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2006
REGULATING
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BROADBAND
WORLD
Summary



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TRENDS IN TELECOMMUNICATION REFORM 2006

*Regulating in
the broadband world*

Summary

February 2006

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TRENDS IN TELECOMMUNICATION REFORM 2006

Regulating in the broadband world

Summary

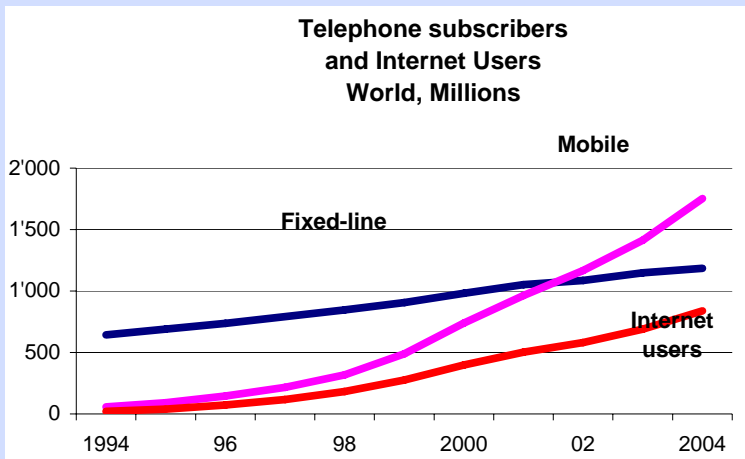
1 INTRODUCTION

ITU/BDT is pleased to present the seventh edition of *Trends in Telecommunication Reform*, an integral part of our dialogue with the world's information and communications technology (ICT) policy-makers and regulators. This 7th edition has been released at a time of remarkable transformation of the information and communication technology (ICT) sector, fueled by a combination of technological, market, policy and regulatory developments. These changes include unparalleled numbers of voice telephone subscribers, the rise of IP-enabled networks and Voice over IP (VoIP) services, initial—yet promising—deployment of fixed line broadband and broadband wireless access (BWA) services and intelligent radio devices. At the same time that developed countries are busy planning for the deployment of next generation networks and visualize a world of ubiquitous networks, most developing countries have expanded their continuing quest to provide universal access to basic voice services to include universal access to broadband internet services. Are developing countries making any progress in this quest? How can regulators harness the potential of new technologies and innovative business models to foster ICT sector development?

In 1984, the Maitland Commission's 'Missing Link' report identified the challenge of bringing basic telecommunication services within easy reach of all the world's people by the early part of the 21st century. In 2002, mobile cellular communications were heralded as the

answer to the missing link. Second generation mobile services have been rolled out to more people in the developing world than the Maitland Commission could ever have imagined possible—although the challenge of universal access to basic services remains (see Figure 1.1). The success of mobile communications is linked to policy and regulatory reforms as well as innovative business models and new technological applications, such as short message services (SMS).

Figure 1.1 – The Number of ICT Users Worldwide, 1994-2004
Fixed-line and mobile subscribers and internet users



Source: ITU World Telecommunication Indicators Database.

Twenty years later, the World Summit on the Information Society (WSIS) set even more ambitious targets, to extend the internet to all the world's villages by 2015 as the foundation for building the Information Society. The WSIS also identified the vital role the regulatory framework plays in enabling the Information Society. The global community of national communications regulators met on the eve of the second phase of WSIS to develop a new vision of a regulatory framework to promote the deployment of broadband internet

communication services worldwide, in developing and developed countries alike. At that same meeting, known as the ITU Global Symposium for Regulators (GSR), regulators recognized that full participation in the Information Society requires access to broadband internet services.

Low cost technologies exist today that can promote broadband access and enable developing countries to “leapfrog” over older technologies to advance into the broadband future rapidly. Many businesses stand ready to start providing broadband services in developing countries—mirroring the keen interest second-generation mobile service providers demonstrated in developing countries throughout this decade. Although broadband technologies and business models hold great promise, the pace of broadband take-up hinges on the regulatory framework. In many countries, today’s broadband ‘missing link’ is the regulatory framework. Regulators have an unprecedented opportunity to speed the uptake of broadband to enable the Information Society. Today’s broadband challenge requires new thinking, and an end to business as usual.

This year’s *Trends in Telecommunication Reform* contains eight chapters addressing each of the broadband-related challenges and opportunities to enable regulators to harness the potential of broadband to build a safe and secure Information Society for all:

- Chapter One provides an ICT market and regulatory overview to set the stage for the following chapters;
- Chapter Two defines what policy-makers and technologists mean by the term “broadband;”
- Chapter Three explores broadband technology at a more technical level and looks ahead, providing a roadmap for regulators to plot the rapid technological changes that are resulting in new opportunities and services;
- Chapter Four examines the role of regulators in promoting broadband;
- Chapter Five, recognizing the key role that wireless technologies are likely to play in the promotion of broadband in developing countries, examines spectrum management practices to promote broadband;

- Chapter Six looks at current regulatory treatment of Voice over IP (VoIP) and the regulatory road that lies ahead for VoIP;
- Chapter Seven addresses enforceable codes of conduct for ISPs as a new legal tool regulators could deploy in their fight against spam, and
- Chapter Eight offers a conclusion and a look ahead.

2 WHAT IS BROADBAND?

In the most basic definition, *broadband* refers to an array of digital, packet-switched network technologies that allow the transport of digital bits at high speeds. These technologies are both wireless and wire-line, and they include both upgrades to existing networks (for example, xDSL or 2.5G networks) and entirely new infrastructure (such as all-fibre networks, WLANs and 3G systems). Generally, networks with bandwidth capacities of 256 kbps or more can be termed “broadband,” although that threshold may well shift higher as new technologies push the envelope on throughput.

What may be more important than network capacity is what one can *do* with broadband networks. Instead of the old, single-purpose networks, broadband networks can carry any combination of voice, data and multimedia (graphics, video and audio), in any format. Indeed, broadband networks are already generating new permutations on old media: audio “podcasts” downloaded to portable players from websites, chat functions incorporated into online video games. The list goes on. The evolution of new applications is suddenly without boundaries, and human ingenuity is now free to pursue services and applications that will improve lives and bolster economies.

The term “broadband” does not just mean an interesting set of network technologies. It is an entirely new paradigm, potentially as different from standard voice telephony as telephony is from the telegraph services of 150 years ago. Never before has there been such power to combine images and information in ways that can actually augment the user’s experience into something more enriched than actually being there.

The single most important thing to absorb about broadband technologies is that they drive intelligence and ingenuity to the edge of networks. More than ever before in the history of telecommunications, it will be not so much the network but rather the people connected to it that count. ICT technology may never catch up to human creativity and diversity, but broadband networks will allow it to remain closely linked. The power of computing to generate and organize knowledge – or to

germinate and nurture art – will suffocate without the media to convey it from one person to another. Broadband networks empower individuals and groups to create and collate, innovate and inspire, without restrictions of time and distance.

As they empower individuals, broadband capabilities will increase the potential for generating content that will be relevant, meaningful and understandable to communities. The key to sustainable network services is demand. And the key to demand is providing useful, culturally sustaining content, in local languages, about local circumstances as well as global realities. Although it certainly will not happen overnight, there is no reason why individuals in the remotest areas cannot eventually become broadcasters in their own communities, educators in their own homes, and performing artists for worldwide audiences.

3 HOW CAN I GET BROADBAND?

For increasing numbers of consumers, especially in developed countries, the answer is that they already have it – and are likely to get more of it. In many countries, broadband is now available in several different user niches on either cable TV and/or DSL networks: at home on a desktop PC or with a Wi-Fi-equipped laptop in the airport. For these lucky users, the future will be about convergence onto multiple platforms – interactive digital televisions, broadband mobile phones and streaming video on computers, just to name a few – and inter-modal competition.

The total number of fixed-line broadband subscribers had reached nearly 160 million at the end of the 2004. Broadband internet subscribers represented approximately 2.5 percent of the world's population, and 38 per cent of all internet subscribers worldwide in 2004.

The vast majority of today's broadband users are in the developed world. Globally, Asia, Europe and the Americas represent no less than 99 percent of all broadband subscribers, the majority of which are in the wealthier countries of North America, Western Europe and Asia (Figure 1.2). By contrast, Africa is home to only a fraction of broadband subscribers, and many African countries have not yet launched high-speed Internet services. Although Africa has the fewest numbers of broadband subscribers globally, the number of subscribers increased some thirty times in the two-year period from 2002 to 2004, signally a healthy trend. A host of other developing countries from other regions are also showing signs of vigorous broadband growth.

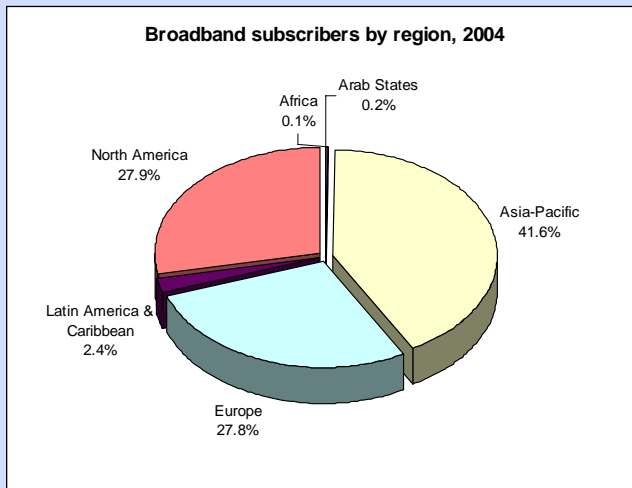
Approximately 25 per cent of all broadband subscribers are in non-OECD countries, fuelled largely by China, which has the second largest number of broadband subscribers in the world, after the United States. Figure 1.3 shows the top 25 non-OECD countries measured by number of broadband subscribers.

For developing countries, the key to the broadband future is the flexibility of the technologies coupled with the declining costs of the network topologies. Broadband technologies can increasingly be either fixed or mobile, and they can convey any mix of voice, data and multimedia content – all at a lower marginal cost than earlier-generation,

circuit-switched telecommunications networks. Moreover, advances in infrastructure – particularly with wireless networking standards in the Wi-Fi and WiMAX families – will allow more and more broadband capabilities at lower cost.

Figure 1.2 – Broadband

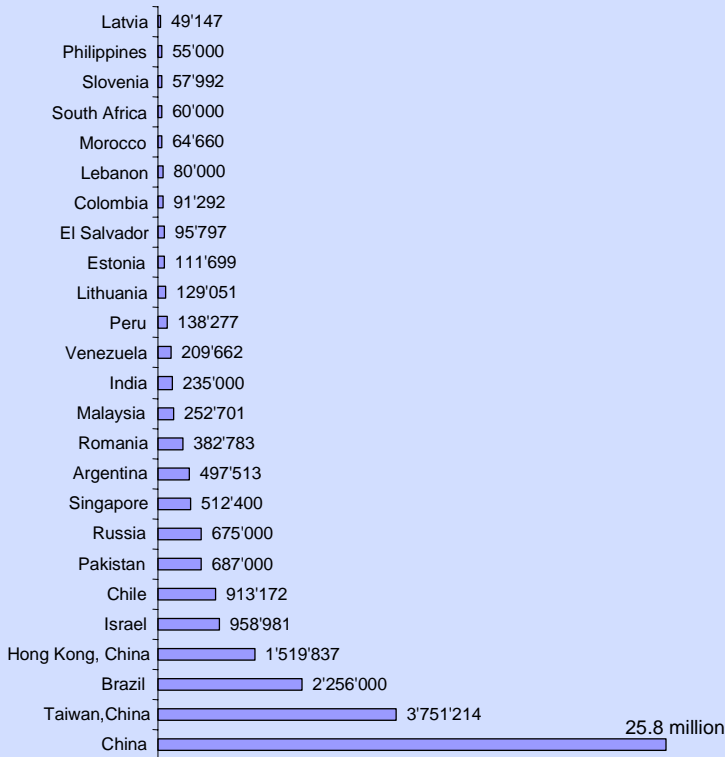
Distribution of broadband subscribers by region, 2004



Source: ITU World Telecommunication Indicators Database.

In the context of developing markets, broadband will clearly have to dovetail with the prevalent mobile flavour of the telecommunication sectors there. For one thing, the age of the ubiquitous wire-line network may never arrive in many countries. And certainly, the broadband revolution will not be obliged to wait around for it. Access networks are likely to continue to be mobile and wireless – including broadband wireless access (BWA) technologies. Mobile and fixed wireless will likely converge, bringing a broadband capability to markets that are essentially mobile, and will continue to be. For transport and backhaul, a combination of network types will have to be employed. This will undoubtedly include terrestrial wireless links, some satellite hops and lit fibre.

Figure 1.3 – Top 25 Broadband Subscribers, Non-OECD Countries (2004)



Source: ITU World Telecommunication Indicators Database.

Non-traditional suppliers will have to be part of the mix in developing countries. For backhaul, this may mean infrastructure sharing between the fibre networks of universities and the transport and energy sectors as well as leased fibre from the private sector. In the access network sector, the decentralized nature of broadband networks will enlist smaller-scale, local and regional operators – community groups,

universities, municipalities and entrepreneurs – to set up “hotspots” or wide-area networks that can be linked back to larger operators’ networks. The network can be built from the periphery inwards, by local operations providing local content and services, generating demand from the ground up.

4 THE ROLE OF REGULATORS IN BRINGING BROADBAND TO THE MASSES

Bringing broadband to the masses is one of the major challenges facing the global ICT community, and national communications regulators in particular. Addressing this challenge requires new thinking, and an end to business as usual. What does an end to business as usual mean? Service providers are now offering the triple play of voice, internet and broadcast as convergence moves from a dream to a part of every day life, starting in the developed world and spreading to the developing world.

As noted above, wireless broadband technologies offer the prospect of faster rollout of services, as well as portability and mobility. Many broadband technologies can also be deployed incrementally, as demand develops, rather than requiring expensive network-wide upgrades. This means that a full range of players, large and small, private and public, can harness the power of these technological developments to become ICT service providers and close the broadband divide that exists between developing and developed countries, and between rural and urban areas within countries.

All of these market and technological developments are exerting pressure on the current regulatory framework. How will regulation change? Broadband regulation means a new vision of reduced regulatory burdens, innovative incentives, and coordinated efforts by all links in the broadband value chain to unleash commercial deployment opportunities. Regulations can be carefully tailored to open the door to both large and small-scale broadband providers. Broadband-promoting regulators can aim to make local communities and non-governmental organizations aware of the technologies and broadband provisioning opportunities they could seize, and also coordinate with other government and public institutions, such as universities, to drive demand for broadband-enabled health, education and government services. At the same time, regulators will strive to revise outdated regulatory frameworks designed for an earlier era. The new regulatory framework could be described as a ‘less means more, old meets new’ approach. Less regulatory intervention means more business opportunities. Time-tested regulatory principles

such as transparency and open competition will be applied to new technologies and the new regulatory issues they raise. And the promotion of wireless broadband technologies will require flexible and innovative spectrum management practices.

Of course, broadband also poses new challenges. Spectrum-hungry broadband wireless access technologies, for example, require innovative spectrum management practices. The rapid rise of voice over IP (VoIP)—hastened by the spread of broadband—is turning the old telecom business model on its head. VoIP service providers have introduced a new business model, providing voice services for free or bundled as a part of a triple play package. What effect will this have on the business plans of traditional telecom operators? And what do these developments mean for the current regulatory framework designed for the old business model? VoIP is not the only broadband-related challenge facing the ICT sector. There is also the scourge of spam, which clogs email inboxes and leads to internet fraud as well as poses network security problems such as the spread of internet viruses and worms.

5 ICT INFRASTRUCTURE DEPLOYMENT

The state of current ICT infrastructure deployment is key to understanding the new technologies that can be used to promote broadband access in developing countries¹. Today, the majority of the world's broadband subscribers are found in developed countries, which have upgraded existing fixed line telephone and cable TV infrastructure to provide broadband services. Access to basic communications in the developing world has largely been achieved through mobile communications. While developing countries will no doubt also deploy some fixed line broadband services, broadband wireless access is expected to play a key role for developing countries seeking to foster the Information Society.

The growth of mobile lines continues to outpace the growth of fixed lines, and this is particularly evident in developing countries, a trend attributed to the introduction of prepaid mobile services, rapid and cheaper network deployment, a competitive environment as well as the fact that mobile services provide access to a range of new applications such as short and multimedia messaging services (SMS and MMS). By the end of 2004, the world counted some 1.8 billion mobile subscribers (including both second and third generation mobile subscribers), or 28 per cent of the world's population. Some 58 per cent of these mobile subscribers were located in developing countries.

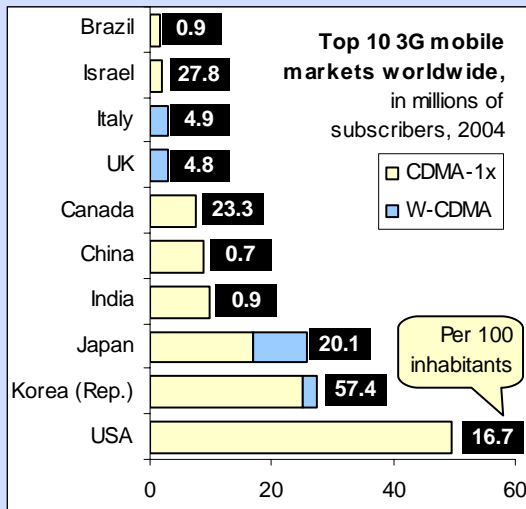
The number of fixed line subscribers worldwide, had reached 1.2 billion lines, and a penetration rate of 19 per cent. Mobile teledensity rates outpace fixed teledensity in every single region. By year end 2004, there were an estimated 840 million internet users in the world, representing 13.2 percent of the total population.

IMT-2000 technologies, known popularly as 3G mobile, are also starting to sprout broadband subscribers. By January 2005, 56 of the world's economies were offering commercial 3G services and the total

¹ A comprehensive picture of the state of current ICT infrastructure deployment may be found in the 2006 *World Telecommunication Development Report*, being released at the same time as this publication.

number of reported subscribers accessing 3G technologies was 150 million, close to 60 per cent growth from the previous year,² and just shy of the 160 million fixed-line broadband subscribers. Of these 150 million 3G subscribers, 100 million are located in just three countries, the United States (49.5 million), the Republic of Korea (27.5 million) and Japan (25.7 million). The dominant 3G technologies deployed to date are W-CDMA and CDMA-1x. Figure 1.4 shows the top ten 3G mobile markets worldwide in 2005, broken down by these two standards.

Figure 1.4 – Top 10 3G Mobile Markets Worldwide, 2005



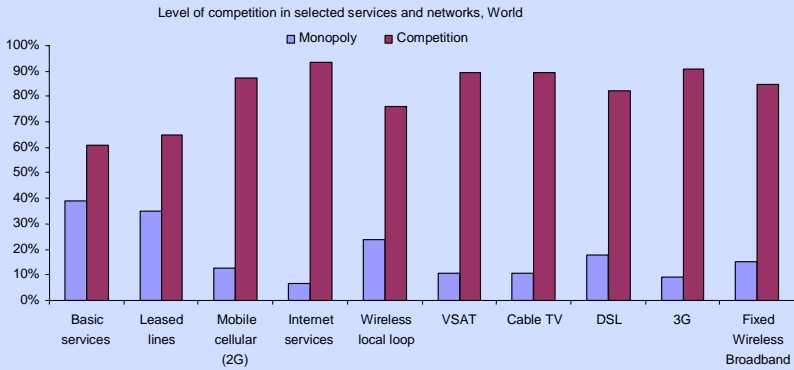
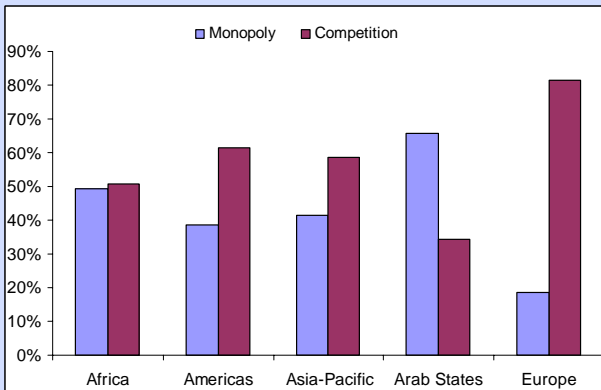
Source: ITU, The Internet of Things.

² 3G Today Newsletter. January 2005. Volume 2. Issue 1. See: http://www.3gtoday.com/wps/portal/!ut/p/kcxml/04_Sj9SPykssy0xPLMnMz0vM0Y_Qiz_KLN4r3DAbJmMUbxBub6keiijjCBXw98nNT9b31A_QLckMjyh0VFQEBN7t9/delta/ba_se64xml/L3dJdyEvUUd3QndNQSevNEIVRS82XzJfsjI!/?newsletterId=1180

6 INTRODUCTION OF COMPETITION IN ICT SECTOR

Over the past decade, the introduction of competition into the second-generation mobile sector has been one of the key factors linked to its success in increasing teledensity in developing countries (along with prepaid cards and cheaper network deployment costs). Many developing countries now seek to replicate this success with broadband services. The level of competition that is authorized by countries (based on the number of competitive players), as well as the kinds of services opened to competition, will remain key to these strategies. Competition in international services, in particular, the international gateway, and leased lines, for example, is vital to ensuring low cost internet access.

Figure 1.5 illustrates that competition is authorized in basic telephone services (defined as local, long distance and international) as well as in leased lines in more than 60 per cent of countries worldwide. Competition is authorized in around 90 per cent of countries for services such as VSAT, Cable TV, internet access, and IMT2000 (3G) offerings, and by more than 80 per cent of countries for DSL and fixed wireless broadband services. The region with the lowest levels of competition is the Arab States, where less than 40 per cent of markets have been opened to competition. Europe is the most competitive region, while Africa is nearly evenly split between monopoly and competitive conditions. Competition prevails in the Americas, Asia and, indeed, around the world as a whole – by a ratio of 3 to 2.

Figure 1.5 – Status of Competition Worldwide, 2005**Level of competition in basic services, per region**

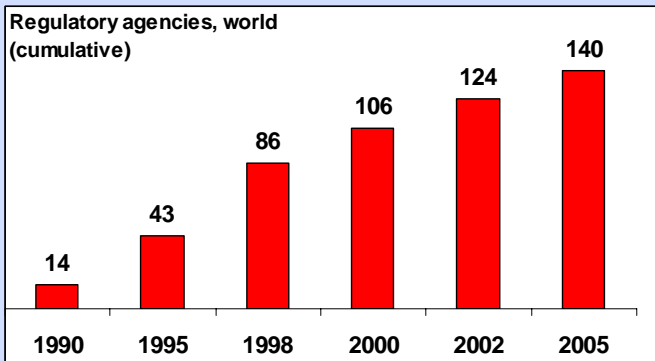
Source: ITU World Telecommunication Regulatory Database.

7 NATIONAL REGULATORY AUTHORITIES, WHO RULES?

The establishment of a separate regulator is one of the most visible signs of sector reform. Separate regulatory agencies lay the grounds for a favourable investment climate and promote market opportunities.

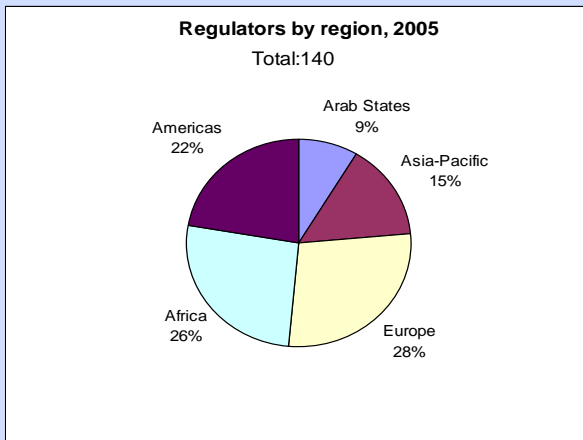
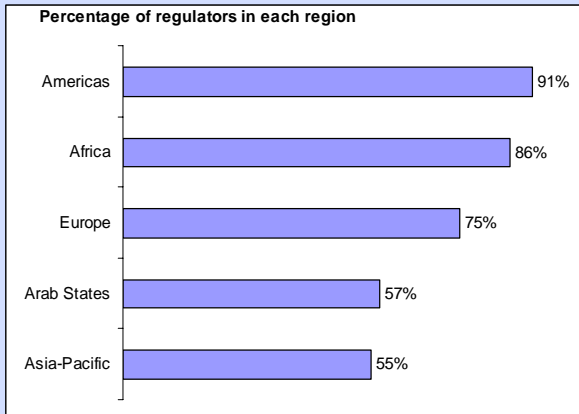
Over the last five years, the number of regulatory authorities worldwide has increased by approximately 36 per cent, with new regulators on the verge in Samoa and Liberia. Regulatory activity is most notably on the rise in the Arab States, Africa and Asia. Figure 1.6 depicts the growth of these regulators worldwide.

Figure 1.6 – Growth of Regulators Worldwide, 2005



Source: ITU World Telecommunication Regulatory Database.

Meanwhile, Figure 1.7 shows the regional variation in countries that have functional regulators in place, breaking out the percentage of countries in each region that have established regulatory authorities. It is evident that the presence of regulators in the Americas and in Africa (relative to the total number of countries in each region) is higher than in the Arab States or in Asia. In absolute numbers, the region with the highest number of regulatory authorities is Europe.

Figure 1.7 – Separate Regulators, by Region, 2005

Source: ITU World Telecommunication Regulatory Database.

8 SPECTRUM MANAGEMENT TO PROMOTE BROADBAND

Spectrum management is taking on an increasingly important role as many developing countries are expected to grow their broadband markets through broadband wireless access (BWA) technologies. Regulators seek to provide pragmatic, flexible, market-oriented spectrum licence rights, which can create a positive investment climate for BWA services. At the same time, regulators want to discourage uneconomic hoarding and speculation in spectrum, which could delay the rollout of services to consumers.

Chapter Five of this report discusses the primary goals of spectrum regulation, as well as the fundamental economics of wireless access systems. It also reviews some of the technological advances that are making new spectrum resources available for BWA services and applications. The chapter identifies certain best practices to improve spectrum management in ways that encourage the rapid deployment of BWA systems. Following a consultation among the global community of regulators, regulators participating in the 2005 ITU Global Symposium for Regulators agreed to a comprehensive set of best practice guidelines on spectrum management to promote broadband. The full set of 2005 GSR Best Practice guidelines are available at <http://www.itu.int/ITU-D/treg/>.

The good news is that at the same time that spectrum-hungry BWA equipment is being developed and deployed, other advances, such as in the computing power of processors in radio equipment, are causing more ferment in the spectrum community than perhaps at any time in its history. The traditional paradigm of spectrum planning, allocation, assignment and monitoring reflect largely the technological limits of an earlier era. New radio technologies may free regulators from some legacy spectrum management practices that may become obsolete, or worse, too rigid for a wireless broadband world. Technological developments such as spectrum-hopping, adaptive and directional antennae use and other techniques promise to shift interference management from governments to operators and even to end-user terminals to allow greater sharing and reuse of existing spectrum.

Box 1.1: Eire's Response to BWA

Ireland's contribution to the 2005 GSR Best Practice Guidelines on Spectrum Management to Promote Broadband Access included the following principle detailed below:

Principle One: Barriers to entry should be as low as possible

Our [Ireland's] experience indicates that regulators should minimize barriers to entry in this area by allowing broadband suppliers to begin operations on a small scale, and not imposing onerous rollout and coverage conditions. Ireland has awarded national licences in the past for broadband wireless access that incorporated rollout and coverage obligations. But none of the licensees were able to make a viable business case and, consequently, rollout of services was less than satisfactory.

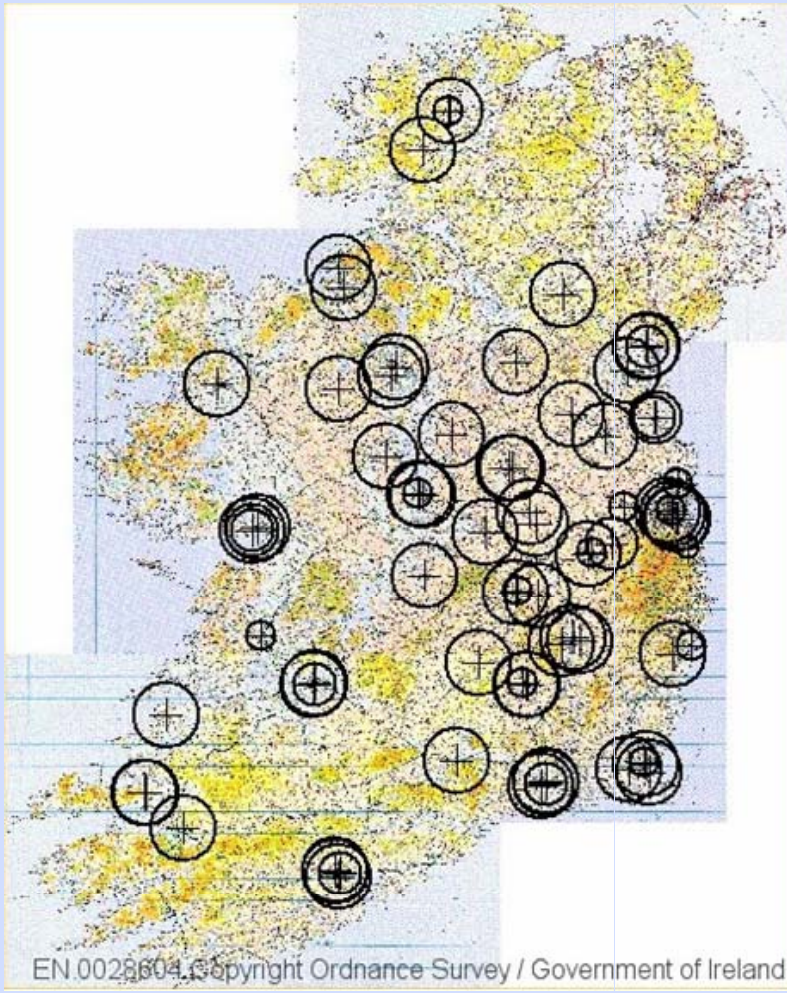
In 2004 ComReg announced a new scheme for the licensing of broadband fixed wireless access services in local areas. Each local service area was defined by a 15 km radius circle from a base station, with an interference zone extending to a 30 km radius, at the perimeter of which a certain field strength should not be exceeded in order to limit interference into adjacent areas. Since its inception, 110 licences have been granted on a first-come, first-served basis. The success of this approach, compared with the earlier attempt at national licences, is reflected in an increase of 43 per cent of customers in the last six months.

One of the key reasons for the success is that operators only take out licences for areas in which they are able to develop a viable business case and, as there is no national network rollout obligation, all attention is focused on the local area. Initial concerns that rollout would only occur in urban areas (due to high population) have proved to be unfounded as small entrepreneurs and local community groups have taken up the challenge to supply broadband access to many rural areas where ADSL is not available. Current rollout is shown in Box 1.2.

Spectrum regulators have begun to respond by granting licensees with more flexible use of technologies so that operators can deliver the services the market demands. This technology and service “neutrality” reinforces the overall trends of decentralizing control over networks. This will allow the application of BWA technologies, for example, to be more agile in responding to local market realities. Indeed, in developing countries generally, and in remote areas within developing countries, in particular, where spectrum scarcity is far less an issue than in developed countries, there is no reason why spectrum management policies could not be tailored to local realities, which may include a less dense environment of spectrum use, allowing greater power and range for wireless systems that do operate there.

In the end, perhaps the best analogy of the future broadband wireless environment is the highway analogy. Anyone can get on the highway, as long as they obey the rules of the road. That is, as long as operators obey rules designed to limit harmful interference, entry barriers can be lowered to allow as many operators as demand warrants. In congested areas, of course, those rules may need to be more stringent – as speed limits are on urban highways. In the end, however, it makes little sense to restrict market entry when technical demands do not require it. That would be akin to establishing a nationwide limit of cars allowed on any highway anywhere in the country, based solely on the potential for congestion at the single busiest spot, at rush hour, in the country’s capital city.

Box 1.2: BWA Coverage Areas (Circles) in Ireland



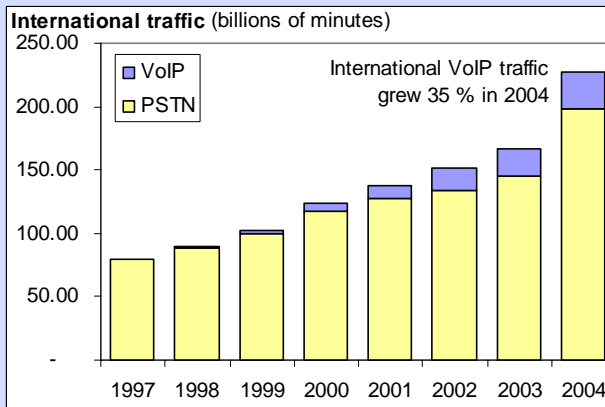
9

REGULATORY CHALLENGES OF VOIP

Many of the world's carriers have begun deploying IP-based networks that can carry both voice and data. In this way, operators are able to invest in a single network that can be used more efficiently for many different forms of traffic. Many of these operators have started to offer VoIP to their customers.

Recognition of this shift in practice and service is widespread and international. In fact, international VoIP increased by 35 per cent from 2003 to 2004 (See Figure 1.8 below). Many historic operators around the globe were using VoIP to carry part of their international traffic in 2004.

Figure 1.8 – Growth of International Traffic



Source: ITU World Telecommunication Indicators Database and TeleGeography *Global Traffic Statistics 2006 report*. Telegeography Research is now part of PriMetrica, Inc. (see www.primetrica.com)

VoIP is also being offered by new market players, which are often viewed as a threat to traditional PSTN operators. VoIP may be offered by ISPs, in internet cafés and, more recently, by companies from abroad that have no local presence, yet whose impact on local market conditions is felt quite strongly. The impact of VoIP is felt from the loss of outgoing international retail traffic (as customers search for the lowest cost

international rates) to reductions of incoming international settlement traffic (as traffic from VoIP customers abroad skirts the international settlement rate system).

Regulators recognize that although VoIP poses increasing challenges to legacy operators, it also brings new opportunities to end users for more affordable services. In many ways, the rise of VoIP has crystallized the delicate balancing act that many regulators have been performing as regulatory reform has been implemented ever more widely. Weighing in on one side of the scale are the commitments of the World Summit on the Information Society (WSIS) to encourage low cost access to ICT services, while the other end of the scale balances the desire to protect incumbent operators—especially when incumbents remain at least partially government owned.

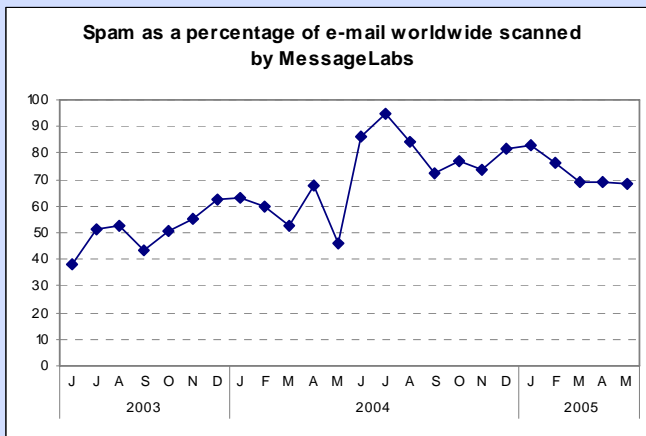
It is not surprising, therefore, that the rise of VoIP has prompted an array of regulatory responses, from outright bans to full legalization. The question of whether to allow or to prohibit VoIP, however, is only one of many issues prompted by the rise of VoIP. Other issues include developing regulatory frameworks for the interconnection of circuit-switched and IP-based networks as well as transitioning to interconnection in a fully IP-based world. There is also a range of issues arising from the fact that VoIP customers can use the same VoIP service nomadically, rather than from one fixed line location or one mobile terminal. The nomadic nature of VoIP is prompting challenges to traditional practices in numbering and emergency services. The variety and intricacies of the regulatory treatment of VoIP are explored in Chapter 6 of this report.

The rise of VoIP is emblematic of the crossroads at which the ICT sector now finds itself. Regulatory practices and wisdom built upon the experiences of the heavily regulated PSTN era are now meeting head on the largely unregulated internet world. Which model will apply as these two worlds converge? Or will hybrid or entirely new regulatory models be developed? This chapter begins to identify the issues and practices facing regulators today and in the years ahead as IP networks replace circuit switched infrastructure.

10 FIGHTING SPAM

Over the last decade, the unbridled growth of spam has gained increasing attention, not only due to its inconvenience and cost, but perhaps even more importantly, because spam often carries viruses and worms or poses other network security issues, or is used a vehicle for fraudulent behaviour. Today, there is general agreement about spam's core characteristics, including that it consists of unsolicited electronic messages sent in bulk. Spam messages tend to be identical and are sent indiscriminately to selected recipients. Most experts involved in the fight against spam counsel in favour of a multi-pronged approach, including technical solutions, legal and regulatory actions, end-user education and international cooperation.

Figure 1.9 – Spam as Percentage of Emails Worldwide, 2003-05



Source: MessageLabs.

According to some analysts, spam accounted for around 70 per cent of all e-mail traffic by mid-2005 (see Figure 1.9). The costs associated with spam are difficult to determine, although it is logical to assume that it puts pressure on ISPs in terms of reduced bandwidth and increased

in tracking down and prosecuting spammers. Having an enforceable anti-spam law in place as part of a coordinated international effort will facilitate action against spammers acting (and hiding) across multiple jurisdictions.

But the time may also be ripe for anti-spam authorities to expand their efforts to include working with ISPs, who can be instrumental in fighting spam. Chapter 7 of this report therefore looks not only at the components of anti-spam laws targeted at spammers, but proposes the establishment of enforceable codes of conduct to be developed by ISPs, and then approved and enforced by regulators. Such a system of ‘managed self-regulation’ would require ISPs to prohibit their customers from using that ISP as a source for spamming and related bad acts, such as spoofing and phishing, and not to enter into peering arrangements with ISPs that do not uphold similar codes of conduct. Rather than continue to rely upon chasing individual spammers, regulators in the most resource-constrained countries in particular would be more likely to succeed by working with and through the ISPs that are closer to the source of the problem, to their customers, and to the technology in question. The regulator’s job would be to ensure that ISPs within their jurisdiction adopt adequate codes of conduct and then to enforce adherence to those codes.

While some ISPs can be expected to resist even such light-handed regulation, the advantage is that it places all ISPs on a level playing field. Under current practices, responsible ISPs find themselves bearing the brunt of the costs of spam. This explains why some ISPs have begun suing spammers for damages, an option that may not be available in all jurisdictions. The goal of managed self-regulation is to reduce spam in a way that protects responsible ISPs. ISPs that implement responsible, effective anti-spam measures should be rewarded for their good behaviour. One means of rewarding those responsible ISPs is for regulators to hold their irresponsible competitors accountable. Regulators can also make consumers aware of the good works of the best ISPs, for example, by certifying ISPs that enforce their codes of conduct and allowing such ISPs to use the regulator certification in their advertising. As with many other telecommunication-related policy issue that is salient across national borders, the importance of consistency, shared strategic approaches and international cooperation is paramount.

11 CONCLUSION

Regulators and policy-makers around the world are reviewing their laws and regulations to judge whether they provide a proper environment to help speed the opportunities and benefits of broadband networks and the new services and applications that ride on them. At this juncture, responses have been varied – everything from initiating an overhaul of licensing and market-entry policies to doggedly restricting access to VoIP services. As with other aspects of sector liberalization, many governments feel the instinct to protect incumbents and ensure that they take the lead in broadband investment.

It may do little good, however, to liberalize traditional telephony markets, or even mobile service markets, while protecting incumbents from inter-modal or broadband competition. Growing numbers of countries are adopting regulations that allow for open market entry at all levels and layers, including applications and services such as VoIP and internet access. Of course, in markets undergoing a transition to competition, it is important for regulators to work towards a level playing field for providers of IP-based services. This will often mean taking steps to ensure that network operators interconnect and provide open access to support infrastructure and some network capabilities.

In many areas of regulation, it may be possible to “regulate down” rather than “regulate up” to achieve competition. That is, as competition becomes viable, and market forces begin to discipline operators’ behaviour, it may be wiser to reduce the regulatory burden on all operators – incumbents and new entrants alike – rather than imposing the same regulatory structure on competitors that has always been applied to the monopoly incumbent. Regulators must strike a balance between giving incumbents too much latitude to obstruct competition, on the one hand, and so many restrictions that it stifles broadband investment, on the other.

In the final analysis, policy-makers and regulators need to address the broadband revolution in three ways. First, they need to accept the reality of its coming and embrace its potential. Second, they need to radically revise the way they understand telecommunications, to

understand all the options they might pursue in accommodating the new networks, services and applications. Finally, and most importantly, they need to plan, with the advice and input of their industries, academic institutions and civil societies, how to make broadband work for all.

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The 7th edition of *Trends in Telecommunication Reform* examines the regulatory challenges and opportunities of enabling ICT development. The report provides regulators with tools they can use to promote effective and innovative development and use of ICTs in a competitive environment.

The ICT sector can only develop to its full potential for the benefit of citizens worldwide if a conducive enabling environment is established. The road to developing ICTs is certainly paved with regulatory challenges but also promising opportunities for consumers if applied in an efficient and innovative way as examined in detail in this report. This report provides an overview of developments in the ICT sector, specifically focusing on broadband, its advent, the technologies, the role of the regulator in broadband development, broadband spectrum management, voice over IP (VoIP) regulation, international efforts to combat spam (including a model law and enforceable code of conduct), and identifies best practices. The report is structured into eight chapters.