

## Broadband — Opening up to the future

**A**t the start of 2003, there were some 62 million “broadband” subscribers worldwide (compared with 1.1 billion fixed-line users) enjoying a range of service speeds from 256 kbit/s to 100 Mbit/s. The term “broadband” is used here to describe high-speed, high-capacity communications for which digital subscriber lines (DSL) and cable modems are currently the most commonly deployed platforms, followed by metro Ethernet, fixed-wireless access, wireless local area networks (WLAN), satellite and other technologies. Current broadband applications include Internet Protocol (IP) telephony, video/audio via broadband, online gaming and telecommuting.

With a few exceptions, the take-up of broadband has been relatively slow. Even where infrastructure is available and the cost affordable, demand for broadband has tended to remain sluggish. It appears that uninitiated consumers do not always perceive the benefits that high-speed data delivery can bring. To help understand this and other pressing issues in the development of broadband and to look at possible solutions, “Promoting broadband” was selected as the topic of a recent ITU workshop\*.

The vast majority of today’s users are in the developed world but, even among OECD countries, there are large disparities, not only in service availability but also in terms of quality of access and price per Mbit/s. Figure 1 shows the penetration of broadband in the fifteen economies where adoption has been most successful.

### Why promote broadband?

- For governments, broadband is seen as crucial infrastructure

for achieving socio-economic development goals. For instance, in the Republic of Korea and Hong Kong, China, which are currently the leading broadband economies, telecommunication expenditure as a percentage of gross domestic product (GDP) grew up to three times faster in the last ten years than the global average, following the introduction of broadband networks. Broadband can also facilitate the provision of public services, such as e-learning, telemedicine and e-government.

- For telecommunication companies, broadband offers a route to offset the current slowdown in the industry. In the Republic of Korea, the average revenue per user (ARPU) for a broadband user is up to seven times higher than for a narrowband user. Worldwide, the broadband market was estimated to be worth some USD 22 billion in 2002.

- For consumers, broadband makes possible a much wider and richer range of applications, especially when higher-speed services are available. Faster access to richer information and the always-on nature of broadband are an attraction for users. In a user survey in Japan, 70 per cent of users reported that broadband had increased their

usage of the Internet. In Iceland, some 40 foreign television channels are broadcast over the broadband network, greatly increasing the choice of services available. In Estonia, the typical connectivity requirement for providing broadband to each school has risen to 100 Mbit/s, and a further rise to 1 Gbit/s is projected, but it is generally difficult to estimate future bandwidth requirements (see Box: *Estonia — Tiger, Tiger, Burning Bright*).

- For businesses, in particular small and medium-sized enterprises, broadband brings advantages previously only available to larger companies in terms of access to high-speed communications, and the ability to reach a worldwide audience. Broadband also adds flexibility to the workplace through teleworking and remote network access at fast speeds.

### Success factors for broadband uptake

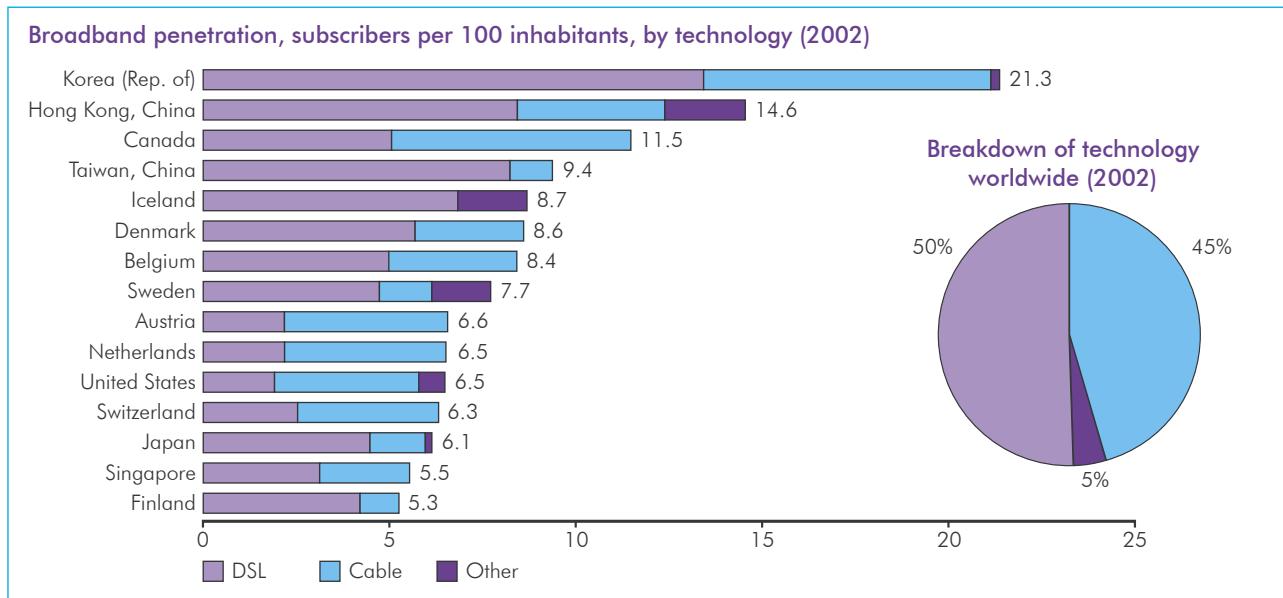
Economies that have been successful in promoting broadband are generally those that have tackled both supply and demand issues. These economies are also characterized by a number of common factors, some of which are highlighted here.

\* “Promoting broadband” was the topic of the latest ITU New Initiatives workshop held in Geneva from 9 to 11 April 2003. This theme was chosen following a survey of ITU Member States and Sector Members that ranked it a topic of high current interest. The workshop was the eleventh in the series organized by the Strategy and Policy Unit (SPU). Richard Horton, Senior Programme Manager at the Commission for Communications Regulation in Ireland, chaired the meeting. An earlier workshop on “Economic and regulatory implications of broadband” was held in May 2001. A CD-ROM containing output from the workshop will be available in June 2003 and can be ordered from the ITU Sales Service at: [www.itu.int/publibase/catalog/](http://www.itu.int/publibase/catalog/). More information about the workshop is available at: [www.itu.int/broadband](http://www.itu.int/broadband).

APRIL - MAY - JUNE 2003

**Figure 1 – Broadband penetration rates around the world**

*Top 15 broadband economies, worldwide*



Note: Data for Canada and the United States are estimates.

Source: ITU.

### Informing the public about broadband

— The benefits of broadband may be hard to appreciate until they have been experienced. An element that is common among successful broadband economies is that potential users are well-informed about how broadband can be useful to them personally. Some lessons could be learned from video game console manufacturers, who are very aware of this power of exposure to their products and have invested heavily in demonstration consoles in shops for people to try, hoping a brief experience will convince potential buyers that they need a console at home.

Schools also provide an ideal environment to realize the educational benefits of information access. Many governments have launched initiatives to provide funding for the supply of broadband to schools. In the United Kingdom, for example, the Government announced in November 2002 that it would provide funding for broadband connections to all schools by 2006.

Some service providers have also expanded access to schools

by connecting them either for free or at reduced rates. Swisscom, for example, is offering free Internet connections for all Switzerland's public schools. Under its "Internet for Schools" initiative, the company plans to have all schools connected by 2005.

**Competition** — Both inter-modal and platform-based competition (cable modem, DSL, fibre and wireless in countries such as Canada and Iceland) and/or inter-operator competition help drive up broadband deployment and take-up.

**Innovation** — Promotion of innovation in relation to broadband technology and applications by both government and private industry has been a key factor in the success of countries such as Japan with its rapid fibre-to-the-home (FTTH) build-out and its Ubiquitous Network Initiative), Iceland (which offers broadband across power lines as well as via DSL and cable modem) and the Republic of Korea (through the provision of converged networks).

**Applications** — Development and rollout of pure-play broad-

band applications, such as online games in the Republic of Korea, has attracted a critical mass of users and demands a high-capacity connection offered by broadband. Broadband offers users the possibility of receiving voice, data and broadcast entertainment ("triple-play") over the same service.

### Pro-competitive regulation

— A key regulatory strategy employed by a number of countries is an open access policy, which encourages shared access to networks. Canada is notable in this regard, having unbundled both its copper and cable networks. Low charges for local loop unbundling and collocation are also important.

**Price** — Affordable, innovative and transparent pricing schemes, such as flat-rate packages, are important to help promote user take-up. In Finland, for instance, a new entrant operator recently bundled a shared DSL connection to a number of subscribers in an apartment complex for USD 6 per month.

**Marketing** — Aggressive promotion of retail broadband services to consumers and user-friendly

packages, which can be installed by the user ("plug and play") help create awareness. In Hong Kong, China, potential customers are offered competing low-priced DSL services from hawkers at street stalls.

**Benchmarking** — Timely and reliable statistics in relation to a country's broadband penetration, coverage and usage are a valuable policy tool to allow governments to measure their progress against other countries and address bottlenecks.

The other side of the picture shows a number of factors that can stifle broadband rollout. These include continued monopolies and low levels of competition, high or metered pricing, the imposition of caps on volume that could be downloaded within a flat rate, lack of competition in the middle mile and State subsidies that produce market distortion. Broadband deployment has also been significantly slower in those economies where there is cross-ownership between telephone and cable television networks as

this reduces the potential for inter-modal competition.

## Government's role in promoting broadband

Apart from creating the right policy environment, governments can also play an important role in stimulating demand and formulating national, regional and local programmes to support the deployment of broadband, especially in areas of market failure or through universal service policies. Broadband promotion campaigns

### Estonia: Tiger, Tiger, Burning Bright

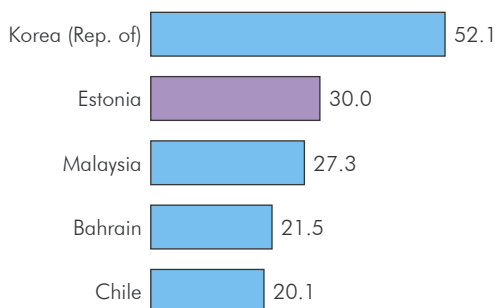
#### Broadband in education: Far-reaching benefits

Estonia launched the Tiger Leap National Programme in 1996 in an effort to make a developmental leap by introducing ICTs, into secondary schools. The targets were to achieve the ratio of one personal computer per 20 students, an Internet connection to each school, and basic computer training for all teachers. Today, the programme has accomplished most of its goals. Through Tiger Leap, 75 per cent of all Estonian schools have broadband Internet connections and the remaining schools have a dial-up option. More than 63 per cent of teachers have received training courses, acquired basic computer skills, and have been given guidance in using contemporary ICTs in teaching.

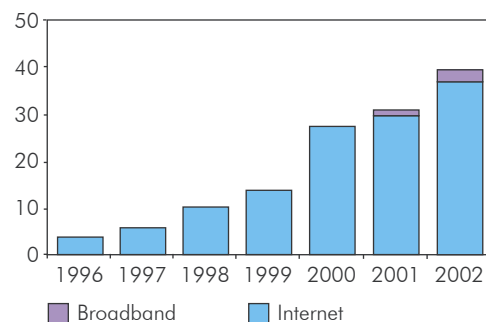
Investment in IT education and the promotion of broadband access in Estonian schools has been a significant factor in spreading the use of ICTs more broadly, beyond the boundaries of the education system. The programme has attracted considerable backing from local governments, the private sector and international investors, and has helped to shape Estonia's progressive reputation. Today, 35 per cent of the Estonian population uses the Internet, 38 per cent uses personal computers, and 18 per cent have their own home computers. Furthermore, 90 per cent of government agencies' computers are connected to the Internet. These figures place Estonia among the leaders in usage of IT in upper-middle income countries (see left chart). Estonia's broadband penetration (at 1.70 per cent of the population in September 2002) ranks it among the world leaders.

Some six years after the introduction of Tiger Leap, a new generation of Estonians, accustomed to fast information access and equipped with ICT skills, is reaching university level. As these students grow older and continue to demand fast access to information in different areas of their lives, the demand for ICT-related competence can be expected to continue its rapid growth.

Internet users, per 100 inhabitants, upper-middle income countries (2001)



Estonian Internet users and broadband subscribers, per 100 inhabitants



Note: 2002 Internet users data are estimated figures.

Source: International Bureau of Education ([www.ibe.unesco.org](http://www.ibe.unesco.org)), 2002. NDP Estonia ([www.undp.ee/tigerleap/2.html](http://www.undp.ee/tigerleap/2.html)), 2002.

that seek to highlight applications, content, and benefits of broadband through public service announcements have proved useful in some countries.

- In Singapore, for example, the “e-Celebrations” campaign, developed by the Government through mass media advertising to raise awareness of broadband and information and communication technologies (ICT) in general, has met with success. This campaign forms an integral part of the Singapore ONE initiative, a collaborative effort between the Government and industry to implement a nationwide broadband network and deliver interactive online applications and services to all Singaporeans.

- The “Try Before You Buy” programme in Wales (United Kingdom) is another innovative approach to increasing broadband awareness, where Government-funded ICT business support centres showcase and demonstrate broadband connections and applications to businesses so they can try the technology before they subscribe.

- In the Republic of Korea, the focus of government policy has shifted over time, from building up domestic manufacturing capability in the 1980s, to building broadband backbones in the 1990s, to developing e-government applications and training users in the current decade. Although it is the private sector which has created that country’s broadband success, the government has played an instrumental role in imparting the shared vision of the creative, knowledge-based society.

- In Malaysia, a National Broadband Steering Committee has been formed to develop a national plan. The target is to reach 12.5 million

broadband subscribers (compared with just 25 000 in early 2003) by 2007. The action areas identified in the programme are demand development, public sector broadband deployment, supply-side intervention, regulatory change, institutional change and funding.

- In Canada, both federal and provincial governments, as well as local communities, have been active in policies to promote broadband. The federal policy on “Connecting Canadians”, launched in 1998, aims to make Canada the world’s most connected country. A national broadband taskforce reported in November 2001 and proposed a number of schemes designed specially to reach unserved communities and particular user groups that would not expect to be served under a normal free market operation. Canada also has a number of local-level projects and, more recently, a National Pilot Programme entitled “Broadband for Rural and Northern Development” was launched.

### Effective regulation

Effective regulation plays a key role in achieving competition in broadband markets, by promoting facilities-based competition, for example. Some common approaches include the lowering of licensing barriers to facilities-based market entry and ensuring reasonable cost access to rights of way. Although a competitive multi-player market is desirable, effective competition can also be achieved where there is strong inter-modal competition between cable modem and DSL operators. In some cases, however, this may require the mandatory divestiture of cable television networks by incumbent telecommunication carriers.

Countries can also promote competition in broadband markets by encouraging the deployment of alternative networks, for example using wireless technologies. Hong Kong Broadband Networks has had considerable success in using fixed-wired access combined with metro Ethernet.

Beyond concentrating on last-mile access, regulators will also have to ensure that other bottlenecks in the supply of broadband services do not emerge. In particular, high leased-line prices may significantly increase the cost of providing broadband access.

### Developing country experiences

Developing economies are beginning to provide and promote broadband. Experiences vary based on several factors, including geography and population. Many developing economies fall into a vicious cycle of high prices and low take-up. Users cannot afford the initial prices and thus providers cannot negotiate better rates for higher bandwidth.

Two viable methods for promoting broadband include connecting schools and using community telecentres to give users access to broadband without the vast fixed costs of wiring to homes.

The COMPARTEL programme in Colombia provides a good example of extending access through community telecentres.

Other countries, such as Jordan, have addressed broadband through government initiatives including e-government, e-health and e-learning. Projects include initiatives that focus on training teachers to interact and deliver material via computers and broadband connections. ■