

# Management and promotion of telecommunications infrastructures

## Executive summary



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## EXECUTIVE SUMMARY

The value of the **net real ICT capital stock** has been multiplied by 58.8 between 1964 and 2013. This growth is not comparable to the one shown by the rest of the assets, which is much lower. The total stock of net real capital has only multiplied by 5.5 between 1964 and 2013.

In absolute terms, it began to increase considerably from the second half of the 1980s until the 2008 crisis arrived and reduced its growth rate to the point that in the year 2011 it shows a reduction of 60 M€. In the last year of the period analyzed (2013), it reached 18,120 M€ and represents 3% of the total capital stock.

The composition of the ICT capital stock in 2013 is as follows: machinery and communications equipment account for 52% of the ICT capital stock, followed by software, weighing 35.4%, and office equipment and hardware, with a weight of 12.6%.

The activity sectors with more ICT capital stock in 2013 are: Information and communications, Professional activities, Other services and Electric energy, gas and water, sanitation and waste management activities. These four sectors represent more than 50% (53.5%) of the ICT capital stock. In the mid-1990s, the Financial and insurance sector takes temporarily the second position.

The Transport and storage sector has a prominent role in the capital of machinery and communications equipment; Trade and repair has this role in software capital, whereas the Public Administration has it in the office machinery and hardware capital stock.

In 2013 the weight of capital real stock of Catalonia in Spain was 17.4% and reached a maximum of 21.4% in 1975. For its part, the weight of ICT capital stands at 17.2% in 2013 and peaked in 1996 when it accounted for 22.4% of the ICT capital stock of Spain as a whole.

The last crisis affected the **prices** of the total capital stock on a downward trend from 2009, although the prices of ICT capital had been declining already since 1989. The behaviour of the assets prices that make up ICT investment is different from the aggregate behaviour, especially in the software case, which shows an upward trend throughout the period analyzed, and office equipment and hardware, which shows a strong downward trend throughout the period analyzed.

Regarding the data provided by the **ICT infrastructure section of the ONTSI**, the available study period is 2007-2014. It is observed that only the number of fixed telephone lines decreases (6.6%). The number of broadband lines is the one experiencing the highest growth (51.4%), followed by the number of mobile subscribers (37.3%) and the number of paid TV subscribers (23.5%).

As for the accesses installed, we found that the most numerous ones are of optical fiber (more than 3.5 million), which are already above the copper pair (almost 3 million).

In relation to the base stations of mobile telephony, the highest number corresponds to UMTS, with almost 7,000 units, followed by GSM (5,320), DCS (3,325) and finally LTE (2,259), which appeared by first time in 2013.

Movistar is the main operator of broadband in Catalonia in 2014 with a share of 49.1% and is also the main mobile operator, with a share of 38.5%. This, despite the loss of 13.1 and 5.9 percentage points in the analyzed period, respectively.

In the international comparison of fixed broadband coverage, Catalonia has a coverage of 31.8 subscribers per 100 inhabitants, which is lower than that of France (40.2%) and Germany (35.8%).

With regard to the specific **broadband (BB) coverage** data for autonomous communities of the Ministry of Industry, Energy and Tourism, the latest publication provides information from the 2015 to 2016 period. It is possible to compare the situation of Catalonia in relation to Spain and the EU-28 for the year 2015.

The BB technology reaching more households is the third generation extended mobile network (UMTS) which covers 99.8% households. In Spain and the EU-28 the coverage of this technology is similar to Catalonia. 4G technology is less widespread than the previous one (84%), but in Spain (76%) and EU-28 (79.4%) coverage is lower.

The second most widely used BB technology is the wireless one. It reaches 96% of Catalan households, a considerably higher percentage than the Spanish (57%) and EU-28 one (19.6%).

Regarding the wiring access technologies to the BB, the most widespread is ADSL, which reaches 91% of Catalan households. In Spain and the EU, coverage is similar. Apart from DSL technologies, the most widespread one is fiber optics, which reaches 60% of households. In Spain (45%) and EU-28 (18.7%) coverage is significantly lower.

As for the broadband coverage of fixed networks according to speed, we find that the coverage that Catalonia has is equal to or higher than that in Spain and the EU-28 for all the speeds considered.

The 2015-2016 evolution in Catalonia of the coverage of households with broadband access shows that, among mobile access technologies, only LTE (4G) has grown by 10 percentage points. Wireless technologies have a modest growth (3 percentage points) which is almost exclusively due to networks that provide service of 30 Mbps or more. As for the technologies of wired access to the BB, the one that has grown most is the optical fiber, with 18 percentage points.

The Catalan households coverage of BB fixed networks according to speed shows that the most important increases occur in the ranges of higher speeds. The coverage of households with 100 Mbps BB or more increases by seven percentage points and that of 30 Mbps or more does it by eight percentage points. In contrast, coverage of households with BB of 10 Mbps or more increases by three percentage points and that of 2 Mbps or more does not grow.

The results of broadband coverage according to the technology and speed of transmission by provinces and municipalities are discussed below.

The province with the highest coverage of fixed networks at speeds of 100 Mbps or more is Barcelona (80.4% of households), which exceeds the Catalonian average (68.3%). The coverage of the other provinces show similarities among them that are well below the average coverage, although they are the ones that have grown the most in the last year. There are only 68 municipalities with coverage of households with fixed networks of 100 Mbps BB or more above 80%.

In relation to the access to BB through LTE mobile networks (4G), the province of Barcelona has the highest coverage (96.8% of households), above the average in Catalonia (93.6 %). The province that has the lowest percentage of covered homes is Lleida (74.7%), which is situated at a considerably lower distance than the average. There are 405 municipalities that have BB coverage with LTE mobile networks (4G) above 80% of households.

As for the access to BB with fixed networks at speeds of 30 Mbps or more, Barcelona is the province with the highest coverage (82.4% of households). The other provinces have considerably lower coverage than the average of Catalonia (72.6%) but, on the other hand, are the ones that have grown the most last year. There are only 84 municipalities with home coverage with fixed networks of BB of 30 Mbps or more above 80%.

If we pay attention to the ranges of less access speed to broadband, the differences between provinces practically disappear. In the case of UMTS mobile networks with HSPA (3.5G), all provinces have a very high coverage that exceeds the rate of 99%. There are 898 municipalities with a coverage over 80% of households with this technology. In the case of fixed networks with speeds of 2 Mbps or more, all provinces have a coverage close to 100%. There are 859 municipalities that have more than 80% coverage in this technology.

The 1999 Strategic Plan for the Information Society and the 2009 National Pact for Infrastructures lay the foundations for what is intended to be the **ICT model of Catalonia**.

Later, in 2012, the Government of the Generalitat defined a new ICT model for the Generalitat of Catalonia with two major objectives. On the one hand, to provide the country with a new generation network, of very high capacity in the whole territory, open to the market, which allows increasing the competitiveness level of Catalan companies. On the other hand, to transform the Administration and society efficiently and promote modernization and innovation in the Administration services and in its relationship with people.

This network has already begun to be deployed with the Open Network project, through which a public-owned fiber optic network is created, which currently includes 1,040 offices of the Generalitat distributed in 104 municipalities.

From 2012, the Center for Telecommunications and Information Technologies launched a public tender for the connectivity service of all the offices of the Generalitat not included in the scope of the Open Network project. This means 4,600 venues, distributed in about 780 municipalities throughout the territory. This new contract was awarded to Telefónica.

This network responds to the ICT needs of the Administration but also to those of the country, since it also has to connect schools, health centres, research and innovation centres and industrial estates. In addition, the network must be available in wholesale mode for other operators at regulated prices, in order to facilitate the arrival of digital services to the maximum possible territory.

Another ICT infrastructure to which we have to pay special attention is the CATNIX; its aim is to be an exchange point of data traffic in the Catalan territorial area connecting the networks of Internet operators and providers of content and services. CATNIX is managed by the Consortium of University Services of Catalonia.

Currently, the Department of Enterprise and Economy gives great relevance to the SmartCAT Strategy. With this line of action the Government of the Generalitat extends the concept of smart city to the scale of what the European Commission calls smart region. It is aligned with the European Commission 2020 Strategy and responds to the objectives and policies established by the Digital Agenda for Catalonia (idigital) and by the Research and Innovation Strategy for Intelligent Specialization of Catalonia (RIS3CAT).

The SmartCAT Strategy starts a set of projects and initiatives aimed at public administrations, companies and citizens, and it structures its priorities around several areas of action, among which we highlight the following ones:

First, the collaboration with the agents involved in the incorporation of new technological tools in order to have a technological environment that favours the development of the technological architecture of the smart region.

Second, collaboration between administrations and the private sector to promote the deployment of smart city projects in Catalonia.

Third, to identify and promote the strategic opportunities related to smart solutions and initiatives that can contribute to strengthen the competitive position of the sectors prioritized in RIS3CAT, on which Catalonia wants to base its industrial growth.

Fourth, to take advantage of the business opportunities generated by the deployment of the smart region in Catalonia and boost a new data industry linked to the big data emerging technological sectors. Finally, the development of the Open Government Strategy of the Generalitat and its interrelation with other areas of the SmartCAT Strategy.

The road map to become a smart city envisions that a smart city must manage and optimize the current infrastructures, and plan under criteria of efficiency and sustainability the ones of new design. It is recognized that resources are limited and that there is overstress on existing infrastructures.

This road map discusses actions of the Digital Agenda for Spain as the one to promote the productivity increase of the companies incorporating the ICT to the productive process as well as actions of the 2020 ECAT Strategy that considers the availability of telecommunications of new generation networks as a key factor for attracting and consolidating foreign companies with high added value.

The results achieved by Catalonia in terms of the digital agenda are equal to or better, depending on the indicator, than those of the EU-28 as a whole, except for the percentage of the population that purchase online and of the regular use of Internet by disadvantaged groups.

There are two indicators in which Catalonia has a difficulty in achieving the European objectives: population that purchase online and SME that sell online. These difficulties could be explained by a question of habit and not by a lack of ICT infrastructures.

We could also include in this situation of difficulty in achieving the European objectives the disadvantaged groups that use Internet on a regular basis, in particular pensioners, people aged 55 to 74 and, to a lesser extent, people with a low level of studies or without studies.

On the other hand, it is verified that there are no statistics in Catalonia referring specifically to the public promotion of the investment in R+D for ICT.

It is confirmed that some of the objectives of the Catalan Digital Agenda are more ambitious than those of the European Digital Agenda.