Global Business Dialogue on Electronic Commerce

Future of the Internet
Broadband

Issue Leader (Europe/Africa): *Jozef Cornu*
Executive Assistant to the Chairman & CEO
and Member of the Board
Alcatel

November, 2003

I. Broadband: A Vision for the Future of the Internet

1. Common Vision

The members of the GBDe share the common vision that broadband is crucial to the future development of the Internet. GBDe members recommend that today's public policies should be designed according to this vision of the future. The question regarding the implementation of this vision is not "if" but "when", and the answer is key for:

- **Benefits to consumers:** High-speed online broadband access will empower end-users both at home and at work to participate in, and reap the benefits of, an Information Society in ways which will enhance their quality of life.

- **Opportunities for new groups of stakeholders:** Broadband permits greater participation in the work force and other productive activities by those formerly disenfranchised or excluded. For example, in Korea, broadband has allowed women office workers and housewives to engage in more than half of the online trading in company shares. The reasons for this include the "always available" nature of broadband access and improved ease of use of PCs and the Internet. Other new stakeholders include audiovisual content producers and providers accessing new delivery channels to the residential market in particular.

- **Growth potential for the general economy:** Response times of less than one second are necessary to hold a user's interest and to encourage interaction with online applications (banking, shopping, stock exchange, etc). Economic growth is increasingly dependent on sub-second response times for downloads of files/web-pages of one to several Mbit/s per individual application. This implies that broadband offers not only a high speed backbone but also the necessary "on-ramps"[1] to the user's premises or office.

[1] "On-ramps, Off-ramps": In the same way that on-ramps and off-ramps provide vehicle access to and from major highways, broadband is an essential component for adequate access to, and to exploit the super high speeds possible on fiber backbones of the Internet.

- **Improvement of life style, education, health and broader participation of the civil society:** Applications in the areas of e-health, e-government, e-learning, e-community and e-society have the potential of improving daily life for all citizens. Ubiquitous broadband is essential, not only to enable such applications, but also to bridge the digital divide between all parts of society, regardless of location. The gaps between societal groups (the differences in development and prosperity between urban and rural, rich and poor, advantaged and disadvantaged, between the sexes) can be bridged through the provision of ubiquitous broadband access and services. Building upon their 2002 Recommendation on Broadband, GBDe members would like to set out some critical facts and to stress what needs to be done.

2. Contribution to the Future of the Internet

It is important to realize how much broadband changes the context of the Internet from both content and communications perspectives:

- Broadband access will provide the high speed "on-ramps and off-ramps" essential for making the Internet more flexible and interactive while providing platforms for designing new business and social applications.

- Recognizing that broadband is not specific to a particular technological platform, but will be provided through multiple and competing open platforms[2], it will also nurture the development of a new multimedia broadband service and content industry.

- Broadband will boost the performance of Internet-based communications to the sub-second response times necessary for interactive commercial applications enabling, over a single Internet-based infrastructure, the transport of any kind of content service.

- New highly efficient technical protection measures and digital rights management (DRM) solutions will better protect valuable content from being pirated while securing new revenue streams for the creative community and other players; this will create an environment that promotes the release of content into broadband networks and unleashes a virtuous cycle of economic growth.

3. Impact on Business, the Economy and Society as a Whole

a) Innovative business models

Broadband will create opportunities for new multimedia and content revenue-generating services, thus adding value to the current business models often limited to selling broadband connectivity. An open, competitive environment based on freedom to market will stimulate the provision of innovative broadband offers. Accordingly, business partners across the value chain will inevitably find new and different balances in the distribution of revenues.

Broadband networks stimulate both offer and demand for richer and more diversified content using fine-tuned user profiles in better-focused markets, thus increasing profitability. At the same time, content and service providers can address a much wider customer base thanks to direct access to worldwide markets. All stakeholders will benefit from increased revenues.

As touched in ***c) Impact on Society*** in detail hereafter, the new systems based on broadband used to improve the quality of life of all citizens and to help addressing many social issues worldwide, will create considerable new business opportunities for the private sector as well.

b) Economic benefits

Broadband networks and services have been tremendous motors of growth for those countries or regions that have fostered key conditions for their successful development.

[2] Based on various technologies such as ADSL, cable, fibre, wireless LANs, satellite, fixed radio, mobile 3G, power-line technology and DTT (Digital Terrestrial Television).

South Korea is a prime example. Broadband services were introduced mid-1999.

The richness of the service offering increased Internet connectivity in Korean households from 15% in mid-1999 to more than 50% by end-2001. Now, more than 90% of those connections are broadband. At the same time, Internet usage has gone up to more than 16 hours per week. This has meant a shift from traditional TV watching (lean-back) to Internet usage (lean-forward) particularly for the age group 13 to 40 years old. In addition, connections to web sites have shifted from 80% foreign to 80% Korean, reinforcing the development of local content and service providers. The impact is important not only on residential behavior, but also on the productivity of SMEs.

In Japan, since the e-Japan strategy was set up in January 2001, the broadband Internet environment has observed a rapid progress, which is especially visible in the last year. The total number of household with broadband Internet connection has reached at the end of September 2003 to 12 million, which is the second largest in the world. At the same time, the subscription price of the DLS service in Japan has become the lowest in the world. Further innovation in the broadband is under progress in FTTH. World's first FTTH service for an ordinary household started in Japan in March 2001. It has reached 688 million at the end of September 2003, and is expected to have robust growth in the future.

Similar opportunities exist in Europe and North America. In Europe, the advent of a mass market for interactive, multimedia services addressing both the PC population and also the much larger number of TV households represents huge potential for the overall economy. Besides the connectivity revenues estimated at around €40 billion for the year 2006, new broadband services on Europe's fixed network will represent a comparable revenue potential of approximately €40 billion by that date. The stakes are high: the development of a new service sector will be key to Europe's economic growth in the years to come. Moreover, growth due to the impact on other sectors is evaluated at €60 billion per year, representing an increase of one-half percent of European GDP.

By way of comparison, the same potential effects are anticipated in the United States, impacting the telecom industry - operators and suppliers – and its neighboring sectors, such as the content industry, evaluated at $500 billion per year. Job creation based on high speed technology and commercialization is estimated to exceed one million; the impact for Europe will likely to be comparable. Today, Europe counts some 17 million broadband subscribers, almost 71% of which employ ADSL technology. The current fixed-line to broadband conversion rate in Europe has jumped significantly since the beginning of the year. The premise for creation of a mass market of new broadband services implies that two-thirds of Europeans must be connected by 2010 requiring a fixed-line to broadband conversion rate of about 7% per year.

In Canada, it has been estimated that savings of between 10% - 30% could be achieved through increased online e-business in the aerospace, chemical, communications, computing, components, forest product, freight, life sciences and paper industries. Additionally, broadband augurs huge benefits for the quality of life of all Canadian citizens. The percentage of "Internet households" with access speeds greater than 56 kbit/s grew from 20% to over 60% between 2000 and 2003[3]. The Government has set as objectives increasing speeds and overcoming the "digital divide" between urban and rural communities by provision of broadband services to every Canadian.

c) Impact on Society

Improving the quality of life of all citizens is a fundamental priority for national governments and society in general. Internet based technology can assist in this task. Many of the burdens of every day life associated with banking, shopping, learning, and access to

[3] Derived from Nielsen//NetRatings and Ipsos-Reid data.

business, etc., can be alleviated. The use of broadband technology will facilitate new applications that were not previously viable with slow speeds encouraging public services to move from off-line to online operation. This also opens the door to the introduction of new and innovative services in all sectors.

Broadband can also help address other social issues, for instance:
(1) video telephony can help fight citizen's isolation;
(2) teleworking from the home in office-like conditions can help limit road traffic congestion and provide flexibility to work schedules;
(3) e-health is a new vital tool which can serve every citizen;
(4) remote monitoring can contribute to increased security;
(5) distributed call centers, broadband SMEs and broadband public services are an asset for a decentralized development of society; and
(6) distance learning and other services over broadband networks promote progress not only for the developed world but also for emerging economies.

II. Challenges to Broadband Services

GBDe members have identified the following key challenges to the development of broadband services:

- The emergence of innovative business models which are rewarding for all value chain contributors (content owners, aggregators, network operators, access providers, Internet service providers and consumers).

- The role of open and interoperable standards and platforms to create the critical mass and economies of scale needed to boost broadband services (e.g. interoperability of terminal equipment/set-top-boxes and other consumer premises equipment, end-to-end interoperability of services, etc.).

- The independence of content from transport and delivery services over seamlessly operated wireless and wireline broadband networks (while allowing service providers to offer an integrated experience to their customers).

- The provision of high quality real-time packet services through the same access network as best-effort data services, as well as the development of Internet-based emergency/security services in cooperation with public authorities.

- An approach to intellectual property rights, content protection, digital rights management technologies and solutions, as well as anti-piracy enforcement which brings confidence to investment in broadband services.

- An approach to content regulation, access to content and content distribution rights which encourages the provision of new content offerings over broadband networks (while respecting property rights).

- Several emerging technologies have shown promise in reducing access costs, including satellite, wireless broadband and digital terrestrial television. Progressively, these technologies will achieve appropriate mass market economies of scale in many countries and service providers will have a greater incentive to deploy broadband to rural areas enabling rural penetration to improve significantly.

- Global cooperation and dialogue should lead to harmonization of regulatory, technical and market practice and standards to best accommodate the global environment in which broadband services and content are accessible.

III. GBDe Recommendations

1. Policy Recommendations

Both governments and private sector can contribute to the successful take-up of broadband

For its part, the private sector is committed to play its role in the development of broadband services. Government should promote policies to develop an environment that facilitates the use of these broadband services. GBDe members encourage governments to invest and to create a fiscal environment to stimulate broadband demand by:

(a) Improving public services and accelerating investment in e-government (including e-procurement), e-health and e-education;

(b) Providing fiscal incentives, e.g. tax incentives to promote tele-working; allowing suitable accelerated schedules to the extent necessary to change the underlying cost of providing service and improve the basic case for broadband deployment in non-urban areas; and more extensive marketing of existing measures;

(c) Supporting selected end users (both institutional – such as libraries, schools, hospitals – and citizens who would otherwise be victims of digital divide) to facilitate purchase of broadband equipment;

(d) Fostering an environment, in part through public/private efforts, which increases citizen and consumer confidence in e-government and e-commerce services and makes these technologies secure for service providers, content suppliers and consumers.

Public authorities at national level should lay down specific national targets for broadband subscribers

Each country needs an ambitious and publicly declared target to equip its citizens and enterprises with broadband connections and create a favorable environment for long-term investment in broadband technologies. In the European Union, all possible ways to reach the objective of eEurope, of half of the Internet connections to be broadband connections by 2005, must be explored.

Government as facilitator to widen the dialogue on solutions and business models

The private sector will develop new solutions and new business models based on broadband services, through alliances and collaboration across industries, and promote their implementation through trial services. In the phase where innovative business models between the business partners of the multimedia value chain are being considered, policy makers can greatly help as facilitators by bringing all stakeholders together in continued dialogue.

New interactive broadband services should benefit from appropriate regulatory conditions

Broadband offers a fertile environment for the development and provision of new and innovative services. However, service innovation can only occur if market entry is not burdened by unreasonable, prohibitive regulatory barriers.

The GBDe believes that these services should be free of legacy regulatory structures. In some cases, the transition may not be free of difficulties, as all players should be able to compete on a level playing field. In any event, all players – whether traditional providers of services and infrastructure or new entrants – should be able to participate fully in competitive Information Society services.

In Europe, the e-Commerce Directive should be clearly designated as the appropriate framework for all new content services over broadband. Indeed, such new services should be treated as Information Society services, and this approach should be maintained in the future without applying any further regulatory regime.

In the USA, the Federal Government should be urged to develop a coordinated strategy to broadband deployment. This strategy should include reasonable goals, regulatory parity among all providers, an appropriate balance between state and federal regulatory authorities, and equal opportunities for different platforms to provide competitive access-to-content video and broadcast services.

In Asia, where the two leading broadband markets, Japan and South Korea, have recently introduced new forward looking sector regulation, attention should be given to further building the most appropriate marketplace for content providers over multiple access platforms.

In all regions, online availability of media rich content should be encouraged, and a level playing field for access to content and for content delivery should be guaranteed.

It is necessary to monitor the progress of national broadband policies periodically

Because both technology and markets are permanently subject to dramatic change, it is necessary to monitor the progress of initiatives, such as eJapan/eEurope, periodically. Governments and the private sector should cooperate not only in conventional benchmarking, but also in reviewing national action plans on a regular basis.

It is necessary to set a predictable regulatory and competitive environment that stimulates investment in broadband

Much progress can be made in the deployment of broadband infrastructure and services if broadband providers feel secure in making substantial investment in innovative products and services. Only a predictable regulatory framework, inspired by competition principles and ensuring that a level playing field exists for all markets participants, will stimulate investment in broadband infrastructures and services, while fostering innovation.

2. Industry Recommendations

Interoperability standards

Suppliers and service providers need to develop open standards or reach consensus on adopting existing ones to facilitate competitive service design and provision in a competitive broadband service environment with multiple actors at different levels of the value chain. In such an environment, however, the consumer should not be compelled to install multiple "boxes" at home, but on the contrary enjoy one "interface-box" to access all the services desired. At the same time it is important that the end-to-end architecture not be unnecessarily complicated by different sets of protocols and standards.

Accordingly, two complementary objectives can be defined to drive the definition of standards to support interoperability: a) Home networking equipment (set top boxes etc.) should be independent of new services; b) Content providers and aggregators should be able to provide (but not be compelled to offer) the same content over different access infrastructures. The GBDe encourages efforts of industry cooperation in several standards fora, which are exploring interoperability between different consumer devices that would make them independent of the delivery channel.

The digital divide needs to be eliminated

The provision of broadband technology to lesser developed countries can, at the same time, meet the objectives of these countries to achieve economic development and poverty alleviation, as well as the target of the private sector for an adequate return on its commercial activities in ICTs[4]. The challenges and the recommendations set out above apply here as well. In these states the government may play a

[4] Based on a study drawing on the experiences of its members, the GBDe has identified best practices for companies undertaking investment and other commercial activities in ICTs in developing countries. In its Recommendation, the GBDe concluded that the objectives of the private sector and of these states are complementary. Recommendation of the Digital Bridges Working Group, Brussels (2002).

proportionally greater role in fostering services to its citizens and in promoting the transition to a regulatory and fiscal environment favorable to ICTs. When implemented, broadband technologies can help citizens, consumers, SMEs and government to overcome disadvantages caused by economic disparity, gaps in education and training, and geographic isolation.

3. Social Recommendations

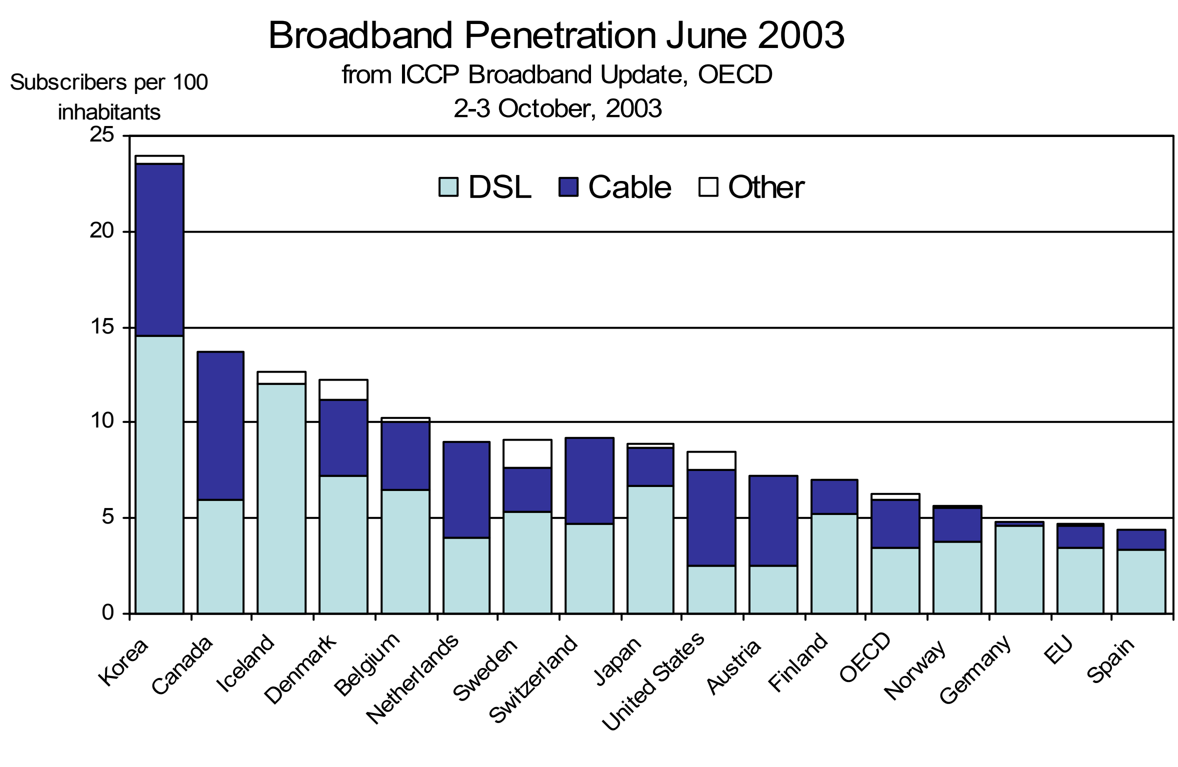
The use of broadband to enhance the quality of life of all citizens

The availability of broadband services to all citizens has the potential of greatly improving the way people live and work. Consideration needs to be given to the provision of applications, which specifically address quality of life aspects. In particular, developments in the following areas should be addressed:

a. e-health (by online medical care/services, tele-medicine, professional medical broadband applications, research;
b. e-learning (by digitization and adaptation of national educational content, remote-teaching, cooperative teaching, access to multimedia information centers, administration aspects/inscriptions, track records);
c. e-working (by home-working, virtual networking, videoconferencing);
d. e-government (by putting online voting, taxation, licensing, library, and other government services);
e. e-community (by developing associative applications and resource sharing).

The prospect offered by these services for a positive impact on citizens is all the greater in developing countries. These countries have to overcome many disadvantages. The applications listed above can be at the core of the effort by states to bridge the digital divide by encouraging the broadband infrastructure and offering broadband services.

The GBDe is confident that the implementation of these measures will help achieve our common broadband vision of the Future of the Internet and reap lasting benefits for all.



Global Business Dialogue on Electronic Commerce

Broadband in Korea (Rep. of)

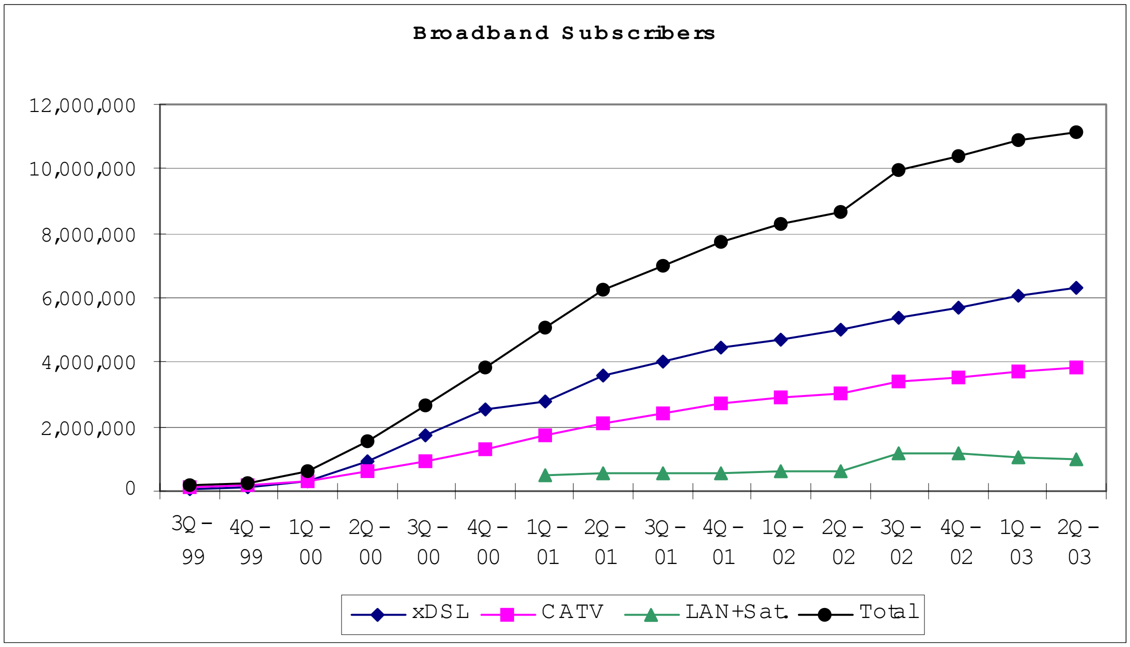
1. Overview

Broadband in Korea has become a new type of lifeline telecommunication service exceeding 72% of penetration rate in households, ranking the country number one in worldwide broadband access.

More than 98% of schools, from elementary to university, are connected to broadband Internet, utilizing IT to perform real online education.

Almost 50% of Internet traffic is generated by women, especially housewives, office workers, and students. Also, more than 70% of stock trading and 14% of bank trading are carried out over the Internet, especially by aggressive participation of women. Regarding content, 74% of Internet users enjoy accessing audio/visual Internet broadcasting, and more than 30% use broadband for their Internet games and music downloading accordingly. Moreover, about 25,000 Internet cafes are widely spread all over the country.

There is a good trend of user demand for wireless Internet services such as wireless LAN and 2.3GHz portable Internet. Through these, Korea has already entered the stage for "anywhere, anytime and any device" communication.



2. Penetration Rate as of June 2003

The cable modem was developed at the earlier stage of broadband service, whereas ADSL has been available since 3Q 1999 and will continue to be increasingly widespread in the Korean broadband market. In 1999, the ratio between CATV and ADSL was 0.97% and 0.3%, respectively, but after takeoff of ADSL, the Korean broadband market evolved to high penetration of ADSL subscribers with more than 1 million within a year, and more than 2 million in 1Q of 2001.

As of June 2003, more than 11 million subscribers are using broadband Internet access services reaching 72% of Korean households.

Korea has just closed its 1st phase of broadband service development and now is moving towards the 2nd phase based on VDSL and Fixed-Mobile convergence services. VDSL has been commercialized since November 2002 and it is becoming more and more popular day by day.

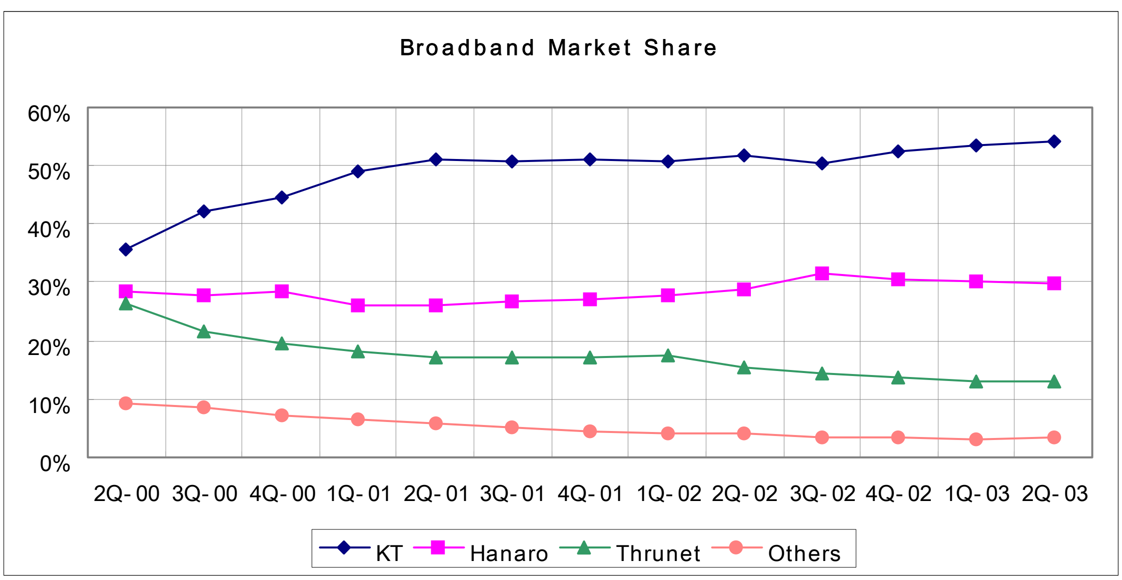
As depicted in the graph on page 15, it is worthwhile to note that the role of LAN-based (Ethernet over optics) broadband services will continue to increase over time.

3. Pricing and Competition Aspects

There is a diversified price range of broadband services in Korea. The most popular broadband service prices are at 40,000 KRW (1,200 Korean Won = US $1), and wireless LAN service prices at 10,000 KRW added to the broadband access service.

There were 110,000 SME multi-ADSL subscribers in Korea in 2002 which allow for connection of up to 16 computers to one ADSL line ranging from 40,000 KRW up to 256,000 KRW.

The major drivers of the rapid development of broadband access services in Korea have been competition among carriers, dense geographical user populations, market driven demand, and supportive government projects for the Information Society. Such drivers have resulted in aggressive marketing causing competition.



In Korea, KT, Hanaro Telecom and ThruNet are three major broadband service providers strongly competing with each other. Having only begun to provide ADSL from 3Q of 1999, KT has already secured more than 5 million subscribers, or 49% of total broadband users nationwide, emerging as one of the world's leading broadband Internet service providers. Due to an aggressive marketing and pricing strategy, Hanaro directly follows KT with a market share of 27%. (see graph on page 16)

Today's access network service market, however, is already in a mature stage where service provider revenues are facing a slow growth rate.

4. National Policy Environment Strategy

The Korean government successfully built KII (Korea Information Infrastructure) as a new vision of the 21st century. Broadband Internet infrastructure was fostered by the implementation of the Global Leader, e-Korea Initiative.

When it comes to pro-competitive policy, government promoted competition through significant deregulation on ISPs, and has put in place the open access network.

Moreover, the Korean government also made a great deal of effort to upgrade the user environment available to broadband services by encouraging the upgrading of communication lines to customer premises. One typical policy, seriously impacting households, was giving formal certification on communication quality inside customer premises.

For the success of the 2nd phase of broadband service, the Korean government is also preparing various political and regulatory measures in cooperation with industry. This will cover Fixed-Mobile integration and Telecom-Broadcasting convergence which mainly concerns the next generation broadband service targets.

Global Business Dialogue on Electronic Commerce

Broadband in Canada

1. Overview

Canada ranks 2nd in the OECD (behind only Korea) in terms of overall broadband penetration.

Some 60% of Canadians regularly make use of the Internet from the office or home and 60% homes are connected to the Internet, making Canadians among the most connected and biggest users in the world.

Of these Internet households, roughly half - some 3.5 million or 30% of total households - subscribed to cable modem or DSL broadband access services at the end of 2002. This is expected to rise to 35% of total households by the end of 2003 and to more than 50% by 2005[5].

On a per capita basis, broadband access in Canada continues to exceed that in the USA by almost two to one, although the USA recently has begun to narrow this gap.

2. Competition Driving Broadband Penetration

The principal driver of the rapid development of broadband access services in Canada has been competition among cable and DSL broadband networks, resulting in aggressive marketing and pricing strategies.

a) Cable vs. DSL

Canada's cable television infrastructure developed independently of the telephone network and is well established, with more than 93% of homes passed. Early to recognize a new market opportunity, in 1996 Canadian cable companies were among the first in the world to offer broadband Internet access. By the end of 2000 they had signed up almost 1 million subscribers.

Canada's telephone companies also were the first among OECD countries to offer high speed commercial Internet access using DSL technology in 1996. As networks were upgraded to provide DSL services in more metropolitan areas, the telephone companies challenged the early lead of the cable companies in 2000 with aggressive marketing and pricing strategies, targeting not only cable's broadband customers, but also their own dial up subscribers. By the end of 2000 the number of DSL customers had increased to almost 500,000, a figure which more than doubled during 2001.

Fierce competition between the telephone companies and cable companies for residential customers continues to fuel the demand for broadband access services. During 2003, for the first time, the number of broadband households will surpass dial-up households. Further, within these broadband households, DSL use will exceed cable modem use.

[5] IDC Canada Canadian Internet Access and Broadband Market Forecast and Analysis 2003-2007, April 2003.

b) Pricing

This competition for customers has kept prices low. Retail pricing for both DSL and cable modem service generally has remained constant at around $C40 ($US30) per month since these services were introduced. Recently some users have begun to see modest increases, as both the telecommunications providers and cable companies introduce new tiered pricing plans based on the speed of service. However, the availability of lower priced schemes and the bundling of Internet access with other services mean that prices are unlikely to increase substantially. Both the telephone companies and cable companies are required to provide third party access to their broadband access services. However, reflecting low retail prices, the wholesale market has been slow to develop and the incumbent cable and telephone companies remain the major suppliers in all regions of the country.

c) Alternative technologies

Alternative access technologies, including fixed wireless and satellite, are available commercially across the country but, since they are mainly used only in areas with very sparse population, they do not significantly affect total figures. Several "Wi-Fi" pilot projects are underway, including the provision of wireless broadband access on trains in the heavily travelled Montreal-Toronto corridor, and the government recently has announced its intention to make available additional radio frequency spectrum for applications such as Internet access.

d) Small Business Market

The small business market (less than 100 employees) for broadband services generally has followed a pattern similar to that of the residential market, with more than half of firms using the Internet making use of high speed technology in 2002, with DSL access more popular than cable. Price competition for small business customers also is fierce, with recent reductions bringing prices down to as low as $C60-90 ($US42-65) per month depending on the speed and services offered. For larger businesses, broadband access generally is available through dedicated T1, frame relay, ATM or IP Virtual Private Network (VPN) technologies which integrate Internet access with a firm's other data communications requirements and comparable statistics are not available.

3. Government Strategy

While competition remains the principal driver of broadband growth in Canada, other factors have been important. In particular, government understood early on the importance of Internet access and broadband connections for both economic and social development.

A series of initiatives were launched beginning in 1998 under the Minister of Industry's "*Connecting Canadians*" agenda which, among other things, sought to ensure a friendly policy environment for e-commerce through a technology neutral tax regime, creating the legal framework for digital signatures in electronic records and to protect personal information and encourage the development of voluntary business guidelines to protect consumers conducting online transactions. It also established an ambitious e-government program with the result that, for the past several years, Canada has led international surveys measuring the availability of online government services.

4. Canadians are "Early Adopters"

Canadians also appear especially receptive to adopting the use of new communications technologies. For example, historically they generally have been faster than their U.S. counterparts to adopt new services such as the use of ATMs, telephone banking and debit cards, and in 2001 some 38% of individual tax returns were filed online. They also are among the world's largest users of bandwidth intensive services on the Internet, including online gaming, music downloads, education and training and using the Internet to work from home[6].

5. The Impact of Geography on Broadband Penetration

Because of Canada's huge geography and relatively small population of 32 million, among the biggest challenges is the extension of broadband service to the 20% of Canadians that live outside metropolitan areas. Having met an initial target of ensuring Internet access for all public schools and libraries by 2000, the first country in the world to do so, the government is working in partnership with the private sector to ensure broadband access for all communities by 2005.

The "*Smart Communities*" initiative is a program of funding through a competitive process to bring publicly available broadband access to qualifying communities led by community "champions" for broadband development. In addition, there are a growing number of other federal, provincial and local initiatives to accelerate broadband penetration. These include, for example, contracting for government institutions, provision of seed funding to community projects, provision of capital funding for infrastructure projects, R&D tax credits to equipment manufacturers, and support for the development of online content to drive demand for broadband access.

[6] Veenhof, Neogi and van Tol *High-speed on the Information Highway:Braodband in Canada* Statistics Canada Research Paper, September 2003 quoting International Telecommunication Union (ITU) *Promoting Broadband: The Case of Canada* ITU Workshop April 2003 (forthcoming).

Global Business Dialogue on Electronic Commerce

Broadband in the USA

1. Overview

In the U.S., broadband penetration predominately relies on landline-based technologies using cable television infrastructure (cable modem) and wireline telephony infrastructure (Digital Subscriber Line).

Broadband penetration in the U.S. has not been as rapid as many of the countries it competes with economically (e.g. Korea or Canada).

Some of these reasons include: unique demographic and geographic challenges (a lower percentage of population lives within central office-based DSL range); non-metered local phone rates that do not make dial-up access as unattractive as systems with metered rates; regulatory advantages of cable modem compared with DSL; and the lack of an overall government plan or incentives for increased broadband penetration.

In December 2002 (see table below), compared with other member countries in the Organization for Economic Cooperation and Development (OECD) consisting of 30 of the world's industrialized countries, the U.S. ranks sixth in per capita broadband penetration. More recent statistics compiled by the OECD (see page 14) place the U.S. in 10th place.

December 2002	DSL subscribers	Cable subscribers	Other subscribers	Total subscribers	Subscribers per 100 inhabitants
South Korea	6,386,646	3,701,708	39,959	10,128,313	21.4
Canada	1,642,554	2,008,566	-	3,651,120	11.7
Belgium	517,000	326,181	25,813	868,994	8.5
Denmark	307,055	133,003	5,784	455,842	8.3
Sweden	424,000	153,700	142,500	720,200	8.1
U.S.	**6,595,532**	**11,300,000**	**1,928,152**	**19,823,684**	**6.9**
Switzerland	195,220	260,000	-	455,220	6.3
Japan	5,645,728	1,954,000	206,189	7,805,917	6.1
Germany	3,195,000	56,845	70,000	3,321,845	4.0
U.K.	590,000	779,319	2,000	1,371,319	2.3
OECD	30,058,261	23,075,208	2,625,176	55,758,645	4.9

2. Penetration Rate as of December 2002

According to the Federal Communications Commission (FCC), there were 19,823,684 broadband subscribers in the United States as of December 2002 (see table on page 21). This total number represents 6.9% of the population, and 6.5 million of these subscribers relied on DSL, 11.3 million on cable modem, and 1.9 on other technologies (FTTH, wireless, etc.). Broadband penetration has increased dramatically over the last two years with more telephony lines being upgraded to provide DSL services and pricing packages that make broadband subscriptions more attractive for consumers.

3. Pricing and Competition Aspects

The competition among varying broadband platforms in the U.S. is beginning to create price pressures and the bundling of services. In the late 1990s, cable television providers upgraded their networks to provide cable modem services and began to offer bundled packages of cable television, Internet, and (occasionally) local phone services. Incumbent local exchange carriers (ILEC) were slow to invest in the DSL market, citing high costs, low return, and the threat of network sharing obligations with competitive providers.

Recently, the main ILECs in the U.S. have achieved, or announced plans to achieve, approximately an 80% DSL availability rate for their customers, and several have announced plans to increase this penetration with investment in remote terminal facilities and fiber-to-the-premises projects. The ILECs have responded to the cable modem challenge with bundled packages of DSL, local phone, and (occasionally) wireless phone services. Several ILECs have recently made arrangements with satellite television providers with plans to bundle these video services with DSL, wireline, and wireless. Most stand-alone DSL or cable modem services are priced between $30 and $40 per month for the first tier of service with additional costs for higher or synchronous speeds.

4. National Policy Environment – Strategy

The U.S. lacks an overall national policy on broadband penetration. To date, most government activity has focused on unbundling obligations and achieving regulatory parity among the two primary broadband platforms.

The FCC is attempting to relieve ILECs from unbundling obligations for their fiber loops and broadband network elements while preserving the status quo for cable modem providers (no unbundling of networks and no mandated access for unaffiliated ISPs). However, no macroeconomic strategy exists to achieve ubiquitous broadband penetration in the same manner as previous government plans for telephony and electrification.

Global Business Dialogue on Electronic Commerce

Broadband in Europe (Belgium)

1. Overview

As of July 2003, there were 17,566,550 broadband lines in the EU, a 36.19% increase since January 2003. Of these lines, 12,579,164 were DSL lines (71.6% of the total) while 4,987,386 (28.4%) were provided using other transmission means, mostly cable modem.

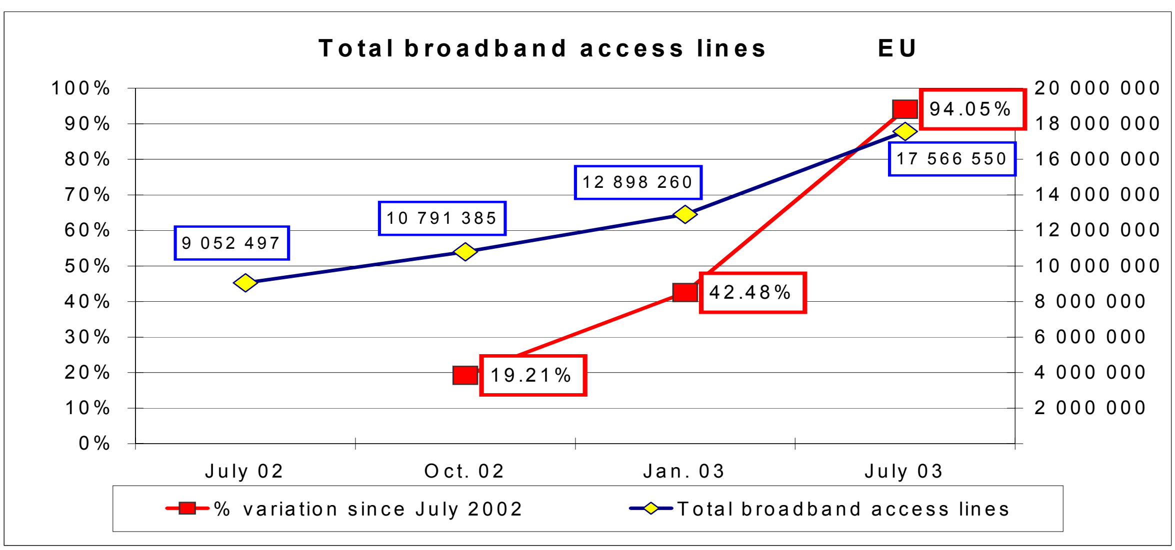
During the first six months of 2003, a total of 4,668,290 new broadband lines were added. This is a significant increase over the second half of 2002, when 3,845,763 lines were added.

Graph 1 shows the broadband penetration rate per number of inhabitants:

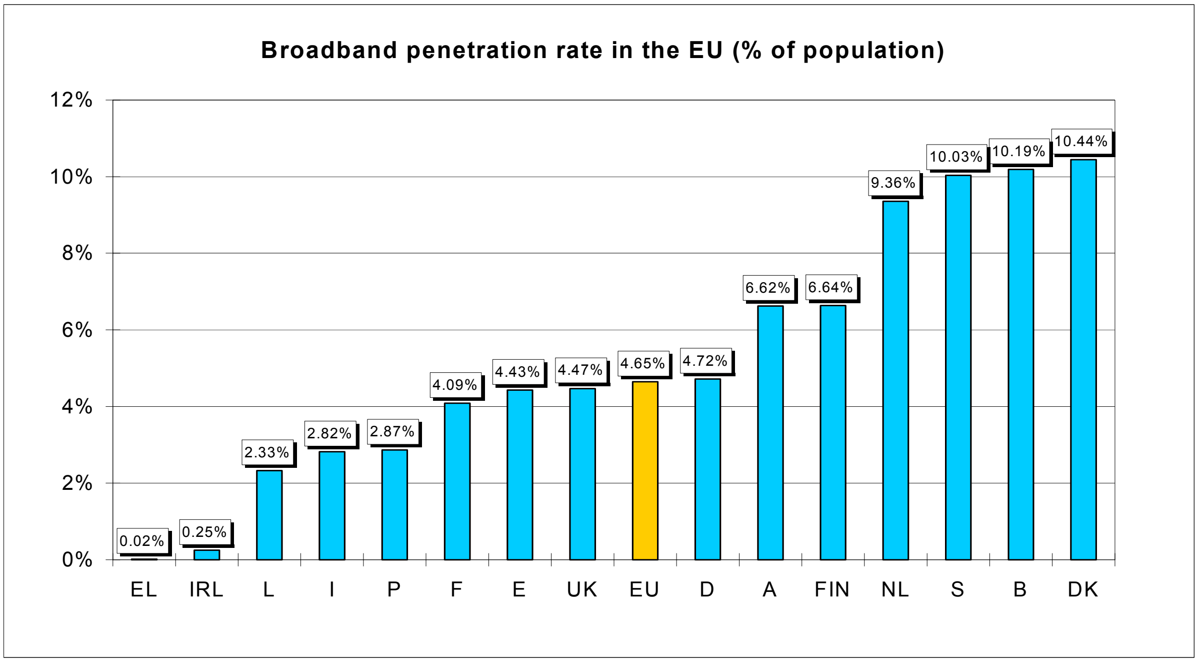
Graph 2 shows the broadband penetration rate per number of inhabitants. Finally, Graph 3 shows the percentage of PSTN lines that are being used to provide DSL access.

A number of factors involving EU-wide initiatives (e.g. eEurope) or national policies (e.g. Plan Info XXI in Spain) should be considered when analysing the success of broadband in Europe. However, the GBDe focuses on one of the most compelling examples of the advantages of infrastructure competition for the successful take-up of broadband, namely the Belgian case.

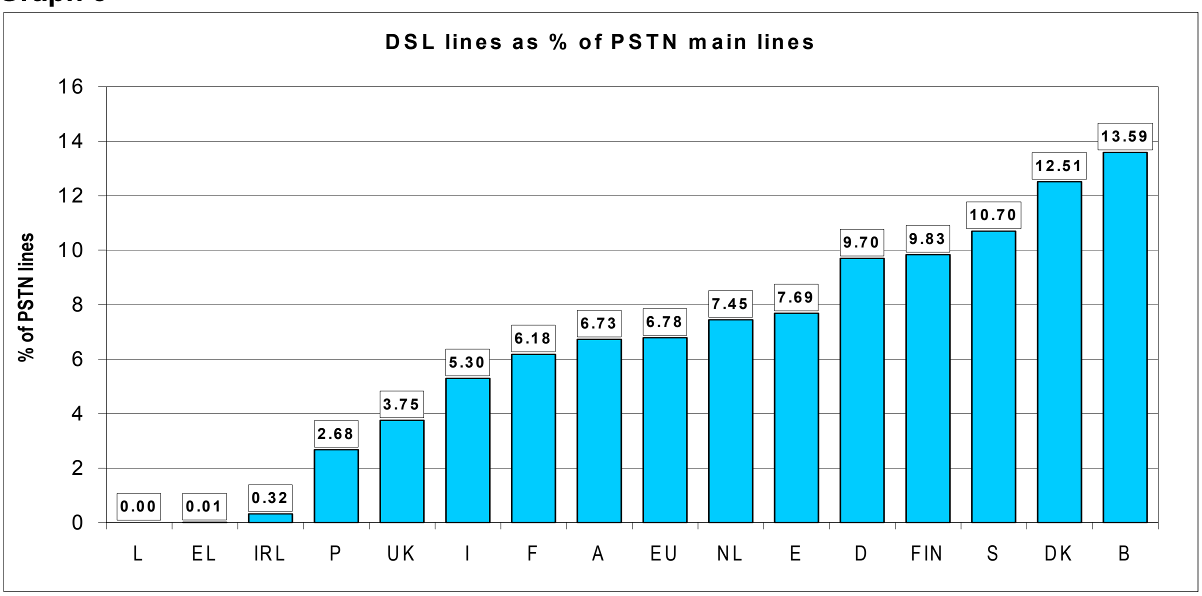
Graph 1



Graph 2



Graph 3



2. Key Success Factors of Belgian Broadband

Whereas Belgium boasts a successful experience in the broadband business, the following factors can explain the Belgian case.

Multiple access and competition in infrastructure.

Belgium has one of the highest cable penetration rates in Europe, which amounts to 98% of households. As far as DSL is concerned, the infrastructure coverage reaches about 98% of households: consequently, Belgian consumers have wide access to both broadband cable services and DSL via Belgacom or other DSL carriers who offer Belgacom's wholesale services[7]. This factor is key in broadband penetration in Belgium as the presence of two competing infrastructures and technologies explains the current success story of Belgium.

The total broadband market in Belgium amounts to more than one million connections, which represents a very high penetration rate in terms of actual users per households.

As shown by Graph 4 on the consumer and business market segments (CBS), cable and DSL are highly competitive in Belgium. In Flanders, the broadband split shows that cable is the leading technology, while Telenet, the major Belgian cable operator, currently holds 50% of this market segment.

3. Design of the Product

Another important factor explaining the successful case in Belgium is linked to the design of broadband products, characterized by a very high (download) capacity. While cable services offer a speed of up to 4 Mbps, Belgacom DSL products provide consumers with a 3 Mbps (download) capacity, which is already available with the basic ADSL retail product[8].

Population coverage for such a 3 Mbps ADSL offer amounts to 84% (in its "best efforts" guarantee) and amounts to 60% on an "always" guarantee.

Belgacom is currently investing in new network infrastructures to gradually increase this ratio.

4. Pricing

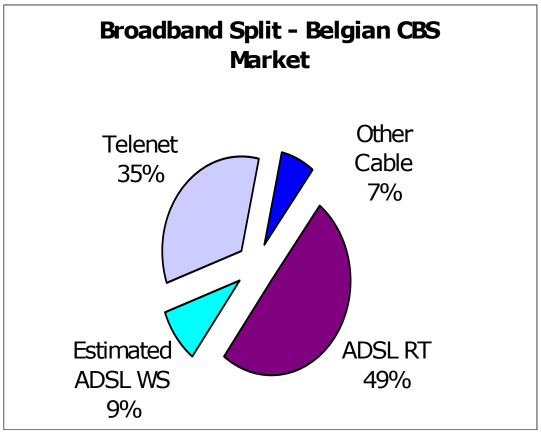
The third key factor in the extensive and rapid development of broadband in Belgium can be found in the very low prices for broadband services. As exemplified by the following statistics, Belgium is characterized by very low prices. The basic ADSL Belgacom product, for example, costs 30€ (incl. VAT) at the retail level.

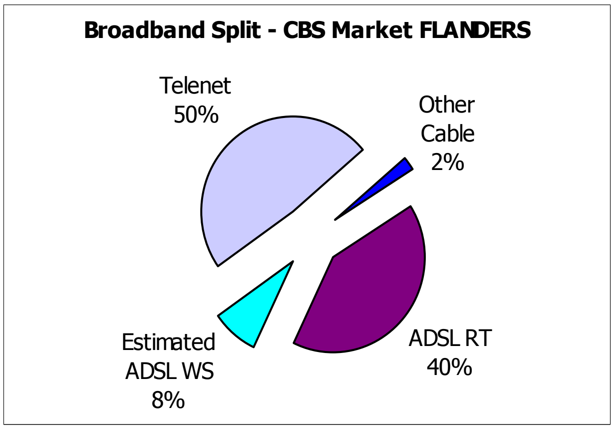
It is also worth mentioning that the Belgian ADSL offer features one of the best quality/price ratios in Europe.

[7] Contrary to the cable sector, DSL technology is fully regulated in Belgium with Belgacom providing a regulated reference offer for bit stream access (BROBA) both at the local level (BROBA I) and at the ATM switch level (data connectivity-BROBA II). This allows other operators to define, market, distribute and sell their own DSL products to end-users, using Belgacom's installed and existing network infrastructure.

[8] ADSL GO: 3 Mbps download.

Graph 4





5. Government Policy

- Promoting Internet access in schools and libraries (I-Line project).
- Defining an e-inclusion program (new government agreement).
- PC *privé* context in order to increase PC penetration.
- E-government services:
  - Electronic individual and company tax declarations;
  - E-identity card for every Belgian should become a reality by 2007;
  - Secured Access to personal civil file via the Internet.
- Promotion of tele and home-working through:
  - The administration's investment in PCs and Internet lines;
  - Analyzing and defining an attractive and more suitable legal framework for teleworkers.

6. Key Factors to Further Developing Such a Success Story

- **Regulatory environment**

Belgium ranks number one in Europe in the penetration of both cable (98% households) and DSL due to the fierce competition that exists between both infrastructures.

However, the current regulatory environment in Belgium suggests that the cable sector should not be subject to *ex ante* regulation.

Such a situation is critical. The principle of technological neutrality in the regulation of electronic communication networks and services as well as the requirement to further support the current competition between cable and DSL services should lead to the conclusion that both technologies should be subject to the same regulatory treatment.

- **Public policy**

Belgium suffers from too low a PC penetration rate. The government should take all necessary measures in order to increase the penetration of terminals, thus enabling access to the Information Society. PCs are certainly part of the solution but other types of terminals may also be envisaged.

In order to guarantee the success of this strategy, more cooperation with industry will be required. More coordination with public authorities and entities will also be necessary in order to achieve coherent and efficient communication.