Broadband for Networked Society

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Presentation outline

- Introduction
- Worldwide Broadband Growth
- Broadband Growth Challenges
- Impact of IoT
- Broadband Commission Goals
- Broadband in Pakistan
- Telecommunication Policy 2015

Introduction

ICT – Sustainable Development

Affordable BB

- Economic Growth
- Social Inclusion
- Environmental Protection

Digital Divide Persistent

- Access to BB Internet
- Access to Remote Areas

Gender Digital Divide

Local Content and Services

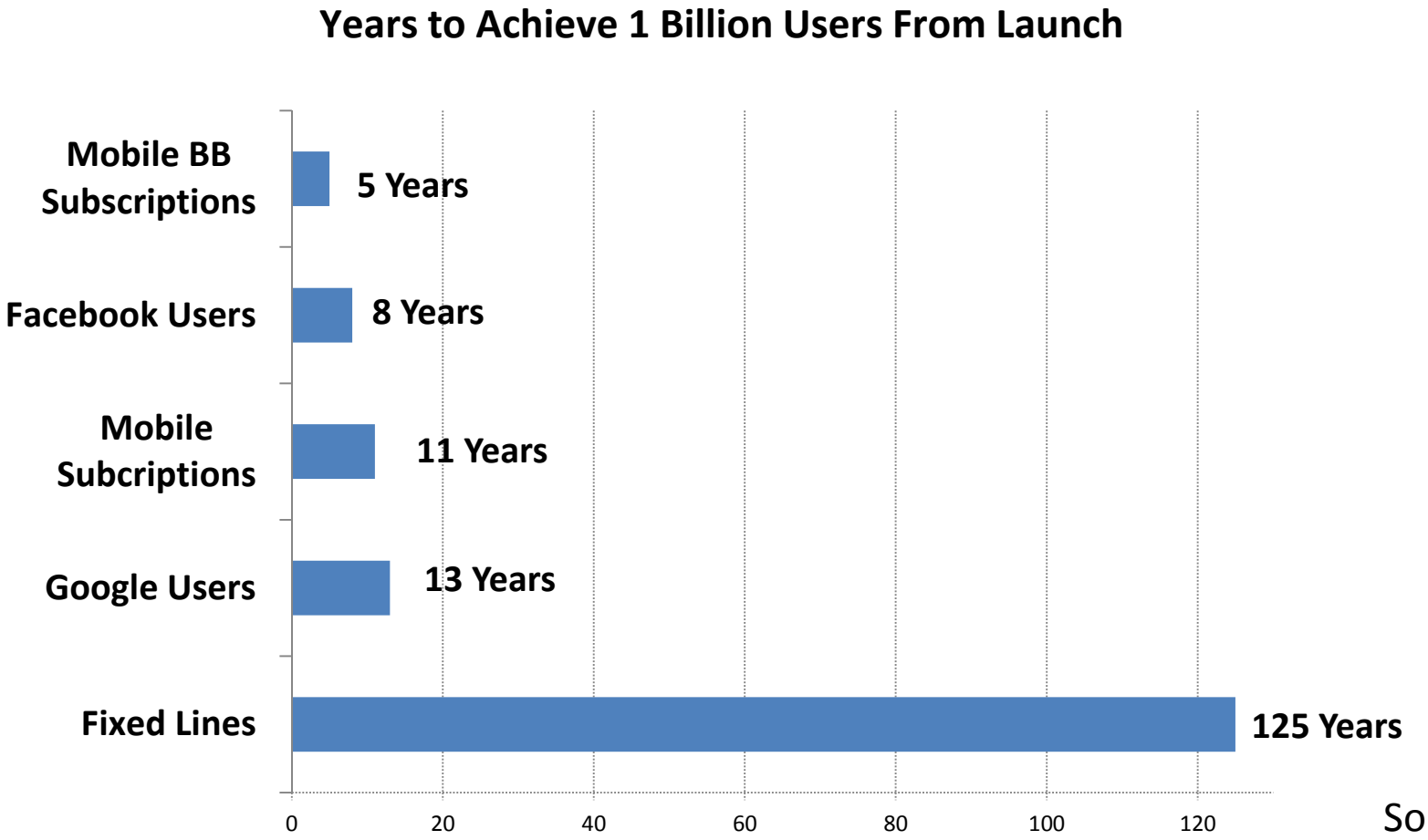
Local Languages

Need for Effective Policies

Worldwide Broadband Growth

World Wide BB Growth

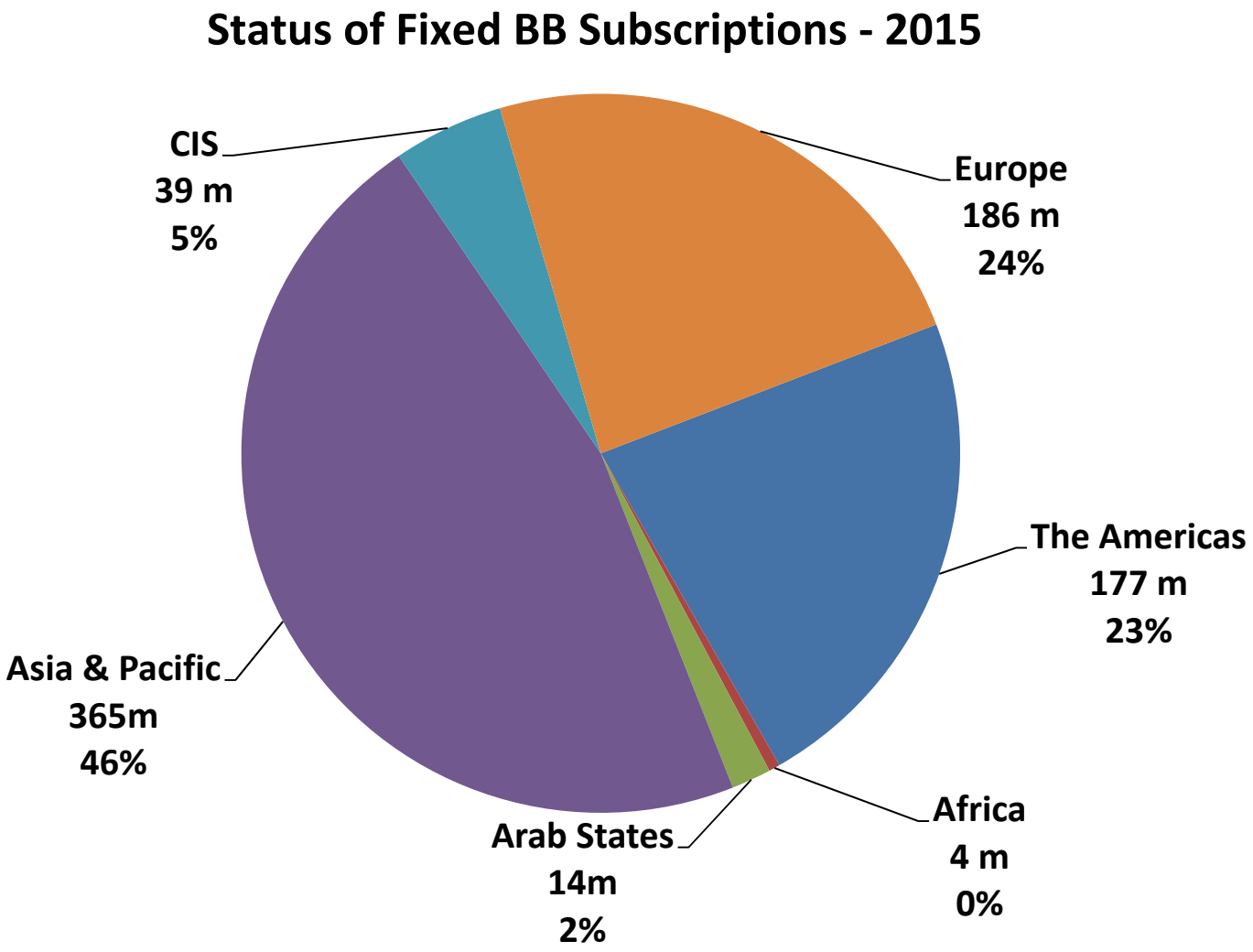
Mobile BB Growth



Source : ITU

7.7 Billion MBB Subscriptions by 2021, as Compared to 3.5 Billion in 2015

Fixed BB Growth



Source : ITU

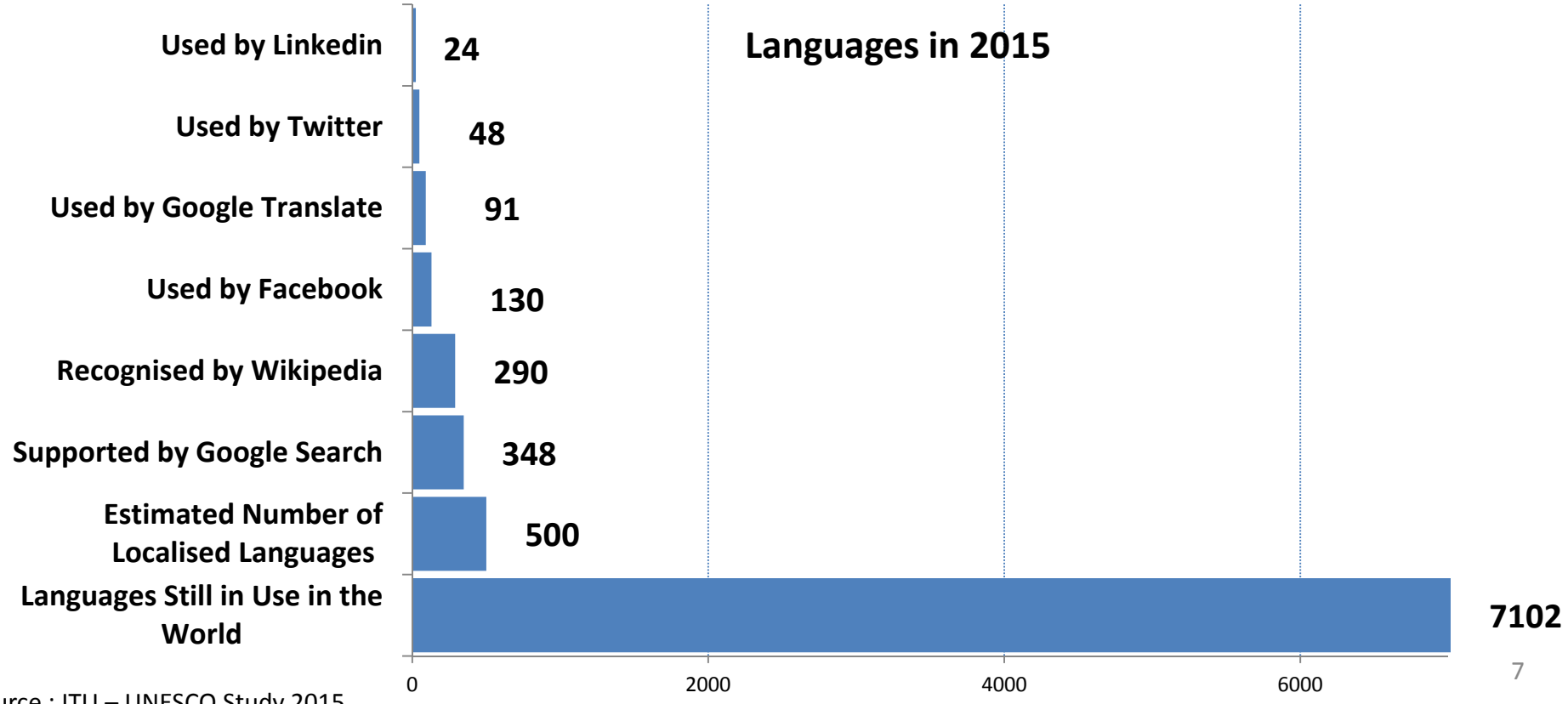
–920 Million Subscribers by 2019

–Sustained Growth Expected in Fixed BB

Broadband Growth Challenges

Demand Side

- After 3 Billion Internet Users , Addition of the Next 4 Billion Challenging
- Future Internet Users from Less Educated Rural/Remote Areas
- Other Languages and Dialects
- Only 5% Languages present on the Internet

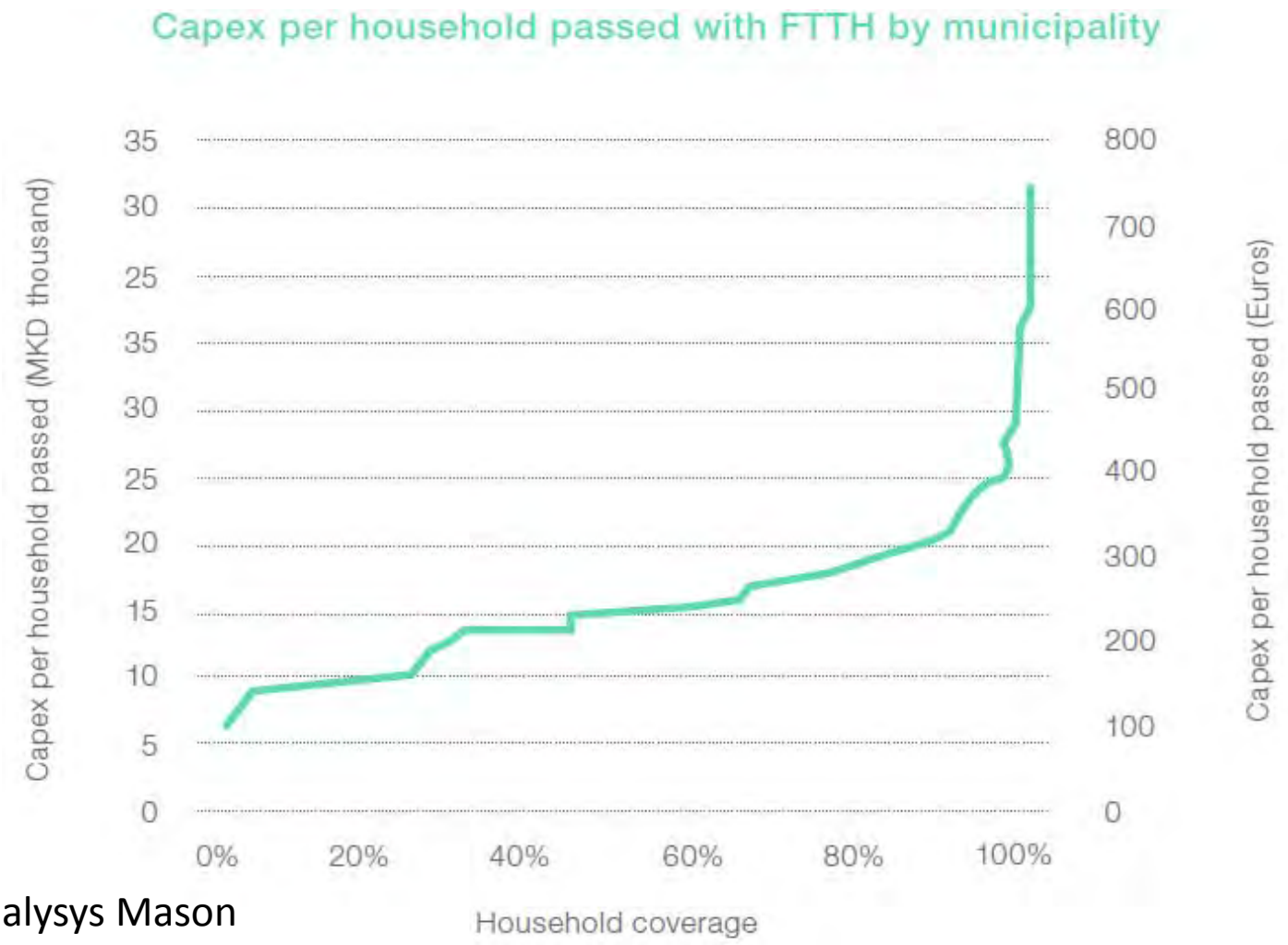


Source : ITU – UNESCO Study 2015

Broadband Growth Challenges

Universal Access

- **CAPEX increases greatly for coverage of last 10%-20% of population**



Source : Analysys Mason

Impact of IoT

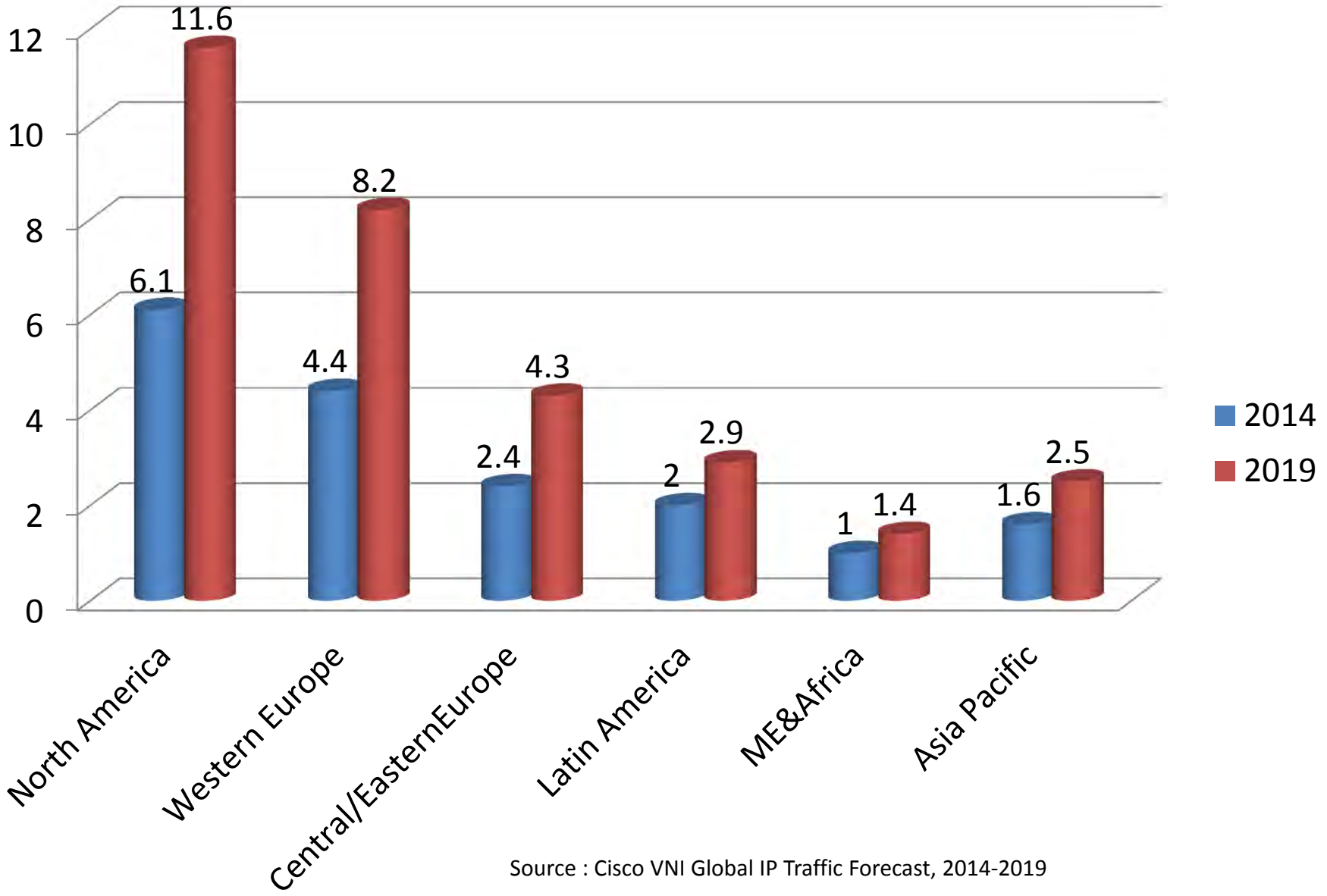
25 Billion Networked Devices by 2020

Additional Demand on Speed, Accessibility

Growth in IoT – New Form of Digital Divide

Greater Economic Growth With Greater Intensity of ICT Use

Impact of IOT



Source : Cisco VNI Global IP Traffic Forecast, 2014-2019

Broadband Commission Goals - 2015

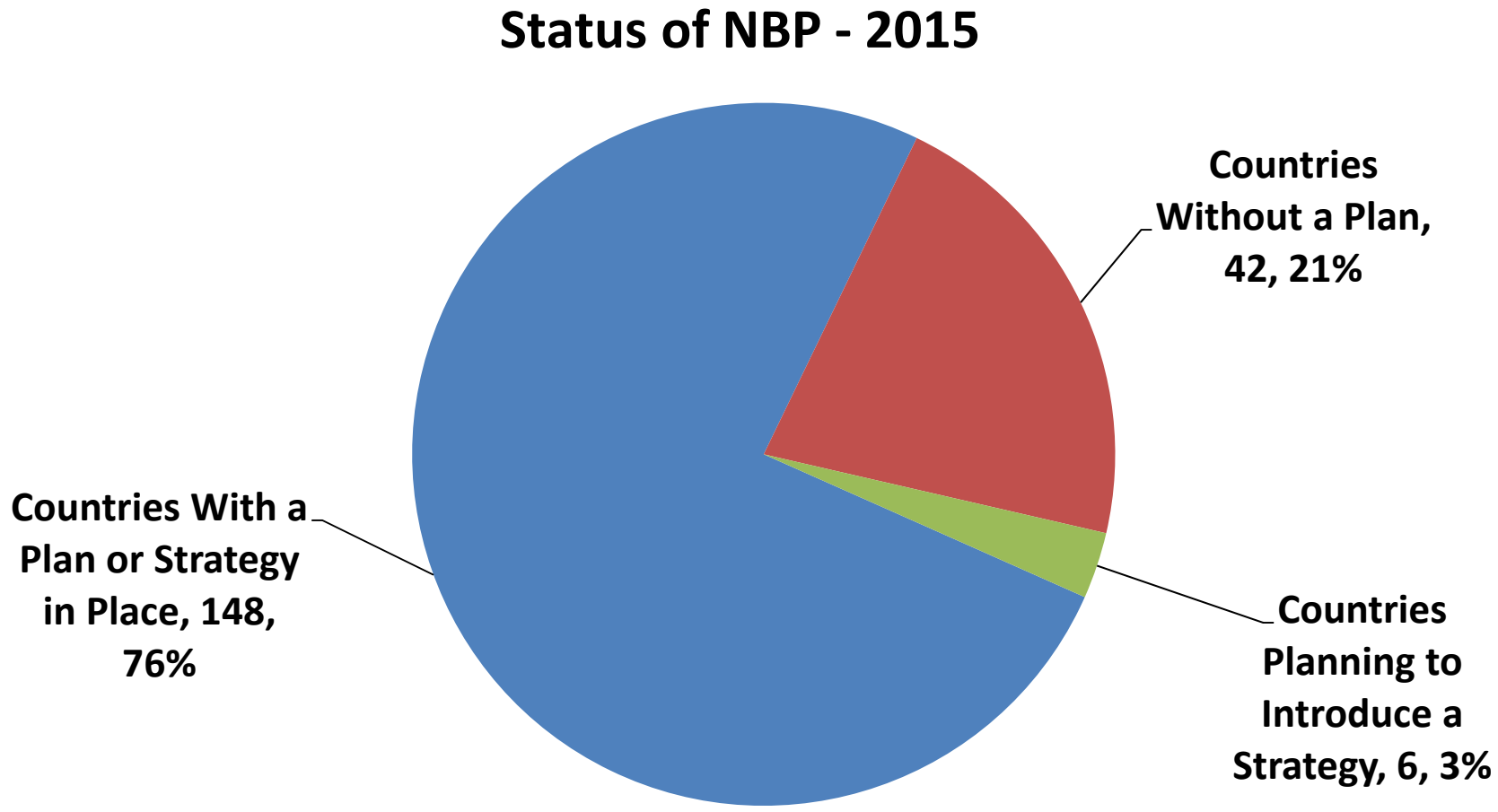
- BB Commission for Digital Development - 2010
- Set Targets to Promote Digital Inclusion
  - National Broadband Plan
  - Affordability
  - Connecting Homes to BB
  - Getting People Online
  - Gender Equality

BROADBAND COMMISSION FOR DIGITAL DEVELOPMENT

ITU

UNESCO

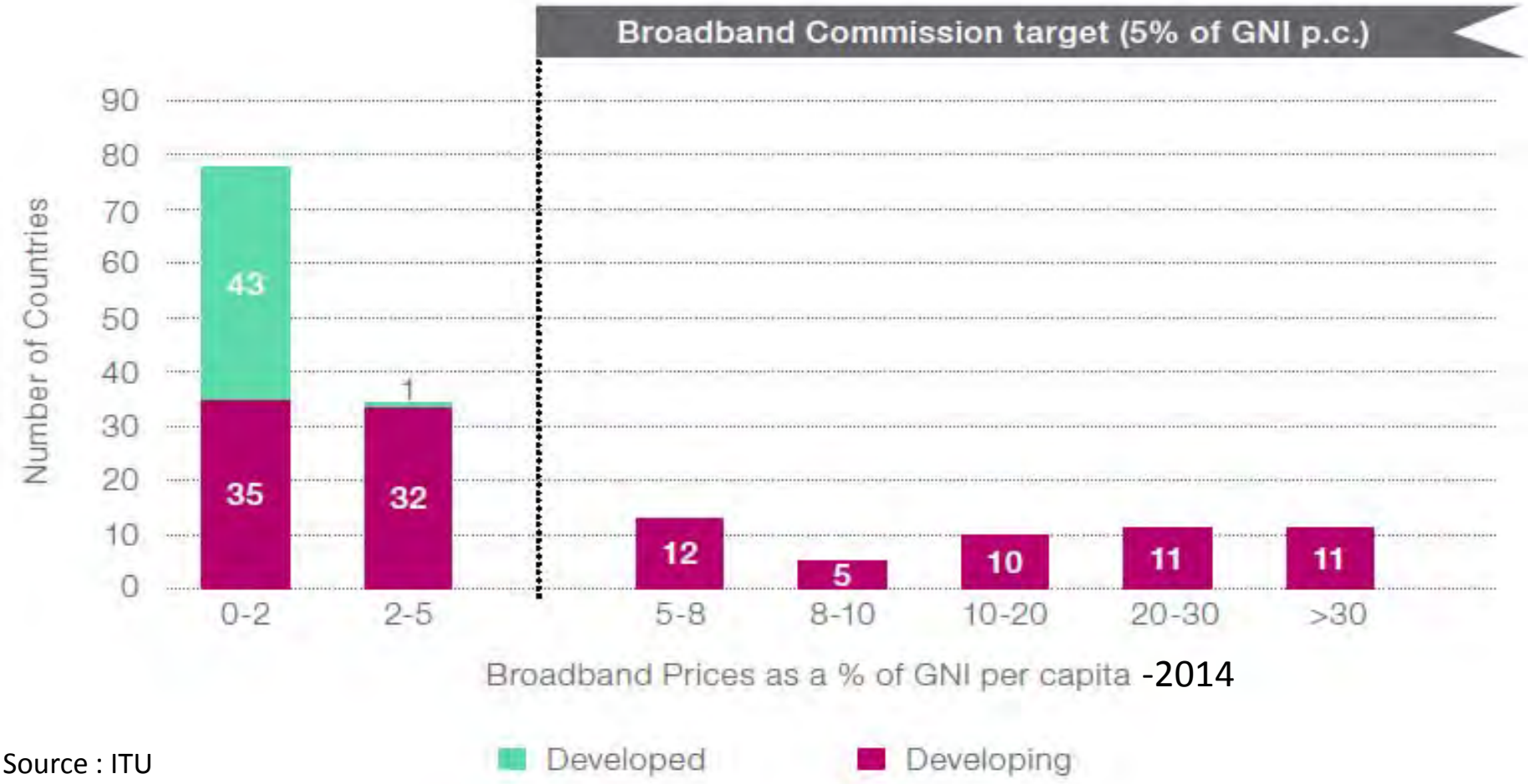
Target 1 : By 2015 All Countries to Have a National BB Plan



Source : ITU

By and Large the Goal Has Been Achieved

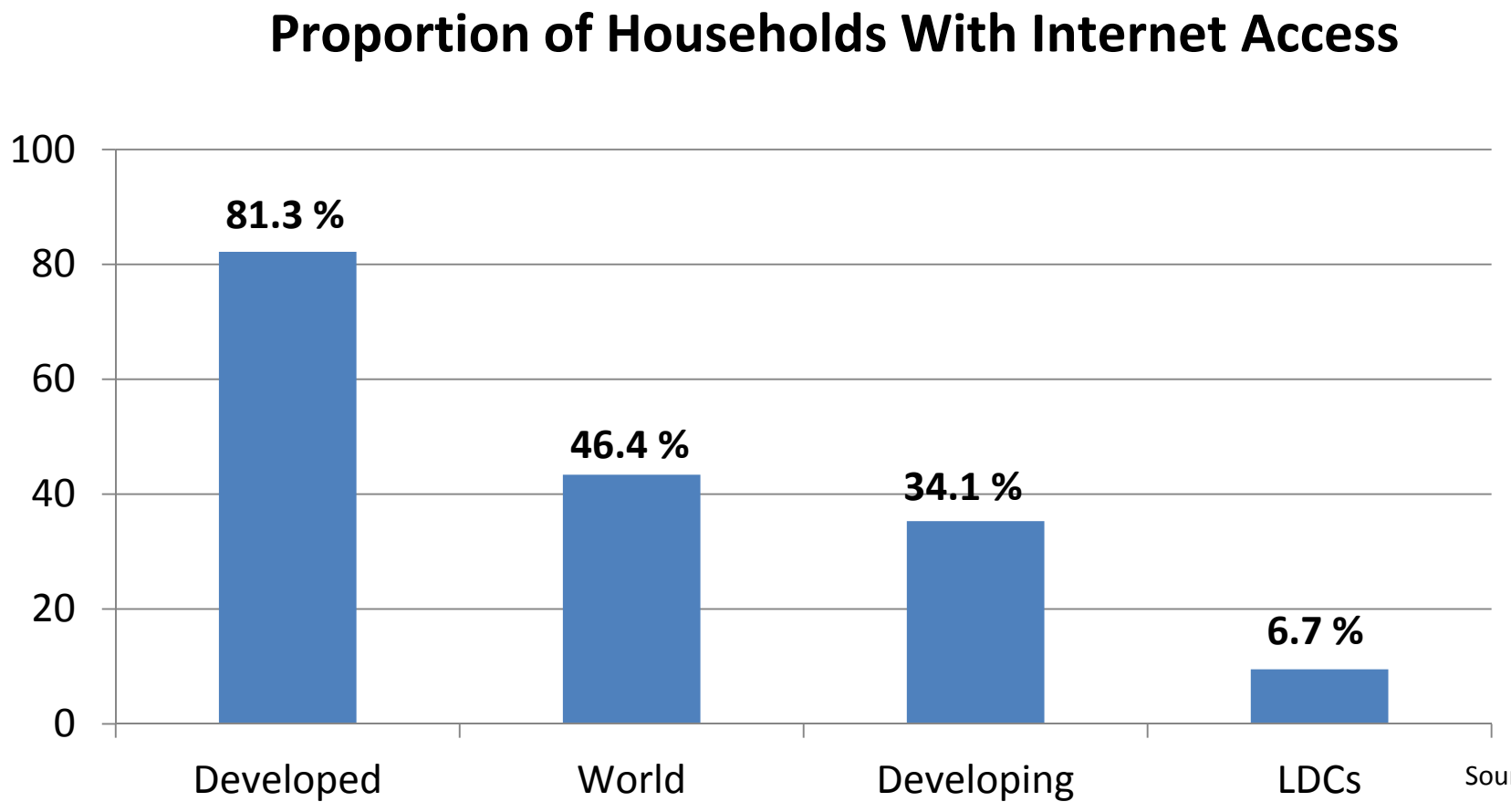
Target 2 : By 2015 Entry Level BB be Made Affordable in Developing Countries



Source : ITU

111 Countries With Affordable BB Services & 49 With More Than 5% of GNI p.c.

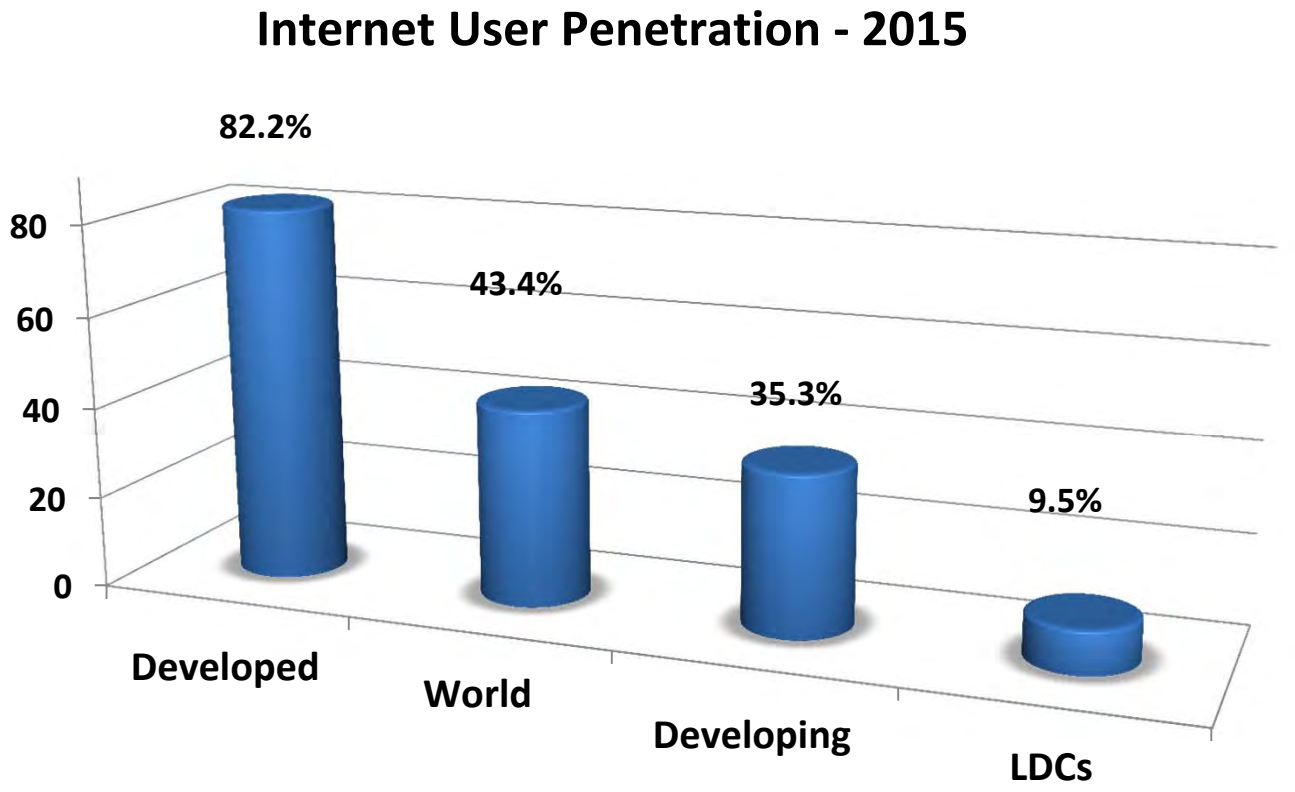
Target 3 : by 2015, 40% of Households in Developing Countries With Internet Access



Source : ITU

The Target is Expected to be Achieved by 2018

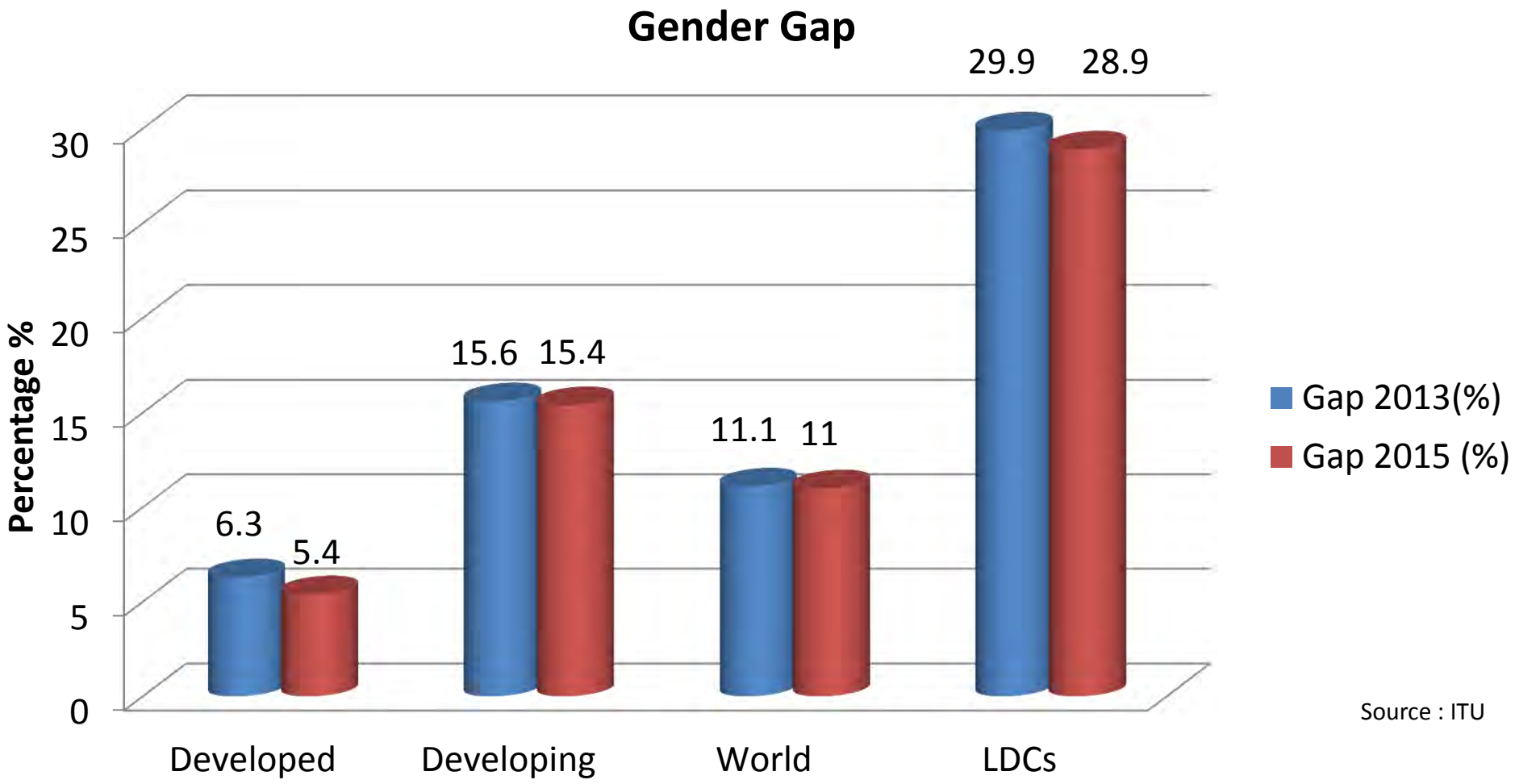
Target 4 : By 2015, Internet Penetration Should Reach 60% Worldwide, 50% in Developing Countries and 15% in LDCs



Source : ITU

The Target Failed by a Wide Margin. Unlikely to Be Achieved Until 2021

Target 5 : Achieve Gender Equality in Access to BB by 2020

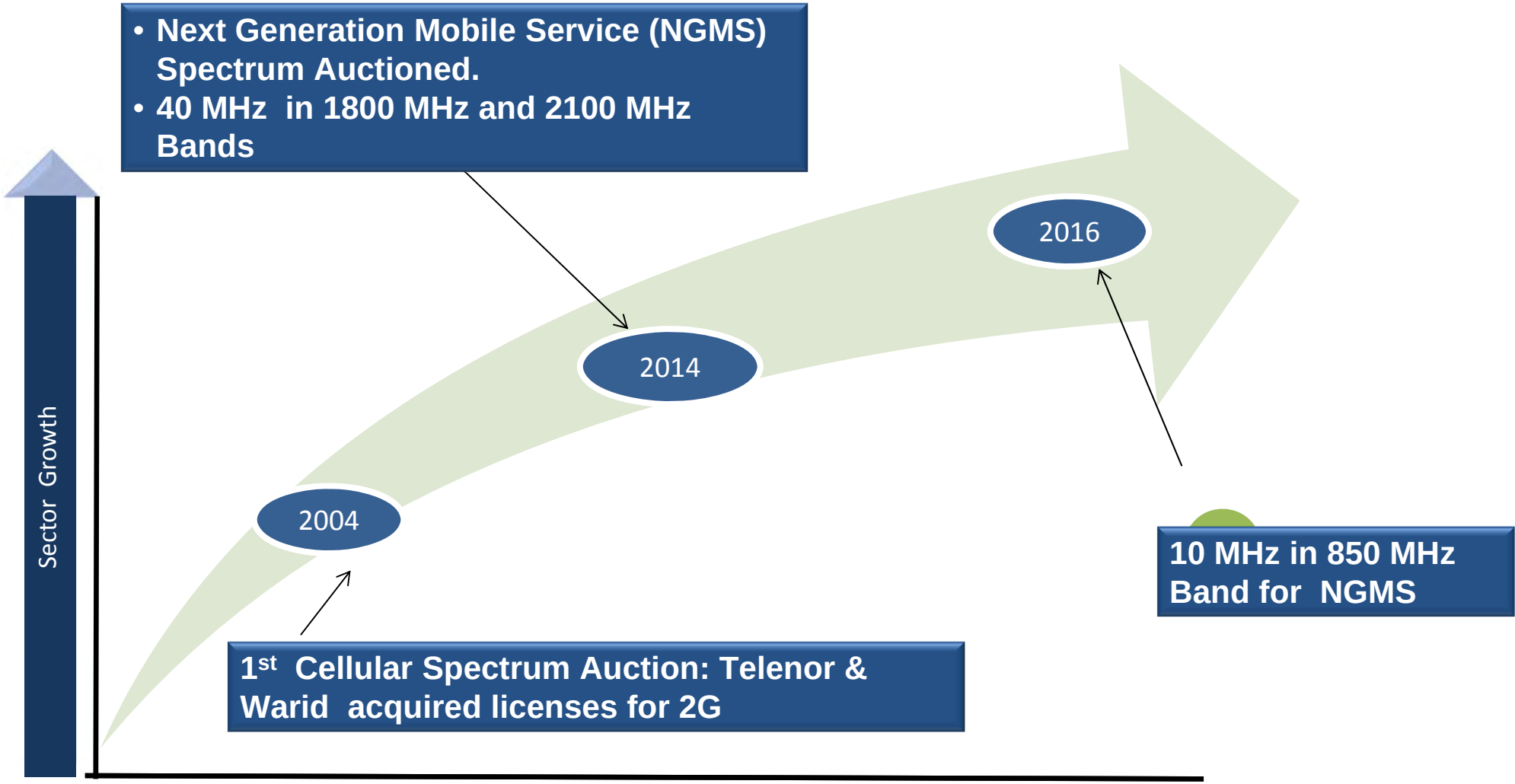


Source : ITU

Gap represents difference between Internet user penetration rate for male-female relative to Internet user penetration rate for males, expressed as a percentage. The gender Internet user gap in LDCs is twice as high as in developing countries

Broadband in Pakistan

History of MBB in Pakistan

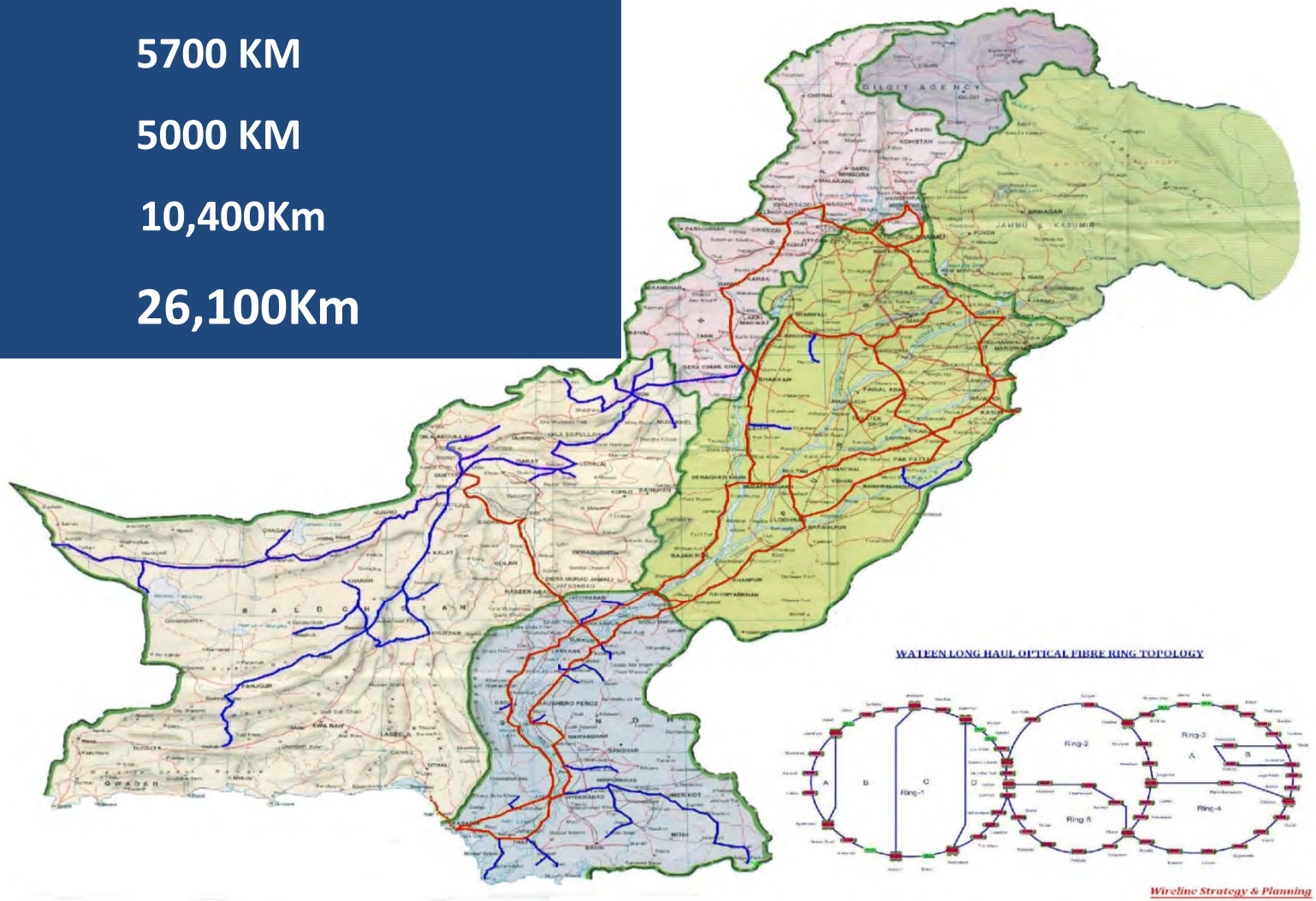


SOURCE: PTA Data

Fiber Deployment Nation wide

4 Operators have laid long haul fiber N/Ws across the country covering most of the cities

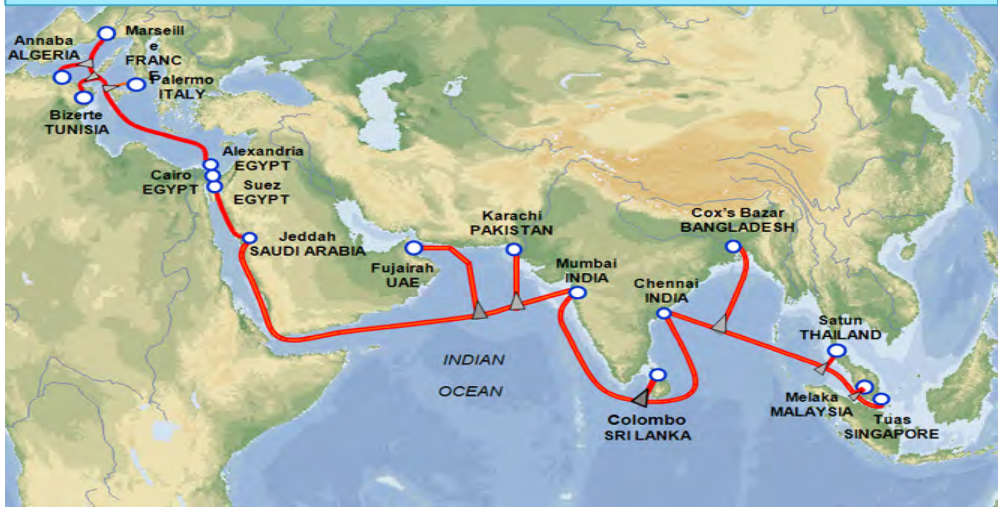
Link Direct	-	5000 KM
Wateen	-	5700 KM
Multinet	-	5000 KM
PTCL	-	10,400Km
Total	**-**	**26,100Km**



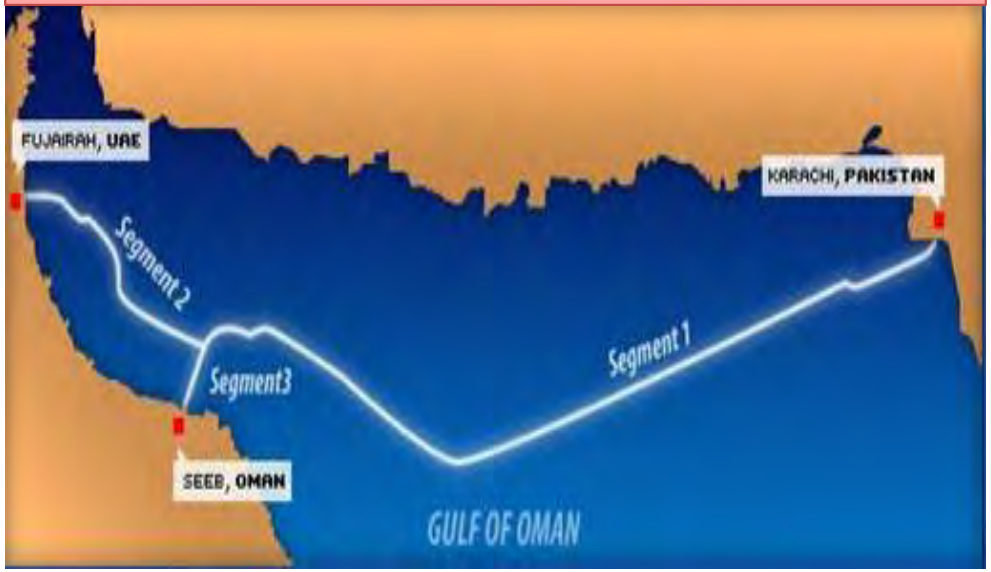
Current International Connectivity

SEA-ME-WE 3

SEA-ME-WE 4



TW-1



I-ME-WE

Future International Connectivity

SEA-ME-WE 5

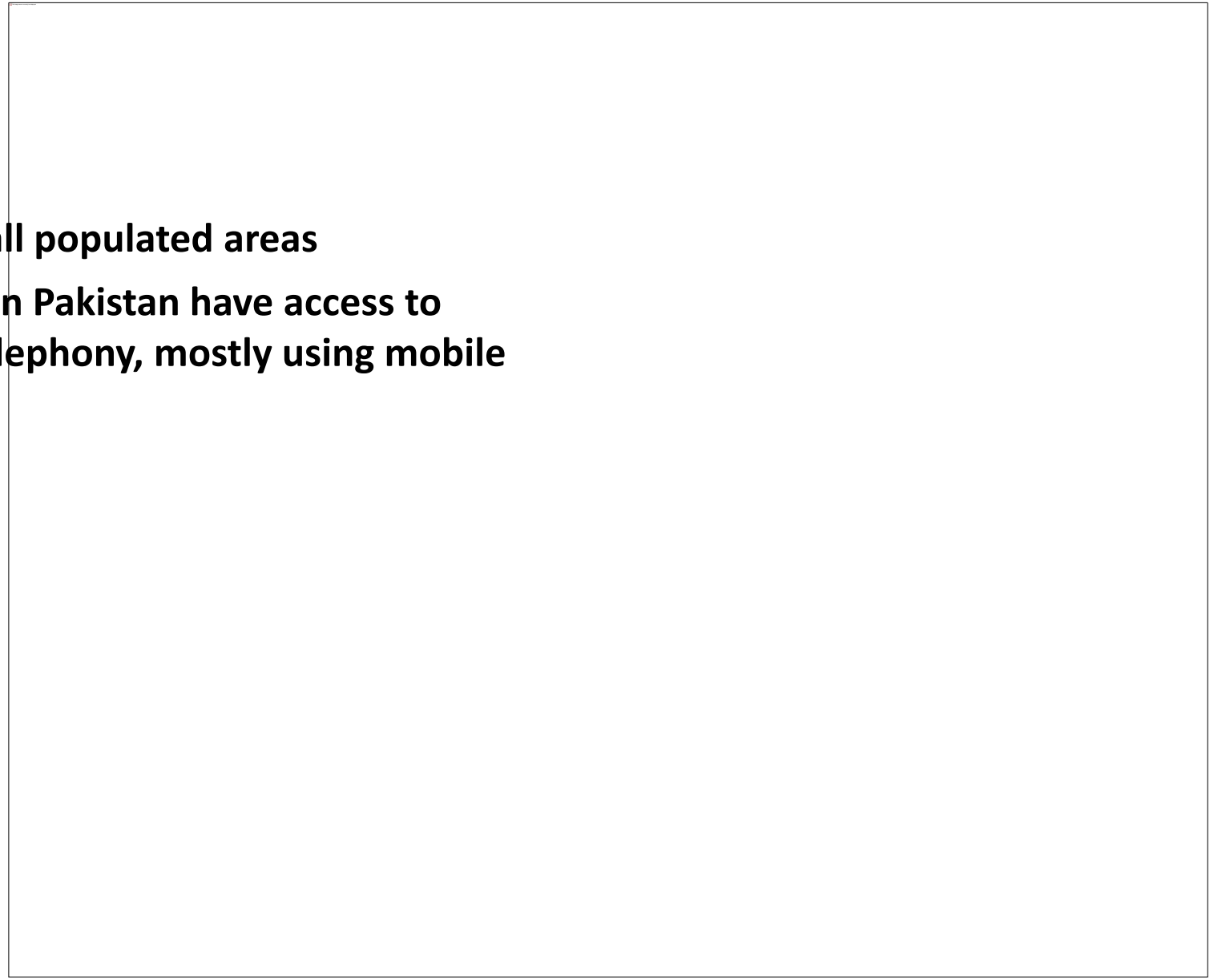
AAE -1

SRG-1

Future International Connectivity

Cellular Coverage(2G)

- Coverage in all populated areas
- Most people in Pakistan have access to basic voice telephony, mostly using mobile phones



Cellular Coverage(3G & 4G)

- **Out of 4 phases for n/w roll out ,**
  2 phases have been completed.

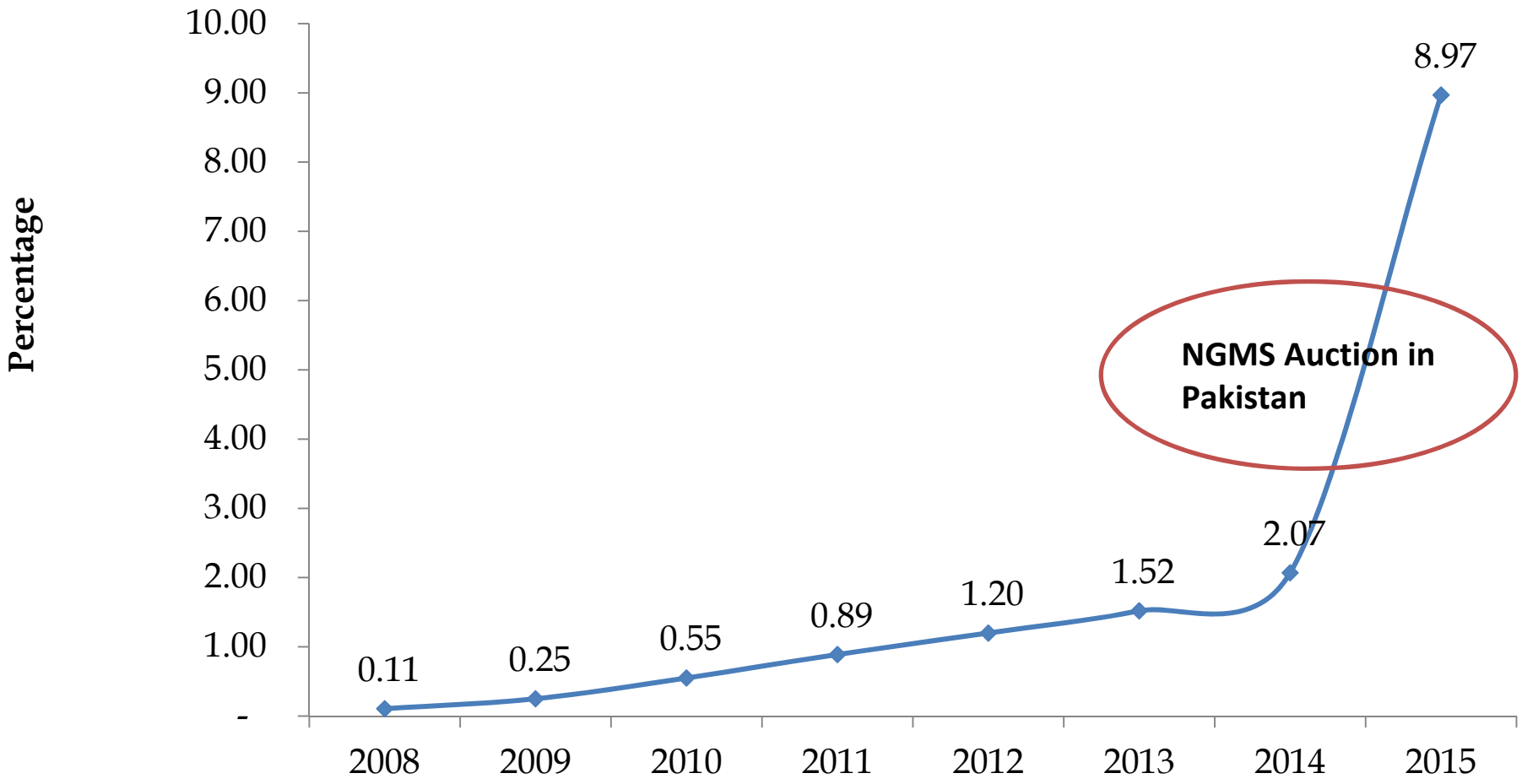
Role of USF in BB Proliferation

USF BB Program	
No of Towns with BB Facility	399
No of Educational BB Centre	1328
No of Community BB Centre	356
N o of BB Connections	0.461 Million
Subsidy to BB Programs	9.5 Billion (PKR)

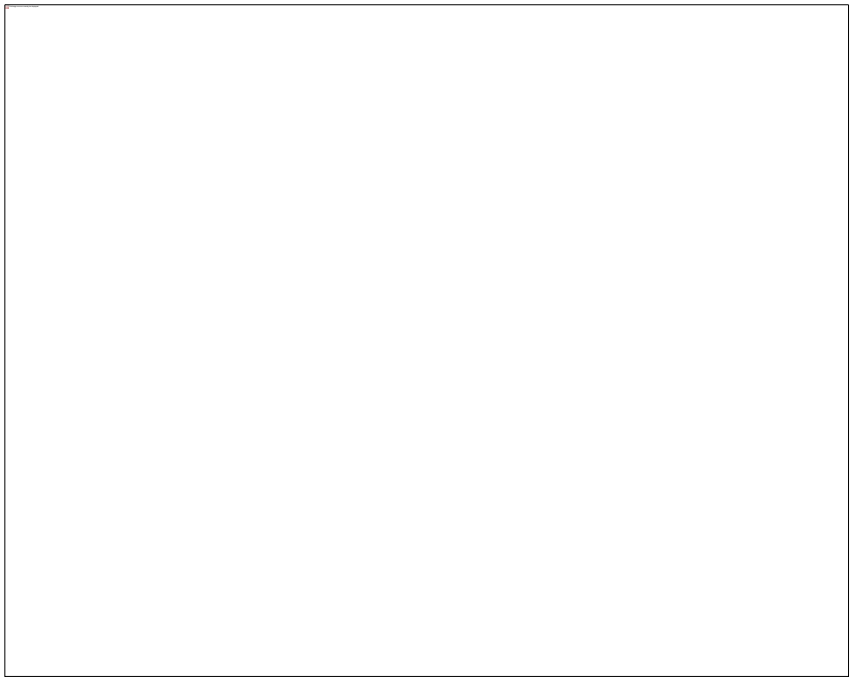
USF Optical Fiber Program	
No of Towns	82
Laid Optical Fiber length	5722 Km
Subsidy to BB Programs	6.4 billion (PKR)

Source: http://www.usf.org.pk/Projects.aspx

Broadband Penetration in Pakistan



Pakistan Ranked in Top 5 Mobile Subscription



Source- Ericsson Mobility Report June 2016

Telecommunication Policy 2015

Telecom Policy 2015

Vision

Universally available, affordable and quality telecommunication services provided through open, competitive and well managed markets and ubiquitously adopted to the benefit of the economy and society.

Policy Statement on Broadband

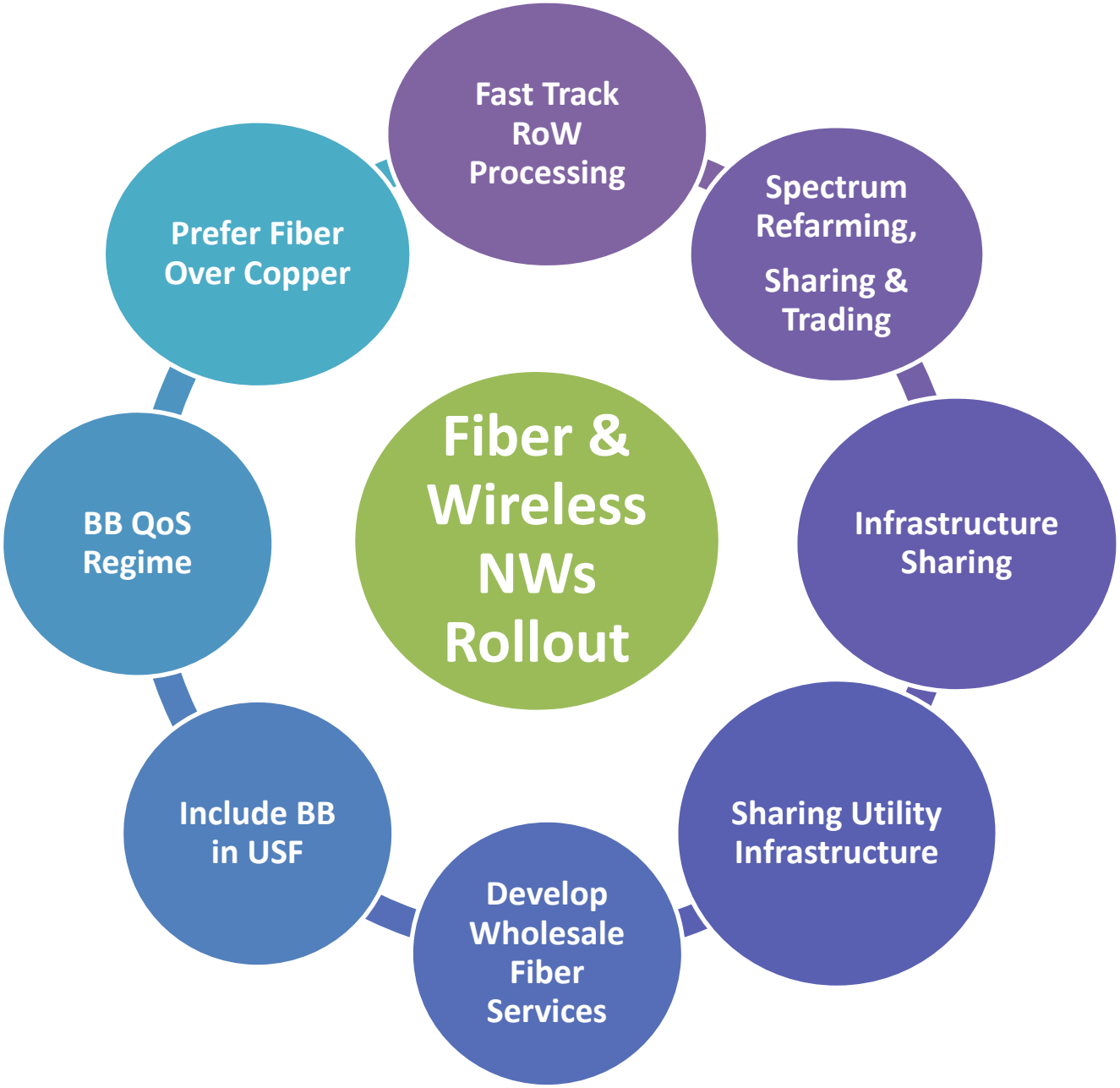
- **Widespread Availability of Affordable Broadband Services Provided Over Fixed and Mobile Networks With Characteristics That Support Contemporary and New Digital Applications and Content**

Telecom Policy 2015

Policy Initiatives on Broadband

- Facilitate & Promote Fiber and Wireless NW Rollout
- Ensure Spectrum Availability
- Ensure Suitable Backhaul
- Competition in Retail Broadband
- Develop Regulatory Framework for VoIP
- Regulation for Provision of Hotspots
- Develop Broadband QoS Regime
- Facilitate Content Development

Facilitation of Fiber & Wireless NWs Rollout

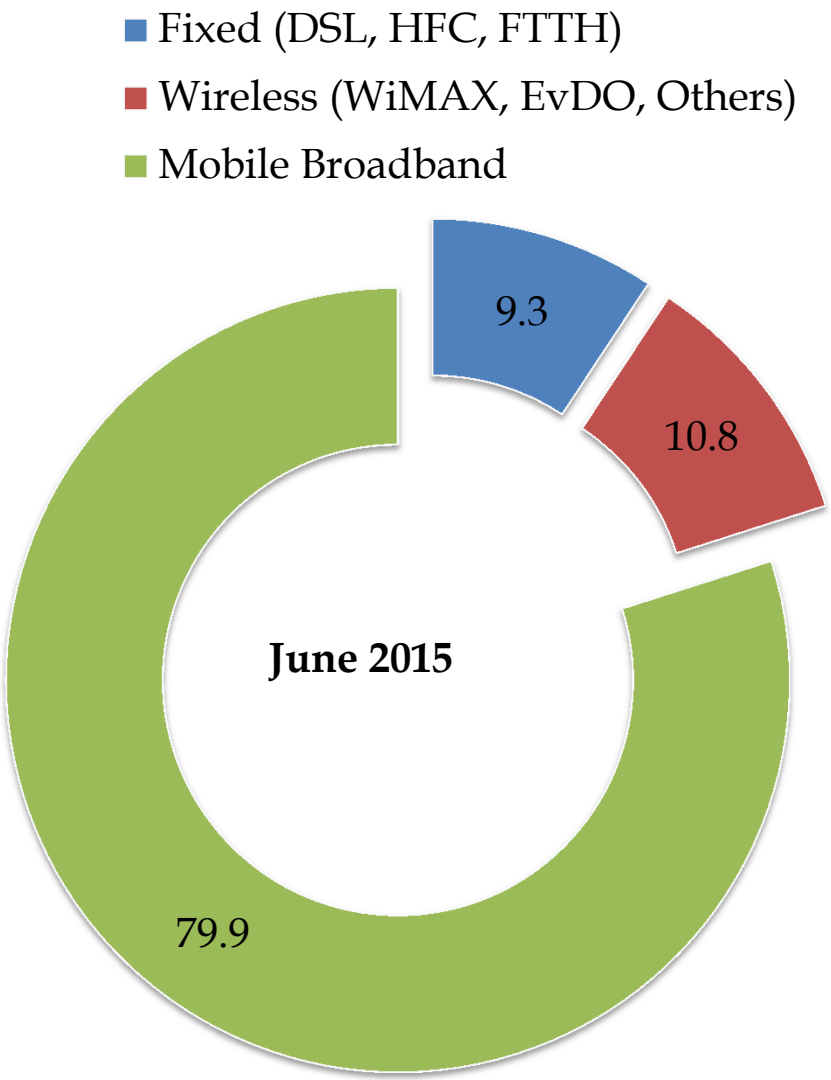


Future Frequency Assignment Roadmap

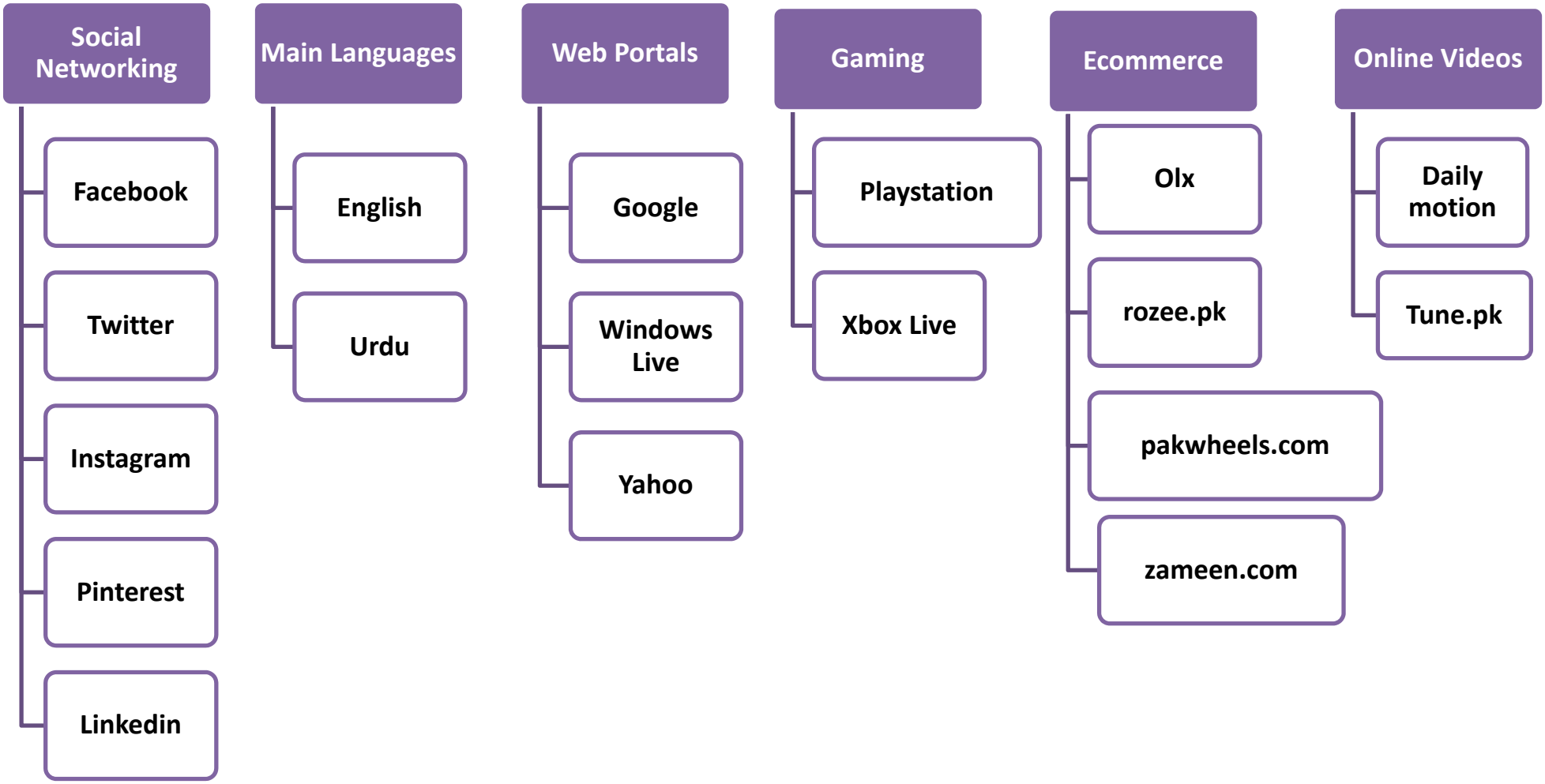
Frequency Band	Bandwidth (MHz)	Status
700 MHz	703-748 /758-803	Under Refarming
850 MHz	824-834/869-879	Assigned for NGMS in June 2016
1800 MHz	1775-1785 /1870-1880	Available
2100 MHz	1950-1980 /2140-2170	10 MHz available, rest is under Refarming
2300 MHz	2300-2400	Under Refarming
2600 MHz	2500-2570/2620-2690	Under Refarming

THANKS

Deployed Broadband Technology Trends



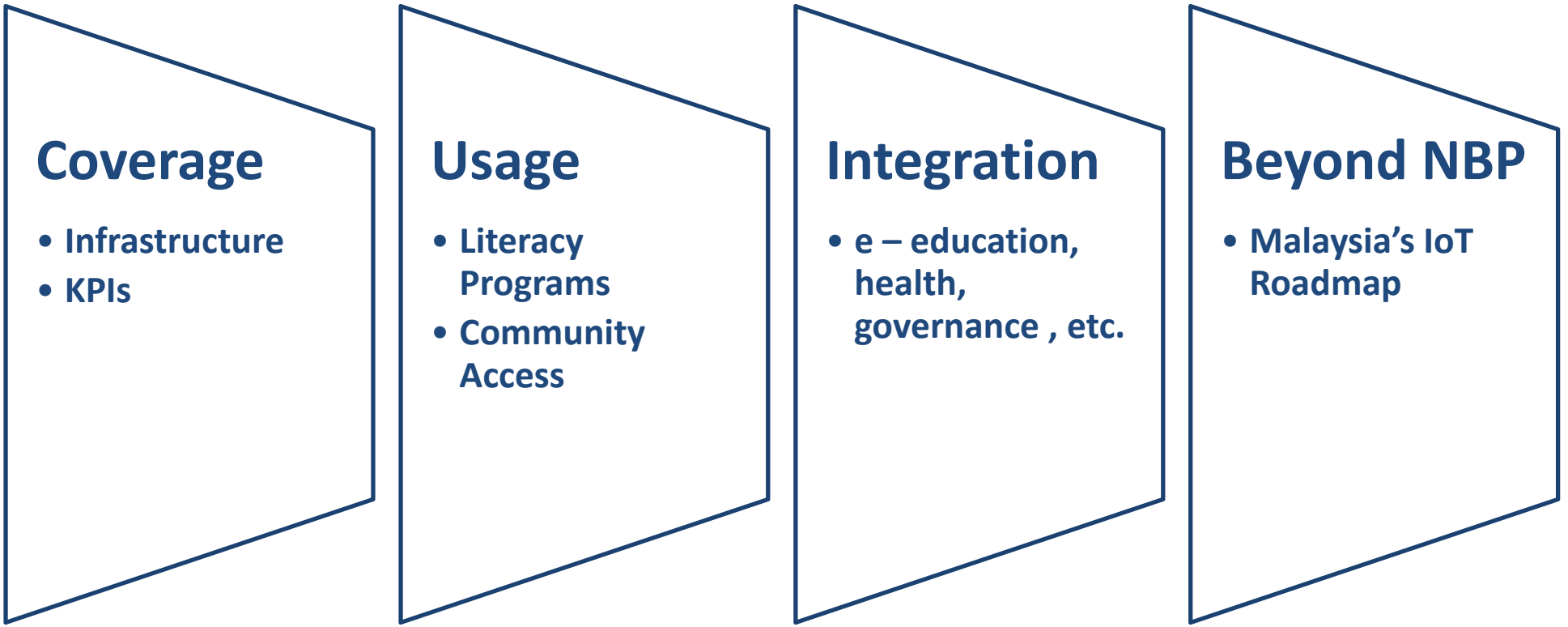
Internet Usage Trend in Pakistan



Broadband Commission Goals - 2015

National Broadband Plan - by 2015 All Countries to Have a National BB Plan

Phases of a NBP



Broadband Growth Challenges

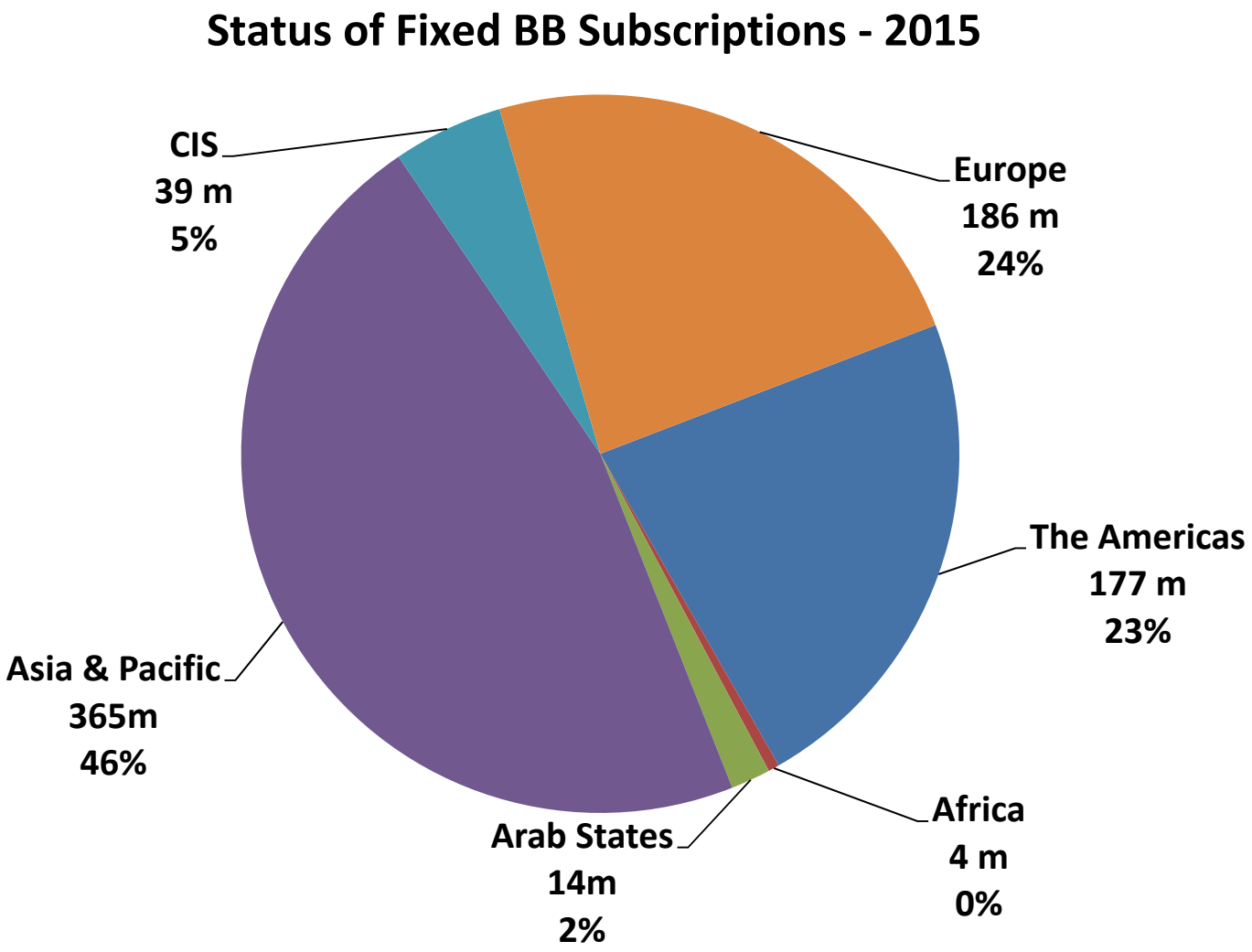
Universal Access

- **Universal Service Funds**

USF Funds With Funding Options for BB - 2013

Source : ITU – UNESCO Report 2015

Fixed BB Growth



Source : ITU

–920 Million Subscribers by 2019

–Sustained Growth Expected in Fixed BB

Policy Measures to Increase BB Access

Supply Side

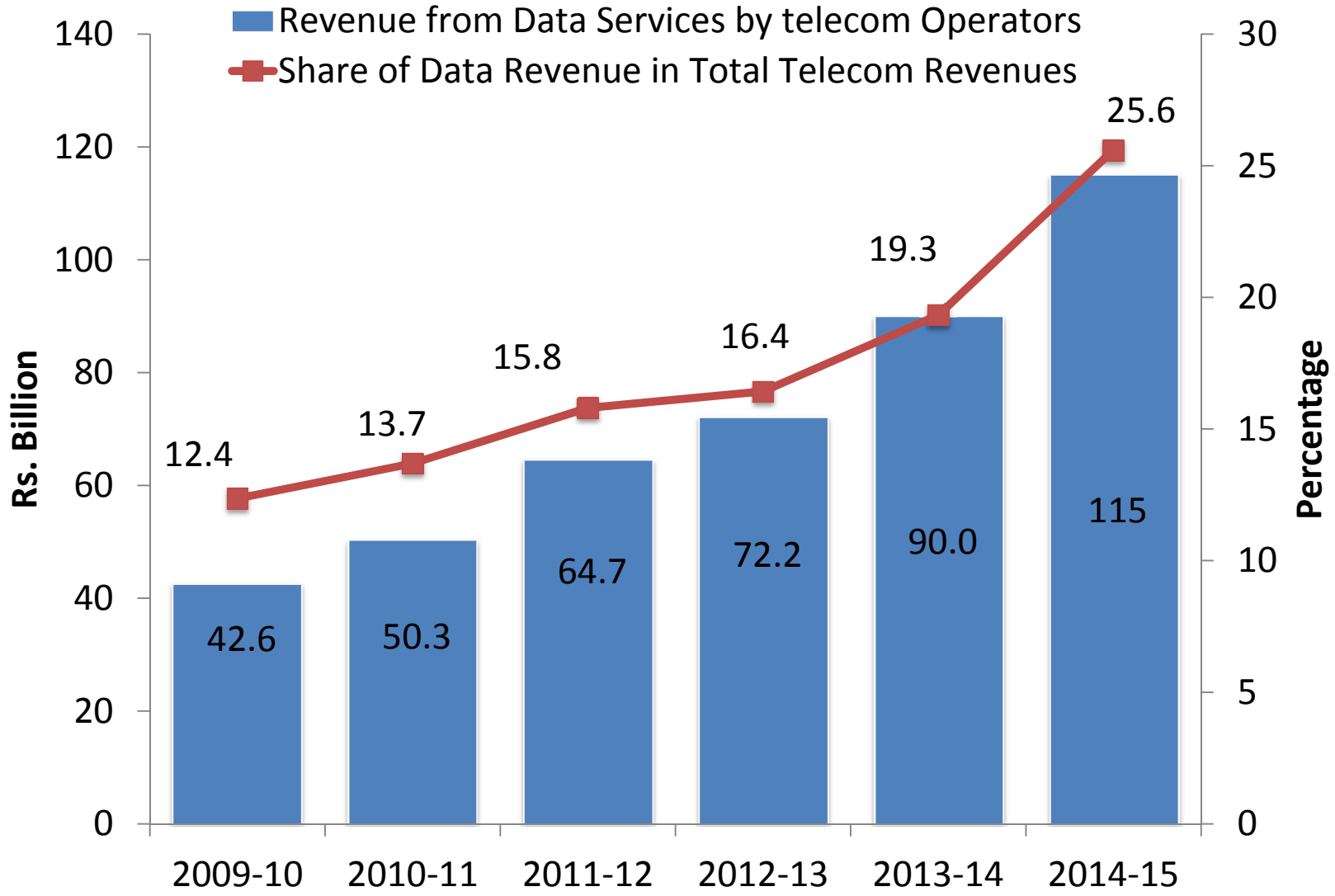
Review and update regulatory frameworks regularly	
Infrastructure sharing	• Amongst Telco's and non-Telcos like power lines
Ensure availability of clean spectrum to deploy mobile BB.	• Measures could include spectrum refarming, sharing and trading.
NW expansion through	• USFs, USOs instead of spectrum proceeds, • Reduction in taxes and import duties on telecom equipment and services.
Measures to make BB affordable through	• Effective whole sale and retail markets and formulation of effective technical standards.

Policy Measures to Increase BB Access

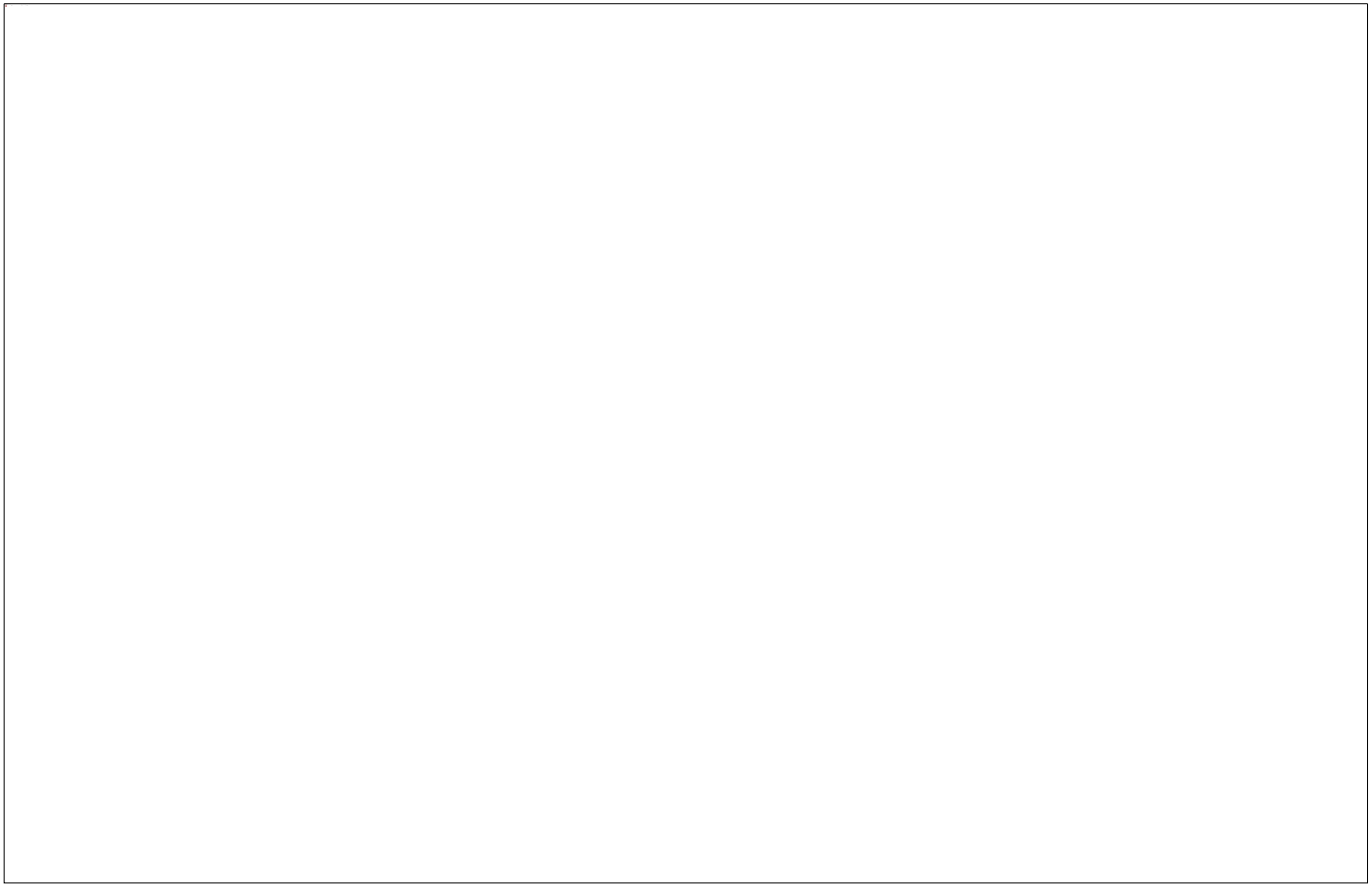
Demand Side

- Availability of Low Cost Devices
- Local Applications and Content in Local Languages.
- Create User Awareness of BB Availability & Market Prices
- Literacy and Training Programs
- Focus on women, Handicapped and Impoverished.

Telecom Data Revenue



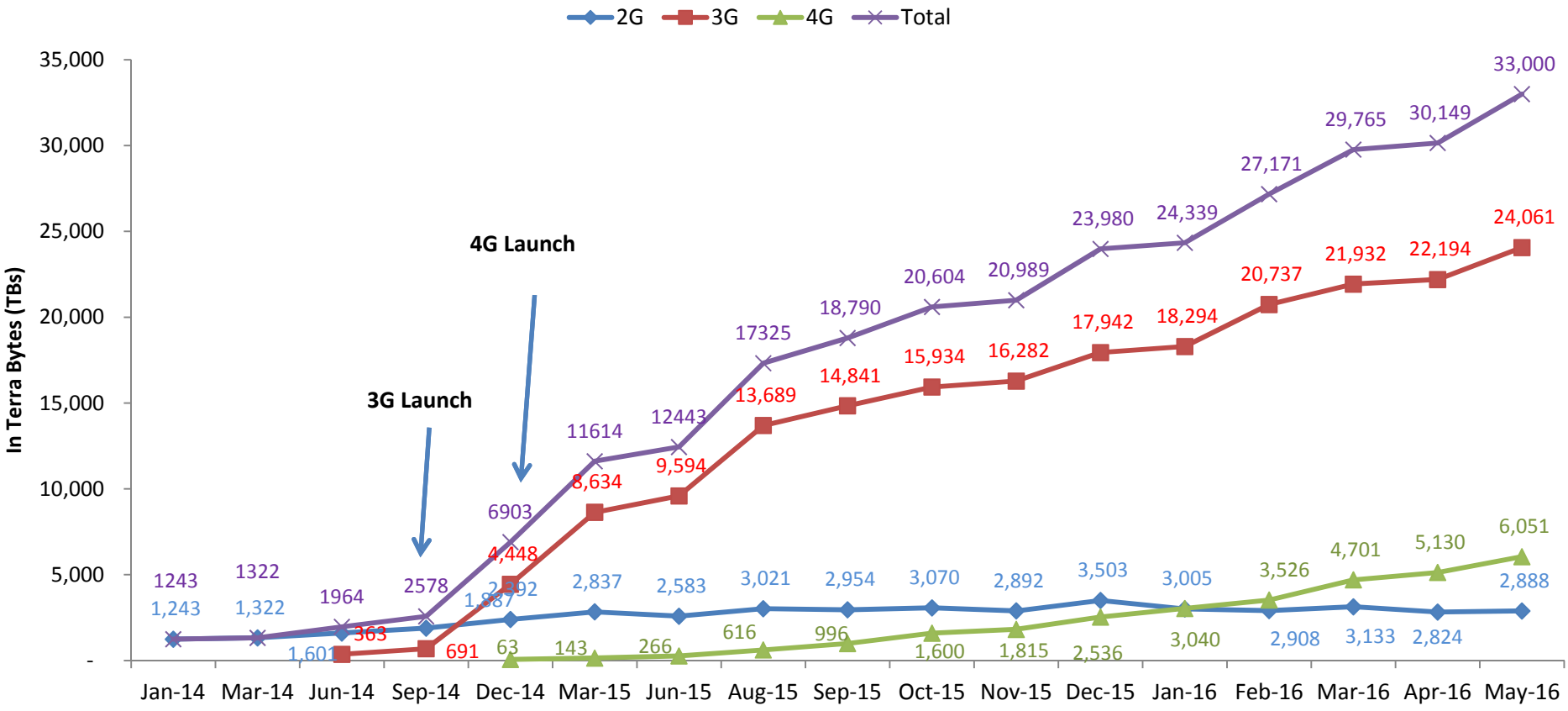
Fixed Wired BB Subscription/100 Inhabitants



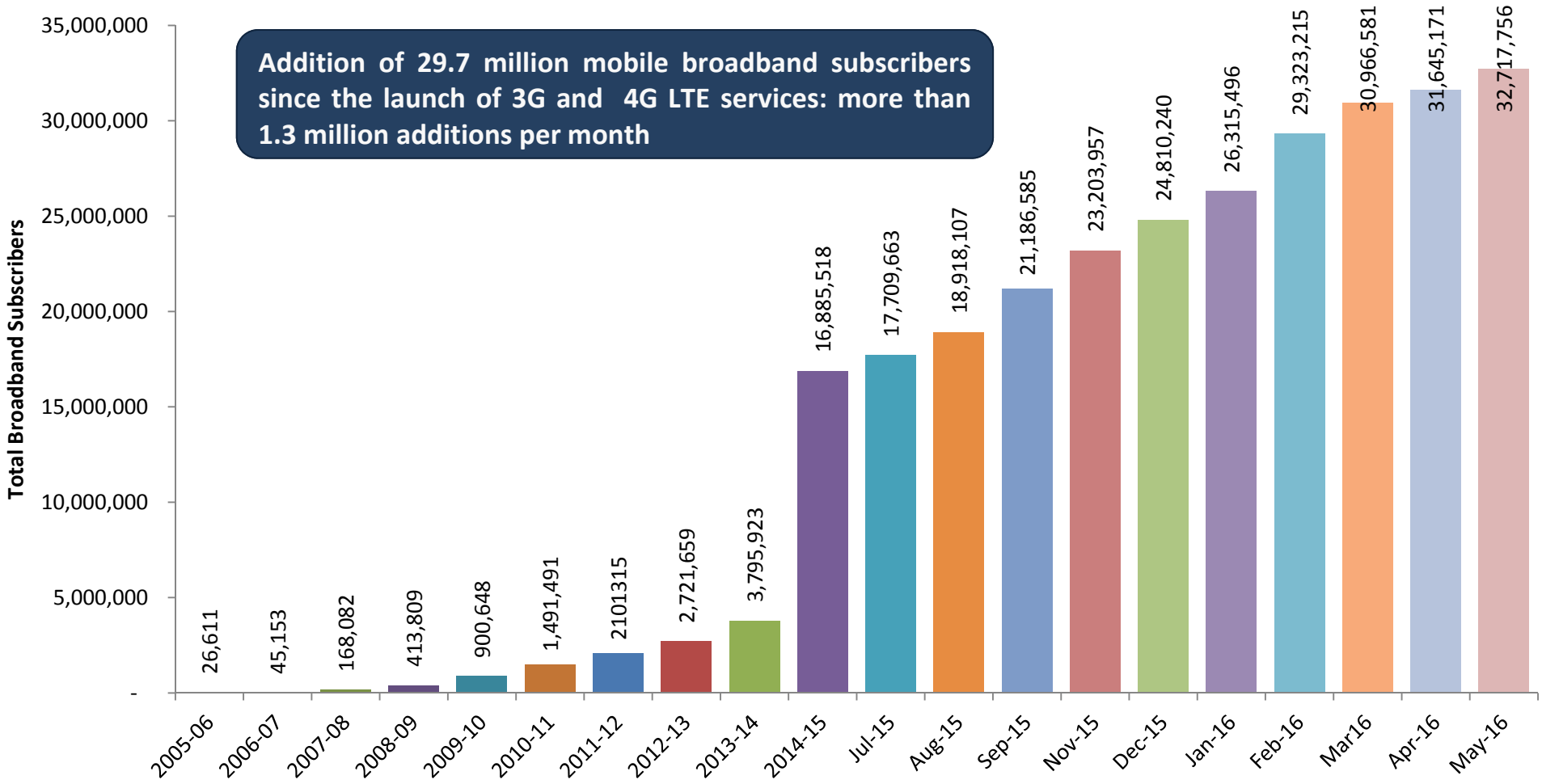
http://www.itu.int/net4/itu-d/icteye/

Extensive Data Usage on 3G Networks

	3G shares %	2G shares %
Voice	3%	87%
Data	97%	13%



Outstanding Growth in MBB After Auction

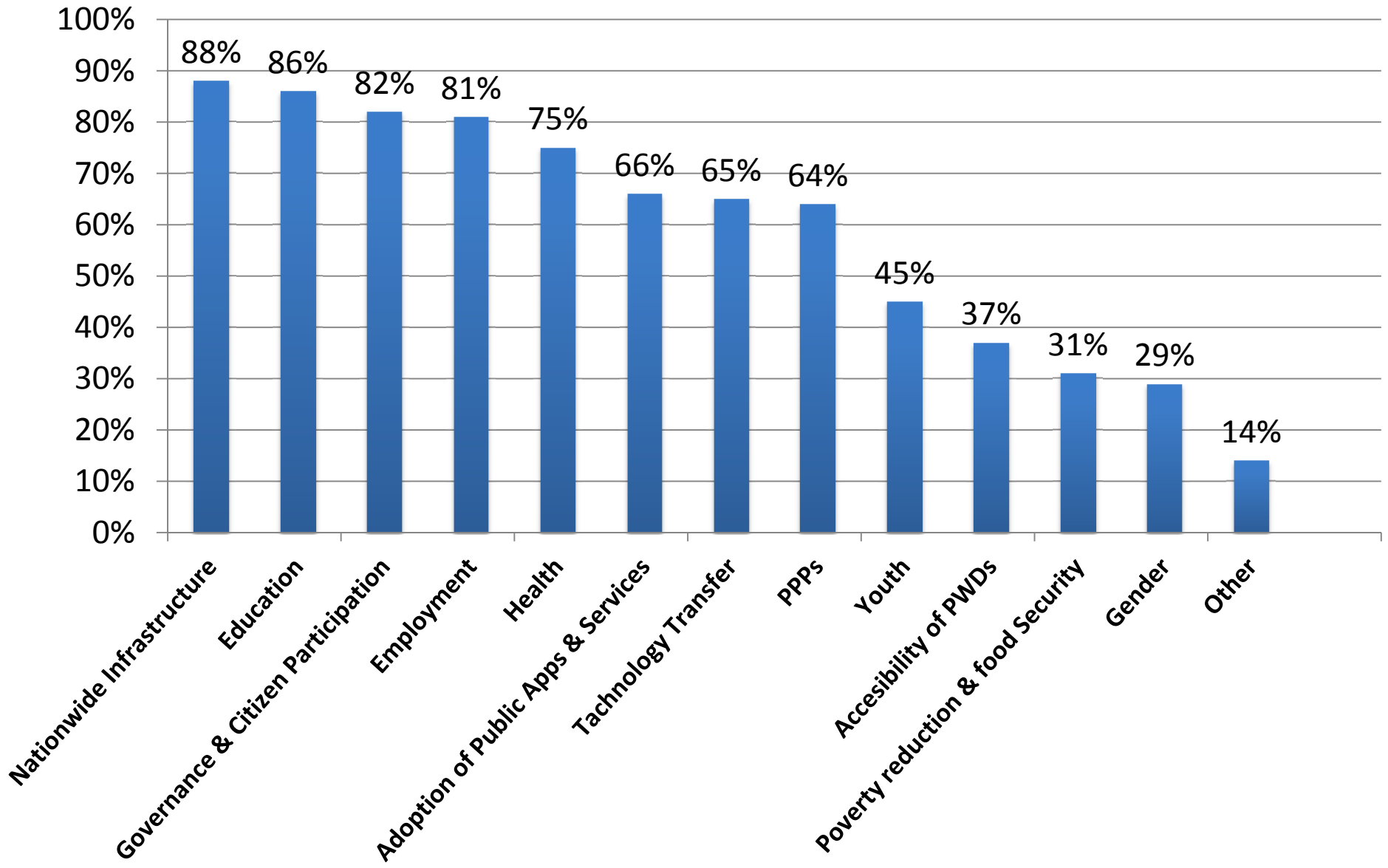


National Broadband Plan

Phase	1-Deployment	2-Adoption	3-Integration
Focus	BB network availability	BB Access & Capacity Building for effective use	BB integration in economy and society
Examples	Optical Fiber Cable & Wireless BB Access networks	Digital literacy programmes, Community access projects	e-health E-governance E-education E-commerce
Indicators	Telecom Indicators	Performance Indicators	Outcome/Impact measure

Source- The Status of Broadband 2015- ITU

Broadband Focal Issues

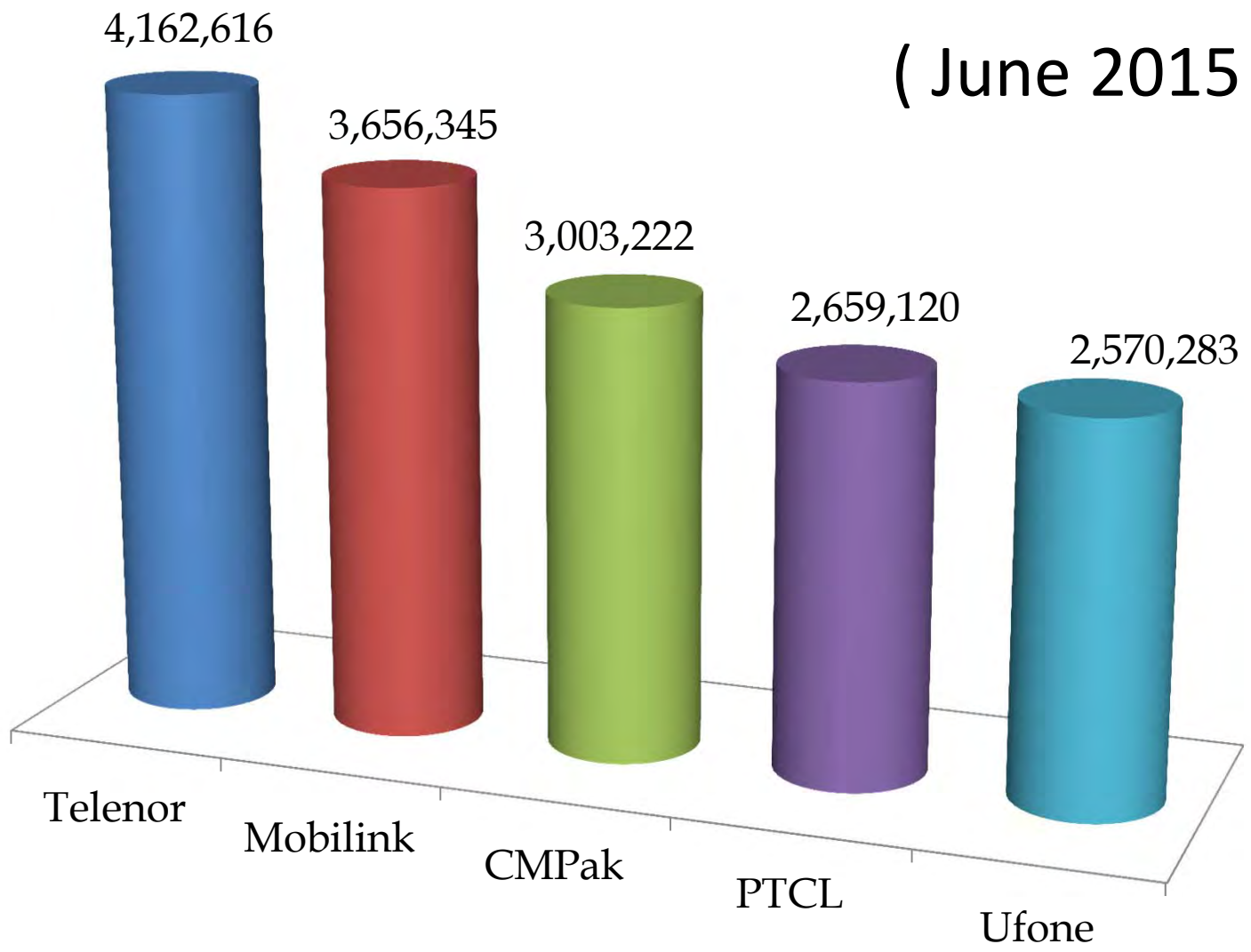


Source-.Planning for Progress-Why National BB Matters by ITU-Cisco July 2013

Pakistan Broadband Policy 2004

- Policy issued in 2004 by Federal Government
- BB defined as “Always on internet connection with a download speed of at least 128kbps connectivity.”
- Major policy objectives
  - Spreading of affordable, always on , bb high speed internet service across Pakistan.
  - Encourage entry and growth of new service providers.
  - Encourage private sector investment in local content generation and BB service provision
  - Class licenses will be issued for provision of BB using access platform of LL,LDI infrastructure
  - Encouraging the deployment of new technologies WiMAX, FTTH etc.

Broadband Subscribers – Top Five Operators



Pakistan Telecom Policy 2015

Vision

- Universally available, affordable and quality telecommunication services
- Open Competitive and Well managed markets
- Used by all
- Benefit to economy and Society

Guiding Principles

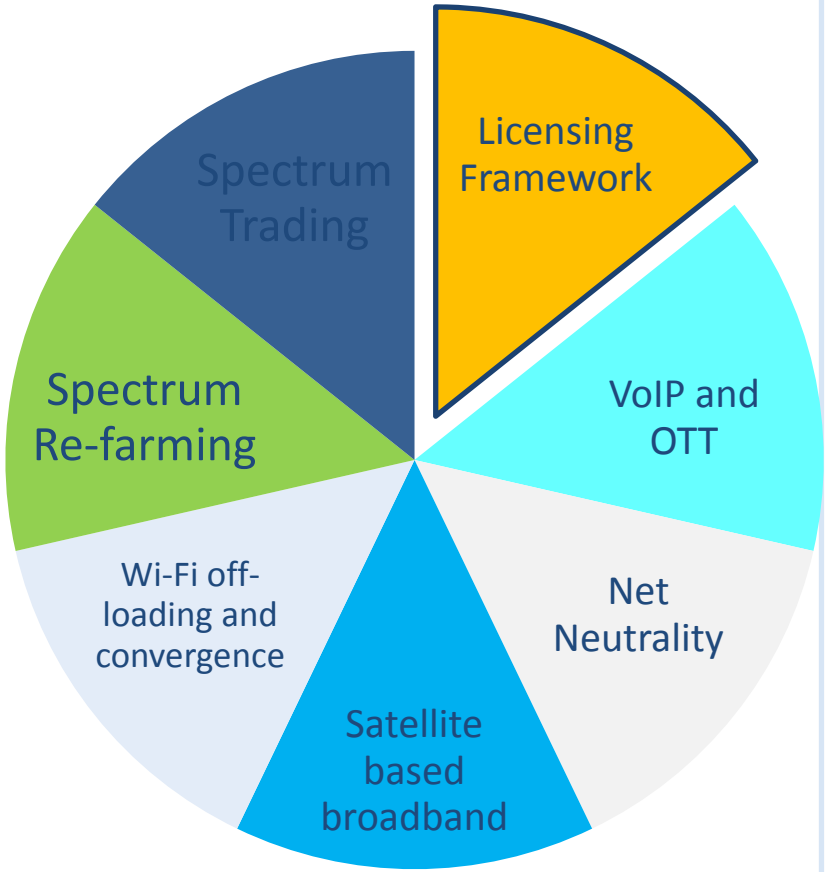
- Market Driven
- Appropriate Regulation
- Forward looking
- Accelerated Digitalization
- Universal Access
- Government Intervention Only When necessary

Telecom Policy 2015

Policy Goals

- Promote competition
- Ensure consumer welfare
- Encourage Innovation
- Promote Private sector investment
- Efficient allocation and management of Spectrum, Infrastructure and Right of ways
- Affordable broadband services for every Pakistani
- Maximize the use of Broadband in public sector especially Health Care, Education and Utilities

Areas of Focus



BB Growth Driver-IOT

Source- Ericsson Mobility Report June 2016

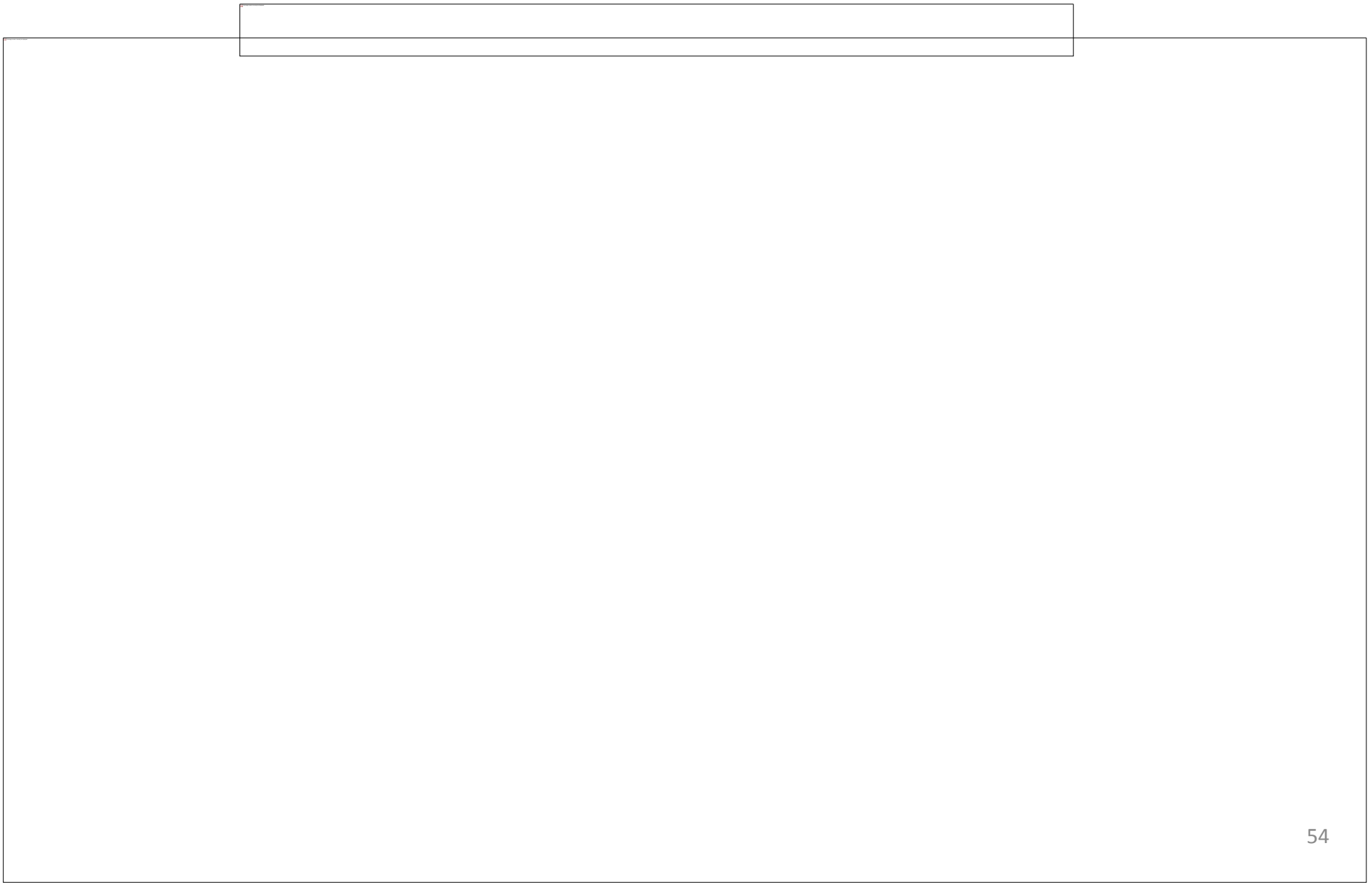
Fixed Vs Mobile Broadband Subscription growth

Source- Ericsson Mobility Report June 2016

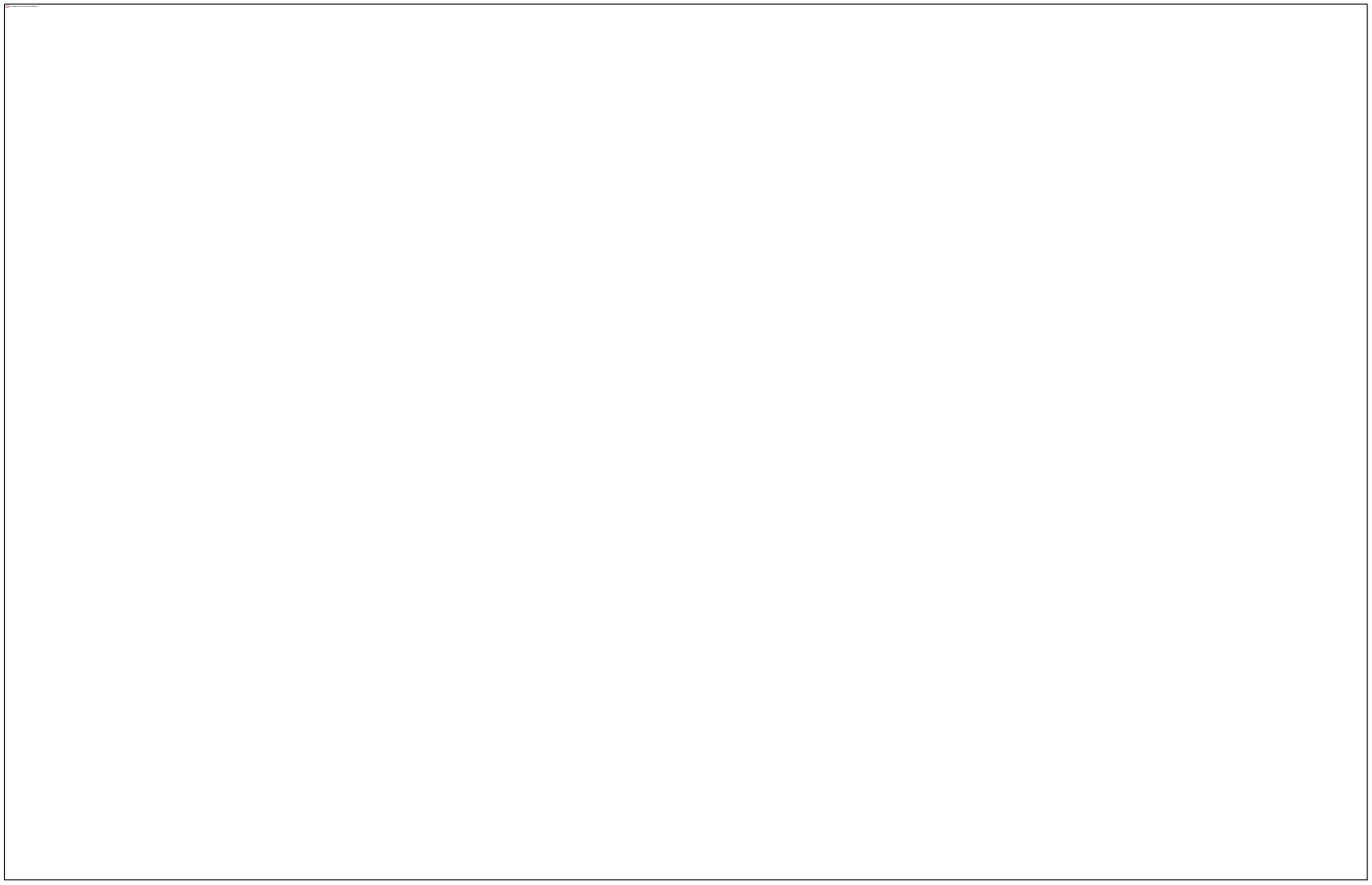
Driver of BB Data Demand

Source- ITU

Fixed Broadband Subscriptions



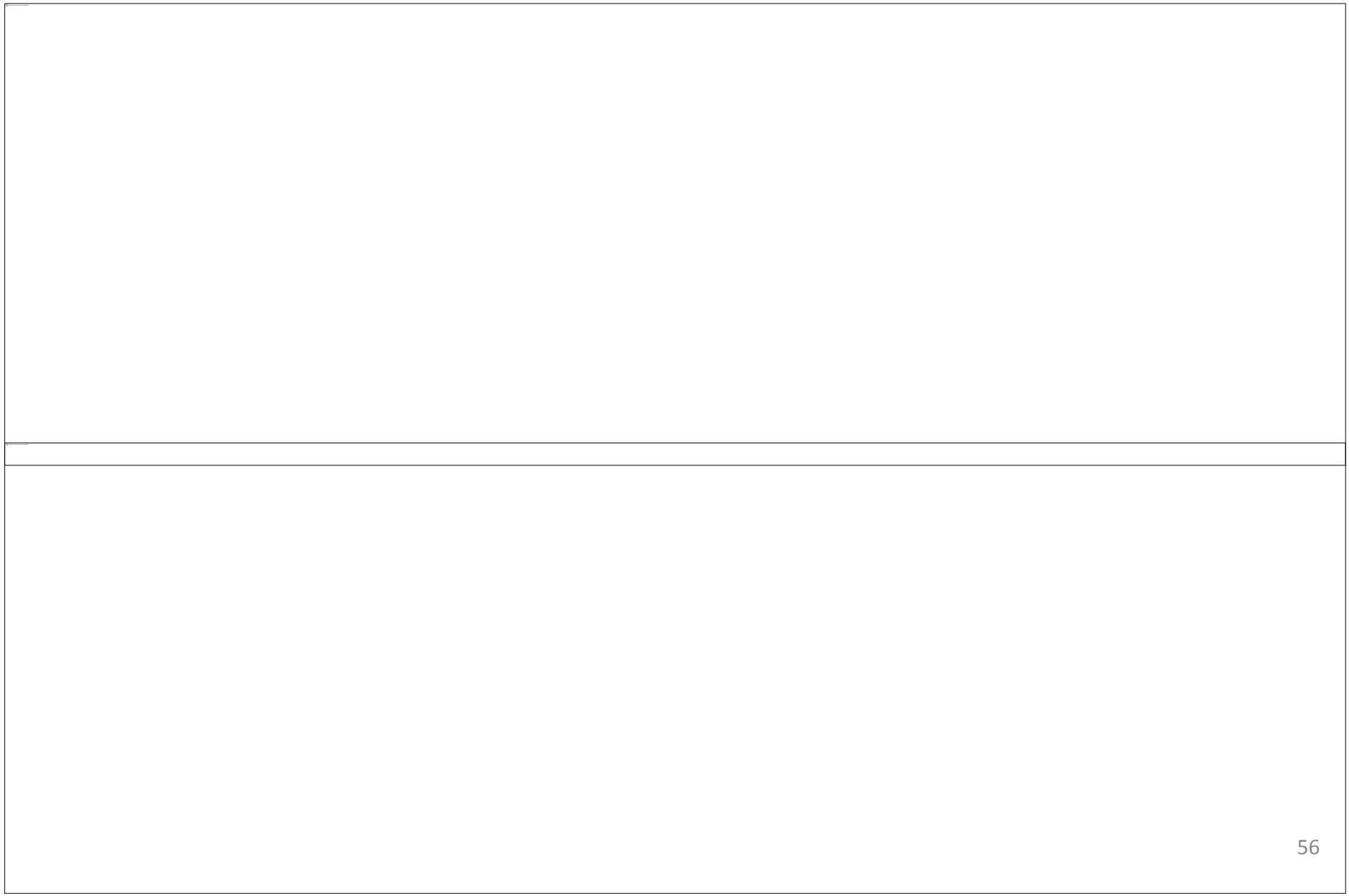
Tremendous growth in Mobile Broadband



The rapid expansion of Asia-Pacific is squeezing other regions in terms of regional market shares. For example, Europe and the Americas both saw declining proportional shares of mobile broadband subscribers from 2014 to 2015 despite absolute increases in the number of subscribers.

Source- The Status of Broadband 2015- ITU

Fixed Vs Mobile Broadband Subscription



What is Broadband

- Traditionally, broadband has often been defined in terms of data transmission speed (i.e., the amount of data that can be transmitted across a network connection in a given period of time, typically one second, also known as the data transfer rate or throughput).

- To address these limitations, some countries and international organizations (e.g., OECD) have decided not to categorize broadband in terms of speed, but are instead looking at broadband in terms of functionality—focusing on what can and cannot be done with a certain type of connection.

- In general

Broadband means a fixed-line and /or wireless connection that enables the delivery of voice, video, and data at high speed to any node with a similar connection, whether around the corner or around the world

Source- ITU- http://broadbandtoolkit.org/1.2

Broadband Technologies

- **Fixed BroadBand (FBB)**
  - **Digital Subscriber Line (DSL**) - Wireline transmission technology that transmits data faster over traditional copper telephone lines already installed to homes and businesses.
    - **Asymmetric DSL-** Provides faster speed in the downstream direction than the upstream direction for home users.
    - **Symmetric DSL-** typically provides significant bandwidth for both upstream and downstream e.g. video Conference.
  - **Cable Modem-** Provides broadband using the coaxial cables
  - **Fiber** - transmits data at speeds far exceeding current DSL or cable modem speeds, typically by tens or even hundreds of Mbps.
- **Mobile BroadBand (MBB)**
  - **Wireless LAN-** provide wireless broadband access over shorter distances to extend the reach of a "last-mile" Wireline or fixed wireless broadband connection within a home, building, or campus environment.
  - **Mobile Broadband-** Provide wireless broadband services using HSPA,CDMA,LTE, LTE-A
  - **Satellite-** provide wireless broadband in remote or sparsely populated areas using satellite.

Source- https://www.fcc.gov/general/types-broadband-connections

MBB – Wireless Technologies

Source- 3GPP Alliance, UMTS Forum, InformaTelecoms & Media, Motorola, ZTE, Huawei, internal analysis

THANKS