Development of broadband access in Europe

Methodological report
2008 Survey
Data as of 31 December 2007

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Table of contents

1. Introduction

The goal of this report is to provide methodological details on the final results of the survey performed at the end of 2007 on broadband coverage and take-up across Europe (29 countries).

This report provides details on the methodology used, country by country, as well as the questionnaire disseminated in each country.

Main definitions used

All of the **main broadband platforms** have been taken into account: primarily DSL and cable modem or FTTx, in addition to other platforms such as WLL, WLAN, Satellite and PLC.

The survey did not consider Leased Lines connections.

Data were collected up to **31 December 2007.**

The survey distinguishes **urban, suburban and rural areas,** using the following approach based on population density:

- Urban area: a population density superior to 500 inhabitants/km²,
- Suburban area: a population density superior to 100 inhabitants/km² and inferior to 500 inhabitants/km²,
- Rural area: a population density inferior to 100 inhabitants/km².

Segmentation by **download rate** (for ADSL lines, Cable modem and FTTx) is as follows:

- from 128 kbps to 512 Kbps included,
- from 512 Kbps excluded to 1 Mbps included,
- From 1 Mbps excluded to 2 Mbps included,
- From 2 Mbps excluded to 8 Mbps included,
- From 8 Mbps excluded to 20 Mbps included,
- Over 20 Mbps.

2. General approach

At the beginning of the project, a general questionnaire was submitted and discussed with the project committee within the European Commission. This questionnaire was divided into several sub-parts dedicated to different categories of broadband players: incumbent telcos, ISPs, cable operators and mobile operators (see annex).

Once consensus was reached for the questionnaire, IDATE then forwarded it to the regional coordinators which, in turn, sent the material to their national correspondents. In the meantime, the correspondents prepared a list of contacts covering most of the players active in the broadband sector in their respective countries.

In many of the countries, the questionnaires also needed to be translated before being broken down into categories and submitted to the operators, along with a covering letter from the Commission – in most cases via e-mail. Numerous conference calls, e-mails and meetings were needed to collect or discuss figures. The number and quality of the answers varied a great deal from country to country, and depending on the players (see specific country comments).

The method used to calculate and produce detailed figures was adapted for each specific situation, which can be broken down, schematically, into three methods:

- when operators (generally incumbent telcos or cable operators) provided us with complete databases containing the number of broadband subscribers by category and by area (town, region, local exchange…), we were able to make our own calculations and fill in the tables;
- when operators filled the tables in directly, we needed only to cross-check certain totals with other sources;
- when operators returned only a few indications on market structure, we were required to examine all of the material available (from regulators, from large databases…) and statements or papers provided by experts.

In all cases, we have cross-checked the results with national grand totals provided by Cocom, ECTA or Pointopic. When discrepancies with those sources were found and proven, we provide an explanation for the different figures (e.g. our study covered broadband accesses starting with download rates of 128 kbps whereas Cocom takes into account only download rates over 144 kbps). Furthermore, DSL data could be validated with incumbent telcos in most countries. In general, we managed to secure interviews with the major operators in each country to discuss the figures.

Finally, we were able to compile synthetic tables and charts to benchmark the situation in the different Member States, and to measure progress over time (for the EU-15 + Norway and Iceland only, as we were unable to obtain historical figures for the new EU Member States).

In the following pages, we describe the specific conditions by country.

3. Countries

3.1. Austria

Responses to the questionnaire

As most operators were able to provide us only with nationwide answers to the questionnaire, Goldmedia asked them, in particular the major ones, for at least estimates of the subscriber bases broken down by urban/suburban/rural areas: prior to this, we sent them detailed data on population density at NUTS5 and NUTS3 levels. As for coverage, estimates were based on regional data and maps which then could be translated into the 3 categories (urban/suburban/rural).

Table completion method

Nationwide data could be derived from the survey and were cross-checked with data from corporate annual reports and data from the National Regulatory Authority (RTR "Rundfunk und Telekom Regulierungs-GmbH"/Austrian Regulatory Authority for Broadcasting and Telecommunications – formerly KommAustria and Telekom Control Commission), the National Statistical Office ("Statistik Austria"/Statistics Austria), ECTA (European Competitive Telecommunications Association), other trade bodies, the European Commission's Communications Committee (CoCom) and Goldmedia's existing database.

The breakdown between urban, suburban and rural areas had to be approximated. In order to do so, Goldmedia took the following steps:

- The number of urban, suburban and rural inhabitants (based on Eurostat definitions) on the NUTS5 level was acquired from the National Statistical Office.
- Goldmedia used several concurrent methods to approximate the breakdown of urban/suburban/rural broadband subscribers:
  - The operators' own calculations, for those who wanted to cooperate but did not want to provide the consortium with data on NUTS5/local exchange level (see above).
  - The operators' estimates (see above).
  - Regional DSL and cable coverage data and maps.
  - Additional in-depth desk research on DSL and cable regional coverage and take-up.
  - Urban, suburban and rural inhabitant demographics (especially age, education, income) combined with broadband user demographics.
  - Findings from these different methods were combined to establish an informed estimate.

3.2. Belgium

Responses to the questionnaire

Unlike previous years, we could get only general figures from major operators (Belgacom, Telenet/UPC).

Table completion method

We considered both details provided for previous year (2006 survey) and new developments in 2007 through:

- operators' reports and websites (in particular for cable operators, we used samples to estimate cable modem availability at local levels)
- tariffs lists
- external databases.

3.3. Bulgaria

As we could not rely on detailed data from the operators, we considered primarily their publications and websites as well as third party surveys and reports. We assumed in particular that DSL and cable modem coverage in rural areas in Bulgaria were still close to 0 at the end of 2007.
To estimate the breakdown of broadband connections by download speeds, we referred to commercial offers and related tariffs and applied certain price-elasticity rules.

3.4. Cyprus

Data for DSL is based on direct contacts with the incumbent operator, CYTA, and the major alternative ISPs (Spidernet, Avacom Net Services, Logosnet Technologies, Netway). Documents were also provided by the Office of the Commissioner of Electronic Communications and Postal Regulation (e.g. Statistical Data for the Sector of Electronic Communications).

3.5. The Czech Republic

Responses to the questionnaire

Most operators were contacted but only few responded.

As for Telefónica O_2, we also referred to its annual reports and public presentations.

Table completion method

The set of broadband data was based on:

- information from the Czech Ministry of Informatics
- information provided by the Czech Telecommunication Office
- information by the Czech Statistical Office
- annual reports of O_2
- press releases published by companies
- press releases published by experts in ICT sector.

The coverage of 85% is a rough estimate of the server www.adsl.cz, which is one of main sources of information about DSL in the CR. A 40% coverage of Cable connection is based on an estimate of Mr František Malina, the official spokesman of UPC, the Czech largest provider of Cable connection. The other data in the general table was delivered by the Czech Telecommunication Office (CTO), which has been monitoring the broadband connection ever since the Ministry of Informatics has been close down.

To estimate DSL coverage in rural areas, we referred to the average gap between national coverage and rural coverage in the EU-27 (12%) but, due to specific efforts made by the incumbent operator to improve broadband networks, especially in rural areas where the local loop is very long, we assumed the gap was somewhat narrower than average in the Czech Republic. We retained a 10%-gap and estimated DSL coverage in rural areas at 75% (compared to 85% for national coverage).

Besides Telefónica O_2, next three top players providing DSL connection are: Ceske Radiokomunikace (Czech Radiocommunication), GTS Novera and Telekom Austria Czech Republic. Neither of these companies were willing to provide data about their provided services, therefore we state only aggregated data for the whole sector obtained from the CTO. The coverage data is an estimate of the company adsl.cz, which also provides Internet connection.

The coverage number (40%) is a rough estimate from the official spokesman of the largest Cable provider, UPC. From the total number of 34 companies providing Cable Internet, only 3 were willing to give out their data, therefore, once again we state only the aggregated data from the CTO.

Since not many of the companies were willing to provide their data, we were not able to fill in the tables which required breakdown of the data for certain density-regions. Most of the companies used the argument that they did not have time or the information was too sensitive for them. Nevertheless, we could refer to two tables from the Czech Statistical Office that states the number of broadband users depending on regions and density-group.

3.6. Denmark

Responses to the questionnaire

Primary data have been obtained from the incumbent operator TDC, NESA, a power company that provides FTTH, Dansk Bredbånd which provides FTTH, FTTC and LAN and Clearwire which provides WiMAX services. In addition, we held consultations with a number of small local broadband providers.

The breakdown of cable modem data by download rate has been discussed with Denmark's major cable TV operators.

Table completion method

The Danish IT & Telecom agency provided extensive information on the Danish broadband market based on data collected from operators. The overall statistics on broadband penetration in Denmark are based on the information received from the Danish National IT and Telecom Agency. The breakdown of download rates and areas was estimated based on available data combined with detailed demographic data. Figures were cross-checked and discussed with several operators (see previous section).

Information on the population and its distribution in urban, suburban and rural areas was provided by official statistical sources: the Danish Municipality Association and Denmark Statistics.

And, finally, the data were reviewed by experts from the Danish telecom sector.

3.7. Estonia

Responses to the questionnaire

The selection of the companies to be contacted for the 2007 survey was based on the 2006 study. A list for 2006 was composed by three experts based on the national database of telecom operators and verified with the National Communications Board. So, all major relevant Estonian operators were contacted and asked for data on their broadband statistics.

However, due to a situation of strong market competition, companies are not revealing such statistics at all and no replies were received, even after several additional enquiries. Even if they were ready to share some (basic) information, a request for detailed and sensitive information made them very cautious and unwilling to co-operate. Although they were reporting to National Communications Board (since 1 January 2008 reorganised into Competition Board), the latter could not disclose any individual and detailed data.

Annual reports of main telecom operators were checked as well, but information included there is very general.

Table completion method

The tables are filled in based on the national level data from diverse public and semi-public sources. Some data was received from the Statistical Office of Estonia, but the main data source was the Competition Board (former National Communication Board). As they are not allowed to reveal company-level data or detailed statistics, the data was extracted from their report on the Estonian telecommunications market of 2007 prepared for the Estonian Ministry of Economic Affairs and Communications.

To estimate DSL coverage in rural areas, we referred to the average gap between national coverage and rural coverage in the EU-27 (12%) and applied this to Estonian figures. Considering the 85% national DSL coverage rate, DSL coverage in rural areas was estimated to be 73%.

3.8. Finland

Responses to the questionnaire

On the whole, operators have been unwilling and/or unable to share detailed information. Ficora and Statistics Finland have only been able to assist with high level figures.

Table completion method

Ficora, The Finnish Communication Regulatory Authority, maintains high-level statistics on the Finnish telecom market, as do Statistics Finland. Official numbers, analysis and publications concerning the telecom market are far less detailed than those available for Sweden and Norway.

According to a study commissioned by the Ministry, the total broadband availability is still approx. 96%, most of which is accounted for by DSL. So the DSL availability should be about 90-94%.

Based on Ficora's market data, nearly 60% of all households are connected to cable TV networks and about 85% of cable TV networks are bi-directional thus enabling broadband. This could give some indication of cable availability. The realistic number is estimated at 40%.

Because no data is available from operators, we have to rely on high level numbers from Ficora, the regulation authority. They report that 30% of all broadband subscriptions (DSL and Cable) had a download rate of 2 Mbps or more, and 4% a download rate of 10 Mbps or more.

Since DSL dominates the market, the figures are probably reasonably accurate for DSL, but it is also the best estimate available for cable.

We have not been able to provide estimates by area for take up.

3.9. France

Responses to the questionnaire

Unlike previous years, France Telecom was unwilling to disclose detailed figures for DSL. However, IDATE manages regular contacts and discussions with French operators about broadband developments and carries out related research work.

Table completion method

Drawing on previous detailed figures and general developments in terms of coverage, subscriber bases and offers for the year 2007, we were able to fill in the various tables.

As regards DSL download speeds, French ISPs generally market only a small selection of offers (which are very simplified for commercial reasons) or only a single one (Free). But effective services can be very different from those advertised according to the subscriber's location (in particular, whether or not they are in an unbundled zone). We have considered that subscribers depending on local exchanges not yet unbundled could get a maximum speed of 2 Mbps: on average, we assumed that 30% of customers for offers with advertised download speeds of over 2 Mbps were in this case.

We can also draw on data supplied by the French NRA, ARCEP, especially from the "broadband observatory" and "unbundling observatory" (updated quarterly).

3.10. Germany

Responses to the questionnaire

As most operators were able to provide us only with nationwide answers to the questionnaire, Goldmedia asked them, in particular the major ones, for at least estimates of the subscriber bases broken down by urban/suburban/rural areas. As to coverage, Goldmedia asked (for the first time successfully) for co-operation with the German Breitbandatlas, an initiative of the German Federal Ministry of Economics and Technology (BMWi). Thus, Goldmedia was able to obtain detailed data on LAU 2 basis for access to DSL provided by the Breitbandatlas. The German incumbent Deutsche Telekom was closely involved in this co-operation. Goldmedia calculated the supply rate by matching the data with statistical data provided by the National Statistical Office.

Table completion method

The supply rate data were cross-checked with nationwide data on DSL access provided by the National Regulatory Authority (BNetzA "Bundesnetzagentur"/Federal Network Agency, formerly RegTP). Nationwide data on broadband usage could be derived from the survey and were also cross-checked with data from corporate annual reports and data from the National Regulatory Authority, the National Statistical Office (DeStatis Statistisches Bundesamt Deutschland/Federal Statistical Office Germany), ECTA (European Competitive Telecommunications Association), other trade bodies, the European Commission's Communications Committee (CoCom) and Goldmedia's existing database.

The breakdown between urban, suburban and rural level had to be approximated. In order to do this, Goldmedia took the following steps:

- The number of urban, suburban and rural inhabitants (based on Eurostat definitions) on the NUTS5 level was acquired from the National Statistical Office.
- Data on DSL access were acquired by Breitbandatlas in co-operation with the German incumbent Deutsche Telekom and other major players. Goldmedia calculated the supply rates for urban/suburban/rural areas by matching the data provided by Breitbandatlas with statistical data provided by the National Statistical Office. Thus, Goldmedia calculated and cross-checked individually the DSL access data for the three categories mentioned above independently from BMWi/Breitbandatlas/Deutsche Telekom.
- Goldmedia used several concurrent methods to approximate the breakdown of urban/suburban/rural broadband subscribers:
  - The operators' own calculations, for those who wanted to cooperate but did not want to provide the consortium with data on NUTS5/local exchange level (see above).
  - The operators' estimates (see above).
  - Regional DSL and cable coverage data and maps.
  - Additional in-depth desk research on DSL and cable regional coverage and take-up.
  - Urban, suburban and rural inhabitant demographics (especially age, education, income) combined with broadband user demographics.
  - Findings from these different methods were combined to establish an informed estimate.

3.11. Greece

The information for Greece was taken from the incumbent operator OTE, some alternative operators (FORTHNET, TELLAS), the mobile operators (Cosmote and Vodafone), Hellasat, the “Information Society Observatory”, a local initiative which tracks the progress of broadband access in Greece, and provides information through regular publications, and EETT, the National Telecommunications and Post Commission, which is the National Regulatory Authority for the Telecommunications and Post Greek market.

ADSL coverage and take-up increased substantially in 2007, especially in rural areas. The OTE 2007 annual report stated that: "2007 could be heralded as the “Year of Broadband” characterized by key developments in the broadband market. During the year, OTE proceeded with the launch of new, higher ADSL access speeds, reduced the tariff plan for conn-x services and focused on developing its infrastructure further by increasing ADSL points of presence in the telecommunications network....

With regards to its infrastructure, OTE made considerable investments in 2007 in the ADSL network (especially in rural areas) and, as a result, broadband services were available at the end of the year in most areas of the country. Today, about 95% of all fixed-line connections in Greece have access to broadband services."

3.12. Hungary

Responses to the questionnaire

The questionnaire was sent to 29 ISPs with a significant market share inside Hungary. This group of companies covered approximately 90% of the broadband market, with relatively good coverage of the different spatial and sectoral segments (fixed communication, mobile communication, cable TV systems):

- Actel Távközlési Zrt.
- AMTEL Hang és Internet Kommunikáció Magyarország Kft.
- Antenna Hungária
- KFKI Rendszerintegrációs Zrt.
- BT Limited (British Telecom) Magyarországi Fióktelepe
- Első Pesti Telefontársaság
- Com.Unique
- Digi TV
- Enternet 2001
- Ericsson Magyarország Kommunikációs Rendszerek Kft.
- eTel Magyarország Kft.
- Hungaro DigiTel
- Invitel (Invitel became the umbrella brand of the following companies after 01/01/2008: Hungarotel Távközlési Zrt., Pantel Távközlési Kft., EuroWeb Internet Szolgáltató Zrt.)
- FiberNet Kommunikációs Zrt.
- GTS Datanet
- Interware Internet Szolgáltató ZRt.
- Magyar Telekom Nyrt.
- Pannon GSM
- PR-Telecom Zrt.
- Siemens TraffiCOM Hírközlési Üzemeltető és Szolgáltató Kft.
- Tarr Építő-, Szolgáltató- és Kereskedelmi Kft.
- TVNet
- UPC
- Verizon Magyarország Távközlési Kft.
- ViDaNet Kábeltelevíziós Szolgáltató ZRt.
- Vivanet
- Vodafone Magyarország ZRt.
- Zalaegerszegi Elektromos Karbantartó és Kereskedelmi ZRt.

The response rate for the questionnaire was below our expectations. The answers we received from companies did not represent either the broadband market, as a whole, or the spatial sub-markets, even in the major sectors. We then attempted to contact the largest broadband market players by phone to interview them, but with limited success.

We were thus obliged to find other data sources. We therefore used the official data from the National Statistical Office (KSH) and the National Communication Authority (NHH) – the national regulatory authority for the entire communications sector. We contacted the Ministry of Economics and Development and the Ministry of Environment, Transport and Informatics (the former and recent representative of the broadband market within the national government structure) to collect additional data on the country's ISPs.

Table completion method

Data for broadband coverage in 2007 was based on:

- KSH official data
- Official data and several additional open data-sources from NHH
- Special data from the two ministries

- Information obtained through the (limited) answers to the questionnaire and phone interviews.

3.13. Iceland

Responses to the questionnaire

Information has been retrieved from the Icelandic regulatory agency, PTA, and has been cross-checked with information on the incumbent operator, Iceland Telecom (Siminn), the second largest operator, Vodafone, and the third largest, HIVE.

Table completion method

These operators have a combined share of the Icelandic broadband market of about 95%; hence the information obtained on availability and take-up forms a representative and reliable basis for our figures.

Different estimates have nevertheless been made, as operators are unable to supply all of the requested information based on the format provided by the questionnaire, primarily because broadband providers do not maintain as detailed and specific data on their customers as required by the project.

With respect to download rates in particular, operators are unable to provide information broken down into rural vs. urban but, based on additional information obtained from them, it is estimated that, on average, download rates are the same in urban and rural areas.

3.14. Ireland

Responses to the questionnaire

IDATE's UK office contacted Eircom (incumbent) and Liberty Global during the first 2 quarters of 2008. As for last year's survey, Eircom and Liberty Global agreed to participate. Eircom provided comprehensive information for Ireland, whilst Liberty Global provided aggregated cable data for Ireland plus 10 other countries as part of the survey: however, the latter was not in a position to provide the same level of granularity regarding usage of bandwidth as previous years. Email and telephone discussion assisted clarification of data where needed.

ComReg was also approached as part of the National Broadband Scheme.

Table completion method

A two-step methodology was followed in a similar manner to previous years' survey:

- ADSL subscribers segmented by type of geographical region, based on Eircom data and categorised into urban, suburban and rural as per survey definitions. Eircom comprehensive data categorises geographical regions as urban, rural and very rural; to ensure consistency data was re-segmented into the urban, sub-urban and rural categories by reference to previous data sets and estimation using demographic data.
- For the purposes of calculating the geographical distribution of all ADSL subscribers in Ireland, subscribers from other providers were assumed to have the same geographical distribution as Eircom's subscribers.
- Calculation for data bandwidth per geographical segment was based on the same approach based on Eircom data set.

Cable modem data was only available from Liberty Global. The breakdown of data by region was again not available. Therefore the data have been extrapolated based on estimates for other operators and trends in Ireland and the UK.

Additional information was sourced to ComReg thanks to its quarterly and annual publications.

Additional secondary research was conducted to support IDATE data for the Wireless, Satellite and FTTx information.

3.15. Italy

Responses to the questionnaire

18 operators were contacted and Databank received direct answers from Telecom Italia, Albacom and FastWeb. Furthermore, Databank maintains regular contact with the main Italian operators and was able to call on telco representatives to provide further details as required, and to cross-check figures on area and download rate breakdowns.

Table completion method

Databank assessment of DSL coverage is based on:

- The list of Municipalities that is covered by xDSL service at the end of 2007 (source: Telecom Italia).
- Some interviews to local operators confirming that no other competitor provides the DSL service beyond the areas covered by TI.

3.16. Latvia

Responses to the questionnaire

All major Latvian operators were contacted and asked for data on their broadband statistics.

However, as no direct answers were received, after several enquiries, several interviews were managed with local operators.

Table completion method

Main statistical data are taken from Latvian Internet association LIA[1] which regularly publishes a list of municipalities where Internet technology was implemented. Other data are provided by the largest Latvian Internet service providers and telecommunication carriers. Where Internet carriers web sites did not provide the data, telephone and e-mail interviews were used to fill in the gaps. For completing data, we used 6 different sources (4 reports of the largest providers, the Ministry of Telecommunications and an independent association):

- the list of municipalities divided upon urban, suburban and rural (based upon data of the Latvian Ministry of telecommunications as of 1st April 2007)
- press monitoring of the Latvian telecommunications providers (Lattelecom, TELE2, Bite, LMT) focused on ADSL, VDSL and WiFi coverage and development (*http://muzejs.lattelekom.lv/muzejs/content/?cat*; *www.lmt.lv*, *www.tele2.lv*, *www.bite.lv*);
- LIA annual report - *http://www.lia.lv/stat_eng.htm;*

[1] Latvian Internet Association (LIA) is a public organization that unites Latvian enterprises working in a diverse Internet Suppliers' sphere and is interested in development of Latvian Internet environment.

3.17. Lithuania

Responses to the questionnaire

There were 115 broadband internet providers in Lithuania in 2007. All of them were informed by telephone about the survey and were asked to answer the questions. But only 12 of them answered a number of the questions. As in the previous surveys, Lithuanian operators provided us only with overall figures, and not with the needed breakdown at the NUTS 5 level. One of the reasons why operators refused to give information was the lack of human resources, as operators are also required to submit quarterly reports to the Communications Regulatory Authority (*RRT*). So we were offered to take information from RRT. Another reason is that Lithuanian providers collect data only at the LAU1 level. It was hard for providers to regroup or supply a breakdown of subscribers according to location and connection speed.

Table completion method

Estimates on Lithuania's broadband market are based on:

- Data collected from providers,
- Data collected from Communications Regulatory Authority (RRT) reports on the electronic communications sector Quarter IV of 2007 and Lithuanian Communications Sector 2007,
- Annual reports from incumbent operator AB "TEO LT" and ISP' official Internet websites.

Distribution of population among urban, suburban and rural areas was made according to the survey recommendation (urban: from 500 inhabitants/Km², suburban: from 100 inhabitants/Km² to 500 inhabitants/Km², rural: up to 100 inhabitants/Km²). According to the Lithuanian Statistical Department there are no suburban areas in Lithuania, only urban and rural ones. In order to obtain data on population distribution we contacted every township and asked them to provide us with population figures in their area, which is how we established our population breakdown.

The broadband technologies coverage was calculated by evaluating answers from operators, their respective market shares and annual reports. We also calculated the total number of broadband subscribers for different technologies.

In Lithuania there exists LAN technology (connection via UTP cable) access, which is not included in this survey. LAN networks have a roughly 12.43% share of the broadband market. LAN users were, however, included in the total number of broadband users. After additional consultations with ISPs, we assumed that, for the backbone, they use WLL or fibre connections, as a result of which 80% of LAN users were counted with FTTx subscribers and 20% with WLL ones.

The calculation of the split of subscribers between urban, suburban and rural areas and of the distribution among different connection rates was based chiefly on assumptions and studies on the demographic distribution of the information society.

DSL Methodology

The dominant DSL provider is Lithuanian telco, "TEO LT", which has a 99% share of the DSL market. TEO LT did not provide data for the survey, which is why information was taken from the annual reports. As to resellers, only one of them agreed to provide data about its subscribers and connections. The gaps were filled using publically available figures.

The distribution of penetration and download speeds is mainly counted on estimations.

Also data about DSL coverage are provided according to a segmentation at LAU 1 level – Municipalities.

Cable Modem Coverage Methodology

In 2007, 12.81% of all broadband subscribers were connected to the Internet via cable TV networks. The questions in the appendix were submitted to all providers, but only three of them provided us with data. Analysis of cable modem network coverage was based on data from providers' official websites

and from the Communication Regulation Authority's reports. To estimate data, it was assumed that a given area was covered with a cable modem network where they existed.

Other Broadband Coverage Methodology

Data about other technologies for broadband communications were taken from providers, RRT reports on the communication sector and coverage maps published by providers.

3.18. Luxembourg

Responses to the questionnaire

We sent questionnaires to the largest operators active in Luxembourg. In response to previous surveys, we had received detailed information on DSL from EPT but, for the last two surveys, they responded that the data required were considered confidential.

Table completion method

As we were unable to obtain data breakdowns concerning DSL directly from EPT, we drew on aggregated data and used previous breakdowns to recalculate detailed figures. As for coverage, it has been at 100% for some time.

For cable modem subscribers, we considered the consolidated figures and were thus able to obtain a segmentation based on detailed figures supplied previously by Coditel (representing the majority of the country's cable modem subscriber base) and taking account of current offers and locations passed.

3.19. Malta

Responses to the questionnaire

As no answer was received directly after the questionnaires were sent, we had to manage direct interviews with operators, especially with Maltacom, the incumbent operator.

Table completion method

Data for DSL coverage is based on:

- The National Statistic Office reports and releases pertaining to the Information Society.
- The Communications Authority, Electronic Communications Market Review
- The National Statistic Office, Demographic Review for population data
- The Malta Communications Authority, Broadband Strategy document
- Mobile operators' public information channels for wireless internet data
- Direct interaction with local operators

3.20. The Netherlands

Responses to the questionnaire

As most operators were able to provide us only with nationwide answers to the questionnaire, Goldmedia used them for calculating data in the 3 area categories (urban/suburban/rural) on a prorata basis as we could not see significant differences in penetration/coverage ratios. As for coverage, estimates were based on regional data and maps which then could be translated into the 3 categories (urban/suburban/rural).

Table completion method

Nationwide data could be derived from the survey and were cross-checked with data from corporate annual reports and data from the National Regulatory Authority (OPTA Onafhankelijke Post en Telecommunicatie Autoriteit), the National Statistical Office, (CBS "Centraal Bureau voor de Statistiek"/Statistics Netherlands), ECTA (European Competitive Telecommunications Association), other trade bodies, the European Commission's Communications Committee (CoCom) and Goldmedia's existing database.

The breakdown between urban, suburban and rural level had to be approximated.

The number of urban, suburban and rural inhabitants (based on Eurostat definitions) on the NUTS5 level was acquired from the National Statistical Office.

Goldmedia was also unable to obtain data on, or indications of disparities between areas of different population density, and thus concluded that there were no significant differences in take-up (relative to coverage) between urban, suburban and rural areas.

3.21. Norway

Responses to the questionnaire

Detailed statistics on DSL were obtained through contact with the incumbent operator. The two major cable operators (Canal Digital and Get) were both unwilling to share any information on market statistics.

Table completion method

The breakdown of the population by urban, suburban and rural areas follows the same definition as last year, based on updated population figures from Statistics Norway (SSB).

The Norwegian Post and Telecommunication Authority (NPT) maintains statistics on the telecom market in Norway, and publishes statistics every half-year. Subscriber numbers for the different technologies are based on NPT figures.

For DSL, the segmentations by download rate, geographical area and coverage are based on a very detailed analysis provided to us exclusively by the incumbent operator. These statistics can be considered extremely accurate. The split in download rates only covers the incumbents own subscriptions, but given a market share of 57% and the high level of competition in the marketplace, they should be representative of the DSL market as a whole.

In the cable market, the two major operators are both unwilling to share detailed information about their operations. As NPT has no information concerning download rates, geographical areas or coverage, detailed and reliable information on the cable market is, unfortunately, not available.

Cable download rates can be estimated in two different ways:

1) Total market less DSL. High level statistics from SSB gives us the total number of cable subscriptions, as well as the breakdown of download rates for the market as a whole. Substracting DSL and FTTH subscribers offers a rough estimate of the breakdown of download rates for cable subscribers. However, this estimate is rather far off the DSL download rates.

2) Same as DSL. It is reasonable to assume that the download rates for cable are similar to DSL, given the competitive market and similarities in price structure. The problem with this approach is that the resulting numbers do not yield the same result per download rate as the total market numbers provided by SSB.

To ensure consistency between our sources (both of which produce official numbers), we have chosen to use the first estimate.

3.22. Poland

Responses to the questionnaire

18 operators were approached:

- the four largest telecom operators/groups (combined market share approx. 97%):
  - Telekomunikacja Polska (incumbent),
  - Dialog,
  - Netia,
  - Multimedia Polska;
- the ten largest cable operators (combined market share approx. 97% in broadband, 70% in CATV market):
  - UPC Polska,
  - VECTRA,
  - Multimedia Polska,
  - Grupa ASTER,
  - TOYA,
  - INEA,
  - Stream Communications,
  - MTK S. Tar,
  - Promax,
  - Sat Film.
- the four mobile operators (MNOs) (99,98% market share):
  - Polkomtel,
  - PTK Centertel,
  - Polska Telefonia Cyfrowa,
  - P4.

All operators refused to answer and in most cases – even refused to be sent the questionnaire as the requested information was considered confidential for security (i.e. detailed location of Local Exchanges) and/or business confidentiality reasons.

During the informal interviews some additional issues – resulting in lack of reliable data – were pointed out:

- data is practically impossible to collect in approach asked (i.e. list of operators providing WLAN, as estimated number of WLANs in the country is in a range of 1,700);
- data is not collected at all (i.e. maximum number of users of WLAN at peak time and average bandwidth per user) as nobody is really interested in collecting it and there is no regulatory obligation;
- data is collected but not in the categories present in questionnaires (i.e. numbers of Local Exchanges at various NUTS levels – as the infrastructure of carriers' networks is not following the administrative/statistical structure of country so the data on infrastructure and users is not collected at the level of NUTS);
- service is at trial/experimental level so the number of users is such insignificant that operators are not publishing it even as marketing/news only (i.e. IPTV).

DSL coverage and eligibility was estimated as in practice operators are not installing DSLAMs in advance – the real eligibility is measured during installation of xDSL on a base of order from customer. In some cases the local loop has to be reconfigured in order to obtain xDSL connectivity. In the case of incumbent it is estimated that approx. 50% of the lines are really “DSL-Ready” with no additional reconfiguration needed. If it were possible to reconfigure these lines the index might reach up to 95% of the lines.

Table completion method

The information presented in the tables is based on:

- official publications:
  - reports published by Polish regulatory body (Office of Electronic Communications UKE – Urząd Komunikacji Elektronicznej) in 2007 and until May 2008;
  - regulatory decisions and its background information published by the Office of Electronic Communications – mainly concerning reference offers (RIO, RUO);
- data published by the Polish Chamber of Electronic Communication PIKE – Polska Izba Komunikacji Elektronicznej) grouping the main cable TV operators;
- quarterly and yearly reports published by operators listed at Warsaw Stock Exchange (TP Group, Netia, shareholders of Polkomtel and Dialog);
- data collected during informal interviews with representatives of operators and consulting/market research companies;
- data collected at conferences and from the media (press releases, publications etc.).

As additional source of data the two publications were used:

- "Łączność, 2007" yearly summary from Central Statistical Office (GUS);
- "Social Diagnosis Poland 2007" yearly sociological survey.

Data collected from the sources listed above was used in order to estimate the values not available directly (i.e. the segmentation of number of users in areas, download rates in categories).

3.23. Portugal

Responses to the questionnaire

The broadband service provision data were gathered from questionnaires received from the following operators: Portugal Telecom, PT Prime, PT.com, PT Accesos de Internet Wi-Fi, Oni Telecom, Clix, Novis, Optimus, AR Telecom, Vodafone Portugal, ZON Multimédia (ex-PT Multimédia), Cabovisão, Nortenet, Clara.net.

The questionnaires were adapted from the general form according to the operator type. The original English version of the questionnaire was translated into Portuguese.

Table completion method

The information on the broadband market presented in the reports of the national regulatory agency (Autoridade Nacional de Comunicações - ANACOM) and in operators' web pages was also analysed; however clarification and interview meetings with operators' representatives were the major information tool to gather relevant information on broadband provision.

The main data on the DSL infrastructure was collected from the incumbent operator (Portugal Telecom). PT provided the following information:

- Number of ADSL subscribers in every Local Central Exchanges, distinguishing between ADSL lines directly delivered by Portugal Telecom (incumbent), ADSL lines delivered by other DSL providers and unbundled lines.
- List of Local Central Exchanges (LCE) with Digital subscriber line access multiplexer (DSLAM) installed and coverage over lines by NUT 5. In order to give this information we calculated the coverage in different steps:
  1. For each NUT 5, we calculated the ratio inhabitans/Km^2 and consequently classified them as "urban area" "suburban area" or "rural area" according to the following parameters:

     Urban area: population density > 500 inhab./Km^2.

     Suburban area: population density > 100 inhab./Km2 and < 500 inhab./Km^2.

     Rural area: population density < 100 inhab./Km^2.
  2. Population addition of total NUT 5 with ADSL coverage in each area (Urban/Suburban/Rural).
  3. We calculated the ratio of ADSL coverage in each area by calculating the proportion of population of the municipalities with ADSL coverage over total population in each area.
- Number of ADSL subscribers in every NUT 5 by download rate. In order to give this information we calculated the ADSL subscribers both by download rate and by zones, taking into consideration the classification (Urban/Suburban/Rural) of each NUT 5.

On the other hand, most of the cable modem operators provided information about subscribers both by download rate and by zones, taking into consideration the classification (Urban/Suburban/Rural) of each NUT 5. The national regulatory authority (ANACOM) provided the ratio cable modem coverage total.

3.24. Romania

As we could not rely on detailed data from the operators, we considered primarily their publications and websites as well as third party surveys and reports. Estimates for coverage are based on cable deployment. At the end of 2007, UPC (the largest cable operator in Romania) indicated that 70% of cable TV networks were upgraded for broadband. National cable modem coverage could be estimated at 51% x 70% = 36%. Finally, we assumed coverage in rural areas was significant but lower than the national average as large centres were the first to be upgraded.
To estimate the breakdown of broadband connections by download speeds, we referred to commercial offers and related tariffs and applied certain price-elasticity rules.

3.25. Slovakia

Responses to the questionnaire

As no direct responses were received to the questionnaire, we conducted several interviews with local operators, and with Slovak Telecom in particular.

Table completion method

Estimates of xDSL coverage are based on:

- The list of 884 municipalities covered by ADSL published by Slovak Telecom on its Web (of December 31, 2007)
- The list of 806 internet providers, 380 data providers, 117 leased lines operators, 112 public telephone providers, 3 mobile operators, two FWA 26 GHz operators and four FWA 3,5GHz (of December 31, 2007)
- Press monitoring of local internet and paper branch newspapers focused on xDSL coverage and development
- OECD and ECTA documents focused on broadband development in Europe incl. Slovakia (incl. data valid for December 2007)
- official relevant Slovak Government documents and statistics of the Ministry of Transport, Posts and Telecommunications and the Telecommunication Office (national regulator) focused on broadband development in Europe incl. Slovakia (incl. data valid for December 2007)
- Annual reports of the Slovak Telekom and Orange
- e-mail and phone communications with operators
- Internet desk research
- several interviews with selected operators.

Slovak Telecom regularly publishes the list of municipalities where its ADSL technology was implemented – at the end of December 2007. This covered 70.3% of the total population in all 884 municipalities. As in many cases municipalities were indicating problems to provide access to ADSL technology, the population coverage was lowered by 10% generally for villages and by 3-15% for cities (where was monitored improvement of implementation of ADSL after December 2007). N.B.: During the period August 2006 – June 2008, Slovak Telecom informed that in total more than 3.8 million inhabitants were covered by ADSL.

3.26. Slovenia

Responses to the questionnaire

Data and estimates are based on:

- data acquired from electronic communications operators,
- data acquired from the Post and Electronic Communications Agency of the Republic of Slovenia (Agencija za pošto in elektronske komunikacije Republike Slovenije - APEK),
- data in the last year's report on Broadband coverage in Europe,
- the list of municipalities divided into urban, suburban and rural (based upon data of Statistical Office of the Republic of Slovenia on 31th December 2007).

Telekom Slovenia, the telecommunications incumbent refused to cooperate in our study, since this would, according to their official statement, require too much of their resources and would expose their business secrets.

Table completion method

Accurate data on the distribution of xDSL penetration in urban, suburban and rural areas have been obtained only for 3.5% of all xDSL connections i.e. from one operator. Therefore we complemented data with last year's data from two other big operators, which declined their cooperation in this year's survey. Those data have been corrected for the relative increase in their market shares (measured in the total number of xDSL connections) in the period from 31st of December 2006 to 31st of December 2007.

Accurate data on the distribution of cable modem penetration in urban, suburban and rural areas have been obtained only for 15.2% of all cable modem connections i.e. from 12 operators. However since the majority of those cover mainly rural and suburban areas, data had to be corrected in order to include penetration in urban areas as well. Therefore they have been complemented with last year's data for one of the bigger operators, which is also heavily present in urban areas. Its data have been used without any additional adaptations, since its market share (measured in the total number of cable modem connections) has remained relatively unchanged in the period from 31st December 2006 to 31st December 2007.

xDSL and cable modem coverage of urban, suburban and rural areas (and for the whole country) has been estimated on the relative growth of xDSL and cable modem penetration in the period from 31st of December 2006 to 31st of December 2007, since there were no other data on which we could rely upon. Therefore data from last year's report have been corrected for the relative increases in penetration.

3.27. Spain

Responses to the questionnaire

The broadband service provision data were gathered from questionnaires received from the following operators: Telefónica de España, Telefónica Data, Telefónica Móviles, Ono, Vodafone, France Télécom, Colt Telecom, Comunitel, Ya.com, Euskaltel, Jazztel, Satconxion (ÓPTIMA), Swisscom Eurospot, Hispasat, Iberbanda, Iberdrola, Epresa, N2S.

The questionnaires were adapted from the general form according to the operator type. The original English version of questionnaires was translated into Spanish.

Table completion method

Information on the broadband market presented in the reports of the national regulatory authority (Comisión del Mercado de las Telecomunicaciones-CMT) and operators' web pages was also analysed, however clarification and interview meetings with operators representatives were the major information tool to gather relevant information on broadband provision.

The main data on the DSL infrastructure was collected from the incumbent operator (Telefónica de España). Telefónica provided the following information:

- Number of ADSL subscribers by distinguishing ADSL lines directly delivered by Telefónica de España (incumbent), ADSL lines delivered by other DSL providers and unbundled lines.
- List of municipalities (NUTS 5) in which there is DSL coverage, coverage over lines by provinces (NUTS 3) and coverage over lines by areas (Urban/Suburban/Rural) according to an internal classification. In order to give this information we calculated the coverage in different steps:

  - For each municipality we calculated the ratio inhabitans/Km^2 and consequently classified them as "urban area" "suburban area" or "rural area" according to the following parameters:

    Urban area: population density > 500 inhab./Km^2.

    Suburban area: population density > 100 inhab./Km2 and < 500 inhab./Km^2.

    Rural area: population density < 100 inhab./Km^2.

  - Population addition of total municipalities with ADSL coverage in each area (Urban/Suburban/Rural).

  - We calculated the theoretic ratio ADSL coverage in each area by calculating the proportion of population of the municipalities with ADSL coverage over total population in each area.

  - We recalculated the effective ADSL coverage ratio applying the percentage of lines with potential capability necessary for ADSL service. Telefónica gave this percentage by provinces (NUT 3) and area (Urban/Suburban/Rural) according to an internal classification.
- Number of ADSL subscribers by municipalities (NUT 5). In order to give this information we calculated the ADSL subscribers by zones, taking into consideration the classification (Urban/Suburban/Rural) of each municipality.

On the other hand, the main cable modem operator provided information about subscribers.

3.28. Sweden

Responses to the questionnaire

On the whole, operators are unwilling to share detailed information. Only the incumbent, TeliaSonera, was helpful in providing us with their latest detailed figures and estimates on DSL.

Table completion method

In addition to information provided by operators, we also called on the Swedish National Post and Telecom Agency (PTS), which monitors Sweden's telecom market and publishes biennial statistics based on information from the country's operators and municipalities. Subscriber numbers for the different technologies are based on these statistics.

The incumbent operator, TeliaSonera, supplied a breakdown of DSL subscribers across download rates. These numbers should be representative for the country as a whole. Unfortunately, a similar breakdown across urban, suburban and rural regions was not available. The numbers here used are estimates.

The breakdown of download rates in the cable market comes from PTS, the Swedish regulator. The three categories are broader than those defined by the report to the Commission. And while the relative percentages given may appear to be very rough estimates, the PTS claims that the numbers are accurate to within only a few percentage points. As was the case with DSL, no breakdown across urban, suburba and rural regions was available.

Statistics Sweden has developed a model for segmenting municipalities into different categories, based on population density and distance between buildings. The population's breakdown into urban, suburban and rural is based on this definition (see datafile for mapping).

3.29. United Kingdom

Responses to the questionnaire

Over the course of first and second quarter 2008, IDATE's UK office contacted BT wholesale and other ISPs. Overall the information is considered increasingly commercially sensitive and operators advised that information available was already made public to government bodies, or in operators' publications.

Table completion method

In a similar fashion to last year, due to data sensitivity, limited information was provided, however operators agreed to validate estimates.

A fair amount of information is also sourced from Ofcom publications such as availability of unbundled broadband line. The Office Adjudicator was referenced as well to cross check data on number of lines along with annual report of leading ISPs.

For the cable modem analysis, we based our calculations on the data provided by Virgin Media. Complementary data was extracted from financial publications and press releases. Virgin Media was interviewed. The outcome from the interview is reflected in the estimates of penetration of bandwidth.

Figures on DSL penetration were calculated based on data provided by BT and from Ofcom publications. Numbers regarding cable modem access and bandwidth were estimated based on data provided previously by operators.

Annex: Questionnaire

Data required as for **December, 31 2007.**

PSTN Incumbent

A – Local Exchange approach:

1 – Complete list of all Local Exchanges (LE) in the country

2 – For each LE, please specify:

- Exact location by indicating in which (NUTS 5) the LE is located
- Installed capacity by indicating numbers of PSTN lines in service
- Is the LE equipped with DSLAM?
    - If **No** go to **section B**
    - If **Yes** go to **question 3 and process normally**

3 – Date of opening of ADSL services first generation in this LE? Date of opening of ADSL2+ services in this LE?

4 – Are all the PSTN lines depending on the LE able to deliver ADSL services? If No, please detail how many lines are not able to deliver ADSL service (e.g. too far from the LE, or too old copper lines) restrictions due to interferences, etc.)?

5 – How many ADSL subscribers are activated in this LE (total number)?

6 –On this total number please specify:

- number of ADSL subscribers by distinguishing?
    - ADSL lines directly delivered by (incumbent or subsidiary)
    - ADSL lines delivered by other DSL providers (via a Wholesale offer by the incumbent)
    - Unbundled lines
- segmentation by **download rate** (for ADSL lines directly delivered by (incumbent or subsidiary), number of subscribers:
    - up to 512 kbps included
    - from 512kbps excluded to 1 Mbps included
    - from 1 Mbps excluded to 2 Mbps included
    - from 2 Mbps excluded to 8 Mbps included
    - from 8 Mbps excluded to 20 Mbps included
    - more than 20 Mbps

7 – Do you provide IPTV services? Available to all your customers or only part of them? To which part?

B – (NUTS 3) approach:

For each (NUTS 3), please specify:

8 – How many ADSL subscribers are activated (total number)?

9 - For each of your access offer, please indicate speed rate description of the offer (Download / Upload rate) and number of subscribers?

- **If information is not available at this level,** please give us segmentation by **download rate** (for ADSL lines directly delivered by (incumbent or subsidiary), number of subscribers:
  - up to 512 kbps included
  - from 512kbps excluded to 1 Mbps included
  - from 1 Mbps excluded to 2 Mbps included
  - from 2 Mbps excluded to 8 Mbps included
  - from 8 Mbps excluded to 20 Mbps included
  - more than 20 Mbps
- please specify **upload rates** generally supplied for each category (e.g. 512/128, 2048/512, etc.)

10 –On the total number of ADSL subscribers please specify:

- number of ADSL subscribers by distinguishing
  - ADSL lines directly delivered by (incumbent or subsidiary)
  - ADSL lines delivered by other DSL providers (via a Wholesale offer by the incumbent)
  - Bitstream access
  - Unbundled lines

C – (NUTS 5) approach: Coverage

11 – For each (NUTS 5) of the country, please give the percentage of population for whom the local exchange is ADSL enabled

D – Eligibily

12 – At a Regional or national level can you indicate population really covered (eligibility) for the following download speeds:

- up to 512 kbps included
- from 512kbps excluded to 1 Mbps included
- from 1 Mbps excluded to 2 Mbps included
- from 2 Mbps excluded to 8 Mbps included
- from 8 Mbps excluded to 20 Mbps included
- more than 20 Mbps

Other DSL providers

1 – Do you provide ADSL in the whole country? In specific areas? Which ones?

2 – For each (NUTS 3) please give:

- A list of Local Exchanges (LE) where you access unbundled lines ? For each exchange, please indicate the number of unbundled lines used?
- The number of ADSL subscribers by distinguishing?
    - ADSL lines directly delivered by (YOU) through unbundled lines
    - ADSL lines delivered through wholesale access by distinguishing :
        - Resale lines
        - Bitstream access
- **For each of your access offer**, please indicate speed rate description of the offer (Download / Upload rate) and number of subscribers by offer?
- **If information is not available at this level,** please give us segmentation by **download rate** (for ADSL lines directly delivered by (incumbent or subsidiary), number of subscribers:
    - up to 512 kbps included
    - from 512kbps excluded to 1 Mbps included
    - from 1 Mbps excluded to 2 Mbps included
    - from 2 Mbps excluded to 8 Mbps included
    - from 8 Mbps excluded to 20 Mbps included
    - more than 20 Mbps
- please specify **upload rates** generally supplied for each category (e.g. 512/128, 2048/512, etc.)

3 – Do you provide IPTV services? Available to all your customers or only part of them? To which part?

Cable modem operators

1 – Please give a list of networks where cable modem is available?

2 – For each of these equipped cable networks specify:

- List of the (NUTS 5) covered by the cable modem network
- For each (NUTS 5) :
    - Percentage of the population covered by your cable modem network
    - Total Number of subscribers to your cable modem offers
- **For each of your access offer**, please indicate speed rate description of the offer (Download / Upload rate) and number of subscribers by offer ?
- **If information is not available at this level,** please give us segmentation by **download rate**, number of subscribers :
    - up to 512 kbps included
    - from 512kbps excluded to 1 Mbps included
    - from 1 Mbps excluded to 2 Mbps included
    - from 2 Mbps excluded to 8 Mbps included
    - from 8 Mbps excluded to 20 Mbps included
    - more than 20 Mbps
- Are you able to offer access to third parties?

WLAN and FWBA

WLAN

1 - List of operators providing WLAN (Wi-Fi) services in the country

2 - For each Wi-Fi provider:

- number of hotspots opened by NUTS 5

3 - For each hotspot by NUTS 5:

- Maximum number of users at peak time?
- Average bandwidth per user?

FWBA (WiMAX)

1 - List of operators providing FWBA services in the country

Please specify the licence conditions (in particular, will mobile WiMAX be allowed?)

2 - For each FWBA provider :

- number of Base Station opened,
- Localisation of Base Station by (NUTS 5/3)

3 - For each Base Station opened:

- Number of subscribers?

4 - For each of your access offer, please indicate speed rate description of the offer (Download / Upload rate) and number of subscribers by offer (at a NUTS 3 level)?

Satellite

1 - List of operators providing internet by satellite services in the country distinguishing between one and two-way satellite,

2 – For each satellite service provider:

- number of subscribers for Internet offers, distinguishing between one and two-way satellite?
- Supplied speeds :
  - For each of your access offer, please indicate speed rate description of the offer (Download / Upload rate) and number of subscribers by offer?
- Please specify number of subscribers by (NUTS 3/5)?

FTTx (FFTH, FTTN, FTTB)

1 - List of operators providing FTTx services in the country

2 – For each FTTx provider:

- Geographical coverage :
  - Please specify which towns are covered? For each covered town, is the offer available in the whole town ? if not please specify where?
  - Do you offer FTTx services in suburban zones ? if yes precise in what locations by indicating (NUTS 5)
- Number of active subscribers?
- Number of Building reached?
- Number of Homes reached?
- Supplied speeds :
  - For each of your access offer, please indicate speed rate description of the offer (Download / Upload rate) and number of subscribers by offer?

3 – Do you provide IPTV services? Available to all your customers or only part of them? To which part?

Mobile operators

1 - List of operators providing 3G services in the country

Please specify the licence conditions (notably coverage obligations and timing)

2 - For each mobile operator:

- number of Base Station opened (Node B or BTS equipped with EDGE) ,
- Localisation of Base Station (by NUTS 5)
- Population covered (by NUTS 5)
- Territory covered (by NUTS 5)

3 - For each Base Station opened:

- Number of subscribers, split into handset SIM cards and PC cards

4 - For each of your access offer, please indicate speed rate description of the offer (Download / Upload rate) and number of subscribers by offer (at a NUTS 5 level)?

NRA & Ministries

Result of national broadband surveys. (to check with aggregated figures).