

# **BROADBAND COMMISSION**

FOR DIGITAL DEVELOPMENT

**ITU-D Study Groups**

**Geneva, Wednesday 17 September 2014**

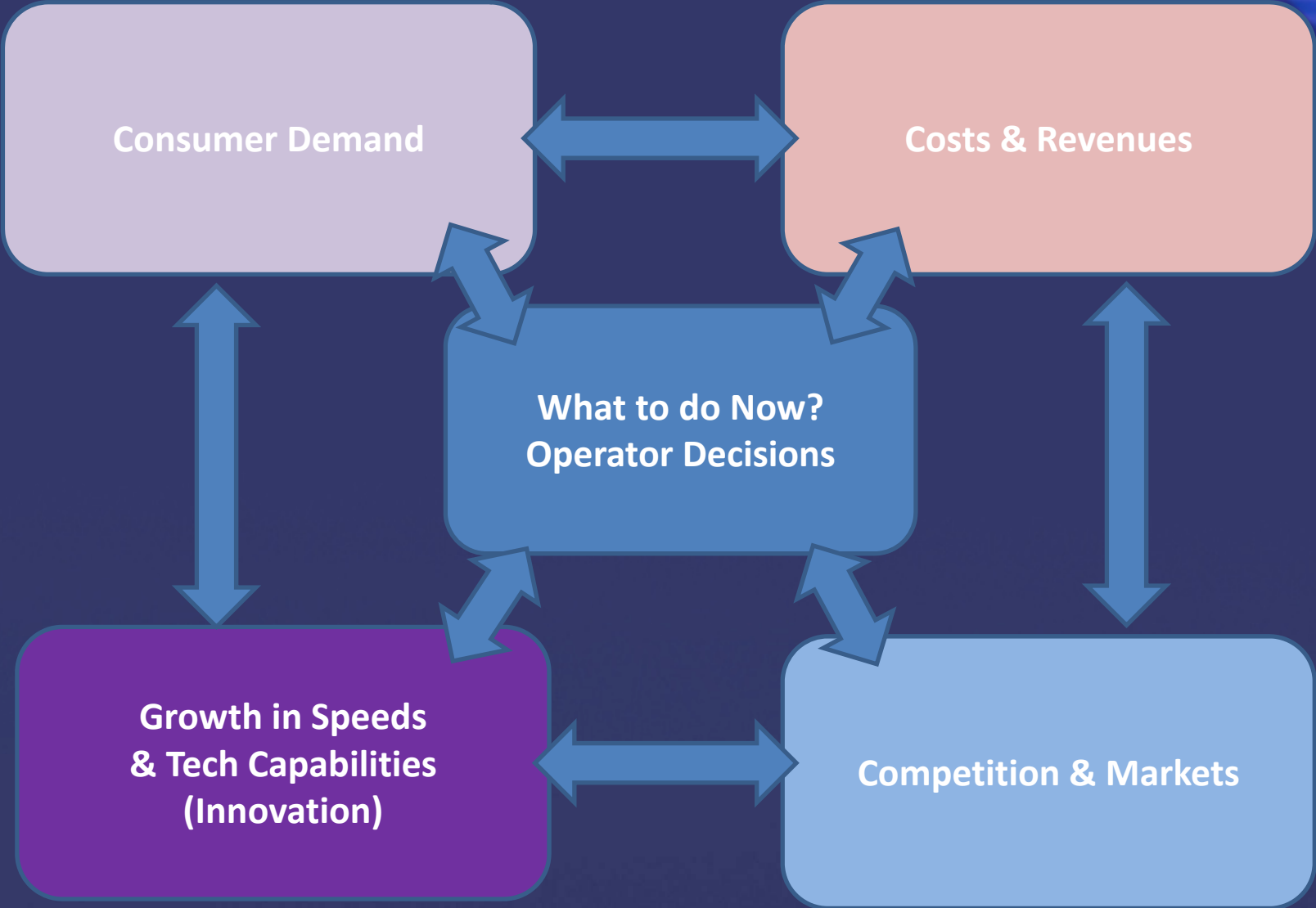
**The Changing Economics of Network Deployment:  
Playing Roulette with RoI**



# Agenda

1. Operator Decisions – getting more complex
2. Cost & Revenue bases – revenue displacement in a more competitive market
3. Growing Speed & Technological Capabilities – getting faster
4. Consumer Decisions

**BDT Study Groups**





# Operator Decisions

# 1. Operator Objectives

## SURVIVAL:

- Make money / compete / build market share;
- Reach more customers with higher speeds;
- Innovate:
  - Leverage existing installed base/infrastructure;
  - Offer new & premium services;
  - Increase bandwidth and distance;
  - Increase their digital serving area.

# 1. Operator Decisions

A number of key factors influence operators' investment decisions, including:

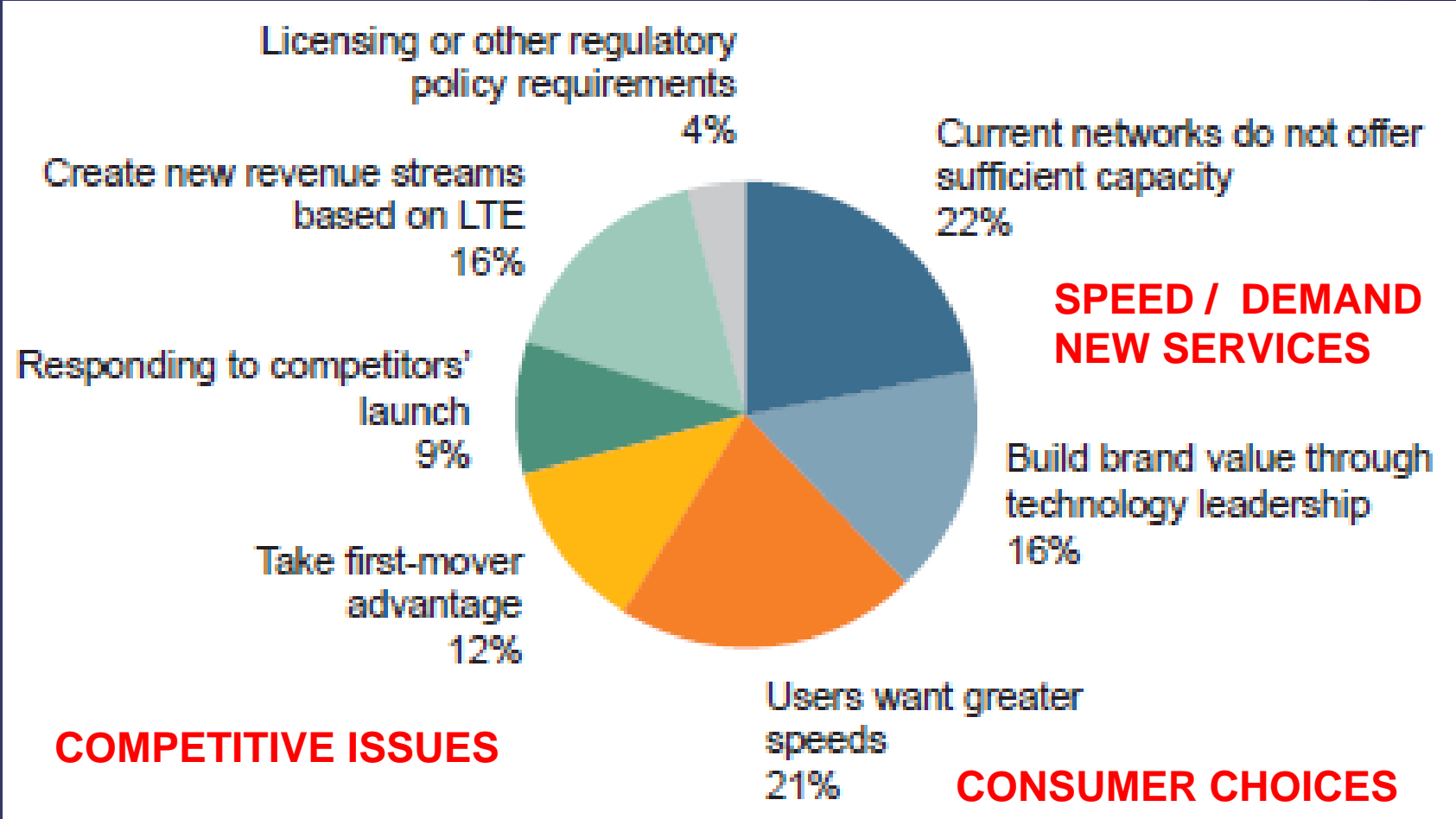
- Technological capabilities of new technologies.
- Age/availability of existing infrastructure (incl. civil)
- Population density (often referred to as urban, peri-urban and rural areas);
- User demand and service take-up;
- Industry structure – competitors & regulation;
- Likely profits (RoI) & levels of ARPU, affecting funding & resources available.

# 1. Operator Decisions

Operator decisions are becoming more complex:

- Number of competing technologies (in particular, mobile v. fixed, DOCSIS 3.0);
- Growing number of competitors, including from other industries.
- OTT players – changing revenue streams;
- New and more varied services – voice, data, TV;
- Increased rate of technological obsolescence.

# Why are Mobile Operators Deploying LTE?



- Informa LTE Survey, 2014.



# A Word About Definitions/Categories

“Fixed”

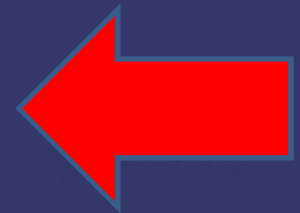
Backbone/FTTN

Access

WiFi

Backbone

CONSUMERS



“Mobile”

Backbone

Access



OPERATORS +  
MORE NUANCED ANALYSIS



# BDT Work Mapping the Backbone



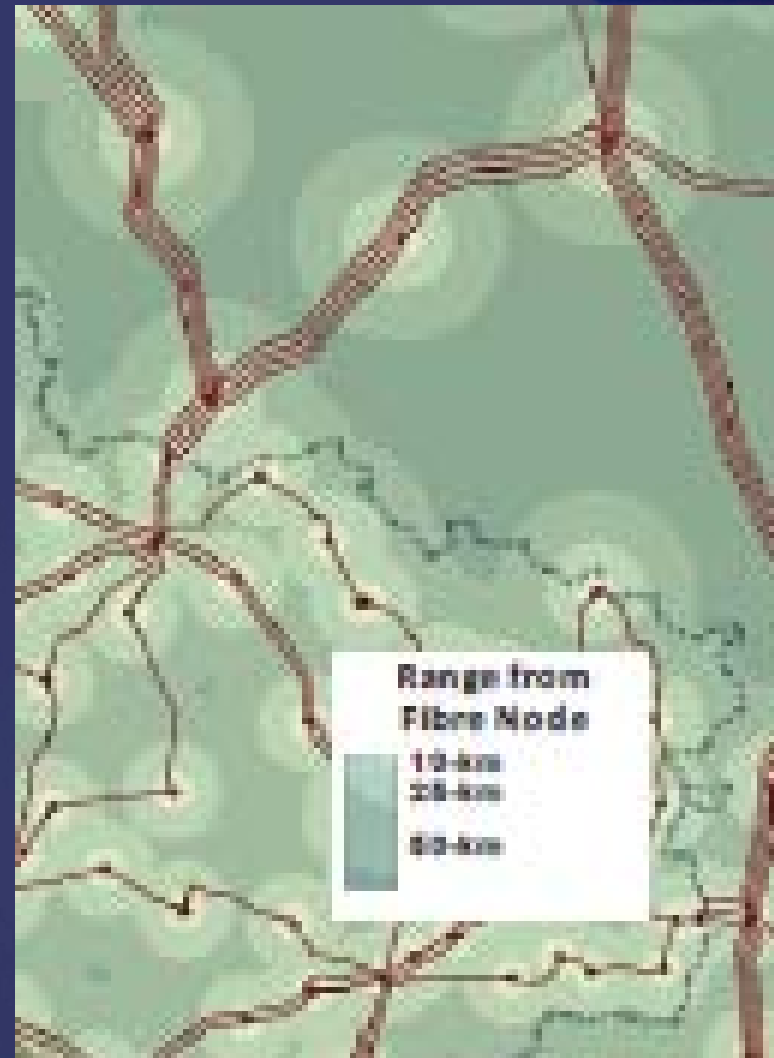
**UNCS Disclaimer:** The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. Final status of the Abyei area is not yet determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

**Sources:** **UN Map base layer** The base map for this infographic is based on the UNmap database of the United Nations Cartographic Section. The UNmap is prepared at a scale of 1:1,000,000. UNmap is being updated on a continuous basis. **Transmission Map data** The data for building the infographic have been collected through: **Primary sources:** Reply to an official request for information (RFI) document has been sent to all Regions outlining the purpose of the project for operators, indicating what level of detail is required, and what format the data is to be published. **Secondary sources:** On average, around 25 to 40% of the data was readily available in the public domain, from operator web-sites, annual reports, company presentations, and presentations at industry conferences. **Partnership:** A number of organizations do already research and produce transmission network maps for particular countries or regions, for various technical reasons. Wherever possible, partnerships with these organizations were established, to seek permission to display their network maps work through the ITU world transmission map. The collection of data as well as their validation from concerned Operators/Administrations is currently a work in progress. The source for the Asian Highway and Trans-Asian Railway networks is the ESCAP Secretariat. **Submarine Cables:** Data concerning submarine cables are provided by TeleGeography. The data for submarine cables displayed in this map are dated 31 March 2014 and it will be constantly updated with new data available at TeleGeography's GitHub account (<https://github.com/telegeography/www.submarinacablemap.com>). For more information: <http://www.submarinacablemap.com>

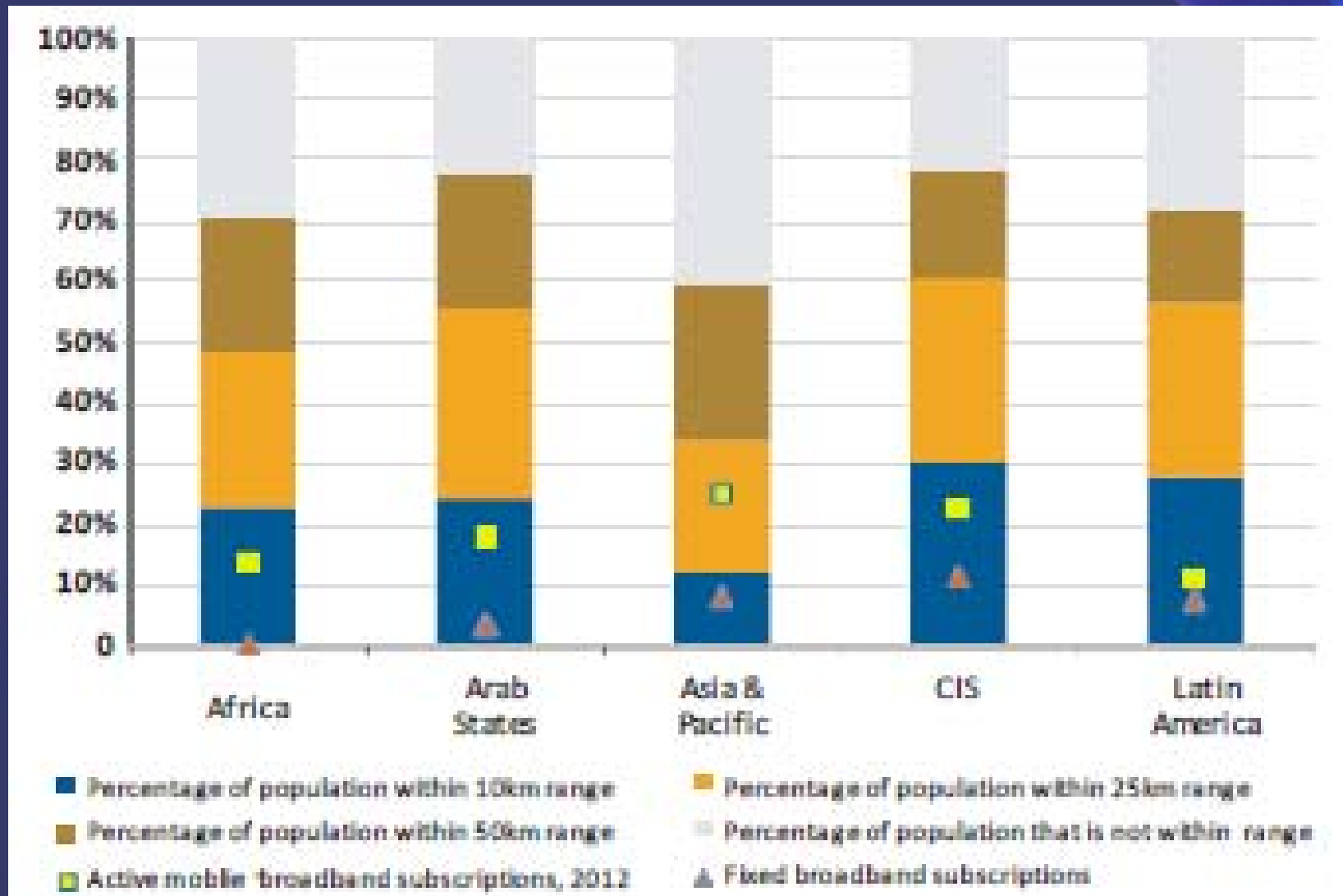
- ITU at [www.itu.int/itu-d/tnd-map-public/](http://www.itu.int/itu-d/tnd-map-public/)

# BDT's Backbone Indicators

- #1: Transmission network length (km)
- #2: Node locations
- #3: Equipment type of terrestrial transmission network
- #4: Network capacity (bit rate)
- #5: Number of optical fibres in the cable
- #6: Operational status of transmission network
- #7a: % population in reach of networks
- #7b: % area within reach of transmission networks



# Population within reach of **Backbone** Nodes



- Chap 1, Trends in Telecommunication Reform report 2013.

## Access Technologies Side by Side

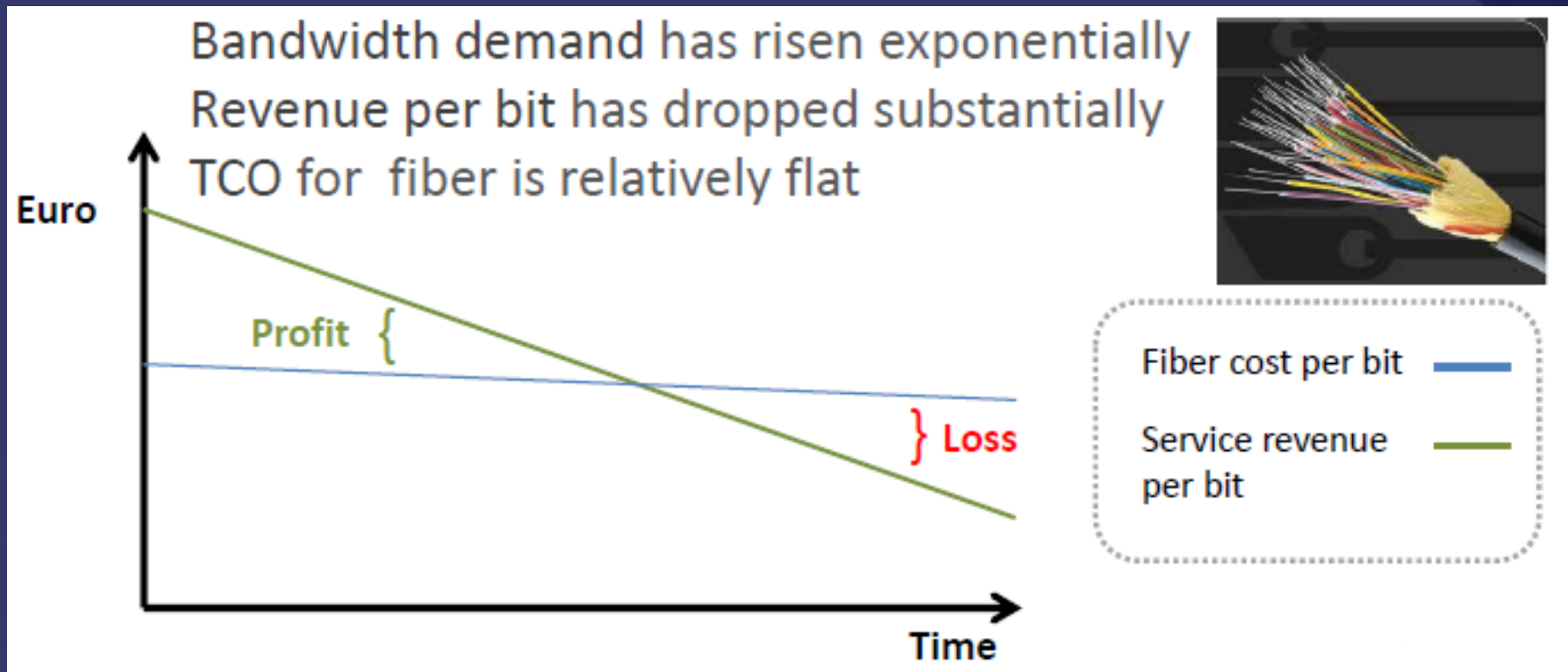
	VDSL2 Vectoring	VDSL2 FTTdp	G.Fast FTTdp	FTTH
<b>DS/US Mbps</b>	200/50	300/50	500/200	2000/1000
<b>Reach</b>	< 500m	< 200 m	< 100 m	~10km
<b>TTM</b>	Today	Today	Future	Today
<b>Relative Capex</b>	Low	Medium	Medium	Very High
<b>CPE Re-use</b>	(Yes)	(Yes)	No	No

- Lantiq.



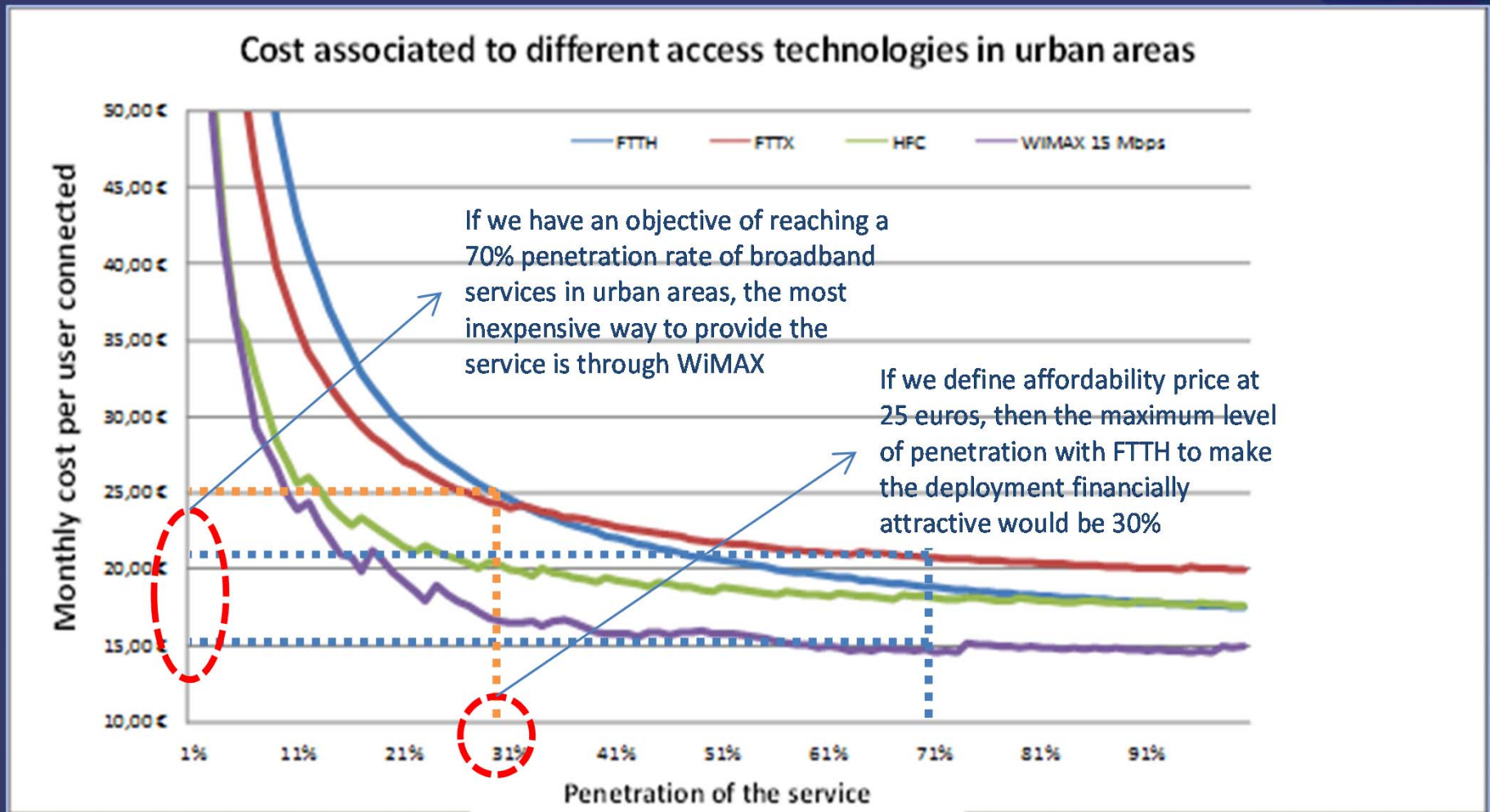
# **Costs versus Changing Revenue Streams**

# Changing Economics from Operator's Viewpoint



- Actelis Networks.

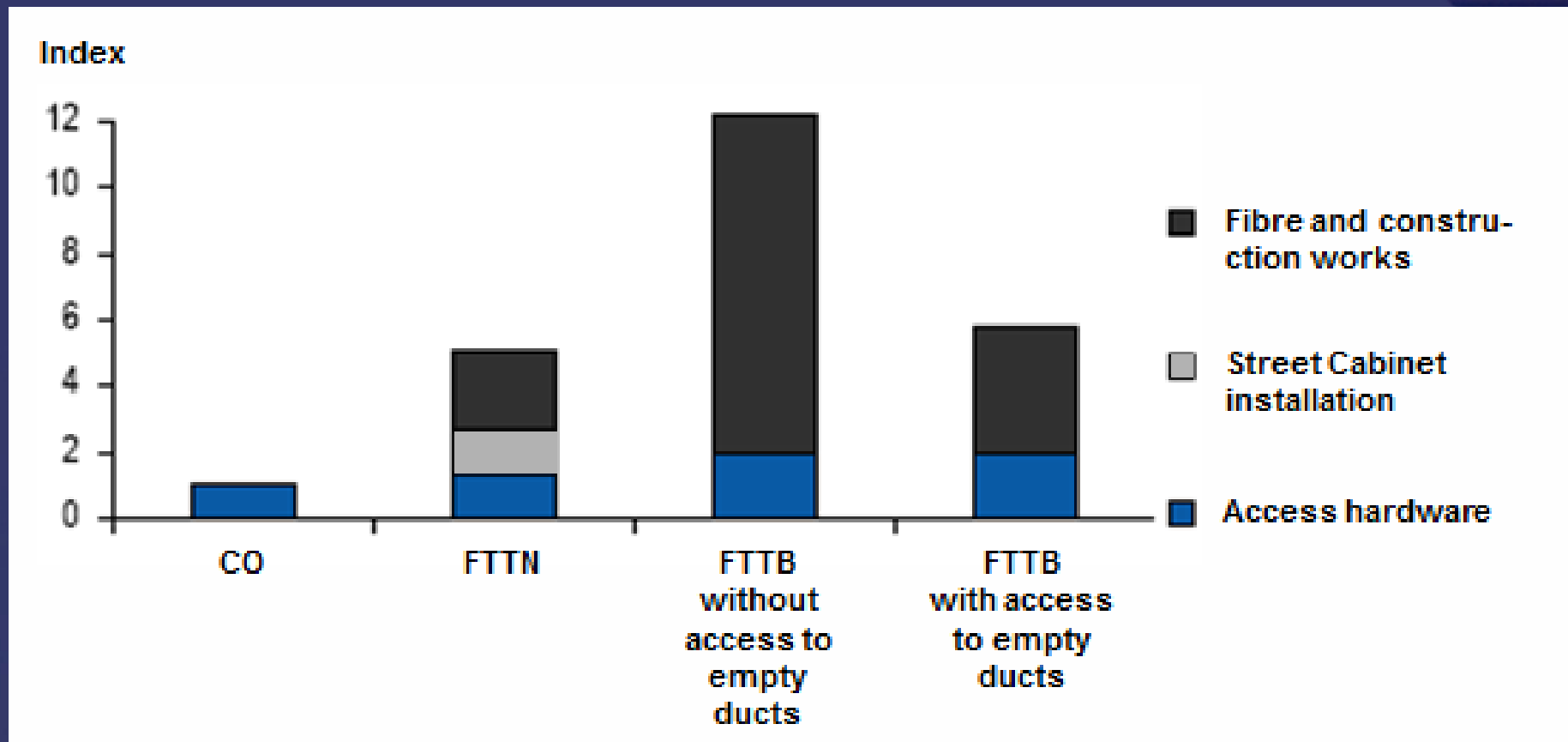
# Costs depend on Objectives



- World Bank.



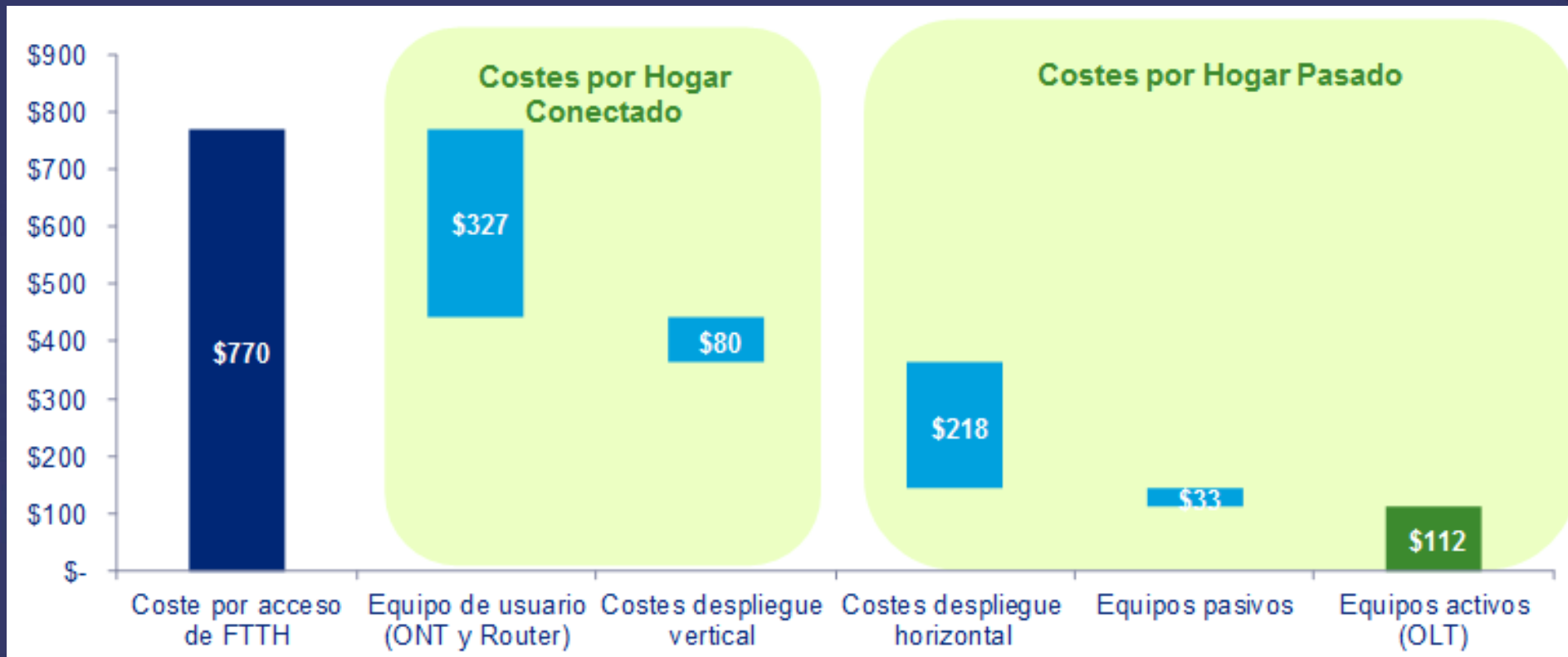
# Majority of fixed broadband costs – civil works



- Alcatel, JP Morgan (2006).

# Cost of FTTH

- Europe - \$2,000-2,500 per household passed.
- Developing country (Bolivia):

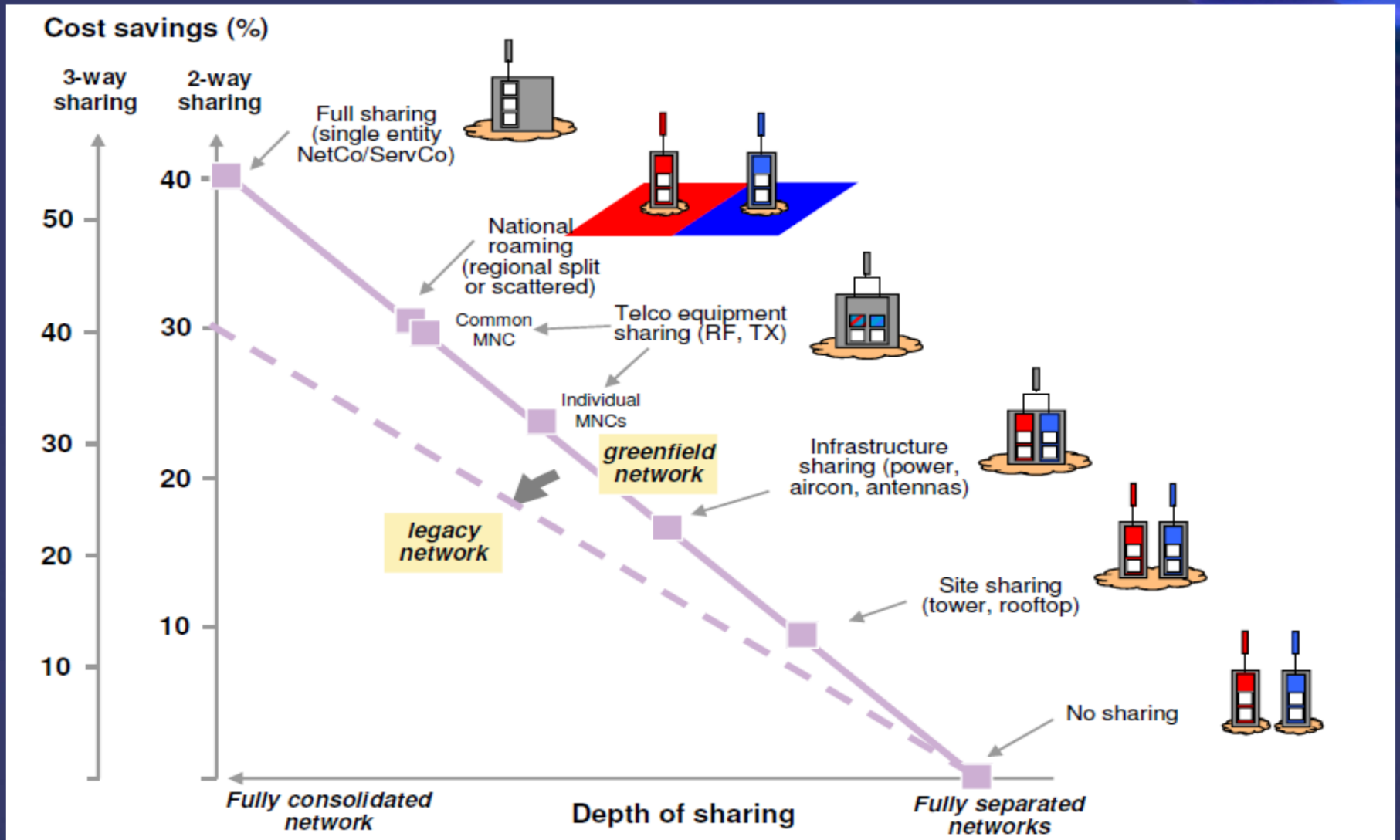


## Estimates of Regional Inv't Needs

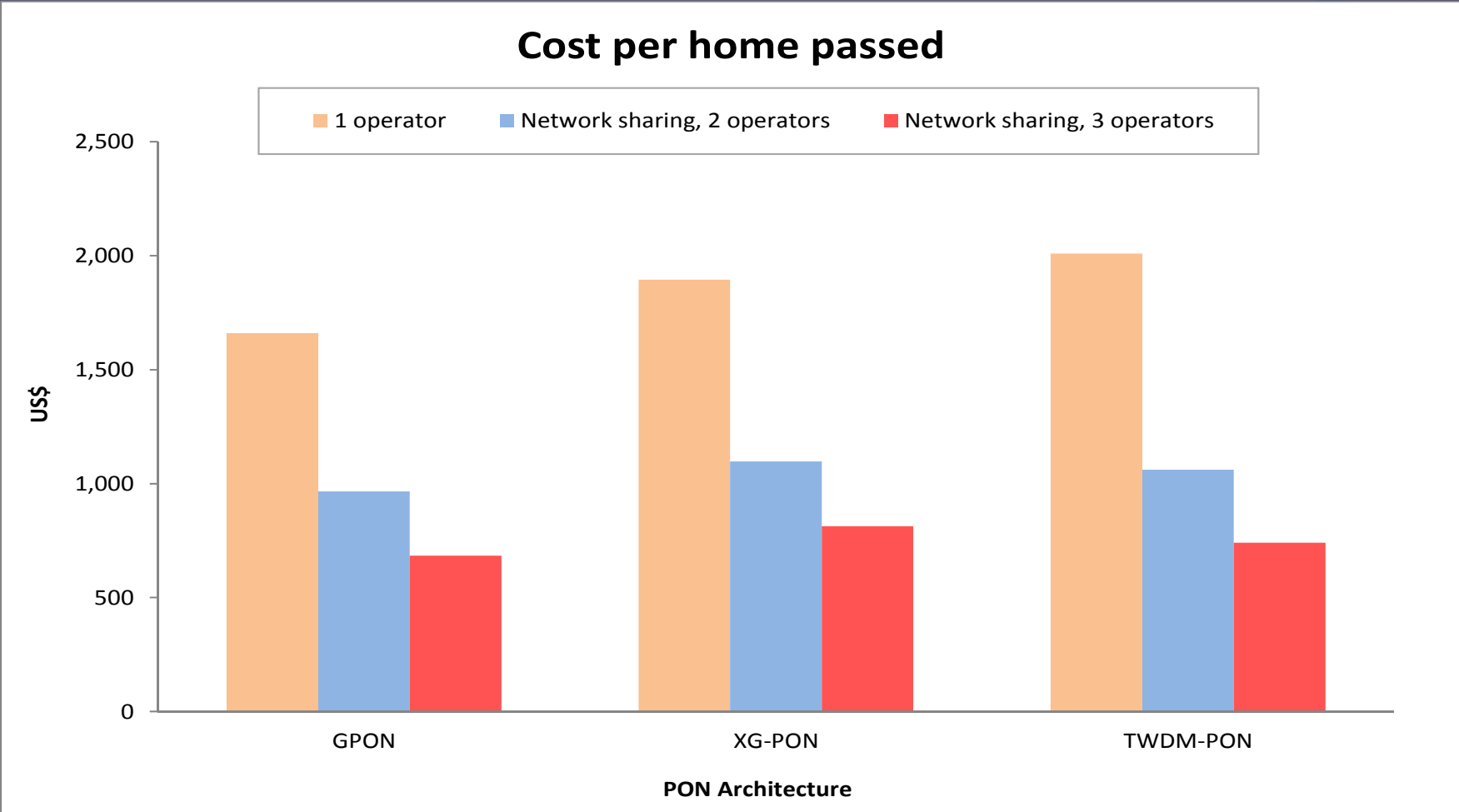
Region/ Country	Amount	Comments	Source
Latin America & Caribbean	US\$ 340 million	Next-generation networks	AHCIET
MENA	EUR 20-25 billion	Estimated for 10 Mbps for 100% of population and 30 Mbps for 50% of population, using a combination of FTTC and LTE technologies.	World Bank
Europe	EUR180- 270 bn	To achieve Digital Agenda targets	EC
Europe	€82 billion	Universal Next- Generation Access	Point Topic

- Report of the WG on Financing & Investment, Sept 2014.

# Infrastructure Sharing (1)

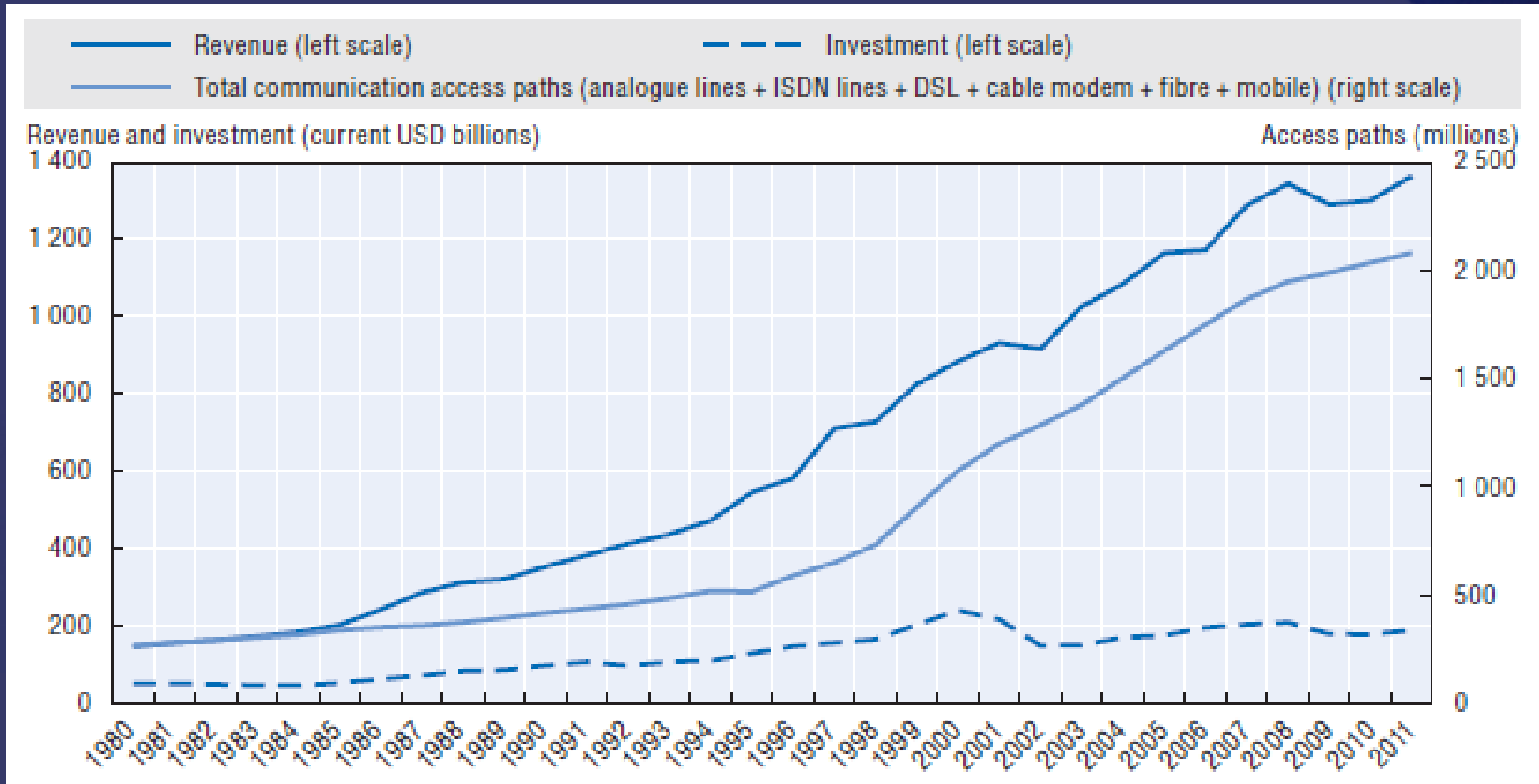


# Infrastructure Sharing (2)



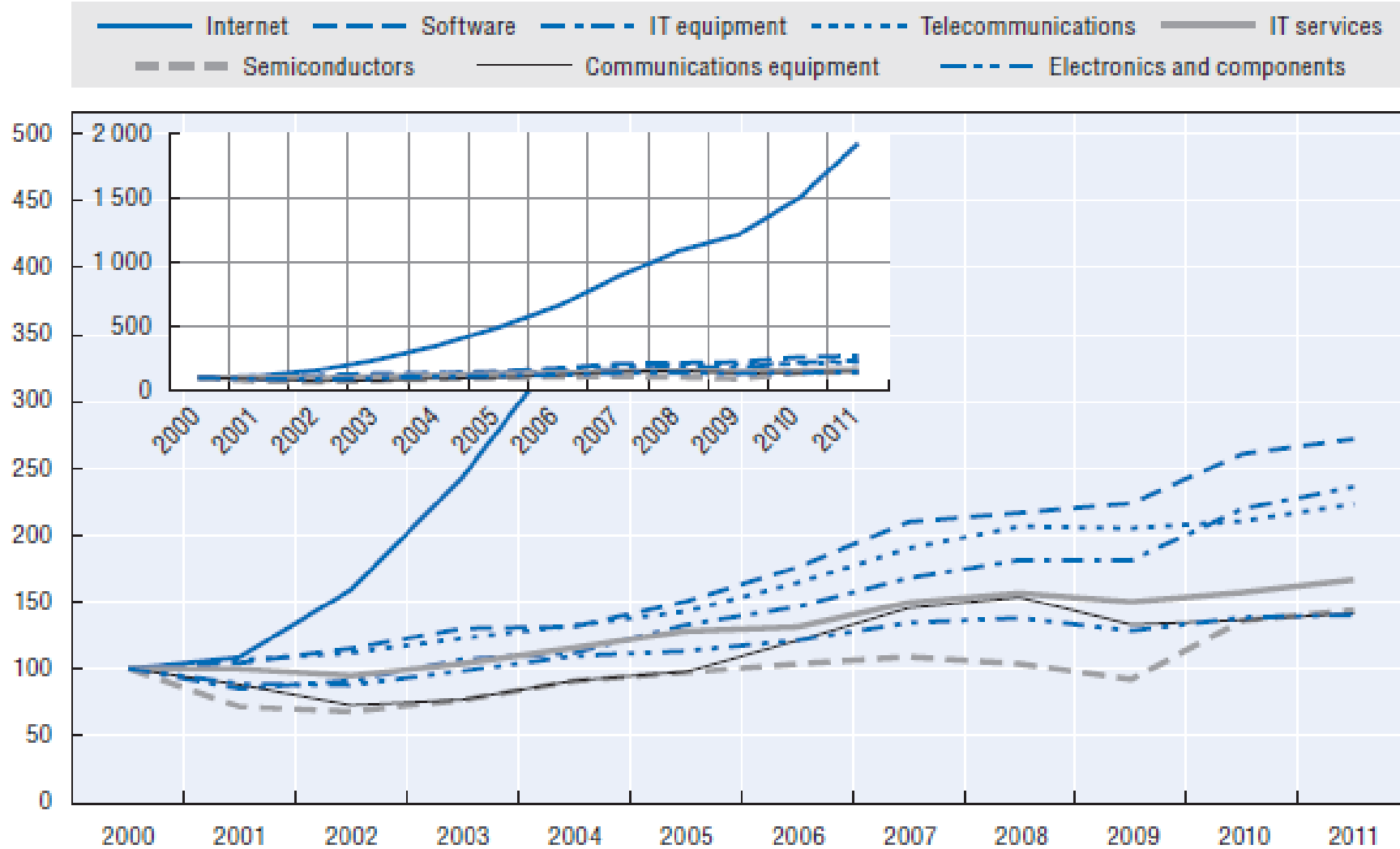
Source: Huawei, Figure 12 in The State of Broadband 2014 report: Broadband for All.

# Access, Revenues & Investment 1980-2011



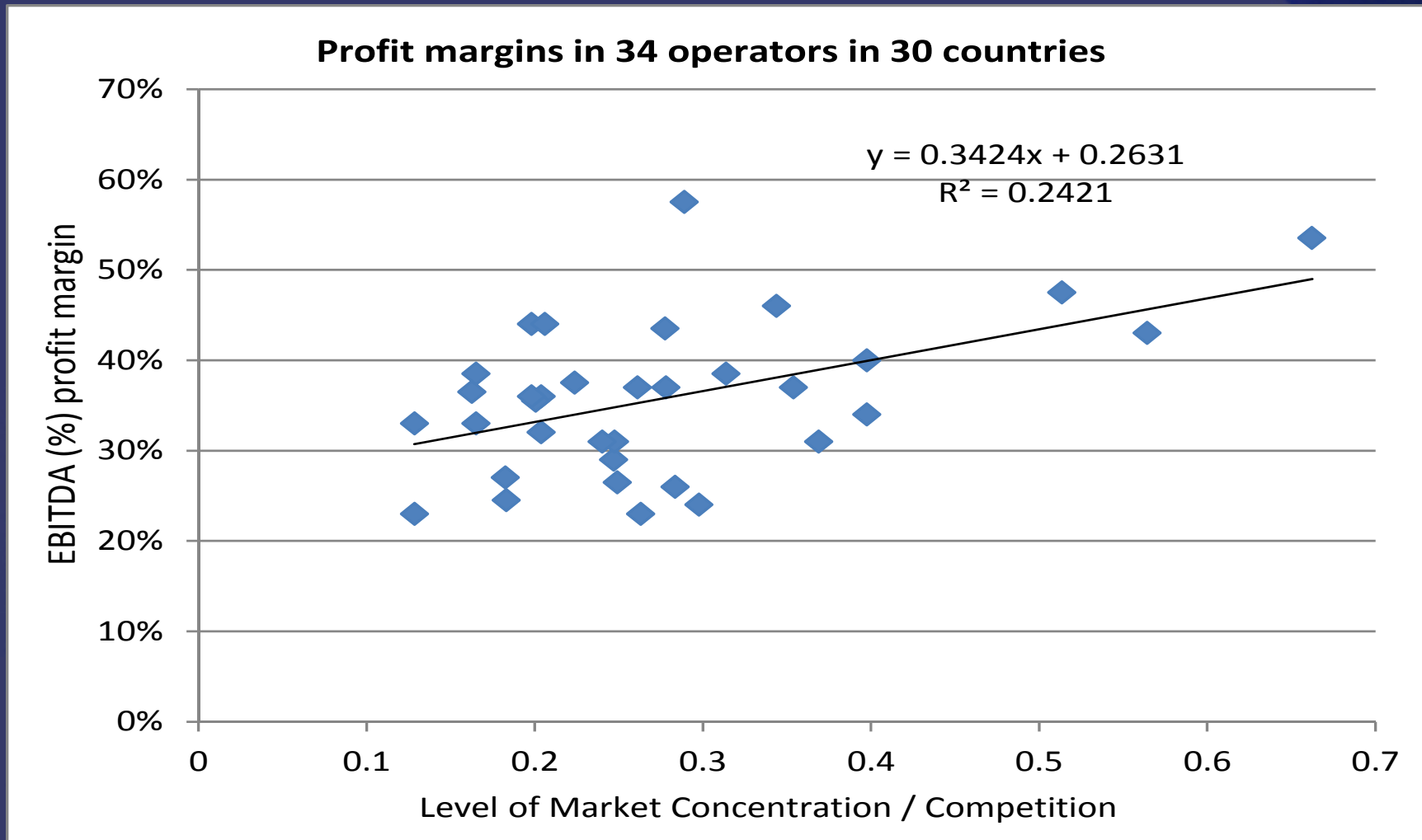
- OECD IT Outlook 2013.

# Revenues, Top 250 ICT Firms, 2000-2011



• OECD.

# Profitability in Competitive Markets

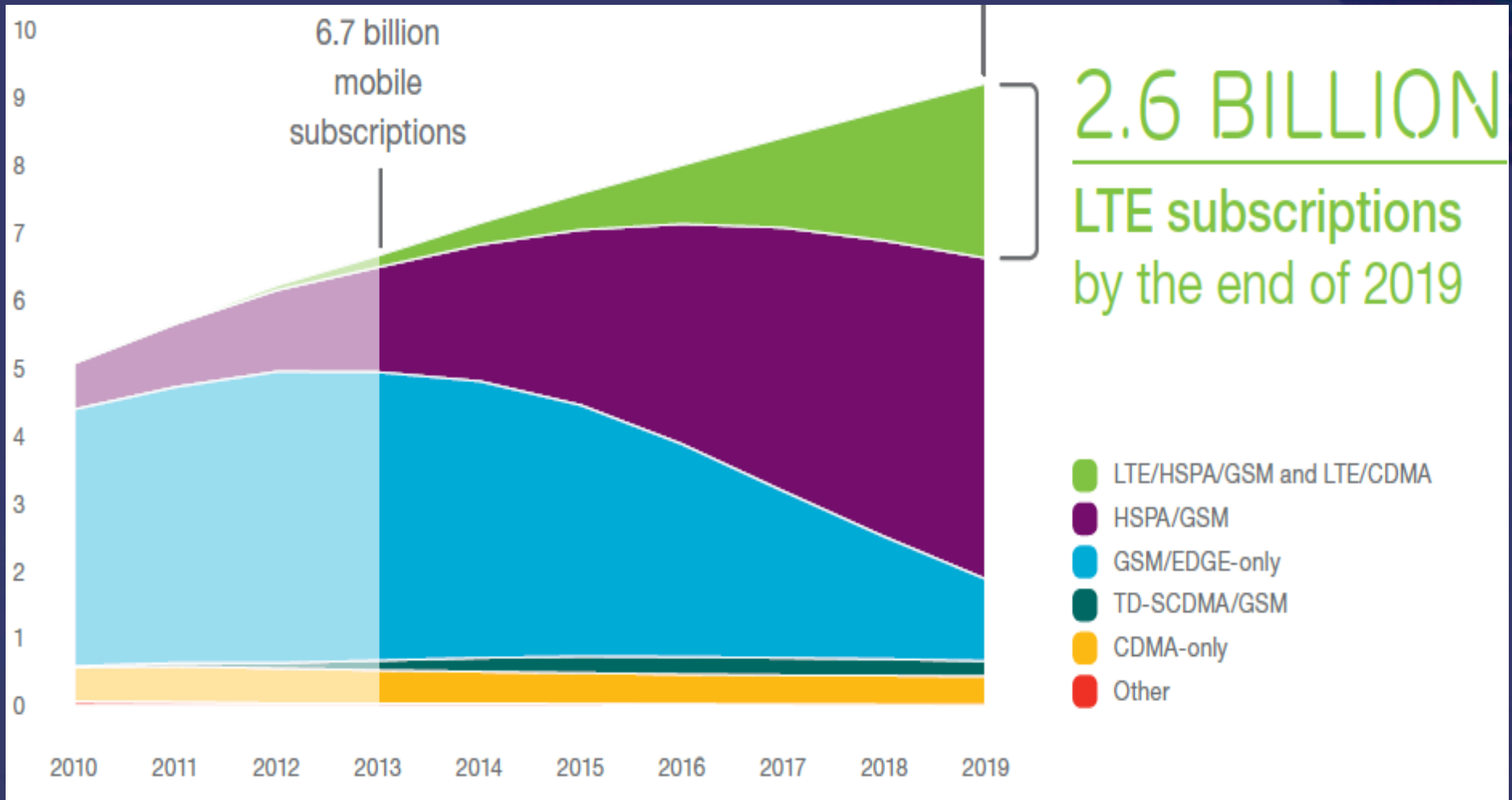






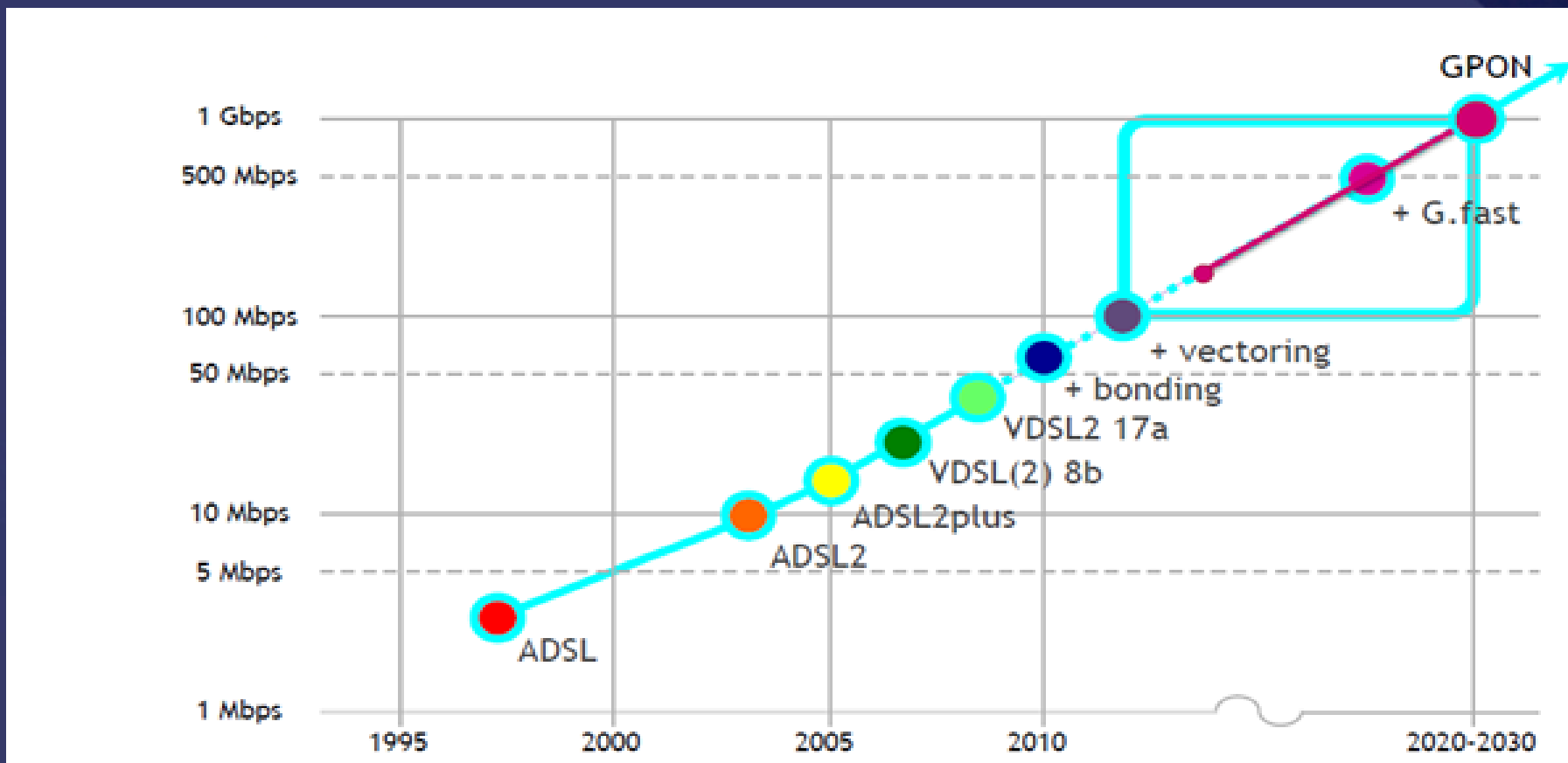
# Speed & Technological Capabilities

# Evolution in Mobile Subscriptions, by tech



- Ericsson Mobility Report, June 2014.

# Growth in Speeds for Copper – bridging the gap between xDSL & fibre speeds



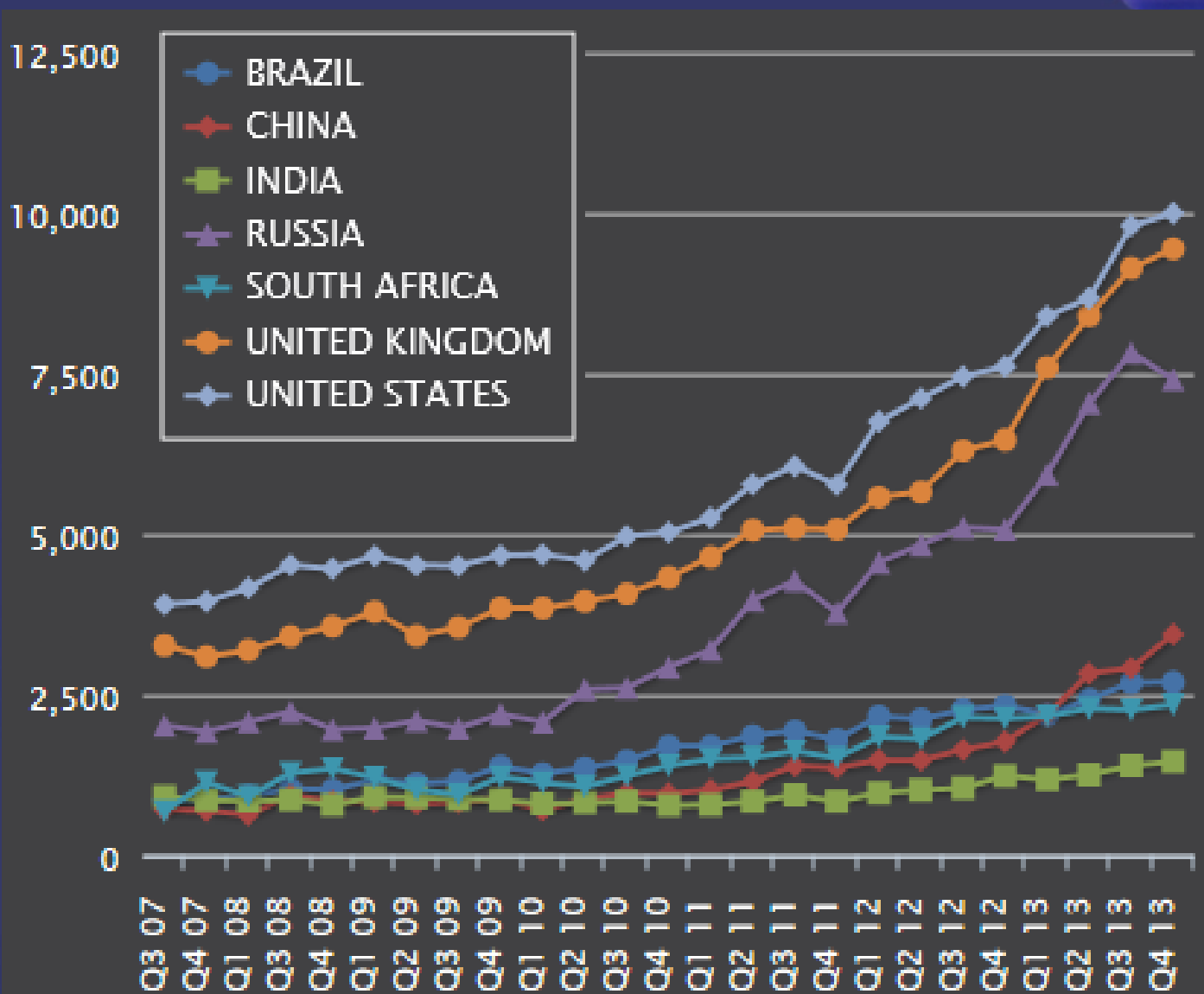
- Alcatel Lucent.

# Boosting Access Speeds – Test Results

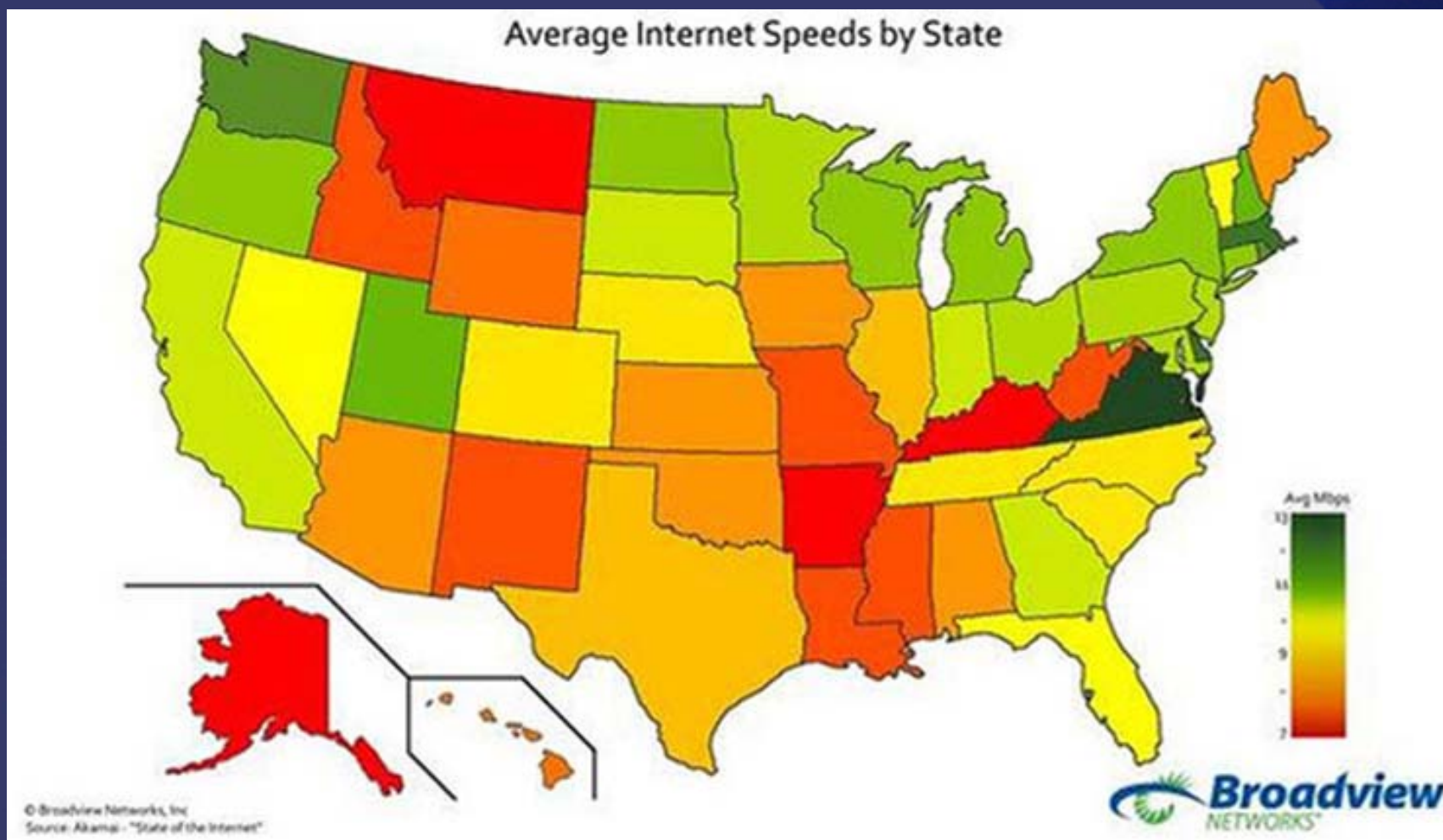
<i>km</i>	Native VDSL2	Delta with VDSL2+ BBA	Delta with VDSL2 + Vectoring	Total bandwidth VDSL2 + BBA + Vectoring
1,8	16 M	7,8 M	11,0 M	➡ 34,8 M
2,1	14.9 M	9,2 M	6,1 M	➡ 30,2 M
2,4	12.6 M	10,7 M	3,0 M	➡ 26,3 M
2,7	9.8 M	8,1 M	3,1 M	➡ 21,0 M
3,0	7.3 M	5,9 M	1,9 M	➡ 15,1 M
3,3	5.8 M	4,8 M	0,2 M	➡ 10,8 M

- Actelis Networks.

# Growth in Average (Fixed) Connection Speeds

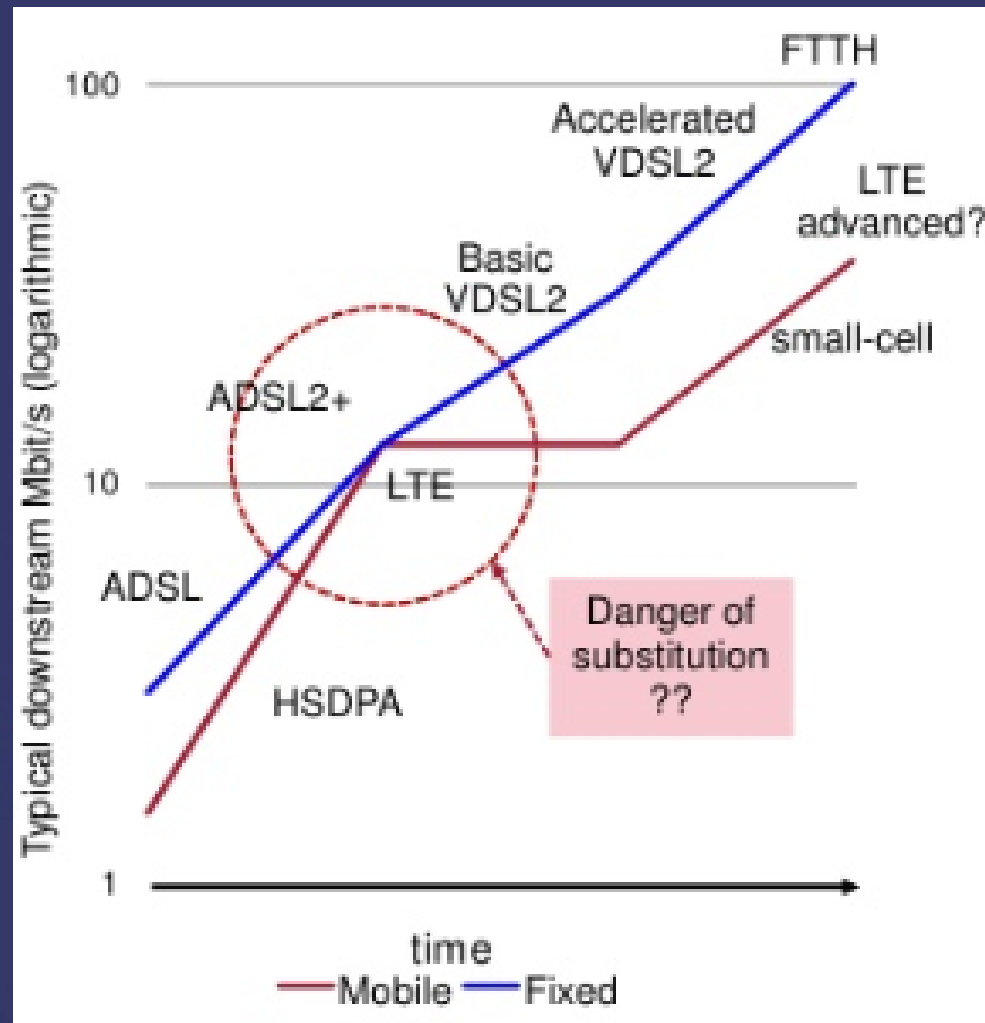


# Average Internet Connection Speeds – U.S.



Broadview, based on Akamai.

# Mobile versus Fixed



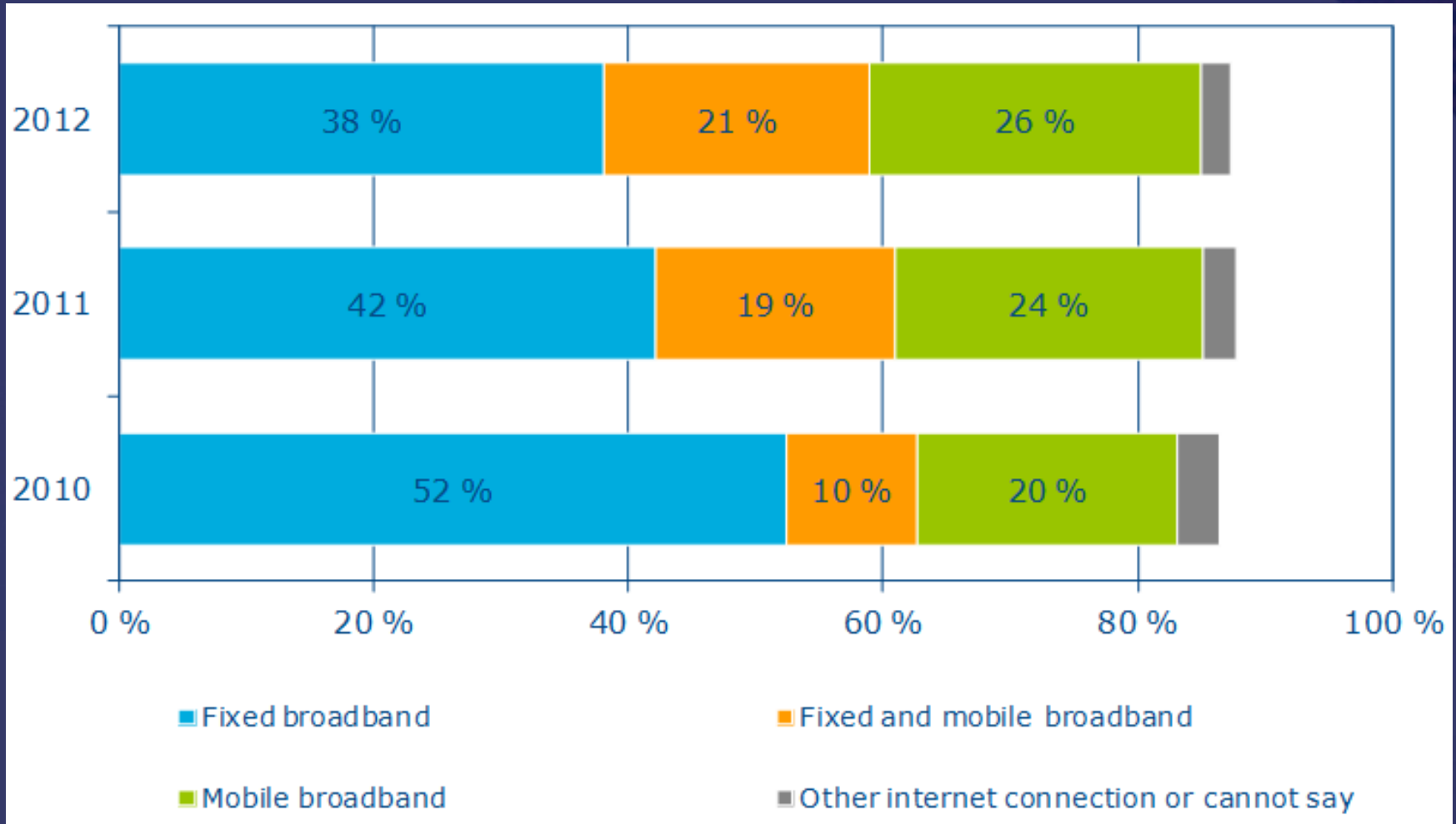
- Analysys Mason.



# Consumer Choices

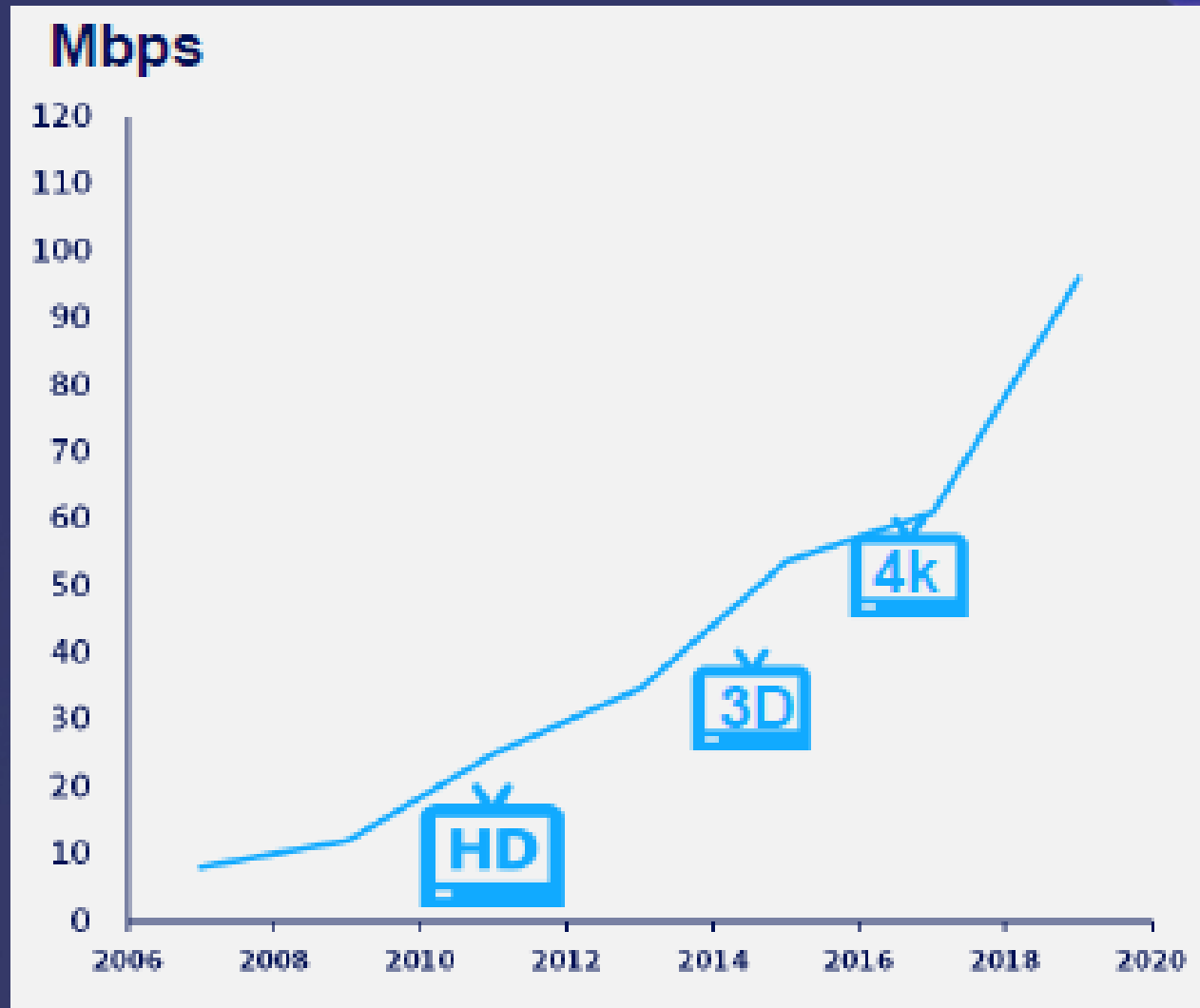


# Fixed/Mobile BB in Finnish Households



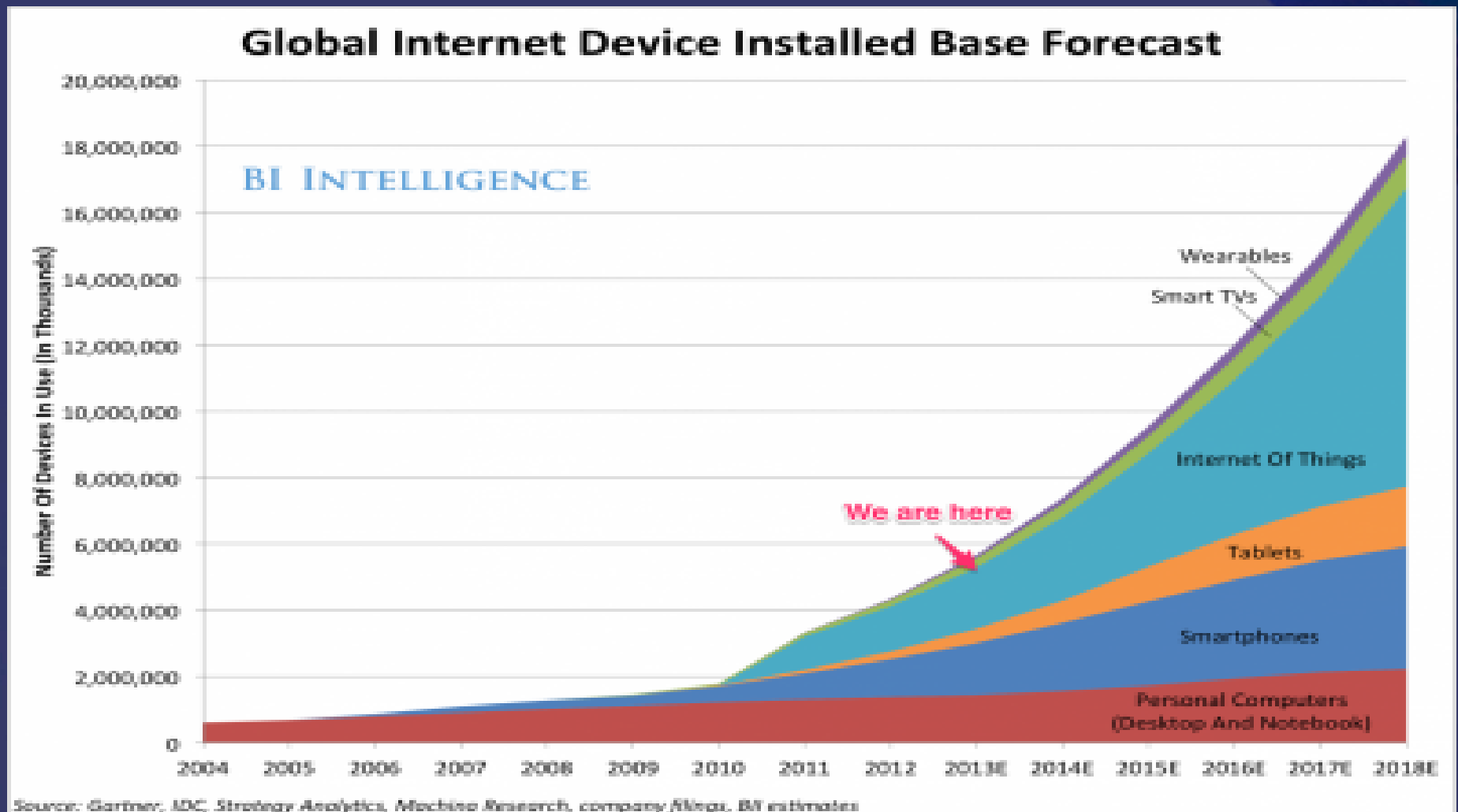
- Finnish Regulatory Authority.

# Changing Customer Expectations



- Swisscom.

# Consumers are becoming more sophisticated



- Business Insider Intelligence.

# The State of Broadband 2014: Broadband for All



Thank you for your attention

# BROADBAND COMMISSION

FOR DIGITAL DEVELOPMENT

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