Ministry for Investment, Industry and Information Technology

mca Malta Communications Authority

# The National Broadband Strategy

December 2004

# 1. EXECUTIVE SUMMARY

The advent of broadband technology has led a number of countries to draft a national strategy which seeks to address the multiple factors which come into play for the deployment of the technology on a national scale reaching the maximum number of residential and commercial users possible.

Malta's progress in attaining an information society and economy together with its accession to the EU, has led to the drafting of a broadband strategy which sets the parameters for the various initiatives which will be co-ordinated by Government, the private sector and other stakeholders.

The strategy is based on the objectives set within the eEurope 2005 action plan and takes into consideration the particular characteristics of the country.

A list of drivers which will increase broadband take-up in Malta are presented. Similarly a list of barriers which inhibit further proliferation are also listed. The broadband model brings together a number of variables and stakeholders, which together set the framework for the broadband strategy.

The model leads to a number of strategic objectives and action lines. Focusing on both the demand side and supply side of the broadband issue, the strategy identifies key deliverables leading to an increase usage of broadband technology, which results in an improved quality of life for citizens and an increase in the economic activity of the country.

Implementing the strategy involves the active participation of a number of leading stakeholders from the public and private sector who have to assume a number of defined roles which lead towards the same objective. A sub-committee will monitor the attainment of the strategy goals while the results emanating from the actions undertaken will be benchmarked against a number of pre-defined key performance indicators.

This draft strategy is the outcome of a concerted joint effort between the Ministry for IT and Investment and the Malta Communications Authority. The two public entities spearhead the rapid development of the information society in Malta.

Interested parties could submit their feedback on the strategy during a 3-week consultation period which terminated on 14 May 2004.

## Contents

# 2. OVERVIEW

## 2.1 What is Broadband?

*Broadband* is a technical term that describes a data communications technology which provides a permanent, high throughput connection. In marketing-speak it is "fast" and "always on" and bridges the gap between dial-up modems and leased line circuits. Typical speeds can vary between 128 kilobits per second (kbps) and several Megabits per second (Mbps). Broadband technologies are able to provide a mix of data, voice, and video services over one "pipe".

Several varying descriptions and definitions of "broadband" exist and there is no universally accepted definition.

In the *Explanatory Memorandum* to the European Commission's Recommendation on Relevant Product and Service Markets[1] within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, footnote 33 explains that "Higher bandwidth or broadband Internet services may be characterised as allowing downstream capacity to end-users in excess of 128 kbits/sec."

In footnote 5 to the eEurope 2005 Action Plan[2], the following is stated "There is no universally accepted definition of broadband, but its key characteristics are high speed and always-on functionality."

## 2.2 The Current Scenario

The fundamentals of an information society and economy have long started to become a reality in Malta. The take-up of different technologies by the local population has been relatively encouraging with a rather slow take-up at the launch phase of such technologies but quickly catching up with the developed countries as the same technologies where embedded in the daily lives of people and production process of the industrial field.

Malta has been an active participant in the eEurope+ process since its launch in 2001. eEurope+ was the action plan for the candidate countries seeking to join the European Union. It set a number of objectives and targets for the attainment of an information society and economy. The action plan mirrored the same objectives of eEurope[3]. It had the aim to accelerate reform and modernisation of the economies of the participating countries, encourage overall competitiveness and enhance social cohesion.

[1] http://europa.eu.int/information_society/topics/telecoms/regulatory/maindocs/documents/explanmemoen.pdf
[2] http://europa.eu.int/information_society/eeurope/2002/news_library/documents/eeurope2005/eeurope2005_en.pdf
[3] eEurope – the action plan for Member States

Malta's achievements in its progress towards an information society where measured against a set of pre-defined performance indicators. These indicators, which formed the basis of periodic benchmarking exercises, measured the progress of the respective countries with that of the average of the Member States and that of the accession and candidate countries.

Malta's performance was among the best of the countries participating in eEurope+ and in some instances the EU average was also surpassed. This was evident in the two eEurope+ progress reports which were issued, with the later being presented at a Ministerial Conference towards the end of February 2004.

The report clearly outlined Malta's ongoing progress in the field. It transpired that the Internet is present in 49% of the households while mobile penetration is in excess of 70% of the population equating to nearly three out of four of the population. Malta also enjoys one of the highest percentages of computers per student population in primary, secondary and tertiary education.

The report also identifies the continued effort in increasing the ICT accessibility through the deployment of a number of web phones and Internet centres in Local Councils. These two initiatives coupled with the provision of ICT awareness courses to citizens has increased technology accessibility not only at hardware level but at competency level where members of the community where taught how to master the Internet and its related technologies.

## 2.3 Broadband in Malta

Broadband take-up in Malta has been rather encouraging. In the last quarter of 2003, 30 per cent of Internet subscriptions were broadband. This means a broadband take up of 17 per cent of households with another 41 per cent being connected to narrowband. This effectively means that from the whole population, 5.4 per cent use broadband. This compares well the EU average of 6.03% of the population using broadband technology in January 2004.

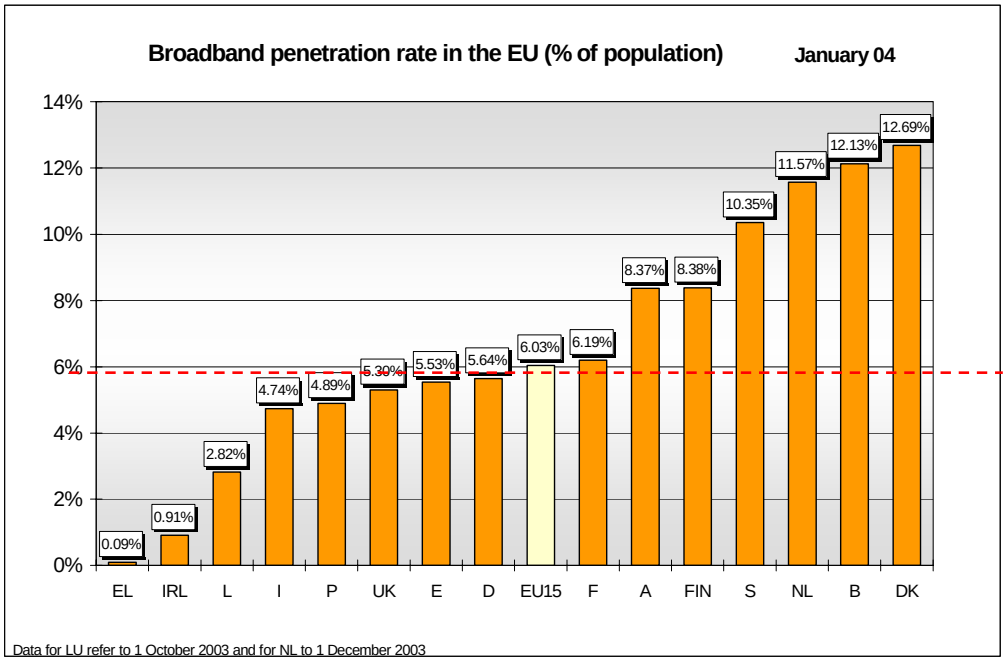



**Figure 1: Percentage of the population which uses broadband**

Broadband in Malta is accessible through two types of technology – DSL and Cable modem. In 2003, 57 per cent of broadband connections were made through DSL while the remaining 43[1] per cent were through cable modem.

The installation of a totally digital system with data transported over fibre optic across all the country's territory resulted in virtually all households and business having a digital landline over which the Internet could be accessed. In fact, DSL is available in 95[1] per cent of the national territory while 81% of the national territory is also covered by bidirectional hybrid fibre coaxial cable thus allowing broadband access via cable modem.

[1] Refer to Annex 2 and 3 for statistical breakdown and coverage maps

# 3. WHY BROADBAND?

## 3.1 eEurope 2005

The conclusion of the eEurope 2002 action plan and the eEurope+ process led to the publication of the eEurope 2005, an extension of the European Union commitment to continue using ICTs as one of the primary vehicles to attain the Lisbon goal – that of becoming the most competitive and dynamic knowledge based economy with improved employment and social cohesion by 2010.

The Barcelona European Council called on the Commission to draw up an eEurope action plan focusing on "the widespread availability and use of broadband networks throughout the Union by 2005 and the development of Internet protocol IPv6 and the security of networks and information, eGovernment, eLearning, eHealth and eBusiness".

Malta together with the other accession countries has been invited to join the eEurope 2005 process together with the member states. Thus, the eEurope 2005 action plan will be followed by the 25 countries who have now adopted the action plan objectives in their national ICT strategies.

The eEurope 2005 Action Plan[4] aims to develop modern public services and a dynamic environment for e-business through widespread availability of broadband access at competitive prices and a secure information infrastructure. The objective of this Action Plan is to provide a favourable environment for private investment and for the creation of new jobs, to boost productivity, to modernise public services, and to give everyone the opportunity to participate in the global information society.

eEurope 2005 therefore aims to stimulate secure services, applications and content based on a widely available broadband infrastructure.

The action plan specifically refers to the new regulatory framework, which came into force in EU Member States in July 2003 and which takes full account of the convergent nature of broadband. Encouraging efficient investment in infrastructure (by new entrants and incumbent operators) and promoting innovations, are explicit objectives for regulators. This means taking account of the need for investors to obtain an adequate return on their investment, in the light of the risks taken. This also means that regulatory uncertainty for investors must be reduced as much as possible. The Action Plan also proposes the following measures:

- The Commission will use the new regulatory framework for radio spectrum policy to ensure spectrum availability for, and efficient spectrum use by, wireless broadband services (e.g. W-LANs)

- Member States should support the deployment in less favoured areas, and where possible may use structural funds and/or financial incentives

[4] http://europa.eu.int/information_society/eeurope/2005/index_en.htm

- Member States should ease access to rights-of-way, poles and conduits to facilitate investment, for instance through the removal of legislative barriers

- Public authorities in Member States and the private sector should aim to offer their content on different technological platforms

- In order to speed up the transition to digital television, Member States should create transparency as far as the conditions for the envisaged switchover are concerned.

In February 2004 the Commission published a Communication on the eEurope 2005 mid-term review. The mid-term review, which was the outcome of a number of consultation exercises, sought to confirm the relevance of eEurope objectives and their adequacy to the challenges of information society in the acceding countries.

The mid-term review revealed that the EU is facing two main challenges which are inhibiting the broadband deployment:

i) There is still a rural–urban divide with the former suffering from lack of infrastructure and network coverage due to the unattractive commercial viability of investing in such areas;

ii) Lack of attractive broadband content

The eEurope mid-term review called for:

- Detailed monitoring especially in view of the wider technological choice and multi-platform environments (for example Digital TV Switchover Plans)

- An assessment of how people integrate broadband into their daily activities. This is needed in order to shift the focus from simple connectivity to stimulating the use of broadband.

- Addressing Digital Rights Management (DRM) at the EU level. Member States need to determine the criteria for the adoption of DRM in determining remuneration schemes. The successful implementation of DRM technologies in systems and services will ensure the development of important new on-line content markets

## 3.2 National Broadband Strategies

The strategic importance of Broadband has led a number of countries to draft their national strategy on the subject. These strategies vary in their approach to increase the use of broadband. A number of countries limit the rate of government intervention to specific regulatory areas without undertaking direct funding initiatives for the restructuring and expansion of broadband infrastructures. Instead such investment is carried out by the private sector while government focuses on the provision of training in ICT skills and other educational and research activities.

The majority of EU Member States adopt an approach where the government focuses on areas which are not of direct interest to the private sector due to lack of commercial viability. The vast territorial size of these countries necessitates the direct intervention of central or local government to bring access to small communities residing in remote areas. Regulatory intervention in these countries is limited as per new EU electronic communications framework. These strategies also focus on government's co-ordination for the provision of specific broadband services and application in the realms of e-health, e-learning and e-business.

## 3.3 Broadband policy in Malta

The Government recognises that broadband connectivity is a key element in ICT development and the adoption of technology as an enabling tool to enhance the quality of life and improve the performance of the commercial and industrial sector.

The take-up of broadband in Malta is considered as a basic building block which will facilitate the deployment and take-up of other ICT related initiatives as contained within the National ICT Strategy (2004 – 2006). The plan which was drafted in consultation with the National Information Society Consultative Council targets 13 strategic objectives which seek to sustain Malta's progress towards a knowledge-based society and economy by adopting targets of eEurope 2005 and other international benchmarks including those set by the World Summit for Information Society.

The National Plan objectives address all the issues contained within eEurope 2005 including those related to eLearning, e-Business, eGovernment and eSecurity. Moreover special importance is attributed to the issues of ICT and education and the elimination of the digital divide.

The Strategy, which has over two hundred action lines, is accompanied by a programme of works which include a series of projects allocated under each strategic objective. The programme of works which covers the period 2004 – 2006 include specific projects which are considered key contributors to the eventual increase of broadband in Malta.

Broadband policy in Malta will be based on the following key principles:

- Limited government intervention with the main role being played by the market players including the telecoms providers and the private industry;

- Limited regulatory intervention – to intervene only in those matters where necessary in order to ensure that underlying infrastructure supports the equitable and competitive uptake of broadband

- Government will co-ordinate a number of activities which will increase accessibility, including the provision of skills training and availability of technology

- Government will aid the development of broadband by acting as a model user, not only through its role as purchaser of services, but also as provider and content developer in key public policy areas such as health and education

## 3.4 Profiles of a Broadband user

The sections below seek to identify the characteristics of three types of broadband users – the residential user, the enterprise user and the industrial user with the later including also the Government.

**Residential**

Similar to the majority of other products and services the product life cycle applies also to broadband technology. There are the early adopters of technology who realise the potential of adopting it due the key differentiating factors of the service – that is the high speed, always-on characteristic and the contemporary usage of the phone and the Internet. Conversely the late adopters of technology will look for convenience and practicality and are usually more demanding than the early adopters. The transition from early adopters to late adopters can be very challenging since companies will have to think of new broadband services to convince the laggards of the benefits of high-speed Internet access.

Non-users of technology present an even bigger challenge in that they have to be convinced not only of using broadband but to adopt technology in their daily lives. Usually aggressive marketing and awareness campaigns coupled with discount offers entice non-users to test Internet related technologies.

The always on characteristic of broadband technology facilitates the mingling of technology devices with other standard household items including the TV and Hi-Fi. Broadband allows multi-tasking as one moves from online to off-line jobs. The technology eases the pressure of billing based on usage patterns and governed by the time of the day when the Internet technology is used. The myriad of broadband technologies is offering greater flexibility in accessing online content through different networks and platforms. The affect of converging different types of technologies is leading to a more

sophisticated type of Internet usage which although is currently engaged upon by the so called 'broadband elite' will soon prove to be a mass type of accessibility.

Three unique characteristics, which differentiate broadband behaviour, are[5]

i) **Community** – Broadband is social with many activities being shared with family and friends. It enables to join or form new online communities based around shared interests or activities

ii) **Control** – Broadband empowers people giving them increased flexibility and choice to manage their lives (to do their banking at 2 a.m., to work from home, to watch or listen to broadcast content when they like)

iii) **Contribution** – broadband enables the user to create their own content and share in contrast to linear broadcast model

There is a clear adoption phase in using broadband. The consumer's first experience with the technology usually comes through the conventional computer channel. The user then moves to utilise the technology in other places including their place of work and entertainment spots and then continue with its usage on the move through the purchase of devices like the PDAs and 3G mobile devices.

Contrary to what was advocated at the outset of broadband technology, there seems to be no 'killer application' which will solely lead to a marked increase in the take-up of broadband. Residential users refer to the improved performance of web browsing as their primary motivation for using broadband technology. There is evidence that digital content such as video and music is downloaded more often by broadband than by narrowband users. Networking and communicating through e-mail and messaging remain popular applications. But broadband introduces new opportunities, making home-generated videos and content important options[6].

A survey[7] conducted in America among broadband users illustrated that among the reasons for Internet users to upgrade their Internet connection are the desire to perform job-related tasks at home, their ability to download files in less time and their interest in freeing up the phone line for telephone calls. It revealed the importance of broadband in driving people to increase their use of the Internet. It transpired that broadband is the largest driver of the frequency of people logging on daily, the amount of time they spend online daily and the number of activities they do daily.

The survey illustrated that most broadband users (61%) spend more time online at home since getting a high-speed connection and one third say they do more work-related tasks since they obtained a broadband connection in the house. The majority of respondents also say that since they got a high-speed connection they have looked more often at online information including addresses, recipes and local events information.

[5] Broadband Stakeholder Group – 3rd Annual Report & Strategic Recommendations, January 2004
[6] eEurope 2005 mid-term review – Background Paper
[7] The Online Difference – Pew Internet and American Life (http://www.pewinternet.org)

## Small and Medium Sized Enterprises

The usage of broadband technology at the enterprise level can lead to substantial multiplier gains not only through faster access, always on connection but by improving the communication channel across the value-chain. Through the adoption of broadband technology businesses will enhance their communication with their clients and with their suppliers. Broadband facilitates the offering of innovative products and service, which prior to the advent of broadband were not accessible to small enterprises.

Similar to the residential sector broadband deployment at enterprise level consists of a number of phases. In medium to large companies, which have already experienced Internet technologies, broadband will usually replace the leased line alternative. The deployment of broadband technology in such companies will usually result in increasing the usage of the technologies for the procurement of their raw material and for the selling of their goods and services. Thus in such companies where Internet technology has been used for a number of years, broadband technology will lead to the integration of e-Commerce practices as part of their operations, ultimately resulting in the development of new delivery channels, innovative products and the development of new consumer markets. E-Commerce can also lead to a reduction in the procurement costs since it usually eliminates the need of an intermediary allowing the firm to deal directly with the supplier who has also adopted e-commerce practices to sell goods/services to its corporate customers.

For small and micro enterprises broadband technology offers an opportunity to acquire an affordable access to Internet technology which is not charged on a usage basis but allows always-on access at high speeds. In these micro settings the advent of broadband technology coupled with the increase in the number of broadband applications including e-government services and electronic banking, will signify the start of an 'experimentation phase' where interaction with the public authorities and other stakeholders (banks, suppliers) will start to take place via web based technology. Following the first phase small companies will start to assess the impact of technology on their business operations and will start considering the adoption of more complex technology driven activities such as e-Commerce, thus opening the consumer market of the enterprise to all Internet users which today total in the millions across all regions.

At corporate level broadband will also facilitate the take-up of teleworking, which allows the workforce to carry out their tasks outside their conventional workspaces. Teleworking can result in a more motivated workforce since it allows the flexibility of working at home and at other places. The take-up of broadband at enterprise level together with the ubiquitous access to technology at home and in other places widens the possibility of completing the tasks in other places away from the confined office space.

Broadband has the potential to substantially change the way of conducting business not only through faster, always-on Internet access but also by making it more productive and innovative.

**Industrial user**

Large corporate companies are also benefiting from the advent of broadband technologies. The usage of ICT in large companies is usually greater than in small companies.

Prior to the deployment of broadband large companies focused on the usage of leased lines connections, which provided a fast Internet connection for offices situated in different locations. The pricing of leased lines has long been a disputable issue between the providers of the service, the regulators and the customers.

Broadband technologies are providing a plausible alternative for Internet access of large corporations. DSL and particularly SDSL technology is replacing leased line solutions as the connectivity route. Particularly symmetrical DSL market, which allows users to send and receive data at the same speeds, is regarded as a cheap leased line replacement service. As broadband speed of such technologies increases the effect of the DSL technologies on leased line solutions is expected to become more pronounced although some argue that the quality of service of these systems is still somewhat inferior to that offered through leased lines.

Other solutions being explored by large corporations is the IP virtual private network solution, which connects several sites through what is commonly referred as a 'mesh' network. A number of employees can be allocated different bandwidths while using the same network. Other alternatives are found in the wireless type of technologies, which are particularly useful for rural settings and free space optics for line-of-sight communications[8].

The table below summarises the typical usage of broadband for small, medium sized firms and large Corporate Users and Government[9]:

| **Small Firms: Basic Broadband Services** | **Medium Sized Firms: Advanced Broadband Services** | **Large Corporate Users and Government** |
|---|---|---|
| **Bandwidth required equal to 0.5 Mbits** | **Bandwidth required equal to 2 Mbits** | **Bandwidth required from 10 to 100 Mbits** |
| ▪ Fast Internet usage<br>▪ On-line ordering<br>▪ Fast, high capacity e-mail<br>▪ Teleworking | ▪ Fast Internet Usage<br>▪ On-line ordering<br>▪ Fast, high capacity e-mail<br>▪ Web Site Management | ▪ Fast Internet usage<br>▪ On-line ordering<br>▪ Fast, high capacity e-mail<br>▪ On-line training / |

[8] Look Beyond leased lines as new telecoms technologies offer long-term cost savings, 24 February 2004 (http://www.computerweekly.com)
[9] Broadband Telecommunications Benchmarking Study – January 2004

| | | |
|---|---|---|
| ▪ Web Site Management<br>▪ Occasional tele-conferencing | ▪ Tele-conferencing<br>▪ Occasional on-line training / seminar use<br>▪ Small scale e-commerce applications | seminar use<br>▪ Large scale e-commerce applications<br>▪ Large company web hosting<br>▪ Tele-conferencing / video conferencing<br>▪ Web hosting services<br>▪ Streaming video feeds (e.g broker service)<br>▪ Large scale voice services, Fax, ISDN integrated with Internet Security back-up services |

**Table1: Profiles of Business / Corporate users**

One of the main industrial users is the public sector which as evidenced by the various national broadband national strategies of a number of countries is considered as a key driver in broadband demand.

Broadband offers the Government an unparalleled opportunity to re-invent its mode of delivery of public services and re-engineer its back-end operations. It provides an opportunity to customise public services, to extend the availability of the government departments to its customer base and to enhance the mode of delivery of public services to the consumer through a selection of technologies.

The provision of electronic public services is considered as one of the major enablers for broadband take-up at both the enterprise and residential level. The interaction with public administration via electronic means offers the kind of flexibility and convenience that often drives the user to experiment and finally adopt this mode of interaction. Moreover the provision of a number of e-Government services has been proved as being one of the killer-applications in driving the demand for broadband since it substantially contributes to the presence of value-added e-content which is better accessed through high speed Internet access.

Digital content and services are imperatives in increasing the demand for broadband. The Government as the provider of a number of key services is considered as a major player in the provision of broadband services not only through the conventional computer medium but also through a number of other technologies such as mobile phones, PDAs and other delivery mediums.

# 4. DRIVERS AND BARRIERS FOR BROADBAND TAKE-UP

Malta's geographical location and its size coupled with its cultural and social characteristics lead to a number of drivers and barriers which affect the take-up of broadband by society. Moreover the country's accession to the European Union coupled with its progress towards information society and economy targets are a source of opportunities which will facilitate the transition from dial-up access to high-speed, always-on connection.

## 4.1 Drivers for Broadband

a. **Quality of Service** – Consumers of broadband need to experience an enhanced online experience when switching to broadband access. The ease of access in downloading high bandwidth applications must be a visible experience which increases the user's aptitude to explore new experiences on the Internet like video streaming, music download and e-Commerce activities. The broadband experience needs to be such that a narrow-band subscriber can be attracted to shift to broadband. The level of service which is offered to broadband subscribers needs to be such as to be a driver for the service in general. Content filtering and user complaints therefore need to be tackled. Service providers need to play an important role and guarantee the quality of service that they have promised.

b. **Availability of Content and services** – The presence of compelling broadband content and services will induce customers to integrate the Internet in their daily lives and increase the number of daily online tasks. Moreover the increase in the number of online services and applications (including e-Government, e-Commerce and e-Learning) will allow users to realise the currently untapped potential of broadband. Content in the form of e-Learning for example would allow users to experience the full benefits of having a broadband connection. Interactive and multimedia learning enhances user experience and enables broadband to be diffused in various households which can reap the full benefits of learning online. The potential content that can be delivered through broadband is immense and this alone will be one of the key factors on why people will make the shift to broadband.

c. **A competitive environment** – Different technologies are available to diffuse broadband. Competing through infrastructure is deemed to be one of the prime factors for increasing broadband. Having such competition not only helps to increase awareness but also to ensure that there are competitive pricing mechanisms which translate into affordable consumer offerings that would entice dial-up Internet users to switch to broadband technology. Such a competitive environment will also ensure that companies within this sector seek to make the best possible use of the existing infrastructures to deliver these services and to increase take-up. It will also stimulate further investment within this sector. The example of mobile telephony is a case in point since added competition has increased penetration levels considerably.

**d. Awareness** – Having a competitive environment ensures that there is increased awareness of the potential that exists in broadband technologies. The advantages of using broadband need to be clearly defined since these alone could push users to shift to broadband. Differences between using dial-up (narrowband) Internet as against broadband Internet therefore need to be presented clearly.

**e. Education** – With awareness, one must also factor into consideration education given the fact that this also increases the demand for broadband. As more and more users become familiar with the technology and with what can be achieved, the interest in the use of this technology also increases. The education of users in reaping the full benefits is therefore essential given the fact that some users may not see a need to switch from narrowband to broadband services.

**f. Ubiquitous coverage** – The presence of the right infrastructure capable of providing broadband access across a national territory is a prerequisite for ubiquitous access. Although the developments in technology (including wireless and satellite based systems) is facilitating access to broadband in under-served areas the issue of ubiquitous infrastructure allowing access through various platforms is still a priority which will drive broadband usage.

**g. Convergence of technologies –** The new developments and the convergence of technologies should also help to push forward broadband use. As IP convergence becomes a reality the distinction between services that today can be described as voice, data or television may be very blurred. The move towards IP based services will make broadband technology more and more important as users try to reap the full benefits of convergence.

**h. Public accessibility** – The diffusion of a number of services and access points has given more visibility to Internet services and what could be achieved by making full use of this potential. Added visibility and improved service delivery will therefore increase the potential for increasing broadband penetration and making users appreciate its importance.

## 4.2 Barriers to Broadband

**a. Lack of broadband based content and services** – Similar to other countries there is a lack of local content especially when one considers the availability of e-content in the Maltese language. Add to this the lack of broadband based content and the ‘case’ for broadband in households is diminished. Why should a household user opt for broadband. Content remains crucial and the development of local broadband based content and services both from the private and the public sector are essential if broadband penetration is to increase over the coming years. The presence of content which addresses the specific needs and circumstances of a specific target audience is one of the key drivers to drive

broadband demand since Internet users will have additional reasons for making use of the Internet throughout the day. The number of services that could be offered online together with content that brings citizens closer to Internet needs to be tailor-made to ensure that it is user-friendly and can reach as many citizens as possible. The use of interactivity in this regard is therefore essential and also builds the case for the shift to broadband

b. **High start-up costs –** Although the price of a personal computer has decreased considerably over the past years, it still remains prohibitive and an important consideration for a number of citizens within society. Moreover the cost of other devices which enable broadband access is also considered high by the majority of the population. The value proposition of these devices is still limited, except for the business traveller who finds value in the mobility offered by these devices. The cost of bandwidth which adds to internet expenses also has a significant impact on the price of broadband. Schemes will therefore have to be devised to ensure that such prices will not be a deterrent to the creation of an information society for all. One other issue relates to the lack of awareness of Internet technologies which could also be another barrier. Awareness needs to be raised especially to explain the benefits of having a broadband connection as against dial-up internet.

c. **Lack of trust and confidence -** Instilling a culture of trust and security among broadband users is critical to broadband's growth potential. Confidence in online activity is key to increasing the take-up of broadband services, as is the protection of users through the implementation of Intellectual Property Rights mechanisms and authentication procedures.

d. **Limited size of the market –** Although developments in technologies are leading to the availability of a number of platforms through which broadband technology could be deployed. Malta's limited geographical size impedes on the potential private investment, that can be made in such infrastructures. The limited market size usually reduces the commercial viability for the deployment of a particular technology where the Return on Investment is decreased at a limit where it is no longer feasible to undertake the initial capital outlay. This limits the availability of the whole spectrum of possible platforms, which allow broadband technology at any point in time.

e. **Lack of flexible pricing structures –** The availability of broadband in Malta is still based on a relatively 'standard' pricing mechanism, which is based on the type of connection speed. This rather un-flexible pricing structure limits the take-up of broadband to heavy Internet users who use the medium during the day and to other rather 'sophisticated' audiences who make use of high-bandwidth services like video streaming and downloading of movies and music. Such a pricing strategy only appeals to a sub-set of the Internet population. It is therefore evident that new pricing models need to be devised to encourage more people to shift to broadband. Such pricing structures may be various and they can take

various forms. Subsidising the cost of the modems, offering metered services (pay as you use) or at particular times of the days (say weekdays between 6pm to 8am and weekends all day) at cheaper prices would encourage more take-up.

## 4.3 The Broadband Model

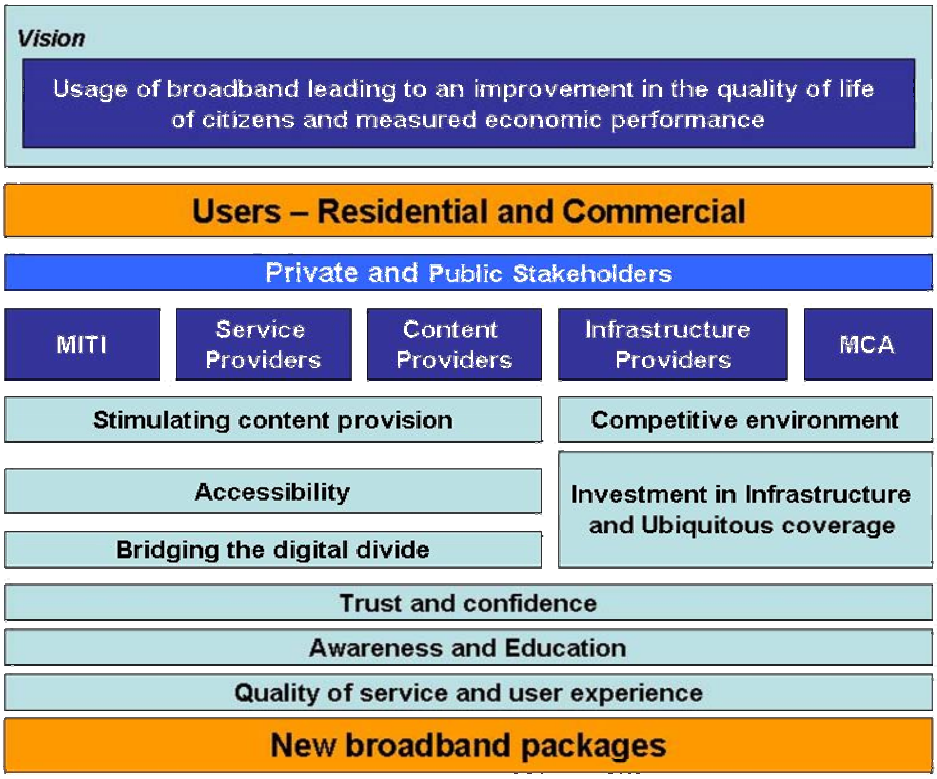



**Figure 2 Broadband Model**

The model presented focuses on the user and the availability of a number of flexible broadband packages, which suit the different lifestyles of the residential user and the different needs of the commercial sector. The later encompasses all other users besides the residential ranging from micro entities, small and medium-sized enterprises, large corporate clients and group of companies, the public sector and NGOs.

The model identifies five key strategic partners which have a leading role in the realisation of the strategy objectives – the Government through the Ministry for IT and Investment, the Malta Communications Authority, the private sector through a number of players including among others the Service Providers, Content Providers and Infrastructure Providers.

The model depicts the building blocks that are necessary to reach the declared objective of stimulating broadband while improving the quality of life of citizens and improving economic performance. The vision is explained in the next section of this strategy.

The aim of the model therefore is to identify the key thrusts that are required and to identify the stakeholders responsible for implementing each action. The thrusts identified in the model are the basis for the national broadband strategy for Malta covering the period 2004-2006.

# 5. A BROADBAND STRATEGY FOR MALTA

## Vision

*Malta will be one of the leading countries in the usage of broadband technologies and that such usage will transpose into a measurable improvement in the quality of life of its citizens and economic performance of the industrial and commercial sector*

## Strategic Objectives

### a. Secure a ubiquitous multiple broadband infrastructure which covers 99% of the population and is capable of delivering a minimum of 512 kbps in the downstream direction to the end user

Malta's limited geographical size coupled with the right decision to switch to a digital network, which supports broadband deployment has resulted in adequate infrastructure which spreads throughout most of the Maltese territory. The number of areas which are not covered by any type of infrastructure which supports broadband are very limited. One can easily state that the divide between urban and remote areas is insignificant.

This rather advantageous position coupled with the presence of two competing networks which allow broadband access (DSL and cable) enables a shift in the focus to other aspects which will lead to an enhancement of the quality of service of broadband in Malta. These efforts will focus on the providers and on the consumers of the service, with the later actively involved in the rating of the service provided and in submitting their views on possible enhancement of the service.

Working towards the improvement of the current service coupled with the adoption of the new regulatory framework which, amongst other, seeks to widen the accessibility of the current infrastructure for the offering of value-added and innovative services, will contribute towards a competitive environment which protects the interests of the consumers and the service provider.

Between 2004 – 2006 the Government will:

- Ensure that Malta is supplied with the necessary international connectivity to global Internet backbones (including redundancy connectivity) at an equitable price

- Promote the strengthening of competition in the local telecoms market, while striving to attain synergies and optimise connectivity among major information networks to reduce interconnection costs and broaden network access

- Identify the regulatory measures to be employed so as to ensure fair and competitive access to broadband networks while ensuring long-term market sustainability

- Seek to make full use of existing infrastructures to offer broadband services and encourage service providers to invest in promoting the use of new technologies

**b. Ensure a regulatory framework which supports and encourages a competitive environment which in turn sustains the availability of multiple technological platforms**

Broadband technology can be made available via a number of different technology devices, which together contribute towards the presence of a ubiquitous service accessible through a number of devices. This successful deployment of differing technologies and services is possible through the existence of a regulatory framework, which seeks to ensure adoption of new technologies in a sustained market framework.

The current regulatory framework, is based on and is compliant with the 1998 EU regulatory framework for telecommunications. It was enacted with the objective of paving the way for the liberalisation of the telecommunications market and created structural separation between service provision and regulation of the sector – a distinction previously not deemed essential. Such services were until then the exclusive domain of a state-owned monopoly. The present framework has been instrumental in getting competition underway in the mobile telephony market. In the fixed telephony and the cable services markets where competition has yet to materialise, the framework is vital for paving the way for competition as well as ensuring, through price controls on dominant players, that consumers receive value for money.

The 2003 EU Electronic Communications regulatory framework is being introduced via an Act that will bring about the necessary changes to the existing Telecommunications (Regulation) Act, (Cap 399 of 1997) and to the Malta Communications Authority Act (Cap 418 of 2000).

The amendments being proposed are driven by three overriding policy objectives for the sector:

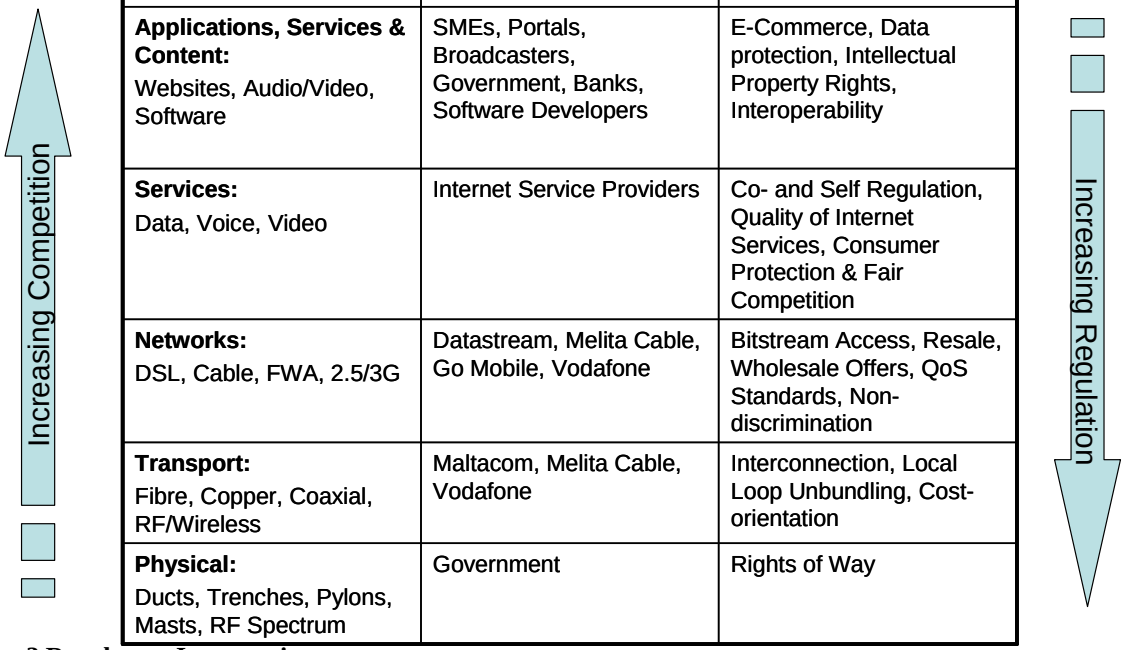
- The continued introduction of competition in the market, based on technological transparency;
- The continued improvement in quality of service and affordability for consumers; and
- The continued sustainability of a robust, healthy and innovative sector capable of meeting the social and business needs of the Maltese community while competing in European markets.

A white paper on the primary legislation has been published by Government. Consultation ended on the 27th of February. The intention is to have the primary legislation in place as soon as possible.

A first version of subsidiary legislation is in the final stages of drafting and will replace most of the existing regulations and provide a more detailed framework around the principles articulated in the parent Act. It will provide for, among others, a general authorisations framework, the designation of dominance, universal service obligations, provisions for the migration of regulatory processes from the current to the new Framework, as well as other general provisions.

The new regulatory framework, takes full account of the convergent nature of broadband. Encouraging efficient investment in infrastructure (by new entrants and incumbent operators) and promoting innovation are explicit objectives for regulators. This means taking account of the need for investors to obtain an adequate return on their investment, in the light of the risks taken. This also means that regulatory uncertainty for investors must be reduced as much as possible.

Regulatory intentions are depicted in the layer diagram below. Regulatory intervention will focus on areas that remain uncompetitive, while sectors that are effectively competitive will be freed from most obligations and remedies.




| Network Layers | Typical Providers | Regulatory Mechanisms |
|---|---|---|
| **Applications, Services & Content:** Websites, Audio/Video, Software | SMEs, Portals, Broadcasters, Government, Banks, Software Developers | E-Commerce, Data protection, Intellectual Property Rights, Interoperability |
| **Services:** Data, Voice, Video | Internet Service Providers | Co- and Self Regulation, Quality of Internet Services, Consumer Protection & Fair Competition |
| **Networks:** DSL, Cable, FWA, 2.5/3G | Datastream, Melita Cable, Go Mobile, Vodafone | Bitstream Access, Resale, Wholesale Offers, QoS Standards, Non-discrimination |
| **Transport:** Fibre, Copper, Coaxial, RF/Wireless | Maltacom, Melita Cable, Vodafone | Interconnection, Local Loop Unbundling, Cost-orientation |
| **Physical:** Ducts, Trenches, Pylons, Masts, RF Spectrum | Government | Rights of Way |

**Figure 3 Regulatory Intervention**

Between 2004 – 2006 the Government will:

- Examine the feasibility of different broadband technologies in respect to their applicability within the local environment, delivery and ubiquity of access with the scope of increasing the penetration of broadband in households and SMEs

- Enact effective electronic communications, e-commerce, data protection and computer misuse legislation that is in line with the prevailing EU directives, international conventions and best practice

- Ensure that the adoption of new technologies result in a tangible benefits for the customer through increased access speeds and enhanced services at affordable prices

- Foster a culture of fair competition and self-regulation amongst all major operators in the electronic communication industry

- Devise policies that ensure the sustainability of broadband services and ensure that service providers have the potential to research and develop new innovative services that generate adequate return on investment

**c. Increase the accessibility of broadband technology to all residential and business set – ups**

The availability of broadband technology to all potential users is not merely a matter of having the infrastructural capability of offering the service or the availability of content and services, which demand a broadband connection. Although prerequisites in the broadband equation, there exist a number of other factors which will facilitate the take-up of the technology by both the residential and business user.

The proliferation of devices which allow broadband Internet is one of the most important basic factors which will increase take-up. The conventional PC channel has to be present in all households while the increased usage of other devices is also a prerequisite for the increase in broadband take-up. Through its efforts to reduce the accessibility cost of broadband take-up the Government will continue to facilitate the acquisition of technologies in both hardware and software format.

Mastering the skills in accessing online services will provide the confidence to users who to date have been fearing the unknown due to their lack of knowledge of the online world and its applications.

Flexibility in the pricing structures of different broadband services will widen the consumer bracket and attract users who are currently not enticed by the rather fixed packages available on the local market. The existence of multiple offerings, which target different consumer lifestyles, will attract that section of the market that will only adopt broadband technology when convinced of its advantage over dial-up option. Other offerings could attract the 'laggards' who are still sceptical of the Internet and require much more convincing and special offers to experiment with the broadband technology and its various uses.

Between 2004 – 2006 the Government will:

- Partner with key players in the telecoms industry to produce a regular inventory of the best telecommunications technologies in order to optimise ICT-access costs

- Facilitate the setting up of variable broadband pricing structures based on the amount of connectivity time and the amount of bandwidth used

- Launch programmes of assistance which increase technology accessibility to residential and business users

- Engage into an awareness and education campaign on the benefits of using broadband targeted at residential and business users

- Customise ICT awareness training programmes to include training on the usage of broadband applications and services and deploy such programmes through a number of community learning the training centres

**d. Sustain the development of broadband content, applications and services targeted at the local population and which expose the Maltese industry to the global virtual market**

The availability of content and services which target specific customer needs and which demand a high speed Internet connection is considered as one of the key drivers to broadband take-up.

The presence of online content has always been associated with a free service that is available for all Internet users with limited restrictions. The advent of broadband has led to the re-thinking of such proposition. This is leading to a number of opportunities for content providers and other companies who are resorting to the Internet as their channel for the delivery of their products and services.

Broadband technology allows content creators to use the medium as a delivery channel to already existing content. Thus, for example, news which is available

through the conventional channels of daily newspapers and journals could be available online. However the true value proposition of broadband technology lies in offering an extension of the content available via the traditional channels. An example would be the offering of additional services to a popular TV programme so as to increase the audience engagement in the particular series through supplemental content, voting, chat rooms and other interactive experiences. Other examples include the offering of downloadable photos and screen savers and episode synopses.

Although the posting of information on the Internet is continuously increasing both on the local and the international arena, there is still limited interactive content that demands broadband connection. The further development of eCommerce practices coupled with the presence of other online applications especially in the ehealth and elearning realms will provide additional reasons why current narrowband users should switch to broadband technology and new users adopt this kind of technology.

The issue of Data Rights Management (DRM) warrants special attention within the context of transmission of multi-media content which has been greatly facilitated by the advent of broadband. It is important that digital content is available under the appropriate conditions which meet the interests of all stakeholders, from the content creators, to the publishers and the users. DRM technologies can potentially provide the right incentives for content development and provide the right remuneration of rightholders while eliminating illegal copying. Currently the issue of DRM is highly debated between various stakeholders who are working towards resolving issues like interoperability and standardisation across various already - available systems. Consensus on the issue of DRM at international level is highly important when one considers the various countries and jurisdictions which make up the content value chain.

eLearning initiatives offer the possibility of engaging the user with the teachers via an online mechanism whereby the student will have access to online content and interact with the tutor in order solve queries, undertake assessment exercises and submit work as part of the learning experience. The development of elearning mechanisms helps in the re-skilling of the workforce who require new skills to work in the new knowledge-based economy but are often limited in time to attend for classes delivered in the conventional class-room setup.

eHealth initiatives include not only the posting of health related information but also a number of interactive services which will not only increase the level of service offered to the consumer but will streamline the administrative operations of the health sector since a number of services, including the scheduling of appointments, will be executed online.

Between 2004 – 2006 the Government will:

- Deploy a number of innovative e-services which demand high speed Internet access such as e-health and e-learning solutions

- Facilitate the production and distribution of local online content while assisting the local content industry through the monitoring of developments on Digital Rights Management (DRM) technologies and encourage the emulation of any best practice interoperable solutions in the local scenario

- Assist the local commercial and industrial sector to develop and adopt broadband services including e-business practices including the usage of ICTs for procurement purposes and for the servicing of their end customers

# 6. IMPLEMENTATION

## 6.1 The Stakeholders

The successful implementation of any strategy rests on the execution of key tasks which falls within the remit of a number of stakeholders. The stakeholders for of a national broadband policy can be broadly segmented into the private and public sector. The later has been segmented in two parties which will have a leading role in the execution of this strategy, mainly the Ministry for Information Technology and Investment and the Malta Communications Authority.

### Ministry for IT and Investment

Entrusted with the co-ordination of the National ICT Strategy and as the political champion of the eEurope action plan the Ministry's roles will include:

- Encourage the usage of broadband technology and its applications by the public sector in order to increase the efficiency and improve service delivery

- Co-ordinate the deployment of a number of broadband applications including those related to e-Government, e-Health and e-Learning

- Together with the private sector sustain an awareness and educational campaign on the usage and benefits of broadband technology targeted at residential and business users

- Facilitate the collation of statistical and qualitative information on the proliferation and usage of broadband in Malta in accordance with pre-defined performance indicators

- Participate in key steering groups and international activities (including the eEurope Advisory Group and the WSIS) and report on Malta's progress in attaining the objectives set by multi-lateral organisations

### Malta Communications Authority

The roles of the national regulatory authority will include:

- Implement a regulatory framework which supports competition and secures the right balance between the rights of the consumer and the commercial gains of the providers

- Monitor the quality of service offered in the local market against pre-defined benchmarks while ensuring a high level of protection for consumers in their dealings with service providers

- Ensure that users, including persons with special needs, derive maximum benefit in terms of choice, price and quality

- Encourage efficient investment in infrastructure and promoting innovation

- Ensure that there is no distortion or restriction of competition in the electronic communications sector

- Analyse the feasibility of deploying different technological platforms which allow broadband access in Malta and provide recommendations to Government

- Promote the provision of clear information, in particular requiring transparency of tariffs and conditions for using broadband

- Protect the interests of the market players and the consumer by monitoring the operations of the telecoms providers and ensure the necessary compliance to the regulatory framework

**Role of the Private Sector**

The private sector has a key role in the deployment of broadband in Malta. The active engagement of the private sector in a liberalised marketplace is the best way to facilitate ongoing and new investment in broadband. The private sector is composed of the various sectors including telecoms providers, content creators and commercial and industrial entities which have adopted (or are planning to adopt) e-business activities. Its roles will include:

- Adopt quality of service standards and mechanisms which meet the demands of their customers and which will continue to build confidence in broadband services

- Enter into public private partnerships with Government to increase broadband accessibility in public places through the usage of different technologies such as wireless hotspots

- Devise new product offerings which reflect the different lifestyles of the residential broadband user and varying work practices of the commercial sector

- Deploy broadband services and applications by taking advantage of the virtual medium to deliver innovative services including those related to eCommerce and other content rich applications such as video-on-demand, media streaming and gaming applications

## 6.2 Monitoring

A sub-committee of the National Information Society Consultative Council will be formed in order to assess the progress in attaining the objectives of the national broadband strategy. The sub-Committee will be composed of representatives from the Ministry for IT and Investment, the Malta Communications Authority, the Chamber of Commerce (ISPSS and the Council) and Consumer Association. The Committee will meet on a quarterly basis and its main focus will be to analyse the current initiatives being taken by the Government and private industry and to advise on how these could be structured in view of local and international market developments. The sub-committee will also be responsible to align Malta's broadband strategy with the objectives set by supra-national organisations including the European Union as reflected in the eEurope process and the United Nations through the World Summit for Information Society (WSIS).

## 6.3 Critical Success Factors

The following are considered as critical success factors in the attainment of the strategy:

- Fostering competition through the increase in access at infrastructural level and ensuring an increase in the deployment of different platforms which enable broadband access

- Complete a revision of the broadband pricing mechanism and introduce a wider choice of ‘connectivity packages’ to residential and business users

- All stakeholders must identify their role and work together towards the attainment of the strategy objectives

- Encourage an increase in the amount of local content which targets specific sectors of the Maltese population and develop pure broadband applications including eLearning, eHealth and eGovernment

- Benchmarking and alignment of the strategy with local and international developments which include the launch of new cost-effective technologies and new targets which reflect the progress made by the countries in reaching towards common objectives

## 6.4 Benchmarking

The collection of qualitative and quantitative analysis in a timely and reliable manner will contribute to the success of any strategy which has to be monitored against pre-identified benchmarks. Such exercise will prove valuable for policy makers who must measure success of their strategy against best practice examples and address any bottlenecks that may hinder further progress and the realisation of the strategy objectives.

Within the process of eEurope, the EU has established a benchmarking mechanism which lead the participating countries to undertake a series of qualitative surveys which measure the progress under the all the objectives of eEurope including the proliferation and usage of broadband technology.

These surveys are carried out by the National Statistics Offices under the surveillance of Eurostat which sets the methodology for the collation of these statistics in order to ensure comparability of data across the different member states.

Ongoing efforts are undertaken to re-define the benchmarking indicators that are used for the measurement of information society statistics. The eEurope 2005 mid-term review has addressed the need to re-assess the current indicators and move from measuring the readiness of the countries to adopt technologies versus the impact and intensity of such adoption. Relating this to the broadband issue, rather than assessing the country's readiness in accessing broadband technology, the impact on the daily lives of citizens and the performance of the business sector should be measured and reported.

In Malta the National Statistics Office has already undertaken a number of surveys related to the usage of ICT in households and businesses. The frequency of such questionnaires is expected to increase with a number of surveys being carried out on a periodic basis. Moreover the Ministry for IT and Investment will also undertake a number of periodic surveys in order to gauge the effects of its policies and the deployment of its initiatives contained within the national ICT Strategic Plan.

The key performance indicators that will be adopted to measure the achievements of the national broadband policy include the following:

- Take-up of broadband – the percentage of the population and households that subscribes to broadband
- Prices and speeds of un-metered offers to the residential and business market
- Percentage of business (split into micro, SMEs and large enterprises) that have access to broadband
- Broadband take-up relative to narrowband take-up
- The change in online behaviour for those who have switched from dial-up to broadband
- Availability and coverage of broadband infrastructure

Considering the importance of the adoption of broadband technology in Malta and its effect on the information society and economy, the Government of Malta will continue to monitor the developments which establish the benchmarking parameters for measuring broadband.

## CONCLUSION

The ubiquitous presence of broadband deployment and its usage by the largest possible percentage of the population is a major milestone in a country's progress towards an information society and economy. Similar to other paradigm shifts, the transition from narrow-band Internet access to broadband technology presents a set of perennial challenges which have to be addressed by a number of stakeholders including central and local Government, the national regulatory authority, private industry and civil society.

The Government through the Ministry responsible for information society will continue to work with public and private institutions to enrol a number of projects which encourage the Maltese to consider broadband technology as one of the main tools to increase their social and economic position. Through the provision of projects which increase broadband accessibility and the deployment of broadband services and applications the Government is committed to continue to be a key player in increasing broadband penetration in Malta and in ensuring that the country contributes towards the progress of the whole European continent.

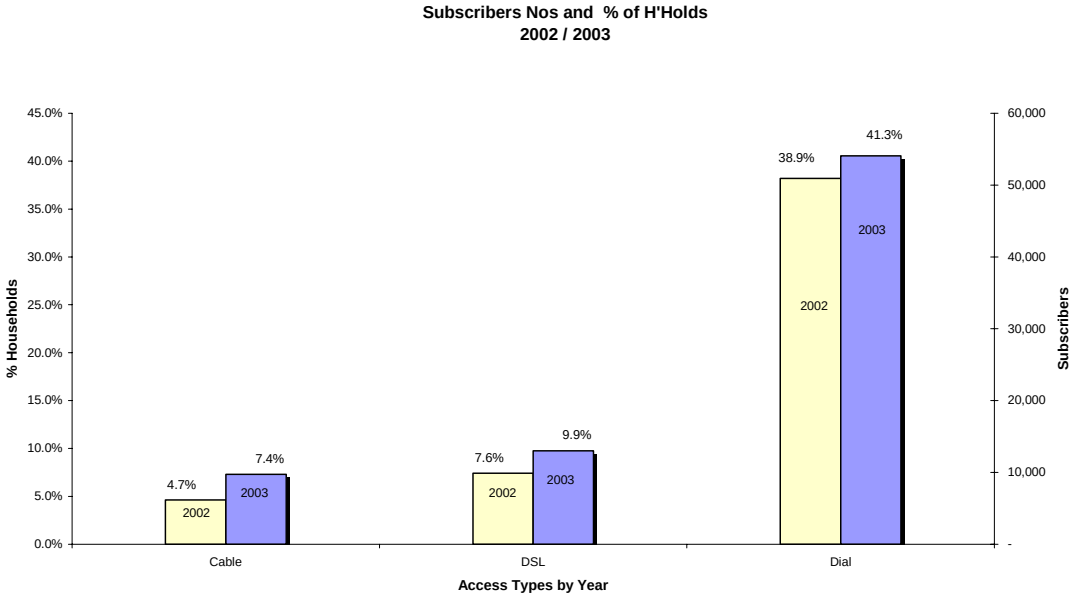
In tandem to demand side initiatives the national regulatory authority will ensure a fair and competitive market which reaches a balance between the interests of the consumers and those of the private investor. Although key actions in the national broadband strategies are common across the European continent others reflect the social, economic and often geographical realities of the respective countries. The common characteristics coupled with the peculiarities will form the basis of a number of actions which will take the European continent towards a new era of the information society where broadband technology will be the principal means through which the true potential of the ICTs is realised for the benefit of its users.

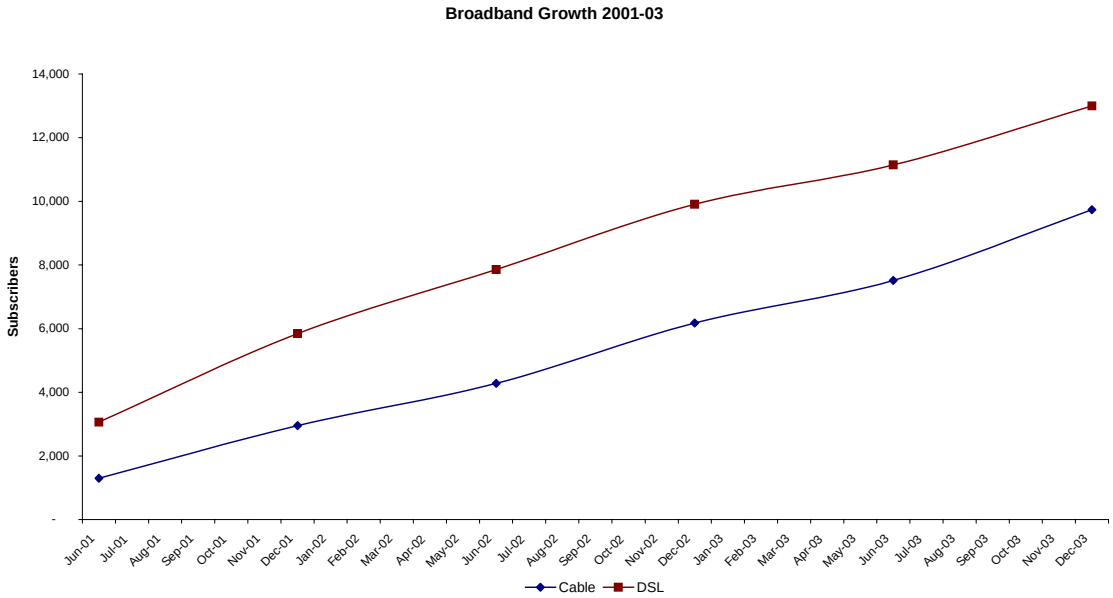
# Annex 1 - Broadband Technologies

| BROADBAND TECHNOLOGY | DESCRIPTION |
|---|---|
| 1. Digital Subscriber Line | DSL is the predominant type of broadband access in use today in Europe.<br><br>DSL provides high speed data access, typically to the Internet, in a variety of speeds ranging from 64K to 2MB, via the existing copper twisted wire pair system that the standard telephony system uses. A DSL modem is connected to subscriber's existing telephone socket via a splitter device that "separates" the voice and data components on the line.<br><br>DSL has the ability to leverage the existing copper wire network infrastructure. This makes DSL technology quick and cost effective for broadband delivery to a large percentage of the population. |
| 2. Cable Modems | A bi-directional Cable infrastructure has the ability to deliver a whole range of services ranging from high-speed Internet access, digital television, video on demand and telephony services.<br><br>Cable broadband access provides speeds of up to 10Mbps. A limitation is that all of the data traffic in a given area has to pass through a common network node. New cable modem protocols however enable operators to provide security and quality of service enhancements to overcome the inherent limitations imposed by the architecture. |
| 3. Optic Fibre Loops | An Optic Fibre infrastructure uses light as a new medium to transfer data. It is characterised by an increasing ability to transmit more information (rates in excess of 100Mbps), more quickly and over longer distances (up to 20km or more).<br><br>Fibre optic cable offers almost unlimited bandwidth and unique advantages. Immune to interference, and being a light medium, it will not conduct electricity, nor potentially create sparks it severed. Moreover it does not radiate any interference. Its main weakness is its cost and related specialised technical expertise required to install and maintain it. |
| 4. Power Line Communication | Power Line Communications (PLC) provide delivery of broadband access across the electricity grid infrastructure. This unique technology transforms the common electrical wiring into a data transmission medium, allowing high-speed data to be transmitted at the same time as the delivery of the normal electricity supply.<br><br>By using the existing electrical supply infrastructure, this technology provides an instant LAN in every dwelling, without the need for any additional cabling. In comparison, DSL and Cable are normally delivered to a single point within a dwelling. |

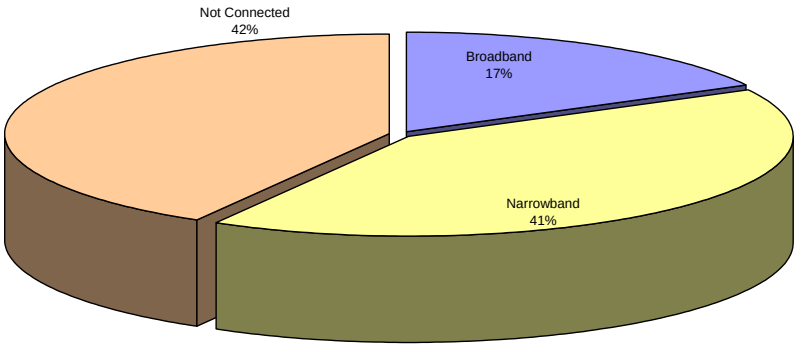
| | |
|---|---|
| 5. Broadband Wireless Access | Broadband Wireless Access provides Internet connectivity via a radio frequency transmission medium, replacing the fixed access portion of the telecommunications network.<br><br>This technology enjoys ubiquitous reach, eliminates the requirement for physical cable transmission - thus reduces the "last mile" barrier for customer access. |
| 6. Wireless LAN or Wi-Fi | Wi-Fi (wireless fidelity) networks operate in unregulated radio spectrum and have throughput capacities ranging from 11 Mbps to 54 Mbps depending on the standard employed. Known also as Wireless or Radio LANs (WLAN or RLAN), this technology normally relies on a terrestrial connection (e.g. DSL or cable) for backhaul and connectivity to the Internet. |
| 7. UMTS/3G | Universal Mobile Telecommunications System (UMTS) is the next generation mobile phone network technology capable of transmitting both voice and data at higher transmission rates. |
| 8. Satellite | Satellite broadband offers bi-directional communications via satellite dishes. Though more expensive to install and maintain, it has excelled in its ability to provide Internet access to inaccessible and remote locations, where traditional broadband deployment is either impossible or uneconomical to roll out. |
| 9. Interactive Digital TV (DVB-T) | Digital Video Broadcasting – Terrestrial involves terrestrially transmitting a television signal that is digitally encoded. The signal is picked up a by a standard antenna and is decoded either by a digital TV or by an appropriate set-top box.<br><br>Digital TV provides better quality, numerous channels, impetus for original niche programming together with the possibility of interactive digital TV through a backhaul channel using POTS or GSM dial-up, GPRS or UMTS mobile or DSL/cable broadband connections. |

# Annex 2 - Broadband Statistics

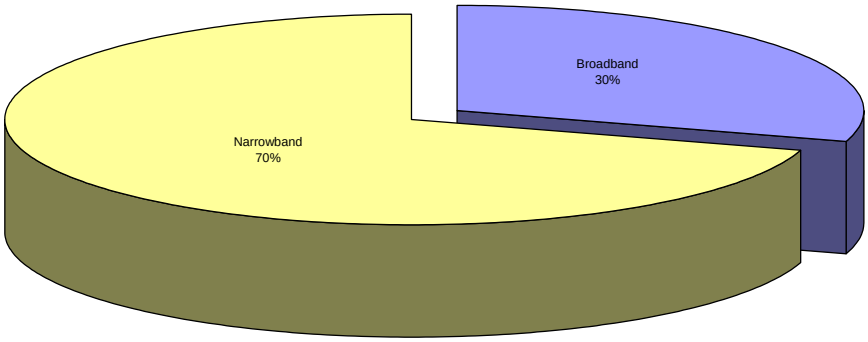


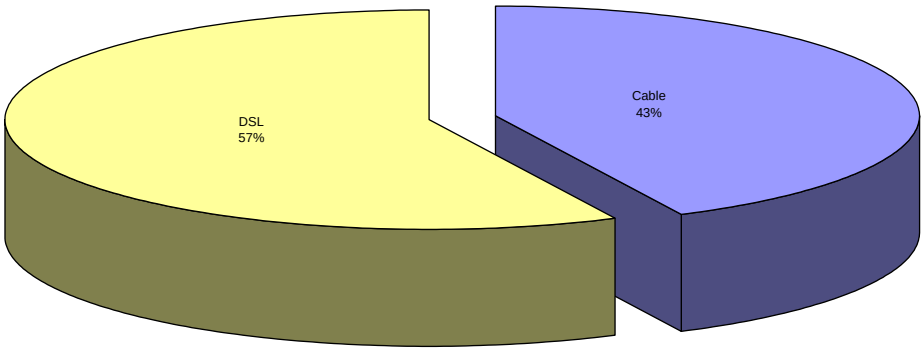
**% of Households Connected 2003**




**Broadband - Narrowband Split 2003**

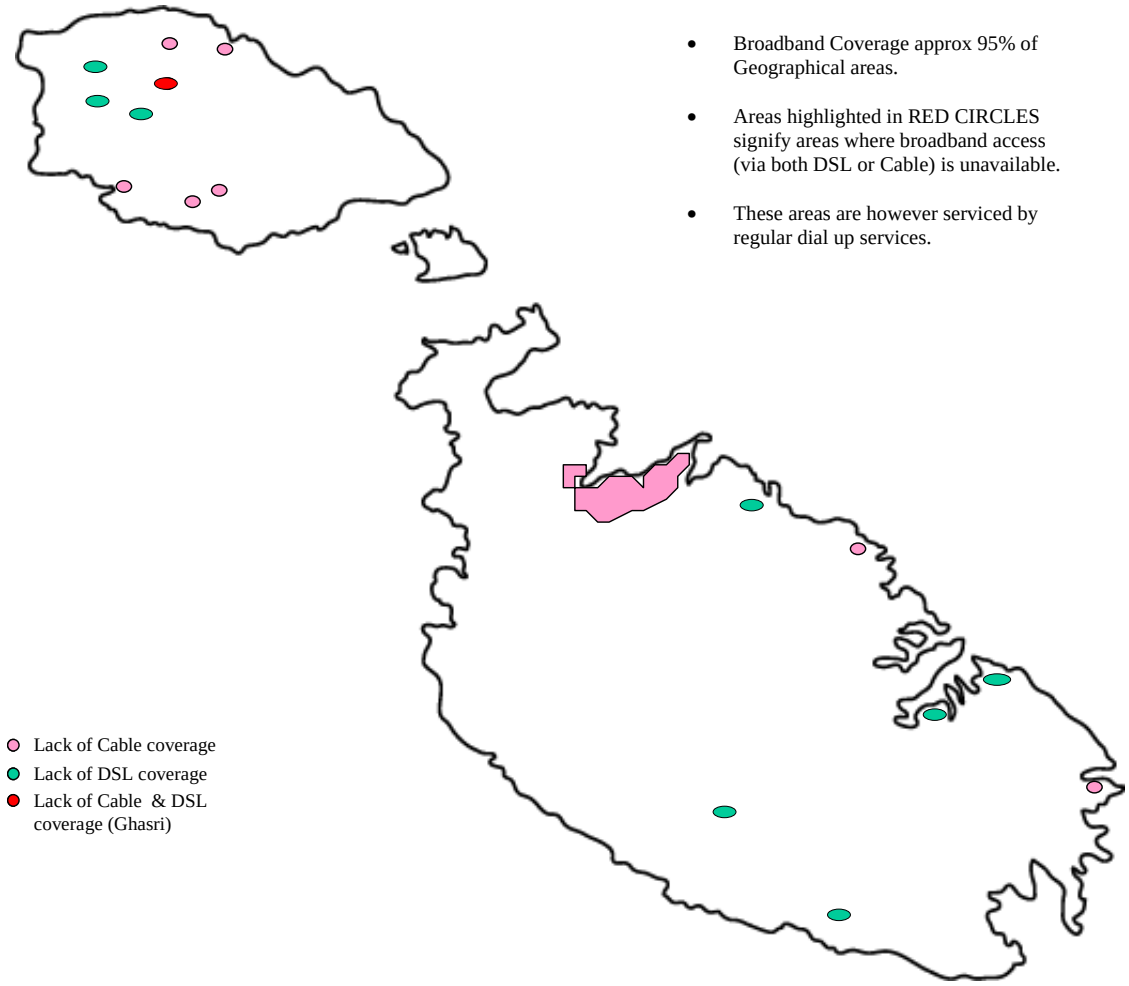



**Broadband Split - 2003**



# Annex 3 - Broadband Coverage

**Broadband- Geographical Coverage**
**(Areas Highlighted represent areas NOT covered by either DSL, Cable or Both)**




- Broadband Coverage approx 95% of Geographical areas.
- Areas highlighted in RED CIRCLES signify areas where broadband access (via both DSL or Cable) is unavailable.
- These areas are however serviced by regular dial up services.