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INTERNATIONAL TELECOMMUNICATION UNION

No. 2 — March 2013

ITU NEWS

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Mobile subscriptions near the 7-billion mark

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Shaping the future of broadband

Dr Hamadoun I. Touré, ITU Secretary-General



The seventh Meeting of the Broadband Commission for Digital Development was held in Mexico City on 16 and 17 March 2013, hosted by its co-Chair Carlos Slim Helú, President of the Carlos Slim Foundation. Once again, I was bowled over by the passion and enthusiasm of the Commissioners.

The Commission set a target calling for "gender equality in broadband access by the year 2020" based on the outcome of the first face-to-face meeting of its Working Group on Gender, which took place on 16 March. The working group was launched in New York just last September by Geena Davis, actress, advocate and ITU's Special Envoy on Women and Girls.

With this new target, the Commission hopes to raise awareness of the gender imbalance in access to information and communication technologies (ICT) and to make sure that an advance on this front becomes a key pillar of the post-2015 global development agenda. As a Commission, we have therefore mandated the working group to implement a project "dashboard" to track gender and technology initiatives worldwide.

The Commission's meeting coincided with *Aldea Digital* (Digital Village), a technology fair staged in Zócalo — Mexico City's most iconic square. The "village" was in fact a huge exhibition enabling ordinary people to experiment with computers and broadband.

On 16 March, I joined the other Commissioners in the opening ceremony and tour of *Aldea Digital,* alongside President Paul Kagame of Rwanda, who is also the Commission's co-Chair, the Mayor of Mexico City Miguel Angel Mancera, Mexico's Secretary of Transport and Communications Gerardo Ruiz Esparza, and the Director-General of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Irina Bokova, who is also the Commission's co-Vice-Chair.

Based on the vision of Mr Slim's Digital Libraries, where citizens can borrow laptops and games as readily as books, the Digital Village was a powerful statement to all Mexico that broadband matters, and that broadband is vital for Mexico's future competitiveness and welfare. The look of sheer wonder on children's faces, as they designed their own cartoon characters in the specially-equipped classrooms, will stay with me for a long time.

This was a remarkable time to be in Mexico, where President Enrique Peña Nieto has launched a raft of reforms, including in education and telecommunications. As I have said before, education cannot nowadays be separated from technology.

A new report from the Broadband Commission's Working Group on Education, presented to the Commission on 17 March, emphasizes the importance of deploying broadband as a means of accelerating progress towards education for all. The report



Roberto Ortiz

Broadband Commissioners participated in the opening ceremony of Aldea Digital 2013, *a technology trade fair in Mexico City that coincided with the seventh Meeting of the Broadband Commission for Digital Development.*
From left to right: Mexico's Secretary of Transport and Communications Gerardo Ruiz Esparza; Irina Bokova Director-General of UNESCO; President Paul Kagame of Rwanda; Mayor of Mexico City Miguel Angel Mancera; Dr Hamadoun I. Touré Secretary-General of ITU; and Carlos Slim Helú President of Carlos Slim Foundation

Technology, Broadband and Education — Advancing the Education for All Agenda also features case studies offering fresh insights into how education around the world is being transformed by technology (see articles on pages 49–55).

Keeping tabs on trends is essential if we are to measure progress towards our goals. This issue of *ITU News* turns the spotlight on the findings in *The World in 2013: ICT Facts and Figures,* a report released by ITU in February. The statistics confirm strong sustained demand for ICT services, but also highlight a gender gap (see articles on pages 10–18).

Figures from ITU's sister agencies — particularly UNESCO and the United Nations Development Programme (UNDP) — also show gender gaps in access to technology varying between 15 and 40 per cent, depending on technology and region. We need to eliminate such imbalances to ensure that all people are empowered through ICT to take control of their own destinies.

As technology continues to advance ever more rapidly, the Commission provides an invaluable platform for dialogue between top industry leaders and policy-makers. Together, the Commission is succeeding in building momentum around our message that broadband can help accelerate progress towards meeting the Millennium Development Goals, sow the seeds of development, and enable people to improve their own lives.

Mobile subscriptions near the 7-billion mark











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Getty Images

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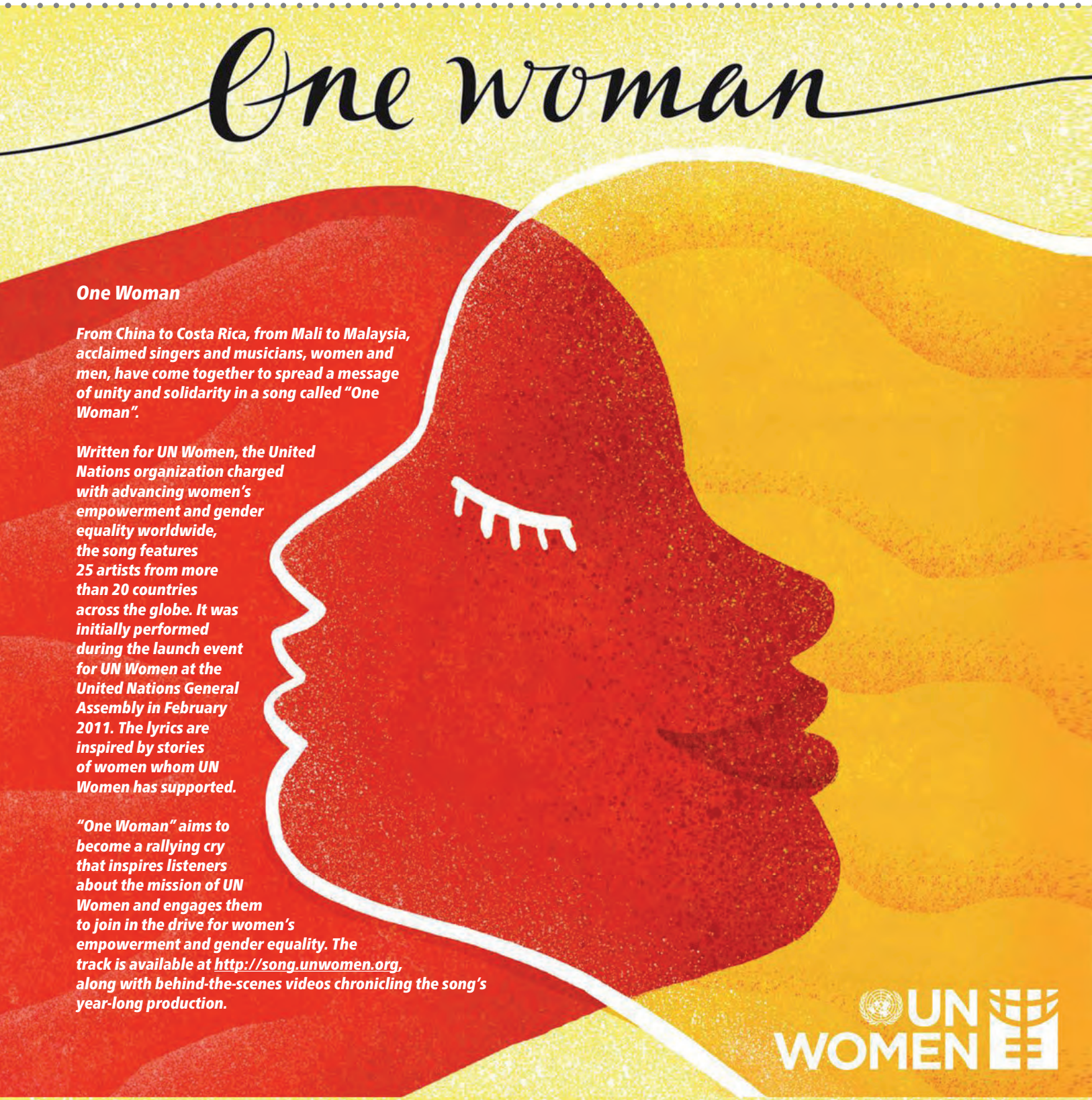
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One Woman

From China to Costa Rica, from Mali to Malaysia, acclaimed singers and musicians, women and men, have come together to spread a message of unity and solidarity in a song called "One Woman".

Written for UN Women, the United Nations organization charged with advancing women's empowerment and gender equality worldwide, the song features 25 artists from more than 20 countries across the globe. It was initially performed during the launch event for UN Women at the United Nations General Assembly in February 2011. The lyrics are inspired by stories of women whom UN Women has supported.

"One Woman" aims to become a rallying cry that inspires listeners about the mission of UN Women and engages them to join in the drive for women's empowerment and gender equality. The track is available at http://song.unwomen.org, along with behind-the-scenes videos chronicling the song's year-long production.

"We are One Woman.
Your world is mine and we shall shine."


UN Photo/Mark Garten

Uniting to end violence against women

United Nations Secretary-General, Ban Ki-moon

As we commemorate International Women's Day, we must look back on a year of shocking crimes of violence against women and girls, and ask ourselves how to usher in a better future.

One young woman was gang-raped to death. Another committed suicide out of a sense of shame that should have been attached to the perpetrators. Young teens were shot at close range for daring to seek an education.

These atrocities, which rightly sparked global outrage, were part of a much larger problem that pervades virtually every society and every realm of life.

Look around at the women you are with. Think of those you cherish in your families and communities. And understand that there is a statistical likelihood that many of them have suffered violence in their lifetime. Even more have comforted a sister or friend, sharing their grief and anger following an attack.

This year on International Women's Day, we convert our outrage into action. We declare that we will prosecute crimes against women — and never allow women to be subjected to punishments for the abuses they have suffered. We renew our pledge to combat this global health menace wherever it may lurk — in homes and businesses, in war zones and peaceful countries, and in the minds of people who allow violence to continue.

We also make a special promise to women in conflict situations, where sexual violence too often becomes a tool of war aimed at humiliating the enemy by destroying their dignity.

To those women we say: the United Nations stands with you. As Secretary-General, I insist that the welfare of all victims of sexual violence in conflict must be at the forefront of our activities. And I instruct my senior advisors to make our response to sexual violence a priority in all of our peace-making, peace-keeping and peace-building activities.

The United Nations system is advancing our UNiTE to End Violence against Women campaign, which is based on the simple but powerful premise that all women and girls have a fundamental human right to live free of violence.

In New York, the Commission on the Status of Women, at its fifty-seventh session on 4–15 March 2013, will see the world's largest ever United Nations gathering that has the stated aim of ending violence against women. We will make the most of this gathering — and we will keep pressing for progress long after it concludes.

I welcome the many governments, groups and individuals who have contributed to this campaign. I urge everyone to join our effort. Whether you lend your funds to a cause or your voice to an outcry, you can be part of our global push to end this injustice, and provide women and girls with the security, safety and freedom they deserve.


UN Women/Catianne Tijerina

A promise is a promise: Time for action to end violence against women

Michelle Bachelet, former United Nations Under-Secretary-General and Executive Director of UN Women

Celebrating International Women's Day at the United Nations (UN) headquarters in New York on 8 March 2013, Michelle Bachelet, the then UN Women Executive Director made a rallying call to the international community to move forward on gender equality and women's rights.

At the event "A promise is a promise: Time for action to end violence against women", organized under the auspices of the UNiTE Campaign, and attended by the United Nations Secretary-General Ban Ki-moon, as well as representatives of Member States, civil society and the private sector, Ms Bachelet highlighted the progress made in the past century but called for more robust action and commitments to protect the right of women and girls to live in dignity, free from violence and discrimination.

Recognizing the critical gains made over the past 20 years in ensuring that women enjoy the same human rights as men, and get equal treatment, Ms Bachelet said "We have moved forward with the 1979 Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), the 1994 Programme of Action of the International Conference on Population and Development (ICPD) and the ICPD+5 Key Actions for further implementation. We have moved forward with the Platform for Action of the 1995 Fourth World Conference on Women in Beijing, the Security Council's landmark Resolution 1325 on women, peace and security, its subsequent resolutions, and all international human rights conventions and other treaties. My message today is: we cannot move backwards, we must keep moving forward. It is what we owe to millions of women fighting for their rights around the world."

> *"We have to move forward, we owe it to the millions of women fighting for their rights globally."*
>
> *Michelle Bachelet, former United Nations Under-Secretary-General and Executive Director of UN Women*

Ms Bachelet considers that the widespread public outrage — shown by men and women, girls and boys — and the calls for action to end violence against women and girls constitute a tipping point. "Never before have we had the instant and global outreach that new technologies afford to record in mere seconds, and communicate

in real time, the atrocities and horrors of violence committed against women and girls", she said.

Ms Bachelet went on to add that "Violence against women is pervasive and knows no borders. It does not discriminate according to nationality, ethnicity, social class, culture or religion." That is why, as she put it, "women, men and young people have raised their voices in every region to say one thing: enough is enough".

In Ms Bachelet's opinion, everyone has the responsibility to act with courage, conviction and commitment to eliminate violence against women. But she feels that a special duty is incumbent on the international community and Member States of the UN to show that they not only listen, but also support what people now demand.

Ms Bachelet said she was pleased to announce that "just as public awareness and outrage are rising, so too is the commitment by governments to take action to end this violence". In November 2012, UN Women invited governments to announce new national action, and this led to the birth of the "COMMIT" initiative. In this context, she said "I am pleased to announce that 50 governments and the European Commission have committed to taking concrete action to end violence against women and girls… From Argentina to Australia, Brazil to Colombia and Denmark, Germany to Jamaica, Liberia to Thailand, from Slovakia to the Republic of Korea, countries have committed to take action. We have just heard good news from the United States of America, where the Violence against Women Act was signed by President Obama. From here to all regions of the world, governments have pledged actions to end violence against women, and guarantee access to critical services and justice. Together we must keep the promise, so that women and girls can, one day, in this century, live free of fear and violence." Today, 54 governments and the European Union have joined the initiative.

Referring to the 57th session of the Commission on the Status of Women, taking place at the UN headquarters in New York from 4 to 15 March 2013, Ms Bachelet said "We have the historic opportunity to make strong commitments, to move forward to prevent and end these widespread human rights violations. The 57th Commission on the Status of Women must uphold, and should advance, the full human rights of women. This is what women and girls all over the world expect from us! We truly have to go the extra mile."

On 15 March, Member States adopted the historic Agreed Conclusions at the Session, providing a framework to tackle the pandemic of violence against women and girls (http://www.unwomen.org/2013/03/un-women-urges-implementation-of-historic-global-agreement-to-end-violence-against-women-and-girls/)
Source: — Courtesy UN Women.



Ending violence against women

How technology can help

Dr Hamadoun I. Touré, ITU Secretary-General

Violence against women is a social scourge that knows no cultural, economic or geographical boundaries. It is a tragic fact that some 70 per cent of women globally will be the victims of some kind of violence during their lifetimes. Violence takes many forms — from physical harm to verbal and psychological abuse, to punitive economic actions designed to distress and deprive. In today's enlightened modern world, we should and must adopt a zero tolerance policy.

As ever, technology is part of the mix — for good and for bad. Simple technologies such as mobile phones, social networks and digital cameras can help protect women by providing vital communication links, ways of sharing, supporting and informing other women and their loved ones, and the means of documenting the actions of those who engage in threatening or violent behaviour. The fear of being photographed, recorded or filmed is sometimes enough to serve as a disincentive to violent language or actions. When it is not, an electronic record of such behaviour can help women seek justice and redress.

A resolution in the International Telecommunication Regulations treaty that was updated by the World Conference on International Telecommunications in December 2012 calls for the creation of a single, globally harmonized number for access to emergency services. World leaders could consider leveraging this resolution to create a globally agreed, easy to remember helpline number for female victims of violence, so that women everywhere could call the same simple phone number for assistance. This could also greatly benefit the millions of female victims of human trafficking.

The technology industry itself represents an exceptional opportunity for girls and women to carve out rewarding careers that offer both economic independence and a stimulating fast-evolving work environment. My own organization is leading global efforts to attract more women into the technology sector, as well as to train women in poorer countries in basic information and communication technology (ICT) skills, to enable them to find better-paid jobs and even start their own small businesses.

These are areas in which technology can play a positive role. But we must not turn a blind eye to the darker side. Hate speech against women on the world's websites has taken a sharp upward turn of late, with anonymity affording a cloak of invisibility to those who seek to abuse and degrade women. I appeal to all online forums and news sites to call an immediate halt to gender-related hate speech. Women have a right to feel safe and protected when speaking their mind, whether in public or online.

As Secretary-General of the International Telecommunication Union, the United Nations specialized agency for digital communications, I champion every woman's right of access to technology. Further, I believe that technology can play a major role in the campaign launched by the United Nations Secretary-General, Ban Ki-moon, to end violence against women. On the occasion of International Women's Day 2013, I urge governments and the global ICT industry to work together to harness this powerful tool.

Mobile subscriptions near the 7-billion mark

Does almost everyone have a phone?

ITU estimates that there will be almost as many mobile-cellular subscriptions globally by the end of 2013 as there are people on Earth. This is the message according to The World in 2013: ICT Facts and Figures, *released by ITU on 27 February. Another message is that mobile broadband is currently the most dynamic market segment.*

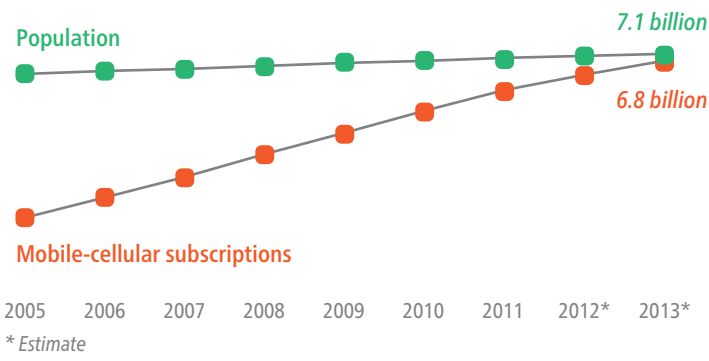
Subscriptions versus subscribers: A big difference?

The World in 2013: ICT Facts and Figures confirms strong sustained demand for information and communication technology (ICT) services. In this report, ITU estimates that by the end of 2013, there will be around 6.8 billion mobile-cellular subscriptions globally, with that figure set to near the 7-billion mark in 2014. More than half of these subscriptions are in the Asia-Pacific region.

"Near-ubiquitous mobile penetration makes mobile cellular the ideal platform for service delivery in developing countries," says Brahima Sanou, Director of ITU's Telecommunication Development Bureau. "Our new m-Powering Development initiative is designed to leverage this potential across markets worldwide, and especially in rural and remote communities."

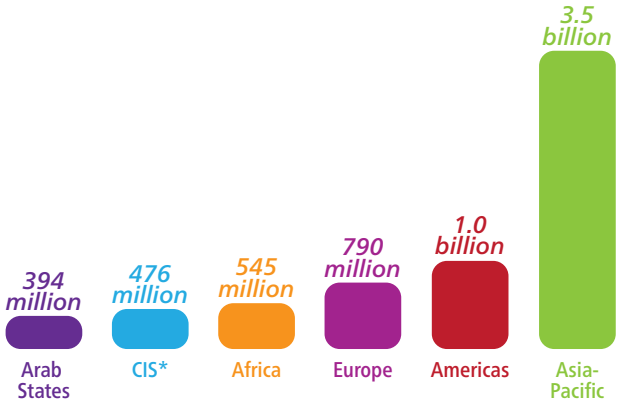
The impressive figure of 6.8 billion mobile-cellular subscriptions implies that global mobile penetration will reach 96 per cent by the end of 2013. But does this mean that almost everyone on Earth has a phone? The simple answer is no. For example, GSMA's report *The Mobile Economy,* released in February 2013, estimates that the actual number of individual mobile subscribers (defined as the unique users subscribed to mobile services) will reach 3.4 billion during this year. So the statistic needs some clarification.

Converging trends in mobile-cellular subscriptions and global population



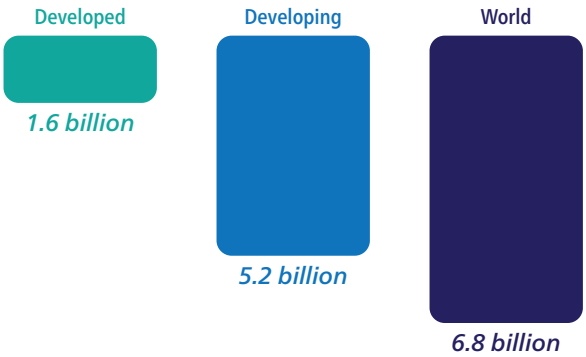
* Estimate

Source: ITU World Telecommunication /ICT Indicators database.



*Commonwealth of Independent States.

Mobile-cellular subscriptions worldwide (by end of 2013)



Source: ITU World Telecommunication /ICT Indicators database.

There are several factors explaining the huge difference between the number of subscriptions and the number of subscribers. But most analysts agree that one main reason is that many subscribers have more than one subscription. So double counting takes place when these individual consumers subscribe to more than one service. For example, individual consumers may have separate subscriptions for business and private use.

As Susan Teltscher, Head of the ICT Data and Statistics Division of ITU's Telecommunication Development Bureau explains, "Individuals may own multiple subscriber identification module (SIM) cards. Many mobile consumers actively use more than one SIM card. Having several subscriptions — for work handset and home handset, for example — is not unusual."



Getty Images

Ms Teltscher also observes that "In many developing countries, where the large majority of subscriptions are on a prepaid basis, people often buy several SIM cards to avoid paying high termination charges which occur when calling from one network to another. In countries with very low shares of prepaid subscriptions and therefore few people with multiple SIM cards (such as the Republic of Korea and Japan), mobile-cellular penetration rates are relatively lower as there is less double-counting."

In contrast, there are also people, particularly in developing countries, who share one subscription, for example through a family or a village phone. Therefore, the actual number of mobile phone users is yet again different from the number of subscriptions or unique subscribers.

Another factor is that, in some cases, operators are slow to remove inactive accounts from their databases and therefore end up reporting inactive SIM cards in their subscription totals. According to ITU's definition, accounts that have been inactive for three months or more should not be counted.

ITU tracks statistics on mobile phone users, which are collected in countries through national household surveys. Available data show that there are significant differences between the number of mobile subscriptions and the number of actual mobile users in some countries, but that the differences are not consistent across countries — even within Europe. Numbers are sketchy, though, since household surveys are costly to implement and collect a large number of indicators, among which mobile phone usage may not always be included. ITU works closely with national statistical offices to improve the availability and quality of country data on the use of mobile phones and other information and communication technologies.

Mobile-cellular penetration estimates in 2013

Mobile-cellular subscription penetration exceeds 100 per cent in four of the six ITU world regions, with the Commonwealth of Independent States (CIS) at 170 per cent leading the pack, followed by Europe (126 per cent), the Americas (109 per cent), and the Arab States (105 per cent). Asia-Pacific stands at 89 per cent, with Africa at 63 per cent.

Mobile-cellular penetration rates stand at 128 per cent in the developed world, and 89 per cent in developing countries.

Mobile-broadband subscriptions

The number of active mobile-broadband subscriptions has grown from 268 million in 2007 to an estimated 2.1 billion in 2013. While people in developed countries use mobile-broadband networks in addition to fixed-broadband connections, mobile broadband is often the only access method to the Internet for many people in developing countries. In these countries, the number of mobile-broadband subscriptions more than doubled from 472 million in 2011 to an estimated 1.16 billion in 2013, surpassing the number in developed countries.

Africa has had the highest regional growth rate over the past three years, with mobile-broadband penetration increasing from 2 per cent in 2010 to an estimated 11 per cent in 2013.

The statistics on active mobile-broadband subscriptions also deserve further explanation. According to ITU's definition, they refer to mobile-cellular subscriptions with advertised data speeds of at least 256 kbit/s (the rate used to define a service as broadband) and which have been used to set up an Internet data connection; and to subscriptions to dedicated data services over a mobile network that are purchased separately from voice services, either as a standalone service — for example, using a data card such as a USB modem or dongle — or as an add-on data package to voice services requiring an additional subscription.

Similar to mobile-cellular subscriptions, mobile-broadband subscriptions do not refer to the number of individuals using mobile-broadband connections to access the Internet. People may access mobile broadband services through different

Mobile-broadband subscriptions and penetration worldwide by end 2013 (estimates) and compound annual growth rate (CAGR) 2010–2013

Americas

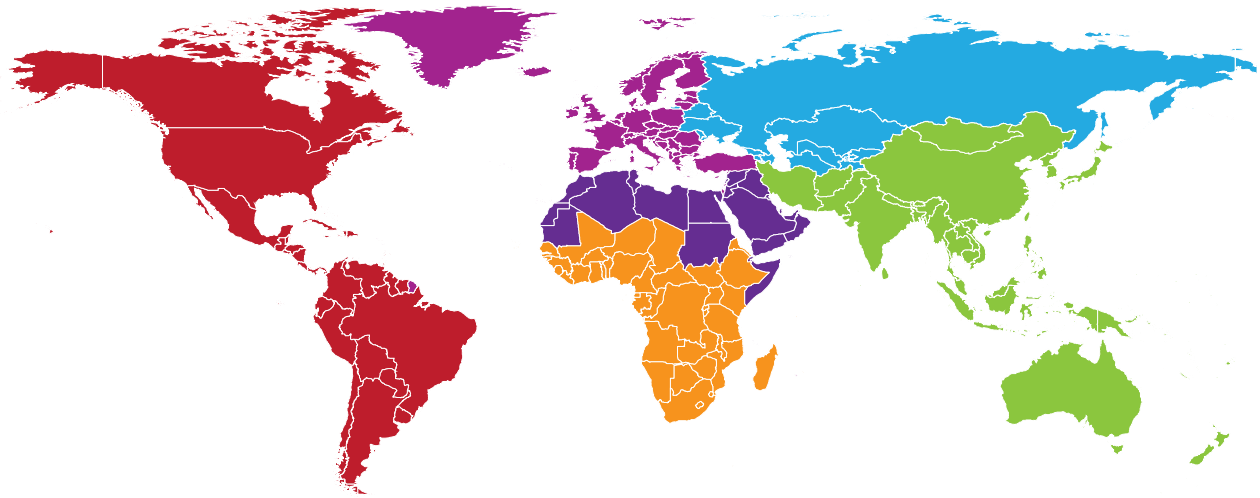
460 million subscriptions
48% penetration
28% CAGR (2010–2013)

Europe

422 million subscriptions
68% penetration
33% CAGR (2010–2013)

CIS

129 million subscriptions
46% penetration
27% CAGR (2010–2013)



Arab States

71 million subscriptions
19% penetration
55% CAGR (2010–2013)

Africa

93 million subscriptions
11% penetration
82% CAGR (2010–2013)

Asia-Pacific

895 million subscriptions
22% penetration
45% CAGR (2010–2013)

Source: ITU World Telecommunication /ICT Indicators database.

devices, such as a handset, laptop or tablet computer. One person may subscribe to several of these services, while another may share the subscription with family and friends.

Significant growth opportunity for the mobile industry

So while mobile access has certainly become ubiquitous, with more than 90 per cent of the global population covered by a mobile-cellular signal, and 3G+ coverage expanding rapidly, the numbers have to be interpreted with care. ITU works actively with data providers in countries to ensure international data comparability and to improve the quality and availability of indicators that provide further insight into mobile phone and broadband usage.

Noting that "almost half the population of the Earth now uses mobile communications", *The Mobile Economy* says that "There are still many adults and young people who would appreciate the social and economic benefits of mobile technology but are unable to access it, highlighting a huge opportunity for future growth and a challenge to all players in the industry ecosystem to expand the scope of products and services to tap this demand."

For more information see http://www.itu.int/ITU-D/ict/definitions/)



AFP

Internet use — the online population

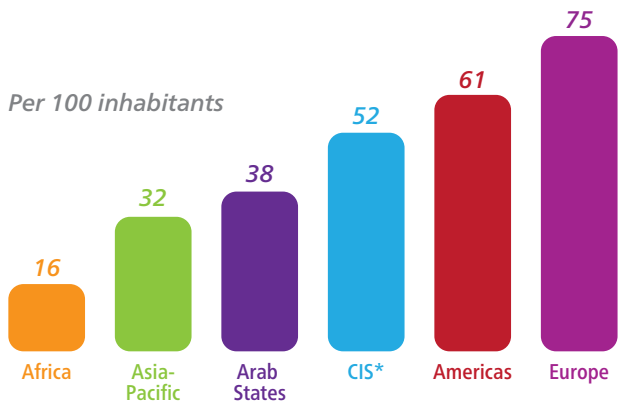
Highlights from The World in 2013: ICT Facts and Figures

ITU estimates that 2.7 billion people — or 39 per cent of the world's population — will be using the Internet by the end of 2013. Internet access is forecast to remain skewed, however, with only 31 per cent of the population in the developing world online by that date, compared to 77 per cent in the developed world.

Users by region

Looking at regional access, Europe has the highest Internet penetration rate in the world (75 per cent), followed by the Americas (61 per cent). The Commonwealth of Independent States (CIS) is in third place (52 per cent), followed by the Arab States (38 per cent), Asia-Pacific (32 per cent), and Africa (16 per cent).

Internet users by region, 2013



*Commonwealth of Independent States.

Source: ITU World Telecommunication/ ICT Indicators database.

Speaking to government ministers gathered at the Mobile World Congress event in Barcelona, ITU Secretary-General Dr Hamadoun I. Touré said "We have made the most extraordinary progress in the first twelve years of the new millennium… and yet we still have far to go. Two thirds of the world's population — some 4.5 billion people — is still offline. This means that two thirds of the world's people are still locked out of the world's biggest and most valuable library. Two thirds of the world's people are still refused access to the world's biggest marketplace. And two thirds of the world's people are still denied the extraordinary opportunities now available to the other third. Mobile broadband is clearly going to be a vital part of the solution, and we must continue to 'mobilize' to ensure that all of the world's people have affordable, equitable access to the Internet."

The World in 2013: ICT Facts and Figures *was produced by the ICT Data and Statistics Division of ITU's Telecommunication Development Bureau. The full report is available at: www.itu.int/ITU-D/ict/facts/index.html. The raw statistics used to create the charts in the report are available on demand.*

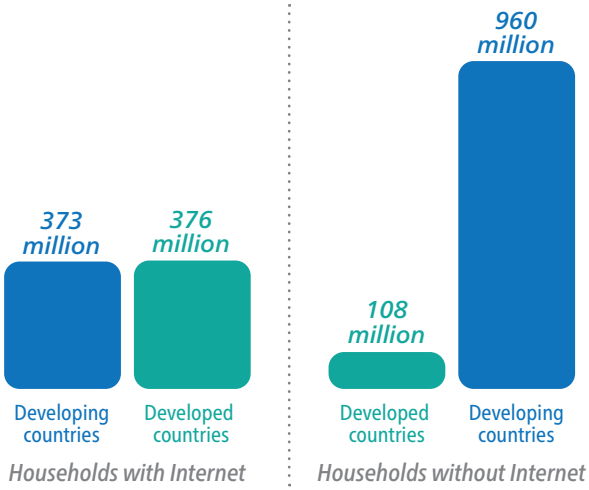
Households with Internet access

Household Internet penetration — often considered the most important measure of Internet access — continues to rise. ITU estimates that by the end of 2013, 750 million households worldwide will be connected to the Internet, with half of them in the developing world.

Africa has seen the fastest Internet penetration in its households between 2009 and 2013, with annual growth of 27 per cent, followed by Asia-Pacific, the Arab States and the Commonwealth of Independent States, with 15 per cent annual growth.

But despite this positive trend, of the 1.1 billion households around the world that are still unconnected, 90 per cent are in the developing world. Among the regions, the contrast is greatest between Europe, with the highest level of household Internet penetration (77 per cent), and Africa, with the lowest level (7 per cent). The majority of households in the Americas are online (61 per cent), compared with around one-third of households in the Arab States and Asia-Pacific.

Households with Internet access, 2013 (estimates)

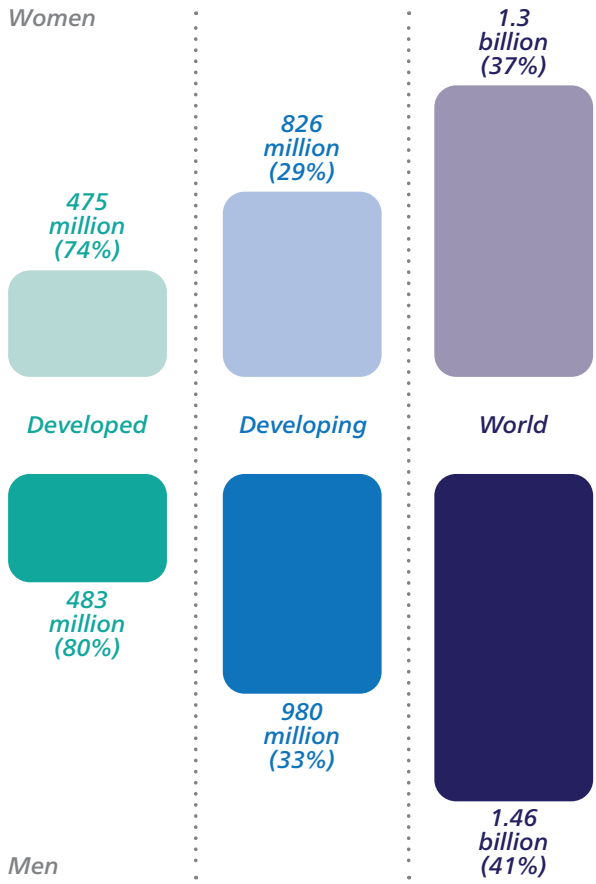


Source: ITU World Telecommunication /ICT Indicators database.

Mind the gender gap

More men than women use the Internet: globally, 37 per cent of all women are online, compared with 41 per cent of all men. This corresponds to 1.3 billion women and 1.46 billion men.

The gender gap: women and men online, totals and penetration rates, 2013 (estimates)



Source: ITU World Telecommunication /ICT Indicators database.



The gender gap is more pronounced in the developing world, which is home to about 826 million female Internet users and 980 million male Internet users. In the developed world, there are about 475 million female Internet users and 483 million male Internet users.

High-speed access to the Internet

Differences in broadband speed persist. Uptake of high-speed broadband (at least 10 Mbit/s) is highest in some Asian economies, including the Republic of Korea, Hong Kong (China) and Japan, and in several European countries, such as Bulgaria, Iceland and Portugal.

In Africa, less than 10 per cent of fixed (wired) broadband subscriptions offer speeds of at least 2 Mbit/s. This is also the case for several countries in Asia-Pacific, the Americas and some Arab States.

Affordability and growth

Over the past five years, fixed-broadband prices as a share of gross national income (GNI) per capita dropped by 82 per cent. With services becoming more affordable, fixed-broadband uptake has shown strong growth. There are now almost 700 million fixed-broadband subscriptions, corresponding to a global penetration rate of 9.8 per cent.

The total number of fixed-broadband subscriptions in developing countries is expected to surpass the number in developed countries by the end of 2013. But there is still a wide gap when it comes to fixed-broadband penetration rates, with 6.1 per cent in developing countries (and less than 1 per cent in Sub-Saharan Africa), compared to 27.2 per cent in developed countries.

Cost of mobile broadband

Competition among different mobile broadband technologies is putting pressure on mobile operators to continuously diversify and innovate in terms of service packages and pricing. The World in 2013: ICT Facts and Figures examines four

Price of mobile-broadband services by region and type of plan, early 2013*

% of GNI per capita

	Europe	Arab States	CIS**	Americas	Asia-Pacific	Africa
Prepaid handset-based (500 MB)	1.1	5.7	5.7	5.9	5.9	38.8
Postpaid handset-based (500 MB)	1.1	2.2	5.6	5.0	3.5	36.2
Prepaid computer-based (1 GB)	1.9	7.4	7.6	11.1	12.6	58.3
Postpaid computer-based (1 GB)	1.2	2.5	7.4	8.0	10.6	54.6

*Simple averages. Preliminary results.
**Commonwealth of Independent States.
Source: ITU World Telecommunication/ICT Indicators database.

typical mobile-broadband plans offered in the market. These are: postpaid handset-based and prepaid handset-based plans, both with 500 megabytes (MB) of data volume; and postpaid computer-based and prepaid computer-based plans, both with 1 gigabit (GB) of data volume.

The report shows that mobile broadband is less affordable in developing countries than in developed ones. And mobile broadband is considerably cheaper than fixed-broadband services in developing countries. For example, a postpaid computer-based mobile-broadband plan with 1 GB of data volume represents 18.8 per cent of monthly gross national income (GNI) per capita, compared to 30.1 per cent for a postpaid fixed-broadband plan (also with 1 GB of data volume).

Of the four plans discussed in the report, postpaid handset-based services are the cheapest, while prepaid computer-based services are the most expensive, across all regions.

Europe has the most affordable broadband services, where a basic subscription costs, on average, less than 2 per cent of GNI per capita. In sharp contrast, Africa has the least affordable mobile-broadband services, with the price of a computer-based plan with 1 GB of data volume, for example, representing more than 50 per cent of GNI per capita on average.

The Arab States, and the Asia-Pacific region enjoy relatively affordable prices. For example, postpaid handset-based services account for 2.2 per cent of monthly GNI per capita in the Arab States and 3.5 per cent in Asia-Pacific. In the Americas and the Commonwealth of Independent States, prices remain relatively high (at 5 per cent or more of monthly GNI per capita) for all mobile-broadband services.

Pricing of broadband will continue to have significant implications for its uptake.



Demonstration of how to pay at a vending machine using a smartphone equipped with near-field communication technology

Mobile marketplace

Offering what users really want?

The Mobile World Congress, held in Barcelona from 25 to 27 February 2013, pitted manufacturers against each other in showing off their latest offerings in smartphones and tablets. In the applications field, mobile money services are vying for customers, while the ability to attract advertising skews all the financial reasoning. Ultimately, the winners will be those who have understood what users really want.

Mobile money — cash, card or smartphone?

Africa is a leader in the use of mobile money. Fixed-line networks are poorly developed, and the continent's one billion people are becoming avid users of mobile phones, which many people rely on for financial transactions.

Mobile money technology is set to become more sophisticated. MasterCard expects to start rolling out MasterPass, a new digital payment system, at the end of March, initially in Australia and Canada. The system will work on a wide variety of devices, including smartphones. Customers' banking and personal data will be stored online in a "secure cloud", and so will be on hand to pay for purchases made in a shop or on the Internet, without the need to provide bank details or delivery address. Payment can also be made by waving a smartphone equipped with near-field communication (NFC) technology near a special reader.

Banks and stores will be able to issue their customers with MasterPass-connected "digital wallets", which will accept credit and debit card information, including from cards other than MasterCard, according to the MasterCard group.

Taking another approach, Visa and Samsung have joined in a global alliance to enable people to make payments with NFC-equipped Samsung smartphones. According to the agreement between the two companies, the next generation of Samsung mobile devices will be equipped with Visa payment technology. This includes pre-loading Visa's contactless payment system — Visa payWave — in Samsung mobiles.

Banks will be able to transmit payment account information to a secure microchip embedded in Samsung devices. Bank data security will rely on secure systems implemented by Visa and Samsung — Visa's Mobile Provisioning Service and Samsung's digital key management system.

ABI Research forecasts that 1.95 billion NFC-enabled devices will ship in 2017, and Visa expects the deal with Samsung to "significantly accelerate" the availability of mobile payments globally.

A different approach is being taken by PayPal, an eBay subsidiary, which has announced a new device that lets cash-based businesses accept PIN-number based "smart" debit and credit cards.

To use the technology, merchants will have to buy the device, which they can then pair with their Android or iPhone smartphone once they have downloaded a Paypal Here application. The device will be able to accept secure payments and issue receipts, while PayPal will receive a "small fee" for each transaction.

In the United States, an older system using PayPal technology has been in use for payment cards that are swiped, but the system is unable to handle cards with embedded microchips and PIN numbers.

Cutting costs — in search of a bargain

Attracting customers means providing devices that they can afford, so price is a challenge for manufacturers.

Huawei has launched a smartphone adapted for Africa, the 4Afrika, running on Microsoft's Windows Phone operating system and with a four-inch screen. Specially adapted for each market, the Nigerian version has a dictionary for the local Yoruba language and local news, along with an application related to the popular low-budget movie industry, called Nollywood.

According to Microsoft, the 4Afrika smartphone sells for less than USD 200 and is already available in Angola, Egypt, Côte d'Ivoire, Kenya, Morocco, Nigeria and South Africa.

Nokia is also trying to lure buyers with lower prices. Nokia has released two Windows Phone-operated smartphones. The Lumia 520 will cost EUR 139 before tax, while the more sophisticated Lumia 720 will have a pre-tax price tag of EUR 249. But Nokia will also offer a mobile handset — the Nokia 105 — for only EUR 15. This simple phone is designed for people who mainly just want to make telephone calls.

Meanwhile, Huawei and ZTE are gaining market share by offering touch screens, fast processors and better cameras at prices around USD 100. Huawei claims that its Ascend P2, priced at EUR 399, is the fastest smartphone on the market. It has a thickness of just 8.4 mm, and the company says that it can achieve speeds of 150 Mbit/s, fast enough to download a two-hour high-definition movie in less than five minutes.

Handbag phones and pocket tablets?

Smartphones are getting bigger, while tablets are shrinking. Some of the latest tablets can now also be used as phones.

Huawei's Ascend Mate — with a six-inch screen — was the largest smartphone exhibited at the Mobile World Congress. Next biggest was ZTE's Grand Memo, with a 5.7-inch display. The 5.5-inch screen of LG's Optimus Pro put it in third position.

These big phones may be hard to hold and difficult to squeeze into a pocket, but they fit easily into a handbag and tend to be favoured by women, especially in Asia.

Shipments of smartphones are predicted to hit one billion this year, while more than 120 million tablets were sold worldwide in 2012, up 50 per cent from the previous year, according to Deloitte.

Among tablets, Samsung's Galaxy Note 8 has an eight-inch screen, competing with Apple's new iPad mini.

The blurring of boundaries between smartphones and tablets, both in size and functionality, has prompted journalists to coin the term "phablet" to cover the whole range of new devices from large smartphones to small tablets.

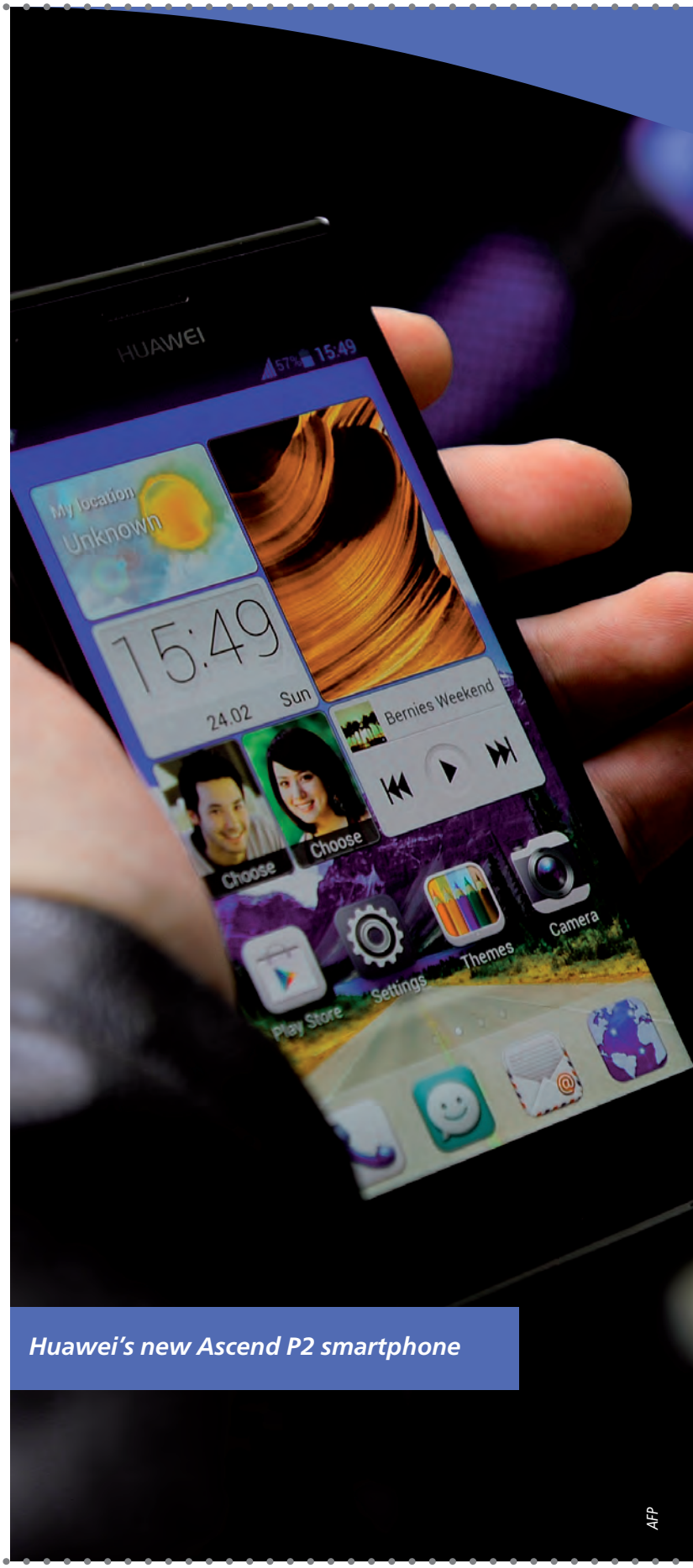
Mobile advertising — we know where you are

With mobile devices increasingly being used for shopping, banking and travel, consumer behaviour is changing. Picking up on those changes, mobile advertising is becoming ever more sophisticated. The days of short text messages to alert consumers to products or services are drawing to a close. Now, owners of mobile devices are being targeted by interactive videos.

The greater screen space generally offered by tablets is attracting advertisers, to the detriment of smartphones. According to a forecast by Deloitte, in 2013 tablets will generate USD 4.9 billion in advertising revenue compared to nearly USD 3.4 billion for smartphones — and the gap is expected to widen.

Online activity reveals the whereabouts of consumers, with a high level of precision — not only the location, but also the speed at which the person is moving and even the person's height above sea level. This enables advertisers to tailor and personalize offers to users, depending on their tastes and in the context of their location in real time. "If you arrive in a shopping centre car park, we can offer you information about available parking spaces. When you are on another floor, we won't offer the same type of service", says Thomas Husson, an analyst at Forrester Research.

For mobile advertising to be successful, customers must see offers as being helpful, not as invading their privacy. Advertisers need the information that flows in from the customer's smartphone or tablet, and so it is in their interests to follow a strategy that makes people willingly to share their data.



Huawei's new Ascend P2 smartphone

Tablets and smartphones are must-have personal devices. They travel along with people in their hands or pockets or bags. Advertisers don't decide what device people will use to connect to a website, and so brands have to adapt to this new environment by optimizing their websites for a range of portable devices and by learning to interact with consumers in real time. This calls for a change in culture and specific skills, which also means substantial investment.

The trends revealed at the Mobile World Congress show that the mobile market is fast-moving and dynamic. Competition is fierce, and it will be interesting to see which players prevail. — Source: Agence France Presse (AFP).

A customer holds up an apple after buying Apple's 7-inch iPad mini tablet



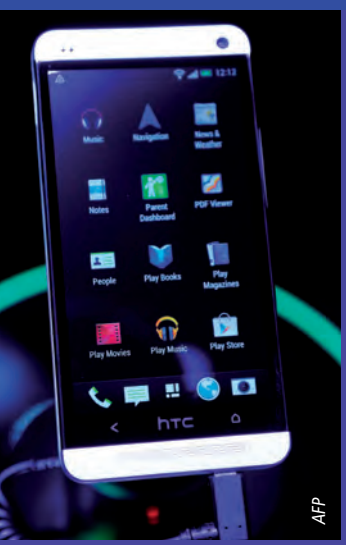
AFP

New mobile devices that stood out on the show floor of the 2013 Mobile World Congress in Barcelona

A prototype smartphone equipped with a photovoltaic film. Wysips, a startup based in Aix-en-Provence in France, has developed a photovoltaic film that fits into a mobile phone screen, allowing the screen to recharge the phone when exposed to light. Wysips expects handset manufacturers to produce the screens themselves, and it hopes the first such phones will be on the market by the end of 2013



AFP


AFP

One X smartphone by HTC


AFP

Galaxy Grand smartphone by Samsung


AFP

Optimus G pro smartphone by LG



AFP

Click/Click Plus by Emporia, a model for people aged 55 and above


AFP

I'm Watch — a smartwatch that lets you view e-mail, calendar, social media updates in easily readable form. It runs Android and custom apps


AFP

Ascend P2 smartphone by Huawei



AFP

The second digital dividend: Another bite for mobile?

The next World Radiocommunication Conference (WRC-15) will be held in Geneva from 2 to 27 November 2015 and will take vital decisions for the future of wireless communications. ITU plays a key role in harmonizing the use of the radio-frequency spectrum around the world and thus enabling the greatest benefit to be extracted from this finite resource.

As noted in ITU's report Trends in Telecommunication Reform 2013 "at the international level, ITU provides a common venue where all Member States can participate in the work of allocating spectrum for new uses and developing standards and plans that maximize the harmonized use of spectrum resource. As the top level of the spectrum allocation process, ITU thus plays a critical role in promoting harmonization among the regions of the world — ensuring that services can coexist with each other, while minimizing interference." In this first article of a series on spectrum matters, we look at what is meant by the second digital dividend, why it is needed and how it will be implemented.

What is the second digital dividend and how will it be implemented?

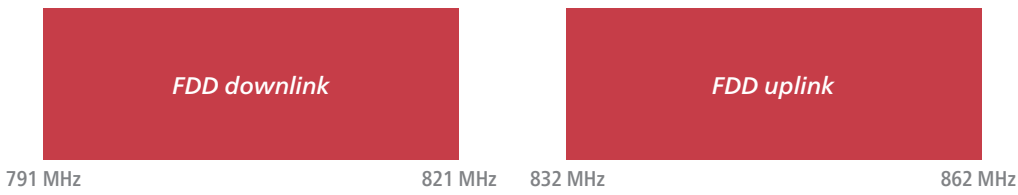
At the start of the World Radiocommunication Conference in 2012 (WRC-12), the African and Arab groups tabled proposals for a new mobile allocation immediately below the existing 800 MHz mobile band (known as the digital dividend band because it was created by migrating the analogue terrestrial television platforms which formerly occupied this band to more spectrally-efficient digital platforms). WRC-12 concluded with a decision to create a new mobile allocation in the band from 694–790 MHz, in ITU Region 1*, which is proposed to come into force in 2015. The delay to 2015 is in order to enable the necessary technical studies to be concluded regarding the availability and assignment of the new band, before bringing the band into use.

ITU has begun a significant work programme of technical studies on two important agenda items for WRC-15:

- Agenda item 1.1: to consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC-12).
- Agenda item 1.2: to examine the results of ITU–R studies, in accordance with Resolution 232 (WRC-12), on the use of the frequency band 694–790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures.

The allocation of the original 800 MHz band for mobile use in Region 1 was agreed at WRC-07. Many regulators in Europe, notably in countries such as France, Germany, Italy, Spain and the United Kingdom, have since awarded the band to mobile operators in accordance with a band plan (see Figure 1) harmonized across Europe through European Commission Decision 2010/267/EC of 6 May 2010. Regulators in the rest of Europe are expected to follow suit between now and

Figure 1 — Harmonized European band plan for the first digital dividend (800 MHz) band



Source: Analysys Mason, 2013.

* *Europe, Africa, the Middle East west of the Persian Gulf including Iraq, the former Soviet Union and Mongolia.*

2015. Commercial 800 MHz LTE services have been operating in Europe since late 2009 and the superior propagation characteristics of this band compared to the 2100 MHz band (hitherto the main band used for mobile broadband services in Europe) should facilitate improvements in mobile broadband coverage in rural areas, as well as better indoor coverage in more densely-populated areas.

Reasons for and against allocating the second digital dividend to mobile

The allocation (at WRC-12) of the second digital dividend band to mobile alongside broadcasting services followed intense debate between, on the one hand, representatives of the African and Arab States and, on the other hand, representatives of the European Conference of Postal and Telecommunications Administrations (CEPT) and administrations of the Regional Commonwealth in the field of Communications (RCC). The CEPT administrations wanted to postpone a decision about this band to WRC-15 because the 700 MHz band is heavily used for terrestrial broadcasting with, in many cases, long-term licensing arrangements in place and a desire on the part of the broadcasters to retain access to this band which could support innovative new terrestrial services in the future. The CEPT line, developed during WRC-12 in response to the 694–790 MHz proposals, was that this was not the appropriate point to make a new allocation in the 700 MHz band and that there were a number of open technical issues that would need to be addressed before a WRC could make such an allocation.

Underlining the fact that the original agenda for WRC-12 did not include any proposal for a second digital dividend, RCC administrations argued that any change in the allocation of frequency bands to the mobile service in the range 694–790 MHz in Region 1 would "require a review of current international agreements regarding frequency plans in border regions of States that are party to the GE06 Agreement and to bilateral and multilateral agreements on use of the band 790–862 MHz, which define the procedural and technical aspects of the use of frequencies in the UHF band by the broadcasting, mobile and other services."

Also, RCC administrations said that no research had been done on the broadcasting service spectrum requirements nor on compatibility with aeronautical radionavigation systems. "Allocating bandwidth below 790 MHz to the mobile service would necessitate the total or partial replanning of broadcasting service frequency allocations in order to compensate for the loss of accessible spectrum, including the transfer to other frequencies of existing stations and stations under construction. Such an undertaking is by its very nature time-consuming and extremely costly," they argued.

The situation in Europe and the RCC countries contrasts with that in Africa and in the Arab States where the 700 MHz band is relatively under-used. Few countries in the African and Arab regions have made the transition from analogue to digital terrestrial broadcasting. In addition, the fixed telecommunication networks in these regions are less developed and hence mobile services take on greater importance. Above all, many African and Arab countries already use the 800 MHz band for mobile services related to governmental applications and therefore cannot release them for IMT applications. For these reasons the proposal from Arab and African administrations was in fact a solution for them to have their "first" digital dividend.

In the end, this argument, together with a recognition that Europe is likely to need more low-frequency spectrum for mobile broadband in the future and the prospect of harmonization with other ITU Regions, for which use of the 700 MHz band for mobile services was agreed at WRC-07 (although for a slightly different bandwidth, namely 698–806 MHz) convinced WRC-12 to allocate the second digital dividend band to mobile (except aeronautical mobile) on a co-primary basis with other services to which this band is allocated on a primary basis, and to identify it for IMT. However, the conference agreed to delay implementation until immediately after WRC-15 to enable the necessary technical studies to be concluded before it is brought into use.



Implementation challenges

Implementing the new 700 MHz allocation within ITU Region 1 will, however, create a number of challenges, which need to be addressed before 2015.

For many countries in Europe where digital terrestrial television services are widely used at present, releasing 700 MHz frequencies for mobile use will require a costly retune of existing networks. In some countries, this will be the second time that digital terrestrial television services have been retuned, since many networks were already replanned in order to release the first digital dividend. Although there are options to improve the capacity of digital terrestrial television networks — such as the use of MPEG-4 coding and migration from DVB-T (the older standard which is the most commonly used in Europe) to DVB-T2 (the newer generation of digital terrestrial television technology) — access to sufficient UHF spectrum is still essential in maintaining existing digital terrestrial television networks and enabling services to expand (for example, by creating more multiplexes to carry additional digital channels). This is particularly the case in European countries such as the United Kingdom, Spain, France, Portugal and Italy, where digital terrestrial television is the main television viewing platform.

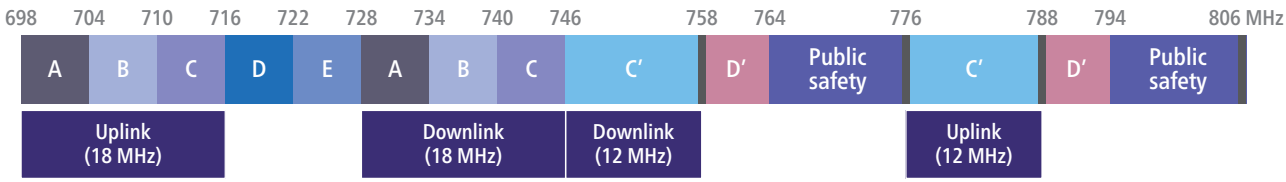
It should also be noted that programme making and special events currently make use of frequency gaps between UHF channels allocated for digital terrestrial television in many countries, by coordinating their transmissions with those of the television networks. Therefore, any replanning of UHF frequencies will affect the future availability of spectrum for those services, which include wireless microphones and other applications used in theatres, sporting events and media events. Without access to the 700 MHz spectrum, in addition to the 800 MHz band, the bandwidth available for PMSE use is going to be severely constrained in comparison to the spectrum previously available.

The other big challenge in making the 700 MHz band available for mobile use is to determine an appropriate band plan that will facilitate harmonization with other world regions. This is primarily because WRC-07 allocated a slightly different 700 MHz band in other ITU

regions (698–806 MHz, which overlaps with Region 1's 800 MHz band). Mobile licenses to use the 700 MHz band were first awarded in the United States, which has adopted a band plan that divides the 700 MHz band into various paired and unpaired blocks, including a paired block (so-called "D block") that is earmarked for use by public safety for future mobile broadband services. However, countries in the Asia-Pacific region have subsequently agreed to implement a different 700 MHz band plan, which provides 45 MHz of paired spectrum with a 10 MHz duplex gap, similar to the European 800 MHz band. Therefore, international harmonization of the 700 MHz band could be achieved, but not without detailed cooperation between the different ITU regions, given the current divergence in 700 MHz deployments between the United States and parts of the Asia-Pacific. This is illustrated in Figure 2.

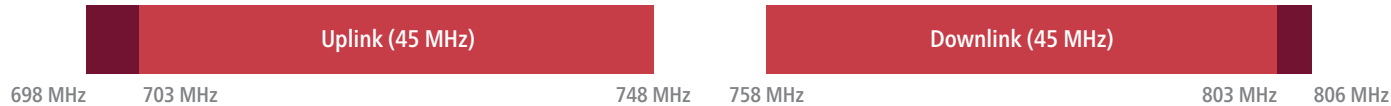
Figure 2 — Current regional 700 MHz band plans

United States 700 MHz band plan (2 x 18 MHz, plus 2 x 12 MHz)*



* *The United States 700 MHz band is divided into lower and upper bands, both of which contain C and D blocks. In this diagram C′ and D′ denote the C and D blocks in the upper band. The D′ block was allocated to public safety in February 2012.*

Asia-Pacific Telecommunity Wireless Group proposed 700 MHz band plan (2 x 45 MHz)



Source: Analysys Mason, 2013.



Status of the technical studies

At the ITU level, the first session of the Conference Preparatory Meeting established, on an exceptional basis, a Joint Task Group 4-5-6-7 (JTG 4-5-6-7) to carry out the preparatory studies on WRC-15 Agenda items 1.1 (which deals with the need for additional mobile broadband spectrum in general) and 1.2 (which deals with proposals relating to the second digital dividend in particular). JTG 4-5-6-7 has so far held two meetings. The second meeting was held in Geneva on 21–28 November 2012 and involved 280 delegates and received 67 input documents including liaison statements from concerned groups, proposals for frequency bands to be studied, elements for sharing studies and proposed text for the Conference Preparatory meeting which meets twice between each WRC.

As noted in *Trends in Telecommunication Reform 2013,* "The IMT studies to be conducted before WRC-15 should assist regulators in identifying spectral efficiencies (and hence the actual spectrum needed) that should be expected as a result of advances in modulation techniques, antenna designs, offloading between different radio networks, coding efficiencies etc. These studies will also indicate potential candidate bands that may be used for the next generation of broadband services."

At the European level, the European Commission issued a mandate to CEPT in March 2013 to develop technical conditions for the introduction of wireless broadband in the 700 MHz band in the European Union (EU) while ensuring appropriate protection for incumbent uses, primarily broadcasting services and PMSE, and taking into account other priority areas of EU spectrum policy such as public protection and disaster relief. Addressing the European Radio Spectrum Policy Group shortly before the CEPT mandate was published Neelie Kroes, Vice-President of the European Commission responsible for the digital agenda said "I want to find a sustainable long-term solution for this band — that is my commitment. There is huge potential in international harmonization. So I want to avoid a fragmented approach, balance the interests of incumbent and new users, and deliver the greatest possible benefits for Europe, economically and socially."



AFP

Benefits of the second digital dividend

Notwithstanding these challenges, the new 700 MHz band could provide a solution for African and Arab countries to award further spectrum for mobile services without disrupting existing services in the 800 MHz band. It could also provide Europe with much needed additional bandwidth for commercial mobile broadband services in the future, as well as possibly offering a solution to the needs of European public safety organizations, which are currently seeking additional spectrum for future mission-critical mobile broadband networks. Finally, it could create some low-frequency spectrum that is harmonized for mobile use across two or possibly all three ITU regions, which would facilitate roaming and create economies of scale for device manufacturers and network equipment vendors alike.

This article was prepared by ITU News *and Analysys Mason, a consultancy and research firm with a focus on telecommunications, media and technology.*



A bright future ahead for our wireless world

Interview with Tariq Al Awadhi, Chairman of WRC-12

The World Radiocommunication Conference 2012 (WRC-12), held in Geneva from 23 January to 17 February, elected Tariq Al Awadhi, Executive Director of Spectrum and International Affairs at the Telecommunications Regulatory Authority of the United Arab Emirates as its chairman.

The work accomplished under the deft leadership of Chairman Tariq Al Awadhi was colossal and WRC-12 ended with 153 countries having signed the Final Acts updating the Radio Regulations — the international treaty governing the use of the radio-frequency spectrum and satellite orbits throughout the world. The bulk of the updated Radio Regulations entered into force on 1 January 2013. As we launch this new column on "Spectrum matters", we look back on the achievements and challenges of WRC-12 with Mr Al Awadhi.

Mr Al Awadhi, what did it mean to you personally, and as a national of the United Arab Emirates, to chair WRC-12?

Tariq Al Awadhi: The importance of the World Radiocommunication Conference to ITU as a whole, and to the ITU Radiocommunication Sector in particular, made it a great honour for me to chair WRC-12. Working with the high-level experts participating in the conference was a new and enriching experience, and a pleasure. Dealing with treaty issues relating to radio frequencies, the radio spectrum and radiocommunication services, culminating in the revised Radio Regulations, also gave me the opportunity to practise my communication skills. For the United Arab Emirates, which joined ITU as a Member State in 1972, it was the first time my country chaired such a conference.

How did you deal with the most difficult items in the conference's lengthy agenda?

TAA: In the end, we reached compromises on all the difficult topics, but it took a long time. For example, there were two totally different views on Agenda item 1.2 regarding the enhancement of the Radio Regulations — one for no change, and the other to make some changes in the definitions of some services.



ITU

General view of the World Radiocommunication Conference 2012

The two views were supported by different regional groups, and a compromise was reached just two days before the end of the conference. My personal involvement was to lead a small group to bring the regional views together. The compromise was to make no change but to agree that the definitions of "fixed service", "fixed station" and "mobile station" would be taken on by the study groups and the results brought to the next conference under a standing agenda item. In the same context, it was not easy to reach agreement on Resolution 951 or Recommendation 34.

Why was there so much difficulty in deciding what to do with Resolution 951 and Recommendation 34?

TAA: Resolution 951 was very broad in regard to enhancement of the Radio Regulations. The resolution had been on the agenda of the two previous conferences, and no conclusion had been reached. One view at WRC-12 was that there should be no change and Resolution 951 should be suppressed. The opposing view was that changes should be made in the light of studies. The compromise was that there would be no conference resolution on further studies on the enhancement of the Radio Regulations, but that changes to three definitions would be considered.

Based on the CPM Report and proposals from countries, however, WRC-12 agreed to recommend continuing studies on enhancing the Radio Regulations.

What other agenda items were particularly troublesome?

TAA: Agenda item 7 is a standing agenda item that relates to Resolution 86 on enhancing the procedures for coordination and notification of satellite filings. It took four weeks to finish discussing all the 35 aspects of this item. Meetings were conducted every day from morning until evening, sometimes till late at night, and during the weekends in order to solve all the difficulties and reach compromises. The most difficult issue was about the bringing into use of a satellite network. There is no indication in the Radio Regulations on how many days of operation constitute bringing into use. At WRC-12, some people said zero days, some 10 days, some a week, some two weeks, and some three months. In the end we compromised on 90 days. That was the unanimous agreement among the regional groups, but it took a lot of difficult discussion and a long time to reach the compromise.

Agenda item 8.2, dealing with the agenda for the next World Radiocommunication Conference, also gave rise to much discussion. We eventually reached agreement on around 20 agenda items for WRC-15, including the important areas of the fixed-satellite service and mobile services, which will be crucial for IMT or mobile broadband.

Where matters are complex, it is a challenging task to reach consensus. In chairing WRC-12, I really appreciated the excellent spirit of cooperation among the regional groups to find solutions. Participants were ready to rise above national interests in order to serve the global objective of developing the ICT sector through enhanced spectrum harmonization. This was really the driver in achieving the successful results of the conference.

What in your view were the greatest achievements of the conference?

TAA: WRC-12 modified the Table of Frequency Allocations to accommodate lightning detection systems and enhance the allocation for almost all major radio services. One of the hottest topics was broadcasting and mobile services, under Agenda item 1.17. In particular, a contribution submitted by Arab and African groups led to an allocation at 700 MHz for mobile services. That was a big achievement and an example of WRC-12 looking towards the future, opening the way for new technologies that can be of benefit to all stakeholders.

What was it like to chair the four-week conference?

TAA: Chairing the conference was like a dream come true. It is a great responsibility to lead experts from around the world and to negotiate with the distinguished delegates from Member States. There were some tough times, especially when we were trying

to reach a compromise and racing against the clock. What I really liked at this conference was the spirit of cooperation from all Member States and the support of all the regional groups. As Chairman of WRC-12, I appreciated the spirit of cooperation and collaboration, and the support that I received. That is exactly what is needed to achieve a successful outcome of a conference.

What about the interference issue that was brought up at the beginning of the conference and discussed right until the end?

TAA: A regional group presented a paper on interference. Knowing that many satellite operators have reported that their transmissions are suffering from interference, the conference agreed to discuss this very important matter even though it was not on the agenda. We established an ad hoc group of the plenary, which considered ways to modify Article 15 of the Radio Regulations. After lengthy debate, the conference agreed to modify only No. 15.21, putting the onus on Member States to make the necessary arrangements to resolve interference problems arising from sources within their countries. A number of delegates pointed out that it might not be possible to identify the source of interference or that interference might be coming from another country. But they agreed to do their best.

So what is your message to the world of spectrum users?

TAA: Every country has to take all possible measures to use the spectrum efficiently, in order to enable stakeholders to benefit from radiocommunications without problems of interference. This can be achieved if all administrations — especially neighbouring administrations — work together. The result will be to bring better services to their countries.

Any final thoughts?

TAA: I would like to thank everybody who was involved in achieving the successful results of WRC-12, starting with Dr Hamadoun Touré, Secretary-General of ITU, who really supported me in making this conference successful. The Directors of the Bureaux, particularly the Director of BR, and all their staff provided invaluable advice and help throughout the conference. Finally, I would like to thank all ITU Member States, and all administrations and regional groups, who worked so well together in this conference. When we started the conference we said we needed to all work as one team, cooperate with each other, support each other, and try to create a good spirit. And I really saw that happen. Let me just add my thanks for the active participation of the United Arab Emirates and of the Arab Group in the work of ITU.

Dubai strengthens ITU–T's global role

Two major ITU events in Dubai in 2012, hosted by the Government of the United Arab Emirates, charted the future of telecommunication standards and standardization activities. These were the Global Standards Symposium and the World Telecommunication Standardization Assembly. But ITU also keeps its finger on the pulse of industry, and these big meetings were preceded by ITU's annual Chief Technology Officer meeting, also held in Dubai. How will the results of these meetings shape the work of ITU in the next four years?


Sergii Figurnyi/Shutterstock.com

Global Standards Symposium addresses major challenges

Government ministers, private-sector executives and the standardization community at the second Global Standards Symposium, which took place on 19 November 2012, urged ITU to create standardization mechanisms to serve the needs of the "vertical" markets (such as health care) that are becoming increasingly dependent on information and communication technologies (ICT).

The Global Standards Symposium was chaired by Nasser Bin Obood Al Falasi, Chief Government Relations and Communications Officer at Etisalat Group. Participants addressed two particular challenges resulting from the convergence of information and communication technologies and their integration into all sectors and industries.

First, because of convergence, the traditional demarcation between the work of different standards bodies is becoming blurred, and there is an increasing risk of overlap and duplication. As a result, there is a need for much closer cooperation between these different standards bodies.

Second, because of integration, standardization bodies in the ICT sector must now work with other industry sectors to develop new global standards for new services. For example, successful standards for intelligent transport systems need the participation of the automobile manufacturers; those for e-health, the healthcare industry; those for mobile money, the banks; and those for smart grids, the utilities.

Participants recognized that different sectors have their own product lifecycles, and their own distinct policy and regulatory conditions, complete with their own concerns about data ownership, safety, security and privacy. These aspects need to be taken into account if the different sectors concerned are to be encouraged to participate in the work of ITU's Telecommunication Standardization Sector (ITU–T).

Most technical standards are developed in a handful of highly industrialized markets, so participants supported ITU's efforts to bridge the standardization gap by improving the standardization capabilities of emerging markets. They also encouraged ITU–T to provide leadership in driving standards education and ICT innovation in developing countries.

Calling on ITU to ensure that international standards reflect the best of innovations rooted in developing countries, the Global Standards Symposium proposed the establishment of national standardization secretariats able to define a country's standardization requirements and channel participation in regional and international standardization work.


ITU/P.M. Virot

"During this World Assembly, and the Global Standards Symposium that preceded it, the importance of collaboration and cooperation with other standards bodies, and vertical sectors, was emphasized…"

Malcolm Johnson, Director of ITU's Telecommunication Standardization Bureau

Chief technology officers call for vertical sector participation in standards development

ITU's annual Chief Technology Officer (CTO) meeting — held on 18 November 2012 under the chairmanship of Malcolm Johnson, Director of ITU's Telecommunication Standardization Bureau (TSB) — acknowledged increasing industry convergence powered in large part by ICT and charged ITU to develop mechanisms that better integrate the needs of "vertical" sectors in its work on international standardization, to enable such innovations as e-health, e-learning, intelligent transport systems, mobile money and smart grid.

As ITU Secretary-General Dr Hamadoun I. Touré said, "Standards power a smoothly-functioning global ICT network that supports health, education, literacy, democracy, commerce and entertainment… and almost every other vertical sector. We must ask ourselves however whether the vast array of forums and consortiums proliferating in the ICT sector today is the most efficient way to

address a market that continues to grow in sophistication and complexity."

The CTO meeting brought together 21 private-sector executives from leading multinational ICT companies, including Cisco Systems, Ericsson, Etisalat, Fujitsu, Huawei, KDDI, NEC, NSN, NTT, Orange FT, RIM, Telecom Italia, Telkom SA and Verizon. They discussed ITU's role in the standardization ecosystem and the associated priorities of ITU–T.

The CTOs emphasized the need for collaboration between the mobile and transport and access standardization communities. This, they said, will be crucial to ensure a coordinated approach to the development of optical transport standards supporting the roll-out of mobile broadband beyond 4G (or IMT-Advanced in ITU parlance). In addition, they proposed smartphone security standardization as a new ITU–T study area, as well as the expansion of ITU–T's work on software-defined networking.

The CTOs discussed the possibility of a release-based approach to standards delivery, to help synchronize work when a number of standards-development organizations and industry forums are involved. They suggested that ITU–T's ongoing work on cloud computing and machine-to-machine (M2M) communications serve as potential subjects for pilot projects to ascertain the effectiveness of a release-based approach to standards delivery.

The CTO meeting also supported ITU's efforts to bridge the standardization gap and better integrate the needs of developing countries.



Structure of the World Telecommunication Standardization Assembly



Chairman of the Assembly:
Mohammed Gheyath (United Arab Emirates)

Vice-Chairmen of the Assembly:

- Vince Affleck (United Kingdom)
- Richard Beaird (United States)
- Gift Buthelezi (South Africa)
- Alisher N. Fayzullaev (Uzbekistan)
- Sherif Guinena (Egypt)
- Seyed Mostafa Safavi Hemami (Islamic Republic of Iran)

Committee 1 (Steering)

(Composed of the Chairman and Vice-Chairmen of the Assembly and of the Chairmen and Vice-Chairmen of the other committees)



Committee 2 (Budget Control)
Chairman: Kyu-Jin Wee (Republic of Korea)

Vice-Chairmen:

- Elvira Sultanova (Kyrgyzstan)
- Abdullah Al-Mubadal (Saudi Arabia)



Committee 3 (Working Methods of ITU–T)
Chairman: Steve Trowbridge (United States)

Vice-Chairmen:

- Musab Abdulla (Bahrain)
- Andrey Y. Mukhanov (Russian Federation)
- Chae-Sub Lee (Republic of Korea)
- Bruce Gracie (Canada)



Working Group A of Committee 3
Chairman: Olivier Dubuisson (France)



Working Group B of Committee 3
Chairman: Bruce Gracie (Canada)



Committee 4 (Work Programme and Organization of ITU–T)
Chairman: Yoichi Maeda (Japan)

Vice-Chairmen:
- Fabio Bigi (Italy)
- Liu Duo (China)
- Hassan Talib (Morocco)



Working Group 4A of Committee 4
Chairman: Fabio Bigi (Italy)



Working Group 4B of Committee 4
Chairman: Joshua Peprah (Ghana)



Committee 5 (Editorial Committee)
Chairman: Marie-Thérèse Alajouanine (France)

Vice-Chairmen:
- Jamal Amin (Sudan)
- Ángel León Alcalde (Spain)
- Oleg Mironnikov (Russian Federation)
- Catherine Warhurst (United Kingdom)
- Xiaoyan Zhang (China)

World Assembly defines new era for ITU–T and calls for expansion of work on e-health, software-defined networking and e-waste

The World Telecommunication Standardization Assembly 2012 (WTSA-12) was held on 20–29 November 2012, with a record 1000 participants from more than 100 Member States, along with some 40 Sector Members and, for the first time, the new Academia membership category.

World telecommunication standardization assemblies are held every four years to review the state of play in the world of ICT and ITU–T's role in it. Throughout the course of every year, thousands of experts from around the world contribute their time, know-how and expertise to ITU–T study groups. These study groups develop and maintain international ICT standards, known as ITU–T Recommendations.

At WTSA-08 in Johannesburg many new initiatives were agreed for ITU–T, especially in the area of sustainability. Over the last four years, ITU–T has begun many new activities that will aid countries, industry and citizens to harness the great power of ICT, to become more sustainable, to mitigate and adapt to climate change, and to enable persons with disabilities to live better lives. The Assembly in Dubai was unanimous in praising ITU–T for the achievements of the 2009–2012 study period.

Speaking at the opening ceremony, Dr Touré underlined that "Standardization and interoperability are at the core of ICT. They are essential to ensure that the host of different devices, communication networks and protocols can communicate and work in parallel to deliver services to end users with reliability, affordability, and without delay no matter their circumstances."

Mohammed Gheyath, Chairman of WTSA-12 and Executive Director of Policies and Programs/Information and E-Government Sector at the Telecommunications Regulatory Authority of the United Arab Emirates, commented that "Since its foundation, ITU has emphasized the importance of developing unified global telecommunication standards in accordance with the principles of global connectivity, openness, affordability, reliability, interoperability, and security".

WTSA-12 called on ITU–T to expand its work on e-health, software-defined networking and e-waste. In addition, WTSA-12 adopted 50 Resolutions, six of which were new. Alongside revising seven of the A-series Recommendations that guide ITU–T's work, six new ITU standards were approved, including two Recommendations on multiprotocol label switching-transport profile (MPLS-TP), which are required by operators to increase network efficiency and reduce costs. These two Recommendations (ITU–T G.8113.1 and ITU–T G.8113.2) represent many years of collaboration with the Internet Engineering Task Force (IETF).

Taking into account the conclusions of the Global Standards Symposium, WTSA-12 adopted Resolution 82 establishing a Review Committee to ensure that ITU–T's structure continues to meet the needs of the continually evolving and convergent ICT landscape, particularly as collaboration with vertical markets increases.

Malcolm Johnson, Director of TSB observed that: "During this World Assembly, and the Global Standards Symposium that preceded it, the importance of collaboration and cooperation with other standards bodies, and vertical sectors, was emphasized, recognizing the competitive forces and the many challenges that ITU–T faces. I am pleased that we have the new Review Committee as a forum with the time to discuss these issues seriously and come up with suggestions on how ITU–T, as the only truly global ICT standards body, can best ensure that it remains the place to come to develop international standards."

One Opinion, concerning Recommendation ITU–T D.156 on "network externalities", was also adopted. It invites Member States to take all measures necessary to implement the Recommendation and, given the progress achieved within Study Group 3, to consider withdrawing any reservations.



Renewing ITU–T study groups

WTSA-12 approved the mandates of the ten ITU–T study groups, and appointed the chairmen and vice-chairmen of the Telecommunication Standardization Advisory Group (TSAG), the ITU–T study groups, the regional groups of ITU–T Study Group 3, the Standardization Committee for Vocabulary and the Review Committee (see full list at http://www.itu.int/en/ITU-T/wtsa12/Pages/wtsa12-results-chairmen.aspx).

As an illustration of the growing involvement of developing countries, of the four new chairmen and a total of 50 new vice-chairmen that were appointed by the Assembly for the 2013–2016 study period, 25 were from developing countries. Congratulating them, Mr Johnson said he looked forward to working with them "to ensure that ITU–T remains the only truly global ICT standards body where all countries and companies, no matter how large or small, are afforded equal opportunity to engage in, and influence, the work to produce the standards they need".

Mr Gheyath commented that the two-week Assembly had been "a consolidation of the tireless activity and major efforts deployed by the ITU–T study groups over the past four years". Speaking on behalf of all delegations, he added that "these efforts were effective in generating positive outcomes that facilitated Assembly business and helped produce recommendations and resolutions to serve the common interest." Acknowledging this outstanding work, Mr Johnson awarded certificates of appreciation to study group chairmen and the chairman of TSAG.

Bridging the standardization gap

WTSA-12 strongly supported ITU–T's "Bridging the Standardization Gap" programme, which endeavours to increase the participation of developing countries in ITU's work. The programme was established in response to Resolution 44 on "Bridging the standardization gap between developing and developed countries", first adopted in 2004 at WTSA-04 in Florianópolis, Brazil, and updated by WTSA-08, held in Johannesburg, South Africa, in 2008.

Mr Johnson reported that "since 2007, more than 40 countries that had never before participated in ITU–T's work were able to do so for the first time, and in 2011 alone we welcomed 16 new countries as active participants in ITU–T."

WTSA-12 revised Resolution 44, calling for country-specific guidelines on how to implement ITU–T Recommendations, especially those with regulatory implications. The resolution mandates ITU to assist developing countries in the establishment of standardization secretariats, and calls on TSB to provide assistance to check that national standards are consistent with ITU–T Recommendations.

Resolution 44 also "invites the Council to encourage the establishment of a specialized panel for stimulating ICT innovations, under ITU–T, with the objective of enhancing global collaborative innovation".

Commenting on the updated Resolution 44, Mr Johnson said: "I am pleased to see the impetus given to the efforts to bridge the standards gap. The Bridging the Standardization Gap fund that we set up after Johannesburg to support developing-country participation has had four contributors: Nokia Siemens Networks, Microsoft, Cisco and Korea Communications Commission. I would like to thank them and encourage further contributions to this fund."

Conformity and interoperability

Of interest to developing countries are the significant changes that WTSA-12 made to Resolution 76 on conformity and interoperability, putting ITU–T on a much better footing to take forward this important programme. Conformance assessment and interoperability testing are indispensable to ensure interoperability of international telecommunication networks and services.

Misuse of numbering resources

Revised Resolution 61 focuses on countering and combating misappropriation and misuse of international telecommunication numbering resources. This is, again, a problem affecting developing countries in particular. The resolution invites Member States to ensure that ITU–T E.164 numbering resources are used only by assignees and only for the purposes for which they were assigned.

Ending discriminatory access to Internet

Noting the global and open nature of the Internet as a driving force in accelerating progress towards socio-economic development, and that discrimination regarding access to the Internet could greatly affect developing countries, revised Resolution 69 ("Non-discriminatory access and use of Internet resources") invites affected ITU Member States to report to ITU on any unilateral and/or discriminatory actions that could impede another Member State from accessing public Internet sites and using resources, within the spirit of Article 1 of the ITU Constitution and the principles of the World Summit on the Information Society (WSIS).

Concern for the environment

Revised Resolution 73 focuses on the environment and climate change, emphasizing that ICT are fundamental to monitoring climate change, mitigating and adapting to its effects, and assisting in the transition towards a green economy.

New Resolution 79 instructs the ITU–T study groups to strengthen their activities on e-waste and to assist Member States in instituting policy frameworks that limit e-waste's negative environmental effects.

ICT and health care

Resolution 78 on e-health will prompt new work in various ITU–T study groups, as well as increased interaction with the World Health Organization and other organizations addressing ICT healthcare standards.


Getty Images

Security standards for e-health communications, services, databases, records handling, identification and authentication are among the priorities identified in Resolution 78.

Standards for software-defined networking

Software-defined networking is a promising technology that, like cloud computing, has led to flexibility, cost efficiency and manageability of computation and storage resources through virtualization. New Resolution 77 is a response to a specific request from industry to accelerate standardization in this space.

Backing words with money

Increased funding will be essential if ITU–T is to implement all the decisions made at WTSA-12. Revised Resolution 34 seeks more voluntary contributions to support the work of ITU–T, but the TSB budget also needs to be increased.

In particular, Resolution 44 "invites the Council to increase the ITU–T budgetary provisions for fellowships, interpretation and translation of documents for meetings of TSAG, ITU–T study groups and regional groups of ITU–T study groups".

Resolution 54 "resolves to invite the Council to consider providing support for the regional groups as appropriate".

Resolution 67 instructs the TSB Director "to translate all TSAG reports in all the languages of the Union" and "invites the Council to take appropriate measures to ensure that information on the ITU websites is made available in all the official languages of the Union on an equal footing within budgetary limits."

International Telecommunication Union

ITU|BIPM workshop

FUTURE of the INTERNATIONAL TIME SCALE



19|20 September 2013
Geneva, Switzerland

www.itu.int/ITU-R/go/itu-bipm-workshop-13/

BIPM

ITU

These three photos show the evolution of Sendai Airport's control tower in Natori, Japan, three years following the earthquake and tsunami that hit the region in March 2011

11 March 2011 | *12 January 2012* | *21 February 2013*



Relief, resilience, recovery

Learning from disaster

Beyond heroic efforts to help people survive disaster lies a strong resolve to learn from the experience and do better next time. This applies to medical teams, rescue workers and firefighters, and many others, including of course — in our hyperconnected world — the telecommunication sector. Our lives increasingly rely on being connected. But what happens when networks are overloaded or connections are broken?

Highlights from fourth meeting of Focus Group on Disaster Relief Systems, Network Resilience and Recovery

An ITU workshop on disaster relief systems, network resilience and recovery, held in Tokyo from 5 to 8 February 2013, looked in particular at the lessons learned from the experience of the earthquake and tsunami that struck east Japan on 11 March 2011.

Hosted by Japan's Ministry of Internal Affairs and Communications, and the National Institute of Information and Communications Technology, the workshop constituted the fourth meeting of the ITU Telecommunication Standardization Sector (ITU–T) Focus Group on Disaster Relief Systems, Network Resilience and Recovery. It was attended by 83 participants from 7 countries and included a one-day technical tour of Tohoku, visiting areas that had been hit by the disaster, and the sites of research and development projects.

The Focus Group on Disaster Relief Systems, Network Resilience and Recovery, was established in January 2012 with the mandate to collect and document information and concepts, from a telecommunication perspective, in order to identify requirements, as well as additional standards that may need to be developed, for disaster relief systems and applications, network resilience and recovery. It reports to the Telecommunication Standardization Advisory Group (TSAG).

The focus group coordinates ITU–T's current work in the disaster relief field, and is expanding this work into two important new areas. First, it is working on disaster relief for individuals, the idea being to be able to notify relatives, friends or employers of a victim's situation. The second area of work is concerned with providing timely guidance for disaster victims, for example to show them routes to evacuation shelters or how to get them safely back home.

Special session on ICT and disaster

During the workshop's special session on ICT and disaster, participants were able to pick up tips from three experts in the field. The first presentation was made by Gregory Bain of the United States, and Piers O'Hanlon, a Fresnel Research Fellow at the Oxford University in the United Kingdom, on behalf of the Internet Engineering Task Force (IETF). Mr O'Hanlon introduced the IETF's activities on technical specifications in the area of ICT for emergency and disaster communications. These take the form of Request for Comments (RFC). Mr O'Hanlon emphasized the importance of the timely receipt of alerts or messages during an emergency, and demonstrated how to achieve the latency control of priority communications using explicit congestion notification.

Workshop participants recognized the effectiveness of explicit congestion notification as a way of avoiding network congestion in the case of disaster. They noted that the method works not only for voice communication but also for video communication over Internet Protocol (IP).

The focus group agreed to include information on explicit congestion notification in the ITU–T Handbook on Public Telecommunications Systems in Disaster Situations, which is currently being drafted.

In the second presentation, Professor Masanao Shinohara of the Earthquake Research Institute of The University of Tokyo, described a system that estimates seismic and tsunami activity on the basis of seafloor observation by using IP technology and the optical fibre network off Sanriku. Professor Shinohara also discussed the importance of standardization in the area of disaster warning and response.

The third presentation, by Kozue Ishida of the Corporate Marketing Department at NTT DOCOMO, introduced "Area Mail", a disaster relief and early warning system designed by NTT DOCOMO that uses cell broadcasting technology. Cell broadcast enables mobile carriers to simultaneously send early warning alarms or warning messages to all the mobile phone users in a designated area. According to Ms Ishida, the Area Mail service ensures that there is no delay in transmitting the alerts.

After the east Japan earthquake and tsunami, NTT DOCOMO launched a tsunami warning service in addition to its existing earthquake warning service. Currently, the warning alarm and message data need to be entered separately for each mobile carrier system. But a common input system is being developed for all mobile carriers in Japan.

Participants recognized that the Area Mail service could contribute to achieving the objectives of the focus group, and agreed to continue discussing it with a view to including the concept in the deliverables of the group.

Written contributions

In addition to the special session, the workshop offered participants the opportunity to discuss specific aspects of disaster relief systems, network resilience and recovery. Communication networks provide a lifeline in disaster situations, and — if they are damaged — their quick recovery is a priority.

During the workshop, various approaches to network recovery were examined on the basis of numerous written contributions submitted by participants. These included papers from telecommunication



MIC/Japan

Workshop participants on a technical tour of Tohoku region

carriers, manufacturers, universities, research institutes and other organizations concerned with disaster relief and network recovery.

A variety of research and development projects aiming at strengthening and protecting ICT networks against disaster damage have been conducted since the east Japan earthquake and tsunami. Many of these activities — by Japan's Ministry of Internal Affairs as well as other concerned organizations and companies — were the subject of contributions to the workshop. Papers were received, in particular, from the Nippon Telegraph and Telephone Corporation (NTT), Tohoku University, Sky Perfect JSA, NEC, NTT DOCOMO and KDDI Laboratory.

Learning from experience

The ICT-related effects of the east Japan earthquake and tsunami prompted a range of research and development projects, as a way of learning from the experience in order to be better prepared in any future disaster.

The results of the studies indicate that there is a widespread shortfall of network resources. The studies also pinpoint some of the disadvantages of the existing transportable network equipment and facilities. In particular, it takes too long to install transportable switching equipment, and it is not easy for people without expertise to install and use satellite communication terminals.

The proposed fixes include various different technologies, such as network congestion mitigation at the disaster site and automatic functional recovery of damaged telecommunication systems in the event of disaster. The focus group agreed to continue discussing these potential improvements in order to identify the requirements, as a first step towards standardization.

Emergency systems for people with disabilities

Taishi Tsukamoto of NTT DATA Corporation presented the corporation's work on emergency communication systems for people with disabilities. The focus group agreed to send a liaison statement to ITU's Telecommunication Development Sector (ITU–D), Radiocommunication Sector (ITU–R), and ITU–T, in particular to ITU–T Study Group 16 and to the ITU–T Joint Coordination Activity on Accessibility and Human Factors (JCA-AHF), with a view to gathering and sharing information on related activities within ITU and in its Member States.

Technical visit to Tohoku region

On 8 February 2013, workshop participants went on a one-day technical tour of the Tohoku region, which included Sendai City, in order to visit the disaster stricken areas, and the research and development project sites.

Tour participants visited NTT's local exchange offices, which had been damaged by the tsunami, and they learned about the company's activities in regard to network recovery.

Participants went on a guided tour of the Resilient ICT Research Centre, established to conduct research and development on network resiliency in the case of disaster. They also visited the sites of disaster-related research and development projects.

These projects aim at the quick recovery of communication functions and smooth installation of a satellite communication line after a disaster. The project titles give a flavour of the type of research and development being undertaken, for example a "reconfigurable communication resource unit for disaster recovery" and "very small aperture terminals (VSAT) can be installed by easy operation during disasters". Tour participants were able to see a functioning test model of an easy-to-install VSAT.

Being prepared

Disasters can occur anywhere in the world. Whether the disasters are earthquakes, typhoons, hurricanes, floods, tsunamis or mudslides, a quick response is always required. It is important to react rapidly, not only to improve the rescue success rate but also to get started with reconstruction.

A rapid response largely depends on how far the response was prepared in advance. Communication, in particular, plays an essential role in mitigating the impact of disaster.

In the area of disaster relief, the focus group expects to see increased standardization of ICT as a way of building a safer society. At its fourth meeting, the focus group gathered together a number of experiences and lessons learned from the east Japan earthquake and tsunami. This information will be of value to all countries that suffer from disasters. It can also be used to raise awareness of the importance of ICT standardization in areas where ICT and disasters intersect.

The topic of disaster relief, and network resilience and recovery, will be further discussed by the Focus Group on Disaster Relief Systems, Network Resilience and Recovery, at its fifth meeting, which is planned to take place in Thailand in May 2013.



Broadband "the missing link" in global access to education

Every citizen should be empowered with the necessary knowledge, skills and values to lead a fulfilling and productive life. This is the aim of the "Education-for-All" goals of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and of the Millennium Development Goal of achieving universal primary education by 2015. All of these goals were adopted in 2000 by the majority of the world's governments. Yet more than a decade later, the global education landscape is still bleak.

In 2010, 61 million children of primary-school age and another 71 million of lower secondary-school age were not attending school. Close to 793 million adults — 64 per cent of whom are women — still lack reading and writing skills, the lowest literacy rates being in sub-Saharan Africa, and South and West Asia. And 1.7 million additional teaching positions need to be created to attain the universal primary education goal by 2015.

A new report from the ITU/UNESCO Broadband Commission for Digital Development, released on 25 February 2013, emphasizes the importance of deploying broadband as a means of accelerating progress towards education for all. The report "Technology, Broadband and Education — Advancing the Education for All Agenda" highlights strategies for leveraging high-speed networks to realize the dream of education for all.

In the twenty-first century, education cannot be separated from technology.

Participation in the global economy is increasingly dependent on skills in navigating the digital world, but traditional school curricula fail to give students the information and communication technology (ICT) skills they will need to ensure their employability in tomorrow's knowledge economy.

What does broadband really offer?

According to the report, broadband networks have the potential to radically alter the education landscape, creating new centres of learning in the developing world, extending access to distance learning programmes to outlying communities, and helping poorer countries retain high-performing students who can help lift their nations out of poverty by serving as local entrepreneurs, researchers and policy-makers.

The report provides a vision of how access to high-speed technologies over both fixed and mobile platforms can be extended, so that students and teachers everywhere can reap the benefits for themselves and for their communities. The report also features case studies offering fresh insights into how education is being transformed by technology (see article on pages 53–55).

"Technology, Broadband and Education — Advancing the Education for All Agenda" is the outcome of the Broadband Commission's Working Group on Education, chaired by Irina Bokova, UNESCO's Director-General. The group held its inaugural meeting in Paris, France, on 5 June 2011 to define the scope and purpose of its activities. By its second meeting, on 24–25 February 2013, the group had finalized this report, which it presented to the WSIS+10 Review Event, hosted by UNESCO in Paris. Following a press launch at the Mobile World Congress in Barcelona, Spain, on 27 February 2013, the report was also presented to all Commissioners at the 7th meeting of the Broadband Commission, on 17 March 2013, hosted in Mexico City by the Carlos Slim Foundation.

The report is the result of collaborative input from a large number of commissioners and their organizations, including Alcatel-Lucent, the Connect To Learn partnership (The Earth Institute at Columbia University, Ericsson and Millennium Promise), Intel, the Inter-American Development Bank, Broadband Commissioners Suvi Lindén, Jasna Matić and Ivo Ivanovski, and Special Advisor to the Broadband Commission, Paul Budde.

Commenting on the report, ITU Secretary-General Dr Hamadoun I. Touré said that: "The ability of broadband to improve and enhance education, as well as students' experience of education, is undisputed. A student in a developing country can now access the library of a prestigious university anywhere in the world."

Distance-learning strategies can help nations educate children and adults living in remote communities. Further, broadband-based educational programmes could become a source of income for higher education institutions that produce curricula tailored to the needs of the billions living in the developing world.

Who is already online?

An estimated 2.3 billion people were Internet users by the end of 2011. Only around 25 per cent of people living in the developing world were online, with a mere 6 per cent from the least-developed countries. While access to technology for educational purposes has increased, progress is uneven.

In member countries of the Organisation for Economic Cooperation and Development (OECD), for example, 93 per cent of 15-year-olds have access to a computer and the Internet at school. The ratio of students to computers has improved, falling from 13:1 in 2000 to 8:1 in 2009 in schools attended by 15-year-olds. In some OECD countries, such as Belgium, Germany, Italy and the Republic of Korea, home access is even higher than at school.

In stark contrast, in most African countries there are 150 students per computer. Elsewhere, countries such as Peru, Thailand, Turkey and Uruguay are committed to providing each student with a computer. Overall, though, access remains limited at school and at home.

"Much progress has been made to reach the 2015 goals — but many countries are still not on track", says Ms Bokova, who co-chairs the Broadband Commission



with Dr Touré. "We must make the most of broadband to widen access to high-quality education for all."

Beyond school?

While fixed broadband infrastructure constitutes the bulk of high-speed connectivity for many countries, the ICT service with the steepest growth rate is mobile broadband.

With the accelerated growth in mobile devices, we are already witnessing the emergence of flexible, open learning environments that allow for real-time, interactive and personalized learning. Enabled by a participatory and collaborative web (Web 2.0), new technology and communication tools have gradually blurred the boundaries between formal and non-formal education.

Much learning now takes place outside traditional classrooms. Distance learning, cooperative work in virtual environments, online learning communities, and access to vast resources and databases are just some of the possibilities on offer.

Is technology used effectively?

Technology has not always been used effectively to improve learning. Data suggest that even in OECD countries both the intensity of usage (the amount of time technology is used) and the quality of usage (the variety and relevance of the technology used) are still low.

In the classroom, students usually use ICT to search for information, rather than to process and share that information. Ironically, this is the opposite of how students use the same technologies during their free time outside of school.

What next?

Although the need to increase educational access and participation will persist beyond 2015, especially in developing countries, priority action should gradually shift towards improving the quality of education for all members of society.

To this end, the Broadband Commission Working Group on Education makes a number of recommendations to governments and other stakeholders concerned

with education, some of which are highlighted below.

Increase access to technology and broadband: Policy-makers should continue efforts to implement cross-sectoral policies ensuring affordable and equitable access to technology and broadband connectivity for all citizens, particularly women and girls and marginalized groups.

Incorporate technology and broadband into job training and continuing education: Given the rapid pace of technological change and the pressing need to address socio-economic challenges such as high unemployment among youth, governments should provide the necessary financial incentives to support technology and high-speed broadband adoption in all activities designed to create new jobs and open up prospects for lifelong training and employability in the emerging knowledge society.

Teach ICT skills and digital literacy to all educators and learners: Governments should prioritize the redesign of education systems in their national education agendas so as to better respond to the challenges of the ongoing digital revolution. Empowering teachers and students to use technology is central to improving education and the assessment of learning.

Promote mobile learning and open educational resources: Policy-makers should introduce policies and incentives promoting the development of open educational resources and encouraging the wide-scale use of mobile technology at all levels and in all forms of education, thereby facilitating access to high-quality learning and teaching resources.

Support the development of content adapted to local contexts and languages: Governments and organizations should invest in an ecosystem, not just in technology, by supporting online educational applications and services with local content and in local languages.

Work to bridge the technological divide between countries: Policy-makers should continue efforts to bridge the digital and knowledge divides between developed and developing countries by promoting international collaboration and partnerships.



Case studies

Advancing education through technology

"Technology, Broadband and Education — Advancing the Education for All Agenda", a new report released by the Broadband Commission for Digital Development (see article on pages 49–52), says that governments should support educators in exploring what works best in the particular contexts of their classrooms, schools or regions. Knowledge and experiences should then be shared, to contribute to the growing body of evidence regarding best practice for ICT in education.

The report features six case studies showing how implementing broadband and information and communication technologies (ICT) expands educational opportunities. Here we highlight four of the case studies: one of a single country; one a multi-country research project; and two global examples.

Digital School Project in Serbia

The **Digital School Project in Serbia** supports digital inclusion in education by equipping all primary schools with computer labs. The objective is to improve the e-skills of students and teachers.

To date, 1589 large schools have been equipped with modern computer labs, while 1321 small schools in rural areas (with less than 40 students per school) have each received a laptop and a projector. Support includes the installation of infrastructure (for example, local area

networks and electricity in classrooms) as well as basic training for teachers managing the digital lab equipment.

The project has increased the digital literacy of primary education teachers and students, reduced technology fear among first-time ICT users, and facilitated inclusive education and innovative approaches to teaching. It has also reduced the rural-urban digital literacy gap (currently 11.4 per cent versus 38.9 per cent, with a computer-use rate of 38.3 per cent versus 58.7 per cent). The project provides public education about online safety.

The official promotional campaign for the project was supplemented by an unofficial, word-of-mouth campaign via electronic media (especially Twitter and Facebook). This unofficial campaign was mainly led by school staff, who shared their positive experiences of teaching with the new equipment and materials. The impact of the project was therefore greater than expected.

Research results from Portugal, Argentina, Turkey and Nigeria

The objective of this multi-country case study is to showcase recent research on the influence of broadband and ICT on education. The work was done by local university researchers in Portugal, Argentina (San Luis), Turkey (Kocaeli) and Nigeria.

In **Portugal,** the initial financing for the ***e.Escolinha*** **programme** — and indeed the whole national ICT plan for education — came from the government's sale of 3G mobile licences through a spectrum auction, which raised EUR 460 million.

Part of the *e.Escolinha* programme is the Magellan project, which enabled nearly every student in grades 1 to 4 to purchase and own a laptop, and provided broadband Internet access to schools and optionally to families. Parents bought the devices at a cost of EUR 0, EUR 25 or EUR 50, depending on their income.

From 2008 to 2011, more than 700 000 Magellan personal computers (PCs) were delivered to families across Portugal. The students owned the "Magalhaes" and took them home after school. This had a positive social effect, promoting digital literacy among parents as well as students.

In the province of **San Luis, Argentina,** Wi-Fi connectivity is now ubiquitous and free. La Punta University, headed by university president Alicia Bañuelos, took the lead in guiding, coordinating and executing implementation of the **Digital Agenda.** As part of San Luis's digital inclusion plan, the All Kids Online Initiative delivered one Classmate PC with educational support software to each child between the ages of 6 and 12 years.

In the municipality of **Kocaeli, Turkey,** the nationwide **Movement to Increase Opportunities and Technology (FATİH) project,** sponsored by the Ministries of Education and Transport, has teamed up with Türk Telekom and several local companies to provide technology in classrooms.

Through this project, 42 000 schools and 620 000 classes will be equipped with the latest information technologies, eventually reaching 17 million students and approximately 1 million teachers and administrators. Total FATİH project costs are around USD 8 billion, with 55 per cent of costs being covered by universal service funds.

According to Türk Telekom, Kocaeli — where the project began — now has the highest rate of home digital subscriber line connections of any city in the country. A survey by the Education Technology Department asked students who else used the computers: 82 per cent of students said their siblings; 55 per cent said their fathers; and 33 per cent said their mothers.

In **Nigeria,** funding of USD 100 000 per school and support from the universal service fund has been used to deploy the Intel Learning model in more than 1000 schools since 2008. The **Intel Learning model** envisages one computer per child, but this was not possible in Nigeria where in general only 100 computers are available for 500 to 800 students. The project is therefore currently being implemented in a lab environment. Students go to the computer room to use the computers a few times per week for specific subjects, such as science and English.

This model, although limited, has already produced encouraging results. Teachers report that there has been an increase in school attendance by students. Students are collaborating more via technology, thereby learning and using twenty-first century skills. The schools sampled saw tremendous gains in students' performance in biology, with the pass rate



increasing from 26 per cent to 90 per cent between 2008 and 2011. These are great strides for the Nigerian education system.

Intel Teach global programme

The **Intel Teach** programme helps teachers redesign their classrooms to meet new educational challenges. The programme focuses on classroom practices in primary and secondary education that advance students' critical thinking, problem-solving and collaboration skills using today's technologies. These are the key twenty-first century skills required if students are to thrive in the innovative, networked society in which they live.

Over the past decade Intel has commissioned objective, third-party evaluations of Intel Teach to assess the degree to which the goals of the programme are being attained. According to surveys from 13 countries, participants indicated that 94 per cent of the teachers who take the Intel Teach Essentials Course meet at least one of the programme's success indicators.

Connect To Learn global programme

Connect To Learn, a partnership founded by the Earth Institute, Ericsson and Millennium Promise in late 2010, harnesses the transformative solutions of the ICT industry to address global educational issues. By building partnerships between the ICT industry, academia, non-governmental organizations and international organizations, Connect To Learn helps extend secondary schooling to everyone through implementing mobile broadband technologies that provide access to teaching and learning resources in schools. Connect To Learn targets underserved segments of the population with a special emphasis on girls, in particular in rural areas.

Connect To Learn increases access to technology for schools that need Internet and computers, and helps address the typically low competence threshold. To date the initiative has been deployed in schools in Ghana, Tanzania, Kenya, Uganda, Senegal, Chile, Brazil, South Sudan, Djibouti, India and Malawi, covering more than 10 000 students and their teachers.

ITU hosts UN youth event around technology

ICT as the way forward in development, peace and prosperity

From 9 to 11 January, ITU opened its doors to some 350 students from across Europe as the host for the Ferney Model United Nations 2013 Conference (FerMUN 2013). The event was run by the *Lycée International* of Ferney-Voltaire, in France, as part of the Model United Nations programme. The students discussed information and communication technologies (ICT) as the way forward in development, peace and prosperity.

At the FerMUN 2013 opening ceremony, held in ITU's Popov meeting room, ITU Secretary-General Dr Hamadoun I. Touré welcomed a panel of high-level speakers including: Kassym-Jomart Tokayev, United Nations Under-Secretary-General and Director-General of the United Nations Office at Geneva; Ambassador Alexandre Fasel, Permanent Representative of Switzerland to the United Nations and other international organizations at Geneva; Ambassador Sylvia Poll, Deputy Permanent Representative of Costa Rica to the United Nations Office at Geneva; Sebastien Chatelus, Counsellor with the Permanent Mission of France to the United Nations; Jean-Paul Brech, Principal of the Ferney-Voltaire *Lycée International;* Christian Caron, Representative of the Academy of Lyon; and Guy Larmenjat, Vice-President of the General Council of the Ain department.

Dr Touré told a packed room of students, teachers and United Nations staff that he was delighted to be surrounded by so many inspirational young people committed to debating technology issues in a spirit of international cooperation. "As young men and women, you hold the keys to the future in your hands. In a hyperconnected world, that future includes ICT in every aspect of modern life — from schools and hospitals and government offices, to homes and businesses and public spaces. Yours is the most connected generation that has ever lived. That connectedness offers fantastic opportunities for engagement and empowerment, as information is accessed, used, created and shared to build tomorrow's knowledge society," he said.

The conference agenda covered topics as diverse as cybersecurity, education for all, biodiversity, equal opportunities, Internet access as a human right, social media and emergency communications. "These are critical issues for our times, and I firmly believe that ICT can do much to help in addressing each and every issue facing humankind today," Dr Touré told students.

As the next generation of leaders, students "bring the new thinking, the innovation and the ideas that we need to solve the challenges before us", said Mr Tokayev, adding that the extensive agenda of FerMUN 2013 already testified to the readiness of the students to confront the most complex challenges. "You have all come here because you are interested in, and inspired by, the United Nations. But, I think that when you have finished your debates, it will be the rest of us who are inspired by the creativity and resourcefulness that you bring to the table," Mr Tokayev commented.

> *"As young men and women, you hold the keys to the future in your hands…"*
>
> *Dr Hamadoun I. Touré, ITU Secretary-General*

He underlined that "Going forward, we need to put in place a strong framework for continued development after the 2015 deadline for the Millennium Development Goals. And here, appropriate and comprehensive use of ICT has to be at the top of the global development agenda. Ensuring



Young people acting as Member State delegates plunge into debate

ITU/J.M Planche

that the potential of ICT benefits all groups and communities is a challenge. Equality in access has to be a priority — regardless of gender, background and circumstance."

Ambassador Sylvia Poll also highlighted the importance of ICT as part of the solution to the global issues of our time. "The role of telecommunications in environmental protection and sustainable development has been shown to be essential. Less energy consumption, reduction of emissions of greenhouse gases and better response to natural disasters, are just a few examples."

Ms Poll sees mobile technology as a great opportunity for the promotion of health. "Mobile health solutions have shown that they can help combat non-communicable diseases such as diabetes, cancer, cardiovascular and chronic respiratory diseases, currently the leading causes of death in the world," she said. But she warned that excessive use of technology, such as "spending more and more hours with our laptops and mobile phones is also affecting our health. We are being less active, practising less sport and becoming overweight people."

She then spoke of the vulnerability of children online. In this context, she recalled that President Laura Chinchilla of Costa Rica is the Patron of the ITU Child Online Protection initiative. Costa Rica has embraced ICT for its social and sustainable development. This is one of the reasons Costa Rica will host the ITU Global Youth Summit in September 2013, "which aims to mobilize youth from around the world, to create, through access to ICT, solutions for social good".

The students plunged into the debate with enthusiasm. "Representing a country that is not my own gave me an understanding of global issues from a perspective I had never witnessed before. It taught me a great deal about diplomacy in other parts of the world. That and the obligation to follow strict speaking procedures ensured that negotiations went as smoothly as possible in order to have real UN atmosphere," said Manon Fabre, Delegate of India during FerMUN.

The students considered that the theme was well chosen, as ICT are central to their day-to-day lives. "This conference has been a huge eye opener as to how surrounded by technology we are. Most importantly,



ITU/J.M Planche

Young people acting as Member State delegates make a vote

I found out that ICT could have an impact on a humanitarian level. I do take an interest in the latest technologies but before FerMUN I never knew that they could actually help so much," said Sebastian Spence, Delegate of Sudan.

The three-day event gave ITU a chance to showcase its conference organizing skills, as teams from across the Union assisted the FerMUN 2013 committee with everything from registration and badging to room allocation and seating plans, audiovisual and live webcast support, training for student interpreters and translators, onsite photo and video production, graphic design and printing for promotional banners and two onsite FerMUN'13 magazines, and media relations activities.

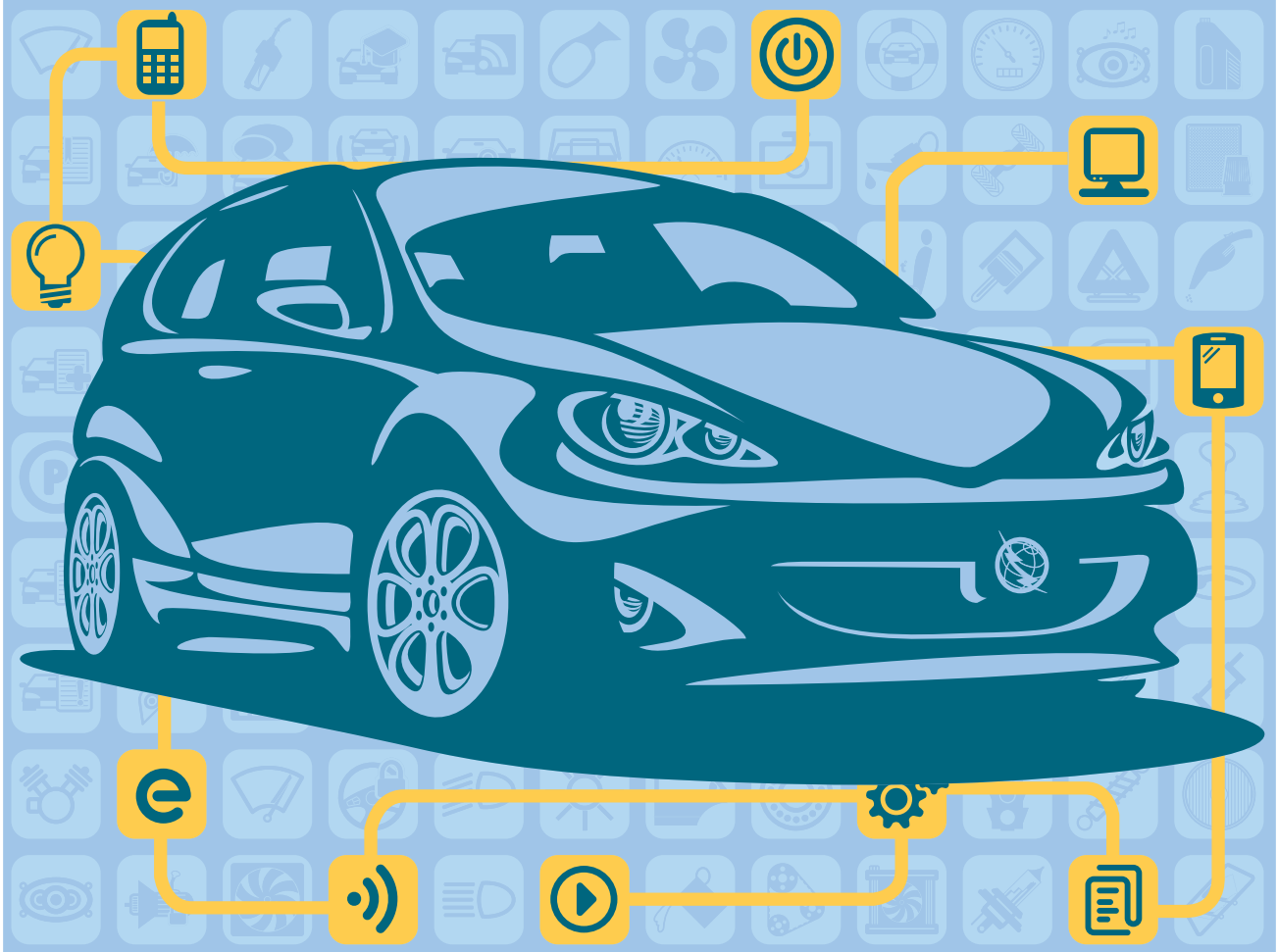
Students were impressed by the slick organization of the conference. "Being hosted by such a place as ITU was inspiring. It gave us the perfect setting to understand how nations come together to communicate. We had access to things we never would have otherwise, such as interpretation systems and conference rooms, as well as the opportunity to interact with real press and other forms of media. Best of all was the help those at ITU were willing to give us. We felt trusted among adults who enabled us to work together for the organization of a successful conference," said Alice Rougeaux, Head of Press at FerMUN.

"Young people will continue to benefit from the fully-networked society in ways that we cannot even imagine today — and I am personally looking forward to seeing where the extraordinary marriage of technological advance and human brainpower will lead us", commented Dr Touré.

Students participating in the conference were invited to visit ITU's new ICT Discovery museum, with visitors eligible to win one of two Samsung Galaxy tablet computers. The lucky winners, drawn by Dr Touré at the closing ceremony on 11 January, were Filip Drzazga, a Polish student representing Italy in the FerMUN debates, and Marta Miori, one of the youngest students at the conference, who was representing Singapore.

World Telecommunication and Information Society Day

17 May 2013



ICTs AND IMPROVING ROAD SAFETY

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Libya seeks regulatory best practice

New telecommunication law in the making

The Libyan Ministry of Communications and Informatics has appointed a high-level committee of telecommunication experts and lawyers from the ministry as well as from outside to draft a new Telecommunication Act that will replace the existing legislation.

Following extensive study of various models of telecommunication law currently in force in different developed and developing countries, the committee has proposed a comprehensive new Telecommunication Act for Libya based on best practices.

There has been public consultation on the draft Telecommunication Act, and the final version is expected to be submitted to the National Congress for approval at the end of March 2013. So Libya is on the verge of adopting a new regulatory regime for telecommunications following the revolution in 2011.

The aims of the new law are:

- to create an independent telecommunication regulatory authority, with clear and transparent terms of reference that set out the authority's functions and powers;
- to promote and protect competition in the telecommunication market;
- to ensure delivery of the highest quality of services at competitive prices to end users across the country;
- to encourage Libya's private sector to participate in building and improving telecommunication services in the country.

In parallel, a Libyan national frequency plan (LNFP) covering the frequency range from 8.3 kHz to 275 GHz is being developed by an international high-level team of experts in close cooperation with Libyan experts from the Ministry of Communications and Informatics. The LNFP is expected to be delivered by mid-May 2013.

The ministry envisages a public consultation on the LNFP, a process used extensively in democratic countries. The purpose of the consultation is to seek the views of all interested parties on the spectrum implications of the LNFP. More specifically, the ministry is looking to receive comments on all matters related to spectrum use, existing and future spectrum requirements, proposed spectrum management policy and strategies, technologies that might coexist with licensed use, and spectrum allocation policy.

Official Visits

During February 2013 courtesy visits were made to ITU Secretary-General Dr Hamadoun I. Touré by the following ambassadors to the United Nations Office and other international organizations in Geneva, and other important guests.





Elizabeth Migwalla, Senior Director of Qualcomm and Dr Hamadoun I. Touré



Minelik Alemu Getahun, Ambassador of Ethiopia



Moncef Baati, Ambassador of Tunisia



Alexandros Alexandris, Ambassador of Greece

All photos are by Rowan Farrell/ITU.



Jean-Marc Jacot, CEO of Parmigiani Fleurier



Valery Tsepkalo, Director of Hi-Tech Park, Belarus



Joaquim da Fonseca, Ambassador of Timor-Leste



Malloum Bamanga Abbas, Ambassador of Chad

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