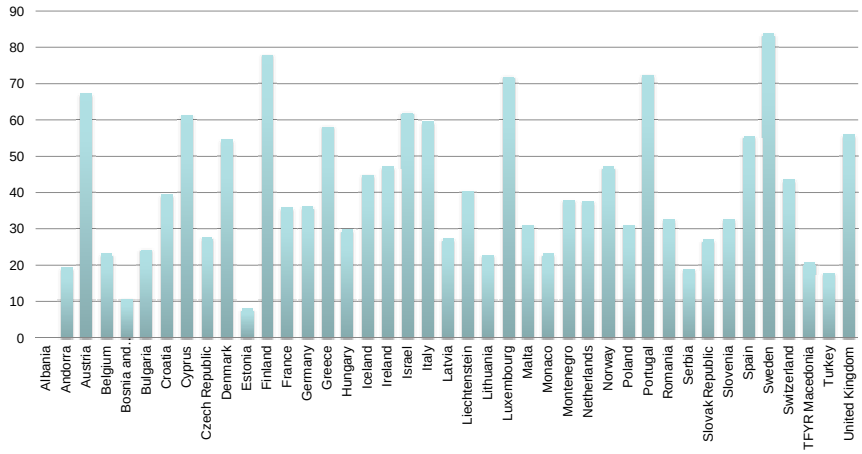
ITU Cross Regional Seminar on Broadband Access for CIS, ASP and EUR Regions
Chisinau (Republic of Moldova)
4-6 October 2011

ITU-D Study Groups and WSIS Action Line C2 activities on Broadband

Riccardo Passerini

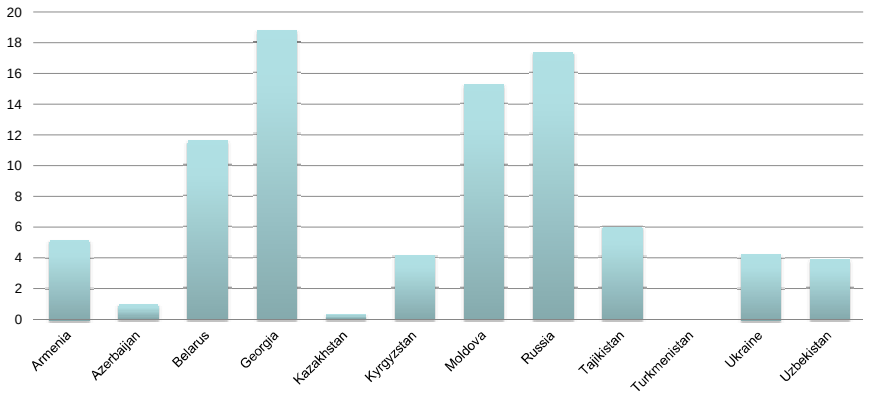
Telecommunication Development Bureau
International Telecommunication Union

EUROPE
Active mobile-broadband subscriptions per 100 inhabitants - 2010



(Source: ITU World Telecommunication/ICT Indicators Database)

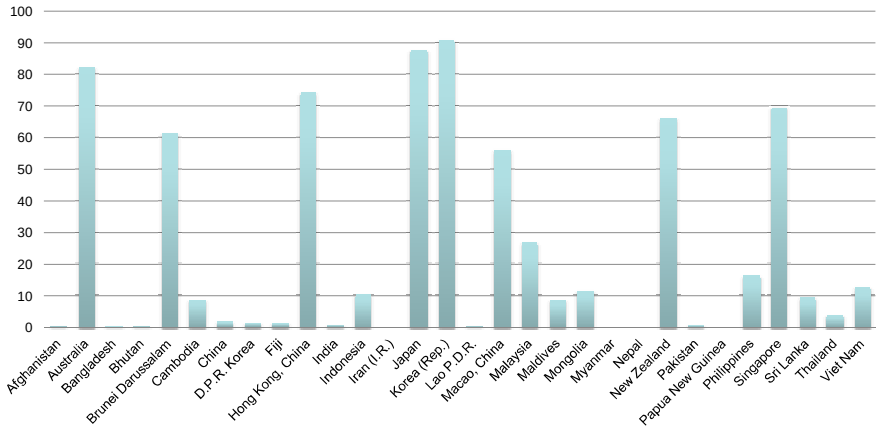
CIS
Active mobile-broadband subscriptions per 100 inhabitants - 2010



(Source: ITU World Telecommunication/ICT Indicators Database)

3

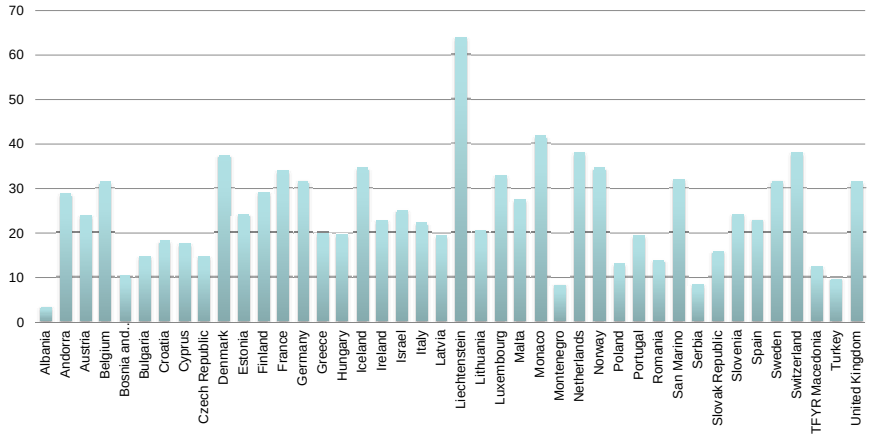
Asia & Pacific
Active mobile-broadband subscriptions per 100 inhabitants - 2010



(Source: ITU World Telecommunication/ICT Indicators Database)

4

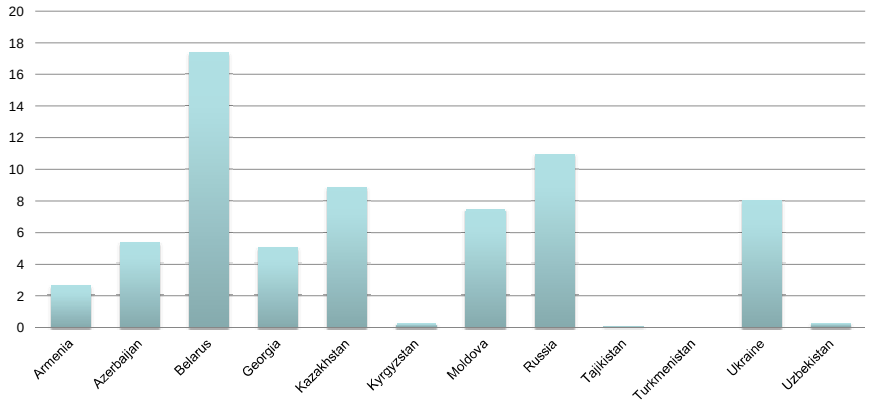
EUROPE
Fixed (wired) broadband subscriptions per 100 inhabitants - 2010



(Source: ITU World Telecommunication/ICT Indicators Database)

5

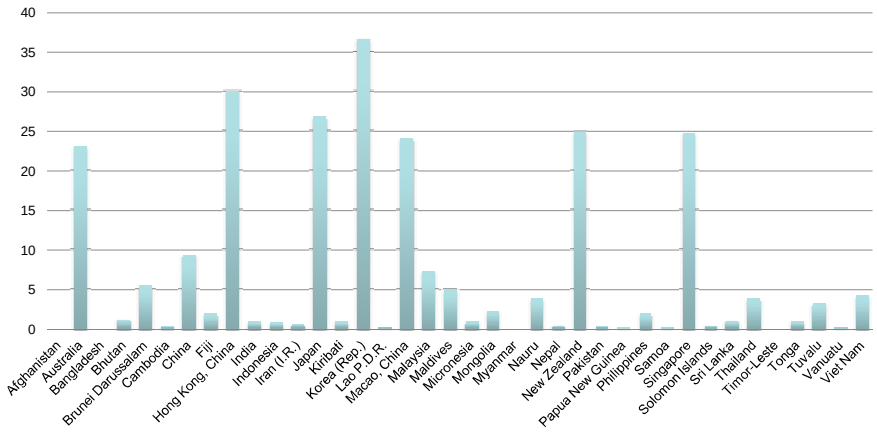
CIS
Fixed (wired) broadband subscriptions per 100 inhabitants - 2010



(Source: ITU World Telecommunication/ICT Indicators Database)

6

Asia & Pacific
Fixed (wired) broadband subscriptions per 100 inhabitants - 2010



(Source: ITU World Telecommunication/ICT Indicators Database)

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ITU-D Study Groups
The History

- The ITU-D Study Groups were established in order to deal with specific telecommunication questions of general interest to developing countries, according to Resolution 2 of WTDC-94 that was held in Buenos Aires, 21-29 March 1994
- The terms of reference, the procedures to be applied by the Study Groups, the Questions under Study have been amended through the successive WTDCs: WTDC-98 (Valletta 23 March-1 April 1998), WTDC-2002 (Istanbul 18-27 March 2002), WTDC-06 (Doha 7-15 March 2006), WTDC-10 (Hyderabad 24 May-4 June 2010)

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ITU-D: Study Groups, TDAG

- **ITU-D:**
  - **Purpose: devise innovative solutions to specific problem areas per WTDC**
  - **No technical standards**
- **SGs focus: telecoms development strategies**
  - **SG 1 - Telecommunication development strategies and policies**
  - **SG 2 - Development and management of telecommunication services and networks and ICT applications**
    http://www.itu.int/ITU-D/study_groups/index.html
  - **TDAG: Advisory Group**

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ITU-D STUDY GROUPS

- **SG 1: *Telecommunication development strategies and policies***

National telecommunication policies and regulatory strategies which best enable countries to benefit from the impetus of telecommunications as an engine of economic, social and cultural development.

Finance and economics, including World Trade Organization (WTO) issues, tariff policies, case studies, application of accounting principles as developed by ITU-T Study Group 3, private-sector development and partnership.

- **SG 2: *Development and management of telecommunication services and networks and ICT applications***

Methods, techniques and approaches that are the most suitable and successful for service provision in planning, developing, implementing, operating, maintaining and sustaining telecommunication services which optimize their value to users. This work will include specific emphasis on telecommunication network security, mobile communication and communications for rural and remote areas, with particular focus and emphasis on applications supported by telecommunications

The implementation and technical application of information and communication technology, using studies by the others Sectors, taking into account the special requirements of the developing countries

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Structure of ITU-D SGs

- ***Chairmen:*** *Chairmen and vice-chairmen appointed by WTDC primarily based upon proven competence (technical and management skill)*
- ***Vice chairmen:*** *Assist the chairman in matters relating to the management of the study group, including substitution for the chairman at official ITU-D meetings or replacement of the chairman.Vice-chairmen may be selected as chairmen of working parties or as rapporteurs.*
- ***Rapporteurs for each questions:*** *Rapporteurs are appointed by a study group in order to progress the study of a Question and to develop new and revised reports, opinions and recommendations. Rapporteurs may have responsibility for only one Question or topic.*
- ***Study Groups management team:*** *(chairman, the vice-chairmen of the study group, the chairmen and vice-chairmen of working parties, the rapporteurs and vice-rapporteurs). It should meet prior to the meeting of the study group, in order to properly organize the coming meeting, including the establishment of a time-management plan.*
- ***Joint SGs management team:*** *(Chaired by the Director of BDT, composed of the ITU-D study group management teams) to coordinate issues common to study groups; to prepare joint proposals to TDAG, to finalize the dates of the study group meetings, to deal with any other issue that may arise.*

MEETINGS

- *The study groups and their subordinate groups shall normally meet at ITU headquarters.*
- *The meetings of the study groups and their subordinate groups studying Questions should take place, to the extent possible, in the ITU-D regions, when invited by Member States or Sector Members, in order to facilitate the attendance of developing countries*
- *Participation in meetings*
  - *Member States, Sector Members, Associates and other entities duly authorized to participate in ITU-D activities shall be represented in the study groups and other groups in whose work they wish to take part by participants registered by name and chosen by them as representatives to make an effective contribution to the study of the Questions entrusted to those study groups. Chairmen of meetings may invite individual experts, as appropriate, to present their specific point of view, without taking part in the decision-making process.*
- *Frequency of meetings*
  - *The study groups shall in principle meet at least once a year during the interval between two WTDCs. However, additional meetings may take place with the approval of the Director of BDT, having regard to the priorities laid down by the preceding WTDC and the resources of ITU-D.*

ITU-D Study Group 1

Telecommunication development strategies and policies

http://www.itu.int/ITU-D/study_groups/index.html

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SG1: QUESTIONS UNDER STUDY

- Q 7-3/1: Implementation of universal access to broadband services
- Q 10-3/1: The impact of the licensing and authorization regime and other relevant regulatory measures on competition in a converged telecommunication/ICT environment
- Q 12-3/1: Tariff policies, tariff models and methods of determining the costs of services on national telecommunication networks, including next-generation networks
- Q 18-2/1: Enforcing national policies and regulations on consumer protection notably in a converging environment
- Q 19-2/1: Implementation of IP telecommunication services in developing countries
- Q 20-1/1: Access to telecommunication/ICT services by persons with disabilities and with special needs
- Q 22-1/1: Securing information and communication networks: Best practices for developing a culture of cybersecurity
- Q 23/1: Strategies and policies concerning human exposure to electromagnetic fields
- Q 24/1: Strategies and policies for the proper disposal or reuse of telecommunication/ICT waste material

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ITU-D STUDY GROUP 2

Development and management of telecommunication services and networks and ICT applications

http://www.itu.int/ITU-D/study_groups/index.html

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SG2: QUESTIONS UNDER STUDY

- **Q 9-3/2:** Identification of study topics in **the ITU-T and ITU-R study** groups that are of particular interest to developing countries
- **Q 10-3/2:** Telecommunications/ICT for **rural and remote areas**
- **Q 11-3/2:** Examination of terrestrial digital sound and television broadcasting technologies and systems, interoperability of digital terrestrial systems with existing analogue networks, and strategies and methods of migration from analogue terrestrial techniques to digital techniques
- **Q 14-3/2: Information and Telecommunications/ICTs for e-Health**
- **Q 17-3/2:** Progress on e-government activities and identification of areas of application of e-government for the benefit of developing countries
- **Q 22-1/2: Utilization of telecommunications/ICTs for disaster preparedness, mitigation and response**
- **Q 24/2: ICT and climate change**
- **Q.25/2: Access technology for broadband telecommunications including IMT, for developing countries**
- **Q.26/2: Migration from existing networks to next-generation networks for developing countries: technical, regulatory and policy aspects**
- **Resolution 9 (Rev. Hyderabad , 2010):** Participation of countries, particularly developing countries, in **spectrum management**

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Reports from the former Study Period

- SG1:

  Question 6-2/1: Regulatory impact of next generation networks on interconnection
- SG2:
- *Question 18-1/2: Implementation aspects of IMT-2000 and information-sharing on systems beyond IMT-2000 for developing countries*
- *Question 19-1/2: Strategy for migration from existing networks to next-generation networks for developing countries*
- *Question 20-2/2: Examination of access technologies for broadband telecommunications*

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Output of Q.6-2/1: Regulatory impact of next generation networks on interconnection

ISSUES FOR STUDY

- *Regulatory impact of next-generation networks on interconnection*
- *legislative and regulatory framework that would be needed to implement appropriate interconnection arrangements for new generations networks.*

OUTPUT

- *http://www.itu.int/publ/D-STG-SG01.06.2-2010/en*
- *The document contains the Report on Question 6-2/1. The report contains a brief discussion on the main issues and potential challenges to NGN interconnection*

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19-1/2 Strategy for migration from existing networks to next-generation networks for developing countries

ISSUES FOR STUDY

- *Trends of telecommunication networks towards NGN.*
- *Examination of NGN technologies (network management, transport networks, access networks, interworking with existing networks, etc.).*
- *Methodologies for planning, with taking into account the behavior of different existing networks.*
- *Migration solutions to NGN (ITU-T SG13 works on NGN)*

OUTPUT

- ***Last Rapporteur's Group Meeting: Geneva September 2009***

➢ ***Guidelines for migration of Existing Networks to Next-Generation Networks (NGN) for Developing Countries***
http://www.itu.int/md/D06-SG02-C-0190/en

Guidelines for migration of Existing Networks to Next-Generation Networks (NGN) for Developing Countries

*The objective of these guidelines is to offer **guidance for developing countries** on the technical issues for consideration when envisaging a migration of their existing PSTN/ISDN networks to NGN.*

- *It explains the trends of telecommunication that would eventually lead to NGN, it explains the NGN technology and provides guidelines for NGN migration as well as some case examples. The report also provides some considerations regarding the regulatory problems raised by NGN migration.*
- *The document contains seven sections and seven annexes. Sections 1-3 contain a general outline of the technology developments that led to NGN, and what NGN really means both in terms of functionalities and benefits and network architecture. Relevant details that are associated with those sections can be found in Annexes 1 and 2. Section 4 discusses the migration to NGN and can be considered as the core of the report. Associated technical details drawn from ITU-T work on migration (in particular Question 7 of former SG13) are presented in Annex 3.*
- *Section 5 of the report presents some examples of NGN deployments. Section 6 outlines some regulatory challenges raised by NGN migration and finally section 7 presents the status of NGN migration and further work stressing on the importance of the development of Broadband access as a lever for NGN migration in developing countries.*
- *Annexes 4 and 5 contain respectively the questionnaire of Q19 that was sent in April 2008 to administrations and sector members and a summary of the responses received (unfortunately only 9 responses in total). Annex 6 contains the text of Opinion 2 of the last World Telcom Policy Forum (WTPF-09) of Lisbon on the "implications of the advent of NGN and advanced broadband access". Finally section 7 presents a list of relevant ITU standards related to NGN.*

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18-1/2 Implementation aspects of IMT-2000 and information-sharing on systems beyond IMT-2000 for developing countries

ISSUES FOR STUDY

a) Identify ways of implementing IMT-2000, using satellites, as appropriate, for some countries and regions,

b) Identify the key elements to be studied in order to provide efficient and cost effective implementation of IMT-2000 and its evolution in developing countries.

c) Propose useful content for the development of training modules by ITU-D for users of IMT-2000 services and applications,

d) Provide information on the specific impact of the implementation of IMT-2000 on women, youth, indigenous people and people with disabilities,

e) Provide information on systems beyond IMT-2000.

OUTPUT

Last Rapporteur's Group Meeting: Geneva September 2009

- ***FINAL REPORT OF Q18 2/2 (INCLUDING GUIDELINES WHERE PERTINENT) http://www.itu.int/md/D06-SG02-C-0246/en***
- ***Supplement to the Guidelines on the Smooth Transition of Existing Mobile Networks to IMT-2000 for Developing Countries (GST) http://www.itu.int/md/D06-SG02-C-0248/en***

FINAL REPORT OF Q18 1/2 (INCLUDING GUIDELINES WHERE PERTINENT)

*This Final Report **provides facts about the various mobile systems and technologies and it is intended for use of telecom operators, policy-makers and regulators to facilitate their understanding of implementation aspects of IMT-2000 and systems beyond IMT-2000**. This Report intends to present an objective and neutral view of the issues to be addressed regarding implementation aspects and has been prepared in response to the specific mandate of Q.18-1/2 from the WTDC.*
It contains seven chapters as follow:

1. Definitions
2. Abbreviations / Glossary
3. Introduction
4. **Ways of implementing IMT-2000, using satellites,** as appropriate, for some countries and regions, taking into consideration ITU-R studies on integrated systems of IMT-2000. (Based on Countries experiences and Contributions)
5. Key elements to be studied in order to provide **efficient and cost-effective implementation of IMT-2000 and its evolution in developing countries**
   - a. key elements for regulators, **including licencing aspects**, on implementing IMT-2000 networks, services and applications (Based preferably on Developed and Developing Countries contributions)
   - **b. IMT-2000 services and applications**, opportunities for developing countries
   - **c. Economics of implementation** of IMT-2000
     - i. Market analysis
     - ii. Economies of scale (including terminals)
     - iii. Business plans and services
6. Information on the specific impact of the **implementation of IMT-2000 on women, youth, indigenous people and people with disabilities**
6. bis. Information on the specific impact of the implementation of **IMT-2000 on environmental issues**
7. **Information on IMT-advanced systems**
8. **Countries' experiences**

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Supplement to the Guidelines on the Smooth Transition of Existing Mobile Networks to IMT-2000 for Developing Countries (GST)

It contains eleven chapters as follow:

1. Introduction [Note: include Res. ITU-R 56]
2. Update on "From existing mobile networks to IMT-2000"
3. Update of IMT-2000 Terrestrial Technologies
4. Information on IMT-2000 Satellite Technologies
5. Update to Standards Development Organizations dealing with IMT-2000
6. IMT-2000 Service Offerings
7. Spectrum Requirements

– Update on Spectrum Identification from WRC-07
– Update on Frequency Arrangements

8. Update on "Interoperability with existing networks and among IMT-2000 technologies"
9. Update on "Transition Paths"
10. Miscellaneous Issues

a) Satellite Backhaul
b) Update of Definitions and Abbreviations and Glossary based on content
c) Update Annex 1 to include case studies for IP OFDMA TDD WMAN

11. Introduction to IMT-Advanced

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20-2/2 Examination of access technologies for broadband telecommunications

ISSUES FOR STUDY

- *Identify the technical, economic and development factors influencing the effective deployment of broadband wired and wireless access technologies and their applications, with a focus on technologies and/or standards recognized or under study by the other two ITU Sectors.*

OUTPUT

- *Analysis of the economic, technical, regulatory and development factors influencing the effective deployment of broadband access technologies. This will also include an assessment of the demand for these technologies and applications in developing countries.*
- *A matrix of different broadband access technologies, both wired and wireless, terrestrial high-altitude systems, including stratospheric-based and satellite. Yearly updating of the technology matrices will be necessary, including an update of the output report of the last study period by the year 2009.*
- ***Last Rapporteur's Group Meeting: Geneva September 2009***

➢ ***BROADBAND ACCESS TECHNOLOGIES MATRIX*** *:*
Wireline Broadband Access Technologies, Fixed Broadband Wireless Access Technologies, Mobile Broadband Wireless Access Technologies (Technology, Standard Name and References)
http://www.itu.int/md/D06-SG02-C-0257/en

➢ ***Report on Broadband Access Technologies***
http://www.itu.int/md/D06-SG02-C-0265/en

Report on Broadband Access Technologies

This report is intended to inform decision-makers and industry participants from developed countries around the world about the technical, economic, and development factors influencing the effective deployment of broadband access technologies and applications.
The Report is organized as follows:

a) *The main body of the Report includes a brief synopsis of available technologies that can be utilized to provide broadband access to end-users.*

b) The annexes contain information on general broadband matters focusing on the economic and social benefits of broadband, strategies for promoting the deployment and use of broadband access technologies and applications along with an analysis of the Questionnaire (CA 25 / Doc. 004) focusing on economic, technical and development factors affecting broadband deployment. A subsequent questionnaire was distributed to Member States in 2006. The BDT conducted an analysis of the responses which can be found on the ITU-D website. Also included in the Annexes are several country experiences which illustrate the technological, economic and social factors that both affect and are affected by the deployment of broadband access technologies. For the purposes of this Report, country experiences are extremely useful because they provide real-world examples of situations where governments and organizations have had to implement creative and innovative strategies in order to extend broadband services to their constituents. Upon examining the country experiences included in this report, developing countries will be able to save time, money and resources by learning from the examples of other communities that faced similar challenges with broadband deployment and access

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New ITU-D Study Period

- **Q.25/2: Access technology for broadband telecommunications including IMT, for developing countries** (merging former Question 18-1/2 Implementation aspects of IMT-2000 and information-sharing on systems beyond IMT-2000 for developing countries and Question 20-2/2 Examination of access technologies for broadband telecommunications)
- **Q.26/2: Migration from existing networks to next-generation networks for developing countries: technical, regulatory and policy aspects** (merging former *Question 6-2/1Regulatory impact of next generation networks on interconnection and Question 19-1/2 Strategy for migration from existing networks to next-generation networks for developing countries)*

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Q.25/2:Access technology for broadband telecommunications including IMT, for developing countries

ISSUES FOR STUDY

- ***a)*** ***Examine wired and wireless broadband access technologies and their future trends;***
- ***b)*** ***Identify methodologies for migration planning and implementation of broadband wired and wireless technologies, taking into account existing networks, as appropriate;***
- ***c)*** ***Consider trends of broadband access technologies; deployments, services offered and regulatory considerations;***
- ***d)*** ***Continue to identify ways and means of implementing IMT, using terrestrial links and satellites;***
- ***e)*** ***Identify key elements to be studied in order to facilitate the possible deployment of systems integrating satellite and the terrestrial component of IMT (see Recommendation 206 (WRC-07);***
- ***f)*** ***Provide information on the specific impact of the implementation of broadband wired and wireless means, including IMT, on underserved populations, including persons with disabilities;***
- ***g)*** ***Provide information on IMT-Advanced systems based on the advice of Working Party 5D of ITU-R Study Group 5.***

OUTPUT

- ***a)*** ***Yearly progress report on the above study items including a matrix of different broadband access technologies, both wired and wireless, terrestrial and satellite, with yearly updates;***
- ***b)*** ***Analysis of the factors influencing the effective deployment of broadband access core technologies;***
- ***c)*** ***A set of guidelines for broadband access deployment that could be delivered inter alia through training seminars in accordance with the BDT Programme 4;***
- ***d)*** ***A handbook on IMT deployment in developing countries to replace the Handbook on Deployment of IMT-2000 systems (2003). This handbook will be the result of study group collaboration between ITU-R Study Groups 4 and 5, ITU-T Study Group 13 and the Rapporteur's Group dealing with this Question as part of ITU-D Study Group 2;***
- ***e)*** ***Draft Recommendation(s), as appropriate and if justified.***
- ***Last Rapporteur's Group Meeting: Geneva 15 September 2011***

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➢ ***Work program for Question 25/2 http://www.itu.int/md/D10-SG02-C-0042/en***

Q.26/2:Migration from existing networks to next-generation networks for developing countries: technical, regulatory and policy aspects

ISSUES FOR STUDY

- *Trends of telecommunication networks towards NGN.*
- *Examination of NGN technologies, Migration solutions to NGN (ITU-T SG13 works on NGN)*
- *Interconnection for NGN, technical and regulatory aspects*

OUTPUT

Report on studies of various issues related to migration from existing networks to next-generation networks and among others the description of the technical, legislative and regulatory framework that would be needed to implement appropriate interconnection arrangements for new generation networks. Economic impact to implement these interconnection arrangements are also to be reported.

- ***Last Rapporteur's Group Meeting: Geneva 15 September 2011***

➢ ***Work program for Question 26/2 http://www.itu.int/md/D10-SG02-C-0042/en***

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WSIS Action Line C2: Infrastructure

- WSIS Forum 2011 was held from 16–20 May 2011 in Geneva, Switzerland.
- The Forum provided structured opportunities to network, learn and to participate in multistakeholder discussions and consultations on WSIS implementation.
- The Forum was hosted by ITU and jointly organized by ITU, UNESCO, UNCTAD and UNDP.

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Action Line C2 Infrastructure

This year the Forum attracted more than 1150 **WSIS Stakeholders from more than** 140 **countries.**
Several high-level representatives of the wider WSIS Stakeholder community graced the Forum, more than **20 ministers** and **Deputies**, **Ambassadors**, **CEOs** and **Civil Society leaders** contributed passionately towards the programme of the Forum. Among participants, there were more than **80 members of parliament**, as well as **several C-level representatives of the private sector and civil society**.

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Action Line C2 Infrastructure

Interactive Facilitation meeting that was organized as a panel discussion during the Forum. The theme for this year's discussion, "Broadband Infrastructure for connecting the unconnected", was selected based on proposals received during the WSIS multistakeholder consultation process.

The Action Line C2 Facilitation Meeting mainly discussed the following aspects, confirming the importance of sharing experiences and knowledge in order to expand the broadband connectivity in rural and remote areas:
(1)Evolution of new telecom services in the next ten years;
(2) Importance of standardization for broadband wireless access;
(3) Importance of standardization for low cost, safe and efficient electrical supply;
(4) Successful story of broadband infrastructure development;
(5) Role of administration for providing broadband in rural and remote areas;
(6) Cost-effective Infrastructure and simplicity of network;
(7) Social impact of broadband.

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The following issues and recommendations were highlighted during the panel discussion:

• Demand of broadband services in developing countries is increasing. Today's new broadband opportunities require a new vision by all potential broadband providers, and a new paradigm for policy-makers and regulators.
• Broadband regulation to reduce regulatory burdens, enhance innovative incentives, and coordinate efforts by all links in the broadband value chain, should be considered. Basically less regulatory intervention creates more business opportunities, ensuring that once in place, the infrastructure is accessible to all operators on open, transparent and non-discriminatory terms.
• New spectrum management policy and adequate and harmonized frequency allocation is crucial to the provision of wireless broadband services in rural and remote areas. In this regard, spectrum flexibility can open opportunities for new players to enter the market, with lower infrastructure costs, bringing greater choice and reducing the price of communications.
The World Radiocommunication Conference next year (WRC-12) will play an important role.
• Standardization of broadband wireless access is important for utilization of broadband system. ITU will continue to play an important role in that regard.
• Standardized, reliable and safe energy systems are also important for utilization of broadband system. Cost and quality of energy are seen as future challenges to be addressed in the provision of broadband to rural and remote areas.

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The following issues and recommendations were highlighted during the panel discussion (cont.):

• Administrations should encourage public–private partnerships (PPP) in conducting projects to overcome economic barriers. Attention should be paid to encourage combination of public and private funding aimed at deploying broadband infrastructure.
• Every administration should facilitate making affordable and high-quality broadband deployment possible in their countries to enable bridging the economic and social digital divide. Incentive from government focusing on e-applications (e.g. e-education) an effective way. Delegation of public services is also recommended for facilitating the development of high speed broadband.
• Every country needs to further develop policies to encourage competitive provision of broadband services coupled with broadband ubiquity policies to address the digital divide. Making use of complementary universal service provisions should be taken into consideration to address a digital divide between those with access to high speed broadband and those without. It is the administration's role to define and the develop a sustainable universal services policy and strategy.
• In order to promote the use of broadband, administration should connect local government buildings, educational institutions and hospitals that either lack broadband options or pay exorbitant fees to incumbent phone companies.
• Access to broadband should be coupled with sufficient focus on increasing PC penetration and enhancing e-skills through demand stimulation measures such as training for students, low skilled groups and professionals, and subsidizing equipment/installation/subscription costs.

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GSR11 BEST PRACTICE GUIDELINES ON REGULATORY APPROACHES TO ADVANCE THE DEPLOYMENT OF BROADBAND, ENCOURAGE INNOVATION AND ENABLE DIGITAL INCLUSION FOR ALL

The Best Practice Guidelines were adopted during GSR11 (Armenia City, Colombia 21-23 September 2011) by the regulators and policy makers participating in the event.
The GSR11 Best practice guidelines focus on identifying innovative regulatory approaches that policy makers and regulators can take to advance the deployment of broadband networks, encourage innovation and extend digital literacy to enable digital inclusion of all in a broadband world. They identify innovative policy and regulatory approaches in the following areas:
- Funding mechanisms to foster public and private investment in broadband, defining the policy and regulatory framework, goals and achievements expected
- Investment incentives, coordination with stakeholders, other national entities involved and collaboration at the regional and international levels
- Stimulating innovation and development of applications and services
- Expanding Digital literacy

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Content of the GSR11 best Guidelines

http://www.itu.int/ITU-D/treg/Events/Seminars/GSR/GSR11/consultation/consultation.html

I. Funding mechanisms for promoting the deployment of broadband infrastructure

1)Leveraging partnerships
2) Modernizing universal service programmes and funds

II. Fostering private investment in broadband through incentive regulation

1)Providing overall direction through a national policy
2) Rationalizing licensing regimes
3) Making spectrum available for mobile broadband
4) Removing barriers to broadband build-out and access to broadband networks
5) Granting tax incentives

III. Stimulating innovation and development of applications and services

1)Nurturing the creation and adoption of applications, services and digital content
2) Spurring investment in R&D activities
3) Enforcing Intellectual Property Rights

IV. Expanding digital literacy

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THANK YOU FOR YOUR ATTENTION!

Riccardo Passerini
Telecommunication Development Bureau
International Telecommunication Union
Tel.: +41 22 730 5720
Fax: +41 22 730 5484
Email: riccardo.passerini@itu.int
www.itu.int/ITU-D/

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