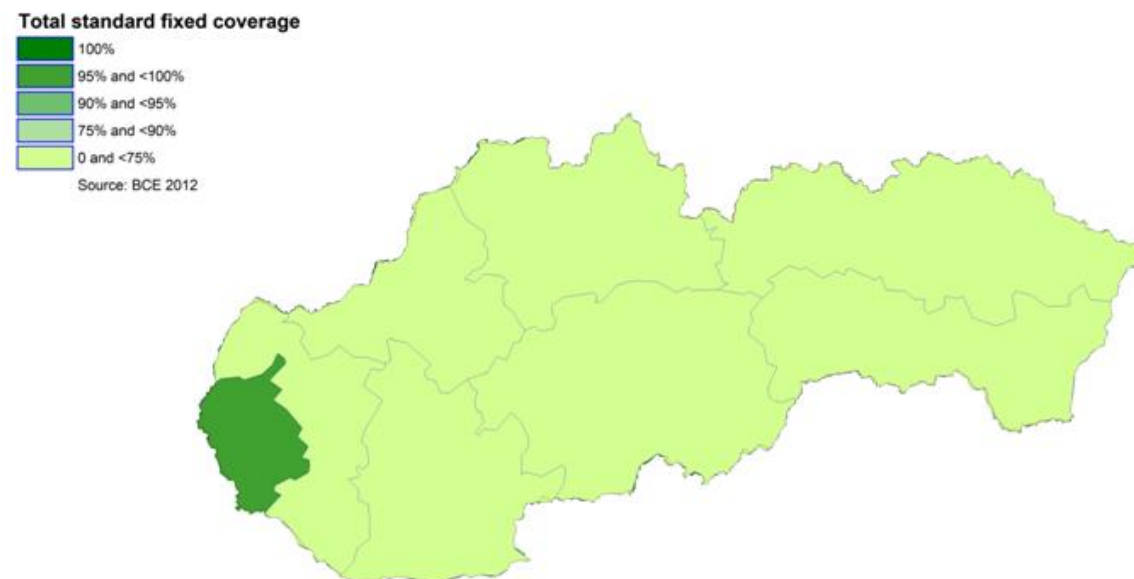
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.26.2 Regional coverage by broadband technology

Slovakia standard fixed broadband coverage



Slovakia Next Generation Access coverage



Standard fixed broadband coverage in Slovakia was highest in the Bratislava province, at 95%. All other provinces had coverage ranging between 70 and 75%.

Bratislava also led on NGA coverage, because it enjoyed the best coverage of Docsis 3 in the country. Coverage was lowest in the Nitriansky province at 40%.

3.26.3 Data tables for Slovakia

Statistic	National
Population	5,404,322
Persons per household	2.8
Rural proportion	14.8%

Technology	SK - 2012		SK - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	45.6%	0.0%	43.9%	0.0%	92.9%	76.3%
VDSL	0.3%	0.0%	0.0%	0.0%	24.9%	4.8%
FTTP	39.4%	0.0%	38.9%	0.0%	12.3%	3.0%
WiMAX	50.0%	50.0%	50.0%	50.0%	17.2%	16.2%
Standard cable	28.3%	0.0%	21.5%	0.0%	42.0%	7.3%
Docsis 3 cable	24.0%	0.0%	16.6%	0.0%	39.3%	5.8%
HSPA	85.5%	7.7%	85.5%	7.6%	96.3%	82.1%
LTE	0.2%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	92.8%	53.8%			99.4%	96.1%
Standard fixed	75.2%	50.0%	75.0%	50.0%	95.5%	83.2%
NGA	51.1%	0.0%	47.2%	0.0%	53.7%	12.4%

3.26.4 Notes on data and coverage estimates

DSL:

Data provided reports only number of accesses. Number of households covered by the technology is an estimate, not exact number.

A top down view of coverage was defined as follows

- a) If inside a municipality a technical node is deployed with broadband technology, this municipality is counted as covered;
- b) If a municipality do not have an own technical node with broadband technology, it is deemed as not covered;
- c) But if such a municipality is in the reach and connection of another municipality that could serve the not directly deployed municipality, it could be deemed as covered.

Such a top down approach lacks in the following circumstances:

Broadband Coverage in Europe 2012

- Not all municipalities that are deployed with broadband nodes can cover the whole municipality,
- Not all municipalities that could be served by neighbourhood broadband nodes can cover all parts of the municipality in question,
- Several of the municipalities that do not have own network nodes could be served by many other network nodes that are not all counted due to their relevance.

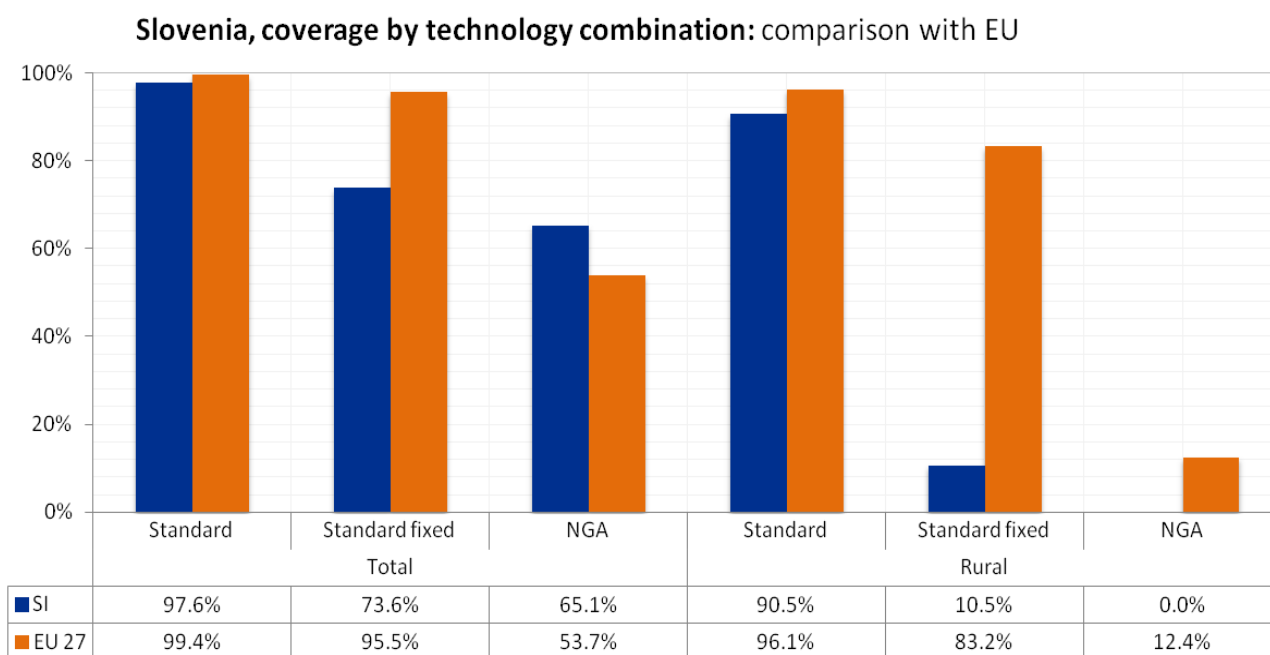
The possible coverage provided shall only present a technical coverage scenario based on internal assumptions if everything works right. Therefore the coverage values are presented as a number of calculated households per municipalities based on the number of inhabitants EY 2011.

Technical coverage refers to the percentage of households that are able to obtain DSL services, taking into account the technical and physical constraints in Slovak Telekom's network.

3.27 Slovenia

3.27.1 National coverage by broadband technology

Slovenia has a similar profile to other Eastern European nations. Standard and standard fixed broadband coverage both fell below the European Union averages for coverage. Overall NGA coverage was advanced, with more than 65% of households covered in 2012, but the most rural households were not able to access the high-speed services.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

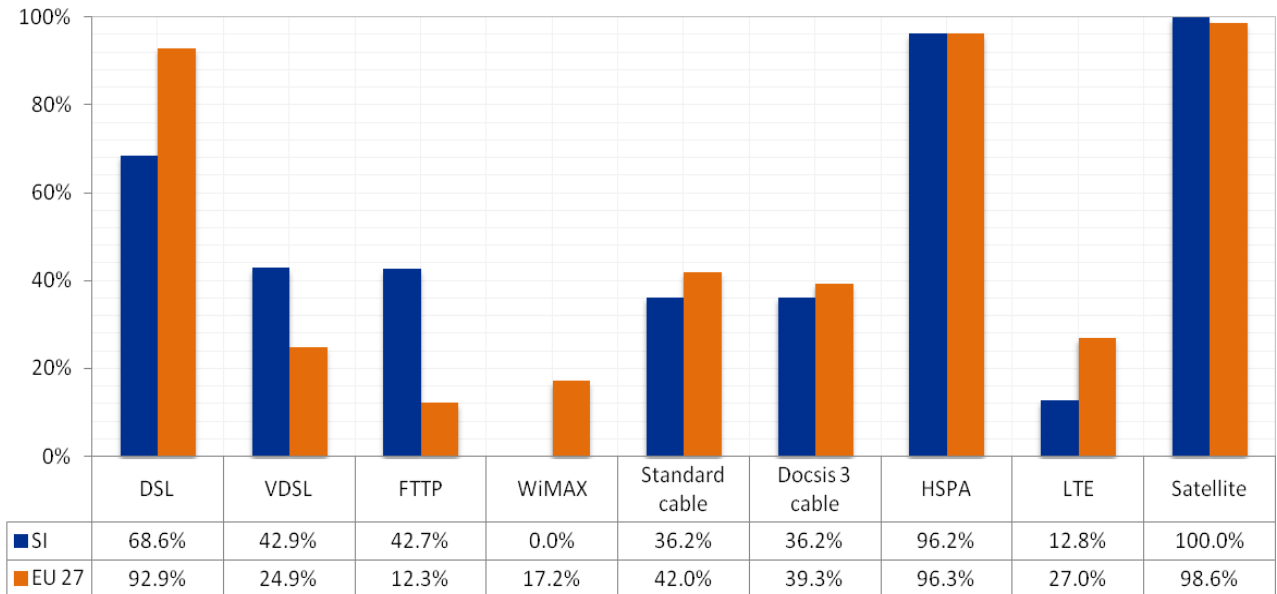
DSL services covered less than 70% of the households in Slovenia in 2012, placing it well below the EU average for coverage. This affects Slovenia's coverage of both standard and standard fixed broadband services. Since we reported last year, it has been confirmed that there is no WiMAX network in Slovenia, which has further reduced our estimate for standard fixed coverage in Slovenia.

Slovenia is making use of a wider range of technologies than some other countries in its area. VDSL, FTTP and Docsis 3 all made a contribution to the country's overall NGA coverage in 2012. Over half of the DSL network had been upgraded to VDSL, contributing to the high NGA coverage reported.

LTE services launched in 2012 and by the end of the year covered nearly 13% of households. HSPA coverage was found to be comparable to the EU average.

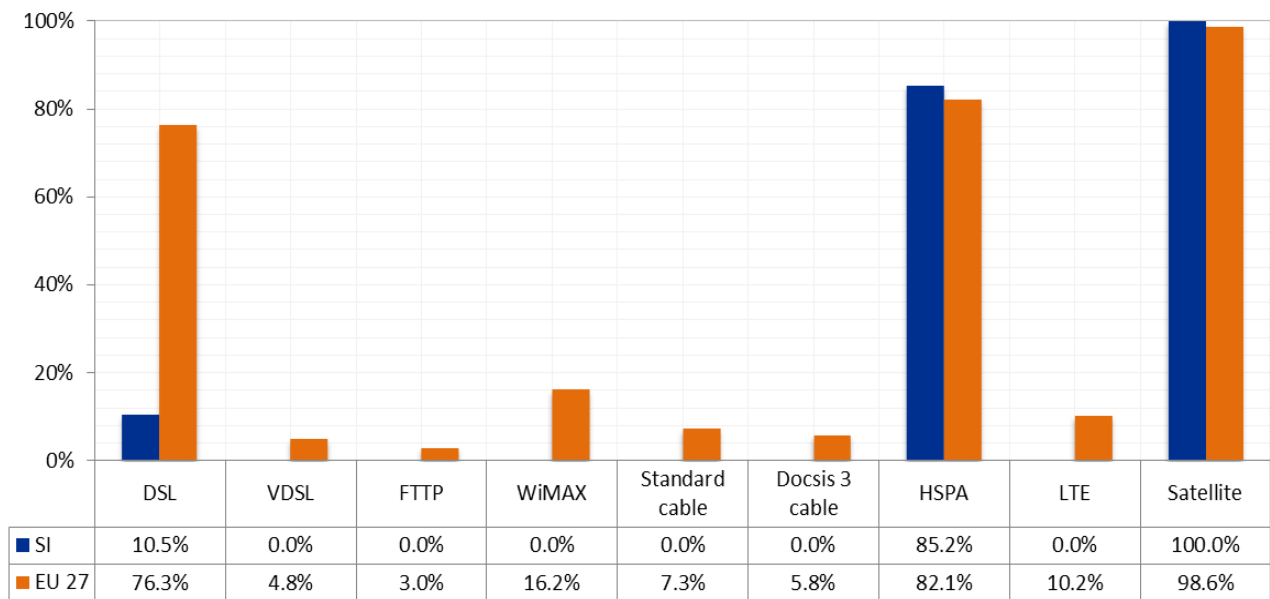
Broadband Coverage in Europe 2012

Slovenia, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

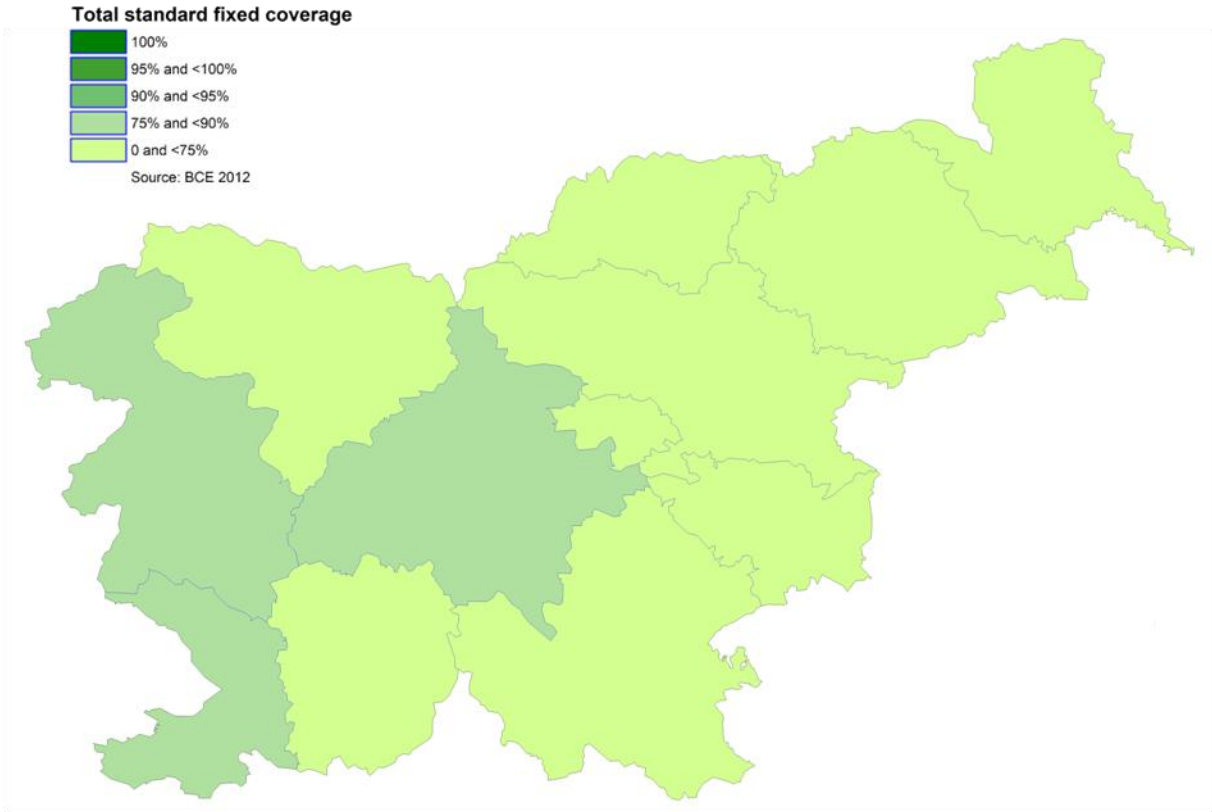
Slovenia, rural coverage by technology in 2012: comparison with EU



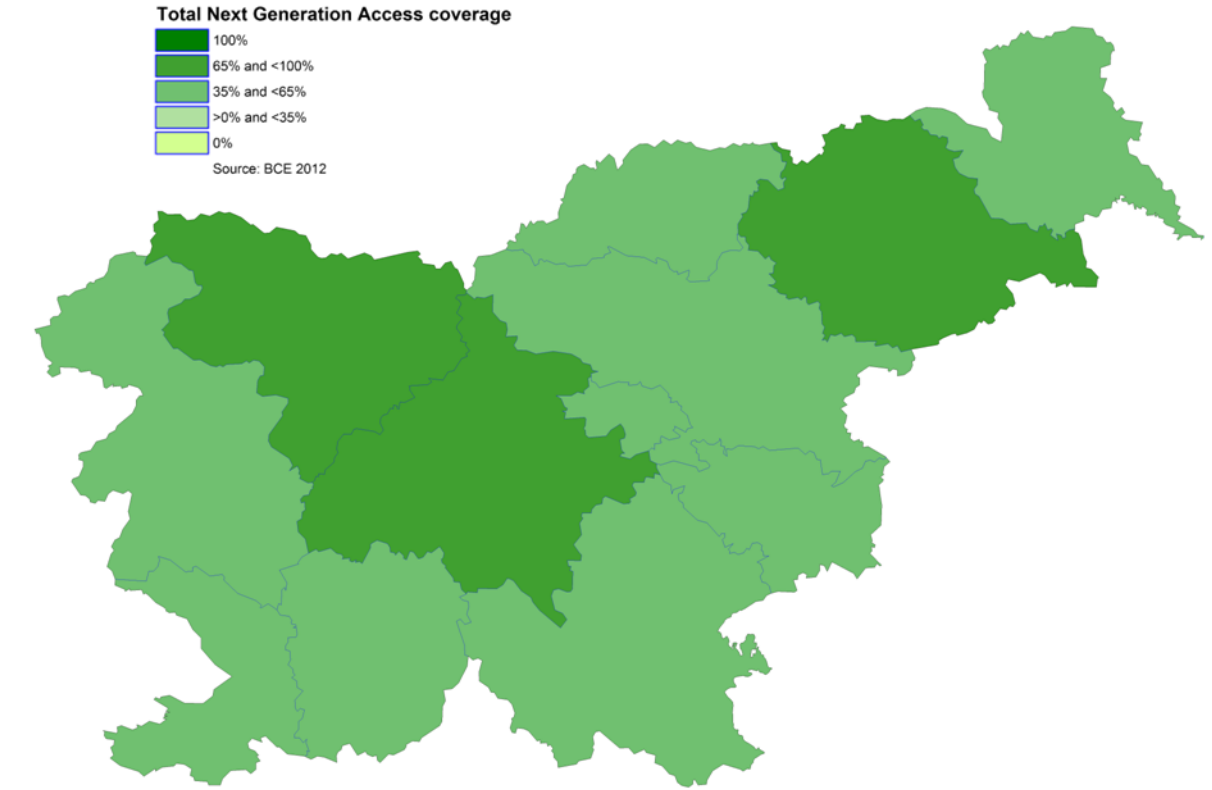
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.27.2 Regional coverage by broadband technology

Slovenia standard fixed broadband coverage



Slovenia Next Generation Access coverage



Broadband Coverage in Europe 2012

The two areas with the highest NGA coverage – Podravska and Osrednjeslovenska – both enjoyed coverage from all three NGA technologies in 2012. In general, the most rural areas had the lowest NGA coverage. The pattern for standard fixed broadband coverage in Slovenia reflects the deployment of DSL services across the country.

3.27.3 Data tables for Slovenia

Statistic	National
Population	2,050,189
Persons per household	2.5
Rural proportion	25.6%

Technology	SI - 2012		SI - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	68.6%	10.5%	71.8%	13.7%	92.9%	76.3%
VDSL	42.9%	0.0%	41.5%	0.0%	24.9%	4.8%
FTTP	42.7%	0.0%	38.6%	0.0%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	36.2%	0.0%	36.0%	0.0%	42.0%	7.3%
Docsis 3 cable	36.2%	0.0%	36.0%	0.0%	39.3%	5.8%
HSPA	96.2%	85.2%	95.6%	83.0%	96.3%	82.1%
LTE	12.8%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	97.6%	90.5%			99.4%	96.1%
Standard fixed	73.6%	10.5%	75.8%	13.7%	95.5%	83.2%
NGA	65.1%	0.0%	62.7%	0.0%	53.7%	12.4%

3.27.4 Notes on data and coverage estimates

VDSL:

The survey definition for VDSL coverage is:

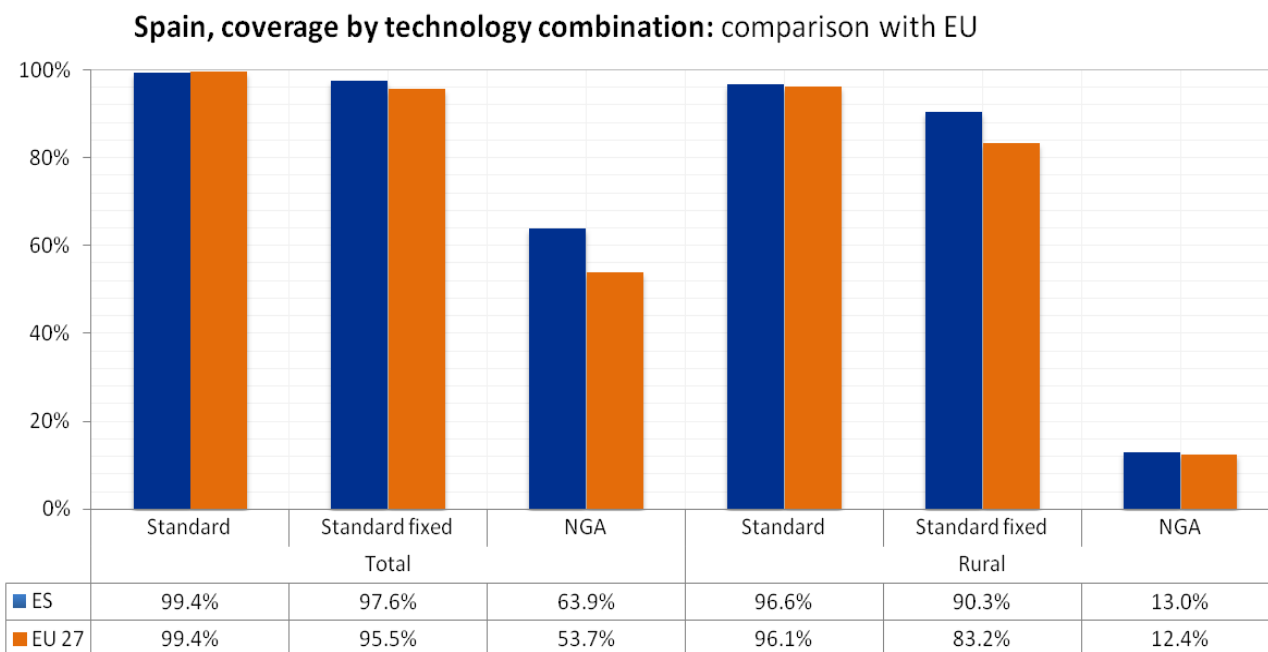
Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

In Slovenia, we were not able to confirm the definition for coverage used in the report, and so we assume that it includes all coverage and is not restricted to superfast coverage.

3.28 Spain

3.28.1 National coverage by broadband technology

Spain has made a major commitment to developing its broadband infrastructure. Despite its thinly populated countryside it is ahead of the European Union averages on all technology combinations.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

In 2012, the backbone of Spain’s NGA coverage was provided by an extensive cable network, covering more than half of Spanish households and mostly upgraded to Docsis 3. VDSL and FTTP contributed a further 13% to the overall NGA coverage in Spain. We estimate that at the end of most of the rural NGA coverage is supplied by Docsis 3 cable, with no coverage provided by VDSL or FTTP.

LTE services had not yet been launched in 2012, but Spain’s HSPA network is more developed than most. WiMAX contributes significantly to standard coverage in rural areas, and Spain has the fourth largest WiMAX network in the study.

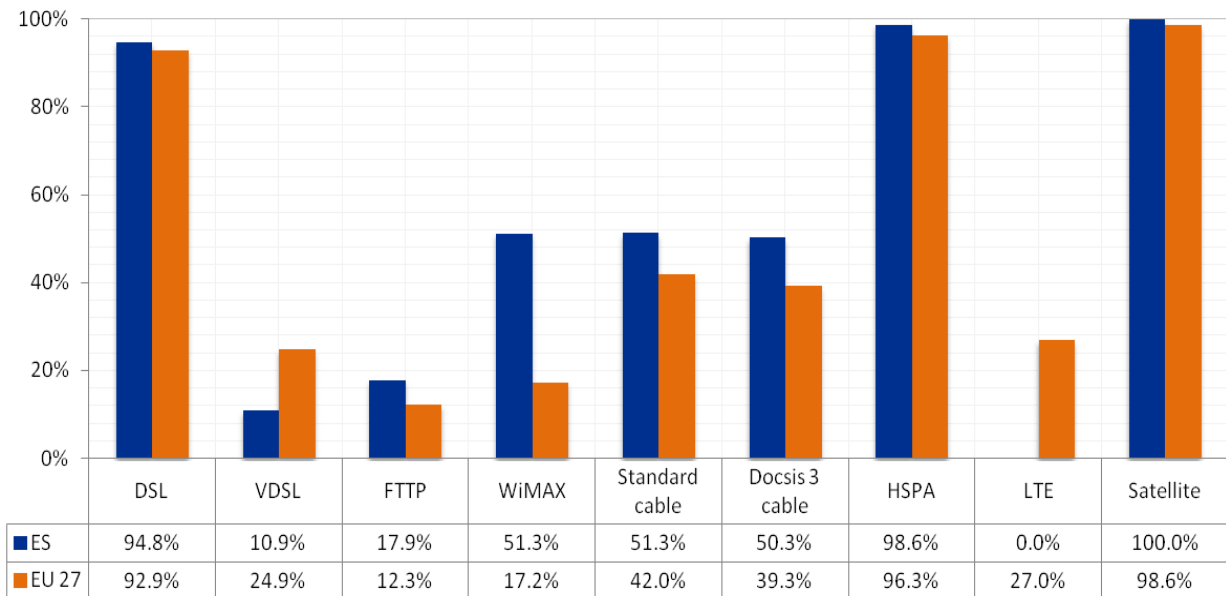
Spain is only behind the rest of the EU when it comes to LTE and VDSL services. Only 11% of the DSL network had been upgraded to VDSL at the end of 2012.

Standard fixed broadband coverage is fairly uniform across Spain. Its lowest coverage is reported on the overseas province of El Hierro, which has a limited DSL network covering only 64% of households.

In terms of its NGA coverage, the northern regions of Spain tend to lead, as well as some other coastal regions. It is the overseas provinces and the Mediterranean islands which tend to have the lowest NGA coverage in Spain.

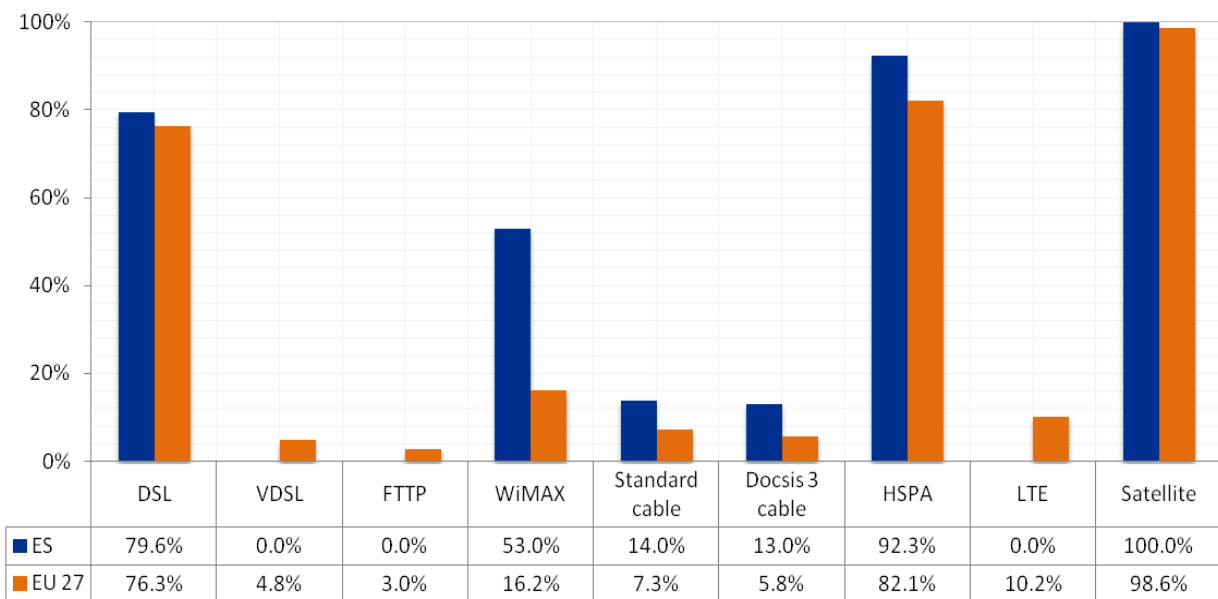
Broadband Coverage in Europe 2012

Spain, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

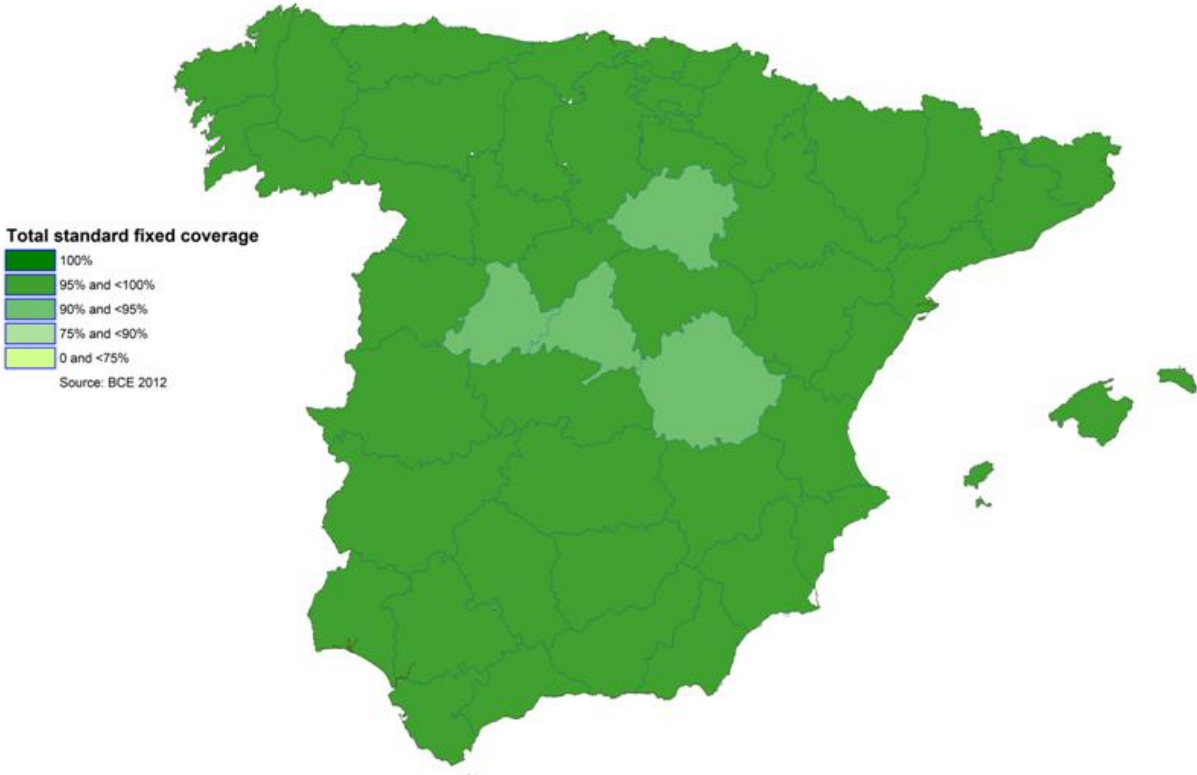
Spain, rural coverage by technology in 2012: comparison with EU



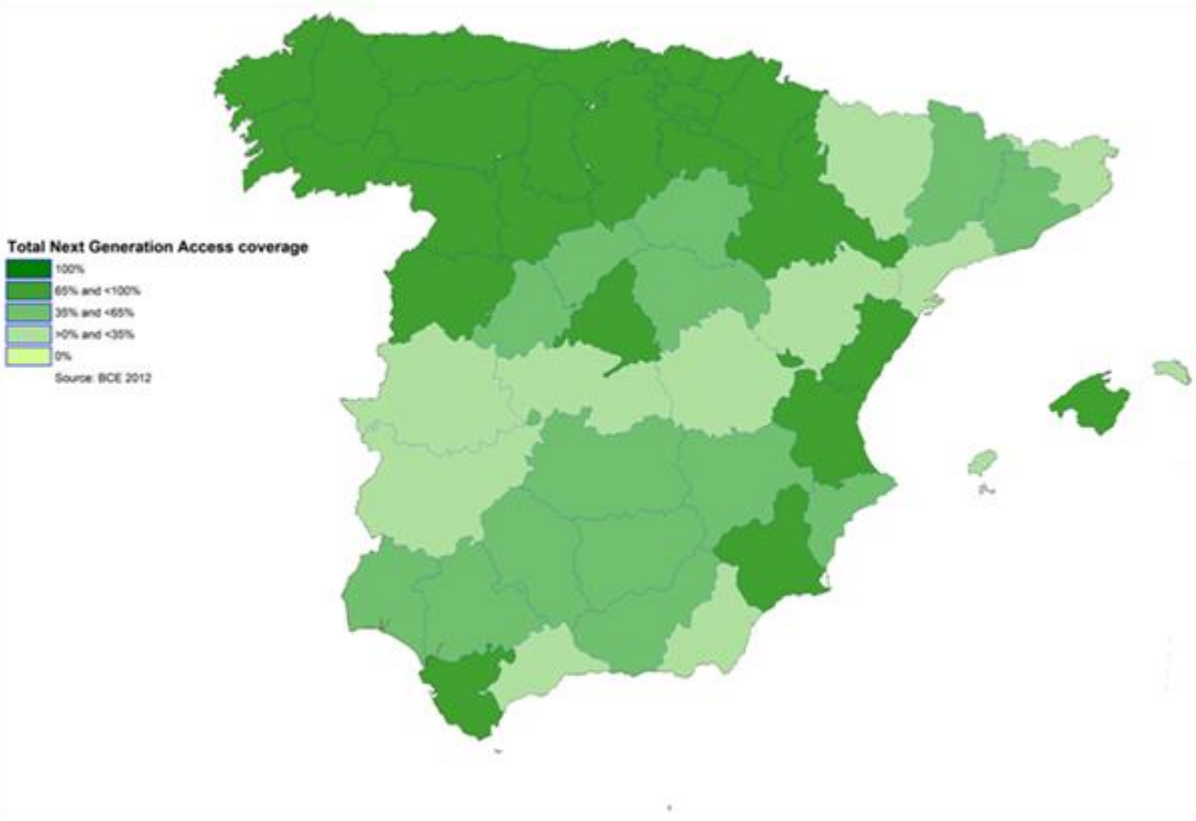
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.28.2 Regional coverage by broadband technology

Spain standard fixed broadband coverage



Spain Next Generation Access coverage



Broadband Coverage in Europe 2012

Coverage data for Spanish NUTS 3 areas outside mainland Europe

Country	NUTS code	NUTS area name	Standard fixed coverage	NGA coverage
Spain	ES630	Ceuta	97.2%	13.7%
Spain	ES640	Melilla	97.7%	2.8%
Spain	ES703	El Hierro	63.8%	4.2%
Spain	ES704	Fuerteventura	94.7%	9.7%
Spain	ES705	Gran Canaria	95.7%	61.6%
Spain	ES706	La Gomera	91.1%	17.2%
Spain	ES707	La Palma	95.4%	9.3%
Spain	ES708	Lanzarote	96.3%	36.5%
Spain	ES709	Tenerife	95.7%	51.4%

3.28.3 Data tables for Spain

Statistic	National
Population	47,021,031
Persons per household	2.7
Rural proportion	17.7%

Technology	ES - 2012		ES - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	94.8%	79.6%	93.3%	68.9%	92.9%	76.3%
VDSL	10.9%	0.0%	10.9%	0.0%	24.9%	4.8%
FTTP	17.9%	0.0%	9.7%	0.0%	12.3%	3.0%
WiMAX	51.3%	53.0%	47.6%	49.1%	17.2%	16.2%
Standard cable	51.3%	14.0%	46.9%	7.5%	42.0%	7.3%
Docsis 3 cable	50.3%	13.0%	46.0%	6.6%	39.3%	5.8%
HSPA	98.6%	92.3%	97.1%	83.8%	96.3%	82.1%
LTE	0.0%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.4%	96.6%			99.4%	96.1%
Standard fixed	97.6%	90.3%	96.4%	84.1%	95.5%	83.2%
NGA	63.9%	13.0%	56.0%	6.6%	53.7%	12.4%

3.28.4 Notes on data and coverage estimates:

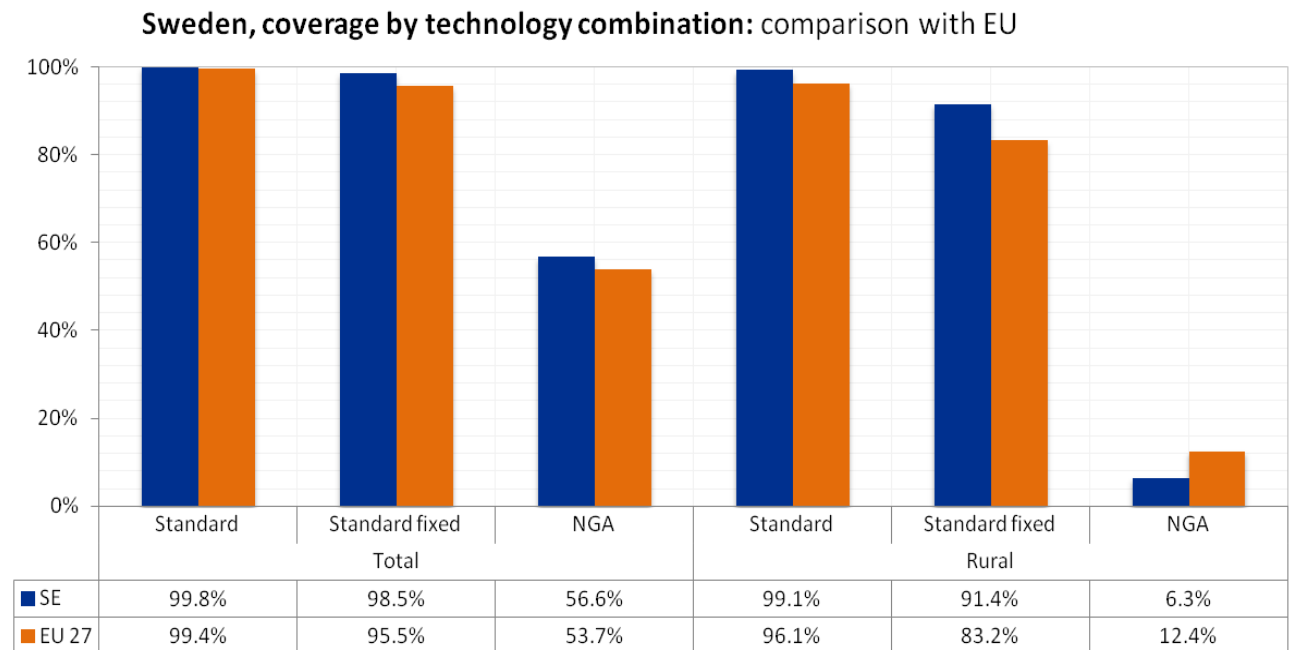
Cable and FTTH

To calculate households passed from the data reported by the FTTH and HFC operators a conversion factor was applied.

3.29 Sweden

3.29.1 National coverage by broadband technology

Sweden is ahead of the European Union averages for every technology measure, except rural NGA coverage. Using our new methodology for defining rural households, Sweden is one of the few countries which now has a greater number of rural households, and its NGA networks are mostly not reaching these most rural households.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

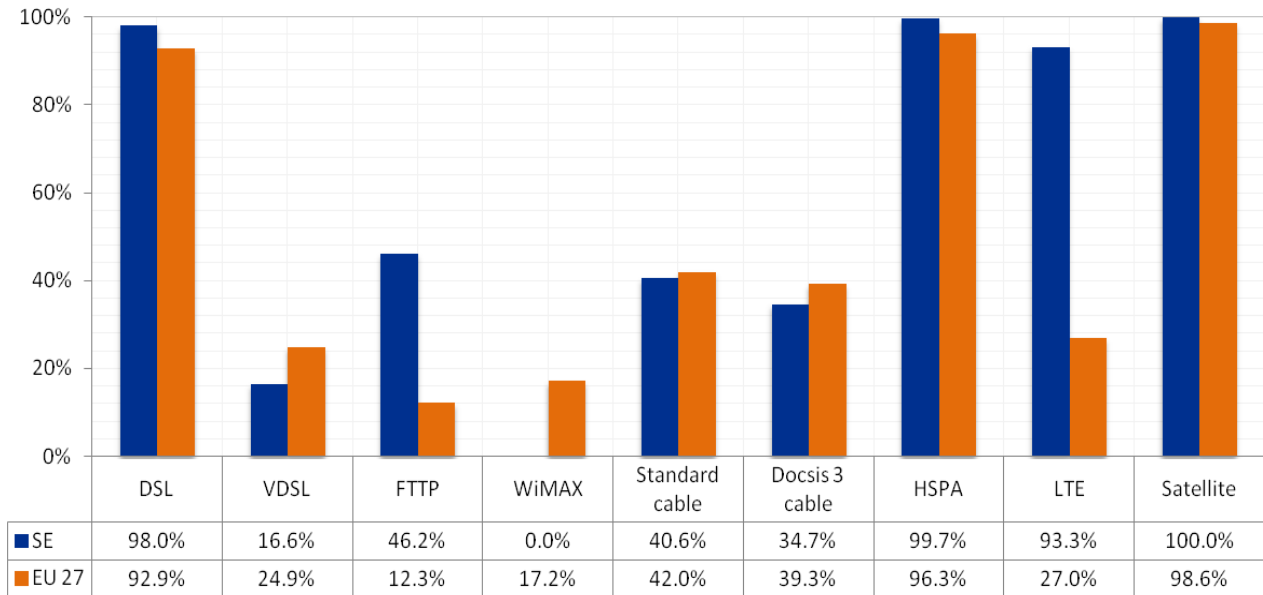
Sweden has the highest reported coverage for LTE services in the study. At the end of 2012 more than 93% of households could access LTE services, including more than 70% of rural households. The network grew considerably in 2012, reaching an extra 45% of households in the year. In fact LTE is now the most extensive service in Sweden after DSL, HSPA and satellite, which became available in Sweden during 2012.

Like other Nordic countries, Sweden has invested heavily in its FTTP networks. Sweden reports the highest FTTP coverage in all Nordic countries with nearly 50% of all households covered by this service. FTTP is the main contributor to NGA service delivery in Sweden. Docsis 3 coverage has grown within 2012, but it still only serves 35% of households. VDSL is more limited still, covering around 17% of households. Overall NGA coverage is reported at nearly 57%, and there is significant overlap between the NGA networks.

Every region in Sweden has more than 90% standard fixed broadband coverage. Stockholm has the highest NGA coverage in Sweden, and the nearby areas of Västerbottens and Örebro also have high coverage. In general it is the most northern regions that enjoy the highest NGA coverage, and NGA services are not focused on the most urban regions.

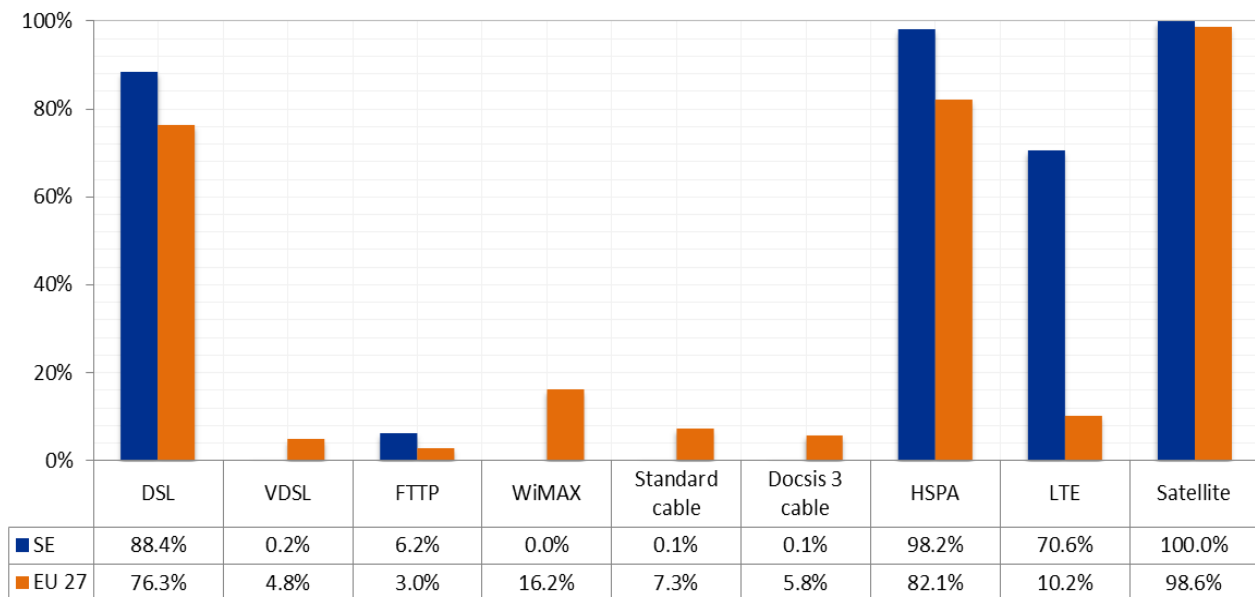
Broadband Coverage in Europe 2012

Sweden, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

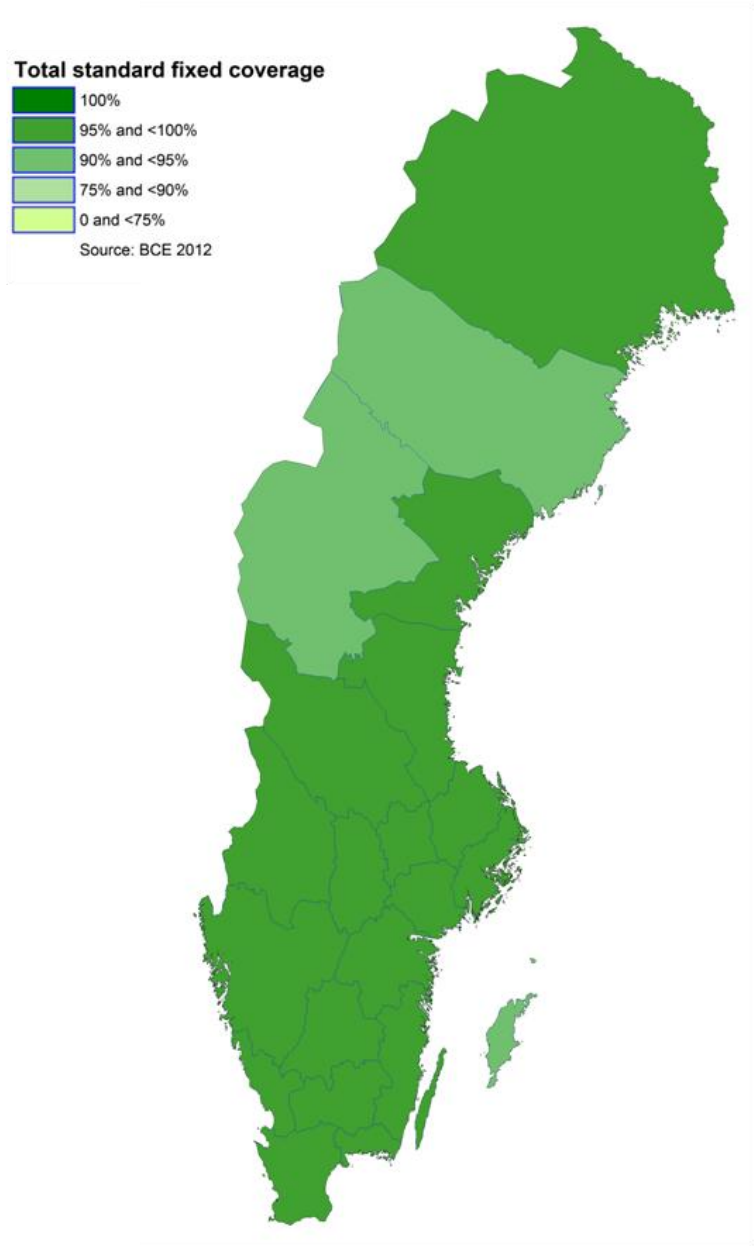
Sweden, rural coverage by technology in 2012: comparison with EU



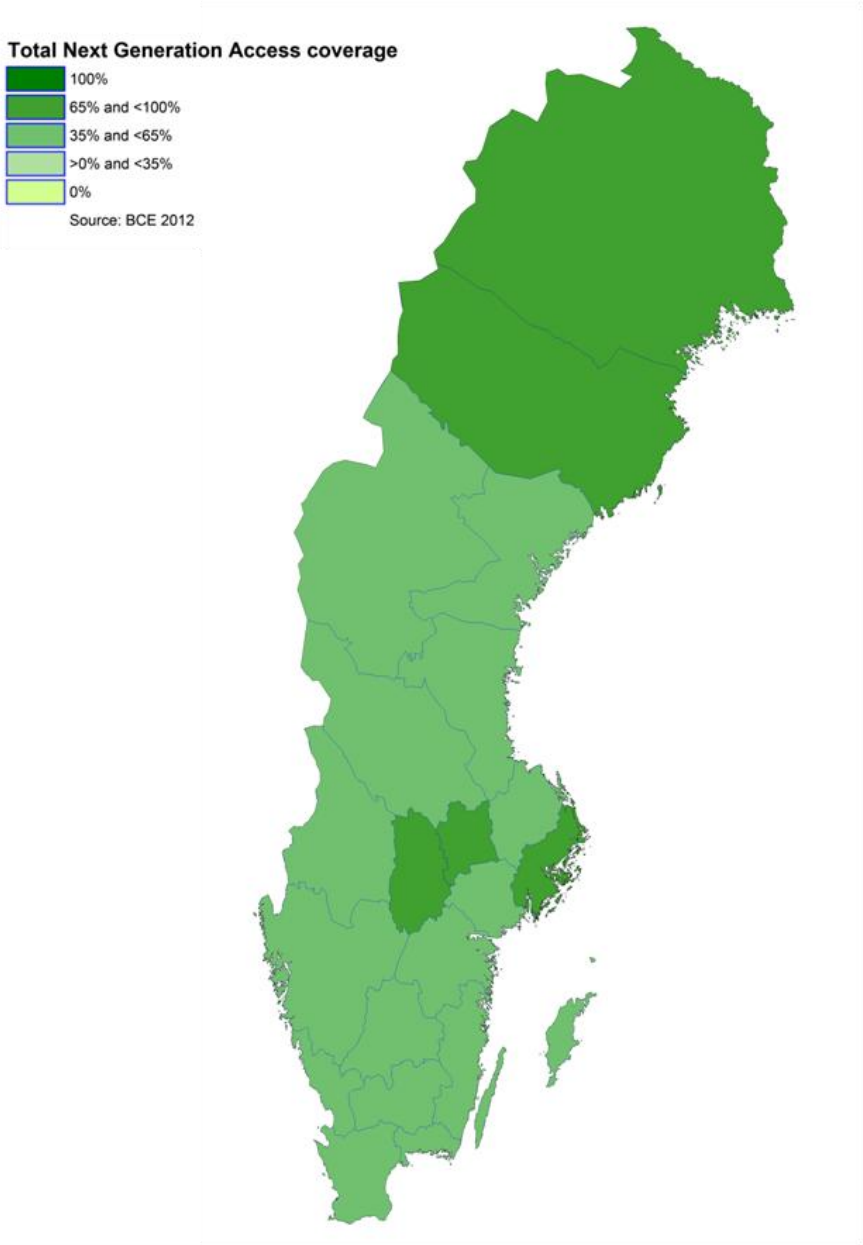
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.29.2 Regional coverage by broadband technology

Sweden standard fixed broadband coverage



Sweden Next Generation Access coverage



3.29.3 Data tables for Sweden

Statistic	National
Population	9,482,855
Persons per household	2.1
Rural proportion	17.0%

Technology	SE - 2012		SE - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	98.0%	88.4%	98.0%	88.3%	92.9%	76.3%
VDSL	16.6%	0.2%	16.7%	0.2%	24.9%	4.8%
FTTP	46.2%	6.2%	46.2%	4.7%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	40.6%	0.1%	36.8%	0.1%	42.0%	7.3%
Docsis 3 cable	34.7%	0.1%	31.0%	0.1%	39.3%	5.8%
HSPA	99.7%	98.2%	99.6%	97.9%	96.3%	82.1%
LTE	93.3%	70.6%	48.1%	7.2%	27.0%	10.2%
Satellite	100.0%	100.0%	0.0%	0.0%	98.6%	98.6%
Standard	99.8%	99.1%			99.4%	96.1%
Standard fixed	98.5%	91.4%	98.1%	91.0%	95.5%	83.2%
NGA	56.6%	6.3%	53.4%	4.9%	53.7%	12.4%

3.29.4 Notes on data and coverage estimates

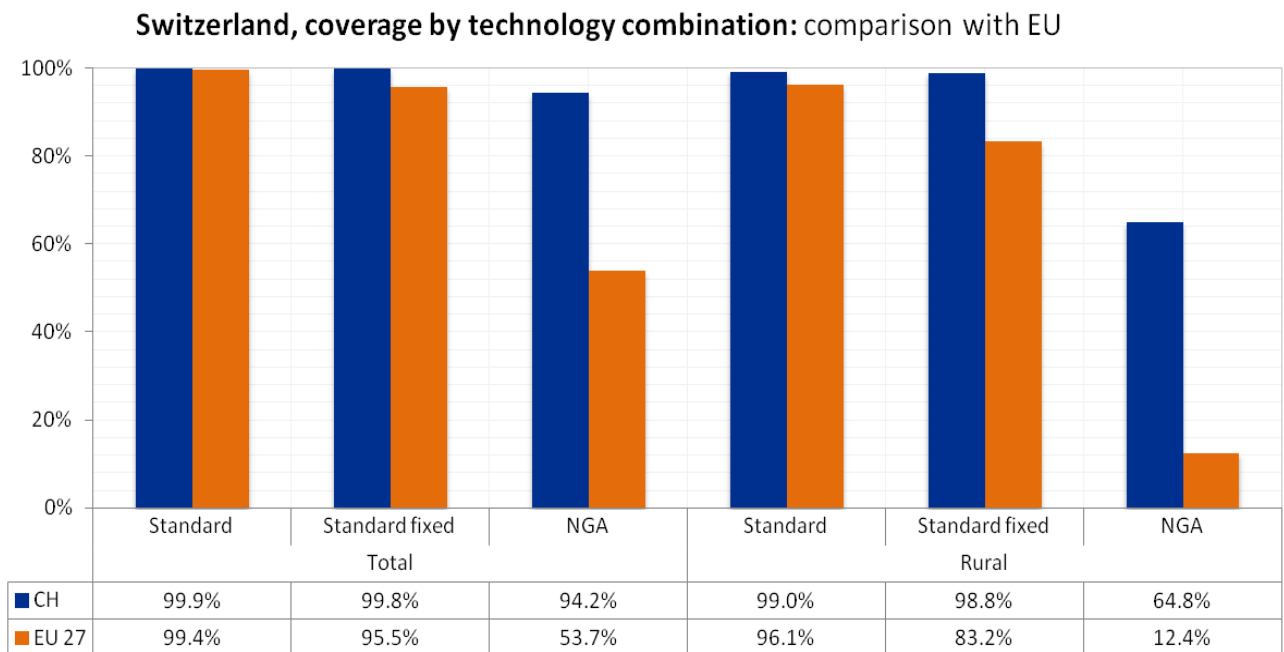
None.

3.30 Switzerland

3.30.1 National coverage by broadband technology

Switzerland was added to the study in 2012, with funding provided by *Glasfasernetz Schweiz* in Switzerland.

NGA coverage in Switzerland was much more advanced than in most of the other study countries – both in total and amongst rural households. Its coverage of rural areas with standard fixed broadband was also significantly ahead of the European Union average.



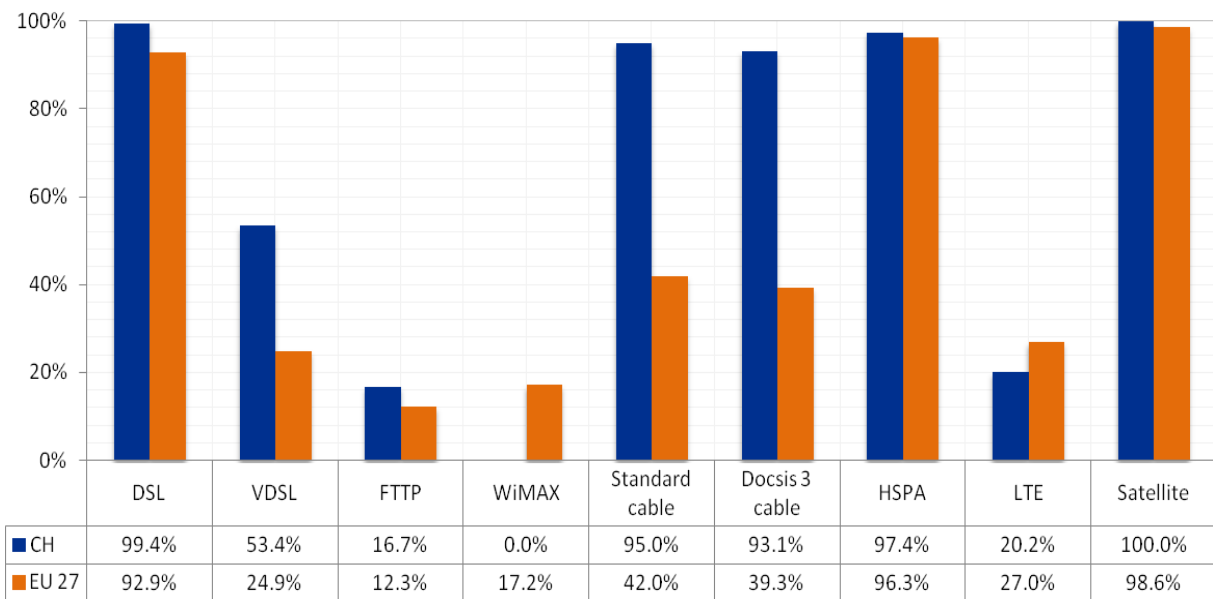
Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

Looking at the technology profiles for Switzerland, we can see that Switzerland gained its NGA advantage by having more than double average VDSL and Docsis 3 coverage. FTTP deployment was comparable to the EU average, although the Swiss incumbent has ambitious plans for the roll out of this technology in the future. Most cable services within Switzerland have been upgraded to Docsis 3.

In terms of HSPA coverage, Switzerland was comparable to the EU averages for both overall coverage and coverage of rural households. At the end of 2012, commercial LTE services had been rolled out to 20% of Swiss households. No evidence could be found for coverage of WiMAX services within Switzerland.

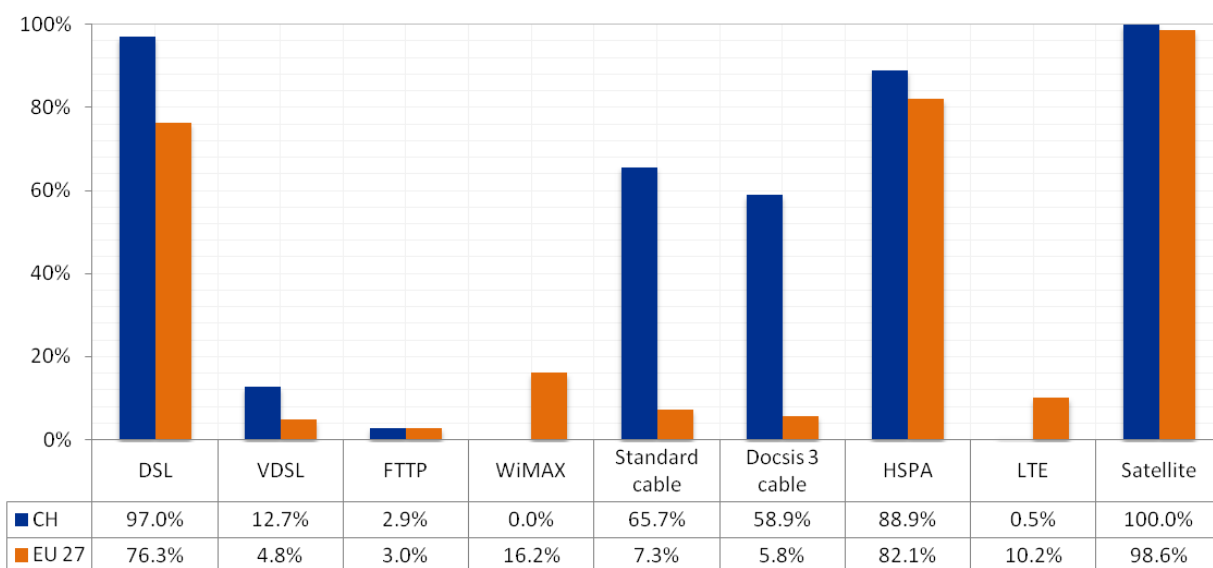
During 2012, VDSL coverage increased by nearly 10 percentage points as a result of a big push by the incumbent to roll-out this technology. Overall cable coverage increased by 3.3p.p., with Docsis 3 coverage increasing by 4.5p.p.. This increase is in part due to a better data quality but also heavy infrastructure based competition, with new buildings being connected to cable wherever possible. The roll-out of cable services has had a significant impact on the rural coverage of NGA services in Switzerland.

Switzerland, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

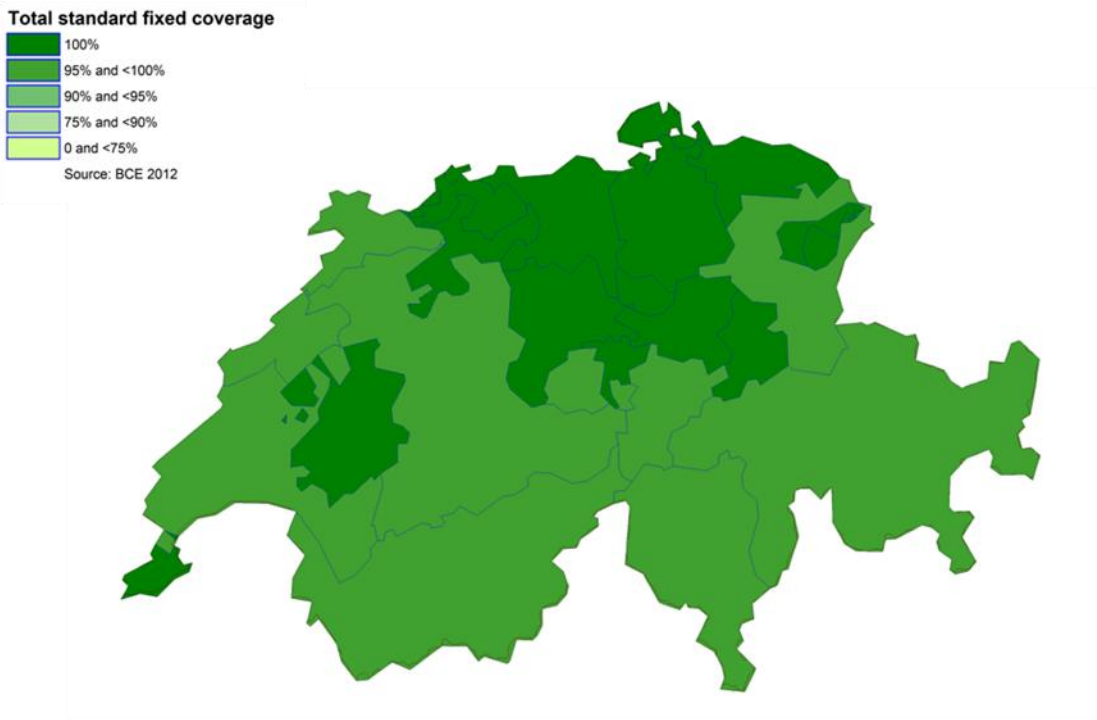
Switzerland, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.30.2 Regional coverage by technology combinations

Map 3.2.1 Switzerland total standard fixed broadband coverage



Map 3.2.2 Switzerland total NGA broadband coverage



Broadband Coverage in Europe 2012

Coverage of both standard and NGA broadband is fairly consistent across the cantons of Switzerland.

In terms of standard broadband coverage, every canton in Switzerland had over 98% standard broadband coverage. Only one canton – Basel-Stadt – had 100% coverage of both standard and cable services. Every canton in Switzerland had NGA coverage greater than 75%.

3.30.3 Data tables for Switzerland

Statistic	National
Population	8,040,281
Persons per household	2.2
Rural proportion	14.6%

Technology	CH - 2012		CH - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.4%	97.0%	99.4%	96.6%	92.9%	76.3%
VDSL	53.4%	12.7%	43.6%	6.9%	24.9%	4.8%
FTTP	16.7%	2.9%	12.2%	0.0%	12.3%	3.0%
WiMAX	0.0%	0.0%	0.0%	0.0%	17.2%	16.2%
Standard cable	95.0%	65.7%	91.7%	64.4%	42.0%	7.3%
Docsis 3 cable	93.1%	58.9%	88.6%	55.6%	39.3%	5.8%
HSPA	97.4%	88.9%	97.4%	88.9%	96.3%	82.1%
LTE	20.2%	0.5%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	99.9%	99.0%	99.7%	98.5%	99.4%	96.1%
Standard fixed	99.8%	98.8%	99.7%	98.3%	95.5%	83.2%
NGA	94.2%	64.8%	92.7%	41.2%	53.7%	12.4%

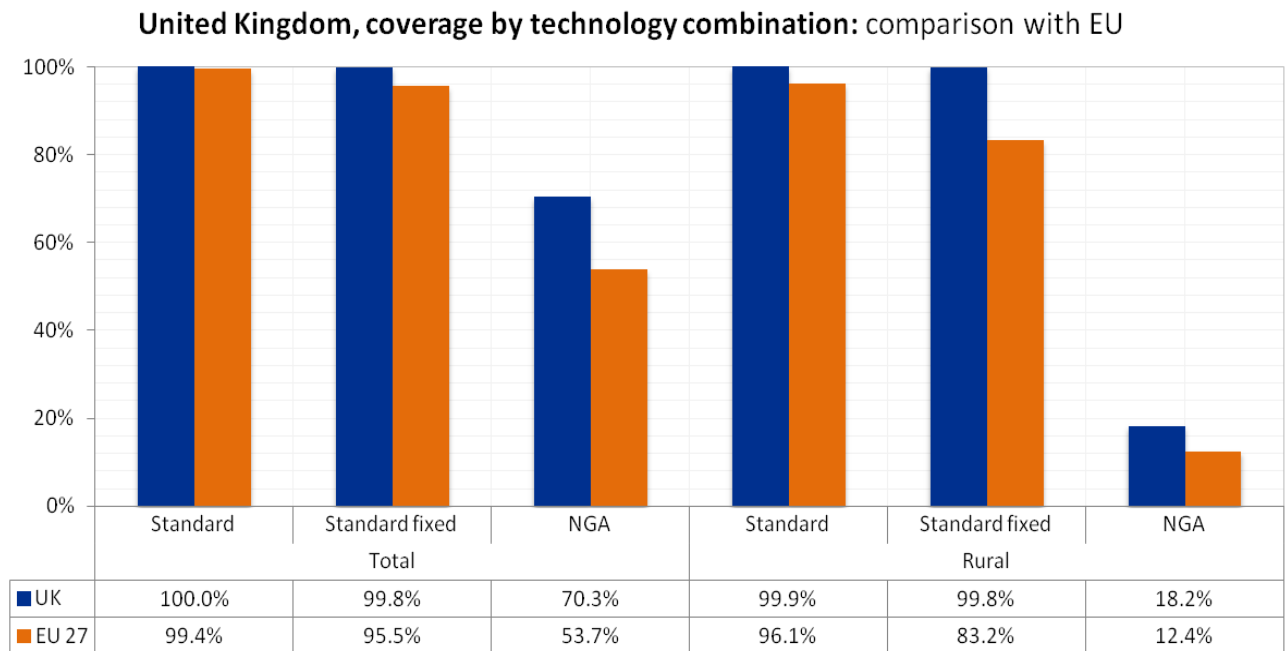
3.30.4 Notes on data and coverage estimates:

None.

3.31 United Kingdom

3.31.1 National coverage by broadband technology

The United Kingdom was above average on all the technology combination measures, with most households able to access a standard broadband service. It was ahead of the European Union average for NGA coverage, both in total and in rural areas.



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

The technology profile for the United Kingdom shows that nearly all households were able to access a basic broadband service through either DSL or HSPA. The reported figure for DSL reflects the fact that some premises are too far from a DSL-enabled exchange to receive downstream speeds of 144kbps.

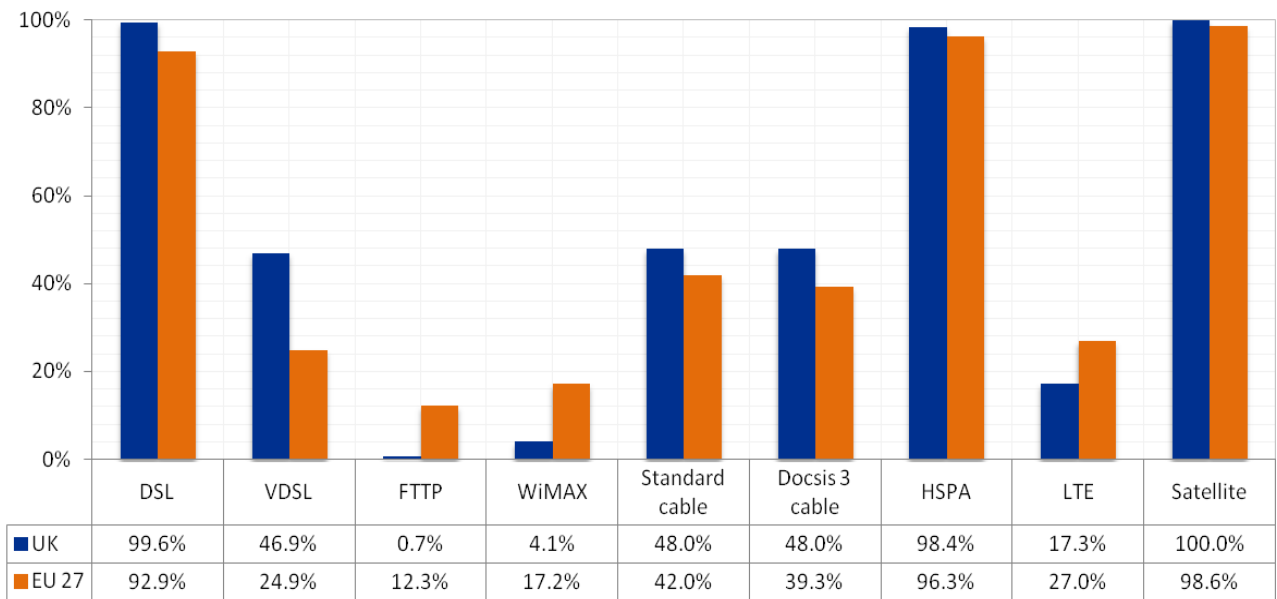
The United Kingdom had an extensive cable network which served 48% of households. The whole network had been upgraded to Docsis 3. These networks also served a small portion of rural households, although they mainly focused on urban areas.

VDSL coverage grew by nearly 20p.p. within the year, and provided relatively good coverage for rural areas. Rural coverage was focused particularly in Northern Ireland and Cornwall, where state funds have been provided to bring high-speed services to all. Note that the data provided for VDSL reflects all coverage and is not limited to households that can receive high-speed services. A more rigorous figure based on performance would reduce this figure.

LTE services were launched in 2012 and covered more than 17% of households, but with no rural coverage at the end of 2012. FTTP was present but negligible, and WiMAX coverage was also limited.

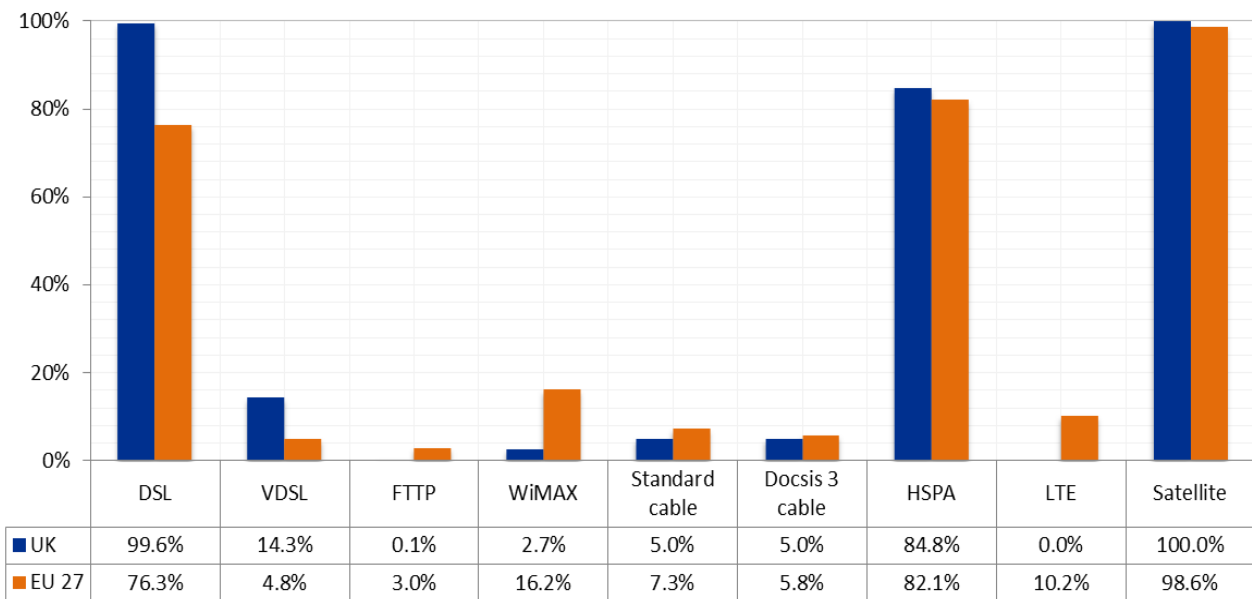
Broadband Coverage in Europe 2012

United Kingdom, total coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

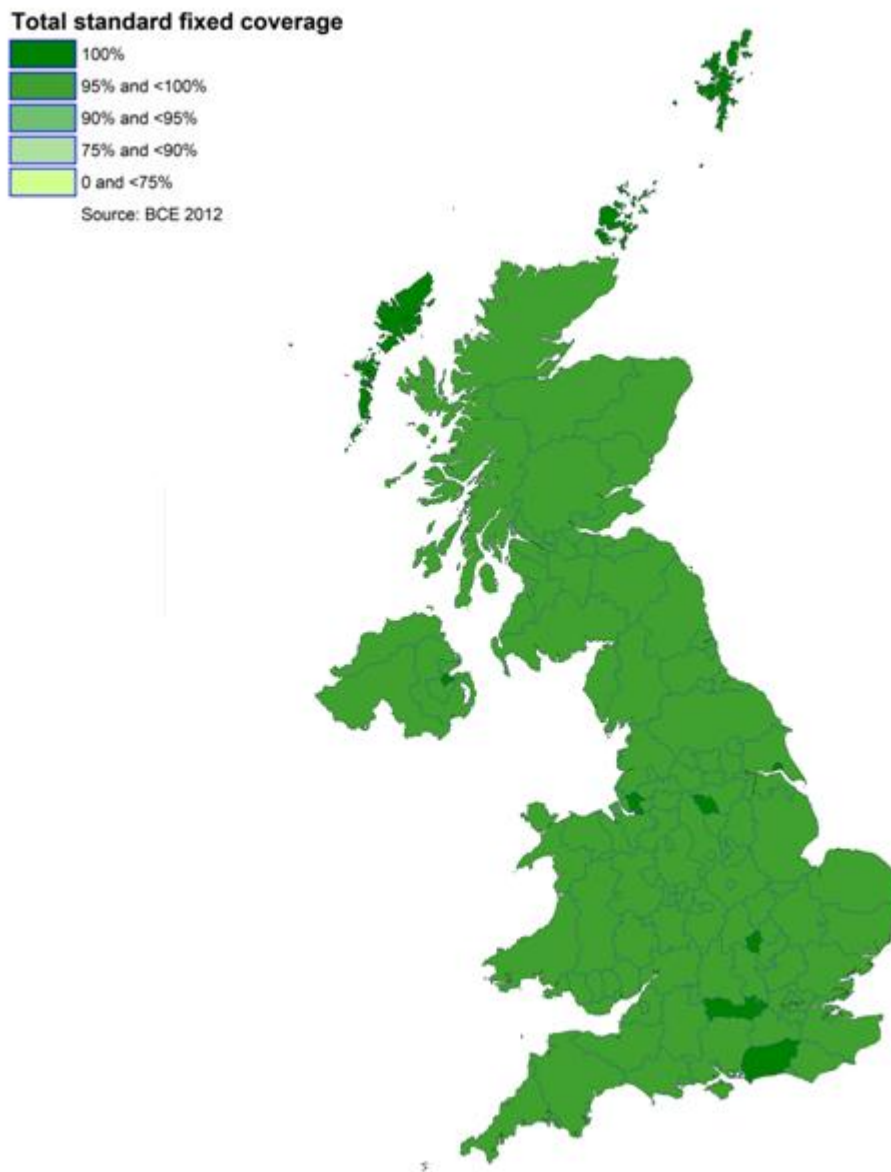
United Kingdom, rural coverage by technology in 2012: comparison with EU



Source: Broadband Coverage in Europe in 2012, a study by point-topic.com for the European Commission

3.31.2 Regional coverage by broadband technology

United Kingdom standard fixed broadband coverage

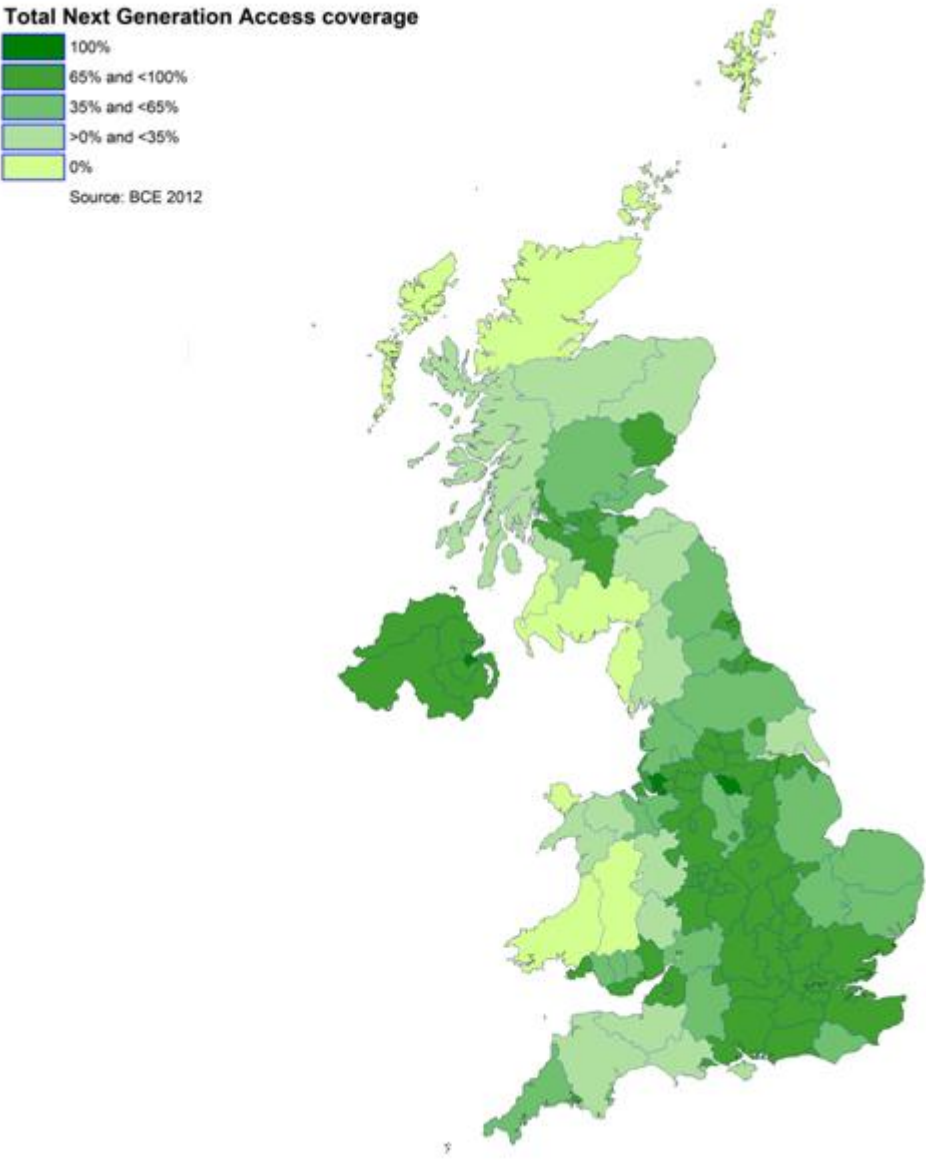


The United Kingdom had mostly uniform coverage of standard fixed broadband services.

The picture for NGA was more complicated. Eleven areas, mainly in Scotland and Wales, had no NGA coverage at the end of 2012. NGA was brought to the rest of the United Kingdom through VDSL and Docsis 3 networks. The highest levels of Docsis 3 coverage were in provincial cities where there is an extensive cable network, rather than in the capital. The extension of the VDSL network is helping to bring more uniform NGA coverage to most of England. Coverage in Wales and Scotland remained focused on the urban areas.

Northern Ireland is a special case. Although it is mostly rural, a state-funded scheme has rolled out VDSL services to cover almost the whole province.

United Kingdom Next Generation Access coverage



3.31.3 Data tables for the United Kingdom

Statistic	National
Population	61,890,675
Persons per household	2.4
Rural proportion	8.8%

Technology	UK - 2012		UK - 2011		EU27 - 2012	
	Total	Rural	Total	Rural	Total	Rural
DSL	99.6%	99.6%	99.2%	92.9%	92.9%	76.3%
VDSL	46.9%	14.3%	26.1%	3.8%	24.9%	4.8%
FTTP	0.7%	0.1%	0.2%	0.0%	12.3%	3.0%
WiMAX	4.1%	2.7%	4.0%	2.7%	17.2%	16.2%
Standard cable	48.0%	5.0%	46.5%	0.0%	42.0%	7.3%
Docsis 3 cable	48.0%	5.0%	46.1%	0.0%	39.3%	5.8%
HSPA	98.4%	84.8%	98.8%	86.5%	96.3%	82.1%
LTE	17.3%	0.0%	0.0%	0.0%	27.0%	10.2%
Satellite	100.0%	100.0%	100.0%	100.0%	98.6%	98.6%
Standard	>99.95%	99.9%			99.4%	96.1%
Standard fixed	99.8%	99.8%	99.6%	93.2%	95.5%	83.2%
NGA	70.3%	18.2%	58.3%	3.8%	53.7%	12.4%

3.31.4 Notes on data and coverage estimates

VDSL:

The survey definition for VDSL coverage is:

Close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.

In the United Kingdom the data provided reported the overall coverage of VDSL with no restriction on the speed delivered. This is expected to have increased the overall figure reported for NGA coverage in the United Kingdom.

Appendices

A1 Categories for definition

One major task in carrying out the BCE 2012 project was to explain, and as far as possible to implement, a complex set of definitions for the multiple different categories required for data collection. The main categories are listed in Table 1 and the issues surrounding them are discussed below. Fuller definitions are provided where needed in the Appendices.

Table 1 Categories and outline definitions for the BCE 2012 project

Category	Definitions
Study Countries	The 27 members of the EU plus Croatia, Iceland, Norway and Switzerland
Sub-national regions	The 1,362 NUTS 3 areas of the 31 study countries as defined by Eurostat under its “National Units for Territorial Statistics” scheme.
Urban vs. Rural	The project defined rural areas as those with a population of less than 100 persons per square kilometer. This was established using Point Topic’s Kilometre Grid for the whole of Europe (the ‘EKG’).
Technologies	The nine broadband technologies specified for study; DSL, VDSL, FTTP, WiMAX, Standard Cable, Docsis 3 Cable, HSPA, LTE, Satellite. See the Appendices for the definitions used for the project.
Coverage	The coverage of a particular technology is the percentage of households within an area (a complete country or sub-national region) which have access to that technology. Having access means being able to subscribe to the service without requiring significant additional investment to connect the household to the technology network. The exact definition varies between the technologies. See the Appendices for the definitions used for the project.
Reference date	The objective of the project was to map the coverage of the different technologies as at end-2012. Most data provided was for end-2012 or was scaled to end-2011 for the final coverage figures but the applicable date was noted in each case. Only in Denmark did we use data for mid-year 2012.

A2 Technology definitions

The table shows the definitions used for the different broadband technologies when collecting data for the project. The first eight definitions were included in the Survey questionnaire. The satellite broadband definition was not included in the questionnaire but it was used for the research on satellite availability across Europe.

Note that the definitions are not intended to be rigorous from an engineering point of view but rather to be easy to use and to relate to the practical definitions used by operators and NRAs.

Technology	Project definition
DSL	Broadband provided over conventional telephone lines with a maximum download speed of under 25Mbps
VDSL (also called FTTC+VDSL etc.)	VDSL (also called FTTC+VDSL for example) is a "Very-high-speed" version of DSL capable of delivering a downstream speed of 25Mbps or faster over conventional telephone lines. VDSL is usually provisioned from a street cabinet which has fibre backhaul or directly from the telephone exchange in areas which are close to the exchange. This definition does not include implementations where fibre is provisioned to a large building, such as a block of flats, and the final connections are provided by VDSL within the building, which are defined as FTTP.
FTTP	FTTP (fibre-to-the-premises) is broadband provided over fibre optic cables going all the way to the home or business premises. This definition also includes "FTTB", where fibre terminates at a large building and broadband distribution within the building, to different flats for example, is by a different non-fibre technology such as VDSL.
WiMAX	WiMAX is a wireless service using one of the IEEE standards 802.16d, for fixed users and 802.16e for mobile.
Cable Modem (Standard Cable)	Cable Modem broadband is delivered over a fixed cable TV network using coaxial cable according to the earlier cable broadband standards such as DOCSIS 1, usually providing download speeds up to about 20Mbps.
DOCSIS 3	DOCSIS 3 broadband is delivered over a fixed cable TV network using coaxial cable according to the DOCSIS 3 standard, providing download speeds of 30Mbps and above.
HSPA	HSPA (High Speed Packet Access) is the upgraded version of 3G mobile networks capable of providing mobile broadband at a maximum download speed of at least 21.1Mbps.
LTE	LTE (Long Term Evolution) is the next-generation mobile service standardised by the 3rd Generation Partnership Project which requires separate spectrum from 3G mobile and which supports maximum downstream speeds up to at least 100Mbps.

A3 Coverage definitions

The table shows the definitions used to determine whether households are within the coverage area for each of the different broadband technologies when collecting data for the project. The first eight definitions were included in the Survey questionnaire. The satellite broadband definition was not included in the questionnaire but it was used for the research on satellite availability across Europe.

Note that the definitions are not intended to be rigorous from an engineering point of view but rather to be easy to use and to relate to the practical definitions used by operators and NRAs.

Technology	Project definition
DSL	A household has DSL coverage if it is a telephone exchange area fully enabled for DSL.
VDSL	A household has VDSL coverage if it is close enough to a VDSL-enabled cabinet or exchange to get a broadband signal of at least 25Mbps downstream, typically equivalent to a radial distance of about 500 metres.
FTTP	A household has FTTP coverage if it can be connected now to a fibre service without requiring the construction of new fibre infrastructure.
WiMAX	A household has WiMAX coverage for broadband if it can receive at least 2Mbps downstream from an existing service without requiring the construction of new WiMAX infrastructure.
Standard cable	A household has cable modem coverage if it can be connected now to a broadband service without requiring the construction of new cable TV network infrastructure.
DOCSIS 3	A household has DOCSIS 3 coverage if it can be connected now to a DOCSIS service without requiring the construction of new cable TV network infrastructure.
HSPA	A household has HSPA coverage if it is in the stated coverage area for at least one HSPA-upgraded 3G mobile network.
LTE	A household has LTE coverage if it is in the stated coverage area for at least one LTE mobile network.

A4 Restated data tables for 2011**Total coverage by technology for each country – 2011**

Country	DSL	VDSL	FTTP	WiMAX	Standard Cable	Docsis 3 cable	HSPA	LTE	Satellite
Austria	97.0%	46.5%	5.3%	17.2%	34.8%	34.8%	97.5%	18.8%	100.0%
Belgium	99.8%	81.0%	0.2%	14.7%	95.9%	95.9%	98.7%	0.0%	100.0%
Bulgaria	84.8%	0.0%	5.6%	16.9%	56.2%	56.2%	98.0%	0.0%	100.0%
Cyprus	>99.95%	0.0%	0.0%	0.0%	45.9%	0.0%	99.0%	0.0%	100.0%
Czech Republic	92.0%	9.6%	11.3%	17.7%	32.8%	29.3%	90.0%	0.0%	100.0%
Denmark	98.1%	19.9%	37.2%	8.0%	62.6%	54.4%	98.1%	54.1%	100.0%
Estonia	38.5%	2.4%	30.7%	40.0%	71.5%	37.0%	87.0%	70.0%	0.0%
Finland	94.5%	46.0%	31.0%	3.0%	41.6%	41.6%	98.7%	24.5%	100.0%
France	99.1%	0.0%	3.8%	0.0%	23.7%	21.1%	97.0%	0.0%	100.0%
Germany	93.8%	40.6%	2.4%	11.5%	55.1%	45.9%	88.5%	21.5%	100.0%
Greece	98.5%	4.2%	0.0%	0.0%	0.0%	0.0%	99.4%	0.0%	100.0%
Hungary	89.4%	2.8%	17.1%	0.0%	62.0%	47.3%	91.3%	0.0%	100.0%
Iceland	93.2%	22.4%	38.3%	4.0%	0.0%	0.0%	96.0%	0.0%	0.0%
Ireland	94.3%	0.5%	1.7%	26.6%	38.4%	30.1%	94.6%	0.0%	100.0%
Italy	97.0%	0.0%	10.7%	30.0%	0.0%	0.0%	95.5%	0.0%	100.0%
Latvia	52.9%	1.6%	60.8%	31.6%	33.1%	26.5%	99.0%	2.4%	0.0%
Lithuania	68.5%	0.0%	59.4%	60.0%	52.8%	41.7%	95.0%	12.1%	0.0%
Luxembourg	99.8%	80.0%	23.1%	0.0%	63.5%	52.0%	99.6%	0.0%	100.0%
Malta	99.0%	75.0%	0.0%	99.9%	98.5%	98.5%	99.0%	0.0%	100.0%
Netherlands	>99.95%	47.3%	12.8%	0.0%	98.5%	96.8%	99.0%	0.0%	100.0%
Norway	93.7%	26.8%	24.9%	10.0%	45.9%	43.7%	91.9%	25.9%	100.0%
Poland	60.4%	11.7%	2.2%	0.3%	30.2%	30.2%	90.0%	25.0%	100.0%
Portugal	99.0%	0.0%	41.2%	0.0%	75.9%	73.7%	92.2%	0.0%	100.0%
Romania	74.6%	17.4%	47.5%	50.0%	23.8%	22.9%	95.9%	0.0%	100.0%
Slovakia	43.9%	0.0%	38.9%	50.0%	21.5%	16.6%	85.5%	0.0%	100.0%
Slovenia	71.8%	41.5%	38.6%	0.0%	36.0%	36.0%	95.6%	0.0%	100.0%
Spain	93.3%	10.9%	9.7%	47.6%	46.9%	46.0%	97.1%	0.0%	100.0%
Sweden	98.0%	16.7%	46.2%	0.0%	36.8%	31.0%	99.6%	48.1%	0.0%
Switzerland	99.4%	43.6%	12.2%	0.0%	91.7%	88.6%	97.4%	0.0%	100.0%
United Kingdom	99.2%	26.1%	0.2%	4.0%	46.5%	46.1%	98.8%	0.0%	100.0%
EU 27	92.2%	19.3%	9.9%	14.6%	39.9%	36.6%	94.7%	8.3%	96.6%
Study Countries	92.2%	19.4%	10.1%	14.5%	39.9%	36.6%	94.7%	8.5%	96.5%

Coverage by technology combination for each country – 2011

Country	Total Standard	Total Standard Fixed	Total NGA	Rural Standard	Rural Standard Fixed	Rural NGA
Austria		98.2%	64.4%		89.6%	8.7%
Belgium		>99.95%	96.8%		97.3%	65.4%
Bulgaria		89.1%	59.3%		58.3%	0.1%
Cyprus		>99.95%	0.0%		98.3%	41.2%
Czech Republic		94.5%	40.3%		>99.95%	0.0%
Denmark		99.0%	61.9%		55.5%	0.0%
Estonia		86.0%	52.1%		81.7%	21.5%
Finland		95.0%	63.9%		93.3%	0.0%
France		99.4%	23.2%		50.4%	1.4%
Germany		95.7%	63.8%		92.4%	0.0%
Greece		98.5%	4.2%		84.1%	6.6%
Hungary		89.4%	52.8%		71.2%	4.2%
Iceland		94.4%	44.6%		95.0%	0.0%
Ireland		94.5%	31.2%		77.4%	3.9%
Italy		98.5%	10.7%		92.5%	0.0%
Latvia		75.5%	66.0%		84.6%	0.0%
Lithuania		88.4%	62.2%		87.9%	0.0%
Luxembourg		99.8%	85.2%		70.1%	22.1%
Malta		99.9%	98.8%		98.1%	84.1%
Netherlands		>99.95%	97.1%		20.8%	7.4%
Norway		95.9%	69.4%		99.9%	2.9%
Poland		65.4%	36.8%		>99.95%	72.9%
Portugal		99.5%	74.5%		78.4%	11.5%
Romania		86.8%	57.4%		37.5%	0.6%
Slovakia		75.0%	47.2%		97.4%	30.7%
Slovenia		75.8%	62.7%		68.4%	21.6%
Spain		96.4%	56.0%		91.0%	4.9%
Sweden		98.1%	53.4%		13.7%	0.0%
Switzerland		99.7%	92.7%		50.0%	0.0%
United Kingdom		99.6%	58.3%		93.2%	3.8%
EU 27		94.6%	48.1%		79.9%	8.5%
Study Countries		94.6%	48.4%		79.9%	8.6%

Rural coverage by technology for each country – 2011

Country	DSL	VDSL	FTTP	WiMAX	Standard cable	Docsis 3 cable	HSPA	LTE	Satellite
Austria	84.7%	0.0%	0.0%	17.7%	11.1%	8.7%	82.9%	0.0%	100.0%
Belgium	97.0%	55.9%	0.0%	3.1%	58.9%	58.9%	75.4%	0.0%	100.0%
Bulgaria	53.7%	0.0%	0.1%	9.4%	0.0%	0.0%	90.1%	0.0%	100.0%
Cyprus	>99.95%	0.0%	0.0%	0.0%	0.0%	0.0%	92.0%	0.0%	100.0%
Czech Republic	45.5%	0.0%	0.0%	17.7%	0.0%	0.0%	35.6%	0.0%	100.0%
Germany	76.8%	13.1%	0.4%	10.8%	7.2%	3.5%	49.0%	33.3%	100.0%
Switzerland	96.6%	6.9%	0.0%	0.0%	64.4%	55.6%	88.9%	0.0%	100.0%
Denmark	88.8%	0.0%	0.0%	9.6%	0.0%	0.0%	89.3%	0.8%	100.0%
Estonia	16.1%	1.4%	0.0%	35.9%	13.7%	0.0%	53.6%	31.0%	0.0%
Greece	92.3%	0.0%	0.0%	0.1%	0.0%	0.0%	96.8%	0.0%	100.0%
Spain	68.9%	0.0%	0.0%	49.1%	7.5%	6.6%	83.8%	0.0%	100.0%
Finland	69.6%	0.0%	0.0%	3.0%	0.0%	0.0%	97.2%	0.0%	100.0%
France	95.0%	0.0%	0.0%	0.0%	0.0%	0.0%	82.9%	0.0%	100.0%
Hungary	73.1%	0.0%	3.4%	0.0%	14.4%	3.9%	73.9%	0.0%	100.0%
Ireland	85.3%	0.0%	0.0%	20.4%	1.4%	0.0%	86.0%	0.0%	100.0%
Iceland	81.3%	0.0%	0.0%	6.6%	0.0%	0.0%	89.1%	0.0%	0.0%
Italy	75.9%	0.0%	0.0%	30.0%	0.0%	0.0%	68.9%	0.0%	100.0%
Lithuania	14.8%	0.0%	22.1%	60.0%	0.3%	0.0%	85.6%	0.0%	0.0%
Luxembourg	98.1%	75.3%	17.6%	0.0%	0.0%	0.0%	96.9%	0.0%	100.0%
Latvia	12.2%	0.0%	7.4%	1.2%	0.0%	0.0%	96.5%	0.0%	0.0%
Malta	6.9%	0.0%	0.0%	99.9%	2.9%	2.9%	6.9%	0.0%	100.0%
Norway	72.1%	2.2%	5.0%	10.0%	8.2%	7.4%	63.6%	3.6%	100.0%
Netherlands	>99.95%	27.8%	8.5%	0.0%	82.9%	65.5%	88.4%	0.0%	100.0%
Poland	37.0%	0.0%	0.0%	0.3%	0.6%	0.6%	51.9%	0.0%	100.0%
Portugal	94.6%	0.0%	5.1%	0.0%	30.1%	29.1%	61.1%	0.0%	100.0%
Romania	50.6%	1.3%	20.0%	20.0%	4.0%	2.0%	90.0%	0.0%	100.0%
Sweden	88.3%	0.2%	4.7%	0.0%	0.1%	0.1%	97.9%	7.2%	0.0%
Slovenia	13.7%	0.0%	0.0%	0.0%	0.0%	0.0%	83.0%	0.0%	100.0%
Slovakia	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	7.6%	0.0%	100.0%
United Kingdom	92.9%	3.8%	0.0%	2.7%	0.0%	0.0%	86.5%	0.0%	100.0%
EU 27	73.2%	3.2%	1.9%	13.3%	5.6%	4.0%	73.6%	4.9%	96.6%
Study Countries	73.2%	3.2%	2.0%	13.2%	5.7%	4.0%	73.5%	4.9%	96.5%

A5 Restatements from Broadband Coverage in Europe in 2011

Rural figures for BCE 2011 have been adjusted to reflect new methodology for defining rural coverage using Point Topic's European Kilometre Grid.

Other restatements were made as a result of new or improved data provided:

Country	Metric	Technology	BCE 2011	Restated	Shift	Reason for update
AT	Total	DSL	93.0%	97.0%	4.0%	Updated source for data.
AT	Rural	DSL	81.0%	84.7%	3.7%	Updated source for data.
AT	Total	Standard fixed combination	95.0%	98.2%	3.2%	Recalculated using new data inputs
AT	Rural	Standard fixed combination	82.6%	91.0%	8.4%	Recalculated using new data inputs
AT	Rural	Standard cable	0.0%	11.1%	11.1%	Updated source for data.
AT	Rural	Docsis 3	0.0%	8.7%	8.7%	Updated source for data.
AT	Rural	NGA combination	8.7%	8.7%	0.0%	Recalculated using new data inputs
BE	Total	DSL	100.0%	99.8%	-0.2%	New survey data supplied
BE	Rural	DSL	100.0%	97.0%	-3.0%	New survey data supplied
BE	Total	VDSL	78.9%	81.0%	2.1%	New survey data supplied
BE	Rural	VDSL	0.0%	55.9%	55.9%	New survey data supplied
BE	Total	Standard fixed combination	100.0%	100.0%	0.0%	Recalculated based on new data
BE	Rural	Standard fixed combination	100.0%	97.3%	-2.7%	Recalculated based on new data
BE	Total	NGA combination	98.0%	96.8%	-1.2%	Recalculated based on new data
BE	Rural	NGA combination	53.8%	65.4%	11.6%	Recalculated based on new data
BG	Total	FTTP	44.2%	5.6%	-38.6%	Double counting between Docsis 3 and FTTP categories removed.
BG	Total	Standard fixed combination	91.5%	89.1%	-2.4%	Recalculated based on new data.

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BG	Total	NGA combination	71.4%	59.3%	-12.1%	Recalculated based on new data.
DK	Total	VDSL	0.0%	19.9%	19.9%	More accurate data provided.
DK	Total	Docsis 3	48.1%	54.4%	6.3%	More accurate data provided.
DK	Total	NGA Combination	61.9%	72.9%	11.0%	Recalculated based on new data
EE	Total	DSL	90.0%	38.5%	-51.5%	Restatement based on improved data
EE	Rural	DSL	71.8%	16.1%	-55.7%	Restatement based on improved data
EE	Total	VDSL	4.5%	2.4%	-2.1%	Restatement based on improved data
EE	Rural	VDSL	0.0%	1.4%	1.4%	Restatement based on improved data
EE	Rural	WiMAX	40.0%	35.9%	-4.1%	Restatement based on improved data
EE	Total	HSPA	100.0%	87.0%	-13.0%	Restatement based on improved data
EE	Rural	HSPA	100.0%	53.6%	-46.4%	Restatement based on improved data
EE	Total	LTE	30.0%	70.0%	40.0%	Restatement based on improved data
EE	Rural	LTE	0.0%	31.0%	31.0%	Restatement based on improved data
EE	Total	Standard fixed combination	95.0%	86.0%	-9.0%	Restatement based on improved data
EE	Rural	Standard fixed combination	85.9%	50.4%	-35.5%	Restatement based on improved data
EE	Total	NGA combination	61.8%	52.1%	-9.7%	Restatement based on improved data
EE	Rural	NGA combination	18.4%	1.4%	-17.0%	Restatement based on improved data
EE	Total	FTTP	34.7%	30.7%	-4.0%	Restatement based on improved data
EE	Total	Standard cable	58.9%	71.5%	12.6%	Restatement based on improved data
EE	Rural	Standard cable	16.5%	13.7%	-2.8%	Restatement based on improved data

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EE	Total	Docsis 3	454.0%	37.0%	-417.0%	Restatement based on improved data
EE	Rural	Docsis 3	11.9%	0.0%	-11.9%	Restatement based on improved data
FI	Total	DSL	95.7%	94.5%	-1.2%	Restatement based on improved data
FI	Rural	DSL	76.5%	69.6%	-6.9%	Restatement based on improved data
FI	Total	Standard cable	78.0%	41.6%	-36.4%	Restatement based on improved data
FI	Rural	Standard cable	18.7%	0.0%	-18.7%	Restatement based on improved data
FI	Total	Docsis 3	67.8%	41.6%	-26.2%	Restatement based on improved data
FI	Rural	Docsis 3	16.1%	0.0%	-16.1%	Restatement based on improved data
FI	Total	HSPA	100.0%	98.7%	-1.3%	Restatement based on improved data
FI	Rural	HSPA	100.0%	97.2%	-2.8%	Restatement based on improved data
FI	Total	Standard fixed combination	97.8%	95.0%	-2.8%	Recalculated based on new data.
FI	Rural	Standard fixed combination	82.4%	71.2%	-11.2%	Recalculated based on new data.
FI	Total	NGA combination	67.8%	63.9%	-3.9%	Recalculated based on new data.
FI	Rural	NGA combination	16.1%	4.2%	-11.9%	Recalculated based on new data.
FI	Total	FTTP	26.4%	31.0%	4.6%	Restatement based on improved data
FI	Total	VDSL	19.8%	46.0%	26.2%	Restatement based on improved data
FI	Total	WiMAX	10.0%	3.0%	-7.0%	Restatement based on improved data
FI	Rural	WiMAX	10.0%	3.0%	-7.0%	Restatement based on improved data
FR	Total	FTTP	21.3%	3.8%	-17.5%	Double counting between Docsis 3 and FTTP categories removed
FR	Total	Standard cable	32.9%	23.7%	-9.2%	Double counting between Docsis 3 and FTTP categories removed

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FR	Total	Docsis 3	27.7%	21.1%	-6.6%	Double counting between Docsis 3 and FTTP categories removed
FR	Total	NGA combination	39.1%	23.2%	-15.9%	Recalculated based on new data provided
FR	Total	Standard fixed combination	99.30%	99.4%	0.1%	Recalculated based on new data provided.
DE	Total	DSL	92.8%	93.8%	1.0%	More accurate data provided
DE	Total	VDSL	41.5%	40.6%	-0.9%	More accurate data provided
DE	Total	FTTP	2.6%	2.4%	-0.2%	More accurate data provided
DE	Total	WiMAX	11.5%	11.5%	0.0%	More accurate data provided
DE	Total	Standard cable	52.5%	55.1%	2.6%	More accurate data provided
DE	Total	Docsis 3	38.2%	45.9%	7.7%	More accurate data provided
DE	Total	HSPA	89.1%	88.5%	-0.6%	More accurate data provided
DE	Total	LTE	22.5%	21.5%	-1.0%	More accurate data provided
DE	Total	Standard fixed combination	95.3%	95.7%	0.4%	More accurate data provided
DE	Total	NGA combination	60.8%	63.8%	3.0%	More accurate data provided
DE	Rural	DSL	51.4%	76.8%	25.4%	More accurate data provided
DE	Rural	VDSL	0.0%	13.1%	13.1%	More accurate data provided
DE	Rural	FTTP	0.0%	0.4%	0.4%	More accurate data provided
DE	Rural	WiMAX	11.5%	10.8%	-0.7%	More accurate data provided
DE	Rural	Standard cable	2.0%	7.2%	5.2%	More accurate data provided
DE	Rural	Docsis 3	2.0%	3.5%	1.5%	More accurate data provided
DE	Rural	HSPA	30.7%	49.0%	18.3%	More accurate data provided

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DE	Rural	LTE	41.0%	33.3%	-7.7%	More accurate data provided
DE	Rural	Standard fixed combination	58.0%	81.7%	23.7%	More accurate data provided
DE	Rural	NGA combination	2.0%	21.5%	19.5%	More accurate data provided
EL	Rural	VDSL	1.0%	0.0%	-1.0%	Confirmed that there should be no rural coverage
EL	Total	WiMAX	16.1%	0.0%	-16.1%	Removed Craig Wireless Networks - assumed not to be offering services
EL	Rural	WiMAX	0.5%	0.1%	-0.4%	Removed Craig Wireless Networks - assumed not to be offering services
EL	Rural	NGA combination	1.0%	0.0%	-1.0%	Recalculated based on new data.
HU	Total	FTTP	23.7%	17.1%	-6.6%	Shifted to IDATE value to have comparable data for 2011 and 2012.
HU	Total	NGA combination	54.0%	52.8%	-1.2%	Recalculation based on new data
HU	Total	Standard fixed combination	93.2%	89.4%	-3.8%	Different combination method used – understating overlap in urban areas.
HU	Rural	FTTP	1.6%	3.4%	1.8%	Recalculation based on new data.
HU	Rural	Standard cable	16.2%	14.4%	-1.8%	Due to redistribution at NUTS 3 level of cable coverage using survey data
IS	Total	DSL	96.8%	93.2%	-3.6%	Restated using new data
IS	Total	VDSL	22.6%	22.4%	-0.2%	Restated using new data
IS	Total	FTTP	38.7%	38.3%	-0.4%	Restated using new data
IS	Total	HSPA	96.8%	96.0%	-0.8%	Restated using new data
IS	Total	Standard fixed combination	98.3%	94.4%	-3.9%	Recalculated using new data
IS	Total	NGA combination	50.0%	44.6%	-5.4%	Recalculated using new data
IS	Rural	Standard fixed combination	94.5%	84.6%	-9.9%	Recalculated using new data

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IE	Total	DSL	95.3%	94.3%	-1.0%	New data supplied.
IE	Total	VDSL	0.7%	0.5%	-0.2%	New data supplied.
IE	Total	FTTP	2.0%	1.7%	-0.3%	New data supplied.
IE	Total	WiMAX	28.3%	26.6%	-1.7%	New data supplied.
IE	Total	Standard cable	43.1%	38.4%	-4.7%	New data supplied.
IE	Total	Docsis 3	34.2%	30.1%	-4.1%	New data supplied.
IE	Total	HSPA	95.0%	94.6%	-0.4%	New data supplied.
IE	Rural	DSL	86.8%	85.3%	-1.5%	New data supplied.
IE	Rural	WiMAX	20.6%	20.4%	-0.2%	New data supplied.
IE	Rural	Standard cable	1.9%	1.4%	-0.5%	New data supplied.
IE	Rural	HSPA	86.1%	86.0%	-0.1%	New data supplied.
IE	Total	Standard fixed combination	97.2%	94.5%	-2.7%	Recalculated based on new data
IE	Total	NGA combination	35.6%	31.2%	-4.4%	Recalculated based on new data
IE	Rural	Standard fixed combination	93.3%	92.5%	-0.8%	Recalculated based on new data
IT	Total	WiMAX	60.0%	30.0%	-30.0%	Restatement after feedback from BCE 2011.
IT	Rural	WiMAX	60.0%	30.0%	-30.0%	Restatement after feedback from BCE 2011.
LV	Total	VDSL	0.0%	1.6%	1.6%	New data supplied
LV	Total	DSL	89.0%	52.9%	-36.1%	New data supplied
LV	Rural	DSL	61.3%	12.2%	-49.1%	New data supplied
LV	Total	Standard fixed combination	89.6%	75.5%	-14.1%	Recalculated based on new data

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LV	Rural	Standard fixed combination	63.9%	20.8%	-43.1%	Recalculated based on new data
LV	Total	Docsis 3	0.0%	26.5%	26.5%	New data supplied
LV	Total	NGA combination	60.8%	66.0%	5.2%	Recalculated based on new data
LU	Total	VDSL	0.0%	80.0%	80.0%	New data provided
LU	Total	NGA combination	75.0%	85.2%	10.2%	Recalculated based on new data
LU	Total	Docsis 3	63.5%	52.0%	-11.5%	New data provided
LU	Rural	DSL	100.0%	98.1%	-1.9%	New data provided
LU	Rural	Standard fixed combination	100.0%	98.1%	-1.9%	Recalculated based on new data
LU	Total	DSL	100.0%	99.8%	-0.2%	New data provided
LU	Total	Standard fixed combination	100.0%	99.8%	-0.2%	Recalculated based on new data
LU	Rural	VDSL	0.0%	75.3%	75.3%	Recalculated based on new data
LU	Rural	FTTP	0.0%	17.6%	17.6%	Recalculated based on new data
LU	Rural	NGA combination	0.0%	84.1%	84.1%	Recalculated based on new data
NL	Total	NGA combination	100.0%	97.1%	-2.9%	Recalculated based on new data provided.
NL	Total	VDSL	100.0%	47.3%	-52.7%	New data provided
NL	Total	Docsis 3	98.5%	96.8%	-1.7%	Estimate based on new data - network is not 100% Docsis 3
NL	Rural	VDSL	27.8%	27.8%	0.0%	Estimate based on new data provided
NL	Rural	FTTP	0.0%	8.5%	8.5%	Estimate based on new data provided
NL	Rural	Docsis 3	82.9%	65.5%	-17.4%	Estimate based on new data provided
NL	Rural	NGA combination	100.0%	72.9%	-27.1%	Recalculated based on new data provided.

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NO	Total	NGA combination	54.2%	69.4%	15.2%	Restated based on new data
NO	Rural	NGA combination	11.5%	20.5%	9.0%	Restated based on new data
PL	Total	DSL	64.2%	60.4%	-3.8%	New data provided by regulator
PL	Rural	DSL	26.7%	37.0%	10.3%	Modelled based on data above
PL	Total	Standard cable	32.6%	30.2%	-2.3%	New data provided by regulator
PL	Total	Docsis 3	30.3%	30.2%	-0.1%	New data provided by regulator
PL	Total	WiMAX	4.4%	0.3%	-4.1%	Restated with data from the regulator
PL	Rural	WiMAX	2.5%	0.3%	-2.2%	Restated with data from the regulator
PL	Rural	Standard cable	0.2%	0.6%	0.4%	Restated with data from the regulator
PL	Rural	Docsis 3	0.0%	0.6%	0.6%	Restated with data from the regulator
PL	Total	Standard fixed combination	72.2%	65.4%	-6.8%	Modelled based on data provided by regulator
PL	Rural	Standard fixed combination	28.1%	37.5%	9.4%	Modelled based on data provided by regulator
PL	Total	NGA combination	37.1%	36.8%	-0.3%	Modelled based on data provided by regulator
PL	Rural	NGA combination	0.0%	0.6%	0.6%	Modelled based on data provided by regulator
RO	Total	DSL	57.0%	74.6%	17.6%	New data provided.
RO	Total	FTTP	12.5%	47.5%	35.0%	New data provided.
RO	Total	WiMAX	13.1%	50.0%	36.9%	New data provided.
RO	Total	Standard cable	28.4%	23.8%	-4.6%	New data provided.
RO	Rural	DSL	78.8%	50.6%	-28.2%	Recalculated based on new data.
RO	Rural	VDSL	4.4%	1.3%	-3.1%	Recalculated based on new data.

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RO	Rural	FTTP	1.5%	20.0%	18.5%	Recalculated based on new data.
RO	Rural	WiMAX	11.4%	20.0%	8.6%	Recalculated based on new data.
RO	Rural	HSPA	93.2%	90.0%	-3.2%	Recalculated based on new data.
RO	Total	Standard fixed combination	91.7%	86.8%	-4.9%	Recalculated based on new data.
RO	Total	NGA combination	42.9%	57.4%	14.5%	Recalculated based on new data.
RO	Rural	Standard fixed combination	86.3%	68.4%	-17.9%	Recalculated based on new data.
RO	Rural	NGA combination	5.8%	21.6%	15.8%	Recalculated based on new data.
RO	Rural	Standard cable	0.0%	4.0%	4.0%	New data provided.
RO	Rural	Docsis 3	0.0%	2.0%	2.0%	New data provided.
SK	Total	DSL	82.7%	43.9%	-38.8%	New data supplied
SK	Rural	DSL	0.2%	0.0%	-0.2%	New data supplied
SK	Total	Standard fixed combination	91.4%	75.0%	-16.4%	Recalculated using new data
SK	Total	FTTP	57.0%	38.9%	-18.1%	Restatement by FTTH Council
SK	Total	NGA combination	65.3%	47.2%	-18.1%	Recalculated using new data
SK	Rural	Standard fixed combination	50.1%	50.0%	-0.1%	Recalculated using new data
SI	Total	FTTP	42.7%	38.6%	-4.1%	Restatement by FTTH Council.
SI	Total	NGA combination	67.7%	62.7%	-5.0%	Recalculated using new data
SI	Total	WiMAX	45.0%	0.0%	-45.0%	New data provided
SI	Rural	WiMAX	45.0%	0.0%	-45.0%	New data provided
SI	Total	Standard fixed combination	90.1%	75.8%	-14.3%	Recalculated using new data

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SI	Rural	Standard fixed combination	52.5%	13.7%	-38.8%	Recalculated using new data
ES	Total	VDSL	11.6%	10.9%	-0.7%	Updated based on new data.
ES	Total	WiMAX	12.2%	47.6%	35.4%	Updated based on new data.
ES	Total	Standard cable	53.8%	46.9%	-6.9%	Updated based on new data.
ES	Total	Docsis 3	51.7%	46.0%	-5.7%	Updated based on new data.
ES	Rural	WiMAX	7.0%	49.1%	42.1%	Recalculated based on new data.
ES	Rural	Standard cable	0.4%	7.5%	7.1%	Recalculated based on new data.
ES	Rural	Docsis 3	0.4%	6.6%	6.2%	Recalculated based on new data.
ES	Total	Standard fixed combination	96.9%	96.4%	-0.5%	Recalculated based on new data.
ES	Total	NGA combination	60.7%	56.0%	-4.7%	Recalculated based on new data.
ES	Rural	Standard fixed combination	91.1%	84.1%	-7.0%	Recalculated based on new data.
ES	Rural	NGA combination	13.0%	6.6%	-6.4%	Recalculated based on new data.
SE	Total	VDSL	9.8%	16.7%	6.9%	New data provided
SE	Total	FTTP	34.8%	46.2%	11.4%	New data provided
SE	Total	Standard cable	31.3%	36.8%	5.5%	New data provided
SE	Total	Docsis 3	26.3%	31.0%	4.7%	New data provided
SE	Total	LTE	47.8%	48.1%	0.3%	New data provided
SE	Total	NGA combination	61.1%	53.4%	-7.7%	Recalculated based on new data provided
SE	Total	Standard fixed combination	98.6%	98.1%	-0.7%	Recalculated based on new data provided
CH	Since the publication of the data for 2011, Swiss Statistics updated their population estimates – this updated data has been used to restate the coverage for the end of 2011.					

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UK	Total	DSL	100.0%	99.2%	-0.8%	Adjusted to match study definition
UK	Rural	DSL	100.0%	92.9%	-7.1%	Adjusted to match study definition
UK	Total	Standard fixed combination	100.0%	99.6%	-0.4%	Recalculated using new data
UK	Rural	Standard fixed combination	100.0%	93.2%	-6.8%	Recalculated using new data