Broadband Policies and Regulations

ITU-D Regional Development Forum for the Arab Region
NGN and Broadband, Opportunities and Challenges
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Agenda

- Presentation Key Messages
- Broadband Situation in Arab States
- Why NGN?
- Next Generation Mobile Broadband Networks
- Policy and Regulatory Aspects
- Recommendations

Presentation Key Messages

- Broadband is key for competitiveness and economic growth.
- Delay of broadband policies results economical loss.
- Flexibility to allow IP and OFDMA based Next Generation Mobile Technologies (WiMAX and LTE).
- 2.3/2.5 GHz licensing provides next generation mobile broadband transformation.
- National Broadband Plan is necessary for success.

The economy runs on broadband

• Key for competitiveness and economic growth.

• Improves the life quality of citizens.

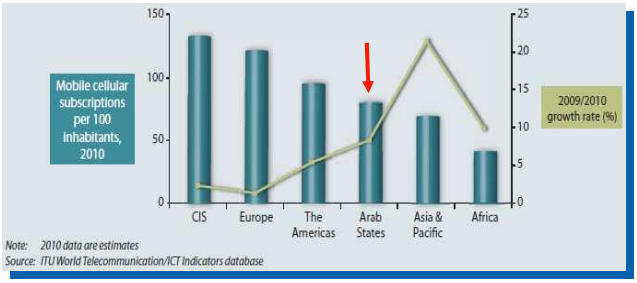
• Remote monitoring of vital signs and electronic health records could save $700 billion over 15-25 years in US.

•The World Bank: Every 10 point increase in broadband penetration rate accelerates economic growth by 1.38.

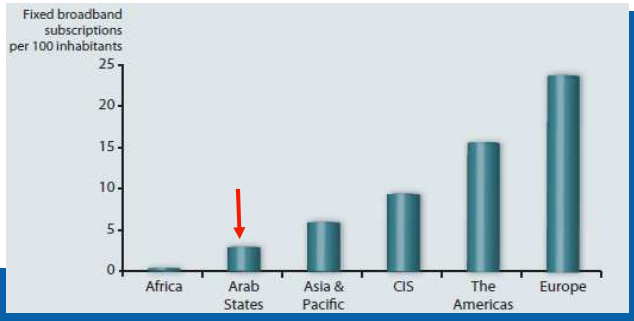
•10 point increase in broadband penetration rate could help ~27.3 billion US Dollar to Arab States economy.

Delaying of broadband policies causes to economical loss!

Broadband & Mobile Situation in Arab States (ITU)



Speeds below 256 kb/s are still common in most Arab Countries (AREGNET 2010 Study)



Arab States need Next Generation Mobile Broadband Networks

Rural population covered by a mobile cellular signal, 2008 (Source: ITU)

	Overall mobile cellular coverage (%)	Rural population covered (%)	Rural population covered (millions)	Rural population not covered (millions)
Africa	69	52	253	230
Americas	93	73	136	50
Arab States	94	86	115	18
Asia and the Pacific	85	76	1 720	533
CIS	94	83	83	17
Europe	99	98	159	3
WORLD	86	74	2 466	852

Note: The rural population covered by a mobile cellular signal is calculated by the following formula:

Proportion of rural population covered by a mobile cellular signal=

$$\frac{(\text{Proportion of total population covered by a mobile cellular signal} \times \text{Total population}) - \text{Urban population}}{\text{Rural population}}$$

Why NGN?

-Need to converge and optimize the operating networks and the extraordinary expansion of digital traffic (i.e., increasing demand for new multimedia services, increasing demand for mobility, etc.).

-All IP based network, consolidates both the fixed and wireless world under the same core network (lower CAPEX and OPEX).

- Accelerates the use of communications for greater socio-economic development, including E-education, E-health, and E-government, and enable countries to boost productivity and growth.

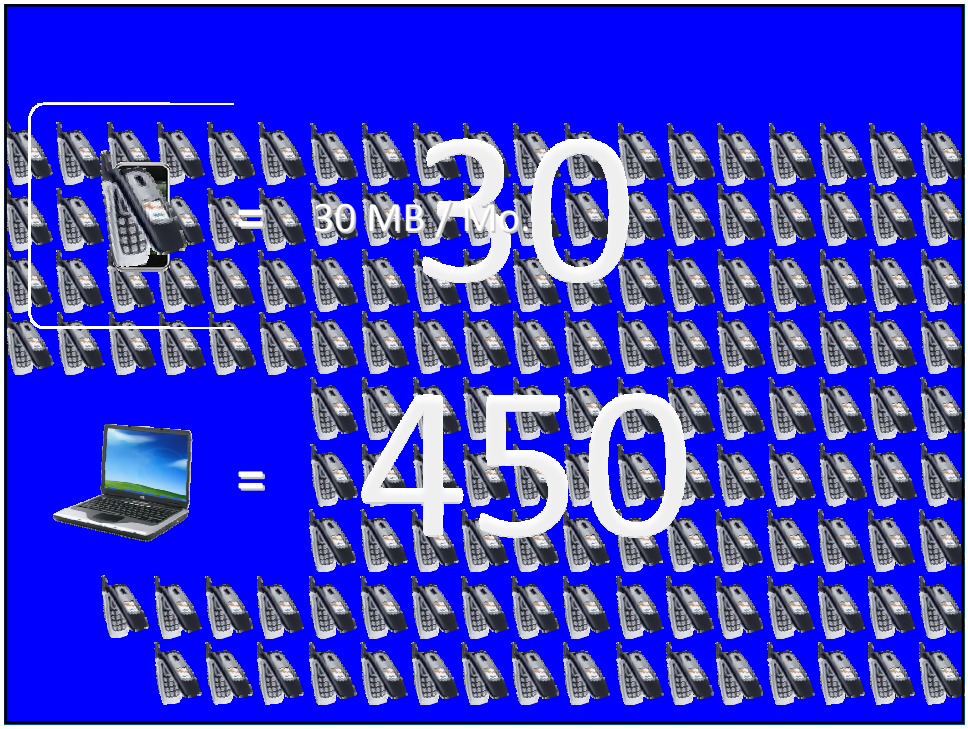
-Broadband capabilities with end-to-end QoS and transparency.

-Support of multiple last mile technologies

-Unfettered access by users to different service providers

Why we need Broadband Spectrum?

- ITU expects the number of mobile cellular subscriptions globally to reach five billion in 2010.
- **It is expected, by 2014 about 80% of all broadband subscriptions will be mobile.**
- Majority of the world's people in developing countries, the first and only access to the Internet is via wireless network.
- Machine to Machine (Internet of things); billions of low-power devices.
- User demands over time require access to high-bandwidth video content.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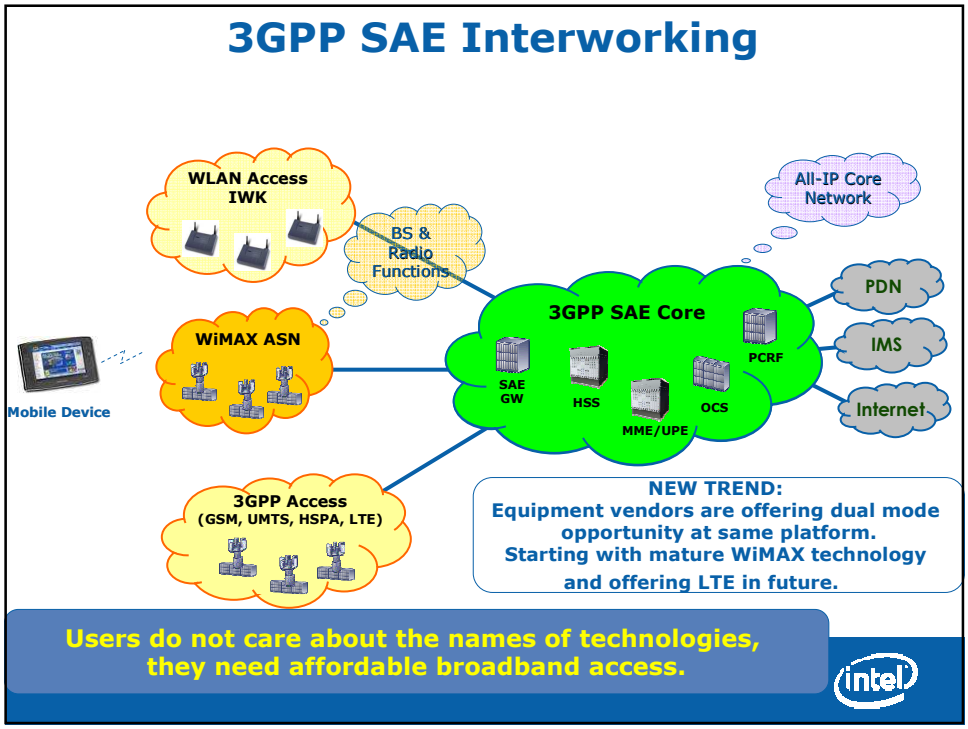
3GPP SAE Interworking
WLAN Access
IWK
BS &
Radio
Functions
All-IP Core
Network
PDN
IMS
Internet
3GPP SAE Core
PCRF
SAE
GW
HSS
OCS
MME/UPE
WiMAX ASN
Mobile Device
3GPP Access
(GSM, UMTS, HSPA, LTE)
NEW TREND:
Equipment vendors are offering dual mode
opportunity at same platform.
Starting with mature WiMAX technology
and offering LTE in future.
Users do not care about the names of technologies,
they need affordable broadband access.
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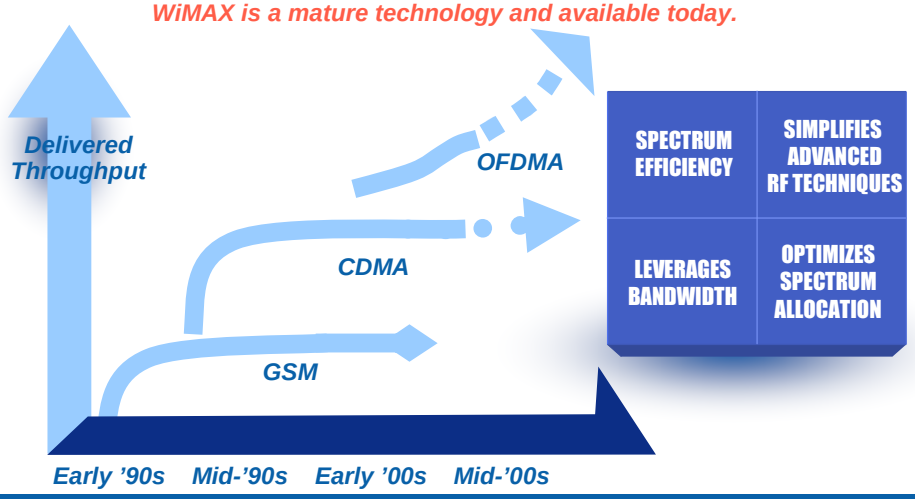
Next Generation Mobile Networks

- **IP and OFDMA Based**
- **Lower CAPEX/OPEX (Significant cost per bit advantage compared to narrowband mobile networks - affordable broadband)**
- **High Data Rates**
- Advanced Antenna Techniques
- Simplified internetworking with other IP based technologies
- Mobile + Nomadic + Fixed Services
- Combination of broadband and mobility

Shift to OFDMA based Mobile Technologies

Both WiMAX and LTE are OFDMA based,
WiMAX is a mature technology and available today.



CDMA=Code Division Multiple Access, OFDMA=Orthogonal Frequency Division Multiplex Access

Narrow Band Wireless Networks (2G, 3G)

Optimized for Voice and Narrowband Data

Next Generation Wireless Broadband Networks

Enabling Wide Range of Applications

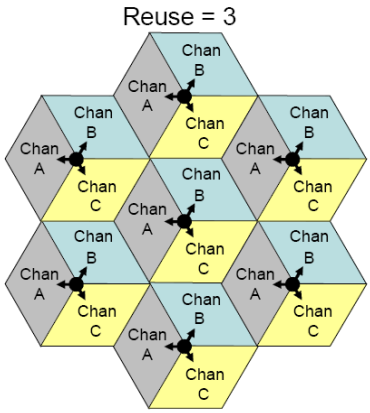
10 or 20MHz Channels

More Capacity at Less Cost

WiMAX and LTE are Next Generation Mobile Broadband Technologies

Need More Spectrum

Smaller allocations limit the capacity per km² requiring more infrastructure to meet demand



Existing need:
Channel Size: 10MHz
3X10 MHz= 30 MHz

Future need:
Channel Size: 20 MHz
3X20 MHz= 60 MHz

ITU WRC2007 Agenda Item 1.4 : Results

Existing global identifications* for IMT-2000 changed to "IMT"

- 802/862 –915 MHz;
- 1 710 –2025,
- 2 110 -2 200 MHz;
- **2 500 –2 690 MHz**
- **2 300 –2 400 MHz (newly identified globally for IMT)**
- 3 400 –3 600 MHz (newly identified in many countries)
- 450 –470 MHz (newly identified globally for IMT)

Widespread commercial Next Generation Mobile Broadband products are available at 2.500-2.690 MHz and 2.300-2.400 MHz bands

Next Generation Mobile Broadband Transformation

- Transformation of mobile networks to next generation mobile broadband networks.

- Transformation of mobile (narrowband) users to broadband mobile internet users.

- Requires the assignment of 2.5/2.3 GHz bands for WiMAX & LTE

Regulatory Obstacles

-**Access to Spectrum (2.3/2.5 GHz bands)**

-Slow Re-farming Process (existence of other systems at 2.3/2.5 GHz bands)

-Insufficient Spectrum Assignment for operators

-Lack of Technology and Service Neutrality

-Regional Licensing

-Restriction for mobile services

-Insufficient Licence Duration (need for return on Investment)

Bandwidth & Business

- **Economic viability of a service provider's business case is highly sensitive to the size of the spectrum allocation license**
- **Spectrum available for deployment determines base station capacity**
- **Capacity constraints accelerate the need to split cells**
- **Excessive cell splitting causes significant operating and financial issues for operators**
  - Increases capital and operating expenses resulting in increased cost to deliver data
  - Additional cells increase interference issues for subscribers
  - Creates quality of service issues for subscribers
  - Limits operators from providing high bandwidth applications such as video and music downloads
  - Limits the number of subscribers that can be served by the operator

Increased bandwidth enhances overall efficiency of the network and reduces cost of network deployment

National Broadband Plans – key focus areas

Countries should develop national broadband plans with well defined targets, to ensure progress to goals. Strategic results are best achieved by setting SMART objectives (Specific, Measurable, Attainable, Relevant, and Time bound)

The key elements should include;

- Minimum initial definition of Broadband (1.5 to 3 Mbps are generally deemed acceptable, although rates should become faster over time).
- Time bound goals established for deployment (coverage) as well as adoption (service and devices for access)
- (ex: cover 80% HH with BB by 2011, 50% of HH subscribe to BB by 2011)
- Establishment of globally recognized metrics and yearly reporting on progress to goals (ITU, UNCTAD)
- QOS performance recommendations
- Defined Subsidies (ex: Universal Service Funds)
- Spectrum assignment in a technology and service neutral manner for BWA (ex: 2.x GHz band)

Bringing the benefits of broadband to:

Small and Medium Businesses
Schools and Universities
Health Care Hospitals, Clinics, & Clinicians
Export Industries
Rural/Agrarian Communities
Governments' Services to Citizens
…. And FAMILIES?

Must set PUBLIC & MEASUREABLE goals … ex:

- **100% of schools with BB, teacher pc training, widespread pc proliferation in schools, local education ISV growth**
- **SMB's in towns >2000 pax with AFFORDABLE & RELIABLE BB; tax relief for BB & ICT**
- **50% of households with computer and broadband**
- **Shared BB access & PC's within 1 hour walk for all**
- **100% of medical clinics with BB & pc's**
- **Internet based info-service for medicine, agriculture, e-Gov**
- **Measurement of access (uptime, cost, consistent speed)**
- **Secure financial transactions**

Universal Service Policy

- Universal Broadband: Affordable broadband service nationally available is an important societal goal.
- Technology and Competitive Neutrality: USF funds available for all means of communications (telephone and broadband in a technology- and competitively-neutral manner)
- Fair and Transparent Distributions: Supporting the pay out of funds in a fair and transparent manner.

Example uses of USF for Broadband

Country	Description
Brazil	Provide BB* access to 56,685 public schools by 2010 (* computer labs, broadband internet connection for free and teacher's training)
Turkey	Connection of all schools with broadband, Subsidizing BB to 18000 rural schools; 4500 Public Internet Centers, 700ku school PC 07/08
Nigeria	Accelerate BB in State Capitals, train 3000 educators; 35000 CMPC
Pakistan	BB Coverage 2010 goal=from .1 to 1.5M BB subs; 10k rural PC centers
Chile	BB connectivity 2010 goal=from 1% to 90% of rural areas
Morocco	Subsidize BB connect to schools + Teachers Laptop
Romania	600 Telecenters
Portugal	400M Euro subsidy of NB's + 3G from spectrum auction
Vietnam	Internet to Villages. Wimax pilots
India	Funding BB connectivity pilot using WiMAX in 50 schools in Tamil Nadu
Colombia	Provide internet connectivity to public institutions (major' offices, schools & hospitals. 4k centers. 4.7M people

Broadband Policy Recommendations

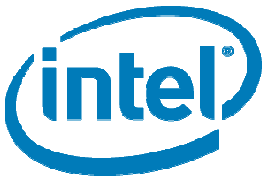
- Permit all types of fixed and wireless broadband technology solutions (ADSL, Fiber, CATV, Satellite, 3G, WiMAX, LTE, etc.).
- Foster the establishment of national fiber backbones, IXPs, the liberalisation of undersea cable landing rights.
- Competition to promote innovation and affordable broadband and internet services for all users.
- Technology and service neutrality.
- National licences where possible and flexibility within licensed use.
- Preference of licenses to be assigned by auction.
- Sufficient Spectrum for operators.

Spectrum Policy General Recommendations

-Implement Service and Technology neutrality regulatory regimes
  - No restrictions on services, e.g. VoIP allowed
  - No preferential treatment for specific technologies
  - No restrictions on mobility

- Market should decide any FDD/TDD split, e.g. 2.5 – 2.69 GHz band
- Minimum 30 MHz (TDD) or 2x15 MHz (FDD) contiguous spectrum per Operator (excludes guard bands)
- Auctions; more market based than other options
- Nationwide licenses; avoid market fragmentation and maximise business case
- Timely access to 2.5 – 2.69 GHz/2.3-2.4 GHz spectrum bands needed to prevent economical loss because of delaying.

Enable a Sustainable and Competitive Broadband Market



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