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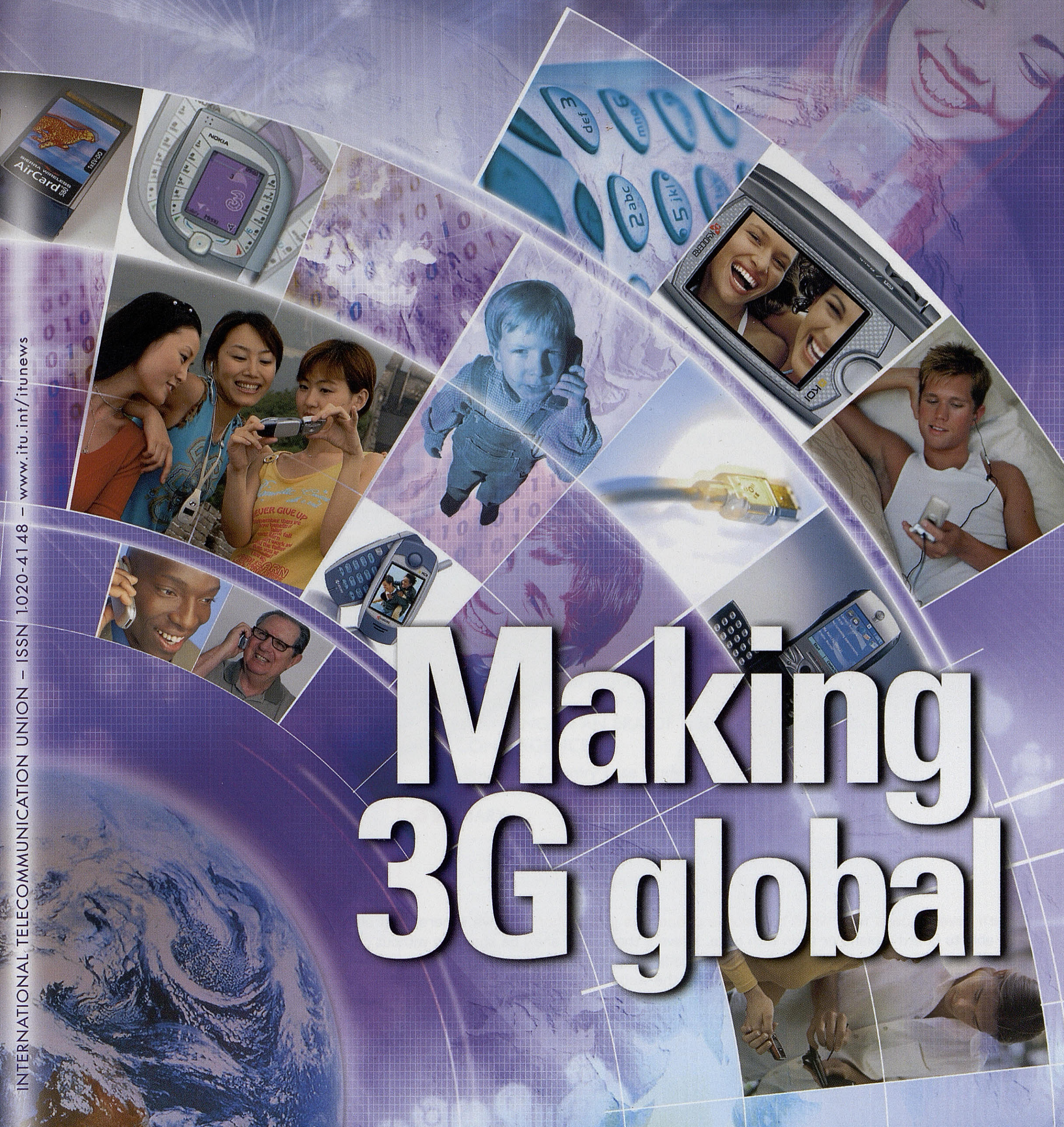
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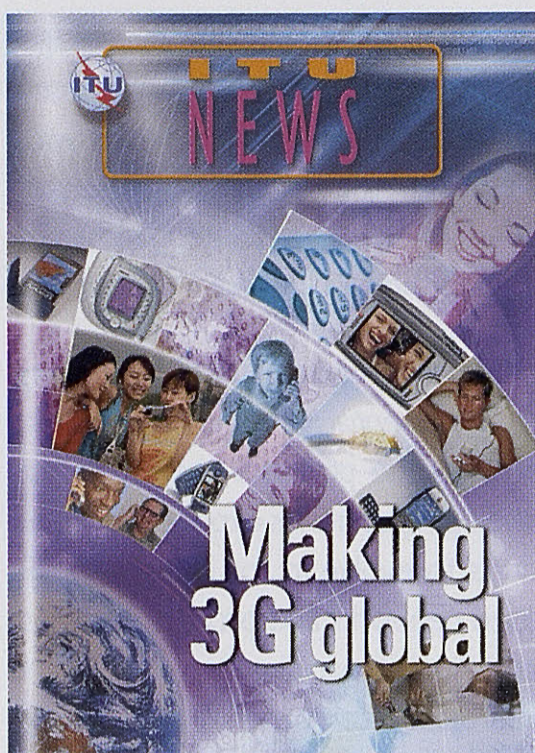
Making 3G global

OUR INNOVATION IS A NEVERENDING STORY.



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ITU TELECOM AMERICAS 2005 to take place in Salvador da Bahia (Brazil) from 3 to 6 October

Backed by recovering economies and an improving investment climate, especially in Brazil, Chile and Mexico, TELECOM AMERICAS 2005 will provide an opportunity to make contacts and seal deals in the region's dynamic information and communication technology (ICT) sector. "Salvador da Bahia provides a spectacular setting for the region's top names in the ICT sector to meet, network and analyse the trends unfolding in this fast-growing region," said ITU Secretary-General, Yoshio Utsumi. The coastal city of Salvador da Bahia is a key destination for business events, and has a rich cultural heritage

AMERICAS 2005 will comprise an Exhibition and a pan-American Forum, which will take place at the Bahia Convention Centre located in the city's financial centre. "This will be a key event not only to see the technologies and applications that are shaping the region's ICT sector, but also for examining core policy and investment issues that are central to its growth," the Secretary-General also said. The last ITU TELECOM AMERICAS event was held in Rio de Janeiro in 2000.

Consultations on setting up Working Group on Internet Governance conclude in Geneva

Over 250 participants from around the world attended the consultations on the establishment of a United Nations Working Group on Internet Governance, held in Geneva on 20 and 21 September 2004. Many participants expressed the sentiment that given the short deadline between now and the time the Working Group is to report its findings to the second phase of the World Summit on the Information Society (WSIS) in November 2005, it should concentrate mainly on key issues, including management of Internet resources, spam, cybersecurity, cybercrime, multi-

lingualism and data protection. The establishment of the Working Group was requested by the first phase of WSIS in December 2003.

Participants also reiterated the importance of adopting a multi-stakeholder approach that would include governments, the private sector and civil society, as well as participants from international and regional organizations dealing with Internet governance issues. The importance of regional consultations was underscored, with Egypt announcing that it would host an Arab-African conference in May 2005 to prepare a regional coordinated stance. The next round of open-ended consultations is scheduled for 15 to 16 February 2005, back-to-back with the second Preparatory Committee meeting of WSIS, planned for 17 to 25 February 2005. Source: *UN Information Service, Press Release PI/1615*.

Preparations begin for the World Telecommunication Development Conference in Doha in March 2006

ITU Member States and Sector Members from both the developing and developed world met in Geneva from 7 to 16 September 2004 to review and approve reports of studies carried out within Study Groups 1 and 2 of the ITU Telecommunication Development Sector (ITU-D). The meeting also examined emerging issues in the telecommunication industry that will require the attention of the World Telecommunication Development Conference, which will take place from 7 to 15 March 2006 in Doha (Qatar). The following is a summary of the studies, whose conclusions should assist developing countries in their transition to the information society

Universal access/service

A report from ITU-D Study Group 1 defines consumer needs and rights in a way that should stimulate telecommu-

nication usage, defines the main stages of a universal telecommunication access and service policy, recommends ways of establishing a framework that is conducive to investment and proposes innovations in funding and management.

Internet Protocol (IP) Telephony

The *Essential Report on IP Telephony* identifies the potential challenges that developing countries experience in their efforts to evolve to, or implement, IP-based networks and broadband access capabilities. It explains how nations and their citizens can benefit from ICTs.

Satellite services

A report on satellite regulation highlights the increase in competition in satellite services and new applications. It recommends that regulators and satellite service providers should work together to expand access to services, increase competition and technological innovation and lower prices while respecting the need for fairness, consistency and transparency within the satellite telecommunication market.

IMT-2000 and beyond

ITU-D Study Group 2 released guidelines for the smooth transition of existing mobile networks to IMT-2000 (third-generation mobile systems) in developing countries. The guidelines are intended for telecommunication operators, policy-makers and regulators. They complement the ITU "Handbook on Deployment of IMT-2000 Systems."

Calculation of frequency fees

One of the most pressing concerns of the majority of developing countries is the need for a national frequency fee calculation model. To tackle this challenge, ITU-D Study Group 2 issued a report that compiles calculation formulae and frequency fees applied by countries for radiocommunication usage in various frequency bands. ■

Looking ahead

World Telecommunication Standardization Assembly **AMNT-WTSA'04**



to address the make-up of the organization in this way because of the rapid pace of change in the information and communication technologies (ICT) industry. World telecommunication standardization assemblies review and decide on working methods, including approval processes for standards, work programmes, structure of study groups and their specific areas of study. These assemblies also develop procedures of cooperation with external organizations. Essentially, WTSA's determine priorities and time-frames for completion of work on standards preparation.

October 2004 is an important month for the global standardization community. The World Telecommunication Standardization Assembly (WTSA) taking place in Brazil (Florianópolis, 5–14 October) will define the work programme of the ITU Telecommunication Standardization Sector (ITU-T) for the study period 2005–2008.

WTSA takes place every four years to examine the structure of ITU-T and propose strategic directions for future global standards setting. It is necessary

The last WTSA was held in Montreal (Canada) in 2000, and saw agreement on an important new way of working: the alternative approval process (AAP). This is a fast-track procedure for agreeing on global, technical standards (ITU-T Recommendations). It was an important step to take — meeting industry demands that standards are produced not just efficiently, but quickly. AAP was complemented at WTSA-2000 with other processes to further reduce time-to-market for standards and

more closely match the industry's time-frames and operational practices. Increased working through electronic means was one such process that was encouraged, and has proved to be a successful way of bringing together experts from around the world.

Also, at WTSA-2000, much emphasis was put on the need for greater involvement of developing countries in standardization activities. This is a theme that is still with us in 2004. It has been the remit of ITU-T to help bridge the standardization gap between developed and developing countries since it was mandated to do so at the Montreal Assembly.

Alongside WTSA-04, ITU will host a "Cybersecurity Symposium" that will address global concerns on this important topic. ITU-T has conducted studies into a range of security issues and has produced over seventy Recommendations focused on ICT security. The event will provide a high-level overview of the subject using practical experiences to illustrate how specific threats can be dealt with and what lessons can be learnt from previous experience.

Houlin Zhao
Director,
ITU Telecommunication
Standardization Bureau



3G by any other name

“Science fiction has promised us fancy gadgets, from the telephone in the shoe used by the 1960s comedy spy Maxwell Smart, to the wristwatch videophone used by detective Dick Tracy. James Bond proved the utility of private personal text messages to us in the 1970s movies when he received text messages on to his watch.” [1]

Fancy gadgets are here with us today, changing our lifestyles and social habits. One lesson from ITU TELECOM ASIA 2004 is that mobile phones have become such important personal items that most people cannot live without them, just like the wristwatch was in its early days. In the latter part of the twentieth century, the almost simultaneous arrival of two major innovations — mobile phones and the Internet — changed the face of communications.

Today’s digital cellular phones are much smaller and more convenient — they fit into our pockets or handbags rather than in the shoe. And text messaging has taken the whole industry by surprise. With the portable messaging device becoming more versatile and multi-modal, messaging has moved on from being a fun idea to becoming an essential communication and business tool. In the United Kingdom, for example, some 2.1 billion text messages were sent from mobile phones during the month of March 2004 alone. [2]

Asia-Pacific is a leader in mobile data applications, accounting for 77 per cent of the world’s estimated 100 million mobile data subscribers. Global mobile data subscribers today represent close to 8 per cent of the total 1.3 billion mobile subscribers worldwide. Gaming has emerged as the main driver for mobile data, and industry

sources estimate that the mobile online gaming market was worth USD 920 million in 2003, of which Japan and the Republic of Korea were the largest markets, with USD 211 million and 122 million, respectively. [3]

Major stages in the technological development of mobile communications are commonly described in terms of “generations”. We have finally entered the third-generation (3G) of mobile systems, or International Mobile Telecommunications-2000 (IMT-2000) in ITU parlance.

Several 3G terminals on display at ASIA 2004 combine the numerous functions of today’s mobile phones, personal computers, television, newspapers, cameras, libraries, personal diaries and schedulers, wallets and credit cards. There were signs from the trade show that the global handset market is picking up momentum, and consumers are personalizing new 3G services to reflect their own lifestyles. For example, ringtones, picture transmission, games and entertainment, e-mail and chat, are all expected to be popular among the youth.

The move towards 3G demands a fundamental shift in the manner in which mobile services and applications are billed. And the customer is King! Whatever the industry concludes, it has been noted that users will not be prepared to simply accept what they are given. Customers will want to choose what is relevant to them and control how they access and pay for it. They will want to see a genuine evolution of services. Success may well lie in basing the business model on the services themselves and charging subscribers for their perceived value. [4]

While the goal of the IMT-2000 project was to harmonize third-generation mobile network radio interfaces into a single standard, in real-

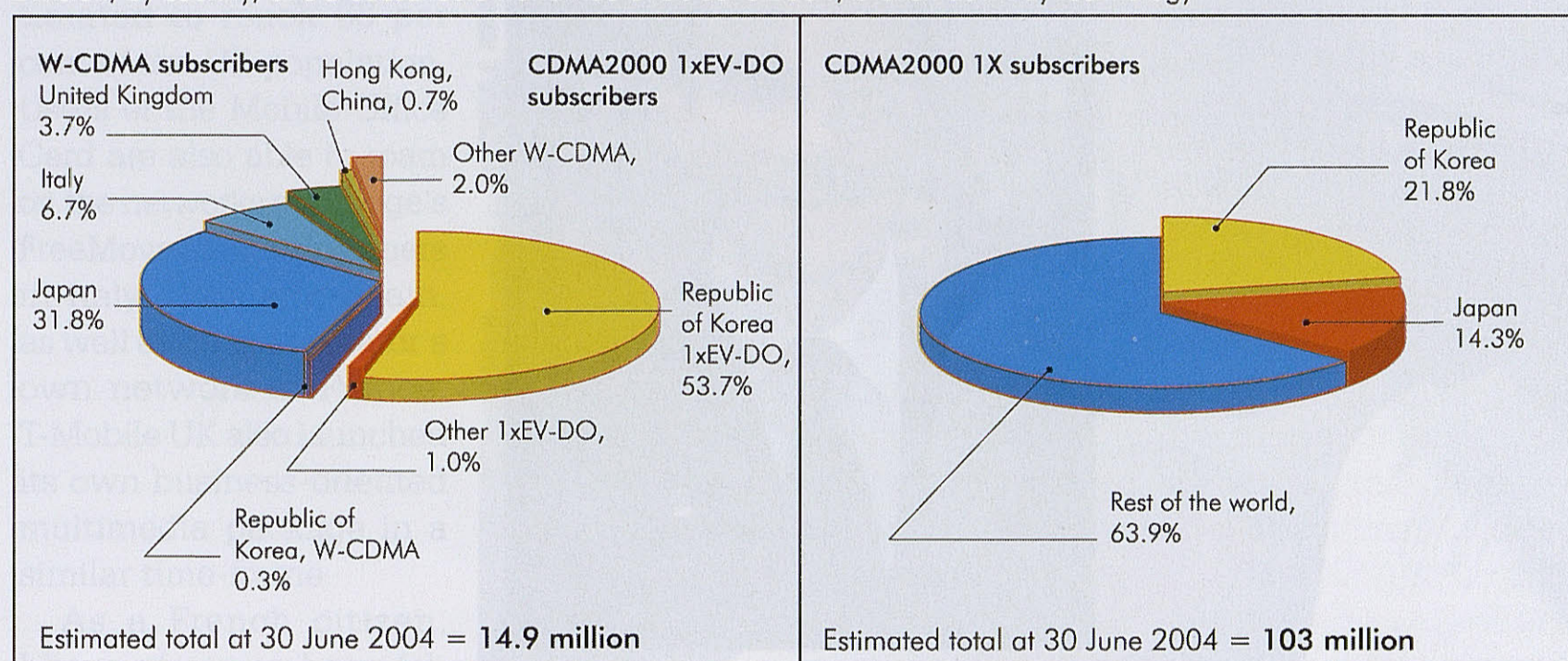


ity, three main approaches to 3G evolved. IMT-2000 encompasses these three different access technologies (CDMA, TDMA, and FDMA) through five different radio interfaces. Most deployments have so far centred around two main interfaces: the CDMA2000 and the wideband-CDMA (W-CDMA), known in Europe as UMTS or universal mobile telecommunications system.

where else in the world, W-CDMA services operate alongside CDMA2000 1X, with operators upgrading to CDMA2000 1xEV-DO (evolution-data optimized). Australia has one W-CDMA network in commercial operation and one CDMA2000 1xEV-DO planned for launch in the fourth quarter of 2004. By mid-2004, there were around 118 million 3G subscribers worldwide (see charts on "3G market shares"). China,

3G market shares

Division, by country, of 3G subscribers worldwide at 30 June 2004, broken down by technology



Source: ITU World Telecommunication Indicators Database, www.3Gnewsroom.co.uk and www.3Gtoday.com

A number of operators in Asia-Pacific have been able to choose which type of technology will take them along their next-generation path. Operators in Hong Kong, China have opted for the W-CDMA route. In Japan and the Republic of Korea where the take-up of next generation mobile services have been more rapid than any-

meanwhile, is trialling the CDMA2000 and the W-CDMA standards, as well as its homegrown standard, TD-SCDMA for the Government to ascertain which path towards 3G it will opt for.

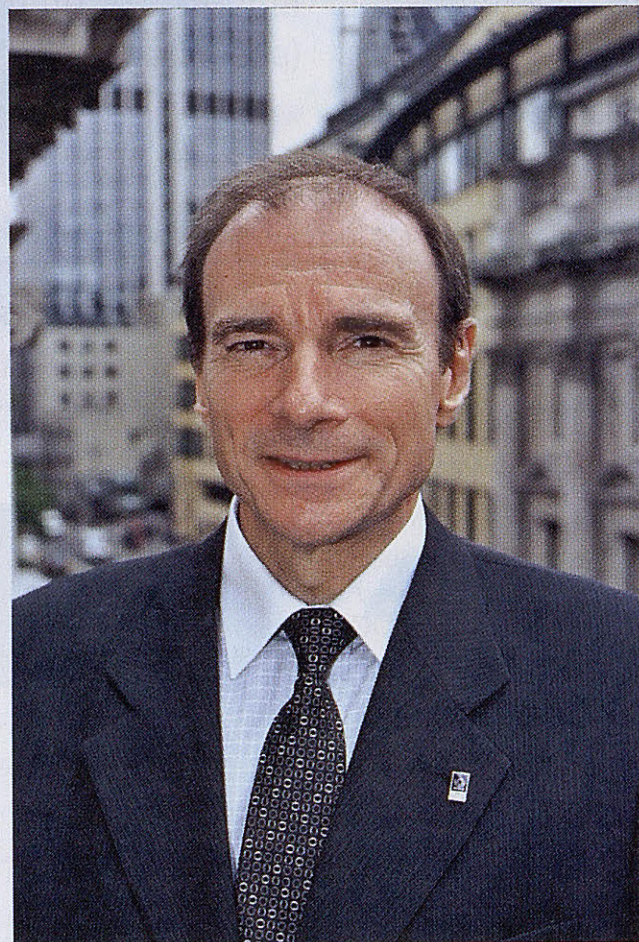
But as the 3G bandwagon begins rolling, CDMA2000 and W-CDMA technologies will need to offer full interworking and roaming with each other in order to make IMT-2000 a truly global standard for the future. How close are we to achieving this goal? A Forum session at ITU TELECOM ASIA 2004 entitled "Making 3G global" examined the attributes of each technology and their future deployment. *ITU News* caught up with keynote speakers Jean-Pierre Bienaimé, Chairman of the UMTS Forum and Perry M. LaForge, Executive Director of the CDMA Development Group to gather their views on the 3G story so far. Read on! ■

[1] *m-Profits: Making Money from 3G Services*, page 21, by Tomi T Ahonen. Published by John Wiley & Sons, Ltd, 2002.
 [2] *ITU Internet Reports: The Portable Internet*, page 98, released in September 2004 at ITU TELECOM ASIA 2004.
 [3] *Asia-Pacific Telecommunication Indicators 2004*, page 10, released in September 2004 at ITU TELECOM ASIA 2004.
 [4] *Deployment of IMT-2000 Systems*, pages 173 and 177 of the first edition of the ITU Handbook, 2003.



UMTS roll-out gains pace

by Jean-Pierre Bienaimé
Chairman, The UMTS Forum



Towards the end of September 2004, there were more than 10 million 3G/UMTS customers subscribing to 46 W-CDMA networks in 24 countries — and another 10 networks were either in advanced testing or in pre-commercial launch phase. With a total of 120 licences awarded to a mixture of incumbent operators and new players, we expect to see an increasing number of networks offering 3G/UMTS mobile multimedia services to their customers over the next few years.

Operators are already introducing a new wave of 3G services enabled by the additional speed and capacity that W-CDMA access technology offers through its spectral efficiency and use of fresh radio resources. Apart from a seductive blend of services already familiar to mobile customers — from Java games and ringtones to

news, sports, entertainment and information services — 3G is readily distinguished from 2.5G technologies by its ability to support a plethora of video-based services. These range from video multimedia messaging service (MMS), videotelephony and multi-party videoconferencing to downloadable video clips and “live” video streaming.

Some early movers: a global perspective

While the total number of 3G/UMTS networks has increased significantly over the last few months, it is instructive to take a selective look at some of the launches that have shaped this fast-growing market since the beginning of 2004. [Note that this survey is *not* intended to be a comprehensive view of all launch activities.]

In the United Kingdom where new player "3" has already been launched for some time, Vodafone was the first incumbent operator to launch a 3G data card service for its business customers. Introduced in April 2004, the Vodafone Mobile Connect 3G/GPRS data card provides users high-speed access to the Internet and corporate intranet from laptop computers, including roaming capability in other selected territories. Orange followed with the launch of its "Mobile Office Card" solution when its 3G network in the United Kingdom went live in mid-July 2004. At launch, network coverage was estimated to reach 66 per cent of the UK population. Users of the Mobile Office Card are also able to roam on the networks of Orange's FreeMove alliance partners in Italy, Germany, Spain, as well as on the operator's own network in France. T-Mobile UK also launched its own business-oriented multimedia package in a similar time-frame.

As a French citizen, I have of course been following developments in my own country with particular interest. French operator SFR initially launched commercial services in May 2004 to business clients via PC card in three key cities (Paris, Lyon and Lille). Gradual, commercial consumer launches have been going on since July 2004. Orange also adopted a measured approach to 3G roll-out, starting off with a PC card commercial service. The operator is likely to have launched commercially in as many as twenty French cities before the end of 2004.

In Germany, T-Mobile launched 3G services on its UMTS network at the end of April 2004. Vodafone had introduced consumer 3G services by May (having already started with a busi-

ness-targeted 3G data card service), offering its German customers the ability to video call with users on other networks of its subsidiaries in Italy, Portugal, the Netherlands and Spain. O2 Germany meanwhile kicked off with a data card service, with the delivery of handsets coming later as well as an upgraded, more robust mobile portal and bundled WLAN access, aimed at generating increased revenues from 3G users. By July 2004, e-plus had also launched its data offering to business users.



You know you are part of the 3G evolution when you can watch the latest news live from your mobile screen and experience other richer, more visually compelling content ranging from video multimedia messaging, videotelephony and multi-party videoconferencing to watching your favourite movies during your long journeys. Customers, of course, need new terminals in order to experience and enjoy new 3G services

Italy has already emerged as a marketplace that was quick to embrace the appeal of 3G/UMTS, as demonstrated by Tre's confirmation that it passed the 1 million customer milestone in March 2004, just 16 months after commercial launch. Half way through this year, Italian subscribers to Tre had already downloaded almost 3 million video and multimedia news clips, as well as 10 million music content downloads and 300 000 downloaded games. The operator reported in July 2004 that its cus-

tomers had also made 120 million minutes of videocalls — a clear signal that 3G is delivering on its promise to stimulate usage and drive new service adoption. During May, Vodafone Italy launched to businesses and consumers at the same time that TIM introduced its “TIM Turbo” mixed UMTS/EDGE offering.

In Spain, Vodafone and TEM have both launched business and consumer-friendly services, while Xfera’s expected launch after Amena will bring the Spanish network count to four by early 2005. Elsewhere in Europe, Euro 2004 football host Portugal has seen service launches from TMN, Vodafone and Optimus. And incidentally, Vodafone Portugal was the first operator to provide its customers with 3G/UMTS data services roaming in Spain, the Netherlands, the United Kingdom, Italy and Japan. The first half of 2004 also witnessed new launches in Austria, Belgium, Ireland, the Netherlands and Sweden.

The picture of course differs significantly in North America from the one in Asia and Europe. Against the backdrop of rapid migration from TDMA to GSM/GPRS and EDGE throughout the Americas, Cingular has run UMTS/W-CDMA network trials in Atlanta, operating in the 1900 MHz spectrum, including testing soon of high-speed downlink packet access (HSDPA) — a technology that promises multi-megabit per second speeds to deliver the vision of true broadband mobile. Cingular plans to launch UMTS-HSDPA in late 2005 or early 2006 possibly in both 850 MHz and 1900 MHz bands, and is currently requesting proposals from leading manufacturers.

The march to 3G services in the United States continues with the announcement by AT&T Wireless on 1 September 2004 that it had extended its 3G/UMTS service to Dallas and San Diego. According to the announcement, the company’s wireless broadband service gives customers the ability to use a handset, personal digital assistant (PDA) or laptop to receive streaming audio and video services; create and share video clips; experience richer and more visually compelling content; and connect to critical business information, in most areas throughout these cities. In July 2004, AT&T Wireless began offering customers in Detroit,

Phoenix, San Francisco and Seattle broadband mobile wireless services when it launched its first 3G/UMTS network in the United States.

New networks, new services, new charging models

Operators that have launched commercially are testing the waters with a range of pre-paid and contract-based tariff options. This enables network providers to gauge customer reactions



to 3G and create a compelling, attractively priced proposition that lures new users while driving additional revenues. Some players — such as Hutchison that has launched 3G/UMTS operations under the “3” brand in Australia; Austria; Denmark; Hong Kong, China; Ireland; Italy; Sweden and the United Kingdom — have secured a foothold in the market through offers based on low-cost voice calls and text.

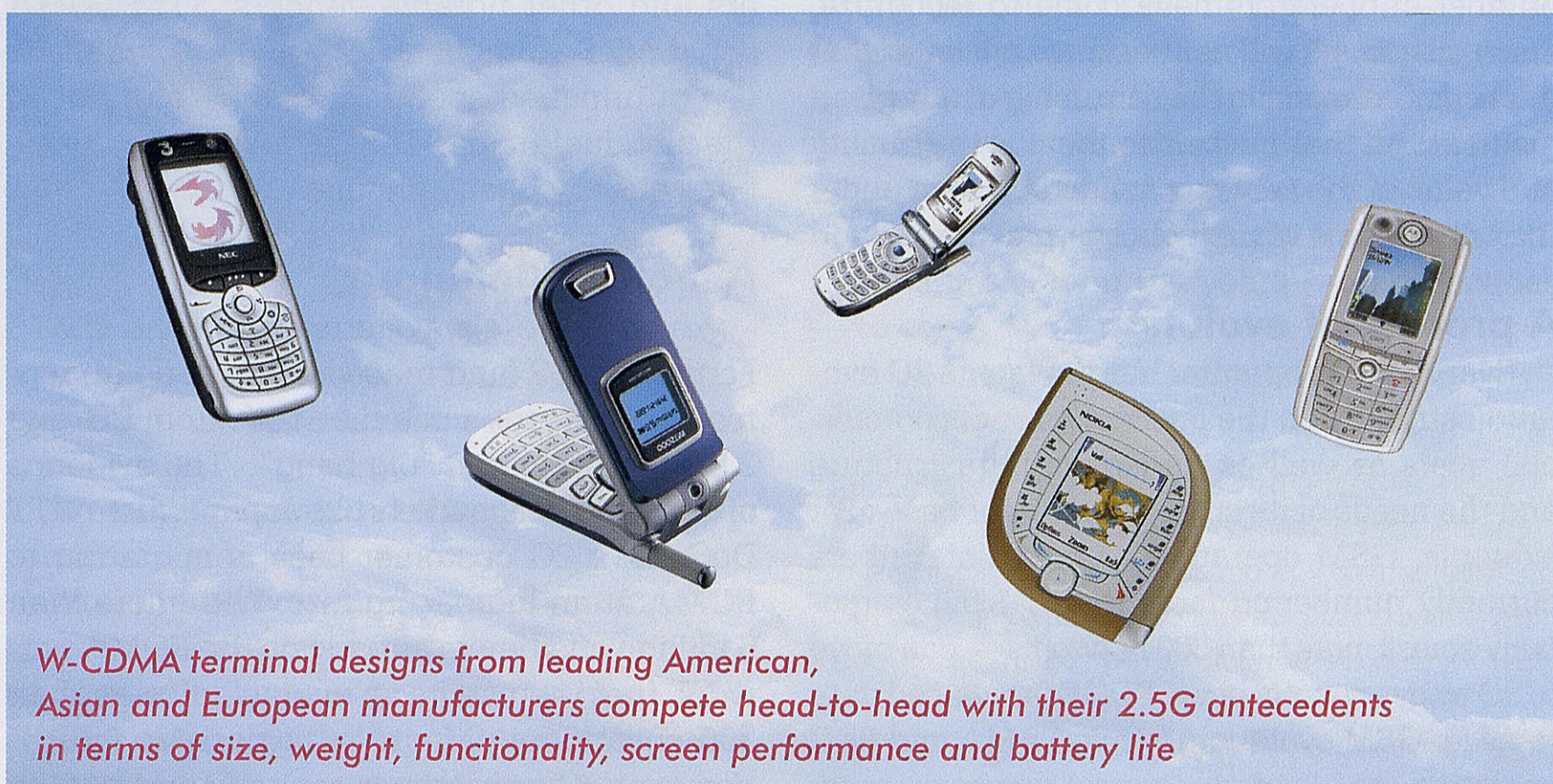
It is important to maintain a sense of pragmatic realism when forecasting the total impact of 3G/UMTS on operators’ revenues. It is gratifying, however, to observe that operators such as NTT DoCoMo that led the way with the world’s first fully commercialized W-CDMA network have observed a significant increase in their non-voice revenues. NTT DoCoMo has confirmed that its average revenue per user (ARPU) increased from just over USD 71 in the first quarter of 2003 to USD 94 in the same quarter of 2004. Of this total, non-voice revenues grew from 25 to 33 per cent in the same period, demonstrat-

ing that usage of “i-mode” and other services has grown as NTT DoCoMo migrates customers from its second generation personal digital cellular (PDC) network to its 3G Freedom of Mobile Multimedia Access (FOMA) network.

Indeed, the bulk of NTT DoCoMo’s FOMA additions come from its existing PDC customer base, who have been lured by attractive, feature-packed handsets and new discount data packages. NTT DoCoMo has also opened up

early uptake of 3G when the first networks were launched.

The earlier part of 2004 saw a number of operators — including several of the major players — introduce “PC only” access to their W-CDMA networks ahead of large-scale availability of high-performance, attractively priced terminals. With connectivity via a mobile data card rather than a handheld terminal, this allowed operators to evaluate and fine-tune the performance



W-CDMA terminal designs from leading American, Asian and European manufacturers compete head-to-head with their 2.5G antecedents in terms of size, weight, functionality, screen performance and battery life

its network to foreign subscribers on 21 international partner networks in 19 countries and is signalling its clear intention to make 3G services accessible to as many customers as possible. It is unwise to look too far into the crystal ball, but one thing is clear. With non-voice revenues hovering at around 15 per cent of monthly ARPU in Europe — and just 2 per cent in Latin America — there is enormous potential for operators to grow revenues significantly as they migrate from 2G and 2.5G to 3G.

Customers, of course, need terminals in order to experience and enjoy these new services. In August 2004, the Global mobile Suppliers Association (GSA) confirmed that 75 different W-CDMA terminal designs were already launched or announced by American, Asian and European manufacturers. Latest models compete head-to-head with their 2.5G antecedents in terms of size, weight, functionality, screen performance and battery life – removing one of the primary obstacles that slowed

of their networks under “real-world” conditions. It has also given business customers the opportunity to experience the speed and performance of 3G/UMTS for themselves, with a range of pricing plans that bundle W-CDMA/GPRS/GSM data cards as low as USD 200 together with volume-based usage charges.

Many operators are seeing the service possibilities that 3G enables in the context of an overall mobility proposition to their customers. For users wishing to browse the Web, download from the Web or access corporate resources while away from the office, 3G offers mobility with wide area coverage, integral security and international roaming. In contrast, wireless local area network (WLAN) or wireless fidelity (Wi-Fi) technology can present the perfect complement by offering high-speed Internet connectivity in nomadic situations where “hot-spot” access is provided. Some European operators are already taking steps to make this process transparent to the user, integrating billing for mobile and Wi-Fi usage

together with connection management software that simplifies the task of configuring a notebook PC to use both methods of wireless connectivity. One example of an operator that has already seen the potential of this seamless mix of network access options is T-Mobile. The operator has launched its 3G/UMTS service in the United Kingdom, allowing anyone with a WiFi-enabled notebook and PC card to access UMTS, GPRS and WLAN within the same tariff plan. As a number of operators have come to recognize, many customers will neither know nor care what method of connection they are using at any given moment. All that matters to them is the quality and value of the service provided to them under the brand name of their chosen provider.

A process of evolution

Every mobile operator has to plan its 3G evolution strategy on the basis of its own commercial goals as well as its legacy infrastructure and the needs of its current customer base. For example, GSM operators — with subscribers currently numbering more than 1.1 billion globally across more than 600 networks — can move to 3G either directly or via EDGE (enhanced data rates for GSM evolution), while TDMA and PDC operators are afforded a logical migration path, too.

With no end in sight for the continuing growth in demand for voice and data services, GSM operators can optimize their existing 2G investments as they switch over to this new, higher capacity air interface by retaining existing cell sites as well as their core networks, service platforms and information technology (IT) infrastructures. Economic factors that influence an operator's technology choice range from economies of scale, ease of international roaming and access to a wide selection of attractively priced terminals.

Technology choices for Asia

And what of the situation in Asia, where 3G technologies will share market space in contrast to the essentially "all-UMTS" picture in Europe, for example? The sheer size and diversity of the Asian market means that there is plenty of scope for the different technological flavours of 3G systems to enjoy a successful future. China

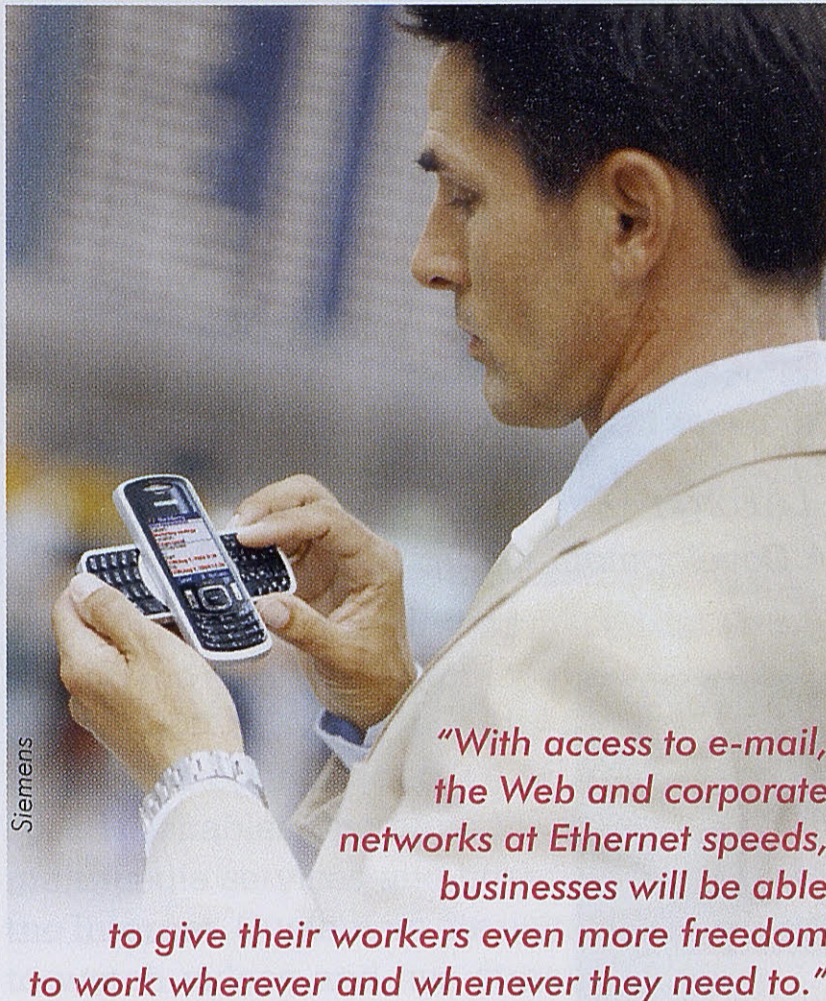
is a good example of this, where TD-SCDMA is one of three air interface standards currently being considered for commercialization in the country. Chinese customers potentially have an additional choice in the shape of TD-SCDMA that uses time division duplex (TDD) spectrum. As part of the IMT-2000 family of standards, TD-SCDMA can present a good complement to W-CDMA for high-speed data applications. With strong support from Chinese manufacturers and other notable vendors, TD-SCDMA could offer a practical TDD mode solution for use of unpaired spectrum bands, and indeed the first dual-mode TD-SCDMA/GSM chipsets have already been announced.

A look to the future

As we have always stressed in the UMTS Forum, UMTS (and indeed 3G in general) represents a steady customer shift from 2G and 2.5G rather than a "big bang". The evidence of this is clear in markets like Japan, where NTT DoCoMo's 2G customer base is migrating to FOMA at an increasing rate. With more than 5 million customers already on the FOMA network, that represents an average of more than 350 customers per site — a positive indication that 3G can deliver capacity and quality of service in "real-world" conditions.

Two interesting observations can be made from the NTT DoCoMo experience: firstly, that customer migration to 3G/UMTS increases data ARPUs, and secondly that customers are responding positively to more attractive terminals with lower weight, better screens, improved multimedia capabilities and longer battery life. The prognosis for other UMTS operators is encouraging: give customers access to appealing handsets and a wide variety of attractively priced services... and they will come to you quickly.

But what about the next chapter of the story? Just as fixed networks are evolving to an all-IP future, it is certain that we will see a similar transformation in the mobile space. While it undoubtedly represents a major investment by the operators, in a few years time we will see mobile infrastructures becoming all-IP environments, reducing the cost of delivery per bit, and at the same time, affording operators far greater possibilities to host, manage and bill



for an exciting new tier of advanced multimedia services.

While there was an undue obsession with theoretical data rates in the early days of 3G, there is still plenty of good news ahead. With HSDPA extending the capabilities of W-CDMA as far as 14 Mbit/s, a standardized platform is already in place that will see 3G delivering the long-held dream of true broadband mobility. With access to e-mail, the Web and corporate networks at Ethernet speeds, businesses will be able to give their workers even more freedom to work wherever and whenever they need to, unconstrained by bandwidth limitation. For consumers, the change is expected to be equally dramatic: with HSDPA — and high-speed uplink packet access (HSUPA) for similar improvements in uplink performance — 3G is expected to usher in a new wave of content-rich applications, blending high quality full-motion video and audio with ultra-quick content downloads and the possibility to support multiple services over the same connection.

We hear news of other exciting developments that promise even faster, cheaper wireless broadband access in the future. The ceaseless pace of technological research is inevitable, and indeed it is the work of manufacturers, operators and standardization bodies that has put us in the

position we are today. It is easy to be distracted by the promise of multi-megabit per second transmission speeds, but it is important not to lose sight of the tangible benefits that 3G is already delivering and is expected to continue to deliver. As 3G matures in terms of its service capabilities, and becomes more affordable and accessible to a greater proportion of the world's population, it has the potential to improve the personal connectivity of a billion people or more during the course of the next decade — just as GSM has already done so. The priority for us all in the global telecommunication community must be to ensure that the benefits 3G offers are harnessed to improve the social and economic conditions of as many of the world's citizens as possible in the years — and decades — to come. ■

About the author

Jean-Pierre Bienaimé has had a long and distinguished career within the telecommunication industry. In January 2003, he was elected as Chairman of The UMTS Forum, a mobile industry association with a mission to promote the worldwide success of 3G (www.umts-forum.org). He joined France Telecom in 1979, where his responsibilities included financial management, marketing and business development for international business services and corporate networks. He served as Director of Business Development and subsidiaries at FCR (France Telecom Group), Chief Executive Officer of France Telecom's subsidiary Nexus International, and as Director of International Development at France Telecom Mobiles (2000).

After the purchase of Orange by France Telecom, Mr Bienaimé was appointed Group Technical Support Director at Orange until January 2003. In this position, he provided technical and IT support to the international zones of Orange and France Telecom for business development, and to the mobile affiliates of the Group worldwide for operations, and contributed to Orange's corporate programmes such as re-branding and franchising.

Jean-Pierre graduated from the ESSEC Business School (Paris), the *Institut d'Etudes Politiques de Paris* and the *Ecole Nationale Supérieure des Postes et Télécommunications* (Paris). He also holds a business degree from INSEAD, Fontainebleau (France), and attended a senior executive programme at Kelley School of Business, Indiana University at Bloomington (United States).



3G achieves global reach with CDMA

by Perry M. LaForge
Executive Director, CDMA Development Group



CDMA2000: More than 100 million subscribers and growing

At the end of June 2004, over 112 million people across all continents used CDMA2000® technology to make voice calls or to access the Internet and advanced data services. This gives the wireless industry a historic milestone to celebrate. CDMA2000, as the first IMT-2000 technology to be deployed and to offer broadband wireless services, is a good foundation for discussing the promise of third-generation (3G) mobile communications: that of providing an unprecedented level of voice and data services that can be used anytime, anywhere, by anyone.

In October 2000, SK Telecom and LG Telecom of the Republic of Korea pioneered the introduc-

tion of 3G networks using the CDMA2000 1X standard. By August 2004, there were 98 networks providing commercial 3G CDMA2000 services to more than 112.6 million customers in 46 countries around the world (see map on page 14 and chart on page 15).

CDMA2000 users account for 96 per cent of all 3G subscribers worldwide and the customer base is increasing at the rate of more than 4.6 million new subscribers per month. This growth rate is expected to continue for several more years. According to the Yankee Group, CDMA2000 will have 290 million users in 2008. Of these users, 121 million (or 42 per cent) are expected to subscribe to CDMA2000 broadband wireless technologies: 1xEV-DO (evolution-data optimized) and 1xEV-DV (evolution-data and voice).



Kyocera

Initially deployed in Asia, 73 per cent of the CDMA2000 networks now operate in other regions, with Latin America and the Caribbean having the greatest number deployed. The use of CDMA2000 is also expanding rapidly in the world's two largest markets, China and India, and it is now being deployed in Europe.

CDMA2000 1X and its broadband evolution, 1xEV-DO, support the most advanced data services on the cellular market today. For example, CDMA2000 1xEV-DO, with its 300–600 kbit/s average throughput and 2.4 Mbit/s peak data speeds, enables operators to offer innovative multimedia services and broadband access to the Internet. Customers are using their phones to watch videos and live streaming news, to send and receive video mail, and for picture messaging, banking and e-commerce. CDMA2000 1xEV-DV, offering simultaneous voice and data at peak speeds of 3.1 Mbit/s, will continue the evolution of CDMA2000 3G services. The Republic of Korea, which has the “world’s most extensive CDMA2000 1xEV-DO network,” according to the latest ITU Report: *The Portable Internet*, launched at ITU TELECOM ASIA 2004, is expected to see the first 1xEV-DV offering later this year.

Innovative services, handsets and devices

The adoption of innovative services is already driving rapid development of handsets and devices. Today, more than 650 CDMA2000 devices are on the market, including 86 1xEV-DO models. The devices are manufactured by more than 56 vendors, and range from low-cost phones to high-end devices with advanced functionality. This is good for consumers, because the great quantity and wide variety of devices provides something for everyone at a

range of price points. It is good for operators because it expands opportunities to differentiate services for various market segments, and it is good for handset manufacturers, because they will benefit from the continuing demand for innovative devices that new applications and services create.

CDMA2000 has demonstrated that it serves operators’ business interests by enabling them to deploy services and applications that attract new customers, reduce churn rates, create new market opportunities and increase revenues. As voice, even wireless voice, becomes increasingly commoditized, operators look

to the 3G data service offerings to enhance their individual business cases. One recent example of how operators are gaining market advantage with the technology is Verizon Wireless in the United States, which reported that it gained an industry record 1.5 million customers in the second quarter of 2004, while dropping its churn rate from 1.7 per cent to 1.45 per cent and posting a 25 per cent increase in total revenues. [1]



Sierra Wireless

In Japan, KDDI had amassed more than 15 million 3G subscribers as of August 2004, just over two years after its entry into the 3G market in April 2002. The company attributes this achievement to its CDMA2000 1X and 1xEV-DO services that enable it to offer market-differentiating advanced broadband content and innovative handsets. [2]

One of the most popular services being offered by CDMA2000 operators on their 1X and 1xEV-DO networks is “push-to-talk”, which allows users to engage in immediate communication with one or more people. Push-to-talk over cellular (also known as PoC) is expected to lead to a variety of other “push-to” features such as instant conferencing and instant voice messaging.



Sierra Wireless



Initially deployed in Asia, 73 per cent of the CDMA2000 networks now operate in other regions

CDMA2000 deployments



- 91 CDMA2000 operators
- 46 countries
- 88 CDMA2000 1X commercial networks (first deployed in October 2000)
- 18 CDMA2000 1X networks scheduled to be deployed
- 6 CDMA2000 1X trial networks
- 11 CDMA2000 1xEV-DO commercial networks (first deployed in January 2002)
- 18 CDMA2000 1xEV-DO networks scheduled to be deployed
- 4 CDMA2000 1xEV-DO trial networks

★ 1X Commercial	■ 1xEV-DO Commercial
● 1X Deployment	◆ 1xEV-DO Deployment
☾ 1X Trial	▲ 1xEV-DO Trial

Note – At the end of August 2004, around 91 operators had launched CDMA2000 networks across the regions of the world as shown in this map, with Latin America in the lead with 27 operators, followed closely by Asia-Pacific (22), North America (21), Europe (14) and Africa and the Middle East (7). Source: CDG.

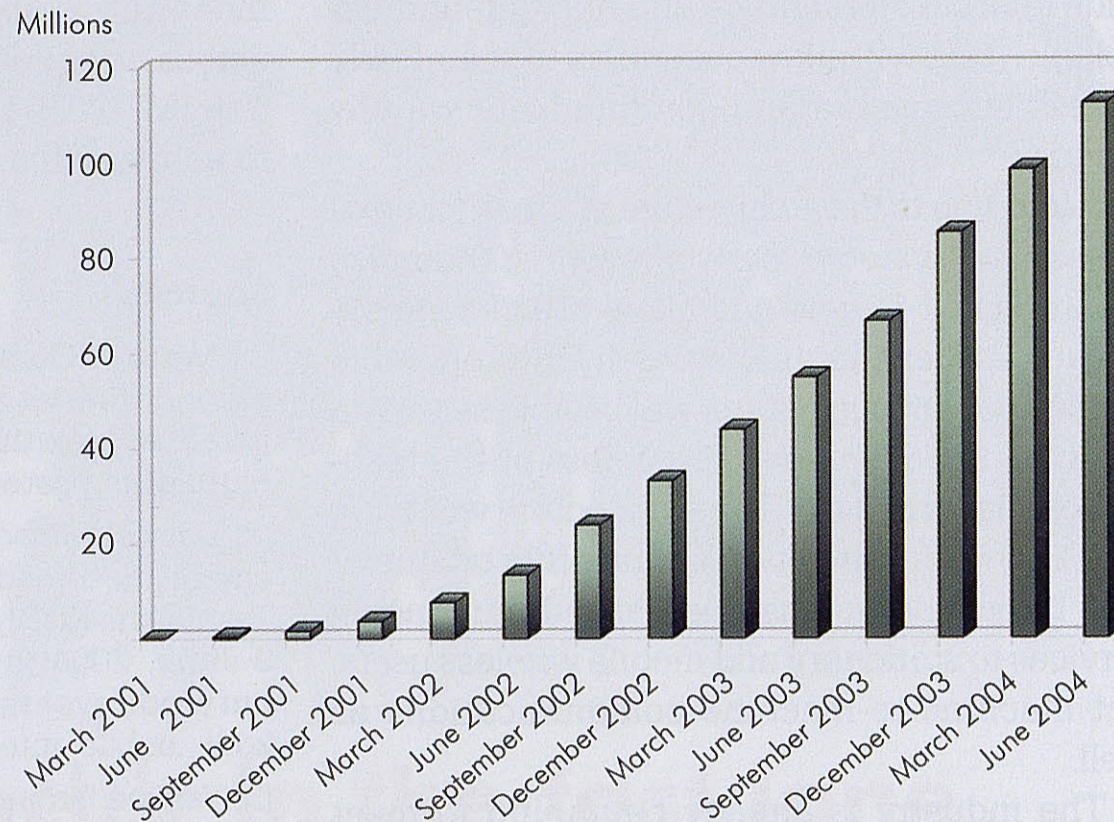
The service has broad applicability within both the consumer and enterprise sectors, as well as for public safety and government use. A number of handsets are already available with push-to-talk functionality, and more are expected to enter the market soon.

3G data services are noticeably increasing operators' average revenues per user (ARPU). The CDMA experience in the Republic of Korea is a good example of this. There, operators have reported a five-fold increase in data ARPU with 1X compared to 2G cdmaOne™. They have tripled their overall ARPU with 1xEV-DO compared to 1X, and doubled their data ARPU with 1xEV-DO compared to 1X.

CDMA2000 technologies operate in a variety of frequency bands (450, 800, 1700, 1900 and 2100 MHz) and can therefore support the varying needs of wireless operators around the world. A prime example is the 450 MHz band, where CDMA2000 is the only 3G wireless technology commercially available. In this band, CDMA2000 has become an exciting option for operators across Asia and in Eastern and Central Europe to deploy 3G services cost-effectively and in a spectrally efficient manner. And it gives analogue NMT-450 operators a thirty-fold increase in network capacity, enabling them to serve a larger number of users within their existing spectrum.

CDMA2000 also gives operators a new means of delivering both voice and broadband Internet services to previously underserved markets, particularly those in developing countries, offering a great opportunity to increase global access to telecommunications. In many developing countries without existing wireline infrastructure, CDMA2000 at 450 MHz is proving to be a particularly effective and efficient way for operators to meet their universal access obligations.

CDMA2000 subscribers



Note — There were approximately 112.6 million CDMA2000 subscribers worldwide, including 8.3 million 1xEV-DO subscribers, at the end of June 2004.

Source: CDG.

It is expected to enhance the lives of many in rural and underdeveloped areas, providing affordable access to telephones and the Internet where there was no access previously.

The future of 3G and CDMA

As the breadth of deployments indicates, CDMA2000 is already a mature technology, yet it is designed to have ongoing flexibility to advance in sophistication as operators have need for new capabilities. CDMA is expected to become the dominant wireless platform worldwide in the next five to six years as W-CDMA (which is also based on CDMA) and CDMA2000 take market leadership from second-generation GSM. The Yankee Group forecasts that by 2008, some 735 million subscribers (or nearly 40 per cent of the global market) will use 3G technologies. Of these subscribers, 628 million (or 85 per cent) will use CDMA-based 3G technologies. [3]

The next challenge: Delivering on the anytime, anywhere promise

While we believe that CDMA will be the dominant platform, it will coexist with other technologies. Creating a world of networks and

services that can deliver the anytime, anywhere promise will require a substantial, industry-wide effort to standardize and implement technologies that will allow customers to seamlessly access information and communicate via any device.

According to the architecture planned for next-generation systems, networks will standardize around an all-IP core and allow use of a variety of radio-access technologies in interoperable fashion so that consumers will be able to enjoy a common set of services regardless of the technology platform used. The architecture will bring in 2G, Wi-Fi, mesh networks and other technologies to provide not just high-speed multimedia services to stationary and mobile wireless users, but machine-to-machine communications as well.

The industry is already beginning to meet these needs in several ways. Many operators have begun migrating to all-IP networks. New multi-mode, multi-band, multi-network chipsets are available now to allow inter-standard roaming between networks, facilitating the manufacture of handsets that are increasingly adaptable to different environments. "World phones" that support both CDMA2000 and GSM are on the market today and within the next two years, devices that incorporate both CDMA2000 and W-CDMA will become available.

While these examples illustrate how interoperability can be addressed at the product level, the CDMA industry is also collaborating with standards-development organizations to define standards that will make it possible for applications and services to work independently of the air interface, allowing customers to exchange information and communicate across networks, service providers, devices and geographies.

Conclusion

With the global reach of 3G now a reality, we have entered an exciting new era in communications in which wireless spectrum has become the preferred medium for delivering text, video, music and speech to increasingly demanding business and consumer markets as well as to those who have never had access to such services before. Our task ahead is to find

even more ways to deliver on 3G's promise to ensure that wireless technologies continue to meet the communication needs of people across the globe rapidly and cost-effectively. The IMT-2000 family of systems will enable us to achieve this important goal. ■

Sources:

- [1] Verizon Communications Reports 6 per cent second-quarter revenue growth, led by wireless revenue growth of 25 per cent (second quarter highlights posted on 27 July, 2004).
- [2] Data obtained from "The Mobile Internet Strategy of the Broadband Era," presented by Makoto Takahashi, KDDI, at BREW Developer's Conference, 9 June, 2004 (http://brew.qualcomm.com/brew_bnry/pdf/events/brew_2004/makoto_takahashi_kddi_mobile_internet_strategy.pdf).
- [3] Yankee Group Global Wireless/Mobile Forecast, April 2004.

About the author

Perry LaForge is the Founder, Executive Director and Chairman of the CDMA Development Group (CDG). The CDG is a trade association comprised of over 100 of the world's leading wireless operators and manufacturers. At the CDG, Perry is responsible for overseeing the expansion of CDMA technology throughout the world and for leading the evolution of the technology through the CDG's subcommittees. Currently, there are over 500 individuals working on various CDG subteams. Perry has been involved in the development of CDMA since the first proof of concept trials in 1988. Perry sits on an advisory board for Innovative Global Solutions (IGS) and serves on the Board of Directors of SignalSoft and Broadband Wireless (BBW) corporations. He has participated in various industry committees, including the Cellular Telecommunications Industry Association's (CTIA) Presidents Technology Subcommittee, the Telecommunications Industry Association's (TIA) TR45 committee as well as the American Electronic Association's (AEA) interest groups. He has been a speaker in over twenty countries and has worked with government officials throughout the world to develop telecommunication policies. He is a frequent guest columnist for a number of publications and sits on editorial advisory Boards for *CDMA Spectrum* and *Wireless Business & Technology* magazines. Recently, Perry was listed as one of the top 50 telecommunications industry executives by *Wireless Week* magazine.



A nation united by network

Let's **KT**

Asia-Pacific in the fast lane

Can the region remain in the driving seat?

ITU TELECOM ASIA 2004 confirmed Asia-Pacific's position as global leader in information and communication technologies (ICT). Asia Leading the Future" — the theme of ASIA 2004 — was very much in evidence on the Exhibition floor, Forum sessions and in the data released from ITU research and analysis. Broadband penetration in Asia is the highest in the world. The Republic of Korea is the world leader, and there are three Asian economies among the top five worldwide. IMT-2000, or third-generation mobile, has taken off rapidly, particularly in Japan and the Republic of Korea. India has established itself as a hub for software development and outsourcing. Singapore has emerged a trendsetter in the field of e-government. And the region has become a dynamic manufacturing presence on the world stage. Alongside the big Korean and Japanese players at ASIA 2004

were Chinese companies showcasing their products in large booths. A total of 224 exhibitors from 25 countries (including 7 national pavilions) took part in the trade show.

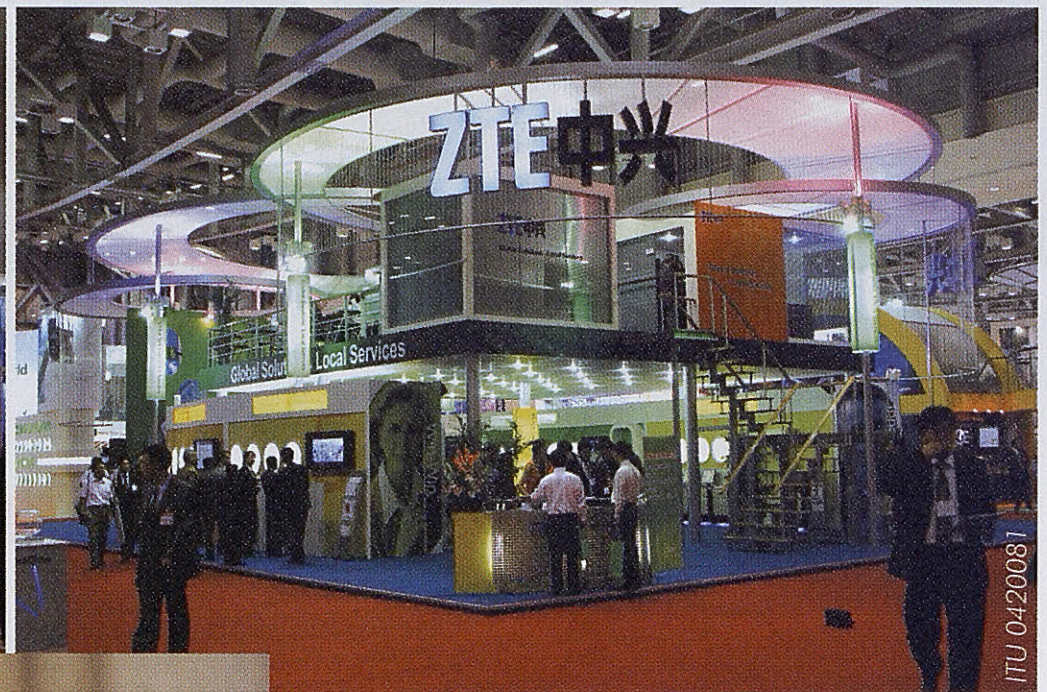
President Roh Moo-Hyun of the Republic of Korea opened what was the seventh regional telecommunication Exhibition and Forum for



President Roh Moo-Hyun of the Republic of Korea opening ITU TELECOM ASIA 2004

the Asia-Pacific region." The event which took place in the port city of Busan from 7 to 11 September 2004 attracted a total of 24 432 participants, including leading players in the regional and global telecommunication industry as well as top-level representatives of the region's government and regulatory bodies.

A total of 727 Forum delegates from 43 countries, including visiting ministerial delegations from Africa, Europe and Latin America examined the Asian model. Sessions such as "Turning market demand into profit," or "Building on broadband" looked at how to capitalize and build upon existing revenue schemes and harness the



So what has driven Asia's success? Forum examines avenues for ICT growth

ITU Secretary-General, Yoshio Utsumi attributed the region's success mainly to sound policies. "Asia's policy-makers have played a vital role in supporting competition and private sector participation in key markets. Instead of launching full competition onto markets, which arguably were not ready for it, policy-makers have taken a more measured approach. Where gradual but functioning market competition is in place, it has been visibly successful."

Mr Utsumi also noted "that a well-educated population together with the traditional Asian values of team spirit and a strong work ethic combined with cooperation at all levels between government and industry have ensured the success of Asia's information and communication technology sector."



ITU Secretary-General, Yoshio Utsumi, underlining how Asia-Pacific has come to top the global league in broadband penetration

opportunities offered by new services. "Making 3G global," or "Internet governance" were also important sessions that brought together representatives from government and industry to discuss future scenarios for next-generation mobile technologies or how the Internet should be governed.

Maintaining a competitive edge

Despite Asia's market leading position, broadband penetration is increasing in the rest of the world, and next generation services are being gradually deployed. So can Asia retain its edge over North America and Europe? Broadband speeds may be increasing in Europe, but leading countries in Asia are taking full advantage of their head start by rolling out technology, marking the next step in broadband development. In Japan, for example, fibre-to-the-home (FTTH) is being deployed — a broadband tech-

nology that offers faster speeds than DSL — and one which is suited to providing entire buildings with broadband access. Currently, common European DSL rates are up to 3Mbit/s while FTTH speeds start at 100Mbit/s. Thus, not only is broadband roll-out continuing, but it is doing so at far greater transmission speeds.

have ranges that extend up to 50 kilometres from a base station, and provide near-nation-wide coverage when offered as a networked service.

A number of Asia-Pacific economies including China are pushing ahead with the development and adoption of advanced wireless



A wire-free future?

A new set of advanced wireless technologies now promises to bring affordable, high-speed Internet connectivity to the masses. This set of technologies, and the market opportunity they create, has been termed the “Portable Internet”, which is also the subject of a new ITU report produced for ASIA 2004. Portable Internet technologies, very much in evidence on the Exhibition floor at ASIA 2004, promise to cut the cords to a wire-free future in which Internet access, for both fixed locations and users on the move, is supplied over the airwaves.

The technologies that make up the portable Internet operate at short, medium and long range, according to the geographical range of their radio signals (see *ITU News*, September 2004 issue, page 5). Short-range technologies, such as Bluetooth, ZigBee and RFID allow low-power connectivity within a range of 30 metres. Medium-range technologies can communicate at least 150 metres from a hot spot (e.g. Wi-Fi, or IEEE 802.11b) and up to several kilometres, depending on environmental and regulatory factors. Finally, long-range technologies such as WiMAX (IEEE 802.16) and IMT-2000 (3G)

Youth Forum at Asia 2004

Around 60 young people from 34 countries across the Asia-Pacific region, who are widely acknowledged as the region's ICT leaders of the future, came together at ASIA 2004 for the Youth Forum. They were able to meet with exhibitors from across Asia and around the globe and to take part in the main Forum sessions of their choice. Debates focused on three distinct areas: technology and applications, policy and regulation and finance and business opportunities.

The Youth Fellows worked together to produce a declaration and action plan, which they released to industry leaders at ASIA 2004. Essentially, the declaration calls for action on three levels: broader education and awareness of ICTs, further government accountability and increased cooperation between government, industry and civil society to help bridge the digital divide. The declaration is available at http://web/ITU-D/youth/events/youth_declaration_2004.pdf

broadband technologies such as WiMAX or iBurst — which is currently being deployed in Australia. In China, for example, the majority of the “connected” population lives in urban areas, concentrated mainly in the eastern part of the country. The Government has outlined objectives, which should help the roll-out of broadband. The Government’s short-term universal service objective is to bring the telephone service to 95 per cent of villages by 2005, and its long-term goal is to connect all businesses

and households to the public network by 2020. Earlier this year, an important development took place to boost broadband deployment when a new industry-wide alliance was formed. China Netcom joined forces with 18 major industry partners, including foreign manufacturers such as Ericsson, Siemens, Microsoft and Alcatel, as well as domestic manufacturers, Huawei, ZTE, Lenovo and Sina Corp. to develop access devices and applications for broadband users.



Map No. 3974 Rev. 12, August 2004

Copyright: United Nations Cartographic Section

Note – This is a map of the Economic and Social Commission for Asia and the Pacific showing its members and associate members. It is reproduced here with permission from the United Nations Cartographic Section to give a sense of the diversity of the Asia-Pacific region and the size of its market for telecommunications discussed in this article. The region has the world’s largest continent (Asia) and the smallest islands, and had 60 per cent of the world’s population of more than 6.3 billion people in 2003.

And so China is fast on track to become the world's largest broadband market, with 11.1 million DSL broadband subscribers in 2003 alone. Observers expect the Chinese market to grow by a 10 to 15 million broadband subscribers per year for the next several years. China Telecom, the country's largest broadband provider added nearly 5 million new broadband subscribers in 2003 and by mid-2004 announced that it had 10 million broadband subscribers. China Netcom (the country's number two fixed line provider) expects its broadband subscriber numbers to reach 15 million in 2005, and an ambitious 25 million broadband subscribers in 2006.

Disparities in the region remain

The Asia-Pacific region encompasses some of the most and least connected economies in the world. Success in areas such as broadband or next-generation mobile should not mask the gap between the region's low and high-income economies, underlines ITU's *Asia-Pacific Telecommunication Indicators 2004* report. "At year-end 2003, lower-income economies had an average total telephone penetration of 22.6 per cent, compared to 139.4 per cent in higher-income economies and 116.4 per cent for developed economies," the report states. The good news is that although this gap is considerable, it is showing signs of getting smaller. High levels of demand and more affordable technologies, amongst other factors, have meant that the growth rate for total teledensity between 2001–2003 in lower income economies was substantially higher (averaging 27.9 per cent per year) than in upper-income economies, where it stood at 5.6 per cent. At these rates, it could take less than eight years for lower-income economies to catch up with

Digital Access Index (2003)

High (0.70 and above)

Korea (Rep. of)	0.82
Hong Kong, China	0.79
Taiwan, China	0.79
Japan	0.75
Australia	0.74
New Zealand	0.72

Upper (0.50–0.69)

Macao, China	0.64
Malaysia	0.57
Brunei Darussalam	0.55

Medium (0.30–0.49)

China	0.43
Fiji	0.43
Iran (I.R.)	0.43
Philippines	0.43
Maldives	0.43
Sri Lanka	0.38
Samoa	0.37
Indonesia	0.34
India	0.32
Viet Nam	0.31

Low (0.29 and below)

Papua New Guinea	0.26
Vanuatu	0.24
Pakistan	0.24
Nepal	0.19
Bangladesh	0.18
Solomon Islands	0.17
Cambodia	0.17
Myanmar	0.17
Lao P.D.R.	0.15
Bhutan	0.13

Note — The Digital Access Index (DAI) shows rankings on a scale of 0 to 1 where 1 = highest access. DAI values are shown to hundreds of a decimal point. Economies with the same DAI value are ranked by thousands of a decimal point.

today's levels of teledensity in upper-income and developed economies. Governments could play a key role in helping less developed economies catch up, underlines the ITU Digital Access Index (DAI) published at the end of 2003. The DAI measures the overall ability of individuals in an economy to access and use information and communication technologies. Availability of infrastructure, affordability of access, educational level, quality of ICT services and Internet usage are key factors on which the DAI is based. It classifies economies into one of four digital access categories — high, upper, medium and low (see table). The DAI covers a total of 178 economies, making it the first truly global ICT ranking. Results of the DAI point to potential stumbling blocks in ICT adoption, and can help countries identify their relative strengths and weaknesses. In terms of affordability of access to the Internet, a regional Internet backbone is crucial. Today, operators (and therefore users) are still paying full-circuit costs to Internet backbones outside the region, which leads to high Internet access charges and hinders the development of the Internet, especially in Asia's least developed countries.

The trump card

Asia's trump card may well lie in its huge potential marketplaces such as China and India, which are emerging as ICT forces to be reckoned with and as important players in the field of research and development. Moreover, with the world's highest penetration rates and a diverse range of ever-evolving technologies, coupled with a populace that is highly receptive to new technologies, Asia-Pacific looks firmly set to hold on to its position as the world's ICT leader. ■

Ubiquitous networks

A move towards a new concept of ubiquitous communications is already afoot, with government and industry working together to help realize it. In Japan, the Government is supporting the development of “ubiquitous networks” to enable services that extend the use of the mobile device itself and provide greater interaction between mobiles, portable devices such as Personal digital assistants (PDA) or PCs, and even household appliances. The Ministry of Public Management, Home Affairs, Posts and Telecommunications (MPHPT) is urging the Government, the private sector and academia to work together to develop initiatives that leverage Japan’s strengths. The proposed initiatives cover three specific research and development areas: microchip networking technologies, the development of practical ubiquitous applications, and the media through which these technologies would be controlled, such as chips, cards or codes.

Already, Sony’s integrated circuit cards, branded “Felica”, are commonly used to ride the JR railway lines. NTT DoCoMo and Sony announced a joint venture in October 2003 to promote the use of Felica cards with mobile technologies. And at ITU TELECOM WORLD 2003, NTT DoCoMo announced the launch in 2004 of mobile phones equipped with these integrated circuit cards. A number of telecommunication businesses are considering the use of integrated circuit cards in combination with mobile phones as a new business opportunity.

In the Republic of Korea, the Government has been looking at the development of a new technology that will fill the gap between mobile and wireless technologies in terms of mobility and speed. Like Japan, it is envisioned that the technology will move emphasis away from the mobile device and instead allow access from any IP-based terminal, so in theory users could configure their Internet-enabled fridge via



ITU 0420080

broadband, their mobile phone, a PDA or any other connected terminal. This new 2.3GHz technology known as HPi (High speed portable Internet) has been developed by the Republic of Korea's Electronic and Telecommunications Research Institute (ETRI), although its final makeup has still to be confirmed.

Hand-held devices as the information gateway to the home

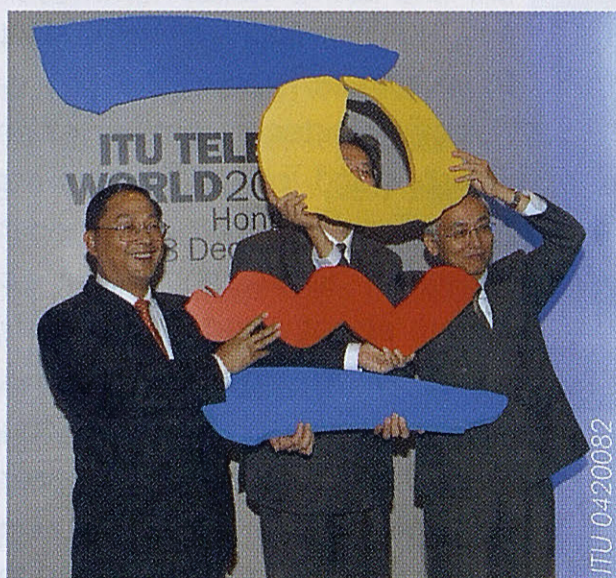
The Korean Government hopes to have 10 million homes equipped with intelligent networks by the year 2007, roughly 61 per cent of all households in the country. Its mobile operators and

handset manufacturers envision a society where mobile phones replace keys, wallets, credit cards, as well as function as the control for all the user's appliances. Many of these services are already available in the country, with several mobile operators offering home networking and application control over their 3G networks. One of the most advanced services is *SK Telecom's* "Nate" service that can interact and control networked appliances from afar. *Samsung and LG* are creating network-ready appliances, along with complementary technologies such as power line communications (PLC) for connecting the appliances to the network, middleware and microchips.

ITU TELECOM WORLD 2006 heads east

Countdown begins

ITU TELECOM ASIA 2004 also saw the launch of ITU TELECOM WORLD 2006. This ITU flagship event for the global telecommunications industry will be taking place at Asia World Expo, Hong Kong, China from 4 to 8 December 2006. "We want to ensure that we are taking into account, and meeting, the changing face and needs of the industry



From left to right: Jiang Yaoping, Vice Minister of Information Industry (China); John Tsang, Secretary for Commerce, Industry and Technology Bureau, Hong Kong Special Administrative region; and ITU Secretary-General, Yoshio Utsumi officially launching ITU TELECOM WORLD 2006 in Busan.



we serve," said ITU Secretary-General, Yoshio Utsumi. "Asia has become a centre for the global ICT industry and Hong Kong, China, with its superb communications and transport infrastructure, will provide a dynamic venue for ITU TELECOM WORLD," he added.

John Tsang, Secretary for Commerce, Industry and Technology Bureau, Government of the Special Administrative region of Hong Kong, People's Republic of China, noted: "Hong Kong is determined to give all participants of ITU TELECOM WORLD 2006 a fruitful experience in widening their business network worldwide and exploring further opportunities in the China market."

Least developed countries

The ICT challenge

Laudable boldness

Moving from the “perpetual pilot-project syndrome” to projects that can make a real difference on the ground was the hallmark of a recent ICT Stakeholder Forum at Pointe Aux Piments (Mauritius), where the primary focus was on least developed countries (LDC). It is widely recognized that greater use of information and communication technologies (ICT) in LDCs could help integrate these countries into the global economy and achieve the United Nations Millennium Development Goals and the targets that the first phase of the World Summit on the Information Society set for 2015. The big question is, how? The United Nations lists 49 countries — 33 of them in Africa — as “least developed.” A country falls into this category if its three-year average estimate of per capita gross domestic product is under USD 900, has a weak human resource base, and its economic base is vulnerable to shocks resulting in instability of economic fundamentals such as agricultural production and exports of goods and services. An estimated 600 million people live in LDCs.

Speaking at the Forum, Jayakrishna Cuttaree, Mauritius’s Acting Prime Minister and Minister of Foreign Affairs, International Trade and Regional Cooperation, said that the digital economy had “a growth potential for

the global gross national product of many countries, of which LDCs cannot be an exception”. He stressed that “countries which perceive the digital highway as one of the vectors of

The marked disparity between the least developed and the developed countries often raises the question of whether ICTs are providing a level playing field for Marshall McLuhan’s “global village” or widening the gap...

In a series of bilateral and multilateral negotiations, development partners at the “Global ICT Stakeholder Forum sought innovative ways of helping the world’s poorest countries join the information society.

growth and which harness its potential to the fullest, will definitely have that marked edge which guarantees growth.” Adapting to this new phenomenon in the shortest space of time possible is the *sine qua non* for

escaping from the underdevelopment trap to prosperity, he also said.

Most of the countries represented at the Forum are experiencing difficulties embracing new technologies because of limited financial, technical and human resources. In the words of Mauritius’s Minister of Information Technology and Telecommunications, Deelchand Jeeha: “Many of these countries have other priorities to address, such as food, housing, health and unemployment problems. And unless and until they obtain the assistance of the international community and donor agencies, it would be very difficult for them to invest in ICTs — and the digital divide between the rich and the poor countries will continue to accentuate.”

Kiribati’s Minister of Communications, Transport and Tourism Development, Natan Teewe, further underlined this challenge: “Whilst the LDCs are still talking about connectivity to the narrowband, slow-speed dial-up Internet access, the developed countries are talking about broadband high-speed connectivity and connections to the home.” He stressed that the marked disparity between the LDCs and the developed countries often raises the question, on the part of LDCs, as to whether ICTs are providing a level playing field for Marshall McLuhan’s “global village” or widening the gap.

Stimulating positive change

"These challenges show why the multi-stakeholder Forum was so important, not only for LDCs but for all of us trying to make a difference on the ground", said Hamadoun I. Touré, Director of ITU's Telecommunication Development Bureau (BDT). "Technological developments, if left unmanaged, can widen the current digital gap and trap developing and least developed countries in a perpetual spiral of poverty and exclusion," Mr Touré also said. He warned governments against over-regulation that can stifle innovation and urged them to ensure they put in place dynamic but flexible and transparent regulatory regimes. He challenged business leaders to explore the abundant market opportunities that remain untapped in least developed countries. While cautious, he expressed confidence that the private sector was now able to develop services in LDCs that have set up adequate regulatory environments with the perspective of an adequate return on their investment.

The Forum (7–9 July 2004) was organized jointly by the International Telecommunication Union and the Commonwealth Business Council and held in association with NEPAD's e-Africa Commission. It enabled development partners to hold a series of bilateral and multilateral negotiations on innovative ways of helping the world's poorest countries break away from the poverty trap to join the information society. Hosted by the Mauritian Ministry of Information Technology and Telecommunications, the Forum attracted 150 participants from government, business, civil society and donor agencies. Ethiopia, Ghana, Lesotho, Mali, Solomon Islands and Sudan were also represented at ministerial level.

The Forum aimed at stimulating positive change. In particular, participants

examined proposals and models that can be translated into concrete projects mainly in the areas of infrastructure, universal access, education services and entrepreneurship, with some seeking possible sources of funding. Governments and small-and-medium-sized enterprises (SME) from LDCs discussed specific areas of

cooperation with development partners in one-on-one sessions. Donors and businesses had the opportunity to examine problems of investment in LDCs. Participating governments showed great interest in finding out how best to attract financing into their ICT sector. The debate gave rise to a number of policy options that could



From left to right (front row): Deelchand Jeeha, Mauritius's Minister of Information Technology and Telecommunications; Jayakrishna Cuttaree, Mauritius's Acting Prime Minister; Professor David Mellor (United Kingdom) President of Cable & Wireless Virtual Academy and Chairman of the Telecommunication Development Advisory Group (TDAG); and Hamadoun I. Touré, Director of ITU's Telecommunication Development Bureau (BDT)

Kiribati's experience

The major challenge that now faces most least developed countries is their capability to improve and expand their basic telecommunication infrastructure within their national boundaries, and to sustain the network in the long term. As far as ICT development is concerned, LDCs are also faced with the challenge of finding an effective and efficient model that delivers services to customers at the lowest prices possible — a model that is self-financing in the long term.

Take for example, the Republic of Kiribati, an LDC made up of 33 scattered coral atolls in the Pacific Ocean, straddling the equator. With a total land area of 810 km² and a population of 84 000 inhabitants, Kiribati has a predominantly rural society with a subsistence economy: the country's exports are copra, fish and seaweed with further income from royalties from former phosphate mining on Banaba, fishing rights, aid and remittances from seamen and others working abroad.

In 2004, Kiribati embarked on the expansion of its telecommunication network to the outer islands, a network which consists of satellite earth stations (providing the main trunk lines), a mini-switch (providing the switching capability) and a digital-radio network providing the intra-island access network and the inter-island trunk lines for islands located close to each other. Work on the implementation of the project is being carried out in three phases. Phase I is progressing with funds solely from the Government's limited funds, and should be completed by year-end 2004. The remaining phases will be rolled out in the coming years, funds permitting.

In an effort to implement Phase I at a minimal cost, second-hand digital-radio equipment was used to provide the local digital-radio network. Care has been taken to ensure that the second-hand radio equipment is robust enough to last in the country's corrosive and adverse environmental conditions, and that it can generate sufficient revenue that can then be used to procure new replacement radio equipment. In addition, the Government is restructuring the communications sector with a view to making it more responsive and self-financing.

A new Telecommunications Bill was introduced in Parliament recently, and passed its first reading. The anticipation is to complete the legislative process in November 2004. The new Act will see the setting up of an independent Telecommunications Authority to regulate the industry and set up and manage the Telecommunications Development Fund. This Fund will comprise revenue from the sale of scarce Government resources, such as the ".ki" domain names and surplus numbers (country code 686), surplus licence fees, lease-fee monies from the leasing of major telecommunication assets and contributions to the universal service obligations from potential telecommunication and ICT service provider(s). The new Act also encourages the unbundling and liberalization of telecommunication services in order to enable more contributions to the Fund from profitable telecommunication and ICT services. This will be a rather slow reform process, which will require strict monitoring considering the country's small economy.

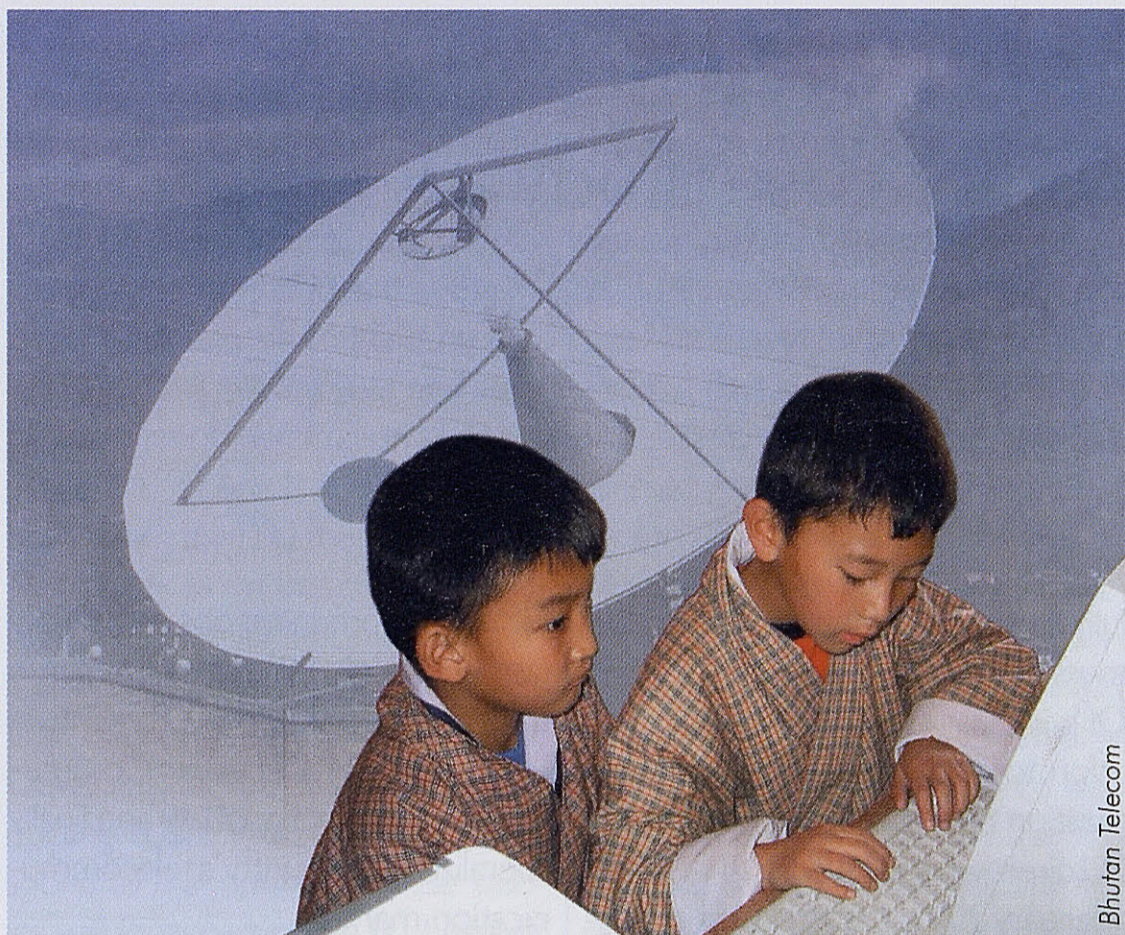
Kiribati wants to establish community-owned multipurpose telecentres on the outer islands, as a development model, to provide affordable ICT access to the community. This is in line with its development strategy to provide ICT access points within easy reach of the community. Telecommunications and ICT is a capital-intensive industry, and to most LDCs, the effort to close the "digital divide" within their national boundaries will take some time, and will involve huge investments. ■

help increase investment flows into LDCs, the accent being on:

- firm commitment from government to develop the ICT sector;
- a well laid out ICT policy that clearly specifies a country's priorities;
- opening up the ICT sector gradually to full competition. In the long run, only competition can ensure that the best of ICT services are available to consumers at reasonable prices.

Mauritius is not an LDC, but its experience in ICT projects and best practices can serve as a model for other countries. The Government has the vision to transform the country into a Cyber Island and to make the ICT sector the fifth pillar of the economy after sugar, textile, tourism and the financial services sector. As Minister Jeeha put it: "We are currently facing threats for our sugar and textile industry and we have to struggle perpetually to survive in this highly competitive world. We have identified ICT as a potential engine of growth, which can generate jobs for our young unemployed and additional wealth for the nation. We consider that ICT is not only a sector of growth by itself, but may also be successfully harnessed to improve efficiency and productivity in the other sectors of the economy. In fact, our objective is to make Mauritius an information society where the citizens, the Government, the business community and the ICT industry can work together to fully reap the benefits of ICTs."

Mohan Kaul, Chief Executive Officer of the Commonwealth Business Council (CBC), underscored the importance of the Forum as a platform that served to "get the various stakeholders talking to each other". Besides, the goals of CBC match those of the ITU Telecommunication Development Sector (ITU-D), making the Forum mutually beneficial. CBC is committed to facilitating the delivery



Bhutan's "ICTization" project aimed at connecting 20 schools and surrounding communities to ICT has captured the interest of the Global VSAT Forum, Cisco Systems and Inmarsat

of ICTs for development through multi-stakeholder partnerships. To this end, CBC identifies appropriate projects and brings together partners locally and internationally to deliver ICTs to assist Commonwealth governments in achieving the Millennium Development Goals.

A new kind of relationship is also being established between Africa and its partners. This is being done through the New Partnership for Africa's Development (NEPAD), that continent's most vital instrument for eradicating poverty. NEPAD's relevance to LDCs was stressed by Henry Chasia, Executive Deputy Chairman of the e-Africa Commission: "Today we see an Africa that is not only determined to address its plight but also one that is united in that determination. In three years, NEPAD has come to be recognized and accepted as the main socio-economic programme of the continent by the UN system as well as all important forums such as the G8, the European Union, the Non-Aligned

Movement, the Commonwealth, the Francophonie, the World Economic Forum and partners in the South-South cooperation sphere." With the support of all, "we should be well on the way to making a real difference to least developed countries", he added. He presented the NEPAD ICT Programme, which seeks to bridge the digital divide within Africa and between Africa and the rest of the world.

Development assistance

Mali sought assistance on an e-government project to link 27 ministries through the Internet. The United States Agency for International Development (USAID), whose assistance programmes focus on facilitating the provision of e-government services to increase transparency, particularly in government procurement projects, responded positively to Mali's call.

Lesotho's plea for assistance in strengthening the regulatory skills of

the regulatory agency's board members raised positive interest from the African Development Bank, which also showed great interest in financing two SMEs from Malawi and Mauritius.

Promising projects

Among the projects reviewed was the ITU Internet Training Centre Initiative implemented in over 50 countries in partnership with Cisco Systems. Comoros and Kiribati saw merit of this initiative for their countries, and have embarked on negotiations with ITU and Cisco to join. Also in the spotlight were the ITU Global Telecommunication University supported by Cable & Wireless and the ITU Youth Education Scheme (the YES Programme) that operates under a partnership arrangement with Vodafone, Anacom of Portugal and NTI of Egypt.

A number of participating businesses expressed interest in the ITU Global E-Learning initiative aimed at providing Internet connectivity to rural schools and e-health services to remote communities in cooperation with Inmarsat and I-Linx. The Global E-Learning initiative is open to other development partners wishing to join. Bhutan's "ICTization" project, aimed at connecting 20 schools and surrounding communities to ICT, has also generated a lot of interest from the Global VSAT Forum, Cisco Systems and Inmarsat. As part of follow-up activities, ITU will facilitate full-fledged commitments and delivery on the basis of the initial contacts established at the Forum. ■

For more information, please contact: "Cosmas Zavazava, Head of the Special Unit for Least Developed Countries, ITU Telecommunication Development Bureau. Tel.: +41 22 730 5447. E-mail: cosmas.zavazava@itu.int " or visit www.itu.int/itu-d/ldc/mauritius

Lithuania

Country case study

Why Lithuania?

Located along the Baltic Sea, the Republic of Lithuania was one of ten European countries to join the European Union (EU) on 1 May 2004. Lithuania's telecommunication policy and regulatory environment has changed dramatically in recent times. In just under two years, the country's telecommunications moved from being a monopoly market to a

fully liberalized information and communication technology (ICT) sector. Of particular note is Lithuania's transition towards greater market liberalization through the transposition of EU directives into its national laws. On 1 January 2003, the legal basis of telecommunication activities (electronic communications) changed in essence, with the coming into effect of a new law. This law transposed the (old)

EU telecommunications regulatory framework of 1998, as well as some parts of the 2002 new Regulatory Framework for Electronic Communications, into national law and finally liberalized the country's telecommunication market.

From a licensing perspective, Lithuania is one of the first EU countries to move to a liberal licensing regime based on general authorizations —



Map No. 3783 Rev. 1, January 2004

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a system that abolishes the requirement for individual licences for an entity to engage in telecommunication activities. These rapid changes have made Lithuania an ideal candidate for the series of case studies that the International Telecommunication Union is carrying out this year on licensing in an era of liberalization and convergence. There is a growing demand from the ITU membership for best practices on this crucial regulatory aspect of efficient market liberalization. The Regulatory Reform Unit of the ITU Telecommunication Development Bureau (BDT) is conducting country case studies to respond to that demand. These studies will form part of the ITU report: *Trends in Telecommunication Reform 2004 — Licensing in an Era of Convergence*. The report will be presented to the 5th annual ITU Global Symposium for Regulators scheduled to take place in Geneva from 8 to 10 December 2004.

Legislative changes that led to full competition and easy market entry

The major transformation of the Lithuanian telecommunication sector reflects not only the policy and regulatory changes that are sweeping through Europe now, but also those that are transforming telecommunication markets worldwide. Until 31 December 2002, Lietuvos Telekomas (then partially State-owned) was the sole provider of public fixed telephony services. Only certain value-added services, such as data and Internet access, leased line and fixed and mobile satellite services were open to competition. In the mobile market, Omnitel launched its services in 1995, Bité GSM started operations at the end of 1995 and Tele2, the third mobile operator, in 1998.

All of this changed on 1 January 2003, when the law passed on 5 July 2002

(No. IX-1053) entered into force, ending the monopoly of Lietuvos Telekomas and opening up the telecommunication market to full competition. Prior to this date, operators of public networks and providers of public telecommunication services (except data, leased lines, VSAT and Internet services) required individual licences granted by the sector ministry for a ten-year period.

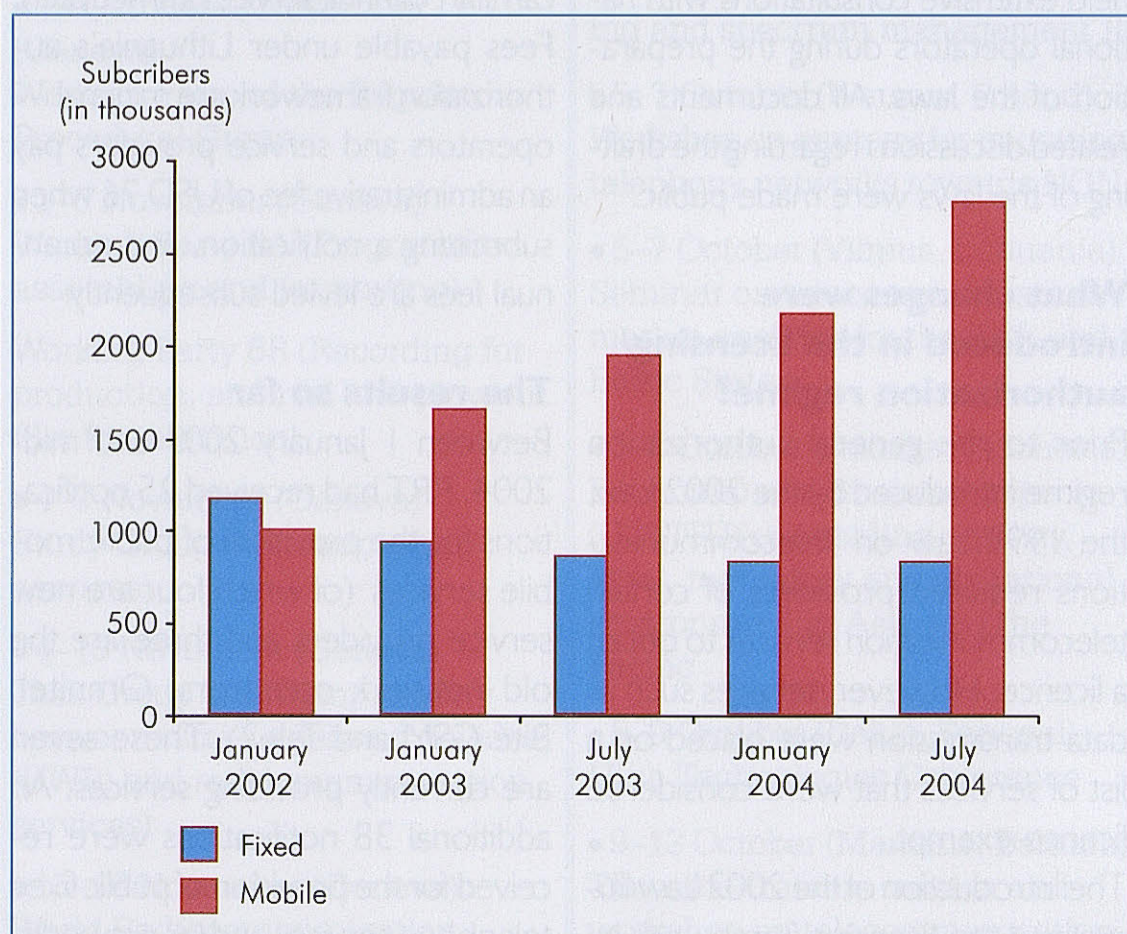
No sooner had the 2002 Law come into effect than the drafting of a new law started, culminating in the 2004 Law (No.X-2135) on Electronic Communications that entered into force on 1 May 2004 on the day Lithuania acceded to the EU. The key objective of the new law is to transpose the 2002 set of EU Directives on the New Regulatory Framework for Electronic Communications and Associated Services into national legislation. In comparison with the 2002 Law, the scope of regulation of the 2004 Law is much broader. New provisions have been introduced to

reinforce consumer and data protection, while provisions on determining significant market power (SMP) have been brought in line with the latest EU competition law principles. By mid-2004, the number of fixed lines had increased to 821 900 while mobile subscribers totalled 2 746 200. The country's fixed line teledensity is at 24 subscribers per 100 inhabitants while mobile teledensity is at 80 subscribers per 100 inhabitants. Lithuania is also one of the countries where the number of mobile subscribers had surpassed that of fixed line users by the end of 2002 (see chart).

The institutions

The principle institutions involved in telecommunication policy and regulation are the Ministry of Transport and Communications (the ministry) and the Communications Regulatory Authority (RRT). The ministry is in charge of defining and implementing the country's Government policy in the field of telecommunication development.

Main lines and mobile subscribers in Lithuania (2002–2004)



Source: Communications Regulatory Authority, Lithuania.

RRT was constituted as an independent State institution from the old State Radio Frequency Service. It began its activities on 1 May 2001. Following the entry into force of the 2002 Law on Telecommunications, RRT was assigned wide-ranging responsibilities. It was also given full authority over licensing activities, including the granting of licences for scarce resources such as spectrum and numbers. Licensing policy pursuant to the 2002 Law was developed entirely by RRT. In line with the 2002 EU regulatory framework on electronic communications, further discretionary powers were granted to RRT under the 2004 Law on Electronic Communications, particularly in the determination of entities having significant market power.

The importance of consultation

Transposing EU directives into the national legislative framework has been made easier largely through information gathering, awareness raising and giving more powers to the regulatory authority and the sector ministry. RRT and the sector ministry held extensive consultations with national operators during the preparation of the laws. All documents and related discussions regarding the drafting of the laws were made public.

What changes were introduced in the licensing/ authorization regime?

Prior to the general authorization regime introduced by the 2002 Law, the 1998 Law on Telecommunications required providers of certain telecommunication services to obtain a licence. However, services such as data transmission were placed on a list of services that were considered licence-exempt.

The introduction of the 2002 Law liberalized the licensing framework by abandoning the requirement for in-

dividual licences. In its place, a general authorization regime was introduced. Under the new regime, an undertaking is permitted to engage in a telecommunication activity without any procedural formality. Notification is only required for the provision of certain listed services (see box).

With regard to spectrum, frequency rights were no longer included in the operating licences of mobile operators. The assignment and use of scarce resources, such as spectrum and numbers, are subject to permission (rights to use). The 2002 and 2004 Laws allow RRT several options when granting frequencies and numbers. These include a direct grant to the applicant on request or by auction or tender (beauty contest) in cases where demand for the particular resource is high.

How to notify

To notify the commencement of telecommunication activities, an undertaking is required to complete and submit a standard notification form to the regulator (see <http://www.rtt.lt/>), and can start offering services immediately. Fees payable under Lithuania's authorization framework are minimal — operators and service providers pay an administrative fee of USD 76 when submitting a notification, and no annual fees are levied subsequently.

The results so far

Between 1 January 2003 and mid-2004, RRT had received 25 notifications for the provision of public mobile services (of which four are new service providers and three are the old network operators: Omnitel, Bité GSM and Tele2). These seven are currently providing services. An additional 38 notifications were received for the provision of public fixed telephone services and/or networks, half of which have started operation

Telecommunication activities requiring notification

An undertaking is required to notify the Communications Regulatory Authority (RRT) on the commencement and ending of any of the telecommunication activities listed in the Authority's Order No. 176. These activities include:

- the provision of a public telephone network and/or public fixed telephone services;
- the provision of a public mobile radio communication network either fully or partially used to provide public mobile telephone services and/or the provision of public mobile telephone services;
- the provision of leased line services.

Source: RRT Order No. 176 on "The Approval Of General Terms And Conditions For Engaging In Telecommunications Activities".

and competition with the incumbent. The liberalization of the market for public fixed line telephony on 1 January 2003 resulted in the telecommunication sector generating USD 0.5 billion in revenues that year (i.e., revenues from public fixed, mobile telephony, leased lines and Internet access services) compared to USD 0.4 billion in 2002.

The migration to the new licensing regime has been viewed as a smooth one by the operators affected. To a large extent, no significant resistance was shown because the new regime was regarded as one that was simpler and more straightforward. ■

More information on Lithuania's experience is available on the Regulatory Reform Unit's TREG website at: <http://www.itu.int/ITU-D/treg/>.

Contributed by Nancy Sundberg, Regulatory Reform Unit, ITU/BDT.



ITU conferences

2004

- 5–14 October (Florianopolis, Brazil)
World Telecommunication Standardization Assembly (WTSA-04)
- 8–12 December (Geneva)
Global Symposium for Regulators

Radiocommunication Sector

- 4–11 October (Geneva)
Working Party 4B (Systems, performance, availability and maintenance)
Working Party 4-9S (Frequency sharing between the fixed-satellite service and the fixed service)
- 11–15 October (Geneva)
Working Party 1A (Spectrum engineering techniques)
Working Party 1B (Spectrum management methodologies)
Working Party 1C (Spectrum monitoring)
- 12 October (Geneva)
Joint Study Groups 4 and 9 meeting
- 13–20 October (Shanghai, China)
Working Party 8F (IMT-2000 and systems beyond IMT-2000)
- 13–21 October (Geneva)
Working Party 4A (Efficient orbit/spectrum utilization)
- 18–19 October (Geneva)
Study Group 1 (Spectrum management)
- 19–27 October (Geneva)
Working Party 3J (Propagation fundamentals)
Working Party 3K (Point-to-area propagation)

- 22 October (Geneva)
Study Group 4 (Fixed-satellite service)
- 25–27 October (Geneva)
Working Party 6Q (Performance assessment and quality control)
- 25–28 October (Geneva)
Working Party 6M (Interactivity and multimedia broadcasting)
- 26–29 October (Geneva)
Task Group 6/9 (Large screen digital imagery)
- 26 October–3 November (Geneva)
Working Party 6E (Terrestrial delivery)
- 28–29 October (Geneva)
Study Group 3 (Radiowave propagation)
- 28 October–2 November (Geneva)
Working Party 6P (Content production/postproduction)
Working Party 6S (Satellite broadcasting)
- 29 October–3 November (Geneva)
Working Party of the Regulatory Procedural Group
- 1–3 November (Geneva)
Working Party 6A (Programme assembling and formatting)
Working Party 6R (Recording for production, archival and play-out film for television)
- 4–5 November (Geneva)
Study Group 6 (Broadcasting services)
- 4–10 November (Geneva)
Task Group 1/8 (Compatibility between ultra-wideband devices (UWB) and radiocommunication services)
- 15–19 November (Geneva)
World Radiocommunication Seminar

- 22–26 November (Geneva)
Radiocommunication Advisory Group (RAG)
- 6–10 December (Geneva)
Radio Regulations Board (RRB)

Telecommunication Standardization Sector

- 4 October (Florianopolis, Brazil)
Symposium on Cybersecurity
- 5–14 October (Florianopolis, Brazil)
World Telecommunication Standardization Assembly (WTSA-04)

Telecommunication Development Sector

- 4–7 October (Cairo)
Regional seminar on telecommunication and environment (joint meeting with LAS)
- 5–7 October (Bratislava, Slovakia)
Workshop on spectrum monitoring and spectrum management II
- 5–7 October (Warsaw, Poland)
Workshop on strategy for migrating telephony networks towards NGN
- 5–7 October (Vilnius, Lithuania)
Seminar on telecommunication market analysis for the CEE and Baltic States
- 5–8 October (Jakarta, Indonesia)
Economic and financial aspects (COSITU) of enabling a policy, legal, regulatory and operational environment in Asia and the Pacific
- 5–9 October (Dakar, Senegal)
High Technologies Conference
- 9–13 October (Manama, Bahrain)
Train-the-trainers session and workshop on telecommunication financial modelling — SIMOBIZ



ITU conferences

- 10–12 October (Cairo)
Workshop on IP telephony
- 18 October–10 December (Montevideo, Uruguay)
Projects full management (PMT)
- 25–29 October (Geneva)
Expert dialogue meetings on analysis of tools and models to conduct economic forecasts, simulations and sensitivity analyses
- 25 October–19 November (San José, Costa Rica)
Transitional scenarios towards next-generation networks
- 25 October–17 December (Montevideo, Uruguay)
Mobile networks planning and design
- 26–29 October (Gaborone, Botswana)
Regional workshop on ICT indicators (SADC /COMESA region)
- 31 October–2 November (Kampala, Uganda)
ITU Partnership Forum for ICT Projects in Africa region (with SONATEL)
- 1–2 November (Kampala, Uganda)
Meeting of the Regional Working Party on private sector issues, Africa region (with SONATEL)
- 3–5 November (Kampala, Uganda)
Forum on Telecommunication Regulation in Africa
- 3–5 November (Phnom Penh, Cambodia)
11th Subregional Telecommunication Meeting for Cambodia, Lao PDR and Viet Nam
- 9–12 November (Curacao, Netherlands Antilles)
Training workshop on COSITU for Caribbean countries
- 15–19 November (Nairobi, Kenya)
Workshop on mobile business simulation — SIMOBIZ (INT France)
- 16–18 November (Kiev, Ukraine)
ITU Partnership Forum for ICT Projects and Regional Working Party on private sector issues in Europe/CIS Region (with URKTELECOM)
- 16–19 November (Mexico City)
Global Indicators Workshop on Community Access to ICTs
- 19–25 November (Dubai, United Arab Emirates)
Regional seminar on e-government
IP regional symposium
- 21–25 November (Amman, Jordan)
Workshop on network interoperability — WLAN
- 22–26 November (Dakar, Senegal)
Train-the-trainers workshop on next-generation networks (NGN)
- 28–30 November (Algiers, Algeria)
Workshop on frequency spectrum management
- 29 November–3 December (Dakar, Senegal)
Train-the-trainers session and workshop on mobile telecom business simulation — SIMOBIZ
- 30 November–2 December (Tunis)
Annual Meeting for Telecommunication Development in the Arab region
Regional Working Party on Private Sector Issues, Arab region (with MOBINIL)
- 6–8 December (Amman, Jordan)
Workshop on universal access and service policies
- 6–10 December (Dakar, Senegal)
Spectrum management workshop on frequency monitoring
- 8–10 December (Geneva)
Global Symposium for Regulators
- 13–14 December (Geneva)
Third Meeting of the Telecommunication Development Advisory Group (TDAG) dealing with Private Sector Issues
- 15–17 December (Geneva)
Tenth Meeting of the Telecommunication Development Advisory Group (TDAG)

This information was correct as of 2 September 2004.



Conferences external to ITU

- 18–21 October (Palais des Congrès, Bordeaux, France)
ICIN 2004 (9th International Conference on Intelligence in service delivery Networks)
Tel.: +33 5 56 15 11 99 / 61
Fax: +33 5 56 15 11 60
Info: icin2004@adera.fr
<http://www.adera.fr/icin2004/>



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Throughout history there have always been certain people who have led the way. People who

ideas and shape the future of the telecommunications industry. Our events read like a Who's Who of telecommunications.

telegraph to voice, data and multimedia services we have helped the telecommunications industry to evolve to where it is today.

didn't allow the world to hold them back. One such example was Alexander Graham Bell and his team. They are evidence that when great minds come together they really can improve the future of humanity. Over time the list has grown to include the Wright Brothers, Edison, Marconi, Berners-Lee and Gates, to name a few.



As part of the United Nations, ITU has also played a key role in the global advancement of telecommunications, through a mix of members which include government, regulators and industry that represent an unrivalled networking opportunity for brokering partnerships. As a non-profit organization, our resources are reinvested into promoting the development of telecommunications worldwide. It is our mission to extend

WHEN THE RIGHT PEOPLE GET TOGETHER, ANYTHING IS POSSIBLE.

The International Telecommunication Union (ITU), the organizer of the ITU

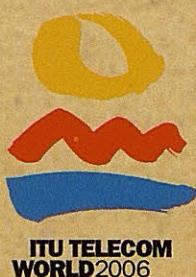
TELECOM events worldwide, connects all the great minds and companies in the telecommunications and ICT sector, bringing together the right people on a global as well as a regional level. The industry gathers at ITU TELECOM events to forge partnerships, conduct business, exchange

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Image donated by Corbis-Bettmann. Alexander Graham Bell National Historic Site of Canada.



Helping the world communicate