Broadband:

A PLATFORM FOR PROGRESS

A contribution to the
Broadband Commission

EXECUTIVE SUMMARY

FOREWORD

The Broadband Commission for Digital Development, launched in May 2010 by the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), comprises government leaders from around the world, and the highest-level representatives of relevant industries, international agencies, and organizations concerned with development.

Ahead of the UN Millennium Development Goals Summit, held in New York in September 2010, the Broadband Commission presented to United Nations Secretary-General Ban Ki-moon "A 2010 Declaration of Broadband Inclusion for All", as well as Recommendations and a Plan of Action in a report entitled "A 2010 Leadership Imperative: Towards a Future Built on Broadband".

A living resource for broadband development

This summary of a contribution from ITU relates to the second outcome to be issued by the Broadband Commission in support of its recommendations. Entitled "Broadband: a Platform for Progress", it will offer more detailed examples, evidence, technical choices and strategies for extending broadband networks within the reach of all. The full report will be issued in due course, with possible amendments and additions, following its review by the Broadband Commission.

"Broadband: a Platform for Progress" is also designed to be the introduction to an evolving collection of resources in the form of an online database to carry forward the work of the Broadband Commission. This repository will carry the outcome reports of the Broadband Commission, as well as numerous research reports, case studies from both developed and developing countries, and other materials to encourage and inform governments and industry — and individual communities themselves — about why broadband is crucially important in today's world and about ways to get connected.

The Broadband Commission's repository of information can be visited at:

www.broadbandcommission.org/sharehouse

All are welcome to access its content, and to submit contributions.

BROADBAND: A PLATFORM FOR PROGRESS

The world today is faced with growing challenges — rising population, poverty, epidemics, climate change. But we also have tools of unprecedented power in helping us to meet those challenges: information and communication technologies (ICT). Prime among them is broadband access to the Internet, which is creating a revolution in how services are delivered, industrial processes are managed, research is carried out — and much more.

In order to make progress in achieving the Millennium Development Goals (see Box 1) by the target date of 2015, it is essential that countries and communities everywhere are enabled to take advantage of this revolution. If they are not, they will lose the opportunity to reap the economic and social benefits that broadband brings.

Box 1: The Millennium Development Goals

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

A COORDINATED TRANS-SECTORAL APPROACH

To achieve the expansion of broadband requires top-level political leadership and joint efforts by the private sector and by governments. Most important of all, these efforts must be coordinated across all sectors of industry, administration and the economy. Developing isolated projects or piecemeal, duplicated networks, is not only inefficient; it also delays provision of infrastructure that is becoming as crucial in the modern world as roads or electricity supplies.

When a trans-sectoral approach is taken — that shares infrastructure and builds synergies among the applications that use it — investments can yield major multiplier effects that benefit healthcare, education, energy efficiency, environmental protection, public safety, civic participation and economic growth. Such a trans-sectoral approach should lead to the development of smart interconnected and sustainable communities, homes and businesses.

A trans-sectoral way of thinking can also be applied across infrastructure projects. Communication systems installed at the same time as electricity networks, for example, can better leverage “smart grid” technologies. It is essential that the various industrial sectors become key anchor tenants of the new infrastructure, so that its financial and social benefits can be fully realized. As well as facilitating these moves through such measures as improving regulations, governments should show leadership by making sure that their various administrative departments work together to use the infrastructure and to create relevant and useful e-applications.

To achieve the best results, broadband needs to be coordinated on a countrywide basis, as a national broadband network (NBN) — which, in order to optimize the benefits to society, can also be an open network to which service providers have access on fair terms, regardless of who owns the infrastructure. Eventually, this can lead to broadband being considered as highly advanced and essential infrastructure, similar to electricity and water distribution networks.

LOOKING AT THE DETAILS

These principles are among those laid out fully in the report from the Broadband Commission for Digital Development, "A 2010 Leadership Imperative: Towards a Future Built on Broadband"[1], which includes recommendations for action. This contribution to the second outcome of the Commission presents a closer look at the facts and figures that could put the recommendations into effect. The chapters referred to are those in the full report to be reviewed by the Broadband Commission.

"Broadband — a platform for progress" considers **what** broadband is — how it can be defined, and **why** broadband is so valuable is demonstrated in evidence of its powerful economic effects, as well as an overview of the services it can carry. Also examined is **how** various types of infrastructure can produce these networks, with examples of broadband deployments being achieved in various countries, including developing ones. In addition, policy issues are covered, such as regulation, spectrum management, and questions of universal service.

Also included is an overview of the current status of broadband deployments on a global and regional basis. Figures 1 and 2, for instance, show how broadband subscriptions have grown worldwide over the last ten or twelve years.

Figure 1

Fixed broadband subscriptions per 100 inhabitants

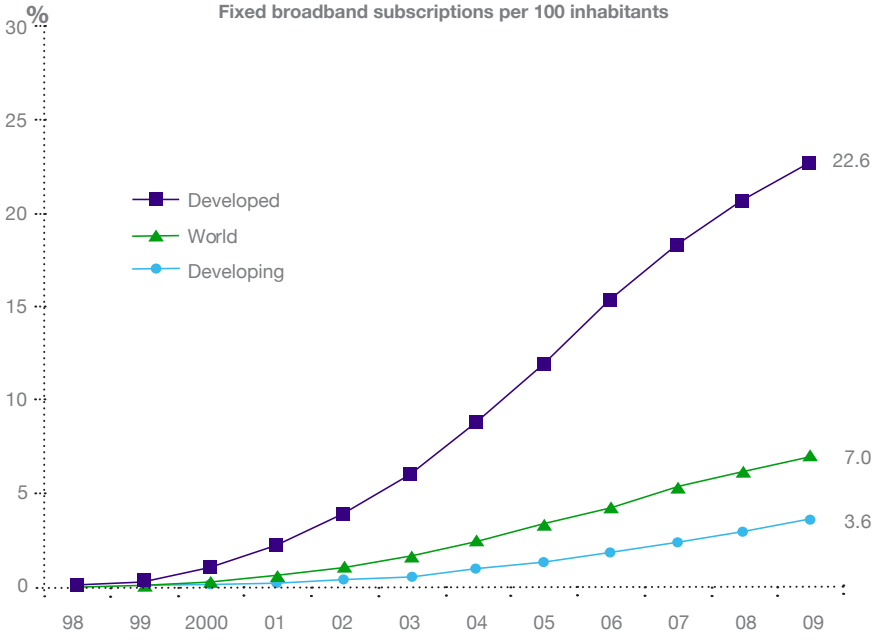
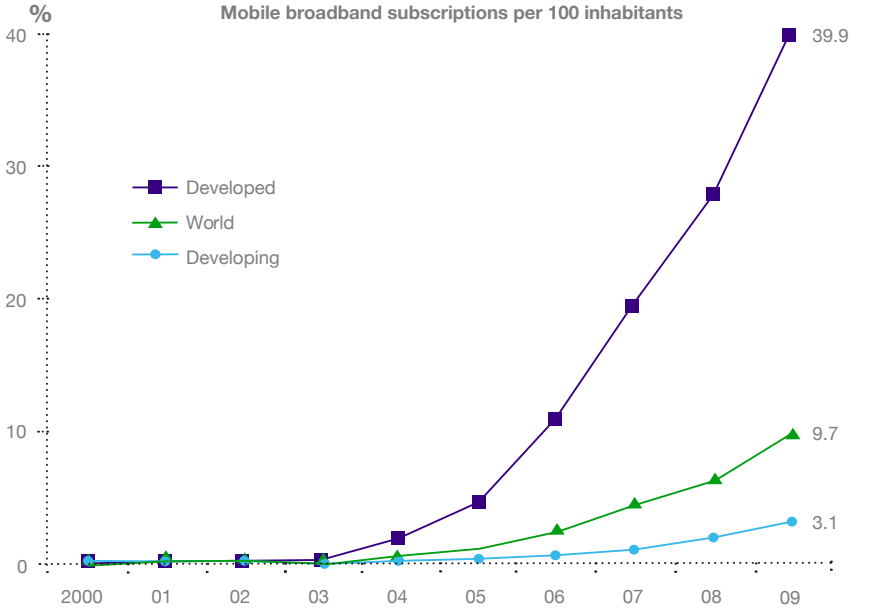


Figure 2

Mobile broadband subscriptions per 100 inhabitants



Source: ITU World Telecommunication/ICT Indicators database.

WHAT IS BROADBAND?

Chapter 2 of this contribution examines the possible ways to define “broadband”; for example, as minimum upstream and/or downstream transmission speeds, or according to the technology used or the type of service that it can deliver. However, countries differ in their definitions of broadband, and, as technologies advance, the minimum defined speeds are also likely to increase rapidly. In its Report, “A 2010 Leadership Imperative: Towards a Future Built on Broadband,” the Broadband Commission therefore decided to focus on considering broadband as based on a set of core concepts, such as an always-on service (not needing the user to make a new connection to a server each time), and high-capacity: able to carry lots of data per second, rather than at a particular speed.

The practical result is that broadband enables the combined provision of voice, data and video at the same time.

Just one of many applications that can be enabled by broadband is e-health. Figure 3 shows the types of service that can be provided at various capacities of broadband, from basic e-mail and web browsing to find and exchange medical information, to real-time high-definition video transmissions of medical procedures for diagnostic and training purposes. These valuable health services are highly relevant to achieving several of the Millennium Development Goals.

Figure 3: How various broadband speeds can support e-health

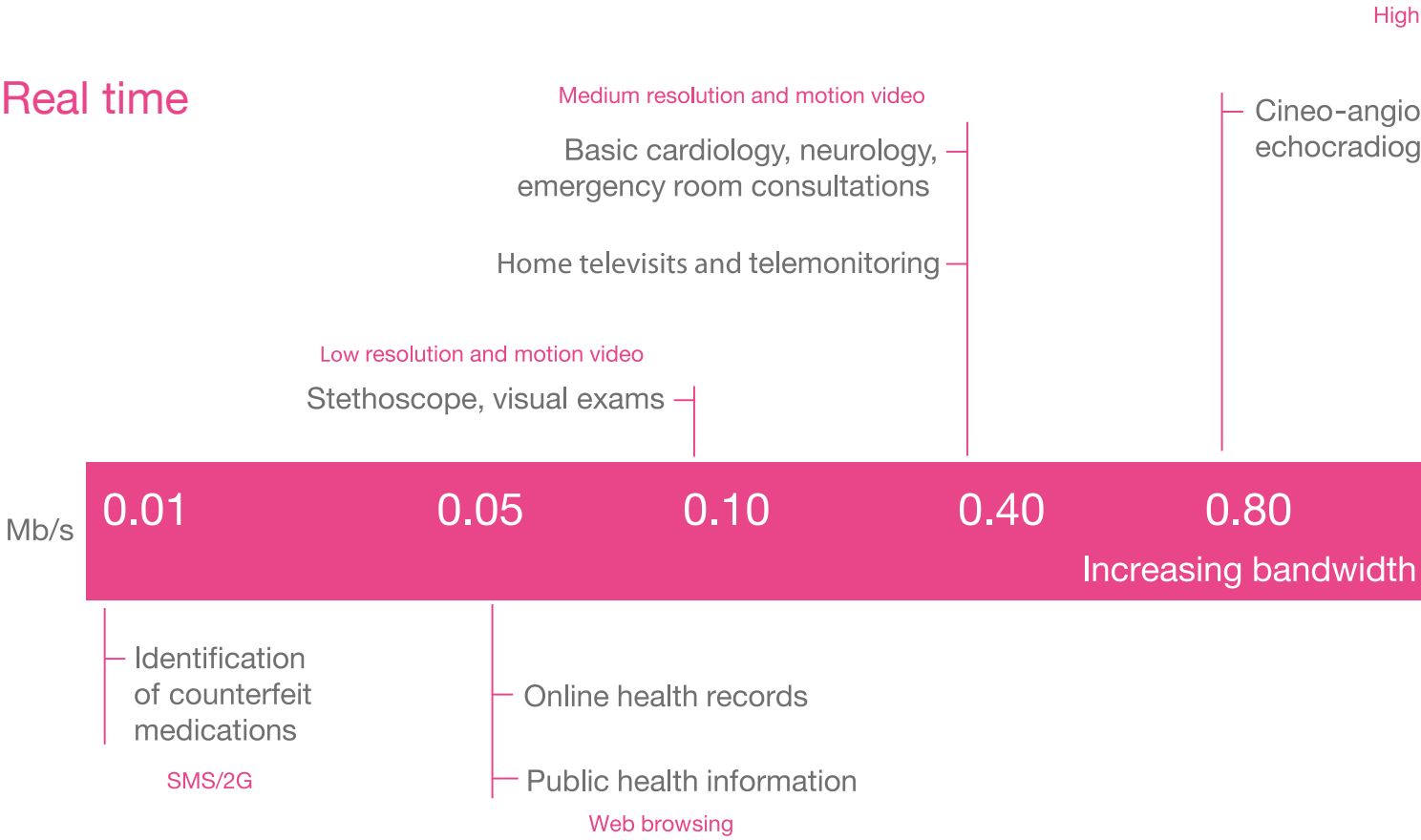
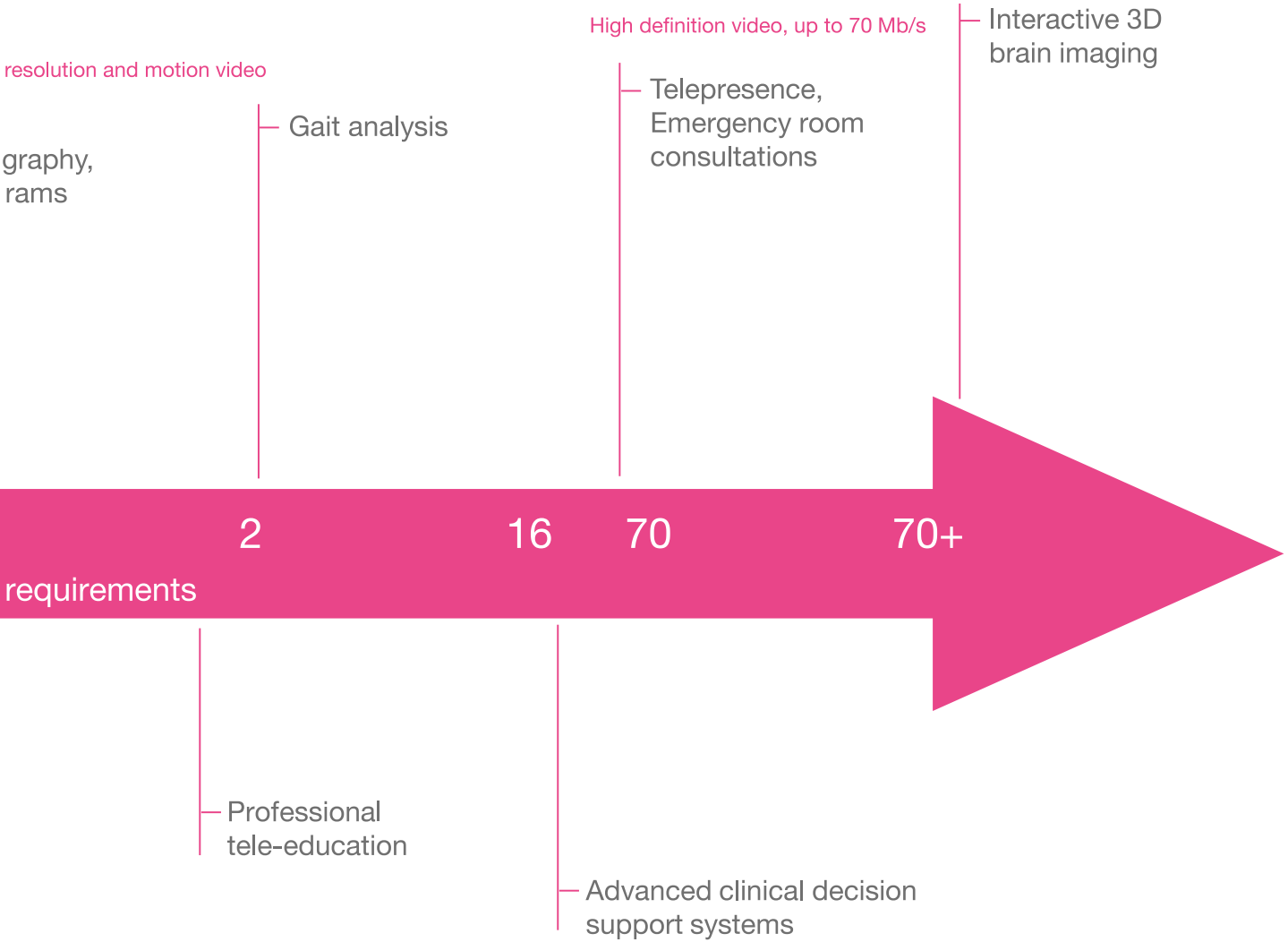


Figure 3 illustrates different e-health applications and their bandwidth requirements. These include non-real-time low-bandwidth messages, such as the transmission of health records via e-mail, but also high-definition emergency room video-conferencing, which may require several tens of megabits per second. Whether broadband or not, most of the applications mentioned are built on technical standards, starting with the underlying networks.

Source: Adapted from: J.Dal Molin (e-cologycorporation): Medical Use of Broadband. Presentation at OECD Broadband Workshop 2002. http://www.oecd.org/dataoecd/16/8/1936586.pdf



For example, the technical standard ITU-T H.323 (from ITU's Telecommunication Standardization Sector), a call signaling and multimedia transport protocol, is widely implemented by voice and video-conferencing equipment manufacturers. It enables real-time communication to take place between different video-conferencing units, such as at a medical practice in a rural area and a hospital in the city. Multimedia encoder/decoders, such as ITU-T H.264 for videos and ITU-T T.800 for images; security standards (including the public key infrastructure defined in ITU-T X.509), and the ITU-T G.1000 family of Recommendations ensuring multimedia quality of service and performance, are crucial for many e-health applications.

WHY IS BROADBAND IMPORTANT

Can broadband create jobs? How soon would investment in these networks pay for itself? What would be the impact on a country's gross domestic product (GDP)? Chapter 3 provides links to more than a hundred research reports and case studies on the economic effects of providing broadband access to the Internet, alongside use of information and communication technologies (ICT) in general. Examples of this research are given in Tables 1 and 2.

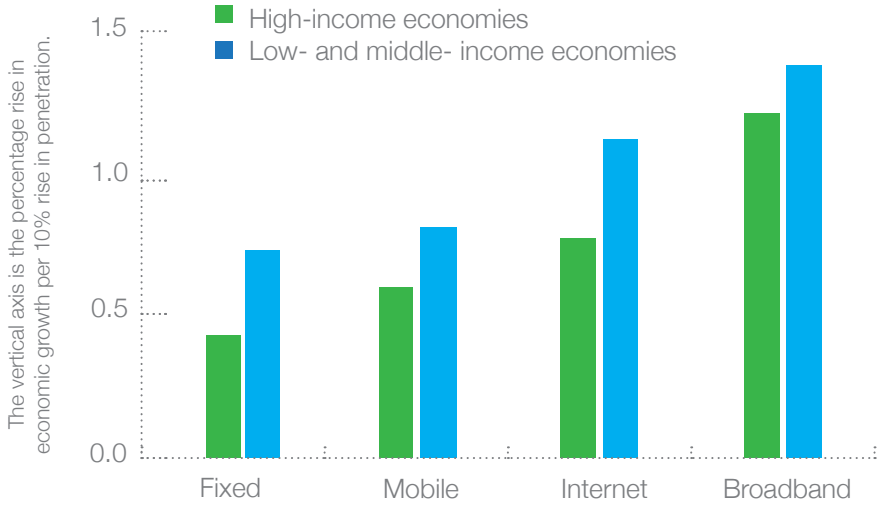
Nearly all studies suggest positive returns can be expected from investment in broadband infrastructure. For example, an analysis for the European Commission estimates that broadband can create more than two million jobs in Europe by 2015, and an increase in GDP of at least EUR 636 billion. A study in Brazil reported that broadband added up to 1.4% to the employment growth rate. In China, every 10% increase in broadband penetration is seen as contributing an additional 2.5% to GDP growth. In Thailand, where in 2010 only some 3% of households have broadband and 12% of individuals, it has nevertheless been forecast that broadband could add nearly one per cent to the country's GDP growth rate.

Moreover, the preliminary results of a quantitative analysis being conducted by the Organisation for Economic Co-operation and Development (OECD) suggest that the expansion of broadband significantly affects labour productivity. According to this analysis, broadband prices seem to be an important driver of this in lower-income OECD countries, where cheaper broadband tends to be correlated with higher growth rates in labour productivity. For OECD countries, raising broadband penetration rates by 1 percentage point in 2009 (e.g. 24.3% instead of 23.3%) results in a labour productivity growth rate that is higher by 0.02 percentage point. Broadband penetration rates higher by 5 percentage points translate into a rise in the labour productivity growth rate of 0.07 percentage point.

A 2009 study by management consultants, Booz & Company[2] found that "10% higher broadband penetration in a specific year is correlated with 1.5% greater labour productivity growth over the following five years." The report by Booz & Company also suggests that "countries in the top tier of broadband penetration have exhibited 2% higher GDP growth than countries in the bottom tier." Another management consultancy, McKinsey & Company[3], estimates that "a 10% increase in broadband household penetration delivers a boost to a country's GDP that ranges from 0.1 percent to 1.4 percent."

For developing countries in the low- and middle-income bracket, broadband is a key driver of economic growth and, according to a study by the World Bank, provides a boost of 1.38 additional percentage points to GDP growth for every 10% increase in broadband penetration — higher than any other telecommunication service (see Figure 4). And following the recent global financial crisis, many countries included the expansion of broadband networks as crucial elements in their economic stimulus plans[4].

Figure 4: How investing in broadband can boost economies



Source: World Bank (2009).

Table 1 Broadband's impact on economic growth: examples of research

Country Focus	Report Title	Institution	Key Findings
United Kingdom	The Economic Impact of a Competitive Market for Broadband (2003)	Centre for Economics and Business Research Ltd The Broadband Industry Group, CEBR	By 2015, the productivity benefits of broadband could result in the GDP of the United Kingdom rising by up to GBP 21.9 billion
Germany	The Impact of Broadband on Jobs and the German Economy (2010)	Columbia Business School, Telecom Advisory Services LLC, Polynomics AG	An investment of EUR 36 billion will return EUR 22.3 billion to the economy during network construction, as well as externalities of EUR 137.5 billion
Republic of Korea	Broadband as a platform for economic, social and cultural development: Lessons from Asia (2008)	The World Bank/InfoDev USA	The contribution of telecommunication services and broadband to GDP more than doubled between 1995 and 2005: the decade of broadband's expansion in Republic of Korea
Thailand	Broadband Thailand 2015 (2010)	Center for Ethics of Science and Technology, Digital Divide Institute, Thailand	In 2010 the Thai broadband penetration rate is only 3.4% of households and about 12% of individuals, but it is forecast that broadband will contribute 0.9% to Thailand's GDP growth rate
Japan	Investment in Broadband Infrastructure: Impacts on Economic Development and Network Neutrality (2009)	Kyushu University, Japan	If the Japanese economy grows and the potential of ubiquitous networks is fully utilized, the real GDP growth rate will be about 1.0 to 1.1 points higher than otherwise

Country Focus	Report Title	Institution	Key Findings
China	Broadband in China: Accelerate Development to Serve the Public (2009)	Value Partners	The development of China's dial-up and broadband Internet together may contribute a combined 2.5% to GDP growth for each 10% rise in penetration.
Global	What Role Should Governments Play in Broadband Development? (2009)	The World Bank/InfoDev	Broadband is a key driver of economic growth, providing a boost of 1.38% in GDP growth in developing countries, for every 10% increase in penetration.
Latin America, Caribbean	The Impact of Taxation on the Development of the Mobile Broadband Sector (2009)	Telecom Advisory Services LLC	In 24 Latin American and Caribbean countries (controlling for educational level and development starting point), a 1% rise in broadband penetration yields a 0.017 point rise in GDP growth. Broadband growth between 2007 and 2008 (prorated average of 37%) contributed between USD 6.7 billion and USD 14.3 billion, including direct and indirect effects, and preservation of an economic growth rate.
15 OECD nations, 14 European	Economic Impact of Broadband: An Empirical Study (2009)	LeCG Ltd., for Nokia Siemens Networks	One more broadband line per 100 people in these "medium or high ICT" countries raises productivity by 0.1%.
OECD nations	Broadband penetration and labor productivity growth — Some preliminary findings (2010)	OECD	In OECD countries, raising broadband penetration rates by 1 percentage point in 2009 (e.g. 24.3% instead of 23.3%) would result in a labour productivity growth rate higher by 0.02 percentage point. Raising broadband penetration rates by 5 percentage points means a labour productivity growth rate higher by 0.07 percentage point.

Table 2 Broadband's impact on jobs: examples of research

Country Focus	Report Title	Institution
United Kingdom	The United Kingdom's Digital Road to Recovery (2009)	LSE enterprise ltd, and The Information Technology and Innovation Foundation
Germany	The Impact of Broadband on Jobs and the German Economy (2010)	Columbia Business School, Telecom Advisory Services LLC, and Polynomics AG
United States	Broadband Impacts on State GDP: Direct and Indirect Impacts (2007)	McClure School of Information and Telecommunication Systems, Ohio University, USA
Brazil	Economic Development and Inclusion through Local Broadband Access Networks (2009)	The Multilateral Investment Fund, Inter-American Development Bank
United States	Broadband, economic growth and sustainable development (2009)	CISCO
United States	Economic Impacts of Broadband, Information and Communications for Development: Extending Reach and Increasing Impact (2009)	The World Bank

Key Findings

An additional GBP 5 billion investment in broadband networks would create or retain an estimated 280,500 UK jobs for a year.

Broadband network construction will create 304,000 jobs between 2010 and 2014, and 237,000 between 2015 and 2020. Based on regression-based forecasting, it is estimated that an additional 427,000 jobs will be created: 103,000 in 2010–2014 and 324,000 in 2015–2020. The accumulated total jobs over a ten year period (2010–2020) will reach 968,000.

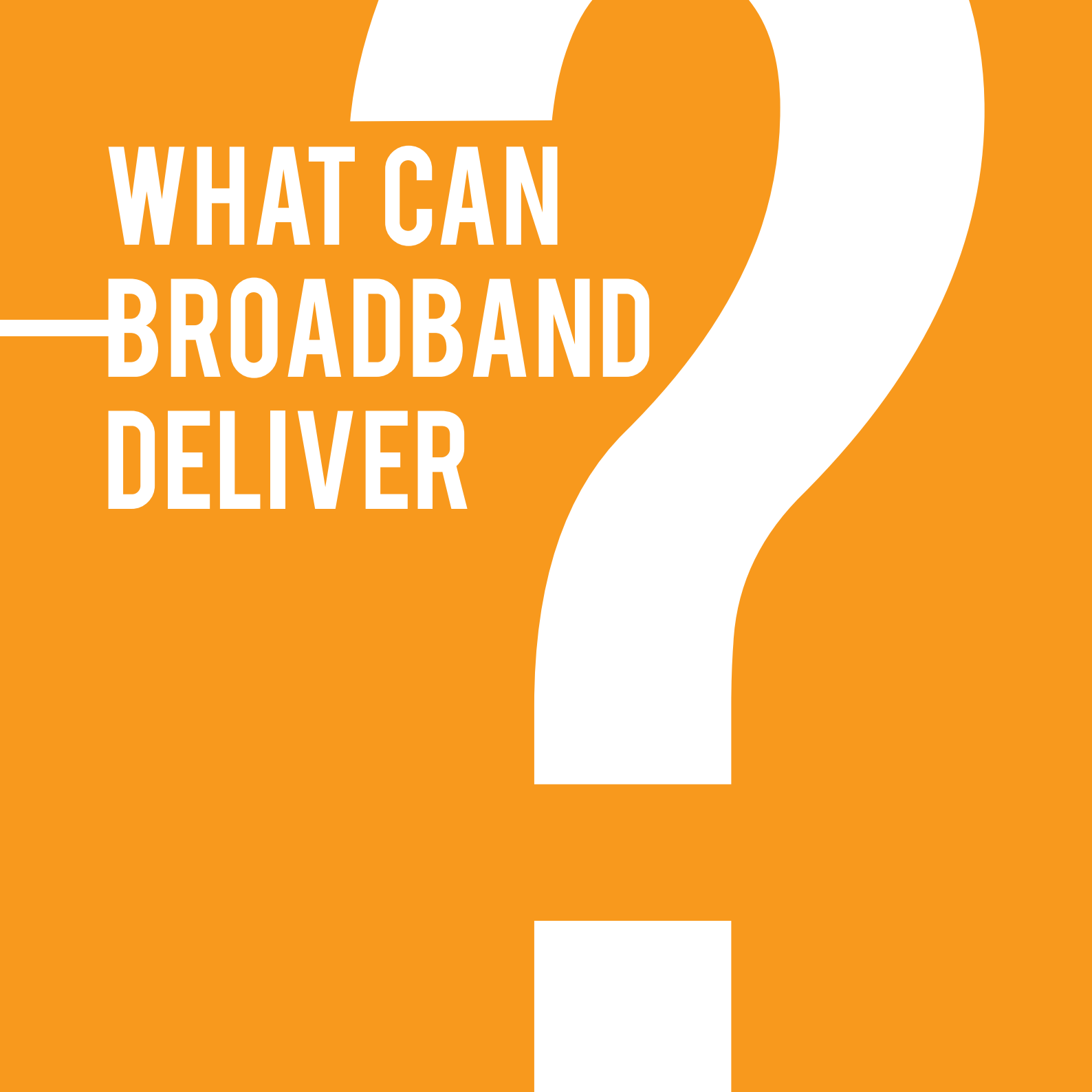
Broadband leads to a 0.2% to 0.3% increase in employment in a US state for a 10% increase in broadband lines.

Broadband has added about 1-1.4% to the employment growth rate.

In the United States, a 1% increase in broadband penetration leads to a 0.2 – 0.3% growth in employment.

Broadband added 10-14% to the growth rate in the number of jobs between 1998-2002.

WHAT CAN BROADBAND DELIVER



It is essential that, as broadband networks are rolled out and capacities improve, the applications using broadband are created at the same time, because improvements in demand can often drive supply. Chapter 4 gives an overview of some of the vast and quickly expanding range of services that can be delivered by broadband networks, and illustrates their impact on society.

E-commerce, for example, is an area that is increasingly familiar. According to one report[5], in 2012 more than a billion people worldwide will spend the equivalent of over a trillion US dollars on business-to-consumer transactions, while the value of business-to-business trade will be ten times greater. Broadband accelerates the whole process, making it faster and more convenient and attractive for sellers and buyers.

Financial transactions and banking are also fast-growing applications carried over broadband. For mobile devices, m-banking is particularly significant in developing countries, where many people would not otherwise have access to such services. It has been forecast that by 2012, around 190 million consumers will be making mobile payments worldwide, with emerging markets growing quickest at 76% per year[6].

Governments too are increasingly using broadband to provide online portals where citizens can both receive information and interact with the administration — by applying for licences, for instance. Government departments themselves become much more efficient when their systems are coordinated through broadband networks.

Healthcare is potentially one of the most important areas where broadband can make an impact. It has been estimated that at least USD 5 trillion is spent worldwide on providing healthcare[7], but cost savings of between 10% and 20% could be achieved through the use of telemedicine delivered by broadband. And if such systems are not put in place, many people could be left without adequate care: a World Health Organization report[8] revealed an estimated shortage of almost 4.3 million medical staff worldwide, with the situation being most severe in the poorest countries. Medical advice, monitoring, diagnosis and training delivered through broadband can help a great deal to overcome these gaps.

Training of professionals in all sectors can be delivered through broadband video and other applications. And this has the potential to take education in general to every school or home, however remote. One example is the partnership announced in late 2009 between Ericsson and the Indira Gandhi National Open University (IGNOU), based in New Delhi, India, which will allow up to 2.5 million students from India and 34 other countries to download IGNOU course contents to their mobile phones via a third-generation (3G) network that Ericsson plans to build. Another example can be found at the primary school level in Uruguay, where every child has been provided with a laptop and Internet access at school. The total expense of the “Ceibal” project, completed in October 2009, came to less than 5% of the country’s education budget — but the “connected” children are likely to reap tremendous educational rewards.

Box 2: India joins Africa to offer broadband e-education and e-health

Launched in February 2009, the Pan African e-Network Project is an initiative of the President of the Republic of India, which aims to connect 53 African countries through satellite, fibre-optics and wireless links, with each participating country connected to a Continental Hub Earth Station. The Pan African Online Services Network will provide tele-education and telemedicine to the 53 States. The services will be provided by seven universities (two in India and five in Africa) and eight hospitals (three in India and five in Africa).

Scientific research on a major scale is greatly assisted by broadband networks. Not only can researchers now exchange vast amounts of data of all kinds extremely rapidly, but new ways have emerged for tackling highly complex topics. Distributed or "grid" computing permits thousands of small computers to be joined together to analyse huge amounts of data and transmit the results to a central point. More broadly, the arrival of "cloud computing" makes sharing information easier and frees individual users and businesses from having to store data and programs on their own computers. Such systems are based on broadband networks, and offer substantial savings in the costs of hardware, software, premises and personnel. One forecast by market analysts[9] suggests that at least 52 countries could benefit from cloud computing services through the addition of around USD 800 billion in net new business revenues between 2009 and 2013.

The power of broadband also underpins the collection, sharing and analysis of vital data on the environment, gathered via satellite, for example, or direct sensor technology. This information can be used to predict natural disasters such as floods or famines. Wireless broadband in particular also provides a platform for reliable communications in the event of natural disasters, when terrestrial communication networks are often damaged or destroyed. In addition, broadband can deliver such services as telemedicine to disaster sites.

Climate change — an origin of extreme weather events — can be tackled through the energy efficiencies that broadband brings across industrial sectors. Better stock control and distribution through using networks to track radio-frequency identification (RFID) tags on goods, means fewer trucks on the road.

Video-conferencing means less travel. Electronic media, such as e-books, mean that fewer physical products need to be manufactured.

Box 3: Broadband supports intelligent energy use

Broadband technologies are leading to intelligent home networks that can assist in controlling indoor climates and monitoring energy. Taking these concepts further leads to the development of smart buildings, smart cities and smart communities.

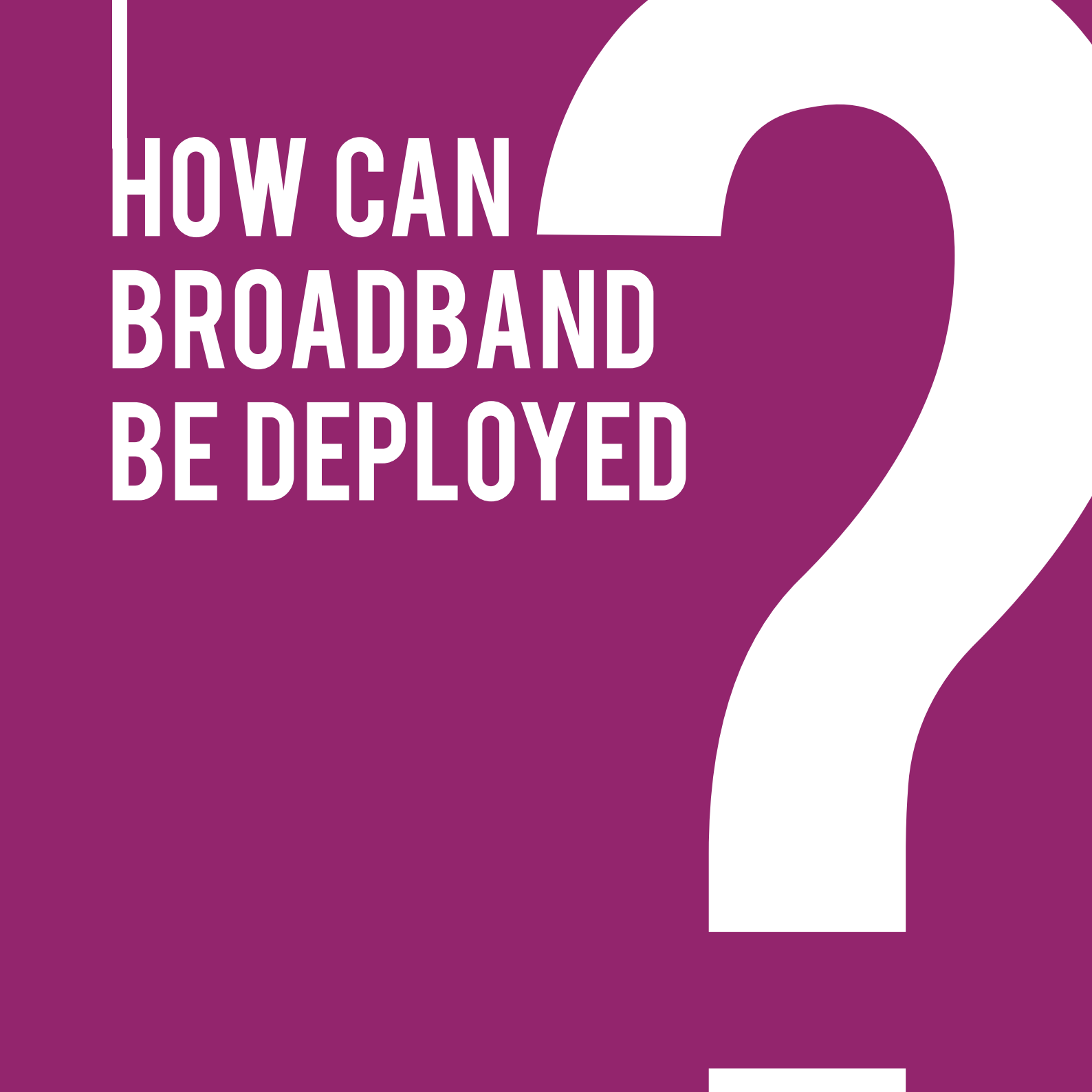
An example is the Urban Energy Management project for apartment complexes launched in 2009 in Madrid, Spain. In each apartment, a home energy controller uses monitoring devices and the building's broadband infrastructure to enable residents to manage their consumption of electricity, gas and water. The system also allows building managers and relevant authorities to monitor and manage energy use across different buildings and urban areas and provide a wider community view of energy consumption. It can provide, for example, real-time graphs displaying energy use, as well as comparison data.

The pilot scheme is the beginning of a project that aims to incorporate such innovations as heating and cooling using geothermal and solar panel technologies. With the management and control systems, it is estimated that these innovations can deliver energy savings of between 75% and 85%.

And when it comes to power supplies themselves, "smart grids", allow electricity companies to limit losses, prevent outages, and provide customers with real-time information they can use to manage their own energy use at home or at a business. In addition, smart grids make it easier for locally generated electricity (including from renewable sources) to be integrated, stored and shared as demand fluctuates across the grid. Some studies in the United States have suggested that savings of between 10% and 25% in electricity demand are achievable through using smart grids — which in themselves can also be used to deliver broadband connectivity along with power supplies.

In summary, Chapter 4 concludes that broadband has important benefits to offer in enabling the provision of a wide array of services in areas as diverse as public health and climate monitoring. Broadband is not an end in itself: it is an important means of meeting a wide variety of goals in highly diverse sectors.

HOW CAN BROADBAND BE DEPLOYED



Infrastructure considerations

Chapter 5 of this contribution seeks to identify key factors in a nation's physical communications infrastructure, and to identify the path for expanding and improving that infrastructure so that broadband connectivity can be delivered to all. Some of the main conclusions emerging from the review of measures to deploy a national broadband infrastructure include:

- Infrastructure policy should take account of rapid technical advances and be focused on larger goals, not directed towards a specific technology mix. Legacy infrastructure (or lack thereof) constitutes both a constraint and an opportunity.
- Infrastructure goals are separate from questions of public ownership of facilities and the role of competition in spurring private investment.
- Pricing or other barriers that restrict access to networks or infrastructure must be removed as far as possible. Interconnection among networks must be robust, cheap and efficient.
- Preserving flexibility and innovation at the network's edges is essential. It must be possible to attach new applications and access devices, such as smartphones — which is much easier and cheaper than replacing core infrastructure.
- The physical network is distinct from the services and functions that travel across it, and, in the interest of competition and technical progress, too close an association between infrastructure and a particular service should be avoided.
- Fibre-optic networks are likely to be preferred as backbone wired infrastructure, but these must be complemented by rapidly-evolving wireless infrastructure that will provide more bandwidth more economically as technology develops.
- The sharing of infrastructure should be facilitated and encouraged, and policy-makers should consider how best to ensure synergies among applications and services. This means adopting an integrated, trans-sectoral approach.

Chapter 5 examines specific areas such as the design of next-generation networks, and wireless broadband infrastructure that is of particular significance to developing countries and remote areas.

Box 4: From IPv4 to IPv6

A crucial aspect of broadband connectivity is the ability to connect to end-user devices and the dramatically growing world of machine-to-machine communications, All this needs an enormous supply of Internet addresses — but these are beginning to run out.

Currently, the vast majority of links use version 4 of the Internet protocol, or IPv4, which was defined in 1981 for a much smaller network. The best long-term answer is expected to be deployment of a new version of the Internet protocol, IPv6. Using 128-bit addresses, IPv6 generates a total number that is so huge it would yield trillions of addresses for every person on Earth, and for the Internet of things. The challenge is to manage the transition so that the Internet does not fragment, while maintaining services and expansion.

There have been many discussions of the technical, administrative and coordination issues that the migration to IPv6 entails, but much more work remains to be done. In addition, there are immediate costs associated with deployment of IPv6, whereas many benefits are long-term and depend on a critical mass of actors adopting it. Migration to IPv6 requires planning and co-ordination over several years, and this means that increased awareness of the issues is needed among all players, including governments.

Country case studies

Chapter 5 also provides examples of how broadband infrastructure and services are being provided in various countries. Successful examples are highlighted of how government initiatives, alongside private-sector investment, have succeeded in extending access to more and more citizens, as national broadband networks are being planned and established.

In Malaysia, for example, a National Broadband Plan was announced in 2004, and in 2008 an agreement was signed between the Malaysian government and Telekom Malaysia to build a high-speed broadband network at an estimated cost of MYR 11.3 billion, with the government contributing MYR 2.4 billion and Telekom Malaysia paying the rest. The project is to take ten years with the initial phase to cover major cities and towns. This was expected to boost the country's broadband household penetration rate to 50% in 2010, as targeted by the government. In early 2010, the Malaysian regulator said the aim is to have broadband connections to 3.2 million homes across the country by the end of the year, which it sees as adding 1% to GDP and 135,000 new jobs.

Morocco is an example of very rapid adoption of broadband services, based on affordable prices for consumers, even though the incumbent Maroc Telecom has a dominant share of the market. Within four years of its introduction in 2003, more than 40% of Morocco's 1.3 million fixed phone lines were using a digital subscriber line (DSL) broadband service. In 2007, the first 3G services were made available for mobile broadband, and by March 2010, 3G had acquired a 65% share of the broadband market. To accommodate the increasing Internet traffic, international connectivity and the fibre-optic national backbone network are being upgraded. Meanwhile, the Moroccan government launched a "Maroc Numeric 2013" initiative in October 2009. It aims to have one in three Moroccan families use broadband Internet access by 2013, and 400 computer centres will be built in low-income districts and remote areas.

In 1999, Sweden was the first country in Europe to develop a broadband policy, with the government aiming to provide broadband in rural areas where there was no market incentive to do so. For the period 2009 to 2013, the government has committed some SEK 4.4 billion in grants to municipalities and operators to expand broadband infrastructure (particularly fibre-optics). Government funding is limited to 50% of the costs, with operators and local governments providing the balance. A highly successful example of a Swedish municipality's support of broadband can be seen in the capital, Stockholm. In the mid-1990s, the Stockholm government established a company called Stokab to build an open-access fibre-optic network. This network is now over 4,500 kms long and connects competing service providers with government and business customers. Stokab also provides broadband access to over 95,000 low-income households in public housing.

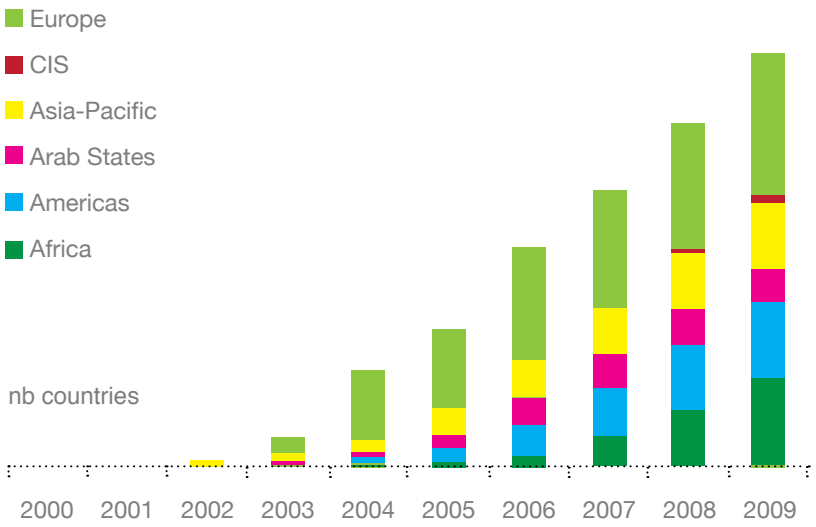
POLICY ISSUES

Broadband is clearly an enabler of economic and social development. However, as broadband adoption and usage widens, growing policy challenges are emerging, which are examined in Chapter 6. The first concern is regulation of broadband access, services and applications. A new vision is needed of reduced regulatory burdens, innovative incentives, and coordinated efforts by all links in the broadband value chain, in order to unleash opportunities for commercial deployments.

Chapter 6 provides a road-map of the policy and regulatory issues related to broadband, with a focus on developing counties. It discusses the elements of sound and forward-looking regulatory frameworks to enable broadband access for all. It addresses the core layers of modern regulation, including competition, liberalization, authorization regimes and universal access from a broadband perspective. It examines the various tools that regulators can use to reshape the national ICT sector and open up new broadband opportunities across the economy. And the chapter also highlights some of the ancillary issues related to pro-broadband regulation, such as ownership structures, infrastructure sharing, technical standards and intellectual property rights.

Figure 5

Number of countries having assigned spectrum for IMT-2000



Source: ITU World Telecommunication/ICT Indicators database.

Another important policy concern is the allocation of radio frequency spectrum — a limited natural resource that is in growing demand. Since the launch of the first mobile broadband network in 2001, no less than 130 countries had launched commercial IMT-2000 (3G) services by the end of 2009 (See Figure 5). Mobile WiMAX services were also gaining ground and services were available to customers in 76 countries. Technological progress and the transformation of telecommunication markets mean that traditional approaches to allocation are set to change, and the chapter considers how the use of spectrum can best be optimized.

Chapter 6 also discusses the issue of universal service for broadband, which is vitally important in ensuring that citizens in remote and rural areas can have access, even though they live outside more profitable urban areas. Countries are now beginning to include broadband as part of universal service obligations, regarding access to the Internet as a utility and an essential tool for social and economic welfare. Out of 132 countries worldwide having established a definition of universal access and/or universal service, more than two-thirds have included Internet access in that definition. And at least 30 countries have explicitly mandated access to broadband, including Brazil, China, Ghana, Kazakhstan, Malaysia, Morocco, Nigeria, Peru, Spain, Sri Lanka, Switzerland and Uganda. Their number is constantly growing, while some countries have gone even further. For example, Finland was the first nation to declare broadband a legal right in 2009, entitling every person to have access to a 1 Mbit/s Internet connection by mid-2010.

BROADBAND FOR THE FUTURE

Some researchers have indicated that there is a “tipping point” at which the penetration rate of broadband services within a nation becomes large enough to begin to rapidly influence all sectors in a significant and highly productive way. Mandating universal access to broadband identifies that goal, at least, while practical ways are developed to connect to the last mile and the last community and household.

Whether or not broadband access to the Internet is considered a universal service, however, it is clear that its expansion to as much of the population as possible has enormous potential to sustain and improve social and economic benefits across the board. Nevertheless, more research is required on sustainable business models for infrastructure and services, especially in relation to developing countries. This will include further examination of the economic impact of broadband across all sectors, as well as its social effects.

The Broadband Commission’s online repository of case studies, recommendations and research materials (www.broadbandcommission.org/sharehouse) will continue to be an interactive resource that is aimed at becoming the focus of such research for the future of broadband — a platform for progress.

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