

The Broadband Status in the Region of Western Greece: Overview and Recommendations

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Abstract

This paper presents a study conducted in the Region of Western Greece, in order to propose an overall planning for the development of broadband infrastructure in the Region of Western Greece. The current broadband status in the region is being described, while the results of a survey on broadband usage and demand are being presented.

The paper proposes some Recommendations that should be adopted in the region of Western Greece in order for the appropriate broadband infrastructures to be developed and adopted so as to contribute to economic growth and to tackle any possible cases of “digital gap” between the citizens of our country.

Introduction

The general aim of the presented study [1] is to investigate the current status concerning the demand of broadband services and the supply of broadband infrastructure that will support them, in the Region of Western Greece. The goal is to propose certain actions and a regulatory framework that will allow the development of broadband infrastructure and services in the region.

This research was conducted during the project “Broadband Promotion in the Region of Western Greece”. The goal of the project was to promote and stimulate the usage of broadband technologies in both the public and the private sector, by studying the current situation in the region and proposing the certain actions that should take place in order to raise the demand and satisfy it by implementing new broadband infrastructure. This project was funded by the “Information Society” Operational Program, within the Third European Support Framework.

This study provides important clues regarding the two main following issues:

- The existence and usage of broadband infrastructures
- The possibility to satisfy the present and future demand

Within this research are also presented ways to develop broadband infrastructure, as the basic goal of this study is to examine the infrastructure that will be provided and their supply in terms of conceding the demand for broadband services.

The keynotes of the conducted study are presented in this paper. In particular:

- The current progress in Greece and worldwide regarding to a) common practises for the promotion of broadband, b) policies, strategies and plans and c) technological practises.

- The results of a survey that captures the users’ demand for broadband services and the business plans of the telecommunications providers that are activated in the area.
- The proposed technical framework for the implementation of high speed access networks.
- The regulatory framework that should be created, along with government initiatives for synergy and funding, as well as the creation of a cooperation spirit among providers.

This paper is structured as follows. Firstly, the methodology of the conducted research is being presented. Then the guidelines from European Union regarding broadband are being described, while the current broadband infrastructure in Greece is being presented in the next section. The following section provides the results of the survey that took place in the region about the usage and demand of broadband services regarding the end users and the major organizations of the area. Then, the recommendations that should be adopted are being described and the proposed regulatory framework is being analyzed. The paper is completed with the conclusions.

Methodology

In this section the methodology of the research is being presented. The research has been divided into different steps in order to succeed its goals.

The first step in order to study the broadband development in the Region of Western Greece, realize the handicaps and suggest practicable solutions, is to examine the current state of broadband infrastructure worldwide, in the European Union, in Greece and then in the region. The European Union’s directions are a roadmap for development, while reviewing common international practices in the specific field is essential. In Greece, a thorough study of the current state consists of a number of actions, like examining the infrastructure in national level, surveying the strategies and the regulations and detecting possible future acts or plans. Regarding the Region of Western Greece, the proper clarifying of the situation is essential in order to provide some solutions.

Towards this direction, we organized public deliberations with the telecommunications firms that act in the region and the major private and public organizations that will be benefited from the broadband infrastructure. In addition, a major survey has taken place in order to measure the end users’ broadband demands. This market research

was conducted through questionnaires that were handed out to the public and also an on-line survey on Internet and broadband services usage. Lastly, a number of technical meetings – one-day events were held, where different viewpoints were expressed about the situation in other European countries, the suggestions of the EU, and the current state of the region of Western Greece.

The broadband public deliberations and the results from the questionnaires helped impressing the current state in the region, by discovering the broadband needs of the end users, the organizations, the public authorities and the companies of the private sector. On the other side, the telecommunications firms and the ISPs revealed their business plans and their future steps regarding the deployment of broadband infrastructure and the provision of broadband services in the Region of Western Greece.

The analysis of the above mentioned information, which is being presented in a separate section, led us to the recommendations and proposals that should be acted out in order to invert the situation in the Region of Western Greece and provide an innovative environment to grow broadband infrastructure and services. Through a generous and ambitious policy, the main objective should be broadband access for all, taking into account the specific needs of the region. The most determining points of the government policy on broadband access for all, which should be taken into consideration in order to formulate proposals, are the following:

- The creation of the conditions for a healthy and competitive market
- Open and transparent government intervention through consultations and research
- To highlight the Information Society as a reality that strengthens the part of citizens and constitutes a drive for regional development and social cohesion.

EU Directives and Guidelines

The importance of broadband infrastructures worldwide is confirmed by the activities of certain advanced countries in order for the appropriate broadband infrastructures to be developed and adopted so as to contribute to economic growth and to tackle any possible cases of “technological exclusion” of citizens.

The importance of broadband networks for the development of a country may be also confirmed by the intensiveness of the activities of many countries that set as their main strategic objective projects for the implementation of such infrastructures. In addition, the development of such networks has also been adopted in the common European policy for the implementation of the Information Society. In eEurope 2005, broadband access is an important priority of the European Union [2].

The main principles and guidelines of this initiative were to ensure safe services, applications, and content based on widely available broadband infrastructures. More specifically, the main objectives set for the development of broadband infrastructures and services were:

- Connecting public administration to broadband infrastructure

- Strengthening of broadband access in less favoured regions
- Introduction of information networks among health centers with broadband access.

All schools and universities, as well as museums, libraries, archives and public organizations, should be connected to broadband networks by 2005. A key point for attaining the above objections is the aggregation of the demand generated, mainly in the public sector and includes public administration, local government, health and education, etc.

In November 2004, the European Commission published a Communication on the challenges to be addressed by a European Information Society strategy up to 2010 [3]. In the 1st of June the Commission adopted the initiative “i2010: European Information Society 2010” to foster growth and jobs in the information society and media industries. i2010 is a comprehensive strategy for modernising and deploying all EU policy instruments to encourage the development of the digital economy: regulatory instruments, research and partnerships with industry. The Commission will in particular promote high-speed and secure broadband networks offering rich and diverse content in Europe.

In its i2010 initiative, the Commission outlines three policy priorities:

- To create an open and competitive single market for information society and media services within the EU. The Commission will propose: an efficient spectrum management policy in Europe (2005); a modernisation of the rules on audiovisual media services (end 2005); an updating of the regulatory framework for electronic communications (2006); a strategy for a secure information society (2006); and a comprehensive approach for effective and interoperable digital rights management (2006/2007).
- To increase EU investment in research on information and communication technologies (ICT) by 80%. Europe lags behind in ICT research, investing only €80 per head as compared to €350 in Japan and €400 in the US. i2010 identifies steps to put more into ICT research and get more out of it.
- To promote an inclusive European information society. To close the gap between the information society “haves and have nots”, the Commission will propose an Action Plan on e-Government for citizen-centred services (2006); three “quality of life” ICT flagship initiatives (technologies for an ageing society, intelligent vehicles and digital libraries available to all (2007); and actions to overcome the geographic and social “digital divide”, culminating in a European Initiative on e-Inclusion (2008).

i2010 is the first Commission initiative to be adopted under the EU’s renewed Lisbon strategy. It focuses on the most promising sector of the EU economy: ICT account for 40% of Europe’s productivity growth and for 25% of EU GDP growth. Member States are asked to define National Information Society Priorities in their National Reform

Programmes in mid-October 2005 to contribute to the objectives of i2010.

Broadband Infrastructure in Greece

The development of broadband access in Greece has not followed the same pace as in other countries. The reasons behind this delay are manifold, including some of the ones presented next.

The potential market of broadband services in Greece is small. Recent studies [4] conducted either in small and medium-sized enterprises, or in Greek households have shown low PC and Internet user percentages. The encouraging outcome of such studies, though, is that the rates of increase of the number of PC and Internet users are high, thus, an improvement of the current situation is hopefully going to be anticipated soon.

The country's remote areas are the least developed ones, and the ones facing the most intense technological exclusion. Big lengths of local loop at a large part of the country's geography as compared to the logical distances observed in urban areas, lead to a dramatic increase of the cost for the development of broadband networks, and the direct effect of this in combination with the low anticipated demand in such areas, is the lack of investment in the creation of new infrastructures.

The limited terrestrial infrastructure (backbone and access) to date in all of Greece able to support widely broadband services is an important problem in competition development. Although some companies have asked OTE (Hellenic Telecommunications Organization) to lease infrastructures in order to be able to provide mid-band access services to their customers, unbundling is proceeding at a particularly slow pace. In general there is not yet sufficient competition in networks and services.

In recent years, research and educational networks in Greece are the first ones to adopt broadband services, training the future users – citizens of the country. The current broadband infrastructures in Greece are divided as following:

- **Public broadband networks:** These are the Greek Research and Technology Network (GRNET), the Greek Network of National Government ('Suzefxis'), the Greek Universities Network and the Greek School Network. The above mentioned networks are oriented to interconnect research and academic organizations, institutes, universities, public utilities and schools through broadband networks.
- **Private broadband networks:** The low demand of broadband services and the high cost in telecommunications services and Internet access haven't permitted any important investing activities in developing alternative broadband infrastructure. Towards this direction led the absence of a sufficient regulatory framework, especially regarding the licensing of the telecommunications providers. In Greece the main telecommunications carrier and provider was the former public carrier OTE, which monopolized the market. Since 2000, the growth of alternative providers led to the implementation of new

broadband infrastructures developed only between Greece's two major cities.

Although 'Suzefxis' is the main instrument of extending the reach of broadband services to the entire Greek territory, the telecommunications firms tried to "pull" early adopters to broadband connectivity, given the launch of ADSL in Greece in mid-2002. As shown in Figure 1, on July 2004, the ADSL penetration in Greece was 0.2% (the lowest percentage in EU15 and EU25) while the average of the EU15 was 7% and the average of EU25 was 6.5%.

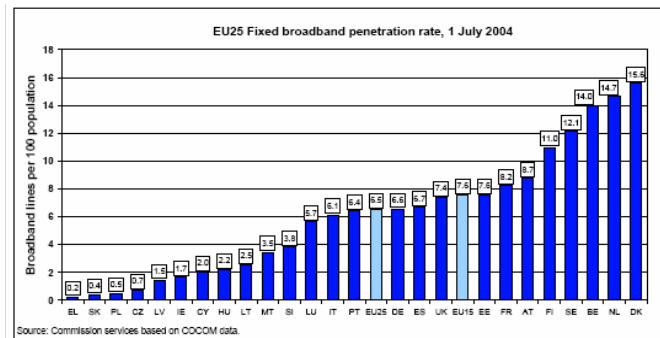


Figure 1: EU25 Broadband Penetration rate

Towards the direction of implementing new broadband infrastructure, the business plan "Information Society", funded by the European Community (3rd EUSF), has planned the start of certain actions by funding the development of both public and private broadband infrastructure. The project's main goal is to start actions that will promote the growth of broadband usage in a regional level, and regarding the fields of government, education, health and entrepreneurship.

Broadband Infrastructure in Region of Western Greece

The current state in the Region of Western Greece will be discussed in this section. It is a fact that the broadband infrastructure, especially in this region, is problematic. This situation is not a fact only in the urban area of the city of Patras, which maintains the main nodes of the networks of Western Greece. Patras is the major city in Western Greece and third in population in Greece, with a number of Universities, Research Institutes and IT businesses. At the current situation the proper infrastructure in Western Greece is owned only by the former public telecommunications provider (OTE), while the alternative providers seem only to have plans in expanding their network infrastructure within the city of Patras. The business plans of the alternative telecommunications companies and network carriers do not include the expansion of their network throughout the Region of Western Greece, since they are afraid that non urban areas appear no business utilization. Broadband access, as defined by the "Strategic text on broadband access" [5] of the relevant Task Force, requires the proper broadband infrastructure and the competition between the Internet Service Providers. Since broadband infrastructure has not been developed up to nowadays, the penetration of

broadband usage has not been increased. Although these findings are pessimist regarding the growth of broadband, the action line of the Operational Program "Information Society", appear to be a significant hope for the near future.

Unfortunately, the broadband penetration level has been very low in Greece and especially in the Region of Western Greece. Greece has been the last country among the EU of 15, and remained last in providing broadband access among the 25 countries of the EU. This is caused by the fact that the absence of competition in the broadband market, does not permit the private sector to invest in broadband facilities in the region.

The main issues that occur during this research for the current state of broadband in Western Greece could be divided in two main categories: a) the clients' side, as far as broadband demand is concerned, and b) the providers' side, as far as broadband supply is concerned.

Regarding the end users the major issues are the following:

- Inhibitory cost of broadband access regarding home usage
- Lack of broadband services that will take advantage of the infrastructure

The telecommunications companies have raised a number of issues that discourage them from investing in broadband infrastructure and services. Synoptically these issues are:

- Lack of the regulatory framework that adjusts and defines the market of broadband services, in order to ensure the market and competition's functioning.
- Difficulties in developing the Local Loop Unbundling (LLU).
- Lack of preparation in supporting the demand of broadband services by the former public telecommunications carrier (OTE).

These issues occur as major problems in the Region of Western Greece, since most areas of the region (except from the city of Patras) have no economical prospects in developing broadband infrastructure. This fact is deterring telecommunication companies from having a powerful presence in the region, and thus contributing in the promotion of the competition in the broadband access.

Since the start of the year, the xDSL penetration seems to rise. The current access network (copper cables) is being updated by installing xDSL technologies such as ADSL mainly and HDSL. According to OTE, 10,929 ADSL ports will have been installed in the region of Western Greece by the end of 2005 (and 270,000 all over the country). In addition, a number of wireless hotspots is being installed in public places, such ports, entertainment parks, etc.

Another measure that is expected to boost ADSL use in the major cities of the country (including Patras), is the provision of ADSL Internet access in a diminished cost to the University students. This measure was announced by the Greek government on June 2005 and it will function on the start of the academic year.

Broadband Usage in Region of Western Greece

This survey has been conducting in the Region of Western Greece for the past months, and is still going on in order to indicate the intension of the broadband growth over time. Moreover, its goal is to indicate possible changes of the current situation through the actions and the projects funded by the Operational Program "Information Society".

During this survey, a market research is taking place, through questionnaires that can be filled on-line through the web site of the "Broadband Promotion in the Region of Western Greece" and are also being shared to the public. The number of the participants in this market research enables the drawing of some very important conclusions about the broadband usage in the Region of Western Greece.

Concisely, the main conclusions show that even though the usage is quite low (Internet users are less than the 25% of the population, including University students who all of them have access to high speed data networks), the demand of higher speed networks and thus broadband infrastructure has been growing. ADSL penetration in Western Greece on June 2005, according to OTE, was less than 2% of the subscribers and 1% of the population. The estimation of growth presented by OTE shows that until 2007, the number of the ADSL subscribers is going to reach the 7% of the households in region of Western Greece. The evidence provided by OTE show that within the last 2 years, the reduction of the cost to the half price had as a sequence a six times increment of the demand.

The profile of the "broadband user" in the region of Western Greece is: male, between 20-30 years old (the 53%) and with a higher educational level. There are also high percentages of users in the age of 30-40 (26%). Unfortunately, there is a gap between men and women, since the vast majority of users of all categories are male. An encouraging clue is that people are well informed about broadband access and technologies (74%), however, it seems that an average percentage of only 30-40% is willing to obtain it in the near future.

The main reason why the users do not hold a broadband Internet connection is the high cost (69%) and the fact that they believe they do not need it (15%). On the other hand, a trigger in order to acquire a broadband connection would be the reduction of the activation and usage cost (41%), the provided connection speeds (40%) and the variety of the provided services (17%).

Regarding the ISP's, the main conclusion of the research showed that they prefer to invest in developing multimedia services and e-services, if the proper broadband infrastructure would exist. Besides, the broadband services demanded by the end users, are ranked as following: video/tele-conference, fast World Wide Web, voice over IP, video on demand, e-learning, tele-working, e-health and gaming. Despite the variety of services the users wish to enjoy, the acceptance of the broadband services by the users who live in non urban areas is quite smaller that the acceptance and familiarity in the major cities.

According to the organizations of the public and private sector that participated in the survey, the main motivation

that would affect them in developing the broadband services market is the profit that would be gained by the adoption of the new services. Moreover, the 67% of the telecommunication providers have never proceeded with any marketing or publicity regarding the provided services and in order to attract specific new users.

Recommendations

At the threshold of the 21st century the Information Society is creating new opportunities for development, prosperity and improved quality of life. Its growth is based on the rapid development of Information and Communication Technologies (ICTs). These technologies promote open and effective governance and improve services to citizens, while creating a new economy based on knowledge [6].

Taking into consideration the current state in Greece and especially in the region of Western Greece, we propose a number of actions that we consider as critical for organizations and citizens of the region of Western Greece in order to acquire broadband culture. These actions should be the following:

- Promotion of broadband culture in the Region of Western Greece
- Development of broadband infrastructure

First of all, there is need for an extensive promotion of the benefits and capabilities of broadband services and infrastructures through a technical, financial and commercial point of view, in order to foster a “broadband culture” in the region. This promotion includes the market researches on the demand and supply of broadband. Moreover, it should focus on the necessity of broadband infrastructure and services and on the organization of events that will inform people about broadband and its advantages. In addition, the promotion through advertisements in printed and electronic information media, the distribution of printed material and some live demonstrations of broadband capabilities and services is necessary in order to pursue the public about broadband’s capabilities.

Furthermore, the promotion could be also achieved through the internet. A web site that contains rich information about the benefits of broadband services and infrastructures, informs about other countries’ experiences and initiatives, displays broadband news and events, and demonstrates broadband services, would be valuable for the citizens in order to be more familiar with the concept of broadband culture. On top of that, a helpdesk operated by experts would give the citizens of the region of Western Greece the ability to solve many wonders about the broadband concept and be well informed.

It is essential for the citizens of the region of Western Greece to understand the significance of the development of broadband services and infrastructures in Greece and the positive effect of new technologies on the citizens’ daily life.

The step that follows the promotion of broadband culture is the deployment of broadband infrastructure in the region of Western Greece. This implies the development of local access broadband networks in the major cities, small

towns and non-urban or remote areas in the region of Western Greece, in order to provide a broad range of basic telecommunications services. This action is concerning the development of Municipal Fiber Optical Networks (dark fiber) aiming to interconnect public buildings and organizations. Through this action, user groups of the public sector will be interconnected on a regional basis (for instance buildings for the administration and the local authorities of the Region, prefectures, municipalities, universities, research centers, hospitals, health centers, schools, etc.). These broadband networks and services should ensure uninterrupted and transparent access to information and telecommunications systems, for meeting customers’ needs. The funded infrastructure will be owned by the municipality and managed by a business schema proposed by the technical consultant of the region. The functioning of the network should be based in the cost oriented pricing. The establishment of cost oriented pricing for the deployed infrastructure will play a determinant part in reducing business risk for new entrants in broadband networks and services on each municipality of the region. The ISPs will be able to invest on broadband services and provide them to the citizens on reasonable prices, as the pricing of their infrastructure will be cost effective. This also concerns the pricing of “dark fiber”, as well as any other “lit fiber” service [7].

The development of local access networks in the region of Western Greece will liberalize the market, increase competition and improve the quality of life for people living in mountains or other rural areas of the region, by using information and communication technologies for improved health, education and business services.

The development of local access telecommunications infrastructure will be based on a regional strategy and take account of the physical particulars, the foreseeable social, economic and population developments, and existing telecommunications infrastructure of Western Greece. Concerning the implementing technologies, fiber optics technology and wireless technology are the two key technologies for such an approach [8]. Fiber optic cable is currently being used in places of high density of demand, such as large volume users in the business market. Wireless broadband technology can offer the most cost-effective means of providing high-capacity, high-speed, data, voice, video and Internet services. It allows gross areas to get covered easily and to be expanded according to customers’ demands. Wireless technology provides one of the best ways to establish high speed networks services without the cost or the long deployment time, which is experienced when installing cable or fiber infrastructure.

Regulatory Framework

This section will discuss some of the regulatory policy issues posed by the entry of municipalities into the commercial market through the proposed actions. The publicly owned community networks are posing new regulatory and policy issues, in particular with respect to community-owned networks that include the open access model and the community-owned networks plus retail service provision to end users model, but less so for the

demand aggregation model. This will result to a clear operating framework for telecommunication companies which can change according to market conditions in order to provide better services to the citizens [9].

From the government's point of view, the government authorities should provide the necessary policies to enhance competition, open telecommunication markets and promote access to infrastructures. The qualitative and quantitative assessment of infrastructure requirements calls for co-operation between public entities, organizations, private companies, and professional and local authorities. Government policy should attempt to ensure that actions complement one another, with optimal use of resources, in a competition-friendly environment.

To justify community initiatives for high-speed networks and services, the benefits of government intervention must be substantial and clear. The first issue to be handled in this respect is whether to allow or permit localities to enter into the broadband market in the light of policies to create competitive local markets, market circumstances and regulatory frameworks. The main question raised by the entry of municipalities into the broadband market is whether such entry may result in barriers to market entry by other providers. If a joint venture between a municipality and private partners or a municipal utility inhibits competition in that local market then clearly guidelines must be put in place by regulators to ensure that these initiatives favour the development of competition.

Taking into consideration the current state in the region of Western Greece where the telecommunications market still depends on the core fiber optics networks of the dominant provider (OTE) and all the above mentioned issues, we can say that it is important for the Greek Government authorities to update the telecommunication law of the country. This could secure the viability of the public and private telecommunication companies and simultaneously the viability of the community-owned networks. To this direction, the Greek Government authorities taking into consideration the issues mentioned in this section and the variability of the Greek telecommunications market, did published a draft for the new telecommunications law. This could secure the telecommunications market and competition in Greece and as a consequence better services will be provided to the citizens. The new law should provide the telecommunications firms with the conditions to enable the reduction of prices. The specific clauses should clearly describe the functioning of the Regulatory Authority (EETT), in terms of independence and efficiency. The issues concerning the rights-of-way should also be defined (e.g. the rights of way of fiber optic through urban planning resources of different proprietors such as Municipalities, individuals, Institutions and Organizations).

Conclusions

As a conclusion we must address that in region of Western Greece, the absence of services that will create demand for broadband services, services of broad

acceptance and interest, does not allow the creation of a critical mass demand for development. However, the development of broadband infrastructures and services is of strategic importance for the region, since it can significantly stimulate economic activities, and contribute to a great extent to the improvement of the quality of life of citizens. In order to achieve development of broadband infrastructures and services, we propose some specific recommendations, present the actions that should take place and describe the regulatory framework that should be provided by the government.

Delays in the implementation of such actions and projects, especially at a time when other important and related technological upgrading actions are being taken, shall lead the region to a more unfavourable position in nowadays competitive economy.

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