Seminar Closing:
Conclusions and Closing Remarks

ITU/BDT Regional Seminar on Mobile and Fixed Wireless Access for Broadband Applications for the Arab Region

Algiers, Algeria, 19 22 June 2006

John Visser, P.Eng.
ITU, ITU-R, ITU-D, ITU-T   **Sr. Mgr., Intl NW Stds**   **WiMAX Forum RWG**

NORTEL

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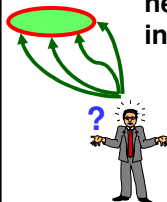

Introduction

- **This presentation, prepared in real time to reflect the key points in ~50 presentations (~1414 slides!) and discussions, aims to provide a summary of the workshop and to provide an aid to more in depth review of the material contributed.**

Quotations

- **"When you get to a fork in the road, take it!" ***
- **"Prediction is very difficult, especially about the future." ****
- **"We always over-estimate the change that will occur in the next two years, and underestimate the change that will occur in the next ten years." *****

> ***   Yogi Berra, American baseball player**
> ****   Neils Bohr, Danish Physicist**
> *****   Bill Gates, Chairman, Microsoft Corporation**

Key Overall Messages

- **Telecommunications: engine for economic growth**
- **Voice important, but ensure build-out includes data capability for IP-based services, internet access**
- **BWA: key technology for bridging the digital divide:**
  - **WiMAX available now, global**
  - **Complements 3G, Wi-Fi, Bluetooth**
- **Many advanced tools can assist decision-making**
  - **Business, technology, deployment**
- **Media/telecom/data convergence leading to service/device/network convergence**
  - **Key enabler: bit rates with new radio access technologies**
- **Strong industry alignment of visions, perspectives**

Let's make it happen!

Opening (1/2)

Welcome Address

- **Brahim Ouarets** (Président Directeur Général, Algérie Télécom)
  - Warm welcome to delegates
  - Algeria recognizes telecommunications is the engine that drives economic development and is investing accordingly

Welcome Address

- **Boudjemaâ Haichour** (Ministre de la Poste et Technologies de la Communication et de l'Information, Algérie)
  - Warmly welcomed participants
  - Strong growth of telecoms in Algeria: mobile, internet access (ADSL), increasing PC ownership, ...
  - desire to implement e-medicine, e-government, etc: requires availability of high capacity communications

Opening (2/2)

ITU/BDT Projects in the Region
- **Miloud Ameziane** (ITU BDT Regional Office)
  - Welcome on behalf of ITU-BDT
  - Noted a number of upcoming events of interest to the region

Introductory remarks/Keynote address/ITU Structure
- **John Visser** (ITU)
  - Seminar outline
  - ITU structure, mandate and roles of Radio, Telecommunications and Development sectors
  - Sectors work together to meet the needs of all involved in telecommunications

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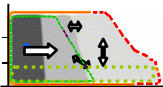# Session 1: Introduction to Wireless Broadband (1/2)

Session Chairman: Mokrane Akli (Algérie Télécom)

1. Global BWA in ITU
- **Colin Langtry** (ITU-BR), presented by John Visser
  - Overview of ITU activities and standards on BWA: Fixed and Mobile, IMT-2000, IMT-Advanced, and Satellite
  - Q: Boundary between NB/BB? A: Primary Rate: T1 / E1

2. ITU-D Report on Broadband Activities
- **Samantha Craig** (Rapporteur ITU-D Q. 20/2)
  - Details on BWA studies and planned deliverables in ITU-D
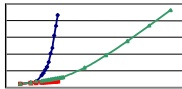 - "Connect the World" initiative (www.itu.int/partners/index.html), recent examples

Session 1: Introduction to Wireless Broadband (2/2)

3. ITU Development Activities on Wireless Communication

- **Riccardo Passerini** (ITU-BDT)
  - Digital divide is narrowing
  - BWA an essential technology for bridging the digital divide: speeds process, makes ICT access more affordable, easier to deploy
  - Industry shifts to IP-based, to mobile, to portable Internet, have a positive effect:
    - especially in developing countries: mobile >> fixed
  - Universal service:
    - mobile and BWA do not fit conditions in Europe
    - should developing world be treated the same way?

Session 2: Broadband Programs and System Implementation (1/3)

Session Chairman: Bilel Jamoussi (Nortel)

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4. BWA: Enabling Broadband Qatar

- **Data Sharan Mishra** (Qatar Telecom - Qtel)
  - BWA is essential where Cu infrastructure not available
  - Bandwidth required per service and per user increasing
  - BWA designed to deliver high quality voice & data services

5. Réseau d'accès haut débit d'Algérie Télécom

- **Mokrane Akli** (Algérie Télécom)
  - Recognition of need for high speed access as key enabler
  - Desire to substantially advance ICT infrastructure in Algeria
  - Multiple projects underway to provide high speed access

Session 2: Broadband Programs and System Implementation (2/3)

6. WLL CDMA, Expérience de Tunisie Télécom

- **Afef Alimi** (Tunisie Télécom)
  - 2 pilot projects: WLL CDMA in 450 MHz band
  - WLL CDMA is an alternative in suburban areas up to ~7Km
  - Necessary to consider alternate solutions as well: WiMAX, EDGE, UMTS

7. Réseau backbone national fibre optique large bande d'Algérie Télécom

- **Mustapha Lounis** (Algérie Télécom)
  - Overview of Algerian fiber backbone
  - High capacity infrastructure with multiple connections to neighbouring countries in Africa and across the Mediterranean
  - A key resource for telecommunications in Algeria

Session 2: Broadband Programs and System Implementation (3/3)

8. WiMAX trial in rural Canada - Case Study: Netago Wireless

- **John Visser** (Nortel)
  - WiMAX trial underway in rural Alberta, Canada
  - Highly successful with satisfied operator and happy users
    - Going commercial in summer 2006
  - Spectrum: work closely with Regulator
  - Services: site engineering; wireless experience important
  - Partnerships, relationships important for success

Session 3: Regulatory aspects of Wireless Broadband (1/3)

Session Chairman: Mouloud Irzouni (Algérie Télécom)

9. Le développement de la technologie WiMAX: Situation et Perspectives en Algérie

- **Leïla Cherid** (Autorité de Régulation des Postes et Télécommunications/ARPT, Algérie)
  - Many points favour WiMAX: rapid evolution, non-proprietary, complements other BWA technologies, IP packet-based, ...
  - Algerian WiMAX experience is at its start, but it is promising

10. Wi-MAX: Cas de la Tunisie

- **Sami Derouiche** (Agence Nationale des Fréquences, Tunisia)
  - 802.16 complements 802.11: complete WAN-MAN solution
  - WiMAX has many advantages: helps reduce digital divide
  - Several other technologies are emerging for providing BWA

Session 3: Regulatory aspects of Wireless Broadband (2/3)

11. WiMAX Regulatory and Spectrum issues

- **Turhan Muluk** (Intel)
  - BB is vital & WiMAX is real solution for true personal mobile BB service in developing and developed countries :
  - Standards and certified products are ready, with commercial fixed deployment today, mobile WiMAX is coming
  - To benefit, regulations and spectrums should be ready.
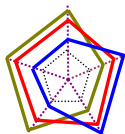
12: BWA in Italy - The WI-FI and WIMAX Experience

- **Fabrizio Savi** (Telecom Italia)
  - Review of Wi-Fi regulation, relaxed requirements from 2005
  - WiMAX trial launched Jul 2005: spectrum 'borrowed" from military; sensitive to interests of UMTS operators

Session 3: Regulatory aspects of Wireless Broadband (3/3)

13bis. Mobile WiMAX Technique & Solution

- **Fareed Al-Attaie** (ST-Samsung Company, Syria)
  - Mobile WiMAX encompasses fixed WiMAX
  - See WiMAX as part of 4G
  - WiMAX is a key service enablers for "anytime, anywhere, any device" IP-based personal broadband services
  - Mobile WiMAX provides the means to realize converging services: voice, data, entertainment, finance, broadcasting

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Session 4: International Wireless Broadband Standards (1/2)

Session Chairman: Nataša Gospić (U. of Belgrade)

14: BWA Standards and Spectrum

- **José Costa** (Nortel); presented by John Visser
  - Overview of ITU activities: BWA, NGN, WMAN, RLAN, IMT
  - BB wireless MANs based on IEEE, ETSI standards, work on RLANs & IMT leading to ubiquitous BB wireless access
  - ITU spectrum allocations will enable global BB systems

15: Information on IEEE 802.20 on Mobile Broadband Wireless Access

- **Luigi Gasparollo** (Qualcomm Incorporated)
  - Summary of technology being standardized in IEEE 802.20, including comparisons with WiMAX; positioning 802.20 as most advanced long term evolution path beyond 3G

Session 4: International Wireless Broadband Standards (2/2)

16: WiMAX Forum RWG: Regulatory issues and progress in support of WiMAX deployment
- **John Visser** (Nortel on behalf of WiMAX Forum)
  - Summary of WiMAX Forum vision, charter, principles
  - Why "WiMAX Forum Certified™" and why it's valuable
  - Activities of RWG: emphasis on "WiMAX friendly regulation"

17: ETSI Technical Committee BRAN and some applications

Bernd Friedrichs (Ericsson), **Mariana Goldhammer** (Alvarion); presented by John Visser
- HiperAccess, HiperMAN, HiperLAN
- Significant effort on test specs, basis for "WiMAX Forum Certified™"
- Works closely with IEEE 802.16 and WiMAX Forum

Session 5: Broadband Technologies and Solutions (1/6)

Session Chairman: Nataša Gospić (U. of Belgrade)

18: 3G/UMTS & its evolution: worldwide deployments and services, perspectives for the Arab Region
- **Jean-Pierre Bienaimé** (Chairman, UMTS Forum); presented by Rémi Thomas (Orange)
  - Deployment of W-CDMA, EDGE, both, now widespread
  - HSDPA providing high speed mobile broadband, making high b/w services (mobile TV, music, etc.) a market reality

19: CDMA 2000 at 450 MHZ: Present and Future for the Middle East and Africa
- **George Mansho** (CDG)
  - Emerging Markets need voice and internet access on affordable devices; 450 & 800 MHz for geographic coverage
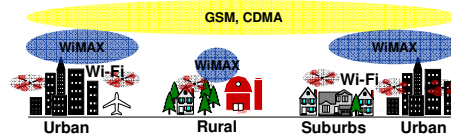
Session 5: Broadband Technologies and Solutions (2/6)

20: WiMAX Forum– Enabling Personal Internet

- **Bilel Jamoussi** (Nortel)
  - WiMAX is part of an ecosystem enabling personal Internet
  - Attractive business proposition, open standard, low cost, multi-vendor

21: 3G CDMA Broadband Wireless

- **Luigi Gasparollo** (Qualcomm Incorporated)
  - There is a significant BWA market opportunity
  - Need to ensure that all options are considered
  - Suggested criteria: technical performance, time to market, cost and scale, business case

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Session 5: Broadband Technologies and Solutions (3/6)

22: Accès large bande satellite d'Algérie Télécom Satellite ATS

- **Nabil Chouam** (Algérie Télécom)
  - Brief history of ATS followed by information on services, coverage, satellite technologies and coverage
  - Multiple satellites provide a range of services

23: Developments in EVDO Wireless Broadband Access Networks

- **Hamdi Breik** (Lucent Technologies)
  - Wireless innovations driven by demand for date rates and bandwidth, flat IP-based architecture, converging services
  - Standards evolving in parallel and converging*: 3GPP (UMTS, HSPA+, LTE), 3GPP2 (EV-DO Rev. C), IEEE (802.16/WiMAX , 802.20)

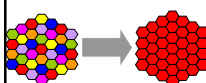> * Mathematically impossible! Reality: moving from parallel to convergence

Session 5: Broadband Technologies and Solutions (4/6)

24: IMT-2000/UMTS delivering full BWA

- **Rémi Thomas** (Orange France)
  - UMTS & evolution (HSDPA, HSUPA, …): solution for BWA
  - Protects investment, enables smooth migration while keeping benefits of GSM (security, worldwide coverage)
  - Evolution: basic & BB services to 14 Mb/s with HSDPA
  - GSM, UMTS in bands <600 MHz are cost effective
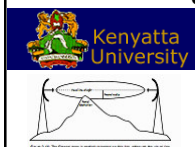
25: WiMAX Wireless Networks in rural area

- **Roland Thies** (Alcatel)
  - WiMAX is the way to connect the next billion users
  - WiMAX complements 3G and is part of the LTE
  - Users "want it all", and at the lowest possible price
  - Approach should not be limited by "old style" thinking

Session 5: Broadband Technologies and Solutions (5/6)
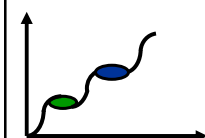
26: Basics of Broadband Wireless Technology

- **Jared Baraza** (Kenyatta University, Kenya)
  - Radio is a very important tool for modern communications but is a complex transmission medium
  - Higher data speeds & bandwidth, less available spectrum: must design radio with narrow channels, tight power control

27: Broadband Network Rationalisation and it's effect on prices

- **Mahmood Faraj Ali Hashimi** (BATELCO, Bahrain)
  - Converged services: increase demand for cost effective transmission capacity
  - Complementary and package of Wireless and Wireline
  - Customers mix mobility and wireless: get right requirement
  - To gain trust: start with Wi-Fi

Session 5: Broadband Technologies and Solutions (6/6)

27bis: VSAT Applications Delivering Broadband Services in Sudan

- **Salma Nasir Elseed** (Sudan)
  - 1994 Sudan Telecommunications Public Corp. became:
    - Sudan Telecommunications Co. (Sudatel), private co.
    - National Telecommunications Council (NTC), regulator
- While penetration is low, growth rate is high
- National fibre backbone misses many
- Hindered by monopoly, need for less restrictive regulation
- VSAT is a possible solution to enhance the availability of broadband, and a means to enhance the situation for the Sudanese people

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Session 6: Broadband Technologies and Solutions (1/4)

Session Chairman: Oscar Gonzalez Soto (ITU)

28: Réseau multiservices large bande de technologie IP/MPLS d'Algérie Télécom

- **Amrane Raouli** (Algérie Télécom)
  - Description of MPLS core network, access and services
  - NGN ready, integrates existing NWs, enables convergence

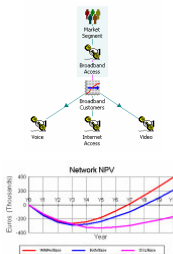### 29: From GSM to UMTS and HSDPA: The BWA solution

- **Rémi Thomas** (Orange France)
  - Architecture, coverage of UMTS & EDGE BB mobile NW
  - Features and services, some commercial results
  - Achieving high QoS in a dense UMTS environment
  - Moving to HSDPA with NORTEL and ALCATEL

Session 6: Broadband Technologies and Solutions (2/4)

30: The business case for WiMAX vs. DSL in rural areas

- **Robin Bailey** (Analysys Consulting Ltd.)
  - Described and demonstrated a software tool useful in making business decisions on which technology to deploy.
    - Demonstration looked at WiMAX vs. DSL, including variations in uptake, other options.
  - Emphasized need to consider technology independent customer behaviour as part of process of using model.
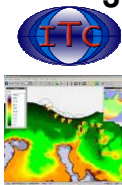 - STEM user group meeting: 20–21 Sep 2006, Cambridge, UK

Session 6: Broadband Technologies and Solutions (3/4)

Session Chairman: Robin Bailey (Analysys)

31: Planning of Broadband Wireless Access for Rural and Remote Areas

- **Ignat Stanev** (International Teletraffic Congress, Bulgaria)
  - Need service/market forecasting, access network optimization, terrain analysis to apply planning tools
  - Case studies: Muscat-Oman, Papua New Guinea, Stuttgart

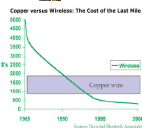### 32: Tools for Radio planning and Implementation in a Wireless Network

- Jared Baraza (Kenyatta University, Kenya)
  - IMT-2000 brings new applications and services to customers
  - Must obtain spectrum before investing in IMT-2000 systems
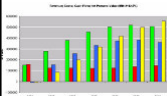 - Proper design & planning necessary: demo'ed software tool

Session 6: Broadband Technologies and Solutions (4/4)

33: Planning of BWA for Rural & Remote Areas using Public-Private Partnership Scheme: Indonesia

- **Loso Judijanto** (Ministry of Information and Communications Technology, Indonesia)
  - **Telecoms overview: good progress but more to be done**
  - **Declining wireless costs: apply to "Ringing Village" to "Smart Village" program, initially for basic service in remote villages, ready to support internet access on same infrastructure**

34: Case study - planning of different broadband solutions in last mile for urban and suburban areas

- **Ignat Stanev** (International Teletraffic Congress, Bulgaria)
  - Described planning process for evaluation of BB solutions
  - Careful planning and comparison of economics essential
  - Study performed with network planning tools and real data

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Session 7: Fixed Mobile Convergence (1/3)

Session Chairman: John Visser (ITU / Nortel)

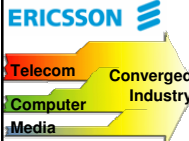**35: Mobile Next Generation Networks: An evolutionary path to NGN**

- **Roland Thies** (Alcatel)
  - **Key aspect of NGN: separation of control and transport**
    - **NGN based on 3G UMTS R4/R5, CDMA2000 1x EV-DO**
  - **Common transport backbone for voice and data, on ATM or IP**
  - **Unified, merged services: standard access independent interfaces, independent of access type**

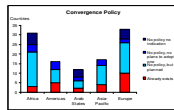# Session 7: Fixed Mobile Convergence (2/3)

36: Ericsson View on Telecom Technology and Services Convergence

- **Wally Hariz** (Ericsson)
  - Media/telecom/data: new battleground & business models
  - Leads to service, device and network (IMS) convergence
    - Key enabler: bit rates with new radio access technologies
  - "Always Best Connected" (seamless access transitions)

37: A new regulation for converging services

- **Fabrizio Savi** (Telecom Italia)
  - **There are many instances of privatization and liberalization; many moving to technology neutral light regulation**
  - **Success from synergies, optimizations, converged services**
  - **Need to match technology time constants in move to common network for all services, but still ensure fair competition**
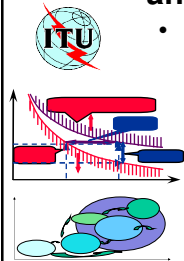
Session 7: Fixed Mobile Convergence (3/3)

38: Convergence Strategy for a Universal Operator and role of Business Planning

- **Oscar Gonzalez-Soto** (ITU)
  - Customize modeling to situation: one size does not fit all
  - Best solution applies appropriate technology in each area
  - Many potential areas of convergence: service, network, radio access, operational, terminal; economies of scale are key
  - Use tools to model, maintain business indicators: multi-service, multi-customer approach for maximum returns
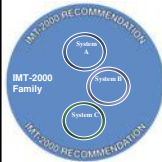
Session 8: Migration/Evolution – Guidelines for Developing Countries (1/6)

Session Chairman – John Visser (ITU / Nortel)

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39: Guidelines on smooth transition ... to IMT-2000 for Developing Countries

- **Nataša Gospić** (ITU-D Rapporteur Q. 18/2)
  - **Developing countries entering global e-economy markets**
  - **Telecom traditionally technology and supply driven, becoming end user and market driven: IMT-2000 is ready to meet needs**
  - **Mobile BB access enables personalized service portability across network boundaries and between terminals**
  - **Base transition on key aspects: demand, investment, revenues**

> *Presentations in this session are summarized in the order in which they were given.*

Session 8: Migration/Evolution – Guidelines for Developing Countries (2/6)

40: Spectrum Considerations & Licensing Aspects for Migration of 2nd Generation Systems to IMT-2000

QUALCOMM

- Samantha Craig (Qualcomm)
  - **Spectrum is a scarce and critical resource**
  - **Considerations in assigning frequencies reviewed**
  - **Presented overview of spectrum identified for IMT-2000**
    - **Bands are identified for IMT-2000 systems and services, not specific technologies**
  - **Bands <600MHz: cost and coverage advantages a good match to developing country needs**
  - **IMT-2000 key role in achieving universal access for Africa**
    - **Recommending flexible spectrum policies**

41: Refarming spectrum from 2G to 3G

GSM ASSOCIATION

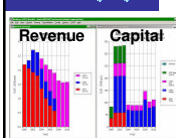- **Roberto Ercole** (GSMA)
  - **Not presented**

**Session 8: Migration/Evolution –
Guidelines for Developing Countries (3/6)**

**42: Conducting auction for allocating frequency for
IMT-2000: The case study of Indonesia**

- **Loso Judijanto** (Ministry of ICT, Indonesia)
  - **Auctions provide effective, transparent process of allocation**
  - **Auction design: must suit market and policy situation**
  - **Auction design: simple to manage with limited resources**
  - **Learn from other countries' experience!**
  - **High costs and fees not a necessary part of auction process!**

**48: Adding data revenues in transition from GSM to
UMTS**

- **Robin Bailey** (Analysys Consulting Ltd.)
  - **Model used to illustrate effects of revenues <u>and licensing fees</u>
    as part of developing business case analysis**
  - **Consider distinctions among different customer revenue
    types, demand, geographical aspects and deployment aspects**
  - **Modelling should be "detailed enough" to meet needs**

**Session 8: Migration/Evolution –
Guidelines for Developing Countries (4/6)**

43: Licensing Aspects

- **Riccardo Passerini** (ITU-BDT)
  - **Background on licensing, supplements Indonesia presentation**
  - **Briefly described hybrid approach: combination of "beauty
    contest" and auction; described tools for decision process**
  - **Emphasized need to tailor approach to local circumstances**

**44: New ITU-D Q. 18/2 "Implementation aspect of IMT-
2000 and systems beyond IMT-2000 for developing
countries"**

- **Nataša Gospić** (ITU-D Rapporteur Q. 18/2)
  - **Issues for study:**
    - **Ways to implement IMT-2000, including satellites**
    - **Key elements for cost effective implementation, evolution**
    - **Propose content for ITU-D training modules on IMT-2000**
    - **Impact on women, youth, indigenous people, disabled**
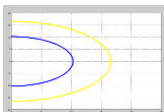   - **Information on systems beyond IMT-2000**

Q.18/2
- *Title*
- *Issues*
- *Outputs*
- *Inputs*

**Session 8: Migration/Evolution –
Guidelines for Developing Countries (5/6)**

**45: Introduction of 3G technologies in 2G bands, the
example of UMTS-900**

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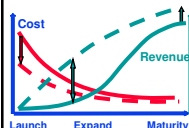- **Jesús de Viguri Garay** (Nortel)
  - **Optimum solution for rural rollout: coverage, fewer sites**
    - **Access capex savings due to need for fewer Node B units**
  - **A good solution when 2G and 3G networks merge**
    - **Good indoor coverage in urban areas**
  - **Node B products and terminals will be available very soon**

46: Business Planning and Migration to 3G
- Oscar Gonzalez-Soto (ITU)
  - **Dynamic and flexible modelling essential to study key economic factors in developing business case**
  - **High impact on profitability**
    - **Sharing infrastructure to decrease costs**
    - **Stimulate service take-up rate to increase revenues**
  - **Critical multiple dimensioning criteria for QoS in 3G**

**Session 8: Migration/Evolution –
Guidelines for Developing Countries (6/6)**

**47: Réseau Mobile 3G d'Algérie Télécom Mobile
MOBILIS**

- **Fayçal Touati** (Algérie Télécom MOBILIS)
  - **Overview of Algerian market & position of MOBILIS in market**
  - **Users want high quality advanced services, high speed access**
  - **3G target: high end, multimedia users**
  - **Approach: cost effective deployment (infrastructure reuse), upgradeable nodes, integration into existing network, service continuity**

**49: MVNO an efficient alternative to develop
telecommunications services market**

- **René Andreescu** (Polytechnic School of Bucharest Association)
  - **no presentation**

Panel Discussion

Topic: How to foster regional and global cooperation for development of wireless broadband?

Moderator:
- John Visser, ITU / Nortel

Panellists:
- Fabrizio Savi, Telecom Italia
- Samantha Craig, Qualcomm
- Nataša Gospić, ITU-D Rapporteur Q.18/2
- Loso Judijanto, Indonesia Ministry of ICT
- Mustapha Lounis, Algérie Télécom
- Oscar Gonzales Soto, ITU
- Nabil Choubam, Algérie Télécom
- Mahmood Faraj Ali Hashimi, BATELCO

Thank you!

19