International Telecommunication Union

ANNUAL REPORT

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Foreword

Yoshio Utsumi
Secretary-General

The year 2000 proved an exceptionally busy and productive one for ITU.

One of the most significant events of the year was undoubtedly the World Radiocommunication Conference (WRC-2000), held in Istanbul in May. With demand for spectrum to feed a spiralling range of new radio-based services now intense, the decisions taken by this increasingly complex international treaty-making conference have an enormous impact on the viability of tomorrow's wireless communications systems. WRC-2000 made exceptional progress, resolving a number of crucial issues and paving the way for strong future development of this important field. Key achievements included agreement on a new Broadcast Satellite Service Plan, which will increase the availability of broadcast channels to countries in Africa, Europe, Asia and Australasia; agreement on spectrum allocation for a new, European satellite positioning service; finalization of spectrum sharing arrangements between geostationary and non-geostationary satellite systems; and new allocations for emerging point-to-point and point-to-multipoint broadband wireless access technologies.

The World Telecommunication Standardization Assembly (WTSA- 2000), held in Montreal, Canada, in September/October, also took major steps forward through a new blueprint aimed at further streamlining ITU standards-making activities, which now cover a huge array of technologies ranging from optical networks and IP to xDSL and next-generation mobile. Included in this blueprint are leaner procedures, such as "virtual" meetings and a new fast-track approval process that will see key standards delivered in as little as eight weeks from technical maturity; the establishment of a new Study Group dedicated to developing standards for IMT-2000 mobile networks and future mobile services; the adoption of a framework for the progressive reduction of international accounting rates; and the creation of an important new Recommendation on Internet interconnection, which establishes a principle for compensation of operators providing international circuits for Internet traffic.

With liberalization, technological convergence and the rapid emergence of new communication services exacerbating the complexity of markets worldwide, the Union is also playing an increasingly vital role as a facilitator of international policy-making. In line with this important function, the year 2000 saw us organize a number of key initiatives aimed at building global understanding and consensus among policy-makers, national regulators and industry. One such initiative is our ongoing programme of strategic workshops, begun in 1999, which in the year 2000 focused on the areas of fixed-mobile interconnection and IP Telephony. Our fixed-mobile interconnection workshop dealt with the regulatory, economic and policy aspects of connecting wireline and wireless networks. Our IP Telephony workshop, meanwhile, sought to address the implications of this emerging technology for the developing world, in preparation for the Union's third World Telecommunication Policy Forum in 2001. In addition to these two important events, ITU also organized its first Development Symposium for Regulators, which met to discuss the emerging challenges prompted by the evolution of national, regional and global markets.

We also played an instrumental role in advancing the uptake of electronic trading in the developing world, with the launch of infrastructure deployment in the 111 countries now participating in our Electronic Commerce for Developing Countries (EC-DC) project. And through our Centres of Excellence project, we furthered Internet-based distance learning with a special course for regulators in Latin America which met with unprecedented success, while at the same time setting up our first Virtual Learning Centre in Asia Pacific.

The year 2000 was also a highly successful one for ITU's TELECOM exhibitions and forums, with an Americas regional event in Rio de Janeiro, Brazil, in April, followed by ITU TELECOM ASIA 2000 in Hong Kong in December.

Finally, in the all-important area of ITU reform, work continued in redefining the structure of the Union and its future role as global facilitator in the areas of policy-making, telecoms development, and standardization.

In a world where market opportunities are not only more exciting, but more complex than ever before, I believe ITU's unique contribution to an increasingly broad range of telecommunication activities will ensure we remain a leading force in the future growth of this most dynamic of industries.

ITU in Transition

Successful refocusing of ITU as a policy-oriented organization through initiatives such as the World Telecommunication Policy Forum and the New Initiatives Programme, along with substantial strengthening of in-house research capabilities to support new projects

Stronger ITU role in international regulatory affairs through annual global symposia for regulators, regulatory workshops on highly topical issues, a regulator's hotline to provide rapid responses to urgent regulatory issues and the development of new publications such as the *Trends in Telecommunication Reform* series and national case studies

Lead role taken by ITU in the organization of a key world policy event – **the 2003 World Summit on the Information Society** – aimed at bridging the Digital Divide

Enhancement of the relevance of the standards-setting process, including a fast-track approval process for ITU-T Recommendations

Development of the IMT-2000 global standard for 3G mobile telephony and coordination of efforts to establish an internationally agreed regulatory framework to facilitate the global circulation of IMT-2000 terminals and full worldwide roaming

Strengthening of the Union's on-the-ground presence and field activities via its network of regional and area offices

More direct involvement of the private sector in planning and governance through a stronger role for the Sector advisory groups

Introduction of efficiency measures to support the diversification of services to Members, particularly in the regulatory and policy arenas, within a nominal zero-growth budget. In 2000-2001, cost reductions should amount to CHF 14.7 million, representing a saving of approximately 5%. The 2002-2003 budget foresees cost reductions in the order of CHF 16 million, or a further 5%

Key Achievements

State of the industry

It is difficult to put an optimistic gloss on a year that saw the book value of the world's telecommunication networks cut in half. From the bursting of the dot.com bubble, to the downfall of high-profile projects such as Iridium and Project Oxygen, to the profit warnings and job cuts announced by several of the largest public telecommunication operators, it is not hard to see why a pall of gloom has descended across the industry.

It is equally possible, however, to regard this outcome as the result of the operation of a healthy, competitive market. After years of moving towards reduced government intervention, the promotion of market entry and competition, a shift in the burden of investment risk from governments to the private sector, and unbridled euphoria about the Information Society, some degree of market correction was bound to take place.

As other industries have discovered, the stock market can be very fickle. While analysts' assessment of the likelihood of more intense competition is certainly accurate, it masks a steady growth in the basic networks that continue to sustain the industry. The fixed-line network reached some 990 million telephone lines at the end of 2000, and had already passed the one billion mark in early 2001.

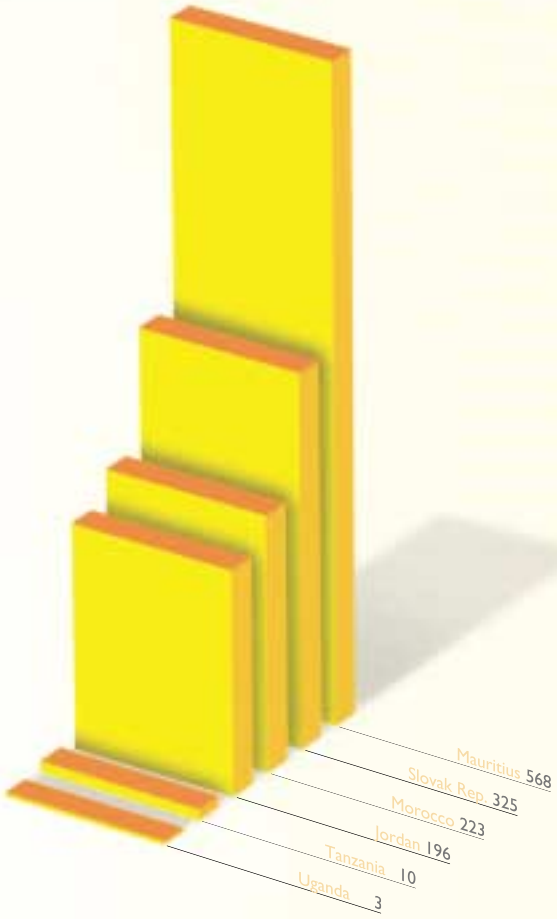
The year 2000 also saw the mobile communications sector continue its astonishing rate of growth. Early projections show that, by the end of the year, there were more than 740 million mobile phones in use. The number of subscribers will pass the one billion mark early in 2002 and, by the end of that year, will have surpassed the number of fixed-line telephones. The list of countries where mobile subscribers outnumber fixed telephone lines also continues to grow, with nations as diverse as Bahrain, Botswana, Singapore and South Africa among the 32 countries that crossed the threshold in 2000.

Internet growth, too, continued unabated despite declining confidence in the market. By the end of 2000, the number of Internet users worldwide had grown to around 350 million. One clear sign of the untapped potential for Internet growth is that, in the first month in which registration of multilingual domain names was permitted, some 700 000 such names were registered, notably in Chinese, Japanese and Korean scripts. In Japan, mobile Internet services grew to almost 25 million subscribers by the end of the year, with NTT DoCoMo becoming the world's second largest ISP (after AOL) after just 18 months of operation.

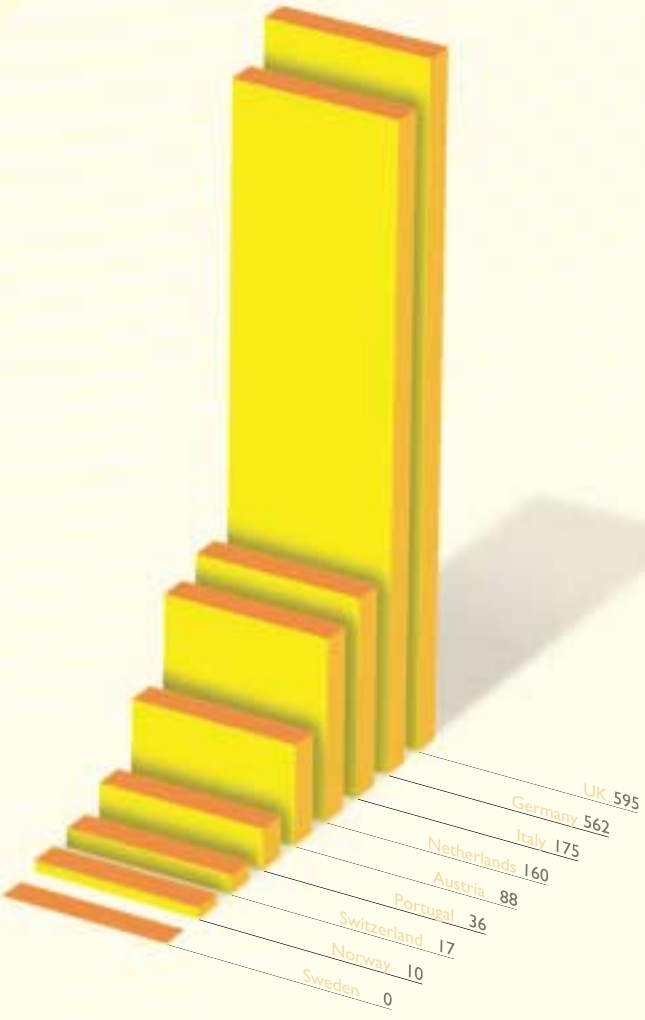
FROM BULL TO BEAR

So what tipped the balance from a confident market to an uncertain one? There were a number of factors, but the biggest single shift probably occurred after the first rounds of auctions for licences to provide third generation (3G) mobile services. By the time the United Kingdom and Germany had completed their auctions, more than USD 80 billion had been spent even before network build-out had started. Given that these two countries represent barely two per cent of the world's population and are already very well served by 2G services, the scale of the gamble began to become evident. Never before had the industry been asked to pay so much simply for the opportunity to provide services. In the face of increasing investor jitters, many subsequent auctions failed to realize even the reserve price that had been set on the value of the spectrum.

In the Internet sector too, rising barriers to entry and the virtual disappearance of venture capital after March 2000 caused a reassessment of the market value of the sector. The merger between TimeWarner and AOL and the takeover of Hongkong Telecom by Pacific Century Cyberworks represented the high watermark in market valuations. Subsequently, the market began to bifurcate between those market leaders who had already achieved brand name recognition, such as Amazon, eBay or Yahoo, and the thousands of other wannabes that trailed in their wake. The former have followed a model of rapid expansion, during a period when profitability appeared to be only a secondary concern, while the latter have been left to seek out niche markets which promise a more immediate return on investment.



Prices paid in US$ per inhabitant for incumbent operators



Prices paid in US$ per inhabitant for 3G mobile licences

FORTUNE AND FOLLY

Prices paid, in US$ per inhabitant, for telecom privatizations and third generation mobile licences in selected countries, 2000.
Source: ITU.

BRIDGING THE DIGITAL DIVIDE

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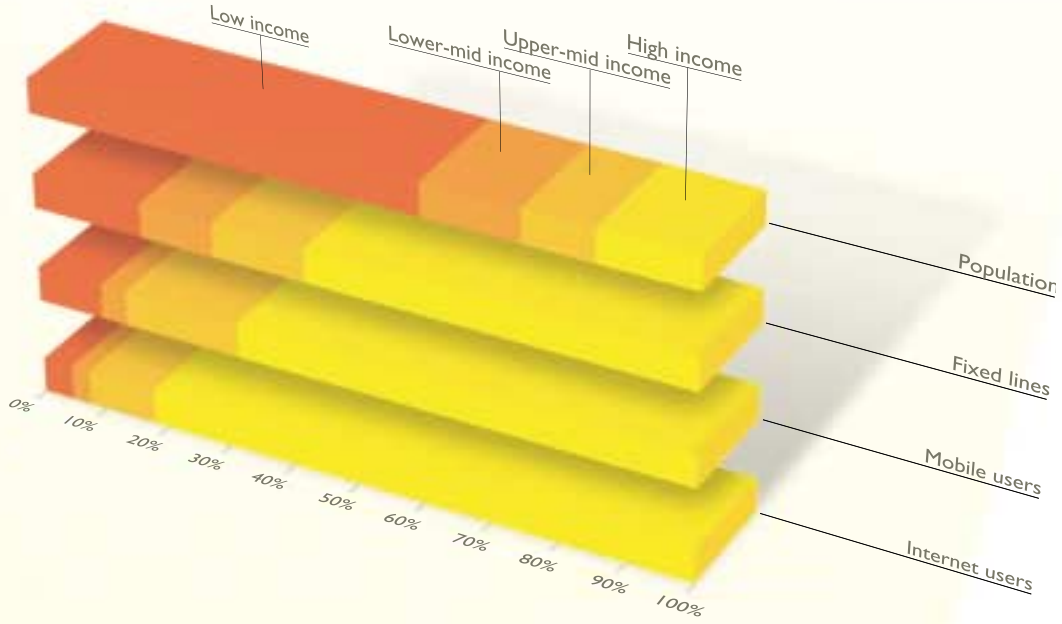
From a political perspective, one of the most significant developments in 2000 was the G8 Okinawa Summit, at which the leading nations of the world made a joint commitment to tackling the problems of inequality of access to information and computer technologies, a problem labelled the "Digital Divide". The problem is not new, and nor is the diagnosis. But the political will to do something about it is. Whether this commitment can be translated into positive action remains to be seen.

Ironically, in 2000, there were signs that the nature of the Digital Divide was already beginning to shift. Many middle-income developing countries are now making rapid progress towards world-class networks. By contrast, in many of the least developed countries, problems like civil instability, under-investment and poor management continue to undermine progress. It is in these, the world's poorest nations, that the problems of the Digital Divide are most acute. The challenge for the years ahead is to show how market reform and investment in information and computer technologies can make a genuine difference to improving the livelihoods of the world's most deprived.

Indeed, the pessimism currently pervading the world's most developed telecom markets has tended to overshadow some significant steps forward in the developing world. In 2000, there were seven telecom privatizations, including three in Africa – the first in that region since 1996 – as well as two in the Arab States, representing the first-ever privatizations outside the Gulf region. The prices paid were a steal compared to Western European mobile auctions, especially considering the long-term potential of these countries.



DIGITAL DIVIDE AND DIGITAL OPPORTUNITY
Distribution of Internet, mobile and fixed-line users by income group, by comparison with the world's population, 2000.
Source: ITU World Telecommunication Indicators Database.

Key Activities

IMT-2000 A flagship series of Recommendations representing the culmination of one of the most intensive and successful development efforts ever undertaken by ITU, IMT-2000 is the globally-agreed standard for third generation (3G) mobile telephony which will serve as the universal platform for 3G voice and mobile Internet services as they begin to be rolled out around the world, starting with Japan in late 2001 and Europe in 2002.

In recognition of the growing importance of mobile communication systems, not only to users in the highly saturated business markets of the developed world, but to a rapidly growing number of users in developing nations where cellular systems are helping fill long-standing gaps in fixed access, the year 2000 World Radiocommunication Conference (WRC-2000) designated additional spectrum for IMT-2000 systems in three harmonized global bands which make use of existing mobile and mobile satellite allocations. These common bands will facilitate the introduction of next-generation services by providing maximum flexibility for operators to evolve current second-generation networks towards broadband IMT-2000 services in line with market conditions, while ensuring the possibility of global roaming for "world-enabled" terminals.

In addition, the World Telecommunication Standardization Assembly (WTSA-2000) created a new Special Study Group (SSG) on IMT-2000 and Beyond, with the purpose of addressing the most important network aspects of IMT-2000 and future mobile systems. This SSG will work towards full fixed/2G/3G internetworking and interoperability, while at the same time addressing other issues relating to wireless Internet, the convergence of mobile and fixed networks, mobility management, mobile multimedia functionality and the need for future enhancements to existing Recommendations to keep pace with next-generation mobile system evolution. The new Group will also help promote harmonization of development activities now under way in a number of forums working on emerging 3G systems.

During the year, Study Group 11 of the Telecommunication Standardization Sector (ITU-T) also contributed three new IMT-2000 Recommendations in the area of core network infrastructure (ITU-T Q.1721, Q.1731 and Q.1751), and published an important roadmap to IMT-2000 standardization by ITU, the Third Generation Partnership Projects (3GPP and 3GPP2) and other standardization bodies. This roadmap is published as Supplement 30 to the ITU-T Q series Recommendations.

Meanwhile, the new IMT-2000 Project, established during the course of the year 2000 under the auspices of the Office of the Secretary-General, addressed a number of aspects of IMT-2000 systems that go beyond the specific mandates of the ITU-R and ITU-T Study Groups, or complement their activities.

Such activities include the facilitation of global circulation of IMT-2000 terminals through an internationally recognized framework, developed in close consultation with ITU Members and based on technical criteria adopted by ITU-R and ITU-T. As the first cellular mobile system specifically designed to support seamless global roaming, it will be imperative to the success of third generation networks that IMT-2000 terminals provide consistent functionality and reliability, regardless of where in the world they are used. ITU is playing

a key role in this area by facilitating the establishment of efficient mechanisms to provide for unhindered cross-border use of terminals, and by harmonizing the complex issues of national type approval requirements and emission limit standards. Through worldwide consultations with regulators, manufacturers and carriers, and using the technical foundations established by ITU-R and ITU-T Study Groups, ITU hopes to have a framework for global circulation ready by the end of 2001.

The Radiocommunication Assembly, held in Istanbul from 1-5 May, took a number of important decisions relating to administrative matters, such as the working methods and study programmes of ITU-R Study Groups, as well as to key emerging technologies, such as Voice-over-IP, IMT-2000, Fixed Wireless Access and frequency sharing. A fast-track approval process was endorsed for ITU-R Recommendations not having regulatory or policy implications, while the number of ITU-R Study Groups was reduced from eight to seven, with the merging of Study Group 10 (sound broadcasting) and Study Group 11 (television broadcasting) to form the new Study Group 6. A direct result of ongoing convergence in broadcasting technologies, the new group will be responsible for developing standards for satellite and terrestrial broadcasting covering image, sound, data and multimedia services. In addition, the Assembly approved some 90 new or revised draft Recommendations, including the landmark agreement on IMT-2000 air interfaces, and set the work programme for the next study period, which contains around 340 Questions, to be addressed in order of urgency.

WRC-2000

The beginning of May saw the opening of the World Radiocommunication Conference (WRC) in Istanbul, Turkey. An increasingly complex and crucial event for the global radiocommunication industry, this four-week conference, held every 2-3 years, is the legal instrument that defines and modifies the Radio Regulations, the binding international treaty which governs the allocation and use of radio frequency spectrum by more than 40 different services worldwide.

Since radio-based services cannot function properly if subjected to harmful interference from other services, international agreement on the way the various bands of the radio frequency spectrum are used is essential to the smooth operation of a growing range of critical applications, from aircraft and maritime navigation to wireless telephony, satellite broadcasting and scientific research.

Despite an onerous agenda comprising a number of highly controversial initiatives, WRC-2000 proved a particularly successful conference, eliciting widespread consensus on key issues, including allocation of additional channels for analogue television broadcasting in Africa, Asia, Australasia and Europe; additional spectrum designations for third generation IMT-2000 mobile services; agreement on sharing between traditional geostationary and new non-geostationary satellite systems; provision of additional spectrum which can be used by a new European global positioning service known as Galileo; and new allocations for emerging high-density fixed services, such as Local Multipoint Distribution Service (LMDS).

The very positive results of WRC-2000 demonstrate ITU's ability to effectively come to grips with increasingly complex cross-regional issues – particularly important in the context of the rapid growth and globalization of radio-based systems, which is making radio frequency sharing ever more difficult. The successful outcome of the year 2000 conference has also been instrumental in creating the right conditions for future industry development and continued deployment of a host of sophisticated new radio-based communication systems in coming years.

SATELLITES

The year 2000 World Radiocommunication Conference was also an important one for the satellite industry, which continues to experience strong growth in spite of setbacks in the development of Global Mobile Personal Communications by Satellite services, thanks to vigorous demand for subscription broadcasting, emerging opportunities in developing markets, and the potential for delivery of new kinds of interactive communication services.

Private sector plans to deploy new non-geostationary satellite constellations to deliver voice telephony and broadband data services, along with a new wave of traditional "geostationary" satellite deployments geared to steadily rising demand for Pay TV, future interactive entertainment services, high-speed Internet and corporate networking, necessitated the development of technical sharing arrangements to ensure neither type of satellite system would cause harmful interference to the smooth functioning of the other. Despite much wrangling, WRC-2000 was ultimately successful in arriving at globally-agreed power limits that effectively give the green light to future development of exciting new services delivered over both geostationary and non-geostationary satellite networks.

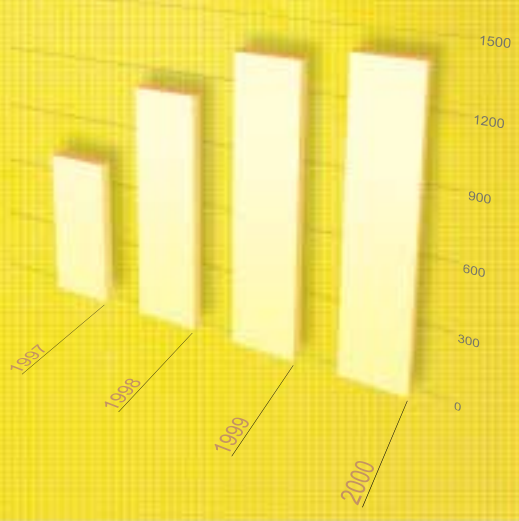
The daunting task of replanning the Broadcasting Satellite Service (BSS), which provides broadcasting services such as direct-to-home TV, was also successfully undertaken by WRC-2000, resulting in capacity increases to the equivalent of 10 analogue broadcast channels in Europe and Africa and 12 analogue channels across Asia and Australasia. This new plan will not only increase consumer choice, but paves the way for future delivery of interactive multimedia services over satellite.

WRC-2000's additional allocations to the radionavigation satellite service, meanwhile, will underpin development of the proposed new European global positioning system, Galileo. This EUR 3 billion 30-satellite constellation will complement the existing Russian GLONASS and US GPS systems, and is scheduled to commence pilot operation in 2004. The additional spectrum allocations will also make it possible for GLONASS and GPS to develop their own second-generation systems.

Finally, agreement on the need for "quiet zones" in the radio spectrum will help further scientific research, particularly in the field of radio astronomy. With faint radio emissions from deep space increasingly being drowned out by a cacophony of signals from new radio-based services such as pagers, mobile phones, satellite telephony and broadcasting, WRC-2000 agreed on new allocations for science services across a range of bands, and authorized the experimental use of unallocated spectrum above 275 GHz for space research and Earth-satellite exploration.

The implications of new developments in satellite technology for ITU standards is handled by the Intersector Coordination Group on satellites (ICG), led by Study Group 13 of the ITU Telecommunication Standardization Sector (ITU-T SG 13). The Group's activities over the course of the year related mainly to harmonization of satellite system operation in areas such as IP over satellite, interworking of GMPCS and public networks, satellite terminal portability and convergence.

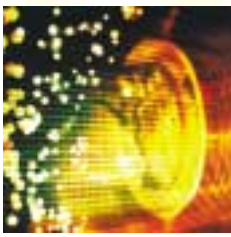
Satellite and Terrestrial System Filings Within the ITU Radiocommunication Bureau (BR), the number of requests for new or modified satellite network filings continued to grow, as did the backlog of network coordination requests. At the end of 2000, BR reported 1 410 satellite coordination requests outstanding, compared with 1 352 requests still unfulfilled at the end of 1999. While some of this growth is undoubtedly due to increased demand for satellite-based services, much is nonetheless believed to result from so-called "paper satellites", a long-standing problem involving the filing of non-existent systems to secure orbital slots for lease, resale or as a "reserve" for potential future applications. In 2000, the already considerable processing backlog was exacerbated by the need to review all satellite systems currently in place as part of the replanning of the Broadcast Satellite Service undertaken by WRC-2000. While introduction of new software and increased use of computing resources did improve the efficiency of coordination request processing over the course of the year, these improvements were not sufficient to keep pace with the growing backlog. In 1998, the ITU Plenipotentiary Conference decided to introduce cost-recovery measures designed to discourage frivolous filing for unnecessary slots, while at the same time providing the resources needed to better serve heavy users through a faster, more responsive process. Following discussions at WRC-2000, this decision looks likely to be further strengthened through automatic cancellation of filings in the event of non-payment of filing charges. A final decision on this matter is expected to be taken by the ITU Plenipotentiary Conference in 2002. In the field of terrestrial system filings, the delayed introduction of new software tools for the processing of terrestrial assignments due to late delivery of some components resulted in a slight backlog. Using existing tools, the Radiocommunication Bureau nonetheless processed 26 149 notifications for frequency assignments, of which 915 covered assignments under Article 11 of the Radio Regulations, a further 3 572, modifications under regional agreements, and 21 662, notices covering other regulatory provisions.



WTSA-2000 The four-yearly World Telecommunication Standardization Assembly (WTSA), held in Montreal in October 2000, took a number of major decisions designed to further streamline ITU's standards development process and help the Union better deliver ever-more timely, stable global standards in an increasingly dynamic environment for equipment and services.

Important new working methods were adopted, including the establishment of online "virtual" Study Group meetings, as well as a fast-track approval process that allows standards to be formally adopted in as little as eight weeks from text maturity.

The Assembly also adopted targets and deadlines for the transition to cost-oriented international settlement rates, and adopted a new Recommendation on international Internet connection which establishes a framework for bilateral inter-operator compensation covering the carriage of Internet traffic across national borders.



CODING The explosion in broadband multimedia applications has made coding a key standardization priority. Coding techniques play a vital role in functions such as encryption, compression, error detection and correction, as well as the multitude of analogue-to-digital conversions and signal processing needed to ensure a wide range of equipment – from simple PC-based modems all the way up to carrier class IP switches and routers – can integrate seamlessly with the public switched network.

Advances in coding have already seen the bandwidth needed to carry a simple human voice track reduced from 64kbit/s in 1984 to less than 10kbit/s, while video coding techniques, particularly Recommendation ITU-T H.263, have become a linchpin of the growing range of applications integrating full motion video.

Continued work in this area during the year 2000 saw a new high quality audio coding scheme adopted as an annex to Recommendation ITU-T G.722.1, along with the adoption of new annexes to Recommendation ITU-T H.263, which provide enhanced video coding efficiency and enhanced error resilience. In addition, a new Recommendation, ITU-T V.44, will provide enhanced data compression procedures to supplement those already specified in the well-known and widely adopted ITU-T V.42 *bis*.

IP NETWORKS

With the Internet Protocol (IP) rapidly becoming one of the most favoured means of exchanging information across the world's increasingly diverse voice and data networks, ITU has moved quickly to prioritize efforts to bridge IP networks and mainstream circuit-switched telephone networks.

Under the IP Project, a general framework and architecture for future IP standardization efforts was adopted, while joint development work with the Internet Engineering Task Force (IETF) led to Recommendation ITU-T H.248 (also called Megaco), which will function as a common standard for both the circuit- switched and IP-based worlds, as well as serving as the platform for future IETF standards work. Recommendation ITU-T Y.1310, which standardizes the transport of IP over ATM in public telecommunication networks, was also approved by ITU Members, and endorsed by the IETF.

In addition, ITU initiated the IP Cablecom project, which aims to develop interoperable specifications for delivering advanced, real-time multimedia services over two-way cable networks.

In other IP-related activities, a senior representative from the ITU-T Study Group dealing with IP networks was elected to the Board of Directors of the Internet Corporation for Assigned Names and Numbers (ICANN), in time for the first general assembly of the Corporation's Protocol Supporting Organization (PSO) in Pittsburgh in August. ITU will undertake the ICANN PSO secretariat function, and will host the ICANN PSO general assembly in 2002.

E-BUSINESS

Already a billion-dollar industry and still growing fast, e-business is not only set to revolutionize the way the world trades goods and services, but has enormous potential to open up new opportunities for local small and medium enterprises in the developing world, bringing economic prosperity to communities which, until now, have been confined to the periphery of potentially lucrative global and regional markets.

ITU activities in the field of e-business range from important standardization work that will provide emerging systems with the robust security and privacy protection features necessary to foster public confidence in online transactions, to hands-on development projects that aim to establish effective e-commerce networks in under-served parts of the world.

Technical standardization activities are coordinated under the umbrella of the GII Project, led by ITU-T Study Group 16. Areas of responsibility include coordination, general framework development, security, protocol development, service management and development of supporting software.

In 2000, ITU updated its ITU-T X.509 public key and attribute certificate standard with the aim of improving the environment for business-to-business (B2B) transactions, setting out a framework for privilege management infrastructure and improving standards for the attribute certificates which define user access privileges. The Union also signed a Memorandum of Understanding

(MoU) on electronic business with a number of other key global standardization bodies, with a view to fostering closer collaboration on new operational elements. Within the framework of this MoU, ITU convened a Business Object Summit designed to streamline data-sharing capabilities between the signatory organizations.

In the field of telecommunication development, meanwhile, ITU's Electronic Commerce for Developing Countries (EC-DC) project was extended to more than 100 countries across five continents during the course of the year, making it one of the largest deployments of e-business infrastructure anywhere in the world. The project offers secure e-business solutions to developing countries under affordable conditions, through the pooling and sharing of available resources. It also provides an easy e-business start-up solution for entrepreneurs, offering first-class security and advanced services through non-exclusive arrangements with industry partners. Besides helping developing nations build effective e-business frameworks and implement basic infrastructure, the project also addresses issues of gender equality, human resources development and special needs assistance to the world's poorest communities.

Through a Partnership Agreement between ITU, the Geneva World Trade Centre and World Internet Secure Key (WISeKey), a Swiss online security specialist, the EC-DC project has to date attracted in-kind contributions of more than USD 7 million from key strategic partners, who contribute facilitating technologies and services to EC-DC participating countries. The EC-DC World Internet Secure Infrastructure was launched in November 2000, during a 3-day workshop which attracted more than 500 participants from 128 countries.

ACCESS NETWORKS

In the context of an increasingly sophisticated Internet environment and spiralling demand for high-speed access to the home and office, ITU approved new Recommendations covering ADSL technologies that will allow users to boost their connection speed by more than 100 times, for almost instant access to data, audio and video services.

In the area of modems, the approval of Recommendation ITU-T V.92 represents a significant boost to the performance of the voiceband modems which currently dominate Internet access, increasing the network connection rate by more than 40% to up to 48Kbit/s. In addition, the new ITU-T V.92 standard offers considerably faster start-up times by "remembering" phone line characteristics and reducing "handshake" time by almost 50% for calls from the same location to the same destination. ITU-T V.92 also incorporates a unique ability to put data transmission "on hold" while processing voice calls, re-establishing the transmission once the line is free without dropping the connection. Among other things, this feature will make it possible to exploit emerging voice response services linked to Internet browsing and online shopping.

OPTICAL NETWORKS Ultra-fast optical networking techniques lie at the heart of the Internet Age, providing cost-effective multi-terabit transmission, thanks to technologies like Dense Wavelength Division Multiplexing, which assign different information streams to the component wavelengths ("colours") of white light to greatly enhance the signal-carrying capabilities of optical fibre.

Approval of Recommendation ITU-T G.871/Y.1301 will help further develop this exciting field, providing an important framework for coordinating development of emerging Recommendations on different aspects of the Optical Transport Network (OTN).

Recommendations developed within this new framework will ultimately deliver consumers on-demand bandwidth, scalable to virtually any requirement, within a switched optical network environment. By offering both improved reliability and reduced cost, these new Recommendations will be instrumental in paving the way for explosive growth in bit-hungry streaming multimedia services.

UIFN Registrar Function In 1996, ITU launched the world's first Universal International Freephone Numbers, which allowed businesses to offer clients around the world a single, centralized global phone number for accessing customer service, tele-sales or information services. The Union's Telecommunication Standardization Bureau (TSB) continues to act as global registrar for this service, processing 4 199 applications for freephone numbers during 2000, for a total of 21 700 numbers now in service. In 2000, TSB also assumed additional global registrar functions for two new special number services, International Shared Cost Numbers (ISCN) and Universal International Premium Rate Numbers (UIPRN). UIPRN allows companies to provide telecoms-based services and products to callers in other countries using the same, centralized phone number, enabling consumers across the region or around the world to access recorded information services and other telephone-based services like opinion surveys, promotions and competitions, through a single number. ISCN provides a centralized number which allows users in selected countries to contact companies and organizations abroad for the same price as a standard national call in their home country.

SECURITY Transaction security and information privacy are issues of paramount concern to users in today's Net economy. Through its development of Recommendation ITU-T X.509, which now serves as the *de facto* global standard for electronic authentication over public networks, ITU has played a crucial role in building a solid, reliable technical framework to underpin the fast-growing electronic marketplace. During the course of the year 2000, a revised version of ITU-T X.509 – Public-key and attribute certificate frameworks – was approved, providing the basis for authentication over a huge range of electronic transaction-based systems.

In the area of online multimedia communications, the year 2000 also saw a number of security features adopted in the form of Annex J to Recommendation ITU-T H.323, which currently serves as the global standard for carrying voice, video, fax and data traffic over the Internet.

GLOBAL COOPERATION In its quest for ever more timely development of effective, stable standards for new equipment and services, ITU recognizes the vital importance of close cooperation with recognized global and regional standards bodies.

Collaboration with the Internet Engineering Task Force (IETF) helped speed the release of Recommendations ITU-T H.248 and ITU-T Y.1310, which were developed through efficient working partnerships between experts from both organizations. An IP-Telecoms interworking workshop was also sponsored by ITU during the course of the year, with the aim of helping ITU and IETF experts proactively identify forthcoming standardization issues relating to Internet Numbering, Naming, Addressing and Routing.

At the same time, an important Memorandum of Understanding (MoU) was signed between ITU and the European Telecommunications Standards Institute (ETSI), ensuring ETSI and ITU-T access to one another's work programme and reinforcing a commitment to joint development work. A second MoU on e-business was also signed by ITU, the International Organization for Standardization, the International Electrotechnical Commission and the United Nations Economic Commission for Europe, defining frameworks for e-business scenarios, interoperability standards and product definition data standards.

Finally, four new organizations were accorded ITU-T accreditation for communication and normative referencing; the Multi Protocol Label Switching (MPLS) Forum, the Association of Radio Industries and Businesses (ARIB), the European Association for Standardizing Information and Communications Systems (ECMA), and the Society of Cable Telecommunications Engineers (SCTE). Accreditation of these organizations permits cross-referencing of their texts in ITU-T Recommendations, to speed standards development activities.



HUMAN RESOURCES ACTIVITIES

ITU's Telecommunication Development Bureau (BDT) works together with government, the private sector and national and regional development agencies to build institutional and organizational capacity through improved human resources development and management, using a range of cost-effective tools such as tele-education, conventional distance learning and computer-based training. Major projects undertaken in the year 2000 included:

MANDEVTEL (Management Development for Telecommunications), a public/private sector partnership programme comprising a series of workshops ranging from business planning to marketing, aimed at providing senior managers with the latest modern management techniques.

Telecommunication Centres of Excellence, five new regional institutions which provide senior-level training in policy, regulatory issues, management and technology, to help operators, regulators and other telecommunication organizations in the developing world make the transition to today's liberalized telecommunications environment. The Centres also serve as regional focal points for information and research, and for the delivery of consultancy services.

Global Telecommunication University and **Global Telecommunication Training Institute**, which use the Internet to provide a range of distance-learning courses, including short continuous education courses on topical themes and specialized learning programmes geared to specific projects. In conjunction with private sector partner Cable and Wireless, the GTU also developed a Masters degree programme in Communication Management, to be run from 2001 under the auspices of Strathclyde University in Glasgow.

Virtual Training Centre, which has been operating for the last five years as a web-based distance training centre, and which was enhanced in response to increased interest from countries through the development of the Learning Management System (LMS), a dedicated platform for e-learning. Incorporating over 200 different management modules in a minimum of three languages, the Centre also comprises a library, a resource section and information databases. MANDEVTEL has been incorporated as a management faculty within the Virtual Training Centre, enabling executives to download course material at their own pace and convenience.

Other activities during the course of the year included development of a Gender Issues curriculum to ensure gender concerns are addressed when developing new telecommunication policies; direct assistance to the Palestinian Authority and to Bosnia-Herzegovina in the area of radio spectrum management; and assistance to network operators and regulators in developing countries in calculating viable interconnection rates which take into account Universal Service Obligations.

SPECIAL PROGRAMME FOR LDCs

The world's poorest nations can obtain practical assistance in areas of urgent need through the Union's special programme for Least Developed Countries (LDCs). In the year 2000, Cambodia, Chad, Comoros, Ethiopia, Sudan and Tanzania benefited from ITU expertise in the critical area of sector restructuring, with a view to helping them come to grips with regulatory, financing and tariff issues. Activities included assistance in establishing national regulatory authorities, and help in formulating effective strategies for universal access and rural telecommunications. The Union also worked in partnership with organizations in target countries to improve human resources management and development, one of the most crucial areas still to be addressed in efforts to bridge the Digital Divide. Finally, ITU worked with government and operators in Cambodia to deploy new communications technologies, and helped authorities in Tanzania design a new radio frequency monitoring station.

TELEMEDICINE AND TELE-EDUCATION

For developing countries, delivering even basic health care and education to remote, sparsely populated regions has long seemed an almost insurmountable challenge. Today, thanks to the advent of broadband communication links and advances in compression and image processing technology, telemedicine and tele-education applications are becoming cost-effective solutions.

A number of telemedicine projects are currently being deployed by ITU in countries including Bhutan, Cameroon, Ethiopia, Georgia, Kenya, Malta, Mozambique, Myanmar, Senegal, Uganda and Venezuela. One example of this work is a ground-breaking pilot project in Uganda, which is already greatly extending the reach of vital health services into isolated rural areas. Using an ISDN point-to-point link connecting Mengo hospital in downtown Kampala with Mulago teaching hospital, doctors in both clinics – along with other specialists connected to the system via the Internet – can now exchange information on patient diagnoses and treatment in areas ranging from primary care to surgery, paediatrics, obstetrics and gynaecology. Future plans will see the capability of the project eventually expanded to include additional specialties such as psychiatry, anaesthesiology and ophthalmology.

In the equally important area of distance learning, ITU is closely involved in two innovative pilot projects to deliver tele-education services in Morocco and India. Both projects combine the latest VSAT satellite technology with advanced Management Information System software to bring interactive online education to rural communities.

In India, where the project is linked to an existing ITU development initiative, VSAT systems now connect 21 online Learning Centres, while in Morocco, VSAT capability is expected to be provided towards the end of 2001 to service an initial 15 new learning facilities. Each Centre can accommodate up to 40 students, who interact in real time with teachers located in centralized off-site training studios. Both pilots are scheduled to run for up to three years, and are being managed in conjunction with partners including the Indian and Moroccan governments, UNESCO and the World Bank.

ACCESS IS ALL The 1984 Maitland Report on worldwide telecommunications development recommended that all mankind should be brought within easy reach of basic telecommunications services by early this century. As part of its strategy to fulfil that pledge, ITU is directly involved in developing nine multipurpose community telecentre projects, which are helping bring telephone, fax, e-mail, Internet and, in some cases, computing resources, distance learning and telemedicine to remote villages in Benin, Bhutan, Honduras, India, Mali, Suriname, Tanzania, Uganda and Viet Nam.

SECTOR REFORM

Around the world, nations are recognizing that reform of their telecoms sector to keep pace with the rapidly changing global environment is increasingly vital to stimulating local growth and attracting the interest of private sector investors.

In line with the Union's increased emphasis on delivering its unique brand of impartial expertise in the area of telecommunication policy, ITU has taken the lead in working with national governments to draft new legislative, regulatory and legal frameworks conducive to private investment, competition and the strengthening of existing regulatory bodies.

Important activities during the year 2000 included the convening of regulatory workshops and seminars throughout Africa, the Americas, the Arab States, Asia and the CIS countries, along with the annual ITU global regulatory survey. This extensive survey serves as the foundation of ITU's T-REG website (http://www.itu.int/treg), an up-to-date, comprehensive information resource on the regulatory environment in each of the Union's 189 Member States.

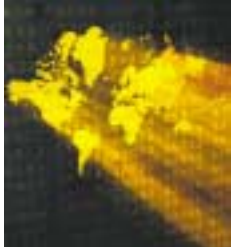
In addition, the Union convened its first Development Symposium for Regulators in November 2000, bringing together regulators from around the world and establishing a global dialogue that will help all countries negotiate the ever-changing tide of telecom service provision. One important outcome of this meeting was a new action plan calling for greater information exchange through a new network of focal points, to be designated by each regulatory authority, and through the establishment of an ITU regulatory hotline to respond to specific national requests, including requests for preparation of country case studies.

Other activities in the regulatory field during the year 2000 included the publication of a number of world-class analytical reports, including *Trends in Telecommunication Reform, 2000/2001: Interconnection Regulation*, and *Trends in Telecommunication Reform: Country Profiles*, along with the *Americas Blue Book 2000*.

In addition, a set of guidelines and recommendations were developed to aid government officials and other policy-makers in the formulation of regulations and policies aimed at fostering growth of Internet infrastructure in developing and Least Developed Countries. ITU was also active in helping governments and operators develop effective policies and strategies in the areas of universal service, investment and tariffing.

DISASTER MITIGATION

Telecommunication plays an increasingly important role in effective disaster response, whether it be through satellite weather forecasting systems that warn of an approaching cyclone, portable radio equipment that supports split-second coordination of rescue teams in the event of a major disaster, or on-the-ground communication links between aid workers distributing food, searching for victims or trying to reunite broken families. ITU's strong commitment to enhancing the vital role of telecommunications in disaster response led to its playing a crucial role in developing the 1998 Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations. With the number of natural and man-made disasters around the world growing each year, work in this important area continued in 2000 with the publication of a Handbook on disaster communications aimed at policy-makers responsible for disaster communications planning and managers responsible for operations. In addition, the Union approved a new Recommendation on the effective utilization of amateur radio services in disaster relief operations.



ITU ACTION IN THE REGION

A Global Presence

To reinforce its unique role as a global organization committed to fostering the growth of telecommunications throughout the world's developing countries, ITU maintains a strong on-the-ground regional presence through eleven strategically-located field offices around the world.

These offices allow ITU to work even more closely with its members, tailoring its programmes to the specific and diverse needs of different countries and regions. Activities range from training programmes, seminars and conferences on new technologies, to provision of policy and regulatory advice and grass-roots assistance to countries in special need.

Field offices also help ITU maintain close ties with administrations, operators and manufacturers, serving as an important focal point for local industry and helping facilitate the public/private sector partnerships which are increasingly vital to building and strengthening networks.

Africa

Home to more than three-quarters of all Least Developed Countries (LDCs), Africa has an urgent need for capacity building in areas ranging from infrastructure deployment and human resources development to sector reform.

ITU field offices in Africa continued to work together with local partners on a number of projects, including INDAFTEL, a regional undertaking aimed at freeing operators from the need to buy expensive imported equipment through the establishment of local manufacturing facilities, and AFRITEL, which seeks to cut costs and improve efficiency through a new, fully interconnected pan-African network that will obviate the need for African operators to transit African-bound calls through offshore third party networks. In 2000, technical studies to modernize two of the sub-regional networks of AFRITEL were completed in partnership with the Southern African Development Community and the Economic Community of West African States.

In addition, Africa's first-ever regulators' summit was organized in Gaborone, Botswana, in October, in collaboration with the African Telecommunication Union, the Economic Commission for Africa and the Regional African Satellite Communications Organization. As well as fostering an exchange of views on challenges in sector restructuring, one of the major aims of the summit was the preparation of regional action plans, with a view to providing greater levels of support to countries embarking on telecoms reform.

Ad hoc regulatory assistance was also provided to a number of countries throughout the region, including five Least Developed Countries, in the areas of regulatory reform, tariffs, frequency spectrum and network management, and human resources development. Workshops and seminars were organized on issues relating to radiocommunication and standardization, as well as on the WTO telecoms agreement.

Finally, for the first time, assistance on gender issues was provided to the Higher Multinational School for Telecommunications (École Supérieure Multinationale de Télécommunication - ESMT) in Dakar, with a view to harnessing the powerful contribution women can make to development.




Americas

ITU activities in the Americas included a strong emphasis on the Enterprise Incubator Partnership, a project which seeks to extend the success of Brazil's enterprise incubator programme to other countries in the region. Enterprise incubators are environments that provide under-funded start-ups with access to essential services such as premises, shared equipment, business consultancy and trained accountants. The Enterprise Incubator Partnership project aims to establish pilot incubators in two countries in the Americas region, focusing on enterprises based on telecoms or IT technologies, such as community telecentres. The year 2000 saw the development of the Guide for Pilot Incubators and the organization of Incubators and Entrepreneurship courses, which form part of the project's initial Capacity Building Plan.

ITU also worked closely with Latin America's CITEL (Inter-American Telecommunication Commission) to develop a database to monitor regional allocation and use of radio spectrum between 137-3700 MHz. This new system makes it easy to generate band-by-band tables of domestic frequency allocation for each country in Latin America, showing each country's modifications to the International Allocation Table. In addition, work was undertaken to harmonize use of the frequency band 170 MHz-2.5 GHz, which is used for a wide range of critical applications including broadcasting and mobile telephony.

In conjunction with ITU field offices in Chile and Honduras, the Union also organized seminars on tariffs, costing, regulatory matters, spectrum management and issues surrounding the World Trade Organization agreement on trade in basic telecommunications, and undertook a study on Telecommunication Network Cost Estimation for OECS (Organization of Eastern Caribbean States) countries.

Finally, a revised Cost Model Methodology was prepared in conjunction with national operators which will help Latin American and Caribbean carriers accurately evaluate cost and termination charges, in line with the global push to realign international settlement rates to reflect actual incurred costs.

Arab States

With an increasing number of Arab States embracing privatization and opening their markets to foreign investment, restructuring is now gaining momentum, with several countries now following Jordan's lead and establishing a separate national regulator.

In line with this changing regulatory and operational environment, work in the Arab States region focused predominantly on training, human resources and assistance with policy development. A number of meetings, seminars and workshops were held throughout the year on topics critical to the future development of the region, including IMT-2000, rural telecommunications and universal access/service, trade in telecommunications, effective business planning, human resources management and development, and the Global Maritime Distress and Safety System.

Field missions were also carried out in Algeria, Jordan, Morocco, Oman, Sudan, Tunisia, and with the Palestinian Authority, to define needs and provide solutions in the area of telecom regulation and/or human resources develop-



ment, while *ad hoc* direct assistance was provided to Morocco, Yemen, Libya, Somalia and to the Palestinian Authority, again in the area of human resources.

Four important preparatory and coordination meetings were also organized to help countries of the region exchange their views and positions, with a view to facilitating the adoption of common proposals. These were the Arab Regional Preparatory Meeting for WTDC-02, the Annual Meeting for Telecommunication Development, the Preparatory Meeting of the Arab States to WTSA-2000, and the ITU-D Study Group coordination meeting.

Asia-Pacific

The range of development activities carried out by the ITU field offices in Bangkok and Jakarta bears witness to the size and diversity of the Asia-Pacific region. In 2000, assistance in policy and regulatory matters ranked first in the overall programme of field activities. In particular, a sector restructuring project in Cambodia was undertaken under the Special Programme for LDCs.

Human resources development was another high priority area, particularly through the Asia-Pacific Centre of Excellence, a virtual training network offering information and e-learning courses in a range of telecommunication development topics. Support was also provided to a number of countries needing assistance with network development and universal access provision.

New development initiatives focused on the Internet and related "new economy" applications, such as e-commerce and IP-based networks. Case studies on costing and pricing of services and the Internet were also conducted in several countries throughout the region.

In addition, ITU field offices continued to work closely with the Asia-Pacific Telecommunity in the areas of policy and regulation, new technologies and training. Finally, efforts were made to strengthen support for the broadcasting sector through joint activities with the Asia-Pacific Broadcasting Union and the Asia-Pacific Institute for Broadcasting Development.

Europe and CIS Countries

While not technically a developing region – of the region's 53 Member States, only 30 are considered developing – a number of countries in Europe and the Commonwealth of Independent States (CIS) nonetheless have special development needs. With the transition to a market economy and the need to develop telecommunication capability to enhance overall economic and business development, countries throughout the region are now embarked on a rapid restructuring process. Actual needs range from policy advice and assistance in telecoms regulation, market liberalization and privatization of the national operator, to help in addressing urgent problems of poorly served rural communities, introduction of new services, and network development and infrastructure reconstruction in countries that have been victims of natural disasters or civil unrest. Almost all the countries in need identify improved human resources as one of the most effective instruments in their development process.

During the year 2000, a number of training seminars were organized in the region, including a sub-regional seminar on tariffs for CIS countries, and regional seminars on interconnection, universal access, and technological, financing and regulatory issues. Through close cooperation with the private sector, ITU attracted sponsorship to fund many of its activities in this region.

ITU TELECOM SURPLUS PROGRAMME

In line with ITU's mandate to foster expansion of modern communications services around the world, surplus income generated by the Union's highly successful TELECOM events is transformed into working capital for the TELECOM Surplus Programme, where it is used to fund a wide range of national and regional development projects.

Funding proposals are evaluated by the TELECOM Surplus Fund Programme Steering Committee, which meets four times a year. In general, successful proposals must meet the following strict criteria:

- Potential to attract additional funding and participation of new partners
- Potential long-term sustainable impact
- Facilitation of cross-national cooperation
- Synergy with other ITU projects
- Potential for self-sufficiency in the short- to medium-term

Projects funded through the Programme during the year 2000 can be broadly grouped into four key areas: Human Resource Development, Infrastructure Development, Assistance to Countries in Special Need, and Application of New Technologies.

Human Resource Development

The TELECOM Surplus Programme continues to represent an important source of funding for the four telecommunication Centres of Excellence established in 1998. Designed to train public officials in policy and regulatory issues, these Centres link existing educational and research institutes in Africa, the Americas and Asia Pacific, to create highly effective virtual training networks. The Centres have already attracted the support of a number of prominent partners, including AFRALTI, ESMT, Nortel Networks, IDRC/ACACIA, and AGRA.

The success of these four initial Centres has prompted development of a fifth Centre in the Arab States region, with the goal of developing regional expertise and creating a network of training providers. A preparatory meeting to launch this project was held in Egypt in October, with the inaugural co-ordination meeting held in Tunis towards the end of the year.

Other important human resources-related activities funded by the TELECOM Surplus Programme include the Global Telecommunication University and Global Telecommunication Training Institute.

Infrastructure Development

During the year 2000, the Programme used USD 596 000 for the AFRITEL and INDAFTEL projects, which aim to modernize Africa's existing Panaftel network and enhance local and regional manufacturing capability.

AFRITEL will upgrade and establish new inter-country communications links throughout Africa, enabling as much as USD 500 million in annual traffic revenues to remain within the African continent.

INDAFTEL, meanwhile, aims to improve telecom industrialization in Africa through the fostering of accelerated growth of the local telecoms industry.

Assistance to Countries in Special Need

In accordance with resolutions adopted in 1994 in Kyoto and 1998 in Minneapolis, ITU continues to offer assistance to Bosnia and Herzegovina through a specially-developed Plan of Action. Within the framework of this Plan, and in partnership with the European Bank for Reconstruction and Development (EBRD), the Telecommunication Law of BiH has been developed, and the Telecommunication Regulatory Agency (TRA) established.

During the year 2000, ITU provided USD 460 000 of assistance to the TRA through the TELECOM Surplus Programme. One important result of this aid was the purchase of a Mobile Frequency Monitoring Unit to aid effective spectrum management.

Application of New Technologies

The TELECOM Surplus Programme provides a vital source of seed funding for projects which are helping bring the benefits of advances in communications technology to those most in need.

Tele-education projects are currently under way in India and Morocco, while a further ten telemedicine projects are helping extend vital medical services to remote and underprivileged areas in Bhutan, Cameroon, Ethiopia, Georgia, Kenya, Malta, Mozambique, Myanmar, Senegal and Venezuela.

In addition, the TELECOM Surplus Programme is also helping fund Multipurpose Community Telecentres (MCTs) in Benin, Honduras, Mali, Mozambique, Tanzania, Uganda and Viet Nam, in collaboration with national and international partners. These MCTs are not only bringing phone, fax and Internet access to rural areas, but are helping provide training in information technology and fostering access to information resources of special relevance to local communities.

Electronic Commerce for Developing Countries (EC-DC)

Since its launch in March 1998, this important initiative has earned wide support from public and private sector companies, the media and the governments of several ITU Member States.

November saw ITU hold a fully-sponsored EC-DC conference at its Geneva headquarters for more than 50 developing countries. The project continues to attract the participation of a growing number of industry partners, including MCI WorldCom, Baltimore Technologies, Network Communication Products, Hewlett-Packard, Oracle, Datamatics, Entegrity, Celo Communications, ValiCert, Rainbow Technologies and Vitress, who are contributing their technologies and services to the project for the benefit of developing countries worldwide.



NEW INITIATIVES PROGRAMME

Established by Council in 1999, ITU's New Initiatives Programme is intended as a seedbed for cultivating research on emerging issues of a cross-sectoral nature. The Programme aims to address topics of urgent importance to the broader telecommunications community, focusing particularly on regulatory and policy-making aspects. Implications for ITU's three Sectors are considered, with a view to possible inclusion of activities relating to each topic in the regular work programme of the Union. The New Initiatives Programme comprises four main elements: Strategic Planning Workshops, Telecommunication Case Studies, Internet Policy and Web Publishing.

Strategic Planning Workshops

These top-level meetings bring together recognized experts from around the world to discuss specific topics of industry concern. During the year 2000, workshops were held on IP Telephony and Fixed-Mobile Interconnection.

The IP Telephony workshop served as the basis for preparations for 2001's World Telecommunication Policy Forum on the implications of delivering telephony services over IP networks.

The workshop on Fixed-Mobile Interconnection, meanwhile, examined the market's failure to efficiently address the cost of terminating calls between fixed and mobile networks. In many cases, interconnection rates between these networks do not reflect underlying costs, resulting in high call charges. The workshop encouraged ITU to create a database of fixed-mobile retail and interconnection rates, with a view to increasing cost transparency.

Telecommunication Case Studies

To support and enhance the Workshop programme, country case studies are regularly commissioned to examine how individual Member States have handled particular issues. In addition to case studies on IP Telephony and Fixed-Mobile Interconnection, case study research was initiated on Internet diffusion, the regulatory implications of broadband technologies, and the licensing of third generation mobile services.

Internet Policy

One of the aims of ITU's New Initiatives Programme is to maintain the Union's relevance and leadership in an era of volatile technological change and rapidly evolving operating conditions. As such, the development of the Internet and the opportunities and challenges it presents for ITU Members has been a major focus of activity. In 2000, the Union's Strategy and Policy Unit published its latest *ITU Internet Report*, this time on the topic of IP Telephony.

Web Publishing

Dedicated websites are created for each Strategic Planning Workshop topic, providing links to background material and case studies. In 2000, development of sites covering IP Telephony and Fixed-Mobile Interconnection was supplemented by the creation of themed websites on ITU and the Information Society, and on ENUM, a new mapping protocol designed to foster smooth interconnection between the Internet and E.164 PSTN phone numbers.

While the New Initiatives Programme receives limited funding from the ITU budget, the expansion of activities during 2000 was facilitated by voluntary contributions, notably from Japan and the Republic of Korea.

INFORMATION SHARING

Ongoing information exchange is a key element of ITU activities.

One of the Union's most widely valued and appreciated activities is its regular *Indicators* reports; timely, impartial regional and global snapshots of an industry in transition produced by the ITU Telecommunication Development Bureau (BDT).

During 2000, new editions of *Americas Telecommunication Indicators* and *Asia-Pacific Telecommunication Indicators* were produced to coincide with ITU TELECOM events held in those regions in April and December.

In the area of the Internet, ITU chose Banjul, Gambia, as the site of the world's first African Internet and Telecom summit. Organized in collaboration with the Commonwealth Telecommunication Organization, the summit provided an unprecedented opportunity for delegates from sub-Saharan Africa to share their experiences and develop practical strategies for helping bridge the Digital Divide through the promotion of Internet access throughout the continent.

As part of efforts to stimulate Internet uptake, a number of Internet Case Studies were also conducted, notably in Bolivia, Egypt, Hungary, Nepal, Singapore and Uganda. These studies aim to help policy-makers and regulators gain an understanding of the diverse needs of emerging markets, as well as how best to expand access to Information and Communication Technologies.

Other information sharing activities of particular interest to developing countries over the course of the year 2000 included:

- formulation of a universal access strategy and action plan for rural communities, including extension of the universal access concept to broadcasting, the Internet and value-added communication services;
- preparation of new pricing models for the delivery of cost-oriented national and international phone service;
- definition of investment criteria which developing nations can use as a guide for attracting foreign equity;
- development of a Web-based tariff database;
- preparation of Handbooks on a range of new technologies and services, including Global Mobile Personal Communications by Satellite, public service applications on the Internet, teletraffic engineering and xDSL;
- technology transfer strategies for rural and remote areas.

In addition, a series of seminars were held on spectrum management, 3G mobile systems, migration to digital broadcasting, GMPCS, maritime radiocommunications, rural telecommunications and universal access and service.

A report which identifies issues relating to standards-setting and spectrum management in the ITU-T and ITU-R Sectors which are of particular relevance to developing countries was also prepared, with a view to facilitating the understanding of countries not in a position to regularly participate in the work of these two Sectors owing to lack of resources, both human and financial. Awareness-raising on issues relating to the impact of the World Trade Organization agreements on telecommunications trade was also conducted in preparation for the next round of negotiations, commencing January 2001.

In the field of radiocommunication, a new bi-weekly publication was launched in 2000: the *BR International Frequency Information Circular*. Published in CD-ROM format, the Circular represents a consolidated regulatory snapshot of activities in the satellite and terrestrial radio markets, replacing the former Weekly Circulars and Special Sections.

For the space services market, each Circular incorporates the latest notification information, advance publications, coordination requests and special sections relating to space plans. For terrestrial services, it contains a complete, continually updated International Frequency List, updated versions of terrestrial frequency assignment plans, and details on transactions in progress.

During the course of the year 2000, the results of compatibility analyses for high-frequency broadcasting schedules were also made available online, while the MARS (Maritime mobile Access and Retrieval Systems) online database, accessible 24 hours a day, was enhanced by incorporating additional search and rescue information for authorized users around the world.

Finally, in the area of telecommunication standardization, ITU continued to produce its invaluable bi-monthly *Operational Bulletin*, which provides administrations, operators and service providers with essential information on changes to international telecommunication networks and services. The Bulletin also contains important information on maritime services and the various codes, numbers and indicators allocated by ITU to countries and service providers.

In addition, the Union's Telecommunication Standardization Bureau maintained its important role as a facilitator of technical information exchange through provision of a number of key public databases offering information on terminology, patents, international country codes, reserved and assigned E.164 network codes and National Numbering Plans.

ITU TELECOM EVENTS

For ITU TELECOM, the year 2000 was marked primarily by the successful organization of the AMERICAS 2000 and ASIA 2000 events, in Rio de Janeiro and Hong Kong.

ITU TELECOM AMERICAS 2000 was the fourth regional telecommunications Exhibition and Forum for the Americas region. The event was held from 10 to15 April, at the RioCentro Exhibition and Conference Centre, Rio de Janeiro, Brazil, and was hosted by the Government of the Federative Republic of Brazil.

Around 17 000 trade visitors came to AMERICAS 2000 to see the latest technology and services on display from 303 exhibitors from the telecommunication, information technology and audio-visual entertainment fields.

On Sunday 9 April 2000, Yoshio Utsumi inaugurated the event. The ceremony was also honoured by the participation of Fernando Henrique Cardoso, the President of the Federative Republic of Brazil.

The Forum at AMERICAS 2000 covered the whole breadth of the telecommunication field. More than 300 speakers came from 42 different countries and a dozen international organizations such as CITEL, the European Commission, United Nations Development Programme (UNDP) and the World Bank. Altogether more than 1 100 people attended the Forum, which encompassed a Policy and Regulatory Summit, an Infrastructure and Applications Summit, a Telecom Development Symposium, and various combined sessions, which had a strong focus on the impact of the digital revolution.

EXHIBITORS	
303	from **25** countries
6	National Pavilions
22 535 m2	of exhibition space, net [1]
VISITORS	
17 100	Registered Trade Visitors [2]
VIPs	
28	Ministers
28	Ambassadors
2	Regulators
23	Directors-General
15	CEOs from Operators
160	National Delegations
164	CEOs from Exhibitors
27	Other VIPs
447	**Total VIPs from 51 countries**
ACCREDITED MEDIA	
407	Accredited Media
27	who attended the event from countries and **249** publications
FORUM	
715	Forum delegates from 36 countries
73	Telecom Development Symposium sponsored delegates from **40** countries
321	Forum speakers from **42** countries
1 109	**Total Forum Participants**

[1] Including upper floors.

[2] Does not include exhibitors, exhibitors' staff and their invited guests.

ITU Telecom Asia 2000 was the fifth regional telecommunications Exhibition and Forum for the Asia-Pacific region. It was held from 4 to 9 December at the Hong Kong Convention and Exhibition Centre (HKCEC), Hong Kong SAR, China, and was hosted by the Government of the People's Republic of China (PRC).

Asia 2000 was the ITU's largest and most successful regional Telecom event ever, and featured world and regional leaders from the telecoms and IT industries as well as key figures from governments across the region. More than 50 000 trade participants attended the event.

A spectacular Opening Ceremony was held on Sunday 3 December, featuring performers in London, New York and Hong Kong singing in unison.

EXHIBITORS	
500	from **29** countries
12	National Pavilions
27 896 m2	of exhibition space, net [1]
	(48.5% increase on AsiaTelecom 97)
19 653	Exhibitor personnel and their Guests [2]
VISITORS	
28 450	Registered Trade Visitors [3]
VIPs	
33	Ministers
5	Ambassadors
5	Regulators
19	Directors-General
11	CEOs from Operators
50	Consuls-General
321	CEOs from Exhibitors
235	Other VIPs
679	**Total VIPs from 77 countries**
ACCREDITED MEDIA	
810	From 44 countries and 437 publications
271	accompanying Photographers/Camera crews
1 081	**Total Media on-site**
FORUM	
883	Forum delegates from **51** countries
75	Telecom Development Symposium
	sponsored delegates from **38** countries
235	Forum speakers from **39** countries
1 193	**Total Forum Participants**

1 Including upper floors.

2 Guests were invited by Exhibitors to the event. These were registered separately from other trade visitors.

3 As of Thursday 7 December at 18h00. Friday 8 and Saturday 9 December were Public Days and the numbers were not therefore counted.

ITU TELECOM AFRICA 2001
Johannesburg
12-16 November

ITU TELECOM ASIA 2002
Hong Kong
2-7 December

ITU TELECOM AMERICAS 2003
Buenos Aires
25-28 February

ITU TELECOM WORLD 2003
Geneva
12-18 October

ITU TELECOM MIDDLE EAST & ARAB STATES

They were followed by dancers, Chinese dragons and dramatic pyrotechnic displays. The ceremony was officiated by Bangguo Wu, Vice Premier of the State Council of the People's Republic of China, Yoshio Utsumi, ITU Secretary-General, and Chee Hwa Tung, Chief Executive of the Hong Kong Special Administrative Region. A keynote speech was also given by Richard Li, the Executive Chairman of Pacific Century CyberWorks, the sponsor of the Opening Ceremony.

The Forum at ASIA 2000 spanned a huge range of telecommunication topics, with more than 250 speakers and over 1 200 people participating in total. The Forum encompassed a Policy and Development Summit, an Infrastructure Summit, a Telecom Development Symposium and various Roundtable sessions, all of which maintained a strong focus on the impact of the digital revolution.

FUTURE EVENTS

Work was performed on preparing for the future ITU TELECOM events to take place from 2001 to 2003. See www.itu.int/itutelecom for further details.


Hong Kong


AMERICAS







CANADA







TOWARDS A NEW ITU

With important work to reform the ITU's structure, role and working methods now well under way, the 2000 session of ITU Council reviewed the progress so far through the preliminary report of the Working Group on Reform (WGR) and reports submitted by the Secretary-General and the Directors of each of the three ITU Sectors.

The recommendations of the Reform Advisory Panel (RAP), a specially-convened group consisting of ministers and other senior government officials, as well as industry CEOs, regulators and operators, were held by Council-2000 to represent a positive framework for transforming ITU into an organization eager to adapt to change, capable of turning challenges into opportunities, and ready to become a body where excellence is a way of life.

In June 2000, Secretary-General Yoshio Utsumi invited the United Nations Joint Inspection Unit (JIU) to assist the ITU reform process by undertaking a study on the management practices and overall efficiency of the General Secretariat. This study, which will comprise an analysis of the present situation along with proposals for a more effective structure and practical measures for responding to new challenges, will be submitted to Council in 2001.

At its final meeting for the year 2000, the Working Group on Reform focused on the urgent need to streamline the Union's technical standardization process, an issue of particular concern to ITU Sector Members, many of whom are equipment vendors whose core business depends on stable global standards delivered in a timely manner to help them keep pace with an increasingly frenetic market.

The WGR's final meeting, scheduled for Brazil in April 2001, will prepare a set of recommendations for submission to Council 2001. Council will take decisions on the immediate implementation of recommendations within its powers, and will transmit recommendations requiring changes to the ITU Constitution and Convention to the 2002 Plenipotentiary Conference in Marrakesh for its consideration.

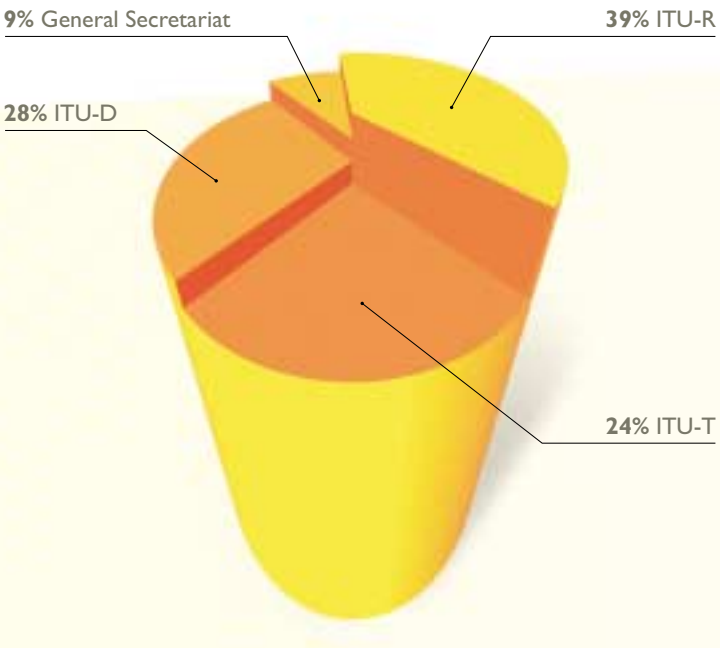
Financial Situation

EXPENDITURE

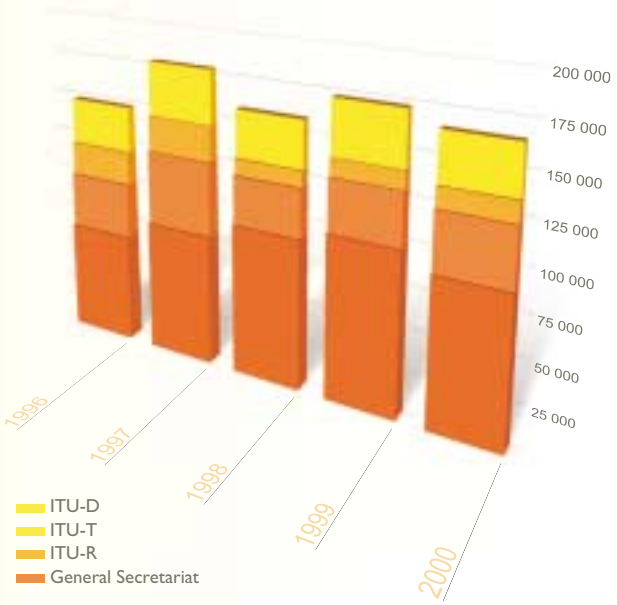
The Union's biennial budget for 2000/2001 is set at CHF 332.6 million, reflecting the approved programme of activities based on decisions and resolutions adopted by the 1998 Minneapolis Plenipotentiary Conference. Falling comfortably within the expenditure ceiling, this figure maintains the expenditure level set in the 1998-1999 budget, and reflects a slight decrease in expenditure compared with the 1996-1997 budgetary period.

The activities of ITU's three Sectors account for 91% of total expenditure, with the remaining 9% allocated to funding the General Secretariat, which provides a broad range of services including conference organization, documentation and translation, publications services, logistics support, information services and long-range strategic planning, as well as corporate functions such as communication and external affairs, legal advice, finance and personnel management.

For the year 2000, total actual expenditure amounted to CHF 163.9 million, or 49% of total appropriations for the biennium.



ACTIVITY-BASED BUDGET 2000-2001
(by Sector in CHF '000)

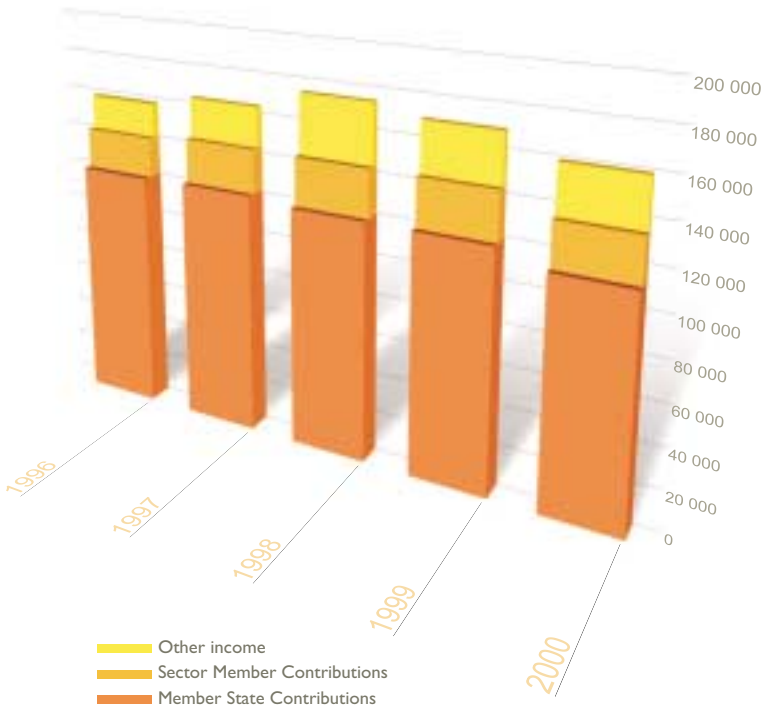


EXPENDITURE 1996-2000 (by Sector in CHF '000)
The costs of centralized administrative and support services fall within the General Secretariat

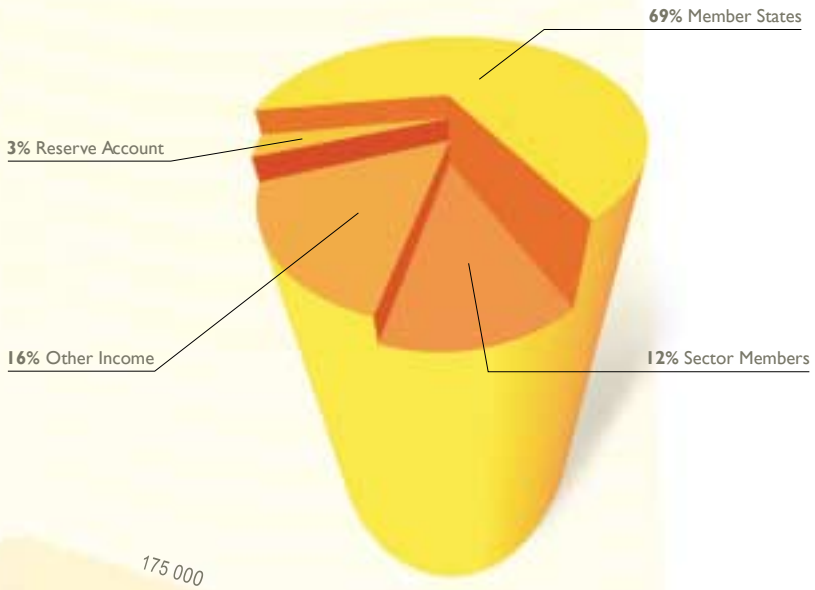
INCOME

At 31 December 2000, ITU represented 189 Member States and 655 Sector Members, in addition to three new Associates which participated for the first time in the work of the Union.

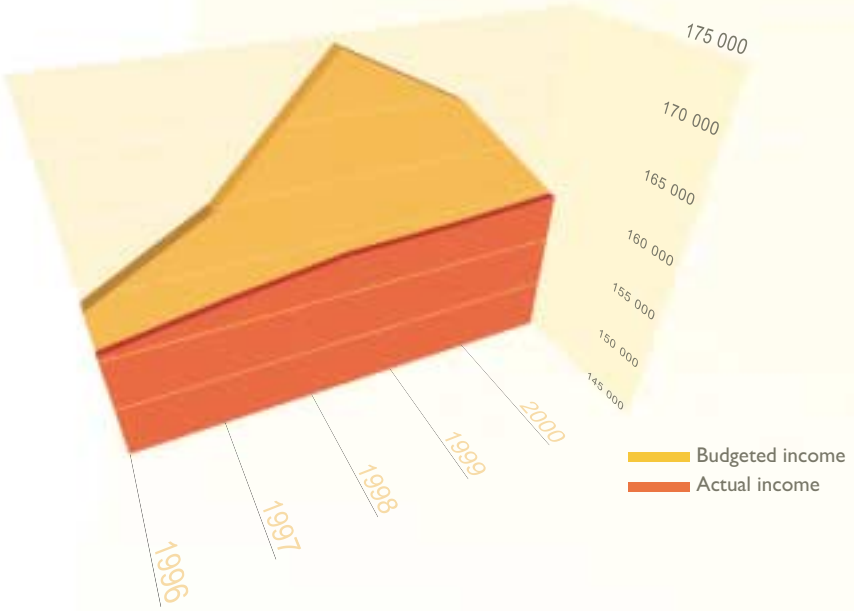
- The Contributory Unit for 2000/2001 for Member States has been set at CHF 315 000 per annum, a slight reduction in the figure of CHF 328 000 for 1998/1999. The amount of the Contributory Unit has been calculated on the basis of a total of 358 3/16 units (against 368 3/16 in 1998/1999)
- The Contributory Unit for Sector Members has been set at CHF 63 000, again slightly lower than the CHF 65 600 in 1998/1999
- Actual income as at 31 December 2000 amounted to CHF 163.7 million, of which CHF 112.7 million was derived from Member State contributions
- Assessed contributions from Member States for the biennium are expected to amount to CHF 225.8 million
- Contributions from Sector Members for the same period are expected to reach CHF 41 million
- Budgeted income derived from the sale of publications and from other cost-recovery activities, as well as other miscellaneous income, amounted to CHF 54.4 million
- The slight shortfall of CHF 11.4 million between estimated expenditure and estimated income has been financed by a withdrawal of that same amount from the ITU Reserve Account
- The decline in income since 1997 largely reflects ITU's efforts to reduce the amount of the Contributory Unit
- As at 31 December 2000, 94.3% of assessed contributions for the year 2000 and 51.4% of contributions for the year 2001 had been received.



ITU INCOME (in CHF '000)



INCOME BUDGET 2000 - 2001
(in CHF '000)



ACTUAL INCOME VERSUS BUDGETED INCOME
(in CHF '000)

EXTRA-BUDGETARY ACTIVITIES

Principal activities funded from extra-budgetary sources consist of a number of Technical Cooperation Projects and the ITU TELECOM events.

Technical Cooperation Projects

Expenditure relating to United Nations Development Programme (UNDP) projects and for Trust Fund projects over the course of the year 2000 amounted to USD 9.7 million and USD 24.9 million, respectively. Related support costs came to USD 2.1 million.

Total expenditure, inclusive of support costs, thus amounted to CHF 64.5 million (converted at an exchange rate of 1.76 CHF/1 USD).

As at 31 December 2000, USD 53 million of Funds in Trust remained available for allocation to projects. The balance of the Special Fund for Technical Cooperation, inclusive of the surplus generated by ITU TELECOM events (the TELECOM Surplus), was USD 13 million.

ITU TELECOM

In accordance with Article 19 of ITU's Financial Regulations, any surplus income or excess expenditure resulting from the world or regional TELECOM events is transferred to the Exhibition Working Capital Fund, a significant part of which is allocated to development projects, primarily in Least Developed Countries.

The unprecedented success of TELECOM 99 + INTERACTIVE 99 generated a surplus income of nearly CHF 25 million, bringing the Exhibition Working Capital Fund to over CHF 32 million at 31 December 2000.

A Growing Membership

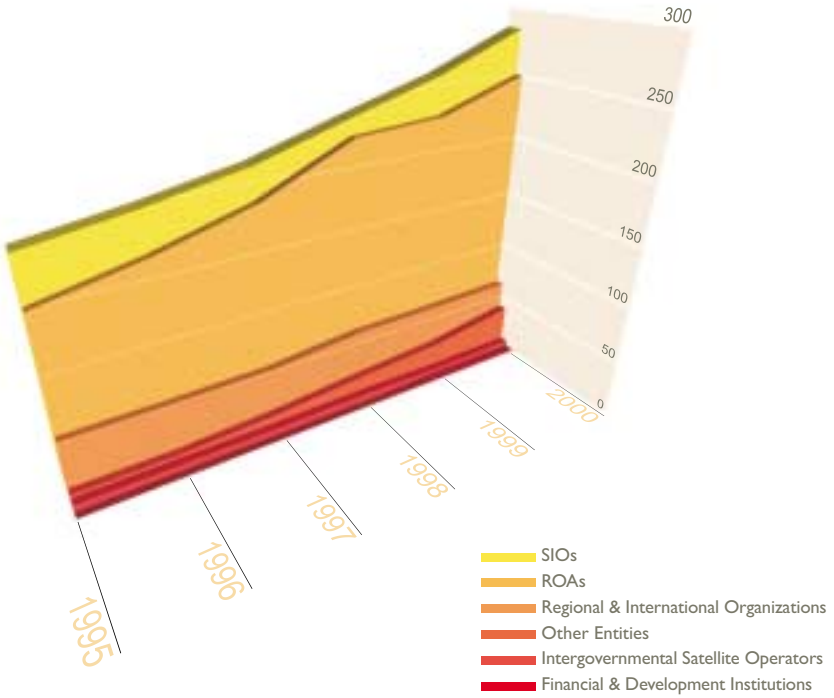
Unique among UN specialized agencies, ITU's membership comprises Member States, represented by their respective government administrations, and Sector Members, which include private and public sector entities, such as operators, manufacturers and regulators, as well as telecommunications-related organizations such as NGOs and research and training institutes.

Since its establishment over 135 years ago, ITU has grown to become one of the most widely-represented organizations in the world, with 189 Member States along with over 650 Sector Members who, between them, represent all the major players from every corner of the telecommunication industry.

Growing interest in ITU activities continued to drive demand for membership across the Union's Radiocommunication, Telecommunication Standardization and Telecommunication Development Sectors during 2000, with overall membership growth of 10.7%, a significant rise from the 6.5% growth reported in 1999.

The Telecommunication Development Sector, in particular, reported a marked rise in membership, with 47 new members in 2000, a 60% increase over last year's figure. Representing service providers, manufacturers, consultancies and international organizations, 26 of these new members came from the developing world.

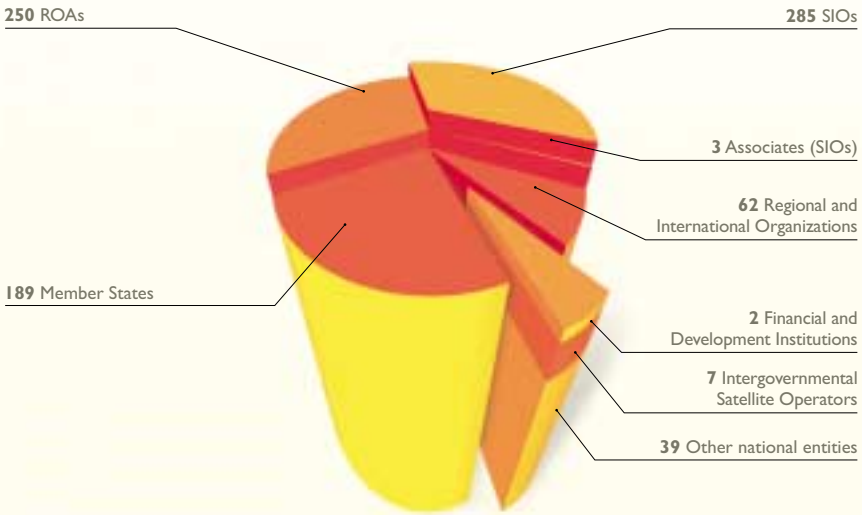
In line with efforts to increase responsiveness and address the evolving needs of members in a fast-changing environment, the year 2000 also saw the introduction of a brand new category of Sector Associates, which allows smaller companies to bring their innovative contributions to the work of a particular Study Group within their Sector of choice. The Radiocommunication Assembly was the first body to approve terms of membership for this new category as they apply to the Radiocommunication Sector, while ITU-T welcomed the Union's first three Associate members, all of whom came from the scientific and industrial community. ITU-D is expected to develop its conditions for participation of Associates at its next WTDC, scheduled for 2002.



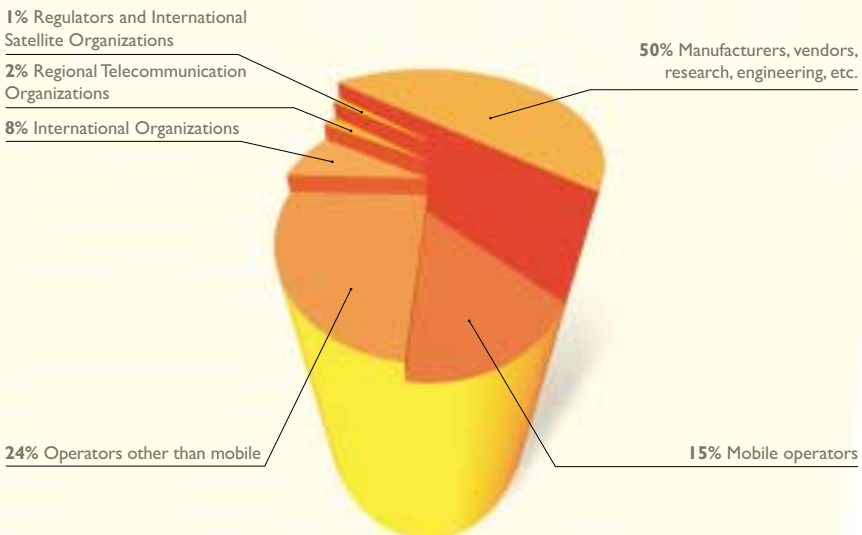
This increased participation from the private sector reflects the Union's rapidly broadening membership base, which now includes not only telecommunication operators and equipment manufacturers, but software developers, Internet service providers, financial institutions, specialized consultancies, research agencies, publishing houses, and even the Union's first university member. National regulatory authorities also continued to account for a growing component of ITU's membership in 2000, in recognition of the Union's increasingly active role in international policy-making.

Despite the healthy increase in membership numbers over the course of the year, a recruitment campaign initiated in 1999 nonetheless fell slightly short of targets, owing in part to the sustained high level of merger and acquisition activity throughout the industry, and also to the depressed climate for telecoms and IT stocks following the March 2000 market decline.

With intense pressure from Sector Members and Associates for ever-faster delivery of timely standards, sustaining the growth levels reported this year will depend in large part on the success of ITU's reform process and the related decisions of the Marrakesh Plenipotentiary Conference, scheduled for September 2002.



MEMBERSHIP 2000



SECTOR MEMBERS 2000

Our Members

AFGHANISTAN **ALBANIA** **ALGERIA** **ANDORRA** **ANGOLA** **ANTIGUA AND BARBUDA** **ARGENTINA** CÁMARA ARGENTINA DE DESARROLLOS Y APLICACIONES SATELITALES (CADAS) • CÁMARA DE INFORMÁTICA Y COMUNICACIONES DE LA REPÚBLICA ARGENTINA (CICOMRA) • COMPAÑIA DE RADIOCOMUNICACIONES MÓVILES • CONSEJO PROFESIONAL DE INGENIERÍA DE TELECOMUNICACIONES, ELECTRÓNICA Y COMPUTACIÓN (COPITEC) • COOPERATIVA TELEFÓNICA LÓPEZ CAMELO (COTELCAM) • IMPSAT • TELECOM ARGENTINA STET-FRANCE TELECOM • TELEFÓNICA DE ARGENTINA (TASA) • TELEFÓNICA LARGA DISTANCIA DE ARGENTINA (TLDA) **ARMENIA** ARMENTEL JV **AUSTRALIA** ASIASPACE • CABLE AND WIRELESS OPTUS • TELSTRA CORPORATION **AUSTRIA** DATAKOM AUSTRIA • KAPSCH • OESTERREICHISCHER RUNDFUNK • TELEKOM AUSTRIA • UTA TELEKOM • **AZERBAIJAN** AZEUROTEL • **BAHAMAS** PUBLIC UTILITIES COMMISSION (PUC) • **BAHRAIN** **BANGLADESH** **BARBADOS** **BELARUS** **BELGIUM** ALCATEL TELECOM • BELGACOM • HERMES EUROPE RAILTEL • SIEMENS ATEA • TELINDUS **BELIZE** **BENIN** **BHUTAN** **BOLIVIA** **BOSNIA AND HERZEGOVINA** PUBLIC ENTERPRISE PTT BOSNIA AND HERZEGOVINA **BOTSWANA** MASCOM WIRELESS BOTSWANA **BRAZIL** BCP TELECOMUNICAÇÕES • EMBRATEL • INSTITUTO DE FORMAÇÃO EM TECNOLOGIA (IFT) • INTELIG TELECOMUNICAÇÕES • WORLDSPACE DO BRASIL **BRUNEI DARUSSALAM** **BULGARIA** BULGARIAN TELECOMMUNICATIONS COMPANY (BTC) **BURKINA FASO** **BURUNDI** **CAMBODIA** **CAMEROON** **CANADA** AGRA SYSTEMS ALCATEL CANADA • AT&T CANADA LONG DISTANCE SERVICES • BELL CANADA • CATENA NETWORKS • EMS TECHNOLOGIES CANADA • CAP GEMINI ERNST & YOUNG • MITEL CORPORATION • NORTEL NETWORKS • PMC-SIERRA • SR TELECOM • TELECOMMUNICATION EXECUTIVE MANAGEMENT INSTITUTE OF CANADA (TEMIC) • TÉLÉGLOBE CANADA • TELESAT CANADA • TELESYSTEME **CAPE VERDE** **CENTRAL AFRICAN REPUBLIC** **CHAD** SOCIÉTÉ DES TÉLÉCOMMUNICATIONS DU TCHAD (SOTEL TCHAD) **CHILE** EMPRESA NACIONAL DE TELECOMUNICACIONES (ENTEL) • TELEFÓNICA CTC CHILE **CHINA** ASIA SATELLITE TELECOMMUNICATIONS (ASIASAT) • CABLE & WIRELESS HKT INTERNATIONAL • CHINA MOBILE COMMUNICATIONS CORPORATION • CHINA TELECOMMUNICATIONS CORPORATION • CHINA UNITED TELECOMMUNICATIONS CORPORATION (CHINA UNICOM) • HUAWEI TECHNOLOGIES • HUTCHISON GLOBAL CROSSING • LUCENT TECHNOLOGIES INFORMATION & COMMUNICATIONS OF SHANGHAI • MANDARIN COMMUNICATIONS • NEW T&T HONG KONG • NEW WORLD TELEPHONE (NWT) • PACIFIC CENTURY GROUP • SHANGHAI BELL **COLOMBIA** CELUMÓVIL • EMPRESA NACIONAL DE TELECOMUNICACIONES (TELECOM) • EMPRESA DE TELECOMUNICACIONES DE SANTAFE DE BOGOTÁ (ETB) • **COMOROS** **CONGO** **COSTA RICA** CÁMARA COSTARRICENSE DE TELECOMUNICACIONES • RADIOGRÁFICA COSTARRICENSE **CÔTE D'IVOIRE** CONSEIL DES TÉLÉCOMMUNICATIONS DE CÔTE D'IVOIRE (CTCI) • CÔTE D'IVOIRE TELECOM **CROATIA** **CUBA** EMPRESA DE TELECOMUNICACIONES DE CUBA (ETECSA) • EMPRESA TELÉFONOS CELULARES DE CUBA (CUBACEL) **CYPRUS** **CZECH REPUBLIC** CESKÉ RADIOKOMUNIKACE • CESKY TELECOM **DEMOCRATIC REPUBLIC OF THE CONGO** **DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA** **DENMARK** EI-ITEK • GIGA • GN GREAT NORTHERN TELEGRAPH COMPANY • TELE DANMARK • TELE GREENLAND **DJIBOUTI** **DOMINICA** **DOMINICAN REPUBLIC** TELECOMUNICACIONES DE VOZ, DATA Y VIDEO (TRICOM) **ECUADOR** **EGYPT** ARAB ACADEMY FOR SCIENCE, TECHNOLOGY AND MARITIME TRANSPORT • EGYPTIAN COMPANY FOR NETWORKS (EGYNET) • INTOUCH COMMUNICATIONS SERVICES • MISRFONE TELEPHONE CO. • MOBINIL • NATIONAL TELECOMMUNICATION INSTITUTE (NTI) • NILESAT • SYSTEL • TELECOM EGYPT • TELECON CONSULTANTS • THE EGYPTIAN GERMAN TELECOMMUNICATION INDUSTRIES (EGTI) • THE EGYPTIAN HIGH TECH ASSOCIATION (EHITA) • TRADE FAIRS INTERNATIONAL **EL SALVADOR** **EQUATORIAL GUINEA** **ERITREA** **ESTONIA** **ETHIOPIA** **FIJI** **FINLAND** ELISA COMMUNICATIONS CORPORATION • FINNET GROUP • NOKIA NETWORKS • SONERA CORPORATION • TELLABS • VDSL SYSTEMS • YLEISRADIO (YLE) **FRANCE** 9 TÉLÉCOM • ALCATEL-COMPAGNIE FINANCIÈRE • ALCATEL CIT • CORVIS-ALGETY • ALGETY TELECOM • ASTRIUM SAS • BOUYGUES TÉLÉCOM • CEGETEL • FRANCE TÉLÉCOM • GROUPE CIRCET • GROUPEMENT DES INDUSTRIES DES TÉLÉCOMMUNICATIONS ET D'ÉLECTRONIQUE PROFESSIONNELLE (GITEP/SIT) • HEWLETT-PACKARD FRANCE • IBM EUROPE • ICS FRANCE • LABORATOIRES D'ÉLECTRONIQUE PHILIPS (LEP) • LUCENT TECHNOLOGIES FRANCE • MATRA NORTEL COMMUNICATIONS • MITSUBISHI ELECTRIC • MOTOROLA • OFFICE DES POSTES ET TÉLÉCOMMUNICATIONS DE POLYNÉSIE FRANÇAISE (OPT) • PRO SODIE • SAGEM • SOCIÉTÉ TEKELEC-AIRTRONIC • TÉLÉCOM DÉVELOPPEMENT • TELELOGIC • THALES COMMUNICATIONS **GABON** **GAMBIA** **GEORGIA** **GERMANY** ACTERNA ENINGEN • ALCATEL SEL • CATEL COMMUNICATIONS • DEUTSCHE TELEKOM (T-NOVA DEUTSCHE TELEKOM INNOVATIONSGESELLSCHAFT) • DEUTSCHE TELECOM MOBILNET (T.MOBIL) • DEUTSCHE TELEPOST CONSULTING-DETECON • DEUTSCHE WELLE • ELSA • E-PLUS MOBILFUNK • IMC TELECOM • INFINEON TECHNOLOGIES • LUCENT TECHNOLOGIES • MANNESMANN ARCOR • MANNESMANN MOBILFUNK • MARCONI COMMUNICATIONS • MOBILCOM CITY LINE • NORDDEUTSCHER RUNDFUNK (NDR) • PHILIPS RESEARCH LABORATORIES • QUANTE • ROBERT BOSCH • ROHDE & SCHWARZ • SCI-WORX • SIEMENS • SOLTEL • TELES • TENOVIS KG • VIAG INTERKOM • ZWEITES DEUTSCHES FERNSEHEN **GHANA** WESTERN TELESYSTEMS (WESTEL) **GREECE** FEDERATION OF HELLENIC INFORMATION TECHNOLOGY ENTERPRISES (SEPE) • ORGANISME DES TÉLÉCOMMUNICATIONS HELLÉNIQUES (OTE) **GRENADA** **GUATEMALA** **GUINEA** **GUINEA-BISSAU** **GUYANA** GUYANA TELEPHONE AND TELEGRAPH **HAITI** HAITEL **HONDURAS** **HUNGARY** ANTENNA HUNGARIA-HUNGARIAN RADIOCOMMUNICATIONS • MATÁV-HUNGARIAN TELECOMMUNICATIONS **ICELAND** ICELAND TELECOM **INDIA** CELLULAR OPERATORS ASSOCIATION OF INDIA • D-LINK INDIA • MAHANAGAR TELEPHONE NIGAM (MTNL) • SASKEN COMMUNICATION TECHNOLOGIES • TELECOM REGULATORY AUTHORITY OF INDIA (TRAI) **INDONESIA** BAKRIE COMMUNICATIONS CORPORATION • PT ASIA CELLULAR SATELLITE (ACES) • PT INDOSAT (PERSERO) • PT SATELIT PALPA INDONESIA (SATELINDO) • PT TELEKOMUNIKASI INDONESIA (PT TELEKOM) **IRAN (ISLAMIC REP. OF)** TELECOMMUNICATION COMPANY OF IRAN (TCI) **IRAQ** **IRELAND** EIRCOM • LAKE DATACOMMS **ISRAEL** BARAK I.T.C. • BEZEQ -THE ISRAEL TELECOMMUNICATIONS COMPANY • ECI TELECOM • GILAT SATELLITE NETWORKS • GOLDEN LINES INTERNATIONAL COMMUNICATIONS SERVICES • METALINK • RAD DATA COMMUNICATIONS • SURF COMMUNICATION SOLUTIONS • TADIRAN ELECTRONIC SYSTEMS • TELRAD-NETWORKS • TIOGA TECHNOLOGIES **ITALY** AEXIS TELECOM SPA • ALCATEL ITALIA • BLU SPA • CSELT • ELSACOM • ELSAG • FONDAZIONE UGO BORDONI • ITALTEL • MARCONI COMMUNICATIONS • OMNITEL PRONTO ITALIA • PIRELLI CAVI E SISTEMI • PLLB ELETTRONICA • POSTE ITALIANE • RAI • SIEMENS INFORMATION AND COMMUNICATION NETWORKS SPA • SIRTI (STET GROUP) • STMICROELECTRONICS • TELECOM ITALIA MOBILE (TIM) • TELECOM ITALIA • TELESPAZIO • WIND TELECOMUNICAZIONI **JAMAICA** CABLE & WIRELESS JAMAICA **JAPAN** BASIC HUMAN NEEDS (BHN) ASSOCIATION • CABLE & WIRELESS IDC • CANON • COMMUNICATION INDUSTRIES ASSOCIATION

OF JAPAN • COMMUNICATION LINE PRODUCTS ASSOCIATION OF JAPAN • DDI CORPORATION • FUJITSU LIMITED • HITACHI • JAPAN ELECTRONICS AND INFORMATION TECHNOLOGY ASSOCIATION (JEITA) • JAPAN RADIO COMPANY • JAPAN TELECOM • JAPAN TELECOMMUNICATIONS ENGINEERING AND CONSULTING SERVICE • JSAT CORPORATION • MATSUSHITA COMMUNICATION INDUSTRIAL COMPANY • MATSUSHITA ELECTRIC INDUSTRIAL COMPANY • MITSUBISHI ELECTRIC • NEC CORPORATION • NIPPON HOSO KYOKAI (NHK) • NIPPON MINKAN HOSO RENMEI • NIPPON TELECOMMUNICATIONS CONSULTING • NIPPON TELEGRAPH AND TELEPHONE CORPORATION (NTT) • NIPPON TELEGRAPH AND TELEPHONE EAST CORPORATION (NTT EAST) • NIPPON TELEGRAPH AND TELEPHONE WEST CORPORATION (NTT WEST) • NOMURA RESEARCH INSTITUTE • NTT COMMUNICATIONS CORPORATION • NTT COMMUNICATIONWARE CORPORATION • NTT DOCOMO • OKI ELECTRIC INDUSTRY • RICOH • SOFTFRONT • SONY • SPACE COMMUNICATIONS CORPORATION • SUMITOMO ELECTRIC INDUSTRIES • THE ITU ASSOCIATION OF JAPAN • TOKAI UNIVERSITY MEDICAL RESEARCH INSTITUTE • TOKYO TELECOMMUNICATION NETWORK • TOSHIBA **JORDAN** JORDAN TELECOMMUNICATIONS COMPANY (JTC) • MIDDLE EAST COMMUNICATION CORPORATION (MEC) • MIDDLE EAST TELECOM & ELECTRONICS (METE) • VISION FOR TELECOM & CONSULTATION **KAZAKSTAN** KAZAKHTELECOM **KENYA KIRIBATI KOREA (REPUBLIC OF)** DATA COMMUNICATIONS CORPORATION OF KOREA (DACOM) • ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE (ETRI) • HANARO TELECOM • KOREA TELECOM • LG ELECTRONICS • LG TELECOM LTD • ONSE TELECOM • SAMSUNG ADVANCED INSTITUTE OF TECHNOLOGY • SK TELECOM **KUWAIT** MOBILE TELECOMMUNICATIONS COMPANY (K.S.C.) **KYRGYZSTAN LAO PEOPLE'S DEMOCRATIC REPUBLIC LATVIA LEBANON** • AL-IKTISSAD WAL-AAMAL • ARABCOM-TXG • INVESTCOM HOLDING • PRE-PAID INTERNATIONAL SYSTEMS (OFF-SHORE) **LESOTHO LIBERIA LIBYA LIECHTENSTEIN LITHUANIA LUXEMBOURG** • ENTREPRISE DES POSTES ET TELECOMMUNICATIONS • MILLICOM LUXEMBOURG • SOCIÉTÉ EUROPÉENNE DES SATELLITES (S.E.S.) **MADAGASCAR MALAWI MALAYSIA** CELCOM MALAYSIA • DIGI TELECOMMUNICATIONS • MAXIS INTERNATIONAL • TELEKOM MALAYSIA (TM) • TT DOTCOM SDN BHD **MALDIVES MALI MALTA** MALTACOM **MARSHALL ISLANDS MAURITANIA MAURITIUS MEXICO** MVS COMUNICACIONES • SATÉLITES MEXICANOS (SATMEX) • TELECOMUNICACIONES DE MÉXICO (TELECOMM) • TELÉFONOS DE MÉXICO **MICRONESIA MOLDOVA MONACO MONGOLIA MOROCCO** • CKM HOLDING • ITISSALAT AL MAGHRIB • UPLINE SECURITIES SA • **MOZAMBIQUE MYANMAR NAMIBIA NAURU NEPAL NETHERLANDS** DRAKA FIBRE TECHNOLOGY B.V • DUTCHTONE • LIBERTEL • LUCENT TECHNOLOGIES NETWORK SYSTEMS NEDERLAND • NEW SKIES SATELLITES • PHILIPS CONSUMER ELECTRONICS • ROYAL KPN • **NEW ZEALAND** BROADCAST COMMUNICATIONS • TELECOM NEW ZEALAND **NICARAGUA NIGER NIGERIA** NIGERIAN TELECOMMUNICATIONS (NITEL) **NORWAY** NERA NETWORK • NORKRING • TANDBERG TELECOM • TELENOR **OMAN PAKISTAN PANAMA** CABLE & WIRELESS PANAMÁ **PAPUA NEW GUINEA PARAGUAY** ADMINISTRACIÓN NACIONAL DE TELECOMUNICACIONES (ANTELCO) **PERU** INSTITUTO NACIONAL DE INVESTIGACIÓN Y CAPACITACIÓN DE TELECOMUNICACIONES (INICTEL) • ORGANISMO SUPERVISOR DE INVERSIÓN PRIVADA EN TELECOMUNICACIONES (OSIPTEL) • TELEFÓNICA DEL PERÚ **PHILIPPINES** CAPITOL WIRELESS • GLOBE TELECOM • INTERNATIONAL COMMUNICATIONS CORPORATION (ICC TELECOMS) • PHILIPPINE COMMUNICATIONS SATELLITE (PHILCOMSAT) • PHILIPPINE GLOBAL COMMUNICATIONS (PHILCOM) • PHILIPPINE LONG DISTANCE TELEPHONE • SMART COMMUNICATIONS **POLAND** • POLKOMTEL SA • **PORTUGAL** COMPANHIA PORTUGUESA RÁDIO MARCONI • PORTUGAL TELECOM **QATAR ROMANIA** LOGIC TELECOM • THE NATIONAL RADIOCOMMUNICATIONS COMPANY • THE NATIONAL TELECOMMUNICATIONS COMPANY • ROMTELECOM **RUSSIA** COMINCOM • ROSTELECOM **RWANDA SAINT LUCIA SAMOA SAN MARINO SAO TOME AND PRINCIPE SAUDI ARABIA** SAUDI LOGISTICS AND ELECTRONICS COMPANY (SALEC) • SAUDI TELECOMMUNICATION COMPANY (S.T.C.) • ZAJOUL FOR ADVANCED COMMUNICATION TECHNOLOGY **SENEGAL** SOCIÉTÉ NATIONALE DES TÉLÉCOMMUNICATIONS DU SÉNÉGAL **SEYCHELLES SIERRA LEONE SINGAPORE** SINGAPORE TECHNOLOGIES TELEMEDIA (ST TELEMEDIA) • SINGAPORE TELECOMMUNICATIONS (SINGAPORE TELECOM) • STARHUB **SLOVAKIA** SLOVAK TELECOM **SLOVENIA SOLOMON ISLANDS SOMALIA SOUTH AFRICA** MOBILE TELEPHONE NETWORKS • ORBICOM • SENTECH • TELKOM • TRANSTEL • VODACOM **SPAIN** AIRTEL MÓVIL • ALCATEL ESPAÑA • CORREOS Y TELÉGRAFOS • HISPASAT • RADIOTELEVISIÓN ESPAÑOLA (RTVE) • RETEVISIÓN • SOCIEDAD ESPAÑOLA DE RADIODIFUSIÓN (SER) • TELEDESIC COMMUNICATION SPAIN • TELEFÓNICA **SRI LANKA** SRI LANKA TELECOM **ST VINCENT AND THE GRENADINES SUDAN** SUDAN TELECOM (SUDATEL) **SURINAME SWAZILAND SWEDEN** GLOBAL ONE SERVICES • SWEDISH SPACE CORPORATION • TELE 1 EUROPE • TELE 2 • TELEFON-L.M.ERICSSON • TELELOGIC • TELENORDIA • TELIA • TERACOM **SWITZERLAND** ASCOM MANAGEMENT • AULM • CARRIER1 INTERNATIONAL • CATEL CARRIER-UND TELEKOMMUNIKATIONS (SCHWEIZ) • DIAX TELECOMMUNICATIONS • INTERCROSS • INTERNATIONAL 800 TELECOM CORPORATION • ORANGE COMMUNICATIONS • SIEMENS-SCHWEIZ • SWISSCOM • THE FANTASTIC CORPORATION • WISEKEY • **SYRIA TAJIKISTAN TANZANIA THAILAND THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA TOGO TONGA TRINIDAD AND TOBAGO** WORLDSPACE CARIBBEAN **TUNISIA** AGENCE TUNISIENNE D'INTERNET (ATI) • CENTRE D'ÉTUDES ET DE RECHERCHES DES TÉLÉCOMMUNICATIONS (CERT) • TUNISIE TÉLÉCOM **TURKEY** • TELSIM MOBILE TELECOMMUNICATION SERVICES **TURKMENISTAN TUVALU UGANDA UKRAINE UNITED ARAB EMIRATES UNITED KINGDOM** • ACTERNA • ADVA OPTICAL NETWORKING • AGILENT TECHNOLOGIES UK • ALCATEL UK • ANALYSYS • BOEING AEROSPACE • BRITISH BROADCASTING CORPORATION (BBC) • BT • CABLE & WIRELESS • CORNHILL PUBLICATIONS • CORNING COMMUNICATIONS • ELEMENT 14 • ENERGIS COMMUNICATIONS • EUROPEAN MARKET LIAISON (EML) • FLAG TELECOM • FUJITSU EUROPE • GE CAPITAL SATELLITES (GIBRALTAR) • HANSON COOKE • HUGHES NETWORK SYSTEMS • ICO GLOBAL COMMUNICATIONS • INMARSAT • INTERNATIONAL TELEMEDIA ASSOCIATION • LUCENT TECHNOLOGIES UK • MADGE NETWORKS • MARCONI COMMUNICATIONS • MOBILE SYSTEMS INTERNATIONAL • MOTOROLA LTD-MOTOROLA LABS. • NOKIA UK • NORTEL NETWORKS (EUROPE) • NUERA COMMUNICATIONS • ORANGE PCS • PANASONIC-DTRL • PIRELLI CABLES • RACAL-DATACOM • SKYLIGHT HOLDINGS • SYMBIONICS • TEKTRONIX EUROPE • TELEDESIC • TELESOFT TECHNOLOGIES • TIMES PUBLICATIONS • VIRATA • VODAFONE GROUP SERVICES • VODAFONE LTD • VODAFONE PLC **UNITED STATES** 3COM CORPORATION • 3M • 8X8 • ADC TELECOMMUNICATIONS • ADTRAN • ADVANCED MICRO DEVICES (AMD) • AERONAUTICAL RADIO (ARINC) • AGILENT TECHNOLOGIES • ALCATEL USA • ALLAN T. 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VANUATU VATICAN VENEZUELA** CANTV • INSTITUTO POSTAL TELEGRÁFICO DE VENEZUELA (IPOSTEL) • TELCEL CELULAR **VIET NAM YEMEN YUGOSLAVIA** YUGOSLAV RADIOTELEVISION **ZAMBIA ZIMBABWE ORGANIZATIONS** AFRICAN TELECOMMUNICATIONS UNION (ATU/UAT) • AHCIET • ARAB SATELLITE COMMUNICATIONS ORGANIZATION (ARABSAT) • ARAB STATES BROADCASTING UNION (ASBU) • ASIA-PACIFIC BROADCASTING UNION (ABU) • ASIA-PACIFIC TELECOMMUNITY (APT) • ASIA-PACIFIC SATELLITE COMMUNICATIONS COUNCIL (APSCC) • ASSOCIATION OF STATE TELECOMMUNICATION UNDERTAKINGS OF THE ANDEAN SUB-REGIONAL AGREEMENT (ASETA) • CARIBBEAN ASSOCIATION OF NATIONAL TELECOMMUNICATION ORGANIZATIONS (CANTO) • CARIBBEAN TELECOMMUNICATION UNION (CTU) • CDMA DEVELOPMENT GROUP • COMMITTEE ON RADIO ASTRONOMY FREQUENCIES (CRAF) • COMMITTEE ON SPACE RESEARCH (COSPAR) • CTO-COMMONWEALTH TELECOMMUNICATIONS ORGANISATION • CONFERENCE OF POSTAL AND TELECOMMUNICATIONS ADMINISTRATIONS OF CENTRAL AFRICA (COPTAC) • COOPERATION COUNCIL FOR THE ARAB STATES OF THE GULF 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(EURELECTRIC) • WORLD BROADCASTING UNION (WBU) • WORLDTEL

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Corporate Communication
International Telecommunication Union
Place des Nations
CH-1211 Geneva 20, Switzerland
Telephone: +41 22 730 6039
Fax: +41 22 730 5939
E-mail: pressinfo@itu.int

More about the ITU can be found at www.itu.int